EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT

FCD 97-06

FINAL STUDY REPORT

VOLUME 1 OF 2

Prepared For

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2801 West Durango Street
Phoenix, Arizona 85009
(602) 506-1501

Prepared By

HNTB

40 North Central Avenue, Suite 300
Phoenix, Arizona 85004

January, 1999
(Revised February, 1999)

HNTB ARCHITECTS ENGINEERS PLANNERS

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February 26, 1999

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Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

RE: East Maricopa Floodway Capacity Assessment
Maricopa County FCD Contract No. 97-06
HNTB Job No. 27559

Subject: Final Study Report Submittal

Dear Joe,

Transmitted herewith are three (3) copies of final study report for the East Maricopa Floodway Capacity Assessment project. In addition, we are also submitting three (3) copies of the half-size Work Study Plan and Profile sheets.

If you have any questions or need additional information regarding the above, please feel free to contact me at 798-7531.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

Enclosures

cc: Tim Murphy - FCDMC
File 27559

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Registered Professional Engineer (Civil) CERTIFICATE NO. 20957 BAILANG SUN Date Signed 2-26-99 ARIZONA, U. S. A.

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(FCD 97-06)

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Registered Professional Engineer (Civil) CERTIFICATE NO. 20937 BAILANG SUN Date Signed 3.3.99 ARIZONA, U. S. A.

1 INTRODUCTION

In August 1997, the Flood Control District of Maricopa County (FCDMC) contracted with HNTB Corporation, under Contract No. FCD 97-06 to provide a capacity assessment for the entire East Maricopa Floodway (EMF), a distance of approximately 27.4 miles (See **Figure 1** for project location).

The EMF is one of the major regional outfalls for the East Valley of the Greater Phoenix Metropolitan Area. It is essential to know if the existing channel can convey the original design flow. In addition, it is desirable to know if there are any problem areas for the existing and future flow conditions, as well as what the estimated bankfull channel capacity is. The capacity assessment consists of the following discharge rate scenarios:

1. The original design 100-year discharges;
2. The future 100-year discharges under the future land use in the watersheds;
3. The existing 100-year discharges under the current land use in the watersheds;
4. The bankfull capacities for the existing EMF channel.

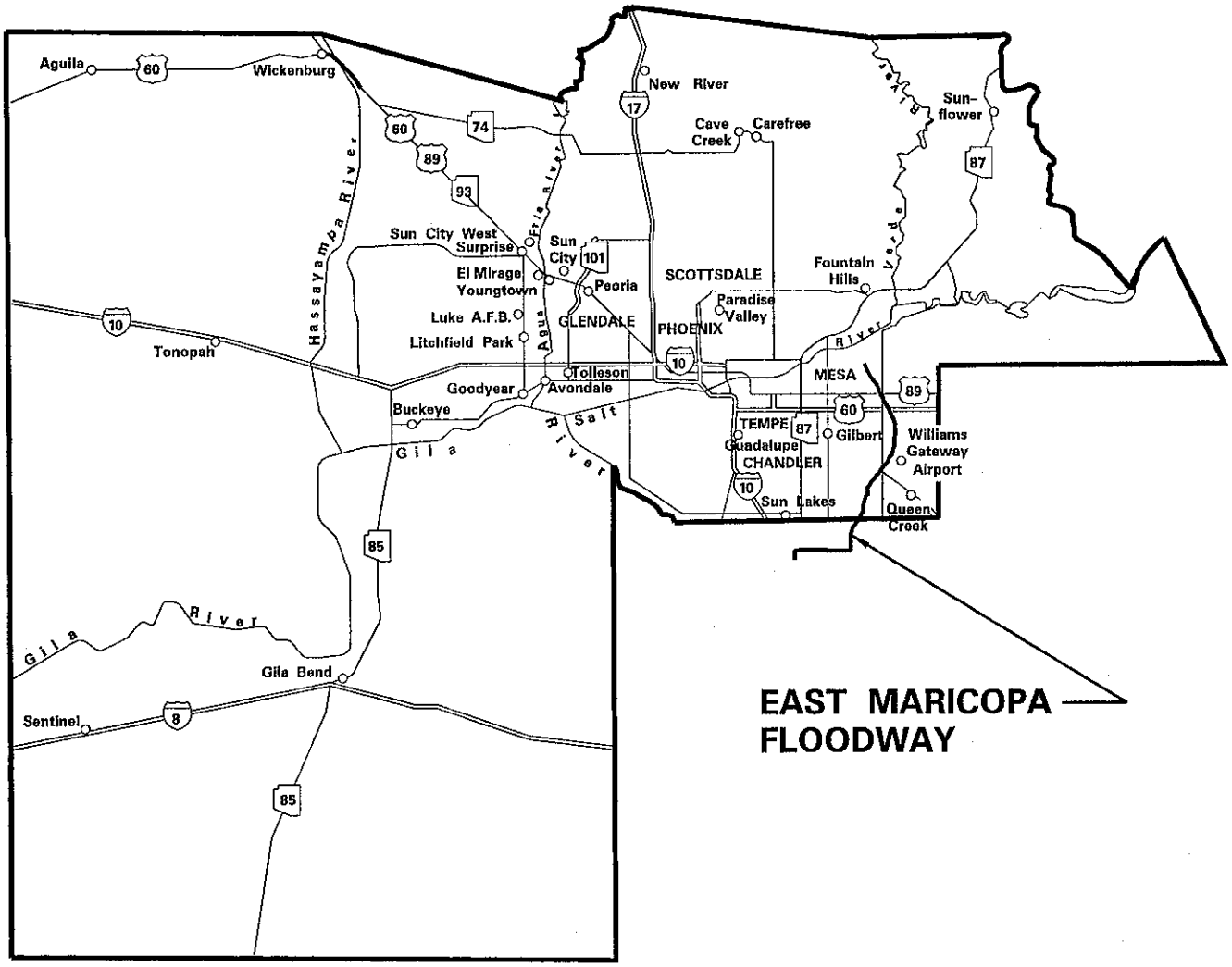
1.1 Purpose of Study

The purpose of this study was to map the entire EMF, and assess its conveyance capacity for three 100-year discharge rates. In addition, the bankfull channel capacity will be estimated. The FCDMC will use the flood profiles, floodplain limits and other pertinent data generated from this study to prioritize any future channel improvements, to provide useful information for flood management, and to regulate proposed development.

1.2 Study Location and Study Reaches

The EMF is a regional floodwater interceptor and conveyance systems for the East Valley. It intercepts floodwaters from three major watersheds including Buckhorn-Mesa, Apache Junction-Gilbert, and the Williams-Chandler Watersheds. These watersheds are located within portions of City of Mesa, Town of Gilbert, City of Chandler, Maricopa County, Pinal County, and the Gila River Indian Community.

The EMF runs parallel to the Roosevelt Water Conservation District (RWCD) irrigation canal from Princess Park north of Brown Road, across Hunt Highway, then southwesterly through Gila River Indian Community into the Gila River. The EMF south terminus is a grouted rip-rap drop structure which connects to an outlet channel to Gila River. Refer to **Figure 1** for the project location map and **Figure 2** for the vicinity map and project limits.



EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT

FIGURE 1
STUDY LOCATION MAP

EAST MARICOPA FLOODWAY
CAPACITY ASSESSMENT

PROJECT NO. FCD 97-06

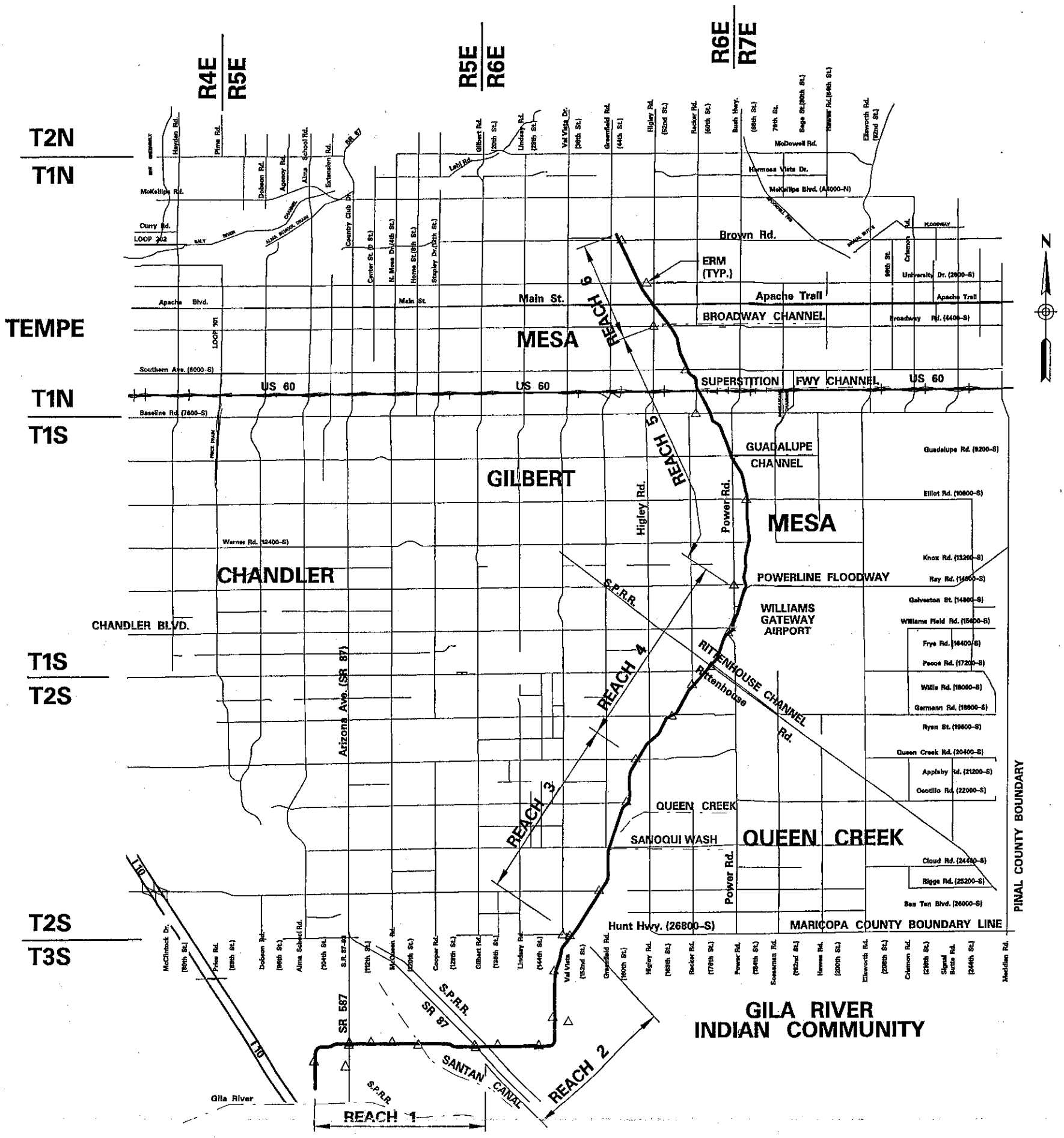


FIGURE 2
VICINITY MAP

The EMF was built between 1980 and 1989 by the Soil Conservation Service (SCS now known as the Natural Resource Conservation Service), which is an agency of the United States Department of Agriculture. Originally, the EMF was known as the RWCD Floodway.

The EMF consists of six (6) reaches. Reaches 1 and 2 located within the Gila River Indian Community, are the two most downstream reaches that were built in 1980 and 1982. Reaches 3 and 4 were built in 1984 and 1986, and extend from Hunt Highway at the Maricopa County line to the Powerline Floodway just north of Williams Gateway Airport. The EMF flows through Leisure World Golf Course and the Superstition Springs Golf Course between Broadway and Guadalupe Roads as a portion of the EMF Reach 5. These two golf courses were developed and are maintained by private parties. The downstream portion of Reach 5 is from Powerline Floodway to Guadalupe Road, and it was built by the SCS. In June of 1989, construction of the last reach (Reach 6) of the EMF was completed. The FCDMC is responsible for the operation and maintenance of the EMF, except for two golf courses located within Reach 5.

1.3 Study Objectives

The objectives of the study are as follows:

1. Provide comprehensive aerial strip mapping, a detailed field survey of existing conditions with cross road structures, and the Hydrologic Information System (HIS) data preparation.
2. Develop the HEC-RAS models to determine the existing channel performance for three 100-year discharge rates, which are for the original design, future land use and existing land use conditions.
3. Prepare Work Study Plan and Profile sheets to show flood profiles and floodplain limits.
4. Identify capacity inadequacy and determine the bankfull channel capacity.

The goal of this study is to determine the channel performance under three (3) different discharge rate scenarios, and to estimate the bankfull channel capacity. It was not the intent of this study to conduct a flood insurance study, or to evaluate the scour and erosion problems.

1.4 Authority of Study

This study was performed for the FCDMC under Contract Number FCD 97-06. Tim Murphy and Joe Tram managed the study for the FCDMC. The study was conducted by HNTB Corporation in association with B. Gary Sun.

2 STUDY SCOPE AND LIMITS

2.1 Scope of Study

The scope of this study is to determine the conveyance capacity of the EMF for three (3) different 100-year discharge rates. These discharge rates were provided by the FCDMC based on three scenarios. These scenarios consist of: (1) the original design, (2) future land use, and (3) the existing land use conditions for the contributing watersheds. Hydraulic models are to be developed in the HEC-RAS model formats.

Final deliverables include this report with the results from the HEC-RAS computer models; 9" X 9" contact prints of the aerial stereo photographs; topographic maps at a scale of 1 inch =100 feet; complete survey notes book; work study plan and profile sheets at a scale of 1 inch =100 feet; and digital data coverage consistent with the FCDMC's Hydrologic Information System.

Originally, only two discharge rates for the design and future discharge values were to be considered in the hydraulic assessment. With the bankfull capacity values being estimated from the results of the two previous HEC-RAS models. In addition, the models were to extend a minimum of 500 feet upstream each of the seven (7) tributaries in order to model the tributary side inflow. However, the HEC-RAS models for the discharge rates for the existing land use conditions were added to the scope through Change Order No. 1. Since the FCDMC provided flow discharges did not specify the tributary side flows, the analysis of the seven tributaries was deleted from the study. In addition, the sheet size for the work study plan and profile was changed from 24" X 36" to 30" X 42" to allow better topographic coverage and result presentation. Copies of completed scope of work and Change Order No. 1 are located in **Appendix A**.

2.2 Study Reach Characteristics

The EMF is divided into six (6) reaches from the downstream end at Gila River (Reach 1) to the upstream end at Princess Park (Reach 6). Reaches 1 and 2 were built within the rights-of-way obtained from the Gila River Indian Community. The RWCD Canal runs directly west of the EMF from Reach 4 through the upstream end of Reach 6. Any flow overtopping the RWCD Canal will drain to the west or the southwest, and will not flow back into the EMF.

In general, the EMF is a trapezoidal earthen channel except for two concrete-lined channel segments and riprap protection at bends or structures. The trapezoidal earthen channel in the downstream reaches is approximately 200 feet wide, and ranges in depth from eight to twelve feet. One of the concrete-lined channel segments is located between Powerline Floodway and Power Road just south of Williams Field Road. The other concrete-lined segment is located in Reach 2, between the future Val Vista Drive alignment and just east of Southern Pacific Railroad and State Highway 87.

The EMF has seven (7) major tributaries and they are Broadway Channel, Superstition Freeway Channel, Guadalupe Channel, Powerline Floodway, Rittenhouse Channel, Queen Creek, and Sanoqui Wash. It has 23 major roadway cross structures, grade control structures, weir structures at Guadalupe and Chandler Heights Roads, numerous side inlets and spillways, and a grouted riprap drop structure to an outlet channel into the Gila River. The existing channel capacity is controlled by the capacity of the bridges and culverts conveying floodwater under the roadways. Flows in excess of the bridges and culverts capacities will flood the upstream area, and escape the EMF by overtopping the roadways and heading southward and/or westward.

Reaches 1 and 2 are located in Pinal County, and extend from the Gila River near Gila Butte to Hunt Highway at the Maricopa County line, a distance of approximately 9 miles. No development exists along the EMF within these two reaches except at State Route 587 where there are residential homes present. A siphon for the Santan Canal transects the Reach 1 channel. Reach 2 has a rectangular concrete-lined channel, that is approximately 3,400 feet long, and 68 feet wide. Reach 2 intercepts the floodwaters from Santan Mountains located east of the EMF.

Reach 3 is approximately 4.5 miles long, and is from Hunt Highway to Queen Creek Road. Two tributaries, Queen Creek and Sanoqui Wash, join the EMF just north of Chandler Heights Road. An energy dissipator drop structure exists at the upstream side of Chandler Heights Road. There is a sediment basin to intercept the Queen Creek flow before it discharges into the EMF through a spillway and an outlet pipe. The land uses adjacent to this reach are predominately oriented towards agricultural uses. There are only a few residences located along this reach.

Reach 4 extends from Queen Creek Road to the Powerline Floodway, and it is approximately 4.9 miles in length. Just north of Southern Pacific Railroad (SPRR) and Rittenhouse Road, the Rittenhouse Channel joins the EMF via a weir structure. The Powerline Floodway joins the EMF at the upstream end of this reach. A Low Drop Structure with an impact wall is located just north of Germann Road. The EMF becomes a concrete-lined channel immediately downstream of Powerline Floodway, and ends at Power Road (a distance of approximately 1.2 miles). Williams Golf Club golf course is located just east of the EMF between the Powerline Floodway and Williams Field Road. The adjacent land uses along this reach are vacant land and open areas, residential development, and some commercial businesses. A Dairy Farm is located at Queen Creek Road.

Reach 5 runs from Powerline Floodway to approximately 1,100 feet south of Broadway Road. Reach 5 is approximately 6.4 miles long, and there are two golf courses in the northern portion of the reach. These two golf courses are Leisure World and Superstition Springs golf courses. They were built by the developers and are privately maintained. The FCDMC, however, does have the authority to periodically do inspections for flood management purpose. A weir structure is located just upstream of Guadalupe Road. The Broadway Channel flows into the EMF via an outlet pipe at the upstream end of this reach. Two other tributaries for this reach are Superstition Freeway Channel and the Guadalupe Channel. Land use in the north portion of the reach is fully developed urban area, while land use in the south portion of the reach is primarily open space and vacant land.

Reach 6 extends from Broadway Road to Princess Park, a distance of approximately 2.6 miles. Princess Park is the northern terminus of the EMF, and is located approximately 680 feet north of Brown Road. A head structure with an outlet pipe at Princess Park is the upstream end of the EMF. The area along this reach is a full-developed urban area.

2.3 Existing EMF Conditions and Problem Areas

The existing EMF has experienced severe bank erosion, siltation build-up and isolated ponding areas. The SCS undertook a major repair work to the existing bank slopes in 1995. The riprap bank slopes were constructed from west of the Reach 2 concrete lined channel through Reach 1 to the Gila River. Gravel mulch was used on the Reach 3 bank slopes to enhance erosion protection.

Siltation build-up is another major problem for Reaches 1, 2 and 3. The sources of siltation are from the Queen Creek, Santan Mountains, and farm lands. Queen Creek does not have enough capacity to carry the 100-year flow. In the 1991 flood, Queen Creek dumped approximately 100,000 cubic yards of siltation into the sediment basin and the EMF. The overflow from Queen Creek entered the EMF via sheet flow between Queen Creek and Chandler Heights Roads. The sediment basin and the EMF had approximately 6 to 8 feet of siltation. The existing bar (interceptor) ditches do not have enough capacity to carry incoming off-site flows to the designated spillways. The undercutting and erosion of these bar ditches and channel bank slopes have generated a lot more siltation into the EMF.

There are at least three ponding areas which are fed by irrigation tailwater. These areas are located at Brown Road (**Photos #1 & #2** in **Appendix B**), south of Chandler Heights Road (**Photos #23 & #24**), and Hunt Highway (**Photo #27**). Brown Road has irrigation water from the Princess Park draining into the EMF, and a tailwater ditch at the south of Brown Road. A tailwater ditch exists at the south side of Chandler Heights Road. The Hunt Highway is the southern terminus for the RWCD Canal, and tailwater can flow into the EMF here. These ponding areas become a wetland and have a dense brush in the channel as high as 4 to 5 feet tall. Since they are always wet, no maintenance and trimming work can be done to these areas.

Based on analyses the EMF does not provide adequate capacity for the existing 100-year flood event. For the original designed flows, the EMF appears to have the conveyance capacity for the 100-year flood event.

3 TECHNICAL DATA

3.1 Survey and Mapping

Horizontal and vertical control surveys were conducted in 1997 by Project Engineering Consultants, Ltd. (PEC). In addition, PEC also provided the as-built data for each of the 23 bridges and culverts. At each bridge or culvert, cross sections were taken at the upstream and downstream face of the structure. The cross section field data was used in the HEC-RAS models for the bridge and culvert hydraulic analyses.

Topographic mapping was developed in a strip format from north of Brown Road to the Gila River. Because the incoming flows are predominately from the east side, the strip mapping covers approximately 1,000 feet on the east side of EMF and 500 feet on the west side. The mapping for this study was developed by Aerial Mapping Company, Inc. (AMCI), at a scale of 1 inch = 100 feet and with 2-foot contours. This mapping was based on field survey data provided by the PEC. Horizontal control uses Arizona State Plane Coordinates based on the 1983 North American Datum. Vertical elevations are based on the National Geodetic Vertical Datum of 1929. Two separate flight dates were made for the study.

The first flight date for the portion of the mapping within Maricopa County was flown on October 1, 1997. The second flight was made on November 22 1997, and covers the mapping within the Gila River Indian Community. The digital terrain models (DTMs) were developed from the survey and mapping.

3.2 Data Collection

Data were collected from a number of sources including the FCDMC, the Arizona Department of Transportation, and two (2) field reconnaissance trips. The data collected from these sources provided the base information needed to perform this study.

The FCDMC provided the majority of data used in this study. This data included the as-built plans for all six (6) reaches, bridges and culverts.

3.3 Discharge Rates

FCDMC provided the original design discharges which the NRCS used for the design of the EMF. Design discharges for the EMF range from 900 cfs at Brown Road to 8,700 cfs south of Hunt Highway. Due to the watershed sizes, it was concluded that the 100-year 24 hour duration discharge values were determined to be the peak flows for the EMF. In addition, 100-year discharges were provided by FCDMC for the future and existing land used conditions. These discharges were generated by the FCDMC Hydrology Branch, and are generally higher than the design discharges. **Figure 3** shows the 100-year discharge rates provided by the FCDMC based on the results of their June 1998 hydrologic models.

EMF Capacity Study
Design and Estimated Flows

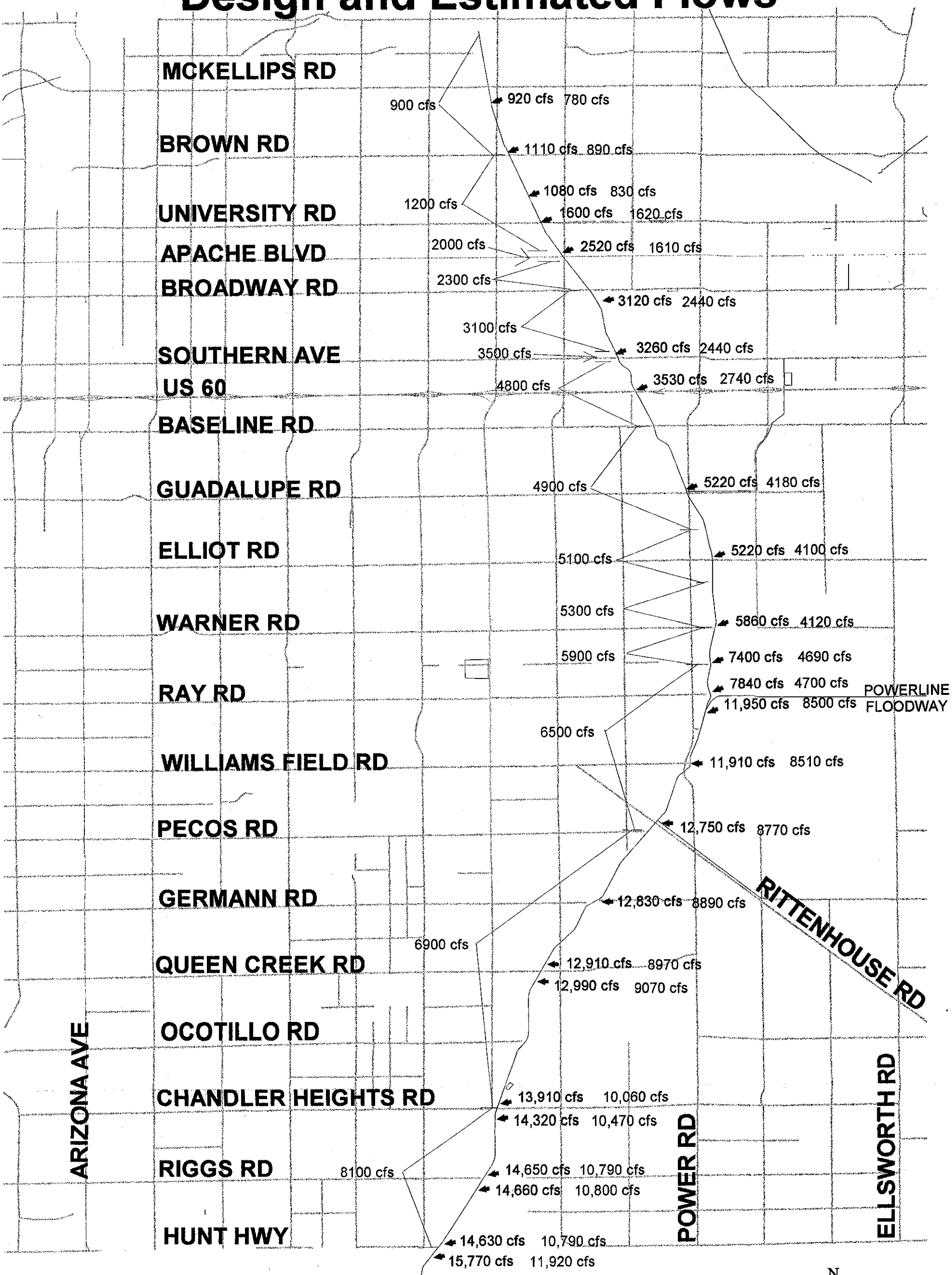


FIGURE 3
SUMMARY OF DISCHARGE RATES

4 HYDRAULIC ASSESSMENT

4.1 Field Reconnaissance

Several field reconnaissance trips were made to the EMF reaches. Two field reconnaissance trips were conducted with the FCDMC on October 7 and October 15, 1997 to observe the existing channel and floodplain conditions, problem areas, possible overflow areas, and incoming flow locations. These reconnaissance trips included discussion of the estimation of Manning's "n" values, and examination of the existing drainage structures, levees and photographic documentation of the floodway characteristics. The filed reconnaissance report is included in **Part 2** of **Appendix B**.

4.2 Hydraulic Modeling and Assumptions

The hydraulic modeling was performed using the U.S. Army Corps of Engineers' HEC-RAS computer program, Version 2.1, dated October 1997, as implemented by Haestad Methods, Inc. (**Reference 1**). Three 100-year discharge rates were provided by the FCDMC, and they are the 100-year flows for the original design conditions, and future and existing land use conditions.

As far as the hydraulic modeling of the EMF is concerned, this study has focused on:

- Developing HEC-RAS models for each of six (6) reaches with three discharge rates.
- Assessing the channel capacities for all six (6) reaches.
- Delineating floodplain boundaries for all three discharge rates*.
- Preparing the work study plan and profile sheets for all six (6) reaches.
- Estimating the bankfull capacities from the results of the HEC-RAS models.

* Occasionally the floodplain boundary was beyond the mapping limits. When this happened the floodplain boundary was considered to stop at the mapping limits.

Each HEC-RAS model was developed to run all three discharge rates because the study intent is to assess the channel capacity not a floodplain insurance study. Therefore, some assumptions made to the HEC-RAS modeling were as follows:

- All overflows and spilt flows will return to the EMF channel.
- The HEC-RAS parameters were set to accommodate the highest discharge rates.
- All levees and dikes are hydraulically sound structures and will resist the 100-year flood even with the overtopping flows.

4.3 Parameter Estimates

4.3.1 Manning's Roughness Coefficients

Manning's roughness coefficients, or "n" values, are determined using procedures adopted by the FCDMC (**References 2 to 5**). In addition, the following materials were used to support the analysis:

- Aerial Photographs: 1:7,200 contact prints prepared by Aerial Mapping Company, Inc. in 1997 used for the base mapping of study area.
- Site Photographs: Color ground photographs taken during field reconnaissance trips.
- As-Built Plans: Construction as-built plans for the EMF channel, bridges and culverts.
- The results of the FCDMC's work done at streamflow stations at Queen Creek Road and SR-587.

The Manning's "n" values were determined based on the results of field observations, FCDMC streamflow station work and engineering judgment. **Part 2** of Appendix **B** presents the Manning's "n" value determination report for this study, which includes a detailed description of the Manning's n values estimation with site photographs.

4.3.2 Contraction and Expansion Coefficients

For most of the study reaches, the contraction and expansion coefficients were selected as the default values of 0.1 and 0.3, respectively. The values were increased to 0.3 and 0.5 at the bridges, culvert and the drop structures.

4.4 Cross Section Description

HEC-RAS cross sections were spaced approximately every 500 feet along the thalweg, unless intermediate sections were required at bridges, culverts and drop structures. The cross section number was labeled according to distance in miles along the thalweg from the downstream end of the EMF. The basis of cross section labeling for the EMF is Mile 0.000 at the top of grouted riprap drop structure to an outlet channel to Gila River.

The thalweg was established along the approximately hydraulic centerline or low point of each study reach. As-built plans of all six (6) reaches of the EMF were used to layout the thalweg. The bearings and curve data from these as-built plans were used to the maximum extent possible for setting up the thalweg. The bridges, culverts and major drainage structures were used to tie down the alignment. Some adjustments were made to best fit the existing conditions. It should be noted that the stationing in feet is from the north to the south end of the EMF on these as-built plans. For this study, the stationing is in river miles and increases from the south end to the north end. Several stationing equations were used for the six reaches because they were built in phases between 1980 and 1989. Since there are no as-built plans available for the Leisure World and Superstition Springs Golf Courses, the thalweg was established based on the topographic maps and engineering judgement.

Each cross section was oriented such that it is normal to the direction of flow across the entire channel and floodplain. Cross sections were bent or doglegged as required. Each cross section's geometric data covered at least the entire 100-year floodplain, except along the RWCD canal. Cross sections along the RWCD canal were only taken up to the canal bank, because any floodwater that overtops the canal bank will not return to the EMF. The channel length was determined by the distance along the thalweg. The overbank length was determined based on the distance between sections measuring through the centroid of the overbank areas.

The location of cross sections and the alignment of channel hydraulic centerline were submitted and reviewed by the FCDMC. Adjustments were made per the FCDMC's review comments. Cross Section stationing is from left to right looking downstream with the thalweg (hydraulic centerline) at Station 5,000. Additional cross sectional data were obtained from field surveys and as-built plans for the bridges, culverts, and drop structures.

Cross section geometric data for this study were generated from topographic maps and DTMs made in 1997 by Aerial Mapping Company, Inc. The topographic maps for the study reaches were furnished with a scale of 1" = 100' and contour intervals of 2'. Intergraph's InRoads program was utilized to generate the cross sectional data in HEC-2 format using the DTMs. These HEC-2 data sets were then imported into the HEC-RAS models.

Locations of cross sections used in the hydraulic assessment are shown on **Part 3 – Work Study Plan and Profile Sheets** (half size sheets) in **Appendix C** under a separate cover. A total of 435 cross sections were taken to develop the HEC-RAS models for all six (6) reaches of the EMF. Cross section plots are included in **Part 2** of **Appendix C** in Volume 2 of 2. These plots show the three water surface elevations, Manning's "n" values, bridge geometry, effective flow areas, and obstructions, if applicable.

4.5 Modeling Considerations

This study was to assess the existing floodway capacities for three different scenarios and determine the bankfull capacity. Since the study was not a flood insurance study, floodway boundaries and flood hazard zones for insurance application were not determined. Following is a summary of the HEC-RAS modeling work that included in the scope of work:

- Flood profiles and floodplains delineation with three discharge rates for each of the six (6) reaches.
- Bankfull capacity using the rating curves generated from three flood profiles.

The HEC-RAS models, however, were not set up to:

- Conduct a flood insurance study.
- Perform floodway and flood zone determination.
- Determine tributary hydraulics.
- Analyze split flows.
- Provide recommendations of channel modifications or improvement alternatives.
- Determine velocities for use in scour calculations.

4.5.1 Study Reaches

A total of six (6) HEC-RAS models were developed, and each model covers one EMF reach. Each HEC-RAS model computes multiple profiles with three discharge rates. The critical depth at the top of grouted riprap drop structure (at Mile 0.000) was used as the starting water surface elevation in Reach 1. The computed water surface elevations for the three profiles at the upstream end of Reach 1 were used as the starting water surface elevations for Reach 2. This process was continued from downstream to upstream, until all six models were completed.

Table 1 shows the locations of discharge concentration points for the three discharge rates, and the HEC-RAS cross section number where the discharge changes.

In **Table 1**, discharge rates are the same for Reach 1 and Reach 2. In general, the discharge rate for the existing land use conditions is largest of the three discharge values. The original design discharge rate usually is the smallest value.

4.5.2 Bridges, Culverts and Other Obstructions

There are 23 bridges and culverts in the six (6) reaches of the EMF. In addition, other obstructions in the EMF include weir, drop structures, and energy dissipators. These obstructions create some constriction to the floodwaters. The contraction and expansion coefficients were increased at these locations to account for the increased energy losses that occur at these constrictions.

Additional cross sections were added to the upstream and downstream ends of these bridges, culverts, weirs, drop structures and energy dissipators. Due to the concern of the accuracy of the DTM (surfaces) at culverts and under bridges, field survey cross section data was used in the HEC-RAS models. First, the EMF thalweg was related to the cross section data by using the topographic maps and as-built plans for the dimensions of piers, abutments, and culvert walls. The horizontal stationing was manually adjusted for the skewed structures before entering the data into HEC-RAS models.

Table 1
Summary of 100-Year Peak Discharges

HEC-RAS Cross Section Number	Location Description	100-Year Peak Discharges (cfs)		
		Design Conditions	Future Conditions	Existing Conditions
27.390	Upstream End at Princess Park	900	780	920
27.278	Just North of Brown Road	900	890	1,110
27.189	Just South of Brown Road	1,200	890	1,110
26.385	Power Transmission Line Inlet	1,200	830	1,080
26.187	Just North of University Drive	1,200	1,620	1,600
25.598	Just North of Apache Boulevard	2,000	1,610	2,520
25.400	Just South of Apache Boulevard	2,300	1,610	2,520
24.723	Broadway Channel S. of Broadway	3,100	2,440	3,120
23.827	Just North of Southern Avenue	3,500	2,440	3,260
23.758	Just South of Southern Avenue	4,800	2,440	3,260
23.219	Superstition Channel N. of US 60	4,800	2,740	3,530
22.615	Just North of Baseline Road	4,900	2,740	3,530
21.282	Guadalupe Channel S. of Guadalupe Rd.	4,900	4,180	5,220
20.799	0.5 Miles South of Guadalupe Road	5,100	4,180	5,220
20.353	North of Elliot Road	5,100	4,100	5,220
19.541	0.25 Miles N. of Warner Road Alignment	5,300	4,100	5,220
19.298	North of Warner Road Alignment	5,900	4,120	5,860
18.970	0.5 Miles S. of Warner Road Alignment	6,500	4,690	7,400
18.345	North of Powerline Floodway	6,500	4,700	7,840
18.237	South of Powerline Floodway	6,500	8,500	11,950
17.170	S. of Inlet and S. of Williams Field Road	6,500	8,510	11,910
16.251	N. of SPRR & S. of Rittenhouse Channel	6,500	8,770	12,750
16.000	At Pecos Road	6,900	8,770	12,750
14.637	At Germann Road Alignment	6,900	8,890	12,830
13.471	North of Queen Creek Road	6,900	8,970	12,910
13.374	South of Queen Creek Road	6,900	9,070	12,990
11.260	North of Chandler Heights Road	6,900	10,060	13,910
11.231	South of Chandler Heights Road	8,100	10,470	14,320
10.441	North of Riggs Road	8,100	10,790	14,650
10.171	Downstream of Inlet at Riggs Road	8,100	10,800	14,660
9.036	Upstream of Inlet at Hunt Highway	8,100	10,790	14,630
9.018	Hunt Highway (County Line)	8,700	11,920	15,770
0.000	Downstream End at Drop Structure	8,700	11,920	15,770

4.5.3 Ineffective Flow Areas

Horizontal ineffective flow areas were coded out using the Ineffective Flow Area option of HEC-RAS. This option was used to eliminate isolated low areas and to model contraction (1H:1V) and expansion (4H:1V) of the flow in the vicinity of the bridges, culverts, and drop structures. This option was also applied to the overbank areas where the water is not actively being conveyed.

Several iterations of the HEC-RAS models were performed to identify the horizontal ineffective flow areas, and obtain a smooth transition of the flow.

4.5.4 Levee and Blocked Obstruction Options

The levee option was used on the cross sections to define the existing levees or the elevations that no water can go to the overbank areas. The levee option was implemented to the cross section set to see what effect a levee will have on the water surface, especially for Reaches 1 to 4. Since there are three discharge rates, the levee elevations were set to model the highest discharge rate at a given cross section.

The block obstruction option was used to define locally depressed areas in the floodplain that will be permanently blocked out. This option was implemented on the overbank areas where small streams, detention ponds, and depressed areas exist. This option was used simultaneously with the levee option. It is crucial to utilize this option to block out the overbank flow area where it is equal to or greater than the channel flow area when the overbank flow occurs.

4.5.5 Model Refinement

No calibration was made to the results of the HEC-RAS modeling due to lack of the observed hydraulic data for the EMF reaches. However, model refinements were made in order to obtain reasonable results. The effort concentrated on the verification of critical input parameters for HEC-RAS models. The verification was accomplished by examining the key output variables which may affect the accuracy of the results. These key variables include computed water surface elevation, top width, velocity, flow distribution, energy slope, and any warning messages. In addition, topographic maps, aerial photographs and field observations were utilized to verify the results.

The initial floodplain boundaries were plotted on topographic maps. Cross section and computed flood profiles were also plotted and reviewed. In addition, ineffective flow areas, ponding areas, and obstructions were identified on topographic maps. Dramatic changes of any key variables between cross sections were carefully examined. These parameters include overbank reach length, contraction and expansion coefficients, and ineffective area parameters. The results of the output analysis were incorporated into the HEC-RAS models by revising the input parameters.

4.6 Special Problems and Solutions

4.6.1 Leisure World and Superstition Springs Golf Courses

Problem:

Since the Leisure World and Superstition Springs Golf Courses were built by the developer, it was difficult to set the thalweg through these golf courses without the as-built plans. Several revisions were made to determine the floodway flowline, especially through the lake systems. One segment of the channel through the Superstition Springs Golf Course is lower than the downstream channel. It is located at just upstream of Guadalupe Road Bridge from River Miles 21.42 to 21.71.

Solution:

The cross section geometric data were taken based on the water surface elevations through the lake systems. Some of the cross section orientations were modified after the initial HEC-RAS model runs. Channel divided flows occurred between River Miles 24.1 and 23.911. The channel segment with a lower invert than the downstream segment, was identified on the profile.

Since the FCDMC does not have the maintenance responsibility on these golf courses, a higher Manning's "n" value of 0.045 was used in HEC-RAS models for this study. For a normal well-maintained golf course, a value of 0.035 might be used.

4.6.2 The RWCD Canal

Problem:

The RWCD Canal is a physical barrier to the floodwater that overtops the EMF, and it was not considered a hydraulic feature to carry floodwater. The floodwaters will pond between the Canal and EMF until it overtops the Canal bank. From the initial HEC-RAS model runs, the overland flows were calculated in the Canal channels as well as its low depressed overbank areas. It appears that the floodwater will not return to the EMF if the water surface exceeds the Canal bank elevation because the breakout flows will flow into other watersheds. When this situation occurs, HEC-RAS shows the warning message "vertical extensions at cross section end points".

Solution:

The cross section geometric data were revised to set the right end station at the top of the Canal left banks (i.e.; the Canal channel was not included in cross section data). Therefore, no flow will be calculated beyond the Canal left bank if the overtopping flow occurs. The levee option was used if the water surface elevation was close to the Canal left bank elevation. There are breakouts in Reaches 3, 4 and 5 where the flows overtop the Canal banks.

4.6.3 Small Stream and Pond on Floodplain

Problem:

There are several well-defined small streams and detention ponds in the overbank areas. It appears that these small streams and detention ponds will carry a fair amount of the floodwaters when overland flow occurs. In reality, the overland flow will be a shallow, wide-spread sheet flow.

Solution:

The levee and blocked obstruction options were used in the cross sections that contain a well-defined small stream in the overbank area. The blocked obstruction option blocks out the area of the stream channel or pond, which gives a more realistic result. These small streams and ponds exist at Cross Sections 15.483 (Reach 4), 15.414, 14.191, 13.755 (Reach 4), and 4.669 (Reach 2). In addition, the blocked obstruction option was used to block out a great portion of the low depressed overbank areas in Reach 1. This was done on Cross Sections 4.142, 4.080, 1.734, 1.693, 1.545, 1.476 and 1.386 because the overland flow is spread out over a wide and flat area.

5 FINAL RESULTS

5.1 Hydraulic Assessment Results

HEC-RAS models were developed to perform multiple profile computations for three discharge rates. These discharge rates were provided by FCDMC and they are the 100-year flows for the original design conditions, and future and existing land use conditions. HEC-RAS model outputs are included in **Part 1** of **Appendix C** in Volume 2 of 2. Water surface profiles and cross section plots are included in **Part 2** of **Appendix C** in Volume 2 of 2.

In review of the HEC-RAS model results, the existing EMF channel can convey the original design discharges with a couple of minor breakouts. One of the breakouts occurs in the concrete-lined channel portion of Reach 2 between River Miles 5.80 and 5.95. However, this breakout will not occur if supercritical flow conditions are maintained in this part of the channel. Another breakout occurs in the Reach 5 left overbank area just south of Elliot Road Bridge between River Miles 19.4 and 20.3. However, the overbank flow is inside the 6 to 8 feet high levee.

For the discharge rates for the future land use conditions, the existing EMF channel does not have the capacity except within Reaches 4, 5 and 6. Since the discharge values are highest for the existing land use conditions, the existing EMF channel does not have the conveyance capacity except from north of Elliot Road in Reach 5 (River Mile 20.5) to the upstream end.

Two golf courses (Leisure World and Superstition Springs) in Reach 5 provide adequate conveyance capacity for all three discharge rates.

For the purposed this study no reductions were made to the discharges because of flow that was lost by overtopping in the right overbank. This approach allowed downstream capacity problems to be identified.

The following is a more detailed reach-by-reach discussion (from upstream reaches to downstream reaches) on the results of hydraulic assessment:

Reach 6 (Mile 24.723 to Mile 27.390, 54 Cross Sections, Sheet Nos. 46 to 50):

A. **Discharge Rates for the Design Conditions:** The existing channel has the conveyance capacity in this reach.
B. **Discharge Rates for the Future Land Use Conditions:** The existing channel has the conveyance capacity in this reach.
C. **Discharge Rates for the Existing Land Use Conditions:** The existing channel has the conveyance capacity, except in the left overbank area north of Brown Road.

Reach 5 (Mile 18.345 to Mile 24.723, 93 Cross Sections, Sheet Nos. 34 to 45):

A. **Discharge Rates for the Design Conditions:** The existing channel has the conveyance capacity except in the left overbank area just south of Elliot Road Bridge between River Miles 19.4 and 20.3. However, the left overbank flow is inside the 6 to 8 feet high levee. The levee is located at the left overbank between River Mile 19.40 and south of Elliot Road (Mile 20.3).

B. **Discharge Rates for the Future Land Use Conditions:** The existing channel has the conveyance capacity except in the left overbank area just south of Elliot Road Bridge between River Miles 19.4 and 20.3.

C. **Discharge Rates for the Existing Land Use Conditions:** The existing channel has the conveyance capacity, especially in the segment south of River Mile 19.4. The RWCD Canal will contain almost all the overbank flows. However, a breakout occurs at Cross Section 18.782, and the flow overtops the Canal bank. The two golf courses have adequate conveyance capacity.

Reach 4 (Mile 13.471 to Mile 18.345, 61 Cross Sections, Sheet Nos. 25 to 34):

A. **Discharge Rates for the Design Conditions:** The existing channel has the conveyance capacity for this reach.

B. **Discharge Rates for the Future Land Use Conditions:** The existing channel has the conveyance capacity except in the segment of the concrete-lined channel just north of Williams Field Road. A breakout to the left overbank area occurs at Williams Gateway Golf Course because the concrete-lined channel between River Miles 17.50 and 17.75 cannot contain the floodwaters. The RWCD canal will contain all the overbank flows.

C. **Discharge Rates for the Existing Land Use Conditions:** The existing channel does not have the conveyance capacity, especially on the left banks. However, the RWCD canal will contain most of the overbank flows. Two breakouts occur at Cross Sections 14.926 and 14.764, and the flows overtop the RWCD Canal.

Reach 3 (Mile 9.001 to Mile 13.471, 75 Cross Sections, Sheet Nos. 17 to 25):

A. **Discharge Rates for the Design Conditions:** The existing channel has the conveyance capacity within this reach.

B. **Discharge Rates for the Future Land Use Conditions:** The existing channel has the conveyance capacity from the energy dissipator north of Chandler Heights Road Bridge (Mile 11.321) to the upstream end of this reach at Queen Creek Road Bridge. Some minor breakouts occur in the downstream portion of the reach south of Chandler Heights Road Bridge. It appears that all the overbank flows will return to the EMF.

C. **Discharge Rates for the Existing Land Use Conditions:** The existing channel does not have the conveyance capacity south of Chandler Heights Road Bridge, but the floodwaters will not return back to the EMF channel if it breaks out to the right overbank areas. The breakouts occur between Cross Sections 9.897 and 9.001 (Hunt Highway), and the flows overtop the RWCD Canal. Some other minor breakouts occur in the upstream portion of the reach, but the RWCD Canal will contain the floodwaters.

Reach 2 (Mile 4.487 to Mile 9.001, 73 Cross Sections, Sheet Nos. 9 to 17):

A. **Discharge Rates for the Design Conditions:** The existing channel has the conveyance capacity except in the concrete-lined channel portion of Reach 2 between River Miles 5.80 and 5.95. However, when this reach was modeled using the mixed flow option, flow in the concrete-lined channel was supercritical. Under supercritical flow conditions the flow is contained within the concrete-lined channel. Therefore, if supercritical flow conditions can be maintained, there will be no breakout of the flow.

B. **Discharge Rates for the Future Land Use Conditions:** The existing channel does not have the conveyance capacity except in the segment from upstream of the SR-87 and Southern Pacific Railroad Bridges to the downstream end of the concrete-lined channel. The concrete-lined channel between River Miles 5.586 and 6.230 cannot contain the floodwaters. A breakout to the west occurs between River Miles 7.8 to 9.001 (Hunt Highway).

C. **Discharge Rates for the Existing Land Use Conditions:** The existing channel does not have the conveyance capacity, especially on the right banks. The floodwaters will not return back to the EMF channel if it breaks out to the right overbank areas.

Reach 1 (Mile 0.000 to Mile 4.487, 79 Cross Sections, Sheet Nos. 1 to 9):

A. **Discharge Rates for the Design Conditions:** The existing channel has the conveyance capacity.

B. **Discharge Rates for the Future Land Use Conditions:** Two breakouts occur at the upstream of SR-587 Bridge, and the Santan Baptist Church Road Bridge.

C. **Discharge Rates for the Existing Land Use Conditions:** The existing channel only has the capacity between River Miles 2.5 to 4.1 just downstream of Santan Baptist Church Road Bridge.

5.2 Work Study Plan and Profile Sheets

The 100-year flood boundaries for the Design, Future, and Existing conditions have been delineated using the water surface elevations from the HEC-RAS models at each cross section. The boundaries were delineated using the Intergraph's InRoads program with the surfaces (DTM files) generated from the topographic mapping. The boundaries between cross sections were interpolated, at approximately every 50 feet, on the topographic maps.

The boundaries and profiles for the three discharges are shown on the full size Work Study Plan and Profile Sheets using a 1"=100' horizontal scale, and a 1"=5' vertical scale. The half size Work Study Plan and Profile Sheets are included in **Part 3** of **Appendix C** under a separate cover. Due to the wide floodplains, it was agreed by the FCDMC to utilize a bigger sheet size (30" by 42") for the plan and profile sheets, than the original scope of work called for.

5.3 Bankfull Discharges

The bankfull discharges were estimated by either interpolating or extrapolating from the results of the HEC-RAS models. Rating curves in the HEC-RAS models were used to estimate the bankfull discharges at all the cross sections. Freeboard requirements were not considered for the bankfull discharge estimation. No detailed hand computations were made to determine the bankfull discharges, instead these discharges were estimated for an accuracy of up to 3 significant numbers by zooming in on the rating curves from HEC-RAS models. **Table 2** presents a summary of the estimated reach-by-reach bankfull discharges.

Table 2
Summary of Bankfull Discharges

1. REACH 6

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
27.390	1347.0	920	At Princess Park Outlet
27.371	1347.8	936	
27.295	1347.4	931	
27.278	1347.4	1,240	
27.274	1345.9	1,210	
27.261	1345.9	1,200	Brown Road 2 - 8'X8' RCBC
27.248	1346.4	1,350	
27.244	1346.3	1,230	
27.189	1346.5	1,260	
27.095	1346.3	1,220	
27.000	1346.7	1,300	
26.905	1346.6	1,290	
26.811	1346.1	1,210	
26.762	1346.2	1,240	
26.727	1345.7	1,170	
26.722	1346.0	1,230	
26.712	1346.0	1,240	Adobe Street 5 – 8'X8' RCBC
26.702	1345.6	1,190	
26.697	1346.2	1,250	
26.678	1346.1	1,230	
26.595	1346.4	1,280	
26.500	1345.8	1,210	
26.385	1346.0	1,230	
26.311	1345.5	1,150	
26.228	1346.1	1,240	
26.187	1345.2	1,790	
26.171	1346.8	2,950	
26.163	1346.8	2,950	University Drive 5-Span Bridge (Pressure Flow)
26.154	1347.1	3,440	
26.133	1346.0	2,740	
26.047	1346.2	2,810	
25.939	1344.9	1,840	
25.844	1345.2	2,100	
25.749	1345.7	2,580	

Table 2 (Cont'd)
Summary of Bankfull Discharges

1. **REACH 6 (Cont'd)**

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
25.647	1346.3	3,170	
25.598	1345.7	4,210	
25.597	1345.5	4,590	
25.578	1345.7	3,400	
25.565	1345.7	2,790	Main Street / Higley Road 5 – 10'X7' RCBC
25.508	1343.7	3,030	
25.490	1343.3	2,740	
25.463	1343.9	3,080	
25.400	1344.3	2,950	
25.300	1343.5	2,580	
25.200	1342.8	2,590	
25.100	1343.1	2,810	
25.028	1342.1	2,120	
24.987	1342.5	2,270	
24.957	1342.6	2,800	
24.946	1344.5	3,580	
24.936	1344.5	3,710	Broadway Road 3-Span Bridge (Pressure Flow)
24.926	1344.3	3,970	
24.900	1341.2	2,170	
24.862	1341.2	2,160	

2. **REACH 5**

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
24.723	1343.3	4,060	
24.621	1343.3	4,140	Begin Leisure World G.C.
24.535	1343.8	4,390	
24.454	1344.0	4,450	
24.320	1344.4	4,830	
24.247	1342.0	3,550	

Table 2 (Cont'd)
Summary of Bankfull Discharges

2. REACH 5 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
24.130	1343.4	4,290	
24.100	1343.2	4,180	
24.060	1343.6	4,280	
23.962	1343.7	4,150	
23.911	1342.0	3,580	
23.827	1341.2	3,680	
23.825	1341.2	3,650	
23.815	1341.7	3,740	Southern Avenue 4-Span Bridge, End Leisure World G. C.
23.804	1341.7	3,770	
23.803	1340.5	3,580	Begin Superstition Springs Golf Course
23.758	1340.4	5,190	
23.712	1342.1	7,490	
23.604	1341.5	7,370	
23.450	1341.3	7,280	
23.315	1340.4	6,510	
23.274	1339.4	5,540	
23.219	1340.4	6,460	Use RWCD Canal Bank Elev.
23.206	1340.4	6,710	US 60 7-Span Bridge (Pressure Flow)
23.193	1340.1	7,240	Use RWCD Canal Bank Elev.
23.166	1340.2	7,040	
23.135	1339.7	6,570	
23.087	1338.3	5,090	
23.009	1338.7	5,790	
22.944	1337.5	4,830	
22.866	1337.2	4,870	
22.797	1339.5	8,000	
22.740	1339.5	8,450	
22.680	1341.3	10,800	
22.615	1338.5	7,970	
22.608	1338.5	7,920	Baseline Road 6-Span Bridge (Pressure Flow)
22.599	1337.8	7,040	
22.557	1337.0	5,970	

Table 2 (Cont'd)
Summary of Bankfull Discharges

2. REACH 5 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
22.475	1335.9	4,440	
22.436	1336.5	5,230	
22.348	1337.2	6,360	
22.263	1337.7	7,810	
22.189	1338.2	10,700	
22.107	1336.8	9,460	
22.022	1336.2	10,800	
21.947	1338.6	5,880	
21.839	1335.3	4,400	
21.745	1334.6	3,880	
21.713	1339.4	6,290	
21.656	1334.9	4,110	
21.633	1335.7	4,490	
21.591	1335.7	4,320	
21.531	1335.4	4,140	
21.485	1335.1	4,240	
21.439	1333.9	3,720	
21.418	1333.5	3,770	
21.413	1335.7	4,480	End Superstition Springs G. C.
21.407	1335.7	4,720	Guadalupe Road 3-Span Bridge (Pressure Flow)
21.402	1335.6	4,690	
21.391	1333.1	3,630	
21.355	1336.1	4,980	
21.339	1336.1	4,980	Power Road 6-Span Bridge (Pressure Flow)
21.326	1336.7	5,330	
21.282	1334.0	5,510	
21.188	1332.8	5,280	
21.093	1332.7	5,290	
21.000	1332.5	5,270	
20.894	1332.3	5,240	
20.799	1332.6	5,230	
20.704	1332.5	5,260	
20.610	1332.2	5,240	

Table 2 (Cont'd)
Summary of Bankfull Discharges

2. REACH 5 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
20.517	1332.0	5,200	
20.428	1332.0	5,220	
20.353	1331.7	5,220	
20.334	1332.4	5,240	
20.328	1335.2	5,440	
20.323	1335.2	5,440	Elliot Road 6-Span Bridge (Pressure Flow)
20.316	1335.0	5,380	
20.306	1332.2	5,240	
20.247	1331.2	5,200	
20.058	1331.0	5,200	
19.863	1330.6	5,180	
19.745	1330.5	5,160	
19.592	1329.8	5,150	
19.541	1329.9	4,500	
19.489	1330.1	4,610	
19.458	1330.0	4,560	
19.408	1329.3	4,240	
19.298	1329.1	4,210	
19.109	1328.7	4,040	
18.970	1328.5	4,570	
18.782	1328.4	4,570	
18.535	1328.8	4,760	

3. REACH 4

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
18.345	1328.3	7,060	
18.237	1328.4	8,920	Powerline Floodway Downstream
18.193	1326.9	8,710	Begin Concrete-Lined Channel
18.087	1326.5	9,250	
17.898	1325.0	8,600	
17.803	1324.6	8,570	

Table 2 (Cont'd)
Summary of Bankfull Discharges

3. REACH 4 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
17.672	1323.8	7,820	
17.571	1323.3	7,950	
17.480	1323.3	7,870	
17.339	1323.6	8,670	
17.288	1323.7	8,800	
17.269	1325.7	10,200	
17.261	1325.7	11,900	Williams Field Rd. 2-Span Bridge (Pressure Flow)
17.254	1326.0	12,600	
17.250	1324.9	10,600	
17.213	1323.6	9,450	
17.170	1324.1	9,850	
17.101	1324.3	10,600	
17.086	1324.3	16,700	Power Road 2-Span Bridge (Pressure Flow)
17.082	1328.2	24,100	
17.071	1326.4	22,900	End Concrete-Lined Channel
17.039	1322.5	11,300	
16.940	1321.0	8,760	
16.819	1321.0	9,020	
16.630	1321.0	9,430	
16.468	1320.6	9,130	
16.389	1320.6	9,350	
16.321	1320.6	9,500	
16.251	1320.9	11,000	
16.242	1319.8	8,530	
16.240	1319.8	8,720	Southern Pacific Railroad Bridge (Pressure Flow)
16.238	1321.7	13,100	
16.221	1323.2	17,000	
16.213	1323.2	16,900	Rittenhouse Road 4-Span Bridge (Pressure Flow)
16.205	1323.3	17,700	
16.190	1320.3	10,800	
16.000	1319.1	8,720	
15.811	1319.3	9,880	

Table 2 (Cont'd)
Summary of Bankfull Discharges

3. REACH 4 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
15.606	1319.2	10,700	
15.483	1319.0	10,800	
15.414	1318.8	10,700	
15.225	1318.1	10,100	
15.305	1317.4	9,530	
14.926	1316.7	8,740	
14.823	1317.5	10,300	
14.764	1316.8	9,420	Low Drop Structure (Upstream)
14.754	1316.7	15,900	Low Drop Structure (Downstream)
14.738	1316.7	17,500	
14.637	1312.7	9,710	
14.412	1312.5	10,300	
14.300	1312.2	10,200	
14.191	1311.9	10,100	
14.000	1311.4	10,100	
13.961	1315.1	17,500	
13.954	1315.1	17,500	Higley Road 6-Span Bridge (Pressure Flow)
13.946	1315.2	17,900	
13.911	1311.2	10,700	
13.842	1311.1	11,100	
13.755	1310.5	10,400	
13.661	1310.3	10,500	
13.566	1310.1	10,700	

4. REACH 3

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
13.471	1309.5	9,820	
13.439	1314.2	18,100	
13.431	1314.2	19,500	Queen Creek Road 8-Span Bridge (Pressure Flow)
13.426	1314.1	19,200	

Table 2 (Cont'd)
Summary of Bankfull Discharges

4. REACH 3 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
13.374	1310.5	12,400	
13.280	1310.3	12,400	
13.232	1310.1	12,200	
13.179	1310.0	12,300	
13.084	1309.7	12,000	
13.037	1309.4	11,500	
12.981	1309.3	11,600	
12.905	1309.0	11,300	
12.884	1309.0	11,400	
12.789	1308.5	10,800	
12.694	1308.4	10,900	
12.600	1308.7	12,000	
12.552	1308.5	11,700	
12.488	1308.6	12,300	
12.441	1308.5	12,300	
12.349	1308.8	13,300	
12.302	1308.6	13,300	
12.245	1308.4	13,200	
12.177	1308.2	13,000	
12.082	1307.5	12,000	
11.988	1307.4	12,200	
11.893	1307.8	13,600	
11.798	1307.4	13,200	
11.703	1307.3	13,500	
11.609	1308.3	16,200	Queen Creek Detention Basin
11.572	1308.4	16,200	
11.531	1307.1	14,400	
11.486	1307.0	14,400	
11.391	1306.7	14,100	
11.328	1307.0	15,000	Concrete Drop Structure (Upstream)
11.321	1307.4	20,600	Concrete Drop Structure
11.308	1307.1	18,400	Concrete Drop Structure (Downstream)
11.297	1306.1	16,400	
11.260	1309.5	24,100	

Table 2 (Cont'd)
Summary of Bankfull Discharges

4. REACH 3 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
11.254	1309.5	24,800	Chandler Heights Road 4-Span Bridge (Pressure Flow)
11.249	1309.5	23,700	Dense Grass in Channel
11.231	1302.1	10,700	Dense Grass in Channel
11.189	1302.1	10,900	Dense Grass in Channel
11.127	1302.0	10,900	Dense Grass in Channel
11.033	1302.0	11,300	Dense Grass in Channel
10.938	1301.3	10,300	Dense Grass in Channel
10.843	1301.6	11,000	Dense Grass in Channel
10.749	1301.8	11,700	
10.654	1301.7	11,800	
10.566	1301.5	11,600	
10.518	1301.5	11,700	
10.441	1300.2	9,920	
10.346	1300.5	10,500	
10.252	1301.1	11,900	
10.218	1306.4	20,300	
10.207	1306.4	23,100	Riggs Road 4-Span Bridge (Pressure Flow)
10.195	1306.4	21,900	
10.171	1300.1	10,500	
10.134	1300.9	12,100	
10.039	1300.2	11,000	
9.944	1300.0	10,800	
9.897	1299.6	10,300	
9.854	1300.2	11,500	
9.849	1300.3	12,100	
9.844	1299.7	10,700	
9.802	1299.5	10,500	
9.708	1299.7	11,100	
9.613	1298.0	8,550	
9.518	1299.3	10,900	
9.424	1299.1	10,700	
9.334	1298.9	10,600	

Table 2 (Cont'd)
Summary of Bankfull Discharges

4. REACH 3 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
9.240	1299.0	11,200	
9.145	1299.2	12,000	
9.053	1298.7	11,100	
9.036	1299.0	11,900	
9.018	1299.3	13,900	

5. REACH 2

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
9.001	1299.0	13,200	
8.948	1298.7	12,600	
8.870	1298.4	12,300	
8.775	1298.1	11,900	
8.668	1297.8	11,700	
8.594	1297.4	11,200	
8.514	1297.4	11,500	
8.403	1297.0	11,200	
8.382	1297.4	12,100	
8.340	1297.4	12,300	
8.245	1296.5	10,800	
8.150	1296.6	11,300	
8.104	1296.6	11,500	
8.057	1297.0	12,600	
8.000	1296.4	11,500	
7.910	1296.7	12,600	
7.823	1296.3	11,900	
7.792	1296.2	11,800	
7.719	1296.3	12,400	
7.618	1296.2	12,600	
7.523	1296.3	13,400	
7.429	1295.8	12,500	
7.334	1295.6	12,300	

Table 2 (Cont'd)
Summary of Bankfull Discharges

5. REACH 2 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
7.239	1295.5	12,500	
7.144	1291.6	6,920	
7.050	1294.5	11,000	
7.026	1295.0	12,200	
6.999	1294.4	10,800	
6.907	1293.4	8,900	Dip Crossing (Upstream)
6.902	1294.0	10,100	Dip Crossing
6.898	1293.7	9,450	Dip Crossing
6.894	1294.2	10,700	Dip Crossing (Downstream)
6.860	1295.1	13,200	
6.766	1298.6	24,100	
6.671	1299.0	26,400	
6.576	1298.6	25,900	
6.510	1297.3	22,500	
6.486	1295.7	20,000	
6.388	1294.5	17,500	
6.300	1293.3	13,200	
6.252	1293.5	18,200	
6.230	1290.8	11,100	Begin Concrete-Lined Channel
6.196	1282.7	7,140	
6.101	1276.6	6,220	
6.007	1271.9	6,610	
5.912	1266.0	5,360	
5.817	1261.1	5,240	
5.722	1255.9	5,310	
5.658	1252.9	5,530	
5.586	1249.2	10,800	End Concrete-Lined Channel and Dissipator Basin (Upstream)
5.582	1249.5	20,600	Dissipator Basin
5.581	1249.7	18,500	Dissipator Basin (Downstream)
5.580	1249.5	18,000	
5.578	1249.4	17,600	
5.483	1248.7	17,200	
5.388	1247.7	16,200	
5.293	1247.2	16,100	

Table 2 (Cont'd)
Summary of Bankfull Discharges

5. REACH 2 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
5.198	1245.7	13,900	
5.104	1245.2	13,700	
5.009	1244.4	13,100	
4.914	1243.4	12,200	
4.746	1242.9	12,600	
4.727	1242.8	12,500	
4.715	1242.3	12,100	
4.669	1241.6	11,200	
4.615	1243.4	13,800	
4.613	1243.4	16,700	Southern Pacific Railroad Bridge (Pressure Flow)
4.610	1242.8	15,400	
4.590	1242.7	15,400	
4.584	1242.7	20,700	SR 87 (5-Span) Bridge (Pressure Flow)
4.578	1242.6	21,700	
4.506	1238.6	11,100	

6. REACH 1

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
4.487	1238.5	10,900	
4.393	1238.4	12,800	
4.298	1238.2	13,800	
4.203	1237.8	14,200	
4.161	1236.3	12,700	
4.156	1237.3	14,600	
4.152	1237.3	18,300	Santan Baptist Church Road 7-Span Bridge (Pressure Flow)
4.148	1237.3	19,300	
4.142	1236.4	15,800	
4.080	1235.7	15,300	
4.047	1235.6	17,600	

Table 2 (Cont'd)
Summary of Bankfull Discharges

6. REACH 1 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
3.964	1235.1	19.800	
3.899	1234.5	22,000	
3.880	1234.4	20,100	Drop Structure (Upstream)
3.877	1234.3	20,400	Drop Structure (Downstream)
3.782	1233.1	17,700	
3.688	1232.3	17,500	
3.593	1231.6	17,200	
3.527	1231.0	16,700	Drop Structure (Upstream)
3.524	1231.1	17,600	Drop Structure (Downstream)
3.429	1230.3	16,300	
3.334	1229.8	16,800	East of Santan Canal Siphon
3.176	1228.6	16,800	Drop Structure (Upstream)
3.174	1228.8	17,300	Drop Structure (Downstream)
3.079	1228.2	17,100	
2.985	1227.5	17,200	
2.912	1226.7	16,100	Drop Structure (Upstream)
2.909	1226.7	16,100	Drop Structure (Downstream)
2.814	1226.0	16,200	
2.757	1225.3	15,900	
2.650	1224.4	16,800	Dip Crossing (Upstream)
2.646	1223.5	14,000	Dip Crossing
2.641	1223.6	14,400	Dip Crossing
2.636	1224.2	17,700	Dip Crossing (Downstream)
2.571	1223.7	16,300	
2.476	1222.5	14,800	
2.381	1222.1	15,000	
2.305	1221.4	14,400	Drop Structure (Upstream)
2.303	1221.3	14,300	Drop Structure (Downstream)
2.208	1220.8	13,900	
2.113	1219.9	12,700	
2.018	1219.3	12,300	
1.924	1218.6	11,700	
1.829	1217.9	11,100	
1.734	1217.2	10,400	
1.693	1216.7	9,790	

Table 2 (Cont'd)
Summary of Bankfull Discharges

6. REACH 1 (Cont'd)

Cross Section I.D.	Bank Elevation (ft)	Bankfull Discharge (cfs)	Remarks
1.649	1217.0	10,900	
1.644	1217.0	12,700	SR 587 (8-Span) Bridge (Pressure Flow)
1.640	1216.8	12,800	
1.545	1215.9	11,400	
1.476	1215.4	12,200	
1.389	1214.7	12,100	
1.306	1214.4	13,700	
1.246	1213.8	13,400	
1.186	1213.2	11,600	
1.142	1213.1	13,000	
1.074	1212.2	13,100	
1.010	1211.4	12,300	
0.917	1210.9	13,500	
0.839	1210.8	16,000	
0.766	1210.1	16,500	
0.752	1210.0	16,300	Drop Structure (Upstream)
0.750	1210.0	16,100	Drop Structure (Downstream)
0.655	1209.0	15,000	
0.560	1208.0	13,700	
0.504	1208.0	14,600	
0.459	1207.0	12,600	
0.454	1206.5	10,900	Dip Crossing (Upstream)
0.449	1206.0	9,920	Dip Crossing (Downstream)
0.445	1206.9	13,400	
0.410	1206.4	12,700	
0.315	1205.5	11,900	
0.220	1205.1	12,600	
0.125	1204.1	12,600	
0.084	1203.9	13,700	
0.077	1203.9	13,900	
0.019	1203.6	15,600	
0.004	1203.8	21,600	
0.000	1201.3	16,800	Downstream End of EMF at the Top of Grouted Riprap Drop Structure

6 REFERENCES

1. **Haestad Methods, Inc.**, "HEC-RAS River Analysis System, Version 2.1, October 1997," developed by the U.S. Army Corps of Engineers at Hydrologic Engineering Center.

2. **Flood Control District of Maricopa County**, "Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona." Prepared by the U.S. Geological Survey, April 1991.

3. **U.S. Geological Survey**, "Roughness Characteristics of Natural Channels," Water-Supply paper 1849, Third Printing, 1987.

4. **V.T. Chow**, "Open Channel Hydraulics," McGraw-Hill, 1959.

5. **Flood Control District of Maricopa County**, "Drainage Design Manual for Maricopa County, Arizona, Volume II - Hydraulics." Prepared by NBS Lowry Engineers and Planners, and McLaughlin Water Engineers, Ltd., January 1996.

7 LIST OF HEC-RAS MODEL FILES AND DISKETTE

No.	Filename	Description
1	EMFR1.PRJ, P01, G01, F01, etc...	HEC-RAS Files for Reach 1
2	EMFR2.PRJ, P01, G01, F01, etc...	HEC-RAS Files for Reach 2
3	EMFR3.PRJ, P01, G01, F01, etc...	HEC-RAS Files for Reach 3
4	EMFR4.PRJ, P01, G01, F01, etc...	HEC-RAS Files for Reach 4
5	EMFR5.PRJ, P01, G01, F01, etc...	HEC-RAS Files for Reach 5
6	EMFR6.PRJ, P01, G01, F01, etc...	HEC-RAS Files for Reach 6

APPENDIX A

GENERAL DOCUMENTS

1. Contract and Scope of Work

CONTRACT FOR CONSULTANT SERVICES
EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT
CONTRACT FCD 97-06

Pursuant to the provisions of the Arizona Revised Statutes Section 48-3603, the Board of Directors has the authority to enter into contracts.

The Flood Control District of Maricopa County, Arizona, hereinafter called the "DISTRICT," is desirous of having certain professional services performed in connection with East Maricopa Floodway Capacity Assessment hereinafter called the "PROJECT" and as more fully described in Exhibit "A," Scope of Work, attached; and

HNTB Corporation, hereinafter called "CONSULTANT" with local offfices located at 40 North Central Avenue, Suite 300, Phoenix, Arizona 85004, is desirous of performing said services;

THEREFORE, the parties hereto mutually agree as follows:

SECTION I - SERVICES OF THE CONSULTANT

The CONSULTANT, under the general supervision of the Manager, Engineering Division, shall prepare studies, reports, surveys, plans, drawings, specifications and cost estimates as are necessary for the PROJECT and according to the directions and designated standards of the DISTRICT and in accordance with Exhibit "A." It is understood and agreed that the DISTRICT's authorized representative shall be the Manager, Engineering Division, or his duly authorized representative, hereinafter called the "AGENT" and that he/she shall be the sole contact for administering this contract.

The CONSULTANT shall meet periodically with the AGENT so as to keep the DISTRICT informed of the progress of the work in accordance with the schedule defined in Exhibit "A."

The CONSULTANT shall promptly advise the AGENT of any factors, which may develop during the PROJECT, that would likely result in construction or design costs in excess of budgetary constraints.

SECTION II - PERIOD OF SERVICE

The CONSULTANT shall complete all work per the schedule provided in Exhibit "A," Scope of Work within 200 calendar days after receipt of the Notice to Proceed, exclusive of DISTRICT review time. The DISTRICT is expected to require up to 40 calendar days for review time, for a total contract time period of 240 calendar days. Should extension of this contract period be necessary, and any such extension(s) continue the date of contract for a time period of more than one year from the date of contract expiration, adjustment(s) of the consultant's fee(s) may, upon agreement by both the DISTRICT and the CONSULTANT, be made in accordance with the Consumer Price Index for Urban Consumers, Western Division published by the U.S. Department of Labor, Bureau of Labor Statistics, using the published edition coinciding with the initial contract expiration date. Any such fee adjustment shall only apply to the extended contract time period.

SECTION III - PAYMENTS TO THE CONSULTANT

The CONSULTANT shall be paid for work under this Contract a lump sum fee of $326,880.00 plus any adjustments that have been approved in writing in accordance with the Maricopa County Procurement Code.

The DISTRICT shall pay the CONSULTANT upon completion of the work as accepted by the DISTRICT, except that progress payments may be made as billed by the CONSULTANT based on approved monthly progress reports subject to the limitations set forth in Exhibit "A," Scope of Work. Ten percent (10%) of all contract payments made on an interim basis shall be retained by the DISTRICT as insurance of proper performance of the contract or, at the option of the CONSULTANT, a substitute security may be provided by the CONSULTANT in an authorized form pursuant to procedures established by the DISTRICT. The CONSULTANT is entitled to all interest from any such substitute security.

When the contract is fifty percent (50%) completed, one-half (1/2) of the amount retained will be paid to the CONSULTANT provided the CONSULTANT is making satisfactory progress on the contract and there is no specific cause or claim requiring a greater amount to be retained. After the contract is fifty percent (50%) completed, no more than five percent (5%) of the amount of any subsequent progress payments shall be retained providing the CONSULTANT is making satisfactory progress on the project, except if at any time the DISTRICT determines satisfactory progress is not being made, ten percent (10%) retention shall be reinstated for all progress payments made under the contract subsequent to the determination.

If the CONSULTANT desires a partial payment in accordance with the provisions above, the CONSULTANT will complete and forward a DISTRICT provided form indicating payment distribution to Minority/Women-owned Business Enterprise firms. The MBE/WBE goal for this project has been set at 5%.

Following approval and acceptance by the DISTRICT of all work described in Exhibit "A" but prior to submittal by the DISTRICT to FEMA, the CONSULTANT shall submit a final invoice and a "Certificate of Substantial Performance" form for release of all monies due the CONSULTANT, except for five percent (5%) retention. Any retention monies shall be paid or substitute security released, as applicable, to the CONSULTANT upon (1) FEMA acceptance/approval of the project and completion of all final work required by the DISTRICT to receive FEMA acceptance, (2) receipt of "Certificate of Performance" form, and (3) an invoice for any sums remaining due and payable under this Contract.

SECTION IV - THE DISTRICT'S RESPONSIBILITIES

The DISTRICT shall furnish the CONSULTANT, at no cost to the CONSULTANT, the following information or services for this PROJECT:

A. One copy of on-hand maps, records, survey ties, bench marks or other data pertinent to the PROJECT. This does not, however, relieve the CONSULTANT of the responsibility of searching records for additional information, for requesting specific information or for verification of that information provided. The DISTRICT does not warrant the accuracy or comprehensiveness of any such information.

B. All available information and data relative to policies, standards, criteria, and studies, etc. impacting the PROJECT as identified by the CONSULTANT.

C. Availability of staff for consultation with the CONSULTANT during the performance of studies and plan development in order to identify the problems, needs, and other functional aspects of the PROJECT.

D. Examination of documents submitted by the CONSULTANT and rendering of decisions pertaining thereto promptly, to avoid unreasonable delay in the progress of the work by the CONSULTANT. The DISTRICT will keep the CONSULTANT advised concerning the progress of the DISTRICT's review of work.

SECTION V - ALTERATION IN SCOPE OF WORK

Any alteration in the scope of work that will result in a substantial change in the nature of the PROJECT so as to materially increase or decrease the contract fee will require negotiation of an amendment to the contract to be executed by the DISTRICT and the CONSULTANT. No work shall commence on the change until the contract amendment has been approved by the DISTRICT and the CONSULTANT has been notified to proceed by the AGENT. It is distinctly understood and agreed that no claim for extra work done or materials furnished by the CONSULTANT will be allowed by the DISTRICT except as provided herein, nor shall the CONSULTANT do any work or furnish any materials not covered by this agreement unless such work is first authorized in writing in accordance with the Maricopa County Procurement Code. Any such work or materials furnished by the CONSULTANT without such written authorization first being given shall be at his own risk, cost, and expense, and he hereby agrees that without such written authorization he will make no claim for compensation for such work or materials furnished.

SECTION VI - RECORDS

Records of the CONSULTANT's payroll expense pertaining to this PROJECT and records of accounts between the DISTRICT and the CONSULTANT shall be kept on a generally recognized accounting basis and shall be available upon request to the DISTRICT or its authorized representative for audit during normal business hours. The records shall be subject to audit by appropriate grantor agency if the PROJECT is funded all or in part by a grant.

SECTION VII - PROJECT COMPLETION

If during the course of this contract situations arise which prevent completion within the allotted time, an extension may be granted by the AGENT.

SECTION VIII - TERMINATION

The DISTRICT may terminate this contract at any time upon reimbursement to the CONSULTANT of expenses which include reasonable charges for time and material for the percentage of work satisfactorily completed and turned over to the DISTRICT.

The DISTRICT reserves the right to postpone, terminate or abandon this PROJECT for the CONSULTANT's failure to complete the PROJECT on time, or failure to comply with the provisions of the contract. The DISTRICT also reserves the right to terminate any or all parts of this contract for its own convenience as the DISTRICT may determine at its sole discretion.

The DISTRICT hereby gives notice that pursuant to A.R.S. Section 38-511, this contract may be canceled without penalty or further obligation within three years after execution if any person significantly involved in initiation, negotiation, securing, drafting, or creating this contract on behalf of the DISTRICT is, at any time while the contract or any extension of the contract is in effect, an employee or agent of any other party to the contract in any capacity or a consultant to any other party of the contract with respect to the subject matter of the contract. Cancellation under this section shall be effective when written notice from the Chief Engineer and General Manager is received by all of the parties of the contract. In addition, the DISTRICT may recoup any fee or commission paid or due to any person significantly involved in initiation, negotiation, securing, drafting, or creating the contract on behalf of the DISTRICT from any other party to the contract arising as a result of the contract.

The CONSULTANT may terminate this contract in the event of nonpayment of fees as specified in Section III, PAYMENTS TO THE CONSULTANT.

SECTION IX - OWNERSHIP OF DOCUMENTS

All original documents including, but not limited to studies, reports, tracings, drawings, physical and computer models, estimates, field notes, investigations, design analyses, calculations, computer software, and specifications, prepared in the performance of this Contract are to be and remain the property of the DISTRICT and are to be delivered to the AGENT before final payment is made to the CONSULTANT. The DISTRICT reserves the right to reuse the documents as it sees fit. However, the DISTRICT will not reuse, alter, or modify these documents without noting such alterations, modifications, or intent of their reuse, and will hold the CONSULTANT harmless from any claims arising from the reuse, alteration, or modification of the documents. The CONSULTANT may retain reproducible copies of all such documents delivered to the DISTRICT.

SECTION X - COMPLIANCE WITH LAWS

The CONSULTANT is required to comply with all Federal, State and local laws, local ordinances and regulations. The CONSULTANT's signature on this contract certifies compliance with the provisions of the I-9 requirements of the Immigration Reform and Control Act of 1986 for all personnel that the CONSULTANT and any subconsultants employ to complete this PROJECT. It is understood that the DISTRICT shall conduct itself in accordance with the provisions of the Maricopa County Procurement Code.

SECTION XI - GENERAL CONSIDERATIONS

A. Prior to beginning the work, the CONSULTANT shall furnish the DISTRICT for approval the names of its key employees, and of its subconsultants and their key employees to be used on this PROJECT. Any subsequent changes are subject to the written approval of the DISTRICT.

   The CONSULTANT in replacing a MBE/WBE subcontractor should attempt to contract with another MBE/WBE.

B. The failure of either party to enforce any of the provisions of this Contract or to require performance of the other party of any of the provisions hereof shall not be construed to be a waiver of such provisions, nor shall it affect the validity of this Contract or any part thereof, or the right of either party to thereafter enforce each and every provision.

C. The CONSULTANT shall be responsible for the cost of any additional design, field layout, testing, construction and supervision necessary to correct those errors or omissions attributable to the CONSULTANT and for any damage incurred by the DISTRICT as a result of additional construction costs caused by such CONSULTANT errors or omissions.

D. The fact that the DISTRICT has accepted or approved the CONSULTANT's work shall in no way relieve the CONSULTANT's responsibility.

E. It is mutually understood and agreed that this Contract shall be governed by the laws of the State of Arizona, both as to interpretation and performance. Any action at law, suit in equity, or judicial proceeding for the enforcement of this Contract, or any provision thereof, shall be instituted only in the courts of the State of Arizona.

SECTION XII - SUCCESSORS AND ASSIGNS

This Contract shall not be assigned by either party without prior written approval of the other except that the CONSULTANT may use in the performance of this Contract without prior approval of the DISTRICT, personnel or services of its related entities and affiliated companies as if they were an integral part of the CONSULTANT; and it shall extend to and be binding upon the heirs, executors, administrators, successors and assigns of the parties hereto.

SECTION XIII - NO KICK-BACK CERTIFICATION

The CONSULTANT warrants that no person has been employed or retained to solicit or secure this Contract upon any agreement or understanding for a commission, percentage, brokerage, or contingent fee; and that no member of the Board of Directors/Supervisors or any employee of the DISTRICT has any interest, financially or otherwise, in the CONSULTANT firm.

For breach or violation of this warranty, the DISTRICT shall have the right to annul this Contract without liability, or at its discretion to deduct from the Contract price or consideration, the full amount of such commission, percentage, brokerage, or contingent fee.

SECTION XIV - ANTI-DISCRIMINATION PROVISION

The Flood Control District of Maricopa County will endeavor to ensure in every way possible that minority and women-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods, and contractual services to the Flood Control District of Maricopa County without being discriminated against on the grounds of race, religion, sex, age, or national origin.

The CONSULTANT agrees not to discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, or disability and further agrees not to engage in any unlawful employment practices. The CONSULTANT further agrees to insert the foregoing provisions in all subcontracts hereunder.

SECTION XV - AMENDMENTS

This Contract may be amended by mutual written agreement of the DISTRICT and the CONSULTANT.

SECTION XVI - INDEMNIFICATION

To the fullest extent permitted by law, the CONSULTANT shall defend, indemnify and hold harmless the DISTRICT, Maricopa County, their agents, representatives, officers, directors, officials, and employees from and against all claims, damages, losses and expenses (including but not limited to attorney fees, court costs, and the cost of appellate proceedings), relating to, arising out of, or alleged to have resulted from the CONSULTANT'S acts, errors, mistakes, or omissions relating to professional services in the performance of this Contract. The CONSULTANT'S duty to defend, hold harmless and indemnify the DISTRICT, its agents, representatives, officers, directors, officials, and employees shall arise in connection with any claim, damage, loss or expense that is attributable to bodily injury, sickness, disease, death, or injury to, impairment, or destruction of property including loss of use resulting therefrom, caused by any acts, errors, mistakes or omissions related to professional services in the performance of this Contract including any person for whose acts, errors, mistakes or omissions the CONSULTANT may be legally liable.

The amount and type of insurance coverage requirements set forth below will in no way be construed as limiting the scope of the indemnity in this paragraph.

For all other hazards, liabilities, and exposures: To the fullest extent permitted by law, the CONSULTANT shall defend, indemnify and hold harmless the DISTRICT, its agents, representatives, officers, directors, officials, and employees from and against all claims, damages, losses and expenses (including but not limited to attorney fees, court costs, and the cost of appellate proceedings), relating to, arising out of or resulting from the CONSULTANT'S work or services. CONSULTANT'S duty to defend, hold harmless, and indemnify the DISTRICT, its agents, representatives, officers, directors, officials, and employees shall arise in connection with any claim, damage, loss or expense that is attributable to bodily injury, sickness, disease, death, injury to, impairment or destruction of property including loss of use resulting therefrom, caused in whole or in part by any act or omission of the CONSULTANT, anyone the CONSULTANT directly or indirectly employs, or anyone for whose acts the CONSULTANT may be liable, regardless of whether it is caused in part by a party indemnified hereunder, including the DISTRICT.

The amount and type of insurance coverage requirements set forth below will in no way be construed as limiting the scope of the indemnity in this paragraph.

SECTION XVII - INSURANCE

Required Coverage

General Clauses. The CONSULTANT, at its own expense, shall purchase and maintain the minimum insurance specified below with companies duly licensed, with a current A.M. Best, Inc. rating of B++6, or approved unlicensed by the State of Arizona Department of Insurance.

Additional Insured. The insurance coverage, except Workers' Compensation and Professional Liability, required by this Contract shall name the DISTRICT, its agents, representatives, officers, directors, officials, and employees as Additional Insureds.

Coverage Term. All insurance required herein shall be maintained in full force and effect until all work or service required to be performed under the terms of the Contract is satisfactorily completed and formally accepted; failure to do so may, at the sole discretion of the DISTRICT constitute a material breach of this Contract.

Primary Coverage. The CONSULTANT'S insurance shall be primary insurance as respects the DISTRICT, and any insurance or self insurance maintained by the DISTRICT shall not contribute to it.

Claim Reporting. Any failure to comply with the claim reporting provisions of the policies or any breach of the policy warranty shall not affect coverage afforded under the policies to protect the DISTRICT.

Waiver. The policies, except Workers' Compensation, shall contain a waiver of transfer rights of recovery (subrogation) against the DISTRICT, its agents, representatives, directors, officers, and employees for any claims arising out of the CONSULTANT'S work or service.

Deductible/Retention. The policies may provide coverage which contain deductibles or self insured retentions. Such deductible and/or self insured retentions shall not be applicable with respect to the coverage provided to the DISTRICT under such policies. The CONSULTANT shall be solely responsible for the deductible and/or self insured retention.

Copies of Policies. The DISTRICT reserves the right to request and to receive, within 10 working days, certified copies of any or all of the above policies and/or endorsements. The DISTRICT shall not be obligated, however, to review same or to advise CONSULTANT of any deficiencies in such policies and endorsements, and such receipt shall not relieve CONSULTANT from, or be deemed a waiver of the DISTRICT'S right to insist on, strict fulfillment of the CONSULTANT'S obligations under this Contract.

Commercial General Liability. The CONSULTANT shall maintain Commercial General Liability insurance with a limit of not less than $1,000,000 for each occurrence with a $1,000,000 General Aggregate limit. The policy shall include coverage for bodily injury, broad form property damage, personal injury, products and completed operations and blanket contractual covering, but not limited to, the liability assumed under the indemnification provisions of this Contract which coverage will be at least as broad as the Insurance Service Office, Inc. Policy Form CG 00011093 or any replacements thereof. The Commercial General liability additional insured endorsement will be at least as broad as the Insurance Service Office, Inc. Additional Insured, Form B, CG 20101093, or replacements thereof. Such policy shall contain a severability of interest provision, and shall not contain a sunset provision or commutation clause, nor any provision which would serve to limit third party action over claims.

Automobile Liability. The CONSULTANT shall maintain Commercial/Business Automobile Liability insurance with a combined single limit for bodily injury and property damage of not less than $1,000,000 each occurrence with respect to the CONSULTANT'S any owned, hired, and non-owned vehicles assigned to or used in performance of the CONSULTANT'S work or services. Coverage will be at least as broad as coverage code 1, "any auto" (Insurance Services Office, Inc. Policy Form CA 00011293, or any replacements thereof).

Workers' Compensation. The CONSULTANT shall carry Workers' Compensation insurance to cover obligations imposed by federal and state statutes having jurisdiction of CONSULTANT'S employees engaged in the performance of the work or services; and Employer's liability insurance of not less than $100,000 for each accident, $100,000 disease for each employee, and $500,000 disease policy limit.

In case any work is subcontracted, the CONSULTANT will require the subcontractor to provide Workers' Compensation and Employer's Liability to at least the same extent as required of the CONSULTANT.

Professional Liability. The CONSULTANT retained by the DISTRICT will maintain Professional Liability insurance covering errors and omissions arising out of the work or services performed by the CONSULTANT or any person employed by the CONSULTANT, with a limit of not less than $1,000,000 each claim.

<u>Certificates of Insurance</u>

Prior to commencing work or services under this Contract, the CONSULTANT shall furnish the DISTRICT with Certificates of Insurance, or formal endorsements as required by the contract, issued by the CONSULTANT'S insurer(s), as evidence that policies providing the required coverages, conditions and limits required by this Contract are in full force and effect. Such certificates shall identify this Contract number and title.

In the event any insurance policy(ies) required by this Contract is(are) written on a "claims made" basis, coverage shall extend for two years past completion and acceptance of the work or services and as evidenced by annual Certificates of Insurance. All Certificates of Insurance shall be identified with a contract number and title. A $25.00 administrative fee will be assessed for all certificates received without the appropriate contract number and title.

<u>Cancellation and Expiration Notice</u>

Insurance evidenced by this Certificate shall not expire, be canceled, or materially changed without fifteen (15) days prior written notice to the DISTRICT. If a policy does expire during the life of the contract, a renewal Certificate must be sent to the DISTRICT fifteen (15) days prior to the expiration date.

All Certificates of Insurance required by this Contract shall be identified with a contract number and title. A $25.00 administrative fee shall be assessed for all Certificates received without the appropriate contract number and title.

IN WITNESS WHEREOF, the parties herein have executed this Contract.

HNTB CORPORATION

George R. Hale
Principal (Signature)

George R. Hale
Printed Name

V. P.
Title

8/15/97
Date

43-1623092
Federal Tax Identification Number

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY:

Michael S. Ellegood, P.E.
Chief Engineer and General Manager

Aug 12, 1997
Date

ACCEPTED AND APPROVED:

Jan Stapley
Chairman, Board of Directors

ATTEST:

Ed Wolfe
Clerk of the Board

SEP 1 0 1997
Date

LEGAL REVIEW

Approved as to form and within the powers and authority granted under the laws of the State of Arizona to the Flood Control District of Maricopa County.

Julie M. Lemmon
General Counsel, District 8/22/97

Date

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
SCOPE OF WORK
EAST MARICOPA FLOODWAY
CAPACITY ASSESSMENT
FCD 97-06

GENERAL

The purpose of this study is to map the East Maricopa Floodway (EMF), assess its existing conveyance capacity and compare the calculated capacity with the design capacity. The study limits are from above Brown Road to the confluence of the EMF with the Gila River, a distance of approximately 27 miles. The consultant will determine the conveyance capacity using the latest version of the U.S. Army Corps of Engineers HEC-RAS River Analysis System computer model. All reports and drawings must be checked and sealed by persons of appropriate registration responsible for the work.

All work under this Scope must be completed within 240 calendar days from the Notice to Proceed, including 40 days for District reviews.

PROBLEM STATEMENT

The EMF is the major regional outfall for the east valley, and it is essential to know if the channel in its existing condition can convey the design discharges and what the maximum conveyance capacity is. In addition, the impact of its existing condition with the future discharges will be assessed.

TASK 1 - COORDINATION

1.1 The consultant will update the project schedule submitted during the proposal stage. The project schedule will show when coordination meetings are to occur and the completion dates for each of the tasks in the scope. The consultant will update and resubmit this project schedule whenever changes in the schedule occur.

1.2 The consultant will participate in regular coordination meetings (at least once every four weeks) with the District's Project Manager and in milestone coordination meetings in the development of the hydraulic analyses. The consultant is responsible for the minutes of any meetings. Whenever possible, coordination and milestone meetings will be combined.

1.3 The consultant will submit a quarterly estimate of the projected billing within 14 days of Notice to Proceed. Thereafter, this estimate will be updated and submitted to the District's Project Manager at least 10 days before the end of each quarter.

1.4 The consultant will submit monthly progress reports with the submittal of monthly invoices. The report will be brief and should be no longer than two typed pages. At a minimum, the monthly report will contain the following:

a. A description of the work accomplished by task during the reporting month.

b. Percent (%) completed for the month and percent (%) cumulative completed for each task.

c. A brief description of the work to be accomplished the following month.

d. A description of any problems encountered.

TASK 2 - DATA COLLECTION

2.1 The District will supply copies of the construction drawings for the EMF. The consultant will collect and review pertinent data from the District and other outside sources. Data to be collected will include: existing topographic mapping; historical flooding information; as-built plans for existing structures; and other pertinent information.

2.2 The District will supply the design and future discharge values to be used.

2.3 The consultant will develop the preliminary draft of the data collection report, and submit it to the District for information purposes within 90 days of Notice to Proceed. The final version of the data collection report will be included in the Final Report for the Study.

TASK 3 - TOPOGRAPHIC MAPPING

3.1 An aerial survey subcontractor shall be retained by the consultant as part of this contract. The topographic mapping of the EMF will be done in a strip format from north of Brown Road to the Gila River. The strip mapping must extend beyond the District's right-of-way, extend far enough upstream and downstream of the study limits for proper modeling of the ends of the study, and far enough up the tributaries so that the confluences can be properly modeled.

3.2 The topographic mapping will be developed with a contour interval of 2-feet, and at a scale of 1 inch = 100 feet. The topographic mapping will be developed using a Digital Terrain Model (DTM). The DTM will be developed and a copy delivered to the District following the guidelines stated in the District's Data Delivery Specifications: The Hydrologic Information System, Revision 2.2, April 25, 1997. The topographic mapping must also meet the quality controls called for in FEMA-37, Flood Insurance Study Guidelines and Specifications for Study Contractors, January 1995.

3.3 The accuracy of the topographic mapping will be checked using the procedures called for in FEMA-37.

3.4 Digital contour and planimetric data developed for this study will be delivered according to the District's HIS specifications. Topography, control items, and corners will be submitted for review and approval before analysis and generation of other HIS data.

3.5 Control:

a. Horizontal control will be on 1983 NAD.

b. Vertical control will be on 1929 NGVD. The consultant will provide a conversion factor, including documentation on how it was derived, for converting the elevations to 1988 NAVD.

c. The consultant will systematically set panel points and establish horizontal and vertical control throughout the areas to be mapped for use in compilation by the aerial survey contractor. The controls for the aerial mapping will be in sufficient numbers and will be in locations that will be compatible with the accuracy of the mapping requirements. The controls will be of at least third order accuracy. Section corners, quarter corners, and mid-section points will be used for control points wherever possible; including ERMs from prior ADMSs, FISs, and FCD projects. Where readily available, surveys will tie into the State Plane Coordinate System.

3.6 The consultant will develop permanent non-erasable mylars of the topographic mapping. The drawings will be 24" X 36" in size, with a scale of 1 inch = 100 feet and a contour interval of 2 feet for all mapping except for section line roads which will have a contour interval of 1 foot. A sample cover sheet will be provided by the District. The project title, date of topographic mapping, and a location map showing geographic range covered by each sheet are typical items that need to be added by the consultant. Each drawing will include a minimum of a north arrow, scale, section corners and quarter corners, current and proposed streets and highway names, State Plane Coordinate System, major drainage features, corporate boundaries, cross section lines, channel station center line, index map, and description and elevation of elevation reference marks (ERMs). A note explaining the proper means to convert the NGVD 29 elevations to NAVD 88 elevations will be included in "NOTES" in the map border. No sticky backs or other types of applied material shall be used on the mylars.

3.7 One complete set of 9" x 9" contact prints of the aerial stereo photographs sequentially numbered and catalogued will be provided to the District. Include an exhibit showing the area covered by each flight.

TASK 4 - FIELD SURVEY

4.1 The consultant will be responsible for obtaining the necessary field survey work to support the topographic mapping effort, and to provide supporting data for the hydraulic modeling and analysis .

4.2 Ground Control:

4.2.1 All topographic mapping and survey work will meet or exceed Federal Emergency Management Agency (FEMA) minimum criteria as defined in FEMA Document 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, January 1995. This would include, but is not limited to: the establishment of "permanent" elevation reference marks (ERMs); field control; and verification of profiles by the ground survey profile procedure.

4.2.2 Horizontal and Vertical Control: Systematically set panel points and establish horizontal and vertical control throughout the area to be mapped for use in compilation by the aerial survey contractor. Where readily available, surveys will tie into State Plane Coordinate System 1983 NAD. Field control will be sufficient, at least one "permanent" point per mile, such points being used as Elevation Reference Marks (ERMs). Surveys will be based on National Geodetic Vertical Datum (NGVD) 1929. The consultant will provide a conversion factor, including documentation of how it was derived, to allow comparison of NGVD 29 elevations to NAVD 88 elevations and it will be included in the Final Report. "Permanent" survey points will consist of existing monumentation, such as brass caps or similar survey monuments. Where additional monumentation is needed, survey markers conforming to Maricopa Association of Governments (MAG) Uniform Standard Detail for Public Works Construction, Detail No. 120-1, Type C, shall be placed 2" +/- above grade, and topped with a brass cap. Elevation Reference Marks will be labeled on available maps and described in a manner which allows them to be readily located in the field.

4.2.3 All aerial targets are to be removed following completion of the topographic mapping.

4.3 The consultant will verify the accuracy of the mapping by the procedures called for in FEMA-37 or other methods acceptable to the District. This will also include the verification of cross sections used in the hydraulic analyses.

4.4 Field surveys of bridges, culverts, and hydraulic structures are to be obtained by the consultant when as-built plans are not available or when changes, such as sedimentation, have occurred since the date of the as-built. The information obtained shall be in a format appropriate for use in the HEC-RAS model. It may be necessary to field survey some structures since the as-built plans may not be on 1929 NGVD.

4.5 The survey notes will be copied, placed into a notebook, and submitted to the District separate from the Final Report.

TASK 5 - HYDRAULIC ANALYSIS

5.1 Hydraulic analyses will be performed using the latest version of the U.S. Army Corps of Engineers HEC-RAS River Analysis System computer model. The upstream end of each analysis will be the terminus of the EMF upstream of Brown Road. The downstream limit will be at the confluence of the EMF and the Gila River. The analysis will include extending the model a minimum of 500 feet upstream each tributary in order to model the tributary side inflow at the major concentration points such as: Superstition Freeway, Guadalupe Channel, Powerline Floodway, Rittenhouse Channel, Queen Creek, and Sanoqui Wash.

5.2 The consultant must obtain District approval at each of the following steps:

a. Field reconnaissance report and estimation of Manning's "n" values.

b. Proposed location and alignment of the cross sections and channel centerline.

c. Each Hydraulic Report (run).

5.3 Field Reconnaissance:

5.3.1 The consultant will conduct a field reconnaissance of the full study reach. This will include observation of channel and floodplain conditions for estimation of Manning's "n" values; photographic documentation of floodplain characteristics; determination of channel bank stations; observation of possible overflow areas; inspection of levees or other flood control structures; and measurement of bridge dimensions.

5.3.2 Manning's "n" values are to be determined using the methodology in the USGS report, Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona, April 1991. Copies of the report are available through the District.

5.3.3 A draft report on the field reconnaissance shall be submitted to the District for review and approval before beginning the HEC-RAS modeling. The report will present the determination of channel and overbank "n" values using captioned color photographs or color photocopies. The report will also discuss floodplain conditions affecting the analyses (such as a negative slope), describe structures and obstructions, and provide color photos or photocopies of major hydraulic structures. Photo locations, structures, and "n" values will be displayed on reduced scale mapping. The field reconnaissance report will be included in the Final Report.

5.4 The consultant will create the hydraulic computer models of the EMF using the topographic mapping developed for this study. The first model will be for the existing topographic condition with the design discharge values. The consultant will develop a second hydraulic model to determine the bankfull capacity value at each cross section, based upon existing topographic conditions without any freeboard. The consultant will develop a third model using the future condition discharges. The District will supply the design and future condition discharge

values.

5.5 The consultant will review the results of the first three hydraulic models to determine areas where the design and future discharges aren't contained within the existing topography for the EMF.

5.6 The computer models will be executed in a mixed flow regime to assess subcritical and supercritical flow through the drop structures and the lined sections.

5.7 Cross Sections:

5.7.1 The location and alignment of cross sections and channel centerline will be submitted for the District's review and approval before digitizing the cross section data. Cross section stationing will be from left to right looking downstream with the thalweg at station 5,000. Cross sections will be spaced approximately every 500 feet, unless geographic, structural constraints, or modeling requirements dictate otherwise, and shall extend the full width of the area in question. Identification of cross sections will be in river miles, increasing upstream. The stationing will tie into the specified river mile of the existing EMF stationing. Cross section orientation may need to be altered after running of HEC-RAS model to ensure that sections are perpendicular to flow. Cross sections developed by the HEC-RAS interpolation routine are not to be used.

5.7.2. All cross sections shall be plotted using a pen, laser, or electrostatic plotter. The cross section plots will show the water surface elevation, ineffective flow areas, "n" values, channel stationing and other pertinent information. All plots are to be accompanied by a legend. These plots are to be available at all reviews and will be included in the as part of the Final Report.

5.8 Bridges and culverts must be modeled according to HEC-RAS modeling requirements for the selected routine. Where multiple bridges occur, each bridge shall be modeled separately. The HEC-RAS modeling results for bridges, culverts, and other hydraulic structures must be checked by using an independent method approved by the District to analyze these structures.

5.9 The consultant is to make refinements to the computer models based on review of the models by the District. Adjustments to the input parameters for obtaining the most realistic results are considered normal to the scope.

5.10 A Final Report will be submitted at the end of the study. The Final Report will include copies of correspondence, minutes of any meetings, the data collection report, field reconnaissance report, discussion of the various hydraulic models developed, discussion of the problems encountered, complete printouts of the HEC-RAS models, copies of the HEC-RAS models on diskette, and reduced (11" x 17") copies of the work study drawings. The Final Report will be organized similar to the way the Technical Data Notebook is for Floodplain Delineation Studies. The Final Report must also assess the hydraulic impacts of flow at bends and side inflow into the channel at: Superstition Freeway, Guadalupe Channel, Powerline Floodway, Rittenhouse Channel, Queen Creek and Sanoqui Wash. The Final Report shall also compare the Manning's n values from the design condition with the ones used in

this study.

5.11 The consultant will develop full size (24" x 36") work study drawings showing the delineation of the hydraulic modeling results. The horizontal scale will be 1" = 100' and the target vertical scale will be either 1" = 5', or 1" = 10'. The upper half of these drawings will be a plan view of the EMF and will be similar to how the drawings are done for a Floodplain Delineation Study. These drawings will include all the information required on the topographic mylars (Task 3.6) and, the cross section location, channel center line, delineation limits, etc. The lower half will be a profile plot showing such items as but not limited to: the channel thalweg, cross section location, left and right bank elevation, and the computed water surface elevations. A total of two sets of plan and profile drawings will be developed. The first set will show the water surface elevations for the design discharges and the bankfull discharges. The second set will show the water surface elevations with the future condition discharges. One copy of each set of these drawings on mylar will be delivered to the District at the end of the study. No sticky backs or other types of applied material shall be used on the mylars.

5.12 The hydraulic modeling information and results will be delivered in electronic format compatible with the District's Hydrologic Information System (HIS).

TASK 6 - HIS DATA

(Only the coverages specified below will be created and delivered)

HIS Data:
Digital data will be prepared in conformance with the District's Data Delivery Specifications, The Hydrologic Information System, Revision 2.2, April 25, 1997 for the following themes:

Name	Page No.	Description
NDXPRJ	LP-40	Shows the map sheet boundaries of the project
PRJ	LP-60	Defines the boundary of the project
CARTO	LP-110	For storing planimetric features typically captured in study workflow but not required for FCD HIS analytic purposes
CORNERS	LP-210	Section corners as defined by the PLSS (Public land survey System)
CTRL	LP-215	Other control points that are not corners
STRCT	LP-360	Structures like building footprints, (If any)
DQ	LP-410	Data Quality of Data: Scale, date, Vertical Datum, Projection
PRJ.REL	LP-430	Contractor name, Project Name, Project Id

Name	Page No.	Description
FPBLN	LP-520	Floodway center line
FPCTLFCD	LP-523	Elevation Reference Marks
FPXFCD	LP-540	Cross sections used in HEC-2 (HEC-RAS)
BRIDGE	LP-608	Bridge
CNL	LP-610	Canals (If any)
CULVERT	LP-612	Culvert
FLTY	LP-620	FCD Project in the area (If any)
RR	LP-650	Railroads in the area (If any)
STRTDTL	LP-660	Edge of Pavement (if any)
ELV	LP-710	Contours and spot elevations
LAKE	LP-950	Lakes are in the area (If any)
RIVER	LP-960	Washes or streams in the area (If any)

This is a comprehensive listing of possible features. If there are no features collected under one of the categories mentioned, then the theme does not need to be delivered, **although the first automation of the CAD digital files must be submitted**.

HIS data submitted will be subject to a rigorous quality control (QC) check by the District. The District makes use of a checklist and a computer program to document and automate the QC process. A copy of the checklist will be furnished to the consultant. The consultant will use the checklist to review each HIS data submittal for compliance, and deliver a completed copy of the checklist to the District along with the data submittal.

The District will supply to the consultant the computerized application that automates the QC process. The consultant must use the computer application to review the data prior to any submittals. The application is available for Arc/Info on all UNIX platforms.

TASK 7 - DELIVERABLES

7.1 One draft copy of the Data Collection Report.

7.2 One (1) copy of the Digital Terrain Model (DTM) will be submitted following the guidelines stated in the Data Delivery Specifications: The Hydrologic Information System, Revision 2.2, April 25, 1997.

7.3 Digitized topographic and other data in conformance with the District's HIS Specifications. The digitized topographic data shall be submitted as soon as it is

available.

7.4 One (1) complete set of 9" X 9" contact prints of the aerial stereo photographs sequentially numbered and catalogued.

7.5 One complete set of non-erasable mylars (24" x 36") of the topographic mapping data.

7.6 Two (2) sets of complete survey notes will be submitted in a notebook separate from the Final Report.

7.7 One draft copy of the Field Reconnaissance Report.

7.8 Three (3) complete copies of the Final Report.

7.9 One (1) complete mylar set of the full size (24" x 36") work study drawings, and one (1) complete set of the work study drawings on paper.

7.10 Copies of any other materials used in the development of the report including the first automation of the CAD digital files.

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

RECEIVED
SEP 21 1998
HNTB

September 16, 1998

HNTB
40 North Central Avenue, Suite 300
Phoenix, AZ 85004

Subject: Change Order No. 1
Contract FCD 97-06, East Maricopa Floodway

Attached is one fully executed original of the subject change order for your files.

If you have any questions, please call the writer at 506-4433.

Sincerely,

Dortha Klaahsen

Dortha Klaahsen
Contract Administrator

ENGINEERING CHANGE ORDER

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Contract Change Order No. 1

Date: 9/04/98 PCN No.: 121-00-94

FCD Contract No./Name: East Maricopa Floodway Capacity Study

TO: HNTB, Consultant

By mutual agreement of the parties, the following contract change(s) are incorporated into Contract FCD 97-06. All other contract terms and conditions remain unchanged.

Description of Change(s)	
1) Add a third profile to the hydraulic analysis using the existing condition discharges developed by the District for the EMF. The results of this third profile are to be included on the plan and profile sheets, and in the Final Report in the same fashion as the other two profiles. 2) Revise the determination of the bankfull discharge from being a separate HEC-RAS model to determining it from the rating curve for each cross section. 3) Revise the requirement for extending the HEC-RAS model 500 feet upstream of each tributary to delineating the EMF's computed water surface elevation up the tributary. 4) In order to better display the study results, the consultant may revise the size of the sheets. However, one side of the sheets may not exceed 36 inches in length. 5) Delete the translation of the study results (hydraulic modeling and delineation) into the District GIS format. Instead this information will be submitted in a CADD format. The consultant shall layer the CADD files in a fashion that will allow translation of the study results into a GIS format at a later date by the District.	
Original Contract Amount	$ 326,880
Total dollar amount of this Change Order	$ -5,525
Total contract amount through this Change Order	$ 321,355
By means of this change order, 163 days are added to the contract completion date. The revised contract completion date is 10/30/98.	

We, the undersigned Consultant, hereby agree that upon execution of this change order we will perform all services as identified above, and will accept the above specified amount(s) as full payment therefor.

Consultant Name/Address: HNTB
40 North Central Avenue, Suite 300
Phoenix, Arizona 85004

By: Benjamin C. Wilde
Title: Pres. W. Div.
Date: 9/4/98

Recommended by: Edwin J. O'Reilly 9/8/98
Date

Approved by: 9-15-98
For Chief Engineer and General Manager Date

Revised 5/98

HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
Phoenix, Arizona
85004
(602) 528-4300
FAX (602) 528-4301

September 21, 1998

Mr. Robert G. Parks
Vice President
Aerial Mapping Company, Inc.
3141 West Clarendon Avenue
Phoenix, Arizona 85017

Reference: East Maricopa Floodway Capacity Assessment
Contract No. FCD 97-06

Subject: Subconsultant Agreement Amendment
Per Change Order No. 1

Dear Bob,

Attached are two copies of the subconsultant agreement amendment for the above referenced project with HNTB . We have deducted your contracted fee from $74,684 to **$69,159** per Change Item No. 5 in the attached Change Order No. 1. With this fee reduction, the translation of the study results into the FCDMC's GIS format was deleted from your scope of work.

Please initial this amendment for acknowledge of the change in scope and fee, and forward a signed original to HNTB.

Very Truly Yours,

HNTB CORPORATION

B. Gary Sun, P.E.
Project Manager

Aerial Mapping Company, Inc.

By _____

Date 9/23/97

Attachment

cc: Judy Hannah
File 27559

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FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

RECEIVED
SEP 21 1998
HNTB

September 16, 1998

HNTB
40 North Central Avenue, Suite 300
Phoenix, AZ 85004

Subject: Change Order No. 1
Contract FCD 97-06, East Maricopa Floodway

Attached is one fully executed original of the subject change order for your files.

If you have any questions, please call the writer at 506-4433.

Sincerely,

Dortha Klaahsen

Dortha Klaahsen
Contract Administrator

ENGINEERING CHANGE ORDER

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Contract Change Order No. 1

Date: 9/04/98 PCN No.: 121-00-94

FCD Contract No./Name: East Maricopa Floodway Capacity Study

TO: HNTB, Consultant

By mutual agreement of the parties, the following contract change(s) are incorporated into Contract FCD 97-06. All other contract terms and conditions remain unchanged.

Description of Change(s)	
1) Add a third profile to the hydraulic analysis using the existing condition discharges developed by the District for the EMF. The results of this third profile are to be included on the plan and profile sheets, and in the Final Report in the same fashion as the other two profiles. 2) Revise the determination of the bankfull discharge from being a separate HEC-RAS model to determining it from the rating curve for each cross section. 3) Revise the requirement for extending the HEC-RAS model 500 feet upstream of each tributary to delineating the EMF's computed water surface elevation up the tributary. 4) In order to better display the study results, the consultant may revise the size of the sheets. However, one side of the sheets may not exceed 36 inches in length. 5) Delete the translation of the study results (hydraulic modeling and delineation) into the District GIS format. Instead this information will be submitted in a CADD format. The consultant shall layer the CADD files in a fashion that will allow translation of the study results into a GIS format at a later date by the District.	
Original Contract Amount	$ 326,880
Total dollar amount of this Change Order	$ -5,525
Total contract amount through this Change Order	$ 321,355
By means of this change order, 163 days are added to the contract completion date. The revised contract completion date is 10/30/98.	

We, the undersigned Consultant, hereby agree that upon execution of this change order we will perform all services as identified above, and will accept the above specified amount(s) as full payment therefor.

Consultant Name/Address: HNTB
40 North Central Avenue, Suite 300
Phoenix, Arizona 85004

By: Benjamin C. [illegible]
Title: Pres. W. Div.
Date: 9/4/98

Recommended by: Edward J. O'Malley 9/8/98
Date

Approved by: [illegible] 9-15-98
FOR Chief Engineer and General Manager Date

Revised 5/98

APPENDIX A

GENERAL DOCUMENTS

2. Meeting Minutes and Progress Reports

EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT STUDY
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Contract No. FCD 97-06

PROJECT COORDINATION MEETING

Date: Thursday, January 13, 1998

Time: 1:30 p.m.

Location: FCDMC

Meeting Attendees:

Marta Dent, FCDMC-G.I.S.
Valerie Swick, FCDMC-Engineering
Jill Bennett, HNTB (528-4361)
Mark Brewer, FCDMC-G.I.S.
Glenn Card, FCDMC-Engineering
David Degerness, FCDMC-Engineering
Tim Murphy, FCDMC-Engineering (506-4605)
Joe Tram, FCDMC-Engineering
Bob Parks, Aerial Mapping Company, Inc. (AMCI) (263-5728)
Gary Sun, HNTB (528-4391)

Meeting Minutes By: Gary Sun, HNTB GS

The purpose of this Project Coordination Meeting was to discuss GIS/CADD requirements, Project Progress and Project Schedule. The following is a summary of items discussed and agreed upon in the meeting:

1. **GIS and CADD:**
   a. HNTB has copied the FCDMC's standard border, cover sheet and plan and profile sheets from the FCDMC's web page today.
   b. Only the existing topography, hydraulic files, floodplain limits and new HIS information will be provided in GIS format. The plan and profile sheets will not go into GIS.
   c. HNTB will provide AMCI a "Layering Scheme" for any new information to be converted to GIS. The GIS files will be prepared and submitted by AMCI.
   d. HNTB will check and review the AMCI's topography submittals, and then AMCI will deliver the existing topography GIS information to FCDMC as soon as HNTB approves.

e. FCDMC will provide HNTB a program that can be downloaded from the FCDMC web page to get the FCDMC Output Tables for GIS directly from the HEC-RAS files.
f. FCDMC will get their CADD personnel to discuss with HNTB on IPLOT setup, cell library, pen tables, font library, plot files, level symbology, and miscellaneous items.
g. HNTB will copy the cell and font libraries used as a part of their CADD deliverable.

2. Project Progress:

a. **Field Survey:** Field survey work is completed, and the Survey notes will be compiled and delivered to HNTB by January 23, 1998.
b. **Mapping:** HNTB only received the first 3.5 miles of topography from the north end of the project. AMCI will deliver the rest of the Maricopa County side of topography by Friday, January 16, 1998. The topography in the Gila River Indian Community will be delivered to HNTB no later than Tuesday, February 10, 1998.
c. **Hydrology:**
   i. The future 100-year peak discharges are being modified due to the 1997 Land Uses change from the 1990 information.
   ii. The existing 100-year peak discharges are almost completed by FCDMC. These discharges will be completed by Friday, January 16, 1998.
   iii. The future 100-year peak discharges will be completed by Friday, January 23, 1998.
   iv. It was decided that no inflows will be provided from Hunt Highway to the Gila River because these inflows are not enough to change the floodway peak flows. Therefore, the last inflow information provided will be at Hunt Highway.
   v. It was agreed that FCDMC can provide all the existing and future 100-year discharges on the same exhibit to HNTB. HNTB will verify the exact inflow locations with FCDMC before the HEC-RAS modeling.
d. **Floodway Centerline:**
   i. HNTB requested the floodway centerline information within two golf courses, Leisure World and Superstition Springs Golf Courses.
   ii. Tim provided HNTB with two plans related to these golf courses. They were "Grading Plan for R.W.C.D. Floodway north of Southern Avenue" and "Flood Boundaries for the Golf Course Design within the R.W.C.D. Floodway, Southern Avenue to Guadalupe Road". HNTB will use any floodway centerline information from these plans.
   iii. It was agreed that HNTB will add a disclaimer on the plans regarding using the as-built plans and accuracy of the floodway centerline.
e. **Plan and Profile Sheet Scale:** It was decided that HNTB will use the 1"=100' horizontal scale and the 1"=5' vertical scale on all the plan and profile sheets.

3. **Project Schedule:** HNTB will revise the Project Schedule to reflect the intermediate submittals delay, but the Final Report submittal date is still the same on May 19, 1998. HNTB will submit the Draft Data Collection Summary, Draft Field Reconnaissance Report, and Draft Manning's n Value Determination Report next week.

If any attendees have any corrections or additions to these minutes, please notify Gary Sun at 528-4391.

cc: Attendees
Larry Maldonado - Project Engineering Consultants
HNTB File 27559

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Name	Org
Tim Murphy	FCD
Gary Sun	HNTB
Bob Parks	AMCI
David J Degumesa	FCD
MARK BREWER	FCD
Marta Dent	FCD.
Glenn Card	FCD
Joe TRAM	FCD
Valerie Swick	FCD
JILL BONNETT	HNTB

HNTB ARCHITECTS ENGINEERS PLANNERS

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August 10, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report I
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from September 22 through October 24, 1997.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	10%
2.0	DATA COLLECTION	30%
3.0	TOPOHRAPHIC MAPPING	25%
4.0	FIELD SURVEY	50%
5.0	HYDRAULIC ANALYSIS	5%
6.0	HIS DATA	0%
7.0	DELIVERABLES	0%
	TOTAL PROJECT	18%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Submitted Project Schedule on October 20, 1997.
2.0 DATA COLLECTION: Collected bridge and culvert as-built plans.
3.0 TOPOGRAPHIC MAPPING: Made the first of two flights on October 1, 1997 to cover the Maricopa County portion of the East Maricopa Floodway.
4.0 FIELD SURVEY: Completed ground control for the first flight of topographic mapping, and completed field survey of bridges/culverts from Brown Road to Riggs Road.
5.0 HYDRAULIC ANALYSIS: Two field reconnaissance trips were made on October 7 and 13, 1997 for the entire 27 mile floodway.

D. Tasks to be accomplished the following month is outlined below:

2.0 DATA COLLECTION: Collect all the bridge and culvert as-built plans, and review the collected as-built plans.

3.0 TOPOGRAPHIC MAPPING: Make the second (last) flight to cover the south end of East Maricopa Floodway within the Gila River Indian Community.

4.0 FIELD SURVEY: Complete ground survey for the second flight and continue the bridge/culvert field surveys.

5.0 HYDRAULIC ANALYSIS: Review the site photographs and prepare the Manning's n Value Determination Report.

Very truly yours,

HNTB Corporation

Bailey Sun

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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August 11, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report II
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from October 25 through November 28, 1997.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	20%
2.0	DATA COLLECTION	70%
3.0	TOPOHRAPHIC MAPPING	65%
4.0	FIELD SURVEY	90%
5.0	HYDRAULIC ANALYSIS	10%
6.0	HIS DATA	0%
7.0	DELIVERABLES	0%
	TOTAL PROJECT	36%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated work tasks with the subconsultants.
2.0 DATA COLLECTION: Collected additional bridge and culvert as-built plans, reviewed the collected as-built plans.
3.0 TOPOGRAPHIC MAPPING: Made the second and last flights on November 22, 1997 to cover the south end (Gila River Indian Community) portion of the East Maricopa Floodway.
4.0 FIELD SURVEY: Completed ground control for the second flight of topographic mapping, completed field survey of bridges/culverts, complied field survey data.
5.0 HYDRAULIC ANALYSIS: Prepared draft Manning's n Value Determination Report and draft Field Reconnaissance Report.

D. Tasks to be accomplished the following month is outlined below:

2.0 DATA COLLECTION: Collect all the bridge and culvert as-built plans. Nine more structures' as-built plans were needed to be collected including US 60 and SR 587 Bridges from ADOT.

3.0 TOPOGRAPHIC MAPPING: Submit the Contact Prints and preliminary topography.

4.0 FIELD SURVEY: Complete the compiling of control points for aerial mapping and submit the bridge/culvert field survey data.

5.0 HYDRAULIC ANALYSIS: Continue preparation of the draft Manning's n Value Determination Report while we are waiting for the mapping.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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August 11, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report III
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from November 29 through December 26, 1997.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	30%
2.0	DATA COLLECTION	90%
3.0	TOPOHRAPHIC MAPPING	75%
4.0	FIELD SURVEY	95%
5.0	HYDRAULIC ANALYSIS	15%
6.0	HIS DATA	0%
7.0	DELIVERABLES	0%
	TOTAL PROJECT	40%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated work tasks with the subconsultants.
2.0 DATA COLLECTION: Collected additional bridge and culvert as-built plans, reviewed the collected as-built plans.
3.0 TOPOGRAPHIC MAPPING: Received a copy of contact prints and a preliminary (95% complete) topography and DTM drawings from AMCI on December 23, 1997 for the north (Maricopa County) portion of the East Maricopa Floodway.
4.0 FIELD SURVEY: Complied field survey data and ground control points.
5.0 HYDRAULIC ANALYSIS: Prepared draft Manning's n Value Determination Report and draft Field Reconnaissance Report.

D. Tasks to be accomplished the following month is outlined below:

2.0 DATA COLLECTION: Collect the as-built plans for two golf courses at Leisure World and Superstition Springs.
3.0 TOPOGRAPHIC MAPPING: Complete topography.
4.0 FIELD SURVEY: Complete and submit the bridge/culvert field survey data.
5.0 HYDRAULIC ANALYSIS: Continue preparation of the draft Manning's n Value Determination Report, review the mapping, and generate the surfaces (DTM).

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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August 12, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report IV
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from December 27, 1997 through January 30, 1998.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	40%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	80%
4.0	FIELD SURVEY	97%
5.0	HYDRAULIC ANALYSIS	20%
6.0	HIS DATA	0%
7.0	DELIVERABLES	10%
	TOTAL PROJECT	42%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: A project coordination meeting was held on January 13, 1998 with FCDMC and Aerial Mapping Company, Inc. (AMCI) to discuss GIS/CADD requirements, project progress and project schedule.
2.0 DATA COLLECTION: Completed collections of all available as-built plans on January 13, 1998.
3.0 TOPOGRAPHIC MAPPING: Received the remaining 16 +/- miles of preliminary (95% complete) topography from AMCI on January 22, 1998 for the north (Maricopa County) portion of the East Maricopa Floodway.
4.0 FIELD SURVEY: Received field survey notes from PEC on January 21, 1998. Continue compiling ground control points.
5.0 HYDRAULIC ANALYSIS: Submitted draft Manning's n Value Determination Report to FCDMC on January 29, 1998. Continued the floodway thalweg determination.

6.0 HIS DATA: No work was done for this period.
7.0 DELIVERABLES: Submitted draft Data Collection Report to FCDMC on January 14, 1998. Submitted a copy of 9"x9" Contact Prints to FCDMC.

D. Tasks to be accomplished the following month is outlined below:

3.0 TOPOGRAPHIC MAPPING: Complete topography for the south end.
4.0 FIELD SURVEY: Complete and submit the panel control points to AMCI for the Gila River Indian Community area.
5.0 HYDRAULIC ANALYSIS: Review the mapping, generate the surfaces (DTM), cut cross sections.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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August 13, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report V
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from January 31 through February 27, 1998.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	50%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	85%
4.0	FIELD SURVEY	100%
5.0	HYDRAULIC ANALYSIS	35%
6.0	HIS DATA	0%
7.0	DELIVERABLES	10%
	TOTAL PROJECT	52%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated with FCDMC and subconsultants.
2.0 DATA COLLECTION: This task was completed in January, 1998.
3.0 TOPOGRAPHIC MAPPING: Received a preliminary topography (breaklines file) from AMCI on February 16, 1998 for the south (Gila River Indian Community) portion of the East Maricopa Floodway.
4.0 FIELD SURVEY: This task is completed in this period.
5.0 HYDRAULIC ANALYSIS: Continued the floodway thalweg determination using river miles for the EMF downstream end at the top of grouted riprap drop structure as Mile 0.000. Completed the floodway thalweg determination on February 20, and began cutting the cross section on February 23, 1998. Generated DTM files for the Maricopa County portion of the EMF.
6.0 HIS DATA: No work was done for this period.

7.0 DELIVERABLES: Received FCDMC review comments on February 25, 1998 for the draft Manning's n Value Determination Report.

D. Tasks to be accomplished the following month is outlined below:

3.0 TOPOGRAPHIC MAPPING: Complete topography for the south end.
5.0 HYDRAULIC ANALYSIS: Complete the surfaces (DTM) generation, Continue cutting cross sections, and begin HEC-RAS modeling.
6.0 HIS DATA: Prepare GIS data for topography.

Very truly yours,

HNTB Corporation

Barley Sun

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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August 14, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report VI
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from February 28 through March 27, 1998.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	53%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	88%
4.0	FIELD SURVEY	100%
5.0	HYDRAULIC ANALYSIS	38%
6.0	HIS DATA	0%
7.0	DELIVERABLES	10%
	TOTAL PROJECT	54%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated with FCDMC and subconsultants.
2.0 DATA COLLECTION: This task was completed in January, 1998.
3.0 TOPOGRAPHIC MAPPING: Received a preliminary topography from AMCI on March 2, 1998 for the south (Gila River Indian Community) portion of the East Maricopa Floodway.
4.0 FIELD SURVEY: This task is completed in February, 1998.
5.0 HYDRAULIC ANALYSIS: Continued generating DTM files with additional information from AMCI for the Maricopa County portion of the EMF. Generated DTM files for the Gila River Indian Community portion of the EMF. Submitted the typical cross section layout on March 4, 1998 for FCDMC review and comment, and received review comments on March 5, 1998.
6.0 HIS DATA: No work was done for this period.
7.0 DELIVERABLES: No work was done for this period.

D. Tasks to be accomplished the following month is outlined below:

3.0 TOPOGRAPHIC MAPPING: Provide breaklines information for the south end.
5.0 HYDRAULIC ANALYSIS: Complete the surfaces (DTM) generation for the south end, Continue cutting cross sections, and Continue Reach 6 HEC-RAS modeling.
6.0 HIS DATA: Prepare GIS data for topography.
7.0 DELIVERABLES: Submit the preliminary topographic mapping sheets for FCDMC review.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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August 14, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report VII
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from March 28 through April 24, 1998.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	57%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	95%
4.0	FIELD SURVEY	100%
5.0	HYDRAULIC ANALYSIS	40%
6.0	HIS DATA	15%
7.0	DELIVERABLES	30%
	TOTAL PROJECT	60%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated with FCDMC and subconsultants.
2.0 DATA COLLECTION: This task was completed in January, 1998.
3.0 TOPOGRAPHIC MAPPING: Provided additional data for the generation of DTM files for the south (Gila River Indian Community) portion of the East Maricopa Floodway.
4.0 FIELD SURVEY: This task is completed in February, 1998.
5.0 HYDRAULIC ANALYSIS: Received the discharge values on April 3, 1998 from FCDMC. Completed Generating the DTM files on April 6, 1998 for the Maricopa County portion of the EMF. Generated the DTM files for the Gila River Indian Community portion of the EMF. Continued cutting Reach 1, Reach 2 and Reach 6 cross sections, and preparing HEC-RAS models.
6.0 HIS DATA: Provided the level symbology and line types for the topographic mapping and prepared GIS topographic data.

7.0 DELIVERABLES: Submitted the preliminary topographic mapping sheets on April 6, 1998 for FCDMC review, and received review comments on April 8, 1998. Submitted 10 topographic mapping drawings and 3 DTM files in MicroStation format on April 9, 1998 for FCDMC review.

D. Tasks to be accomplished the following month is outlined below:

3.0 TOPOGRAPHIC MAPPING: Provide additional information for the mapping.
5.0 HYDRAULIC ANALYSIS: Complete the surfaces (DTM) generation for the south end, Continue cutting cross sections, Continue HEC-RAS modeling and FCDMC's review.
6.0 HIS DATA: Prepare GIS data for topography per FCDMC's review comments.
7.0 DELIVERABLES: Submit the preliminary topographic mapping sheets for FCDMC review.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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HNTB ARCHITECTS ENGINEERS PLANNERS

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August 17, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report VIII
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from April 25 through May 22, 1998.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	65%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	99%
4.0	FIELD SURVEY	100%
5.0	HYDRAULIC ANALYSIS	50%
6.0	HIS DATA	20%
7.0	DELIVERABLES	35%
	TOTAL PROJECT	63%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated with FCDMC and subconsultants. Requested project time extension on May 6, 1998 for the new completion date of July 31, 1998 due to the topographic mapping delay and DTM problems.
2.0 DATA COLLECTION: This task was completed in January, 1998.
3.0 TOPOGRAPHIC MAPPING: Revised topographic data by AMCI per FCDMC's comments and completed only the first 25 of 50 sheets on May 11, 1998. The rest of 25 sheets was completed on May 19, 1998.
4.0 FIELD SURVEY: This task is completed in February, 1998.
5.0 HYDRAULIC ANALYSIS: Completed Generating the DTM files for the Gila River Indian Community portion of the EMF on April 23, 1998. Continued cutting cross sections, and preparing HEC-RAS models.
6.0 HIS DATA: Prepared GIS topographic data.

7.0 DELIVERABLES: Submitted the preliminary topographic mapping sheets on April 15, 1998 for the FCDMC 2nd review, and received review comments on April 17, 1998. Submitted the topographic mapping sheets on May 22, 1998 for the FCDMC 3rd review.

D. Tasks to be accomplished the following month is outlined below:

3.0 TOPOGRAPHIC MAPPING: Revise the topographic data per FCDMC comments.
5.0 HYDRAULIC ANALYSIS: Continue cutting cross sections and submit the HEC-RAS models for FCDMC's review.
6.0 HIS DATA: Prepare GIS data for topographic data.
7.0 DELIVERABLES: Submit the topographic mapping sheets for FCDMC review.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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HNTB ARCHITECTS ENGINEERS PLANNERS

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(602) 528-4300
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August 18, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report IX
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from May 23 through June 26, 1998.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	70%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	99%
4.0	FIELD SURVEY	100%
5.0	HYDRAULIC ANALYSIS	60%
6.0	HIS DATA	30%
7.0	DELIVERABLES	35%
	TOTAL PROJECT	70%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated with FCDMC and subconsultants. On June 25, FCDMC mentioned that a Change Order will be issued to delete the hydraulic analysis of the tributaries, and add the discharge values for the existing conditions to the analysis. It is a no cost Change Order. HNTB will still perform the channel bankfull analysis.

2.0 DATA COLLECTION: This task was completed in January, 1998.

3.0 TOPOGRAPHIC MAPPING: Revised topographic data by AMCI per FCDMC's 3rd review comments.

4.0 FIELD SURVEY: This task is completed in February, 1998.

5.0 HYDRAULIC ANALYSIS: Continued cutting cross sections, and preparing HEC-RAS models. Submitted Reach 6 HEC-RAS model to FCDMC on June 3, and received review comments on June 11, 1998. Received the revised discharge

values from FCDMC on June 12, 1998. Submitted Reaches 1 and 5 HEC-RAS models to FCDMC on June 13, 1998.

6.0 HIS DATA: Prepared GIS topographic data.

7.0 DELIVERABLES: Received the FCDMC review comments on June 3, 1998 for third submittal of the topographic mapping sheets.

D. Tasks to be accomplished the following month is outlined below:

3.0 TOPOGRAPHIC MAPPING: Complete the topographic data revisions per FCDMC comments.

5.0 HYDRAULIC ANALYSIS: Continue cutting cross sections and submit HEC-RAS modeling for FCDMC's review.

6.0 HIS DATA: Prepare GIS data for topographic data.

7.0 DELIVERABLES: Submit the topographic mapping sheets for FCDMC review.

Very truly yours,

HNTB Corporation

Bail G Sun

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
Phoenix, Arizona
85004
(602) 528-4300
FAX (602) 528-4301

August 21, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report X
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from June 27 through July 31, 1998.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	75%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	99%
4.0	FIELD SURVEY	100%
5.0	HYDRAULIC ANALYSIS	67%
6.0	HIS DATA	30%
7.0	DELIVERABLES	45%
	TOTAL PROJECT	77%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated with FCDMC and subconsultants.
2.0 DATA COLLECTION: This task was completed in January, 1998.
3.0 TOPOGRAPHIC MAPPING: Received the revised topographic data from AMCI on July 6 per FCDMC's 3rd review comments.
4.0 FIELD SURVEY: This task is completed in February, 1998.
5.0 HYDRAULIC ANALYSIS: Continued cutting cross sections, and preparing Reaches 3 and 4 HEC-RAS models. Submitted the revised Reaches 1 and 5 HEC-RAS models to FCDMC on July 9, 1998. Submitted the Reach 2 and revised Reach 5 HEC-RAS models to FCDMC on July 16, 1998.

6.0 HIS DATA: Prepared GIS topographic data.

7.0 DELIVERABLES: Submitted the revised topographic mapping sheets to FCDMC on July 9, and received the FCDMC review comments on July 14, 1998. Made another submittal of the revised topographic mapping sheets on July 30, 1998.

D. Tasks to be accomplished the following month is outlined below:

3.0 TOPOGRAPHIC MAPPING: Complete the topographic data revisions per FCDMC comments.
5.0 HYDRAULIC ANALYSIS: Continue cutting cross sections and submit HEC-RAS modeling for FCDMC's review.
6.0 HIS DATA: Prepare GIS data for topographic data.
7.0 DELIVERABLES: Complete the topographic mapping sheets.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
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85004
(602) 528-4300
FAX (602) 528-4301

October 6, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report XI
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from August 1 through August 28, 1998.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	80%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	99%
4.0	FIELD SURVEY	100%
5.0	HYDRAULIC ANALYSIS	75%
6.0	HIS DATA	40%
7.0	DELIVERABLES	50%
	TOTAL PROJECT	80%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated with FCDMC and subconsultants.
2.0 DATA COLLECTION: This task was completed in January, 1998.
3.0 TOPOGRAPHIC MAPPING: Received the topographic map sheets per FCDMC's 3rd review comments.
4.0 FIELD SURVEY: This task is completed in February, 1998.
5.0 HYDRAULIC ANALYSIS: Continued the HEC-RAS modeling and reviewed with the FCDMC.
6.0 HIS DATA: Prepared GIS topographic data. Received a letter from AMCI regarding the upcoming Change Order No. 1 to delete the study results portion of the HIS Data work.
7.0 DELIVERABLES: No deliverables have done for this period.

D. Tasks to be accomplished the following month is outlined below:

3.0 TOPOGRAPHIC MAPPING: Complete the topographic data revisions per FCDMC comments.
5.0 HYDRAULIC ANALYSIS: Continue HEC-RAS modeling and submit for FCDMC's review.
6.0 HIS DATA: Prepare GIS data for topographic data.
7.0 DELIVERABLES: Submit the final topographic mapping sheets including mylars

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
Phoenix, Arizona
85004
(602) 528-1300
FAX (602) 528-1301

October 6, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report XI
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from August 29 through September 25, 1998.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	85%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	100%
4.0	FIELD SURVEY	100%
5.0	HYDRAULIC ANALYSIS	82%
6.0	HIS DATA	40%
7.0	DELIVERABLES	60%
	TOTAL PROJECT	82%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated with FCDMC and subconsultants.
2.0 DATA COLLECTION: This task was completed in January, 1998.
3.0 TOPOGRAPHIC MAPPING: This task was completed on September 3, 1998.
4.0 FIELD SURVEY: This task is completed in February, 1998.
5.0 HYDRAULIC ANALYSIS: Continued the HEC-RAS modeling and reviewed with the FCDMC.
6.0 HIS DATA: Completed GIS topographic data and submitted for FCDMC review on September 9, 1998.
7.0 DELIVERABLES: Submitted the Final Topographic Map original mylars on September 3, 1998. Submitted the GIS topographic data on September 9, 1998 for review.

D. Tasks to be accomplished the following month is outlined below:

5.0 HYDRAULIC ANALYSIS: Continue HEC-RAS modeling and submit for FCDMC's review.
6.0 HIS DATA: Waiting for FCDMC's review comments.
7.0 DELIVERABLES: Submit the Field Survey Notes, preliminary plan and profile sheets, and preliminary Study Report.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
Phoenix, Arizona
85004
(602) 528-4300
FAX (602) 528-4301

October 23, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report XII
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from September 26 through October 23, 1998.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	88%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	100%
4.0	FIELD SURVEY	100%
5.0	HYDRAULIC ANALYSIS	88%
6.0	HIS DATA	60%
7.0	DELIVERABLES	70%
	TOTAL PROJECT	88%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated with FCDMC and subconsultants.
2.0 DATA COLLECTION: This task was completed in January, 1998.
3.0 TOPOGRAPHIC MAPPING: This task was completed on September 3, 1998.
4.0 FIELD SURVEY: This task is completed in February, 1998.
5.0 HYDRAULIC ANALYSIS: Completed the HEC-RAS modeling and prepared Work Study Plan and Profile Sheets.
6.0 HIS DATA: Completed GIS topographic data and submitted for FCDMC review on September 9, 1998.
7.0 DELIVERABLES: Submitted two copies of Field Survey Notebook on October 6, 1998.

D. Tasks to be accomplished the following month is outlined below:

5.0 HYDRAULIC ANALYSIS: Prepare study report and print out the HEC-RAS model results for FCDMC's review.
6.0 HIS DATA: Waiting AMCI's revisions per FCDMC's review comments.
7.0 DELIVERABLES: Submit the preliminary plan and profile sheets, and draft study report.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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HNTB ARCHITECTS ENGINEERS PLANNERS

February 16, 1999

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Subject: Monthly Progress Report XIII
Contract No. FCD 97-06
East Maricopa Floodway Capacity Assessment

Dear Joe,

A. In this letter we are reporting project progress on the above mentioned project from October 23, 1998 through January 29, 1999.
B. Our estimated completion by task is as follows:

1.0	COORDINATION	98%
2.0	DATA COLLECTION	100%
3.0	TOPOHRAPHIC MAPPING	100%
4.0	FIELD SURVEY	100%
5.0	HYDRAULIC ANALYSIS	96%
6.0	HIS DATA	60%
7.0	DELIVERABLES	90%
	TOTAL PROJECT	96%

C. Progress on individual tasks through the reporting period is outlined below:

1.0 COORDINATION: Coordinated with FCDMC on HEC-RAS modeling and Work Study Plan and Profile Sheets.
2.0 DATA COLLECTION: This task was completed in January, 1998.
3.0 TOPOGRAPHIC MAPPING: This task was completed on September 3, 1998.
4.0 FIELD SURVEY: This task is completed in February, 1998.
5.0 HYDRAULIC ANALYSIS:
   a. Revised the HEC-RAS modeling per FCDMC's review comments.
   b. Revised Manning's "n" values to 0.025 for all the channel south of Guadalupe Road per Russ Cruff's (FCDMC) review comments dated November 15, 1998. The "n" values were revised in Reaches 1 to 4, and the south portion of Reach 5 up to Guadalupe Road. Due to the changes in the starting water surface elevations, Reach 6 HEC-RAS model was also revised.

c. Revised Work Study Plan and Profile Sheets per FCDMC review comments. The floodplain boundaries were revised per FCDMC's review comments dated November 16 1998, December 17 1998 and January 12 1999.

6.0 HIS DATA: Completed GIS topographic data and submitted to FCDMC in October, 1998.

7.0 DELIVERABLES: Submitted the revised HEC-RAS models and the work study plan and profile sheets for FCDMC's reviews. The HEC-RAS models were approved by FCDMC on January 12, 1999. HNTB will submit the mylars of Work Study Plan and Profile sheets by the first week of February.

D. Tasks to be accomplished the following month is outlined below:

5.0 HYDRAULIC ANALYSIS: Prepare final study report, submit draft final study report, and revise final study report per FCDMC's review.

6.0 HIS DATA: Submit the CAD files to FCDMC after receiving the FCDMC's approval of work study plan and profile sheets.

7.0 DELIVERABLES: Submit draft final study report, mylars of work study plan and profile sheets, and three copies of final study report after the FCDMC's approval.

Very truly yours,

HNTB Corporation

Barley Sun

B. Gary Sun, P.E.
Project Manager

cc: File 27559

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APPENDIX A

GENERAL DOCUMENTS

3. General Correspondence

HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
Phoenix, Arizona
85004
(602) 528-4300
FAX (602) 528-4301

January 14, 1998

Mr. Timothy M. Murphy
Project Manager
2801 West Durango Street
Phoenix, Arizona 85009

RE: East Maricopa Floodway Capacity Assessment
Draft Data Collection Summary
Maricopa County FCD Contract No. 97-06
HNTB Job No. 27559

Dear Mr. Murphy:

Enclosed is a copy of our Draft Data Collection Summary for the East Maricopa Floodway Capacity Assessment project.

If you have any questions or need additional information regarding the above, please feel free to contact me at 528-4391.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

Enclosure

cc: Joe Tram - FCDMC
File 27559

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HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
Phoenix, Arizona
85004
(602) 528-4300
FAX (602) 528-4301

January 29, 1998

Mr. Timothy M. Murphy
Project Manager
2801 West Durango Street
Phoenix, Arizona 85009

RE: East Maricopa Floodway Capacity Assessment
Maricopa County FCD Contract No. 97-06
HNTB Job No. 27559

Subject: Draft Manning's N Value Determination Report

Dear Tim,

Enclosed is a copy of our Draft Manning's N Value Determination Report for the East Maricopa Floodway Capacity Assessment project.

If you have any questions or need additional information regarding the above, please feel free to contact me at 528-4391.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

Enclosure

cc: Joe Tram - FCDMC
File 27559

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HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
Phoenix, Arizona
85004
(602) 528-4300
FAX (602) 528-4301

May 6, 1998

Mr. Joe Tram
Project Manager
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

RE: East Maricopa Floodway Capacity Assessment
Maricopa County FCD Contract No. 97-06
HNTB Job No. 27559

Subject: Project Time Extension Request

Dear Joe,

I am writing this letter to request time extension for the East Maricopa Floodway Capacity Assessment project. We are proposing the new project completion date of July 31, 1998. The reasons for the project delay were as follows:

1. **Topography Delay:** HNTB received the 95% complete topographic mapping for the area within Maricopa County on December 23, 1997. In addition, we obtained the topographic mapping for the Gila River Indian Community on March 2, 1998. It took 23 weeks (or 5 months) to receive all the topography. These topographic maps were preliminary, and the Aerial Mapping Company, Inc. (AMCI) is still editing these files as of today.

2. **Thalweg in River Miles:** After the review of thalweg, it was decided in February, 1998 to use the river mile for stationing because the stationing used in the as-built plans was from upstream to downstream. HNTB reset the floodway thalweg based on the river miles after receiving the rest of downstream topography on March 2, 1998.

3. **DTM Information:** Due to the size of topographic data (up to 27 MB), HNTB has coordinated with AMCI to generate four different DTM files (or surfaces). HNTB requested additional information from AMCI to complete these surfaces. However, HNTB discovered some "holes" in three of these four surfaces during our cross section geometry data generation in April, 1998. HNTB spent two weeks in April to correct these surfaces.

We will appreciate if you can approve this time extension request. With your approval, we will submit the revised project schedule. If you have any questions or need additional information regarding the above, please feel free to contact me at 528-4391.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

cc: Tim Murphy - FCDMC
File 27559

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→ BGS

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

May 7, 1998

RECEIVED
MAY 13 1998
HNTB

HNTB
Two Renaissance Square, Suite 300
40 North Central Street
Phoenix, AZ 85004

Attn: B. Gary Sun, P.E.
Project Manager

Re: Contract No. FCD 97-06, East Maricopa Floodway Capacity Assessment
Letter of Forbearance

The Flood Control District must advise HNTB that the completion date of May 20, 1998, for the subject contract, can not be contractually waived. In view and consideration of the difficulties HNTB has experienced with your GIS conversion subconsultant, however, the District will forbear the contract completion date to July 31, 1998.

The District reserves and retains all contractual rights and remedies under the subject contract. HNTB shall pursue all aspects of this extended schedule to ensure the successful completion of the contract.

This forbearance letter establishes a new completion date only and shall not increase the contract price. By affixing a signature in the space provided below and returning to the undersigned, HNTB acknowledges receipt and acceptance of this forbearance letter.

Very truly yours,

Michael S. Ellegood, P.E.
Chief Engineer and General Manager

HNTB

By: George R. Hale

Title: Vice President

Date: 5/23/98

HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
Phoenix, Arizona
85004
(602) 528-4300
FAX (602) 528-4301

July 9, 1998

Mr. Joe Tram
Project Manager
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

RE: East Maricopa Floodway Capacity Assessment
Maricopa County FCD Contract No. 97-06
HNTB Job No. 27559

Subject: Topographic Maps

Dear Joe,

Enclosed please find one (1) copy of bluelines of topographic maps (a total of 52 sheets) for the East Maricopa Floodway Capacity Assessment project for your review and approval. In addition, we include the red-lined set with your comments.

If you have any questions or need additional information regarding the above, please feel free to contact me at 528-4391.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

Enclosures

cc: Tim Murphy - FCDMC
File 27559

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HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
Phoenix, Arizona
85004
(602) 528-4300
FAX (602) 528-4301

August 26, 1998

Mr. Joe Tram
Project Manager
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

RE: East Maricopa Floodway Capacity Assessment
Maricopa County FCD Contract No. 97-06

Subject: Second Time Extension Request

Dear Joe,

I am writing this letter to request another time extension for the East Maricopa Floodway Capacity Assessment project. We are proposing the new project completion date to be October 16, 1998 which will extend the previous approved time extension of the July 31 date (See enclosed revised project schedule). The reasons for this time extension request are as follows:

1. **Discharge Values Change:** HNTB received the revised three discharge values from Flood Control District of Maricopa County (FCDMC) on June 12, 1998. HNTB has revised our hydraulic models to incorporate the changes.

2. **Change Order No. 1:** HNTB is currently working with FCDMC to finalize the Change Order No. 1. This Change Order will delete the tributary hydraulic analysis, add the hydraulic analysis using the discharges for the existing conditions, and delete the study results portion of GIS data preparation. However, HNTB will still determine the bankfull capacity using the rating curves and the Aerial Mapping Company, Inc. will complete the topography GIS data work.

We will appreciate if you can approve this second time extension request. If you have any questions or need additional information regarding the above, please feel free to contact me at 528-4391.

Very truly yours,

B. Gary Sun, P.E.
Project Manager

Enclosures

cc: Tim Murphy - FCDMC
File 27559

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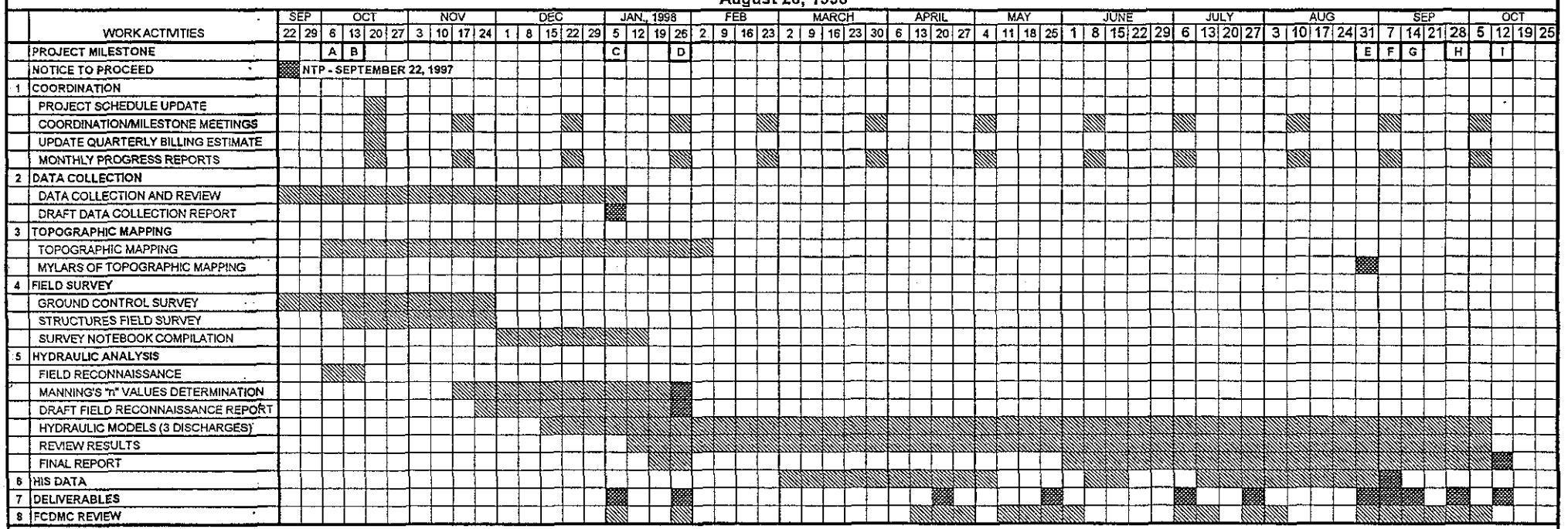
EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT
CONTRACT NO. FCD 97-06
PROJECT SCHEDULE (Revised)
August 26, 1998



PROJECT START: SEPTEMBER 22, 1997

PROJECT END: OCTOBER 16, 1998

DURATION: 360 CALENDAR DAYS (WITH 120 DAYS EXTENSION)

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A	FIRST FIELD RECONNAISSANCE TRIP ON OCT. 7, 1997
B	SECOND FIELD RECONNAISSANCE TRIP ON OCT. 13, 1997
C	DRAFT DATA COLLECTION REPORT SUBMITTAL ON JAN. 9, 1998
D	DRAFT FIELD RECONNAISSANCE REPORT & MANNING'S "n" DETERMINATION REPORT SUBMITTALS ON JAN. 29, 1998
E	TOPOGRAPHIC MAP MYLARS SUBMITTAL ON AUGUST 31, 1998
F	TOPOGRAPHY GIS DATA SUBMITTAL ON SEPTEMBER 7, 1998
G	DRAFT FINAL REPORT & WORK STUDY DRAWINGS SUBMITTAL ON SEPTEMBER 18, 1998
H	PRE-FINAL REPORT & WORK STUDY DRAWINGS SUBMITTAL ON SEPTEMBER 30, 1998
I	FINAL REPORT & WORK STUDY DRAWINGS SUBMITTAL ON OCTOBER 16, 1998

HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
Phoenix, Arizona
85004
(602) 528-3300
FAX (602) 528-3301

September 3, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

RE: East Maricopa Floodway Capacity Assessment
Maricopa County FCD Contract No. 97-06
HNTB Job No. 27559

Subject: Topographic Map Mylars

Dear Joe,

Transmitted herewith the original mylars of topographic maps (a total of 52 sheets) for the East Maricopa Floodway Capacity Assessment project. We have revised Sheets C2, 21, 28, 29, 32, 33, 39, 41, 45, and 49 (a total of 10 sheets) per your review comments dated August 17, 1998.

If you have any questions or need additional information regarding the above, please feel free to contact me at 528-4391.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

Enclosures

cc: Tim Murphy - FCDMC
File 27559

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FAX

HNTB CORPORATION
Two Renaissance Square
40 North Central Ave., Suite 300
Phoenix, Arizona 85004

Date September 21, 1998

Number of pages including cover sheet 5

To:		From:	
	Tim Murphy		Gary Sun GS
	Special Project Branch		HNTB
	FCDMC		
Phone	506-4605		
Fax	506-4601	Phone	528-4391
CC:		Fax Phone	528-4301

REMARKS:

☐ Urgent ☒ For your review ☐ Reply ASAP ☐ Please comment

Project: **East Maricopa Floodway (FCD 97-06)**

Subject: **Aerial Mapping Panel Points**

Attached please find a copy of exhibits and coordinates for Phases 1 and 2 aerial mapping panel points. There are additional control points used such as #104, #106, #110, #111 and #113 beyond points #105 and #120.

If you have any questions, please let me know.

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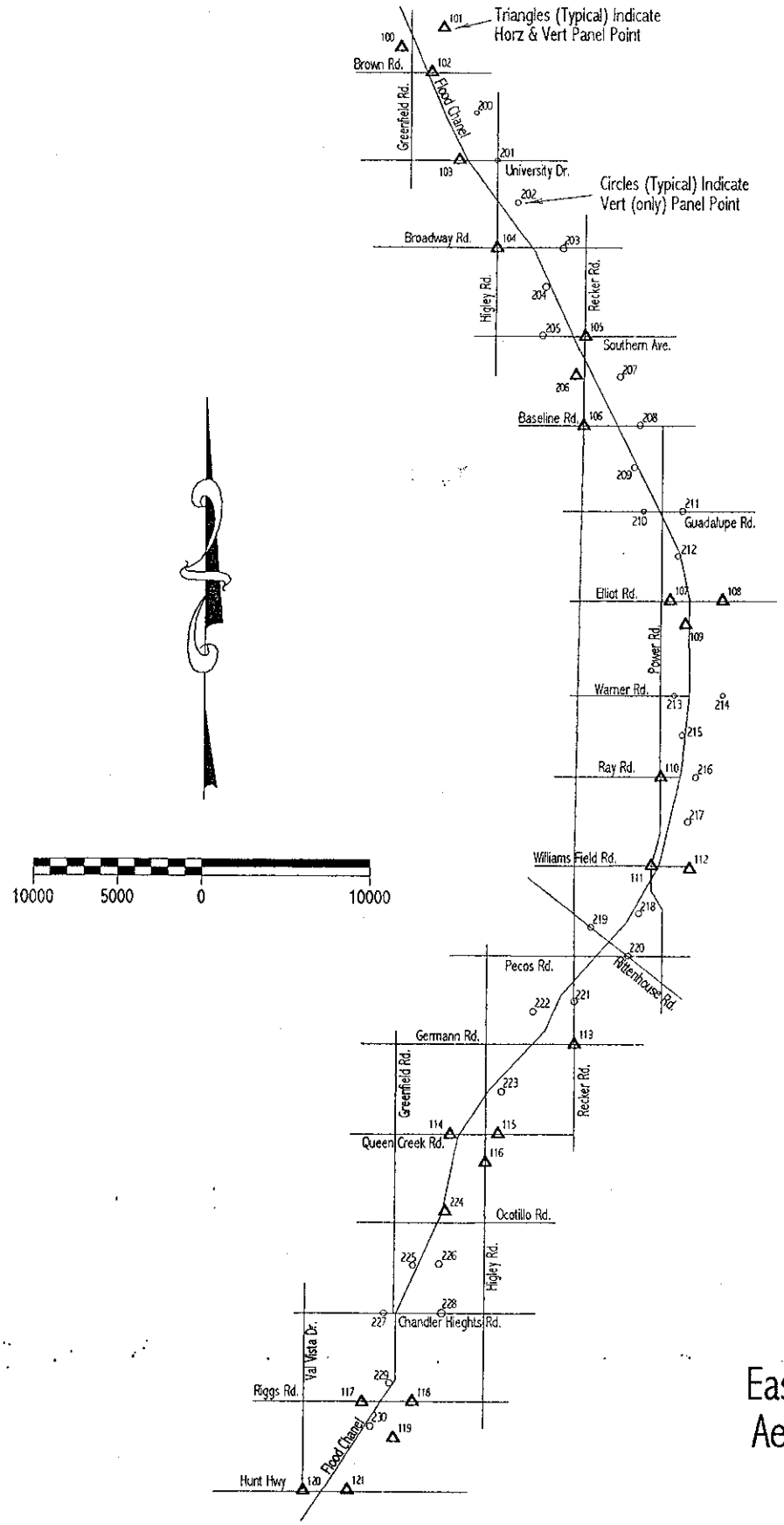
HNTB Facsmile Correspondence

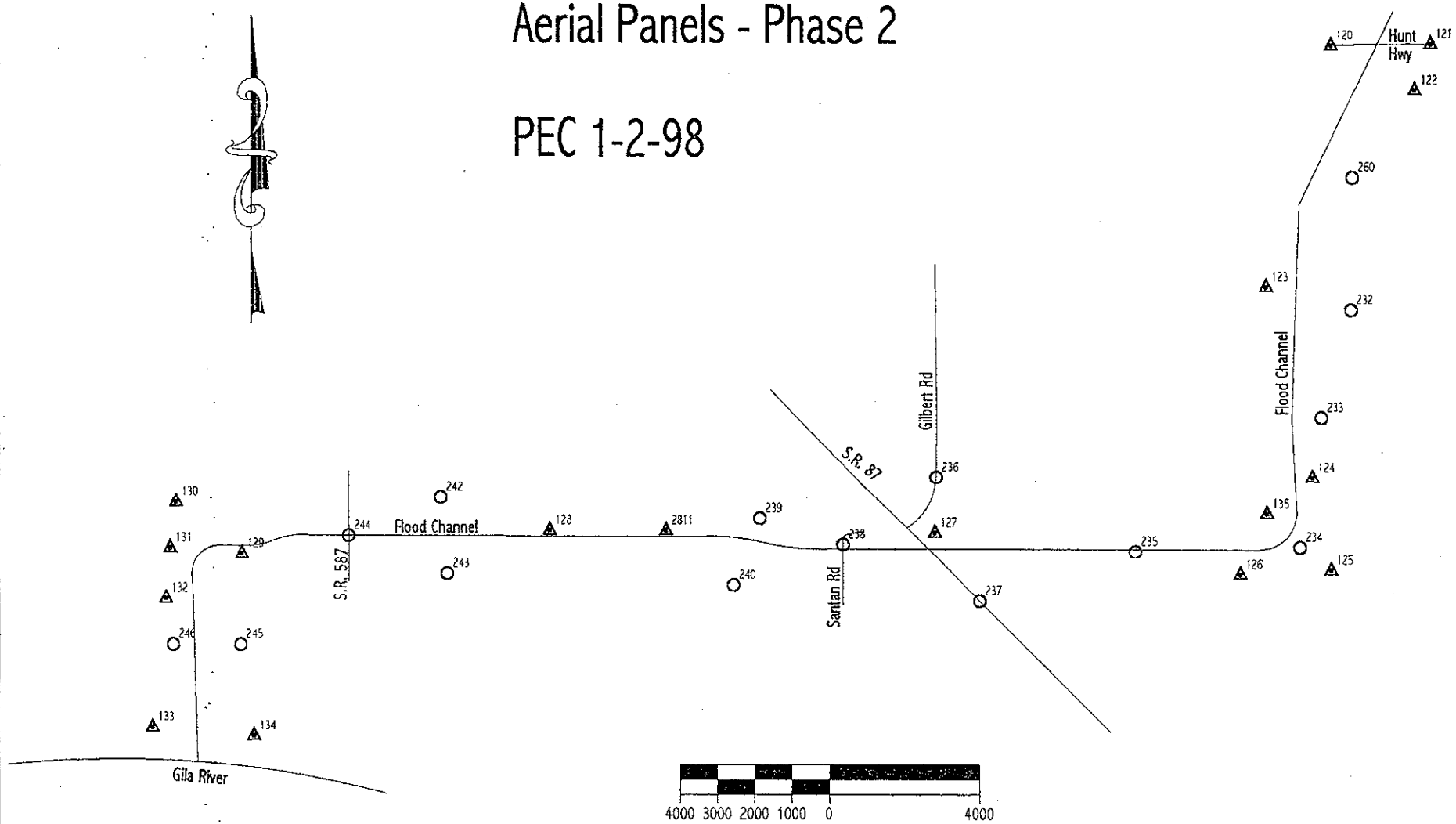


East Mesa Flood Control Aerial Panels - Phase 1

PEC 11-13-97

East Mesa Flood Control
Aerial Panels - Phase 2

PEC 1-2-98



East Mesa Flood Channel
Aerial Control Points
Phases 1 and 2 Complete

Project Engineering Consultants, Inc.
1-16-98

NAD83 SPC System in International Feet
NGVD29 Elevations

Pt	Northing	Easting	Panel Elev.
100	888165.330	754506.868	1341.104
101	889338.214	757028.654	1361.629
102	886681.092	756324.965	1351.033
103	881424.702	758000.352	1340.685
104	876174.897	760268.295	1330.923
105	870921.230	765505.401	1344.959
106	865610.402	765467.191	1326.024
107	855151.510	770683.752	1327.101
108	855130.376	773825.320	1339.980
109	853694.579	771614.046	1328.954
110	844636.788	770174.034	1320.118
111	839369.546	769654.820	1325.381
112	839176.064	771963.260	1326.438
113	828694.105	765167.607	1322.797
114	823330.142	757870.856	1308.769
115	823340.426	760680.606	1319.911
116	821650.879	759952.284	1328.904
117	807365.563	752809.622	1292.603
118	807371.297	755773.308	1308.342
119	805227.075	754674.456	1309.210
120	802038.272	749348.100	1283.548
121	802096.697	751974.793	1306.264
122	800863.993	751586.292	1311.407
123	795652.820	747640.883	1288.023
124	790598.776	748865.142	1311.288
125	788146.687	749354.892	1312.967
126	788004.810	746950.395	1283.236
127	789093.251	738797.872	1237.824
128	789139.706	728520.509	1223.550
129	788507.737	720320.399	1211.267
130	789879.735	718562.090	1207.306
131	788649.250	718409.564	1204.047
132	787319.837	718295.187	1207.173
133	783890.987	717943.639	1203.121
134	783661.451	720647.809	1197.801
135	789618.243	747660.610	1296.896
200	0.000	0.000	1359.564
201	0.000	0.000	1356.243
202	0.000	0.000	1353.585
203	0.000	0.000	1348.803
204	0.000	0.000	1336.744
205	0.000	0.000	1330.569

206	868593.933	764995.083	1330.707
207	0.000	0.000	1347.200
208	0.000	0.000	1343.821
209	0.000	0.000	1335.847
210	0.000	0.000	1327.946
211	0.000	0.000	1341.924
212	0.000	0.000	1333.087
213	0.000	0.000	1322.676
214	0.000	0.000	1334.490
215	0.000	0.000	1327.465
216	0.000	0.000	1334.180
217	0.000	0.000	1326.789
218	0.000	0.000	1321.017
219	0.000	0.000	1316.826
220	0.000	0.000	1324.398
221	0.000	0.000	1318.034
222	0.000	0.000	1310.582
223	0.000	0.000	1314.166
224	818738.647	757600.001	1307.822
225	0.000	0.000	1305.267
226	0.000	0.000	1310.350
227	0.000	0.000	1296.292
228	0.000	0.000	1307.320
229	0.000	0.000	1299.224
230	0.000	0.000	1298.759
231	0.000	0.000	1308.211
232	0.000	0.000	1330.820
233	0.000	0.000	1302.951
234	0.000	0.000	1296.733
235	0.000	0.000	1256.610
236	0.000	0.000	1237.531
237	0.000	0.000	1244.157
238	0.000	0.000	1237.639
239	0.000	0.000	1231.397
240	0.000	0.000	1231.776
242	0.000	0.000	1218.943
243	0.000	0.000	1215.150
244	0.000	0.000	1217.657
245	0.000	0.000	1206.243
246	0.000	0.000	1207.972
260	0.000	0.000	1304.178
2811	789142.075	731633.746	1227.775

HNTB ARCHITECTS ENGINEERS PLANNERS

Two Renaissance
Square, Suite 300
40 North Central
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85004
(602) 528-4300
FAX (602) 528-4301

October 6, 1998

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

RE: East Maricopa Floodway Capacity Assessment
Maricopa County FCD Contract No. 97-06
HNTB Job No. 27559

Subject: Field Survey Notes Folder

Dear Joe,

Transmitted herewith are two copies of Field Survey Notes for the East Maricopa Floodway Capacity Assessment project. These survey notes consist of survey data of horizontal and vertical control points, panel points, ERMs, and drainage structures.

If you have any questions or need additional information regarding the above, please feel free to contact me at 528-4391.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

Enclosures

cc: Tim Murphy - FCDMC
File 27559

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REVIEW OF EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT
FCD CONTRACT # 97-06
BY
R.W. CRUFF, P.E.
NOVEMBER 16, 1998

1. Section 15.811 in Reach 4, on map 29 of 50 is not labeled on the map.

2. Section 23.135 in Reach 5, 0n map 43 of 50 uses an "N" = 45.00 instead of 0.045.

3. I believe that the "N" values of 0.030 to 0.035 are too high. I think that the 0.030 and 0.032 values should be reduced to 0.025 and that the 0.035 values should be reduced to either 0.025 or 0.030. This is based on the work that others and myself have done at the Streamflow Stations at Queen Creek and at Arizona Avenue (S.R. 587). We have found that for low flows, based on Current Meter Measurements, that the "N" values will be about 0.025 for short growth in the channel and about 0.030 for tall growth. We also do not believe that tall growth in the channel will be an affect for high flows. It will either be bent over or more likely washed out.

4. The "N" values of 0.045 used in Reach 5 are probably to high as these primarily are areas within Golf Courses, which are normally mowed fairly short. A value 0f 0.030 or 0.035 would probably be more reasonable for most of these sections.

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
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TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

November 24, 1998

George Hale, Vice President
HNTB Corporation
#36 Executive Park, Suite 200
Irvine, CA 92614

Subject: FCD 97-06, East Maricopa Floodway, Letter of Concern

The Flood Control District's recent review of your contract performance reveals that through no fault of the District the work has fallen behind schedule and that the required completion date of October 30, 1998, may not be met. The District anticipates HNTB's full commitment in meeting their contractual completion date.

A recovery plan has been previously requested, but the completion date continues to be in jeopardy. Accordingly, you are hereby directed to take any and all steps necessary to improve progress, regain the schedule and complete the work by the earliest possible date. A revised recovery plan shall be submitted for approval to the Project Manager, Tim Murphy, within one week of the date of this letter. The Project Manager will work closely with HNTB to ascertain the viability of the recovery plan. None of the costs related to these recovery efforts shall be chargeable to the District.

As stated in previous correspondence, the District does not relinquish any of its rights and entitlements related to the completion date of the contract.

Sincerely,

Edward A. Raleigh

Edward A. Raleigh
Division Manager

Cc: Tim Murphy
Contract File 97-06

HNTB
ARCHITECTS
ENGINEERS
PLANNERS

CALIFORNIA ARCHITECTS, P.C.
36 Executive Park, Suite 200
Irvine, California 92614
(949) 752-6940
FAX (949) 724-0865

December 11, 1998

Mr. Joe Tram
Project Manager
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Dear ~~Mr. Tram~~ Joe:

I am writing this letter to request another time extension for the East Maricopa Floodway Capacity Assessment project. We are proposing the new project completion date to be February 26, 1999, which will extend the previous approved time extension of the October 16, 1998 date. This time extension is requested due to extensive changes requested by Maricopa County and personnel shifts by HNTB that did not consider this much required effort.

We would appreciate your approval of this time extension. If you have any questions or need additional information regarding the above, please feel free to contract me at (949) 752-6940.

Very truly yours,

HNTB Corporation

George R. Hale

George R. Hale, P.E.
Vice President

cc: Tim Murphy – FCDMC
Gary Sun
File 27559

J:\27559\letters\Flood Control

REVIEW OF EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT
FCD CONTRACT # 97-06
BY
R.W. CRUFF, P.E.
DECEMBER 17, 1998

1. Section 23.135 in Reach 5, 0n map 43 of 50 uses an "N" = 45.00 instead of 0.045. (Was not corrected after comments of previous review)

2. The right bank flood boundary needs to be shown for profile #3 for sections 9.001 to 9.334 on sheet 17 of 50.

3. The left bank flood boundary, as plotted, does not agree with the left W.S. Station for profiles #1 & #2 for sections10.749 to 11.231 on sheets 20 and 21 of 50.

4. The right bank flood boundary, as plotted, does not agree with the right W.S. Station for profile #2 for section 13.471 on sheet 25 of 50.

5. The right and left bank flood boundaries, as plotted, do not agree with the W.S. Stations for profile #2 for section 16.819 on sheet 31 of 50.

6. The left bank flood boundary, as plotted, does not agree with the left W.S. Station for profile #2 for section 18.087 on sheet 33 of 50.

7. The left bank flood boundary, as plotted, does not agree with the left W.S. Station for profiles #1 & #2 for sections 19.408 and 19.745 on sheet 36 of 50.

8. The left bank flood boundary, as plotted, does not agree with the left W.S. Station for profile #2 for section 19.458, 19.541, and 19.592 on sheet 36 of 50.

9. The left bank flood boundary, as plotted, does not agree with the left W.S. Station for profiles #1, #2 & #3 for sections 19.863 and 20.058 on sheet 37 of 50.

10. The left bank flood boundary, as plotted, does not agree with the left W.S. Station for profile #3 for section 20.247 on sheet 37 of 50.

11. The left bank flood boundary, as plotted, does not agree with the left W.S. Station for profile #2 for section 22.263 on sheet 41 of 50.

12. The left bank flood boundary, as plotted, does not agree with the left W.S. Station for profile #3 for section 22.475 on sheet 41 of 50.

13. The right bank flood boundary, as plotted, does not agree with the right W.S. Station for profile #1 for section 24.621 on sheet 45 of 50.

REVIEW OF EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT
FCD CONTRACT # 97-06
BY
TIM MURPHY
JANAURY 12, 1999

1. For cross section 1.924 (sheet 4) check the plotting of the right overbank flood boundary for the second profile.

2. For cross section 2.814 (sheet 6) check the plotting of the left overbank flood boundary for the third profile.

3. On the profile plot on sheet 11 the future condition arrow points to the wrong profile (the arrow is located in about the middle of the lower portion of the page).

4. On sheets 14, 15, and 16 the location of the sheet arrow is incorrect in the Key Map.

5. In the HEC-RAS models try to include in the project description, the version number and vendor of HEC-RAS program that you are using.

6. I would like to get all the files for the hydraulic models to have the same date. Also go ahead and revise the date on the sheets.

FLOOD CONTROL DISTRICT
of
Maricopa County

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BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

HNTB
36 Executive Park, Suite 200
Irvine, California 92614

Attn: George R. Hale, P.E.
Vice President

Re: Contract No. FCD 97-06, East Maricopa Floodway Capacity Assessment
Letter of Forbearance

The Flood Control District must advise HNTB that the completion date of May 20, 1998, for the subject contract cannot be contractually waived. In view and consideration of the difficulties HNTB has experienced with the loss of personnel and the closing of your Phoenix office, however, in accordance with your recovery plan the District will forbear the contract completion date to February 26, 1999.

The District reserves and retains all contractual rights and remedies under the subject contract. HNTB shall pursue all aspects of this extended schedule to ensure the successful completion of the contract.

This forbearance letter establishes a new completion date only and shall not increase the contract price. By affixing a signature in the space provided below and returning to the undersigned, HNTB acknowledges receipt and acceptance of this forbearance letter.

Very truly yours,

Michael S. Ellegood, P.E.
Chief Engineer and General Manager

HNTB

By: George R. Hale

Title: Vice President

Date: 1/15/99

Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009-6399
(602) 506-1501
FAX: (602) 506-4601
TT: (602) 506-5859

1-21-99

MEMO TO: Gary Sun, HNTB

FROM: Tim Murphy

SUBJECT: FCD 97-06, East Maricopa Floodway Capacity Assessment Study

I've looked over the information that you submitted on 19 January 1999 and have the following comments:

1. How come the line type for the existing condition delineation changed?

2. On sheet 17 the right flood boundary still isn't being shown between cross section 9.001 and 9.334 for the third profile (existing condition). If the reason the existing condition flood boundary limit isn't shown is because the discharge extends beyond the topographic limits, then a note should be added to the plans stating that. Also, this appears to be happening on sheet 18, and partly on sheet 19.

3. On sheet 17 the left flood boundary as plotted doesn't always match with the station from the HEC-RAS output for the second profile (future condition). I've marked on the sheet where the HEC-RAS station are, make sure that the plotted limits are what you intended. You need to provide some sort of explanation for where the plotted limits are different then the HEC-RAS results.

4. On sheet 21 only a portion of the line for cross section 11.127 printed out.

5. On sheet 37 consider moving the location of the cross section data for cross section 20.306 below and slightly to left of the data for cross section 20.247.

HNTB ARCHITECTS ENGINEERS PLANNERS

[illegible]
Square, Suite [illegible]
[illegible] North [illegible]
Phoenix, Arizona [illegible]
[illegible]
[illegible]
FAX [illegible]

February 11, 1999

Mr. Joe Tram
Project Manager
Special Project Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

RE: East Maricopa Floodway Capacity Assessment
Maricopa County FCD Contract No. 97-06
HNTB Job No. 27559

Subject: Work Study Plan and Profile Sheets

Dear Joe,

Transmitted herewith is the original mylars of Work Study Plan and Profile sheets for the East Maricopa Floodway Capacity Assessment project. There are a total of 51 mylars consists of one cover sheet, and 50 plan and profile sheets.

If you have any questions or need additional information regarding the above, please feel free to contact me at 798-7531.

Very truly yours,

HNTB Corporation

B. Gary Sun, P.E.
Project Manager

Enclosures

cc: Tim Murphy - FCDMC
File 27559

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APPENDIX B

HYDRAULIC ASSESSMENT SUPPORT DOCUMENTS

1. Data Collection Report

DATA COLLECTION SUMMARY
FOR
EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT

The following summarizes the pertinent data collected and reviewed for the East Maricopa Floodway Capacity Assessment project.

1. Flood Control District of Maricopa County, As-Built Plans.

a. RWCD Floodway - Reach 1, Williams-Chandler Watershed Protection and Flood Prevention Project, Maricopa and Pinal Counties, Arizona. Prepared by Soil Conservation Service, U.S. Department of Agriculture. DWG No. 7-E-23802, dated 12-7-79.

b. RWCD Floodway - Reach 2, Williams-Chandler Watershed Protection and Flood Prevention Project, Maricopa and Pinal Counties, Arizona. Prepared by Soil Conservation Service, U.S. Department of Agriculture. DWG No. 82003-AZ-CH, dated 6-14-82.

c. RWCD Floodway - Reach 3, Williams-Chandler Watershed Protection and Flood Prevention Project, Maricopa and Pinal Counties, Arizona. Prepared by Soil Conservation Service, U.S. Department of Agriculture. DWG No. AZ-84041-CH, dated 4-27-84.

d. RWCD Floodway - Reach 4, Williams-Chandler Watershed Protection and Flood Prevention Project, Maricopa and Pinal Counties, Arizona. Prepared by Soil Conservation Service, U.S. Department of Agriculture. DWG No. AZ-85010-CH, dated 4-30-86.

e. East Maricopa Floodway - Reach 5, Apache Junction-Gilbert Watershed Protection and Flood Prevention Project, Maricopa County, Arizona. Prepared by Soil Conservation Service U.S. Department of Agriculture. DWG No. AZ-87001-CH, dated 5-12-87.

f. East Maricopa Floodway - Reach 6, Buckhorn-Mesa-Apache Junction-Gilbert Watershed Protection and Flood Prevention Project, Maricopa County, Arizona. Prepared by Greiner Engineering Sciences, Inc. for Soil Conservation Service, U.S. Department of Agriculture. DWG No. 85015-AZ-CH, dated 4-12-88.

g. Rittenhouse Channel - East Maricopa Floodway to Ellsworth Road, Maricopa County, Arizona. Prepared by Gannett Fleming Engineer & Planners, FCD Contract No. 96-02, Phase 1, dated 5-7-96.

h. Broadway Road Bridge Over RWCD Floodway, Maricopa County, Arizona. Prepared by RGA Consulting Engineers, FCD Contract No. 84-28, dated 4-29-86.

i. RWCD Floodway Box Culvert, Apache Boulevard & Higley Road, Mesa, Arizona. Prepared by Matthews, Kessler & Associates, Inc., FCD Contract No. 86-16, dated 6-8-87.

j. Southern Pacific Trans. Co. Railroad Bridge, RWCD Floodway - Reach 2, Maricopa and Pinal Counties, Arizona. Prepared by Soil Conservation Service, U.S. Department of Agriculture. DWG No. 80001-AZ-SO, dated 5-15-80.

k. San Tan Road Bridge over RWCD Floodway, Maricopa County, Arizona. Prepared by WBC Consultants, Inc., FCD Contract No. 79-3, dated 6-27-79.

l. Concrete Bridge on RWCD Floodway at Baseline Road, Maricopa County, Arizona. Prepared by Sverdrup & Parcel and Associates, Inc., FCD Contract No. 80-4, dated 4-21-80.

m. Concrete Bridge on RWCD Floodway at Elliot Road, Maricopa County, Arizona. Prepared by Sverdrup & Parcel and Associates, Inc., FCD Contract No. 80-4, dated 4-21-80.

n. Brown Road Box Culvert over East Maricopa Floodway, Maricopa County, Arizona, dated 4-5-88.

o. Baseline Road Bridges at RWCD Canal and Floodway, Maricopa County, Arizona. Prepared by Rayden Engineering Co., FCD Contract No. 82-30, dated 12-83.

p. Power Road and Guadalupe Road Bridges at RWCD Canal and Floodway, Maricopa County, Arizona. Prepared by Cannon & Associates, Inc., FCD Contract No. 85-25, dated 7-1-86.

q. Elliot Road Bridges at RWCD Canal and Floodway, Maricopa County, Arizona. Prepared by Sverdrup & Parcel and Associates, Inc., FCD Contract No. 82-31, dated 12-83.

r. Williams Field Road Bridge at RWCD Floodway, Maricopa County, Arizona. Prepared by Wadsworth, Jensen & Associates, FCD Contract No. 81-7, dated 12-81.

s. Guadalupe Road Box Culvert, Maricopa County, Arizona, FCD Contract No. 89-55, dated 9-11-89.

t. Guadalupe Road Channel and Sossaman Road Box Culvert, Maricopa County, Arizona. Prepared by Wells Engineers, Inc., FCD Contract No. 92-35, dated 1-8-93.

u. Railroad Crossing North of Rittenhouse Road RWCD Floodway - Reach 4, Maricopa County, Arizona, dated 3-27-87.

v. Results of Survey (Rittenhouse Road Bridge), Maricopa County, Arizona. Prepared by Adam, Hamlyn & Anderson, dated 4-21-81.

w. RWCD Floodway and Superstition Freeway Underpass Channelization Plan, Maricopa County, Arizona. Prepared by PRC Engineering, dated 12-85.

x. University Drive Crossing at Roosevelt Water Conservation District Floodway, Maricopa County, Arizona. Prepared by Dashney & Associates, Inc. and E.M. Plummer Consulting Engineers, Inc., FCD Contract No. 83-22, dated 5-17-84.

y. Leisure World Grading Plan for R.W.C.D. Floodway, North of Southern Avenue. Prepared by Toups Corporation, dated December, 1978.

z. Flood Boundaries for the Golf Course Design within the R.W.C.D. Floodway, Southern Avenue to Guadalupe Road. Prepared by PRC Engineering for Leisure World Homes, dated September, 1985.

2. Maricopa County Department of Transportation, Construction Plans.

a. Higley Road Bridge Over RWCD Floodway, Maricopa County, Arizona. Prepared by Boyle Engineering., Project No. 71103, dated 1-17-77.

b. Queen Creek Road Bridge over RWCD Floodway, Maricopa County, Arizona. Prepared by Benham Blair Ditzler & Sayler, Project No. 71102, dated 4-25-78.

c. Rittenhouse Road Bridge Over RWCD Floodway, Maricopa County, Arizona. Prepared by James M. Samer/ Engineer, Project No. 71104, dated 6-14-77.

3. City of Mesa, Arizona, Construction Plans.

a. Southern Avenue Bridges at RWCD Canal and Floodway, Maricopa County, Arizona. Prepared by Benson & Gerdin Consulting Engineers. Project No. 86-25, dated 8-86.

b. Storm Water Channel (East Maricopa Floodway Extension), Maricopa County, Arizona. Prepared by Boyle Engineering Corporation. Project No. 87-59, dated 11-18-89.

c. Adobe Street Structures Over RWCD Canal and East Maricopa Floodway, Maricopa County, Arizona. Prepared by Hoffman-Miller Engineers, Inc., Project No. 87-60, dated 8-30-90.

4. Arizona Department of Transportation, As-Built Plans.

a. State Highway, Coolidge to Mesa (SR 87), Pinal County, Arizona. Prepared by Arizona Department of Transportation Highways Division, Structures Section. S-580-501, dated 9-14-82.

b. State Highway, Casa Grande - Chandler (SR 587). Pinal County, Arizona. Prepared by Arizona Department of Transportation Highways Division, Structures Section. S-585-501, dated 7-3-80.

c. State Highway, Superstition Freeway (US 60), Maricopa County, Arizona. Prepared by Arizona Department of Transportation Highways Division, Structures Section. BP-028-1-509, dated 6-8-92.

5. We have received the following additional items from the FCDMC.

a. Data Delivery Specifications: The Hydrologic Information System (H.I.S.) Rev. 2.2., dated 4-25-97.

b. Flood Insurance Study, Gilbert-Chandler Area. Maricopa County, Arizona. Prepared by Franzoy-Corey, dated 7-18-90.

c. Preliminary Design Concept - Queen Creek Area Drainage Master Plan, Maricopa County, Arizona. Prepared by Wood & Associates, Inc., FCD Contract No. 86-23, dated 3-11-91.

d. East Side Subsidence Survey, RWCD Floodway - Reaches 1 and 2, Maricopa and Pinal Counties, Arizona. Prepared by American Geodetic Survey Company, dated 2-86.

e. Power Road Bridge (located south of William Field Road)

APPENDIX B

HYDRAULIC ASSESSMENT SUPPORT DOCUMENTS

2. Field Reconnaissance Report and Manning's "n" Values Determination Report

Field Reconnaissance Report

Dates:	October 7 and 13, 1997
Location:	East Maricopa Floodway (EMF)
Attendees:	Valerie Swick, Flood Control District of Maricopa County (FCDMC) David Degerness, Flood Control District of Maricopa County Tim Murphy, Flood Control District of Maricopa County Ray Carranza, HNTB Corporation Gary Sun, HNTB Corporation

Two field reconnaissance trips were made with FCDMC personnel on October 7 and 13, 1997 to observe the EMF channel and floodplain conditions. Field notes and site photographs were taken at tributaries, major roadway cross structures, side inlets and spillways, detention basins, drop structures, energy dissipator, and ponding problem areas.

The October 7 field reconnaissance trip covered the EMF between Princess Park and Rittenhouse Channel. The second trip was made on October 13, 1997 to covered the remainder of the EMF reaches from Rittenhouse Road to Gila River. Refer to the site photos in the Manning's "n" Values Determination Report for the channel and floodplain conditions.

MANNING'S "n" VALUE DETERMINATION REPORT

for

East Maricopa Floodway Capacity Assessment

Contract No. FCD 97-06

Prepared for:

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

Prepared by:

HNTB Corporation
Two Renaissance Square
40 North Central, Suite 300
Phoenix, Arizona 85004
(602) 528-4300

January 29, 1998
Revised January 29, 1999

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I. INTRODUCTION

Two field trips were made to the East Maricopa Floodway (EMF) with the Flood Control District of Maricopa County staff in October, 1997 to observe channel characteristics, inflow locations, bridges, culverts, spillways, weir structures, and other drainage structures within the study reaches. Side channels and tributaries that drain into the EMF were also investigated for channel characteristics. This report summarizes the results of the Manning's "n" value determination for use in the hydraulic analyses of the EMF capacity assessment.

The estimation of Manning's roughness coefficient, "n" value, for EMF is included with a summary spreadsheet showing the components of the roughness coefficient for the entire 27.4 mile of EMF that consists of six (6) reaches. A set of photographs that depict the channel characteristics is also provided in this report. **Exhibit 1** is included at the end of this report and presents the estimated Manning's "n" values for various sections within each EMF reach. The comparison of similar sites was made to aid and verify the selected "n" values.

II. METHODOLOGY

The determination of Manning's "n" values in this study was estimated by use of the following materials and references:

A. Site photographs taken during field reconnaissance trips.

B. References as listed below:

1. Flood Control District of Maricopa County, "Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona." Prepared by the U.S. Geological Survey, April 1991.

2. U.S. Geological Survey, "Roughness Characteristics of Natural Channels," Water-Supply paper 1849, Third Printing, 1987.

3. U.S. Geological Survey, "Roughness Coefficients for Stream Channels in Arizona," Open-File Report, 1973.

4. Federal Highway Administration, "Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains," Report No. FHWA-TS-84-204, April 1984.

5. V.T. Chow, "Open Channel Hydraulics," McGraw-Hill, 1959.

6. Flood Control District of Maricopa County, "Drainage Design Manual for Maricopa County, Arizona, Volume II - Hydraulics." Prepared by NBS Lowry Engineers and Planners, and McLaughlin Water Engineers, Ltd., January 1996.

The procedure outlined in **Reference 1** was used to determine the roughness coefficients for the channel in this study. The total "n" value was determined by assigning a base "n" value for each channel section and applying adjustments for various roughness factors (**References 1, 4 & 6**). The roughness factors considered consisted of degree of irregularity, effects of obstruction, vegetation, variations in channel cross section, and degree of meandering (**References 4 & 5**). The adjustments were made to the base "n" value through addition or multiplying by a factor to arrive at a total value. Photographs of channels from **References 1 and 2** with a known resistance were used to aid in the determining of roughness coefficients. These photographs were used for comparison with field situations to help verify selected "n" values. The estimated "n" values were also checked against values found within **References 1, 2 and 3.**

The total value of Manning's "n" was computed by:

$$\mathbf{n} = (\mathbf{n_b}+\mathbf{n_1}+\mathbf{n_2}+\mathbf{n_3}+\mathbf{n_4})\mathbf{m}$$

Where: $\mathbf{n_b}$ = a base value of "n" for a straight uniform channel

$\mathbf{n_1}$ = a value for the degree of surface irregularities

$\mathbf{n_2}$ = a value for the effects of obstruction

$\mathbf{n_3}$ = a value for vegetation

$\mathbf{n_4}$ = a value for variations in shape and size of the channel cross-section

and $\mathbf{m}$ = a multiplier to correct for meandering of the channel

1. Selection of Base "n" Values

Base values of Manning's "n" were selected from **Table 1** in **Reference 1**. In general, a base value of .025 was assigned to each cross section of the EMF. Three sections deviated from this range due to their concrete linings. A base value of .015 was used for these sections. One other cross section was given a base "n" value of .013 for the box culvert.

2. Adjustment Factors for Channels

Channel irregularities, obstructions, vegetation, variations, and meandering increase the roughness, and the value of "n" was adjusted accordingly. Only a few obstructions to channel flow exist along the EMF. These obstructions include trees that are found within the two golf courses that the floodway encroaches upon and a small, irregular shaped weir at the end of Superstition Springs Golf Course.

The vegetation ranges from being non-existent to thick, tall grass entwined with cattails. Small bushes also tend to grow along many of the section banks. The channels' meandering was found to be small for most sections. No cross sections are needed adjustment due to meandering.

3. Subdivision of Cross Sections

Each cross section was divided into left overflow, channel, and right overflow areas. Subdivision of channel cross sections was not needed for this study because the floodway contains well-defined channels with fairly uniform roughness across the cross-section.

III. RESULTS

The Manning's "n" values required for the EMF capacity assessment were determined based upon the above mentioned procedure. The values estimated for the study reaches were ranging from .025 to .045 for channel and .040 to .050 for overbank areas. In the three sections that were lined with concrete, an "n" value of .015 was found.

The "n" values determined for this study based on the results of FCDMC's work done at the streamflow stations at Queen Creek Road and SR-587. The results showed that the "n" values would be .025 for short growth in the channel and about .030 for tall growth. The "n" values of .025 for the channel were used for the reaches downstream of Guadalupe Road to Gila River. Two cross sections had considerable ponding that supported the growth of large vegetation such as cattails. These "marsh" areas were found at the Chandler Heights drop structure and resulted in an "n" value of .030 for the channel.

The "n" values of .045 were used for the channel in two golf courses. A value of .030 or .035 would probably more reasonable because the grass are normally mowed fairly short. However, a higher .045 value was used because the FCDMC does not have the maintenance responsibility. A "n" value of .030 was used for the channel in Reach 6.

The "n" values were estimated for 37 representative sections within the six (6) reaches of the EMF. The results of the "n" value determination for the selected representative sections are shown in **Appendix A**. **Appendix B** shows site photographs for these representative sections.

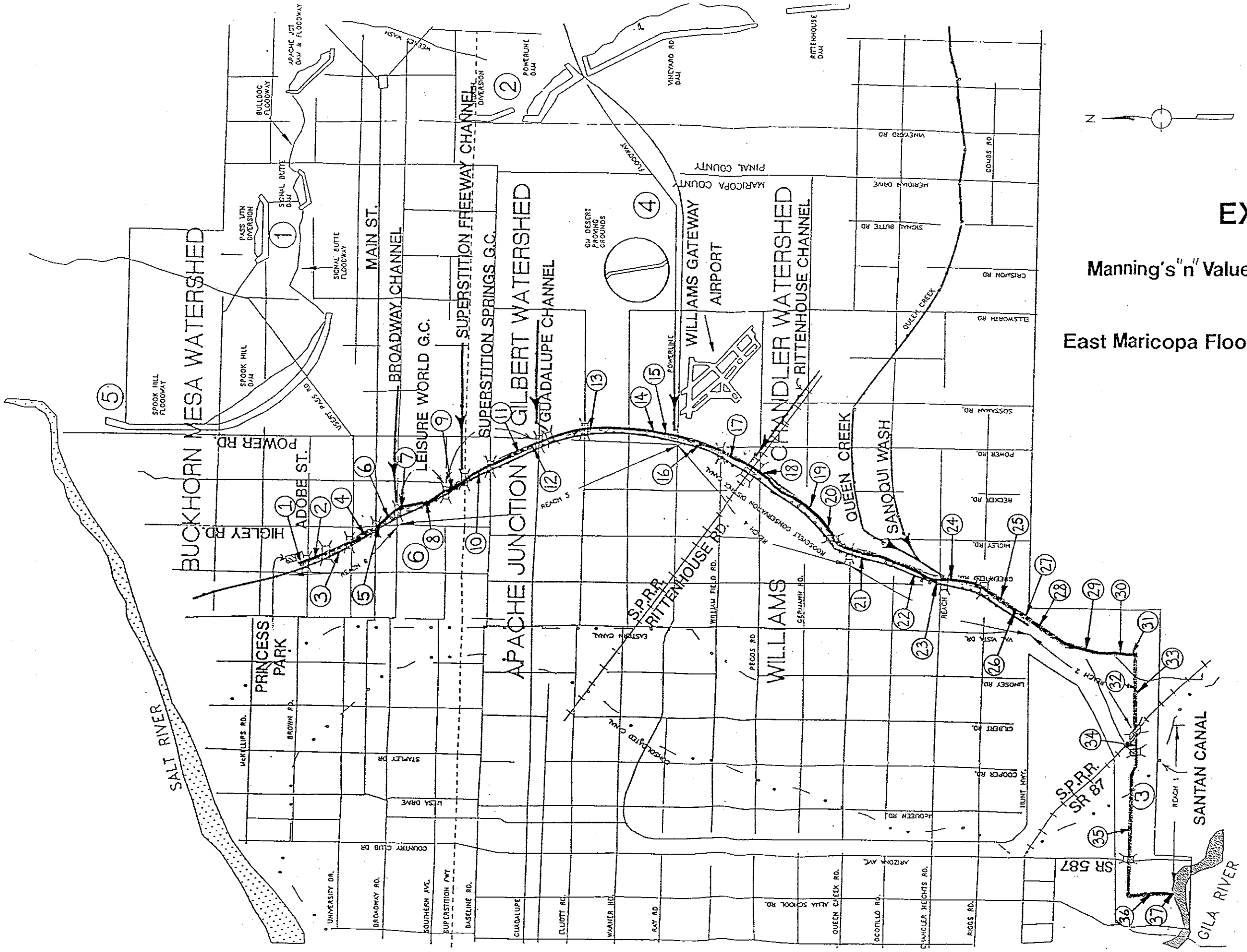

EXHIBIT 1

Manning's "n" Value Determination Locations

for

East Maricopa Floodway Capacity Assessment

APPENDIX A

CALCULATIONS

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : North of Brown Road
Photo No. : 1
Section Description : Bed material is soil with grass
Bank material is soil with grass and small bushes
Overflow area is gravel with some trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Midway between Brown Road and Adobe Street
Photo No. : 2
Section Description : Bed material is soil with grass
Bank material is soil with grass and small bushes
Overflow area is gravel with some trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just north of University Drive
Photo No. : 3
Section Description : Bed material is soil with grass
Bank material is soil with grass and small bushes
Overflow area is gravel with some trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material						
	Firm Soil	n_b	.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Midway between University Drive and Main Street
Photo No. : 4
Section Description : Bed material is soil with grass
Bank material is soil with grass and small bushes
Overflow area is gravel with some trees on left side

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Concrete box culvert under Main Street and Higley Road
Photo No. : 5
Section Description : Concrete channel with a rectangular cross-section
Overflow area is gravel with some trees and obstructions

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Concrete		.012 - .018		0.013	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.010	0.000	0.010
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.013	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just south of Main Street
Photo No. : 6
Section Description : Bed material is soil with grass
Bank material is soil with grass and small bushes
Overflow area is gravel with some trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material						
	Firm Soil	n_b	.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just north of Leisure World Golf Course
Photo No. : 7
Section Description : Bed material is soil
Bank material is soil with grass and some small bushes
Overflow area is gravel with some bushes

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Leisure World G.C., between Broadway Road and Southern Avenue
Photo No. : 8
Section Description : Bed material is soil with grass and some trees
Bank material is soil with grass and some trees
Overflow area is soil with grass and some trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material						
	Firm Soil	n_b	.025 - .032	0.025	0.025	0.025
Degree of Irregularity	Smooth	n_1	0.000			
	Minor		.001 - .005	0.002	0.005	0.002
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004			
	Minor		.005 - .015	0.005	0.005	0.005
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010			
	Medium		.010 - .025	0.013	0.010	0.013
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000		0.000	
	Alternating		.001 - .005	0.005		0.005
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.050	0.045	0.050

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Superstition Springs G.C., south of Southern Avenue
Photo No. : 9
Section Description : Bed material is soil with grass
Bank material is soil with grass, small bushes and some trees
Overflow area is soil with grass, small bushes and some trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material	Firm Soil	n_b	.025 - .032	0.025	0.025	0.025
Degree of Irregularity	Smooth	n_1	0.000			
	Minor		.001 - .005	0.002	0.005	0.002
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004			
	Minor		.005 - .015	0.005	0.005	0.005
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010			
	Medium		.010 - .025	0.013	0.010	0.013
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000			
	Alternating		.001 - .005	0.005		0.005
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.000	1.000	1.000
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.050	0.045	0.050

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Superstition Springs G.C., south of Superstition Freeway
Photo No. : 10
Section Description : Bed material is soil with grass and some trees
Bank material is soil with grass and some trees
Overflow area is soil with grass and trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material	Firm Soil	n_b	.025 - .032	0.025	0.025	0.025
Degree of Irregularity	Smooth	n_1	0.000			
	Minor		.001 - .005	0.002	0.005	0.002
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004			
	Minor		.005 - .015	0.005	0.005	0.005
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010			
	Medium		.010 - .025	0.013	0.010	0.013
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000		0.000	
	Alternating		.001 - .005	0.005		0.005
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.050	0.045	0.050

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Superstition Springs G.C., south of Baseline Road
Photo No. : 11
Section Description : Bed material is soil with grass and some trees
Bank material is soil with grass and some trees
Overflow area is soil with grass and some trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material	Firm Soil	n_b	.025 - .032	0.025	0.025	0.025
Degree of Irregularity	Smooth	n_1	0.000			
	Minor		.001 - .005	0.003	0.005	0.003
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.002		0.002
	Minor		.005 - .015		0.005	
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010			
	Medium		.010 - .025	0.015	0.010	0.015
	Large		.025 - .050			
	Very Large		.050 - .100		0.000	
Variations in Channel C/S	Gradual	n_4	0.000			
	Alternating		.001 - .005	0.005		0.005
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.050	0.045	0.050

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : End of Superstition Springs G.C., just north of Guadalupe Road
Photo No. : 12
Section Description : Bed material is soil with grass, small bushes and a weir obstruction
Bank material is soil with small bushes
Overflow area is gravel with some trees and bushes

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032	0.025	0.025	0.025
	Gravel		.028 - .035			
Degree of Irregularity	Smooth	n_1	0.000		0.005	
	Minor		.001 - .005	0.003		0.003
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.002		0.002
	Minor		.005 - .015		0.005	
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.010	
	Medium		.010 - .025	0.015		0.015
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000		0.000	
	Alternating		.001 - .005	0.005		0.005
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.050	0.045	0.050

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just south of Elliot Road
Photo No. : 13
Section Description : Bed material is soil with medium length grass
Bank material is soil with some grass
Overflow area is gravel

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.010	0.000	0.010
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Midway between Warner Road and Ray Road
Photo No. : 14
Section Description : Bed material is soil with some grass
Right bank material is soil with some grass / Left bank is cobble
Overflow area is gravel

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material	Gravel	n_b	.028 - .035	0.03		0.03
	Firm Soil		.025 - .032		0.025	
	Cobble		.030 - .050			
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.010	0.000	0.010
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000			
	Alternating		.001 - .005	0.000	0.000	0.000
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just north of Powerline Floodway
Photo No. : 15
Section Description : Bed material is cobble
Bank material is cobble
Overflow area is gravel with trees on left side

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material	Firm Soil	n_b	.025 - .032		0.025	
	Cobble		.030 - .050			
	Gravel		.028 - .035	0.03		0.03
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.010	0.005	0.010
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Midway between Ray Road and William Field Road
Photo No. : 16
Section Description : Concrete Channel
Overflow area is gravel with grass, trees on left side

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Concrete		.012 - .018		0.015	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.000	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.000	1.000	1.000
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.015	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : West of Power Road near Williams Gateway Airport
Photo No. : 17
Section Description : Bed material is soil with grass
Bank material is cobble and some gravel
Overflow area is gravel with some small bushes

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material	Gravel	n_b	.028 - .035			
	Firm Soil		.025 - .032		0.025	
	Cobble		.030 - .050	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.010	0.005	0.010
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just south of Rittenhouse Road
Photo No. : 18
Section Description : Bed material is soil with some grass
Bank material is gravel
Overflow area is gravel with some bushes

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : South of Germann Road
Photo No. : 19
Section Description : Bed material is gravel with sparse grass
Bank material is gravel
Overflow area is gravel with grass and some small bushes

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Gravel		.028 - .035	0.030		0.030
	Firm Soil		0.025 - .032		0.025	
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.010	0.005	0.010
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just east of Higley Road
Photo No. : 20
Section Description : Bed material is gravel with grass
Bank material is gravel with some grass
Overflow area is gravel with some trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Gravel		.028 - .035	0.030		0.030
	Firm Soil		.025 - .032		0.025	
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.010	0.005	0.010
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : South of Queen Creek Road
Photo No. : 21
Section Description : Bed material is soil with grass
Bank material is gravel with grass
Overflow area is gravel

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.010	0.000	0.010
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : North of Chandler Heights Drop Structure
Photo No. : 22
Section Description : Bed material is soil with grass
Bank material is gravel with some grass
Overflow area is gravel

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.010	0.000	0.010
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Between Chandler Heights Road and Drop Structure
Photo No. : 23
Section Description : Bed material is soil with thick grass and cattails
Bank material is cobble with some grass and small bushes
Overflow area is gravel with some grass

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material	Gravel	n_b	.028 - .035	0.03		0.03
	Firm Soil		.025 - .032		0.025	
	Cobble		.030 - .050			
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just south of Chandler Heights Road
Photo No. : 24
Section Description : Bed material is soil with thick grass and cattails
Bank material is cobble with some grass and small bushes
Overflow area is gravel with grass, especially on left side

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material	Gravel	n_b	.028 - .035			
	Frim Soil		.025 - .032		0.025	
	Cobble		.030 - .050	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : South of Riggs Road
Photo No. : 25
Section Description : Bed material is soil with grass
Bank material is gravel with some grass
Overflow area is gravel with trees on left side

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.000	0.010
	Medium		.010 - .025	0.010		
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000			
	Alternating		.001 - .005	0.000	0.000	0.000
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.000	1.000	1.000
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Between Riggs Road and Hunt Highway
Photo No. : 26
Section Description : Bed material is soil with thick, short grass
Bank material is gravel with some grass
Overflow area is gravel with small bushes on left side

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.000	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just north of Hunt Highway
Photo No. : 27
Section Description : Bed material is soil with thick, tall grass
Bank material is gravel with some grass
Overflow area is gravel with some small bushes on left side

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just south of Hunt Highway
Photo No. : 28
Section Description : Bed material is soil with grass
Bank material is gravel with some grass and small bushes
Overflow area is gravel with some small bushes mainly on left side

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.04

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Midway between Riggs Road and SR 87 bridges
Photo No. : 29
Section Description : Bed material is soil with grass
Bank material is gravel with some grass and small bushes
Overflow area is gravel with bushes mainly on left side

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.010	0.005	0.010
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Midway between Riggs Road and SR 87 bridges
Photo No. : 30
Section Description : Bed material is soil with grass
Bank material is gravel with bushes and some grass
Overflow area is gravel with some bushes / trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : East of SR 87, east of Lindsey Road
Photo No. : 31
Section Description : Bed material is cobble
Bank material is cobble
Overflow area is gravel with small bushes

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material	Firm Soil	n_b	.025 - .032		0.025	
	Cobble		.030 - .050			
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.000	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : East of SR 87, just west of Lindsey Road
Photo No. : 32
Section Description : Concrete Channel
Overflow area is gravel with some trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Concrete		.012 - .018		0.013	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004		0.000	
	Minor		.005 - .015	0.010		0.010
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.000	0.000	0.000
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.013	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : East of SR 87, just west of Lindsey Road
Photo No. : 33
Section Description : Bed material is soil with some grass
Bank material is gravel
Overflow area is gravel and soil with a few small bushes

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004		0.000	
	Minor		.005 - .015	0.005		0.005
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	0.005	0.000	0.005
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : South of SR 87
Photo No. : 34
Section Description : Bed material is soil
Bank material is soil
Overflow area is gravel with some small bushes

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.000	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just east of SR 587
Photo No. : 35
Section Description : Bed material is soil with some grass and small bushes
Bank material is soil with small bushes
Overflow area is gravel with some small bushes

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.000	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.025	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Just north of Gila River
Photo No. : 36
Section Description : Bed material is soil with some grass
Bank material is soil with grass and some small bushes
Overflow area is gravel and soil with bushes and small trees

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material		n_b				
	Firm Soil		.025 - .032		0.025	
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000	0.000	0.000	0.000
	Minor		.001 - .005			
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC'S METHOD

Project : EMF Capacity Assessment
Stream : EMF
Location : Outlet Channel to Gila River
Photo No. : 37
Section Description : Bed material is cobble that is roughly cemented together
Bank material is cobble that is roughly cemented together
Overflow area is gravel with bushes

Channel Conditions		Manning's n Value		Left Overflow	Channel	Right Overflow
Channel Material	Firm Soil	n_b	.025 - .032		0.025	
	Cobble		.030 - .050			
	Gravel		.028 - .035	0.030		0.030
Degree of Irregularity	Smooth	n_1	0.000			
	Minor		.001 - .005	0.000	0.000	0.000
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0.000	0.000	0.000
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		0.005	
	Medium		.010 - .025	0.010		0.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel C/S	Gradual	n_4	0.000	0.000	0.000	0.000
	Alternating		.001 - .005			
	Alternating		.010 - .015			
Degree of Meandering	Minor	m	1.00	1.00	1.00	1.00
	Appreciable		1.15			
	Severe		1.30			
$n = (n_b + n_1 + n_2 + n_3 + n_4) m$				0.040	0.030	0.040

APPENDIX B

PHOTOGRAPHS

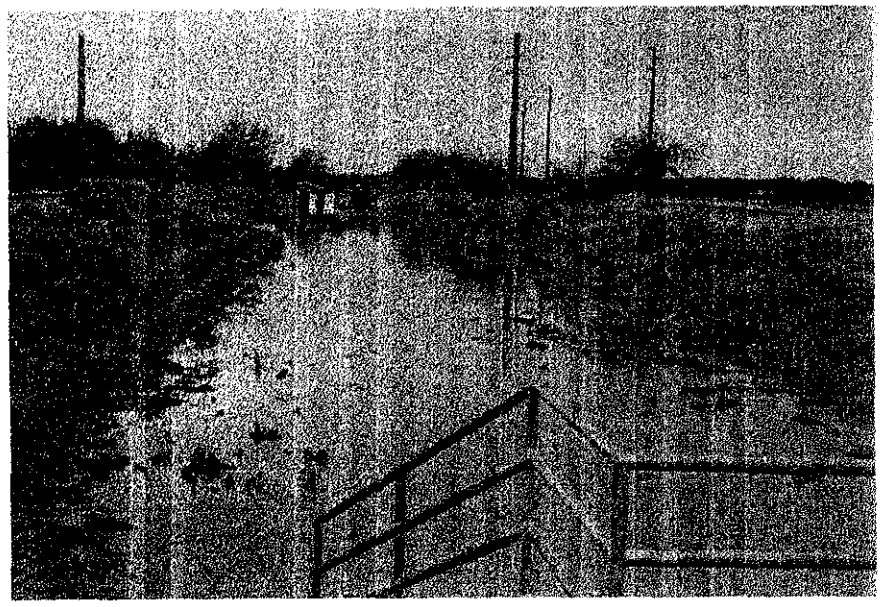

Photo 1

The EMF north of Brown Road at head structure near Princess Park.
Bed material is soil with grass. Bank material is soil with grass and small bushes.

Photo 2

The EMF midway between Brown Road and Adobe Street.
Bed material is soil with grass. Bank material is soil with grass and small bushes.

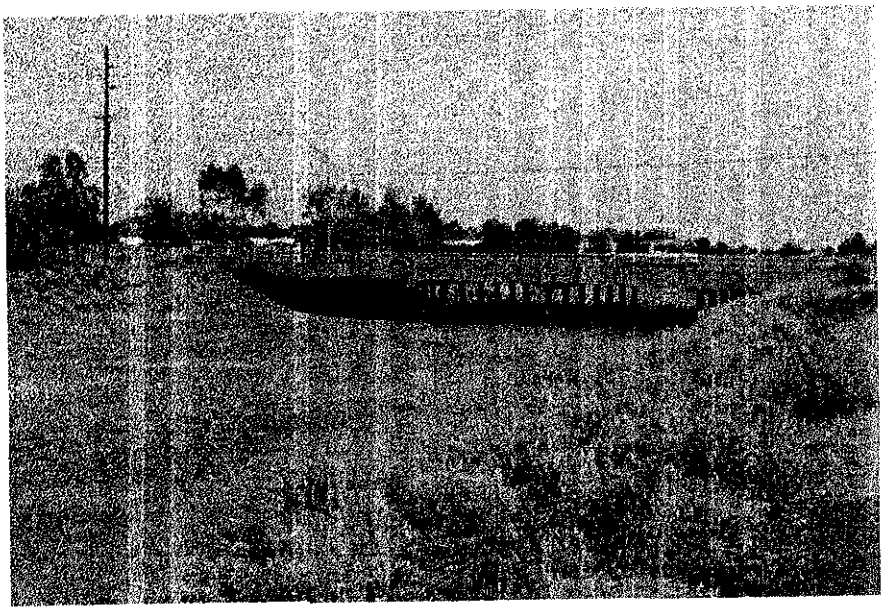

Photo 3

The EMF just north of University Drive. Bed material is soil with grass. Bank material is soil with grass and small bushes.

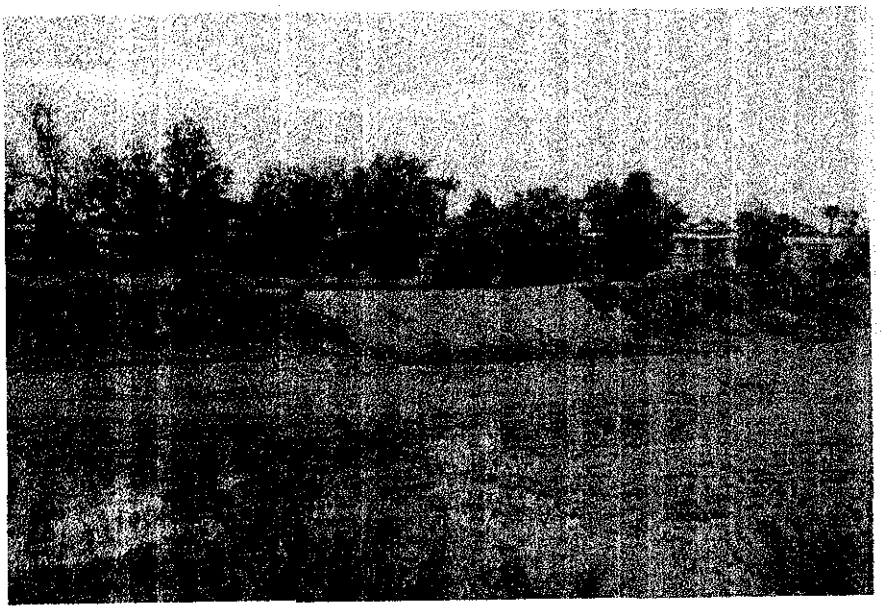

Photo 4

The EMF midway between University Drive and Main Street. Bed material is soil with grass. Bank material is soil with grass and small bushes.

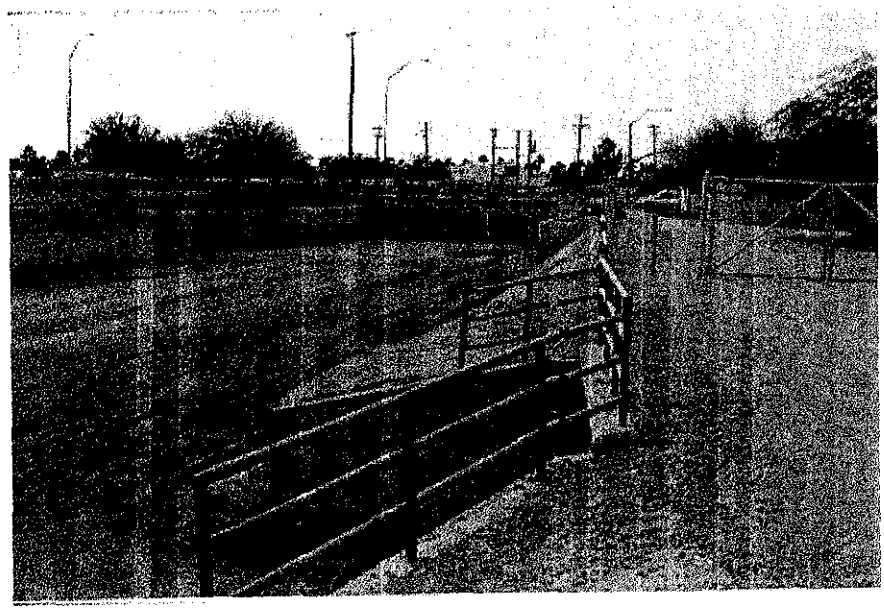

Photo 5

The EMF under Main Street and Higley Road. The channel is a concrete and rectangular in cross-section.

Photo 6

The EMF just south of Main Street. Bed material is soil with grass. Bank material is soil with grass and small bushes.

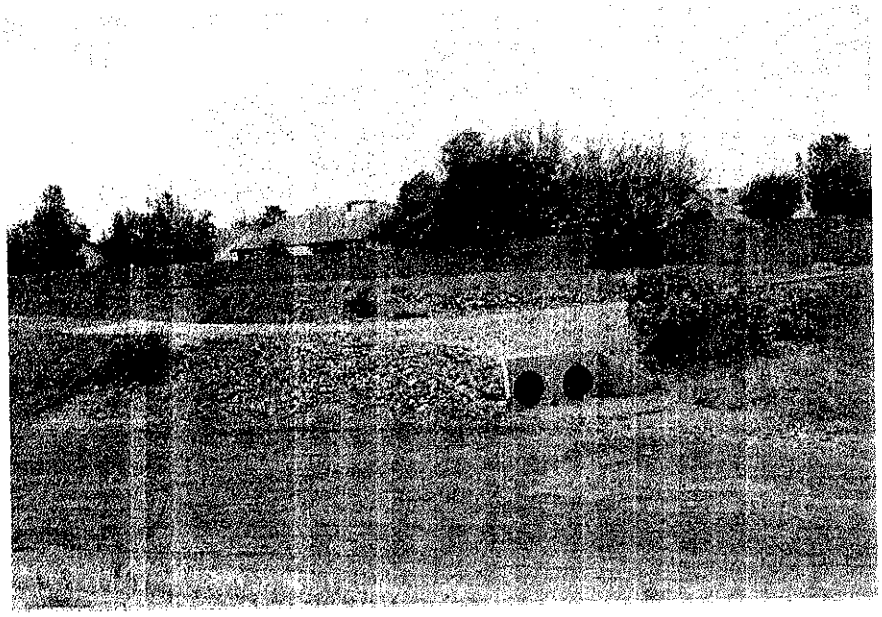

Photo 7

The EMF just north of Leisure World Golf Course at Broadway Channel. Bed material is soil. Bank material is soil with grass and some small bushes.

Photo 8

The EMF at Leisure World Golf Course, between Broadway Road and Southern Avenue. Bed material is soil with grass and some trees. Bank material is soil with grass and some trees.

Photo 9

The EMF at Superstition Springs Golf Course, south of Southern Avenue. Bed material is soil with grass. Bank material is soil with grass, small bushes and some trees.

Photo 10

The EMF at Superstition Springs Golf Course, south of Superstition Freeway. Bed material is soil with grass and some trees. Bank material is soil with grass and some trees.

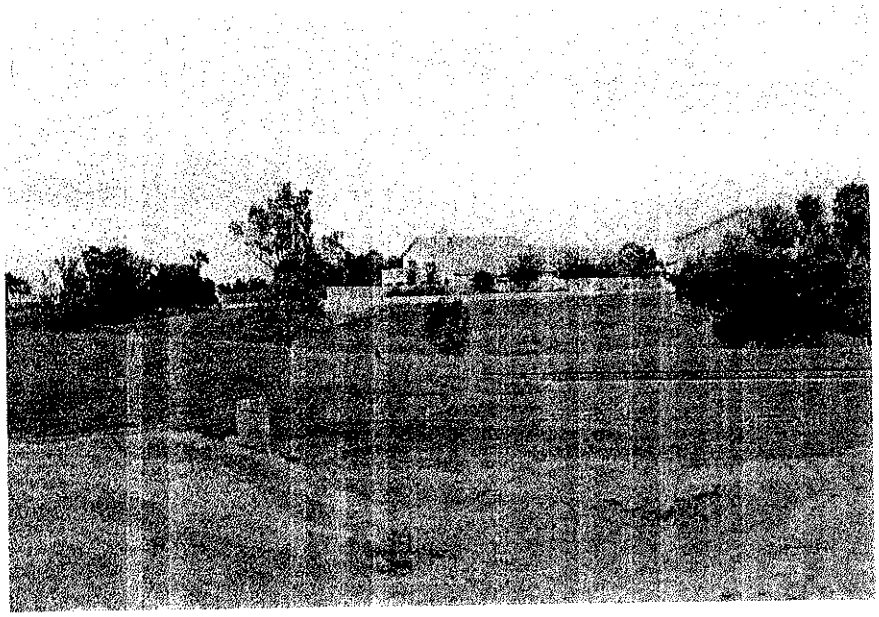

Photo 11

The EMF at Superstition Springs Golf Course, south of Baseline Road. Bed material is soil with grass and some trees. Bank material is soil with grass and some trees.

Photo 12

The EMF at the end of the Superstition Springs Golf Course, just north of Guadalupe Road. Bed material is soil with grass, small bushes and a weir like obstruction. Bank material is soil with small bushes.

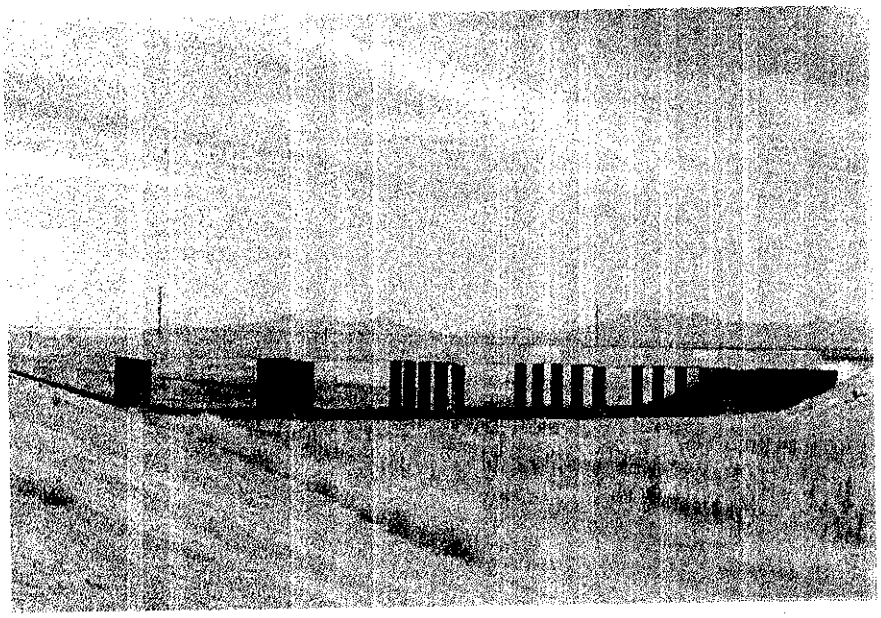

Photo 13

The EMF just south of Elliot Road. Bed material is soil with medium length grass. Bank material is soil with some grass.

Photo 14

The EMF midway between Warner Road and Ray Road. Bed material is soil with some grass. Right bank material is soil with some grass. Left bank material is cobble.

Photo 15

The EMF just north of Powerline Floodway. Bed material is cobble. Bank material is cobble.

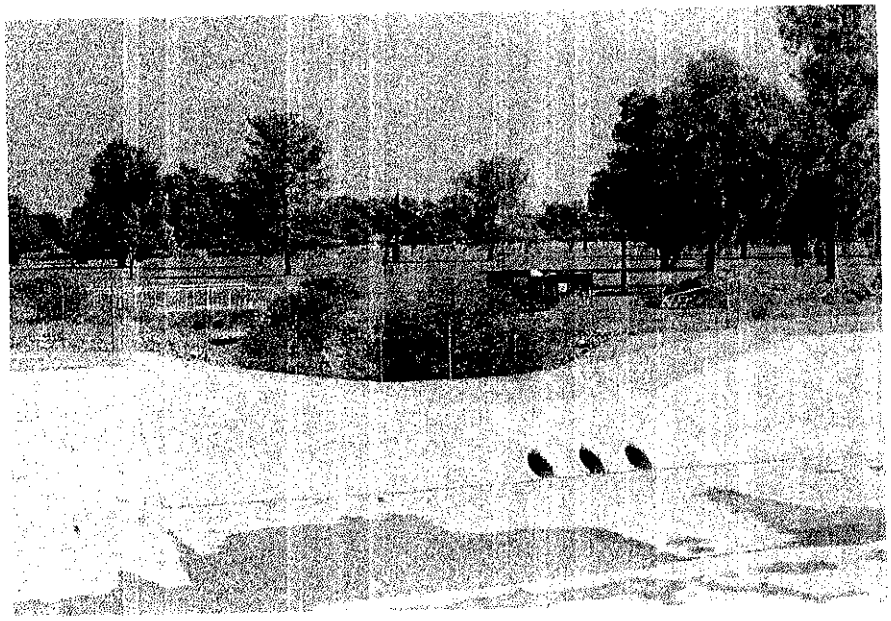

Photo 16

The EMF midway between Ray Road and William Field Road. The channel bed and banks are lined with concrete.

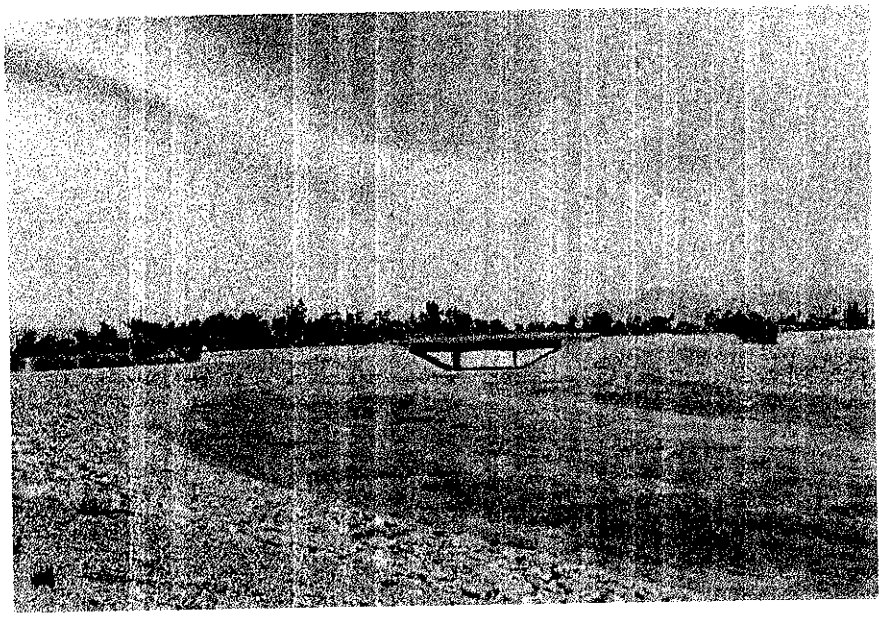

Photo 17

The EMF west of Power Road near William Gateway Airport. Bed material is soil with grass. Bank material is cobble and some gravel.

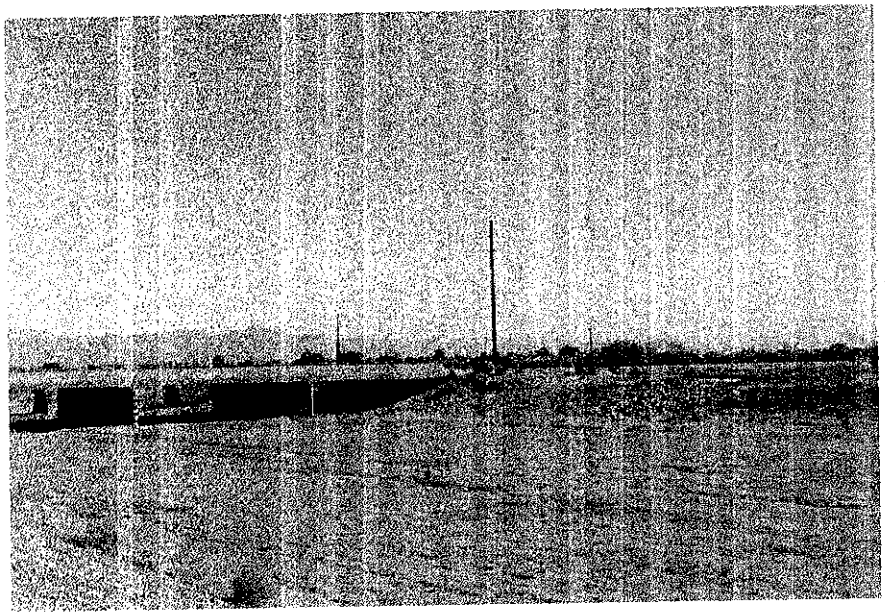

Photo 18

The EMF just south of Rittenhouse Road. Bed material is soil with some grass. Bank material is gravel.

Photo 19

The EMF south of Germann Road. Bed material is gravel with sparse grass. Bank material is gravel.

Photo 20

The EMF just east of Higley Road. Bed material is gravel with grass. Bank material is gravel with some grass.

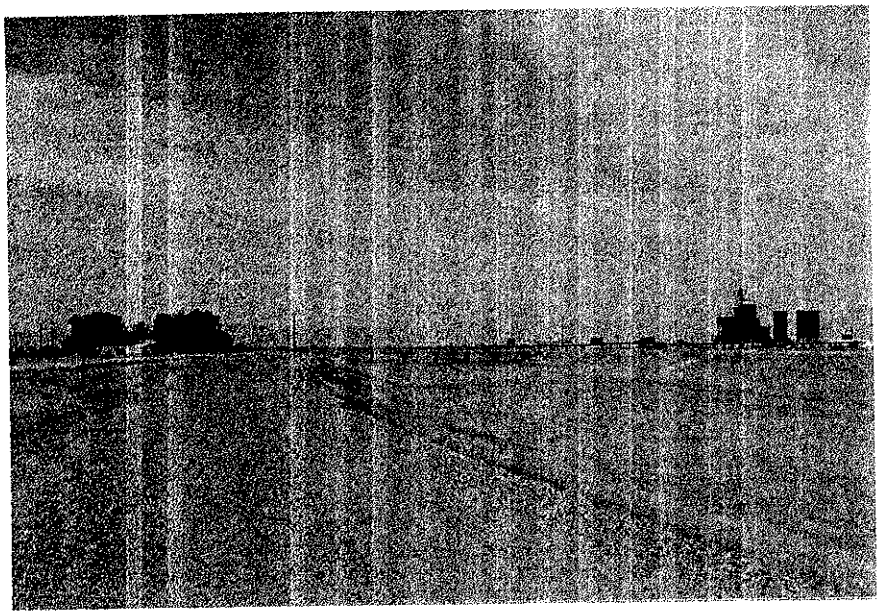

Photo 21

The EMF south of Queen Creek Road. Bed material is soil with grass. Bank material is gravel with grass.

Photo 22

The EMF north of Chandler Heights drop structure. Bed material is soil with grass. Bank material is gravel with some grass.

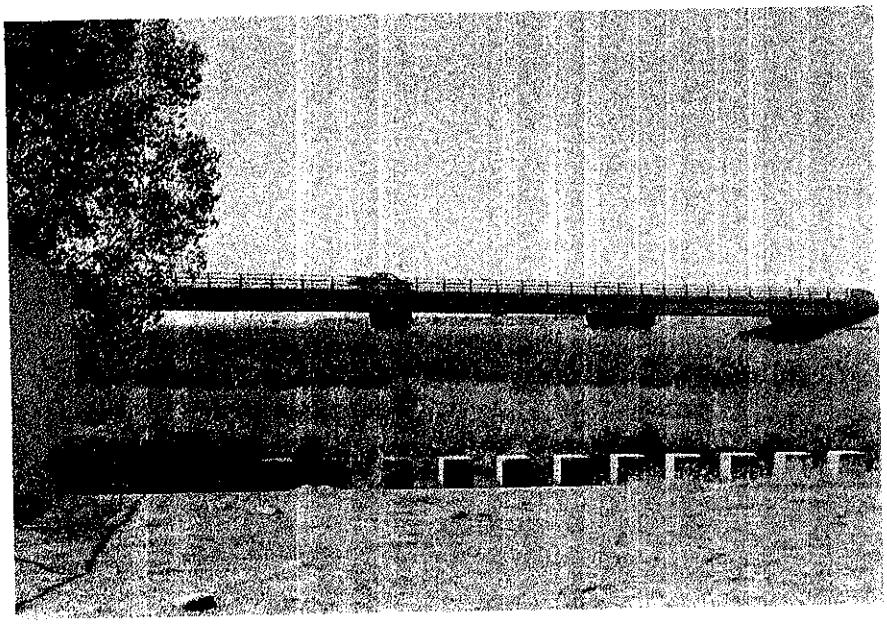

Photo 23

The EMF between Chandler Heights Road and drop structure. Bed material is soil with thick grass and cattails. Bank material is cobble with some grass and small bushes.

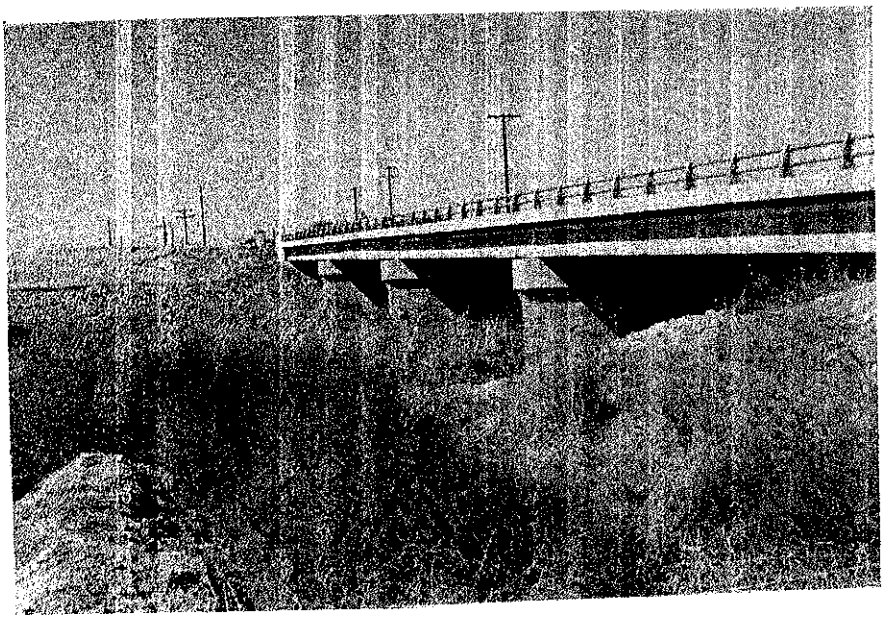

Photo 24

The EMF just south of Chandler Heights Road. Bed material is soil with thick grass and cattails. Bank material is cobble with some grass and small bushes.

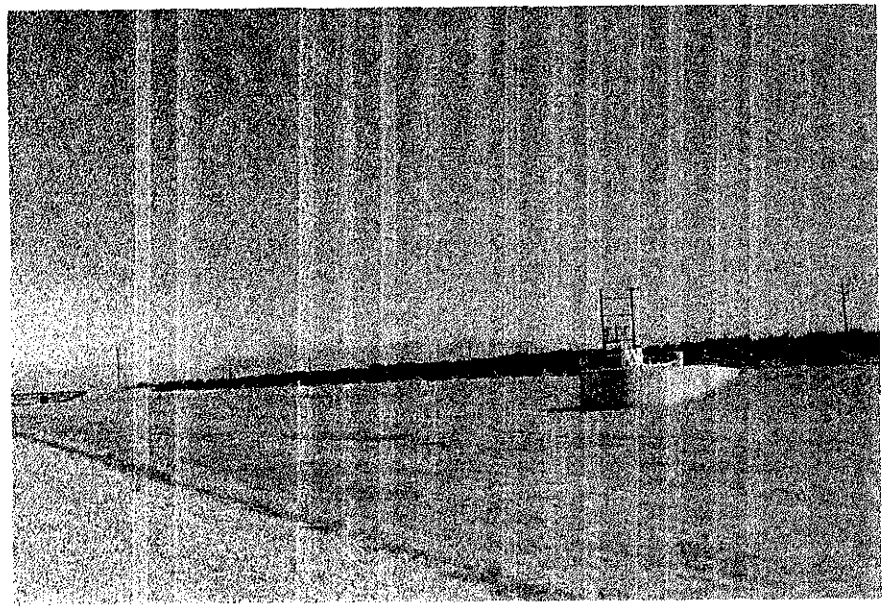

Photo 25

The EMF south of Riggs Road. Bed material is soil with grass. Bank material is gravel with some grass.

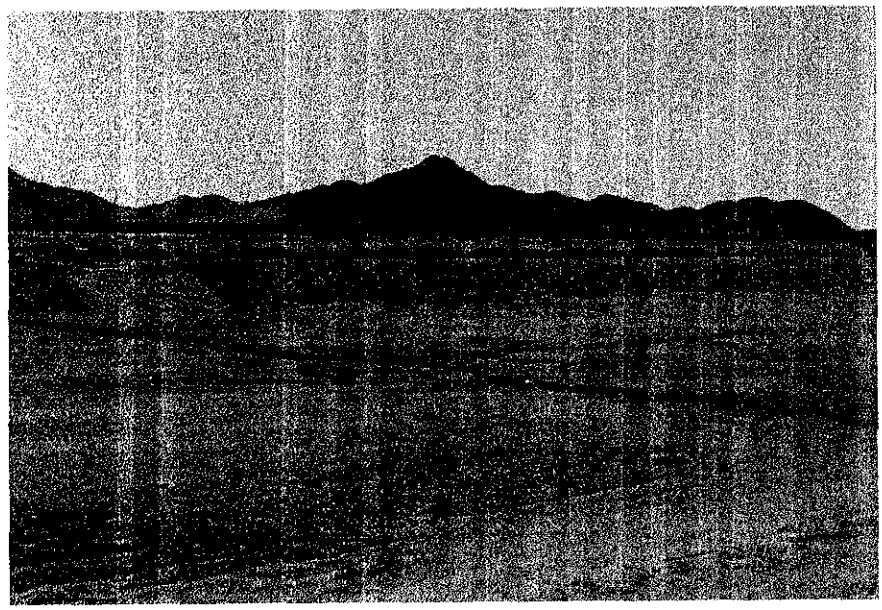

Photo 26

The EMF between Riggs Road and Hunt Highway. Bed material is soil with thick, short grass. Bank material is gravel with some grass.

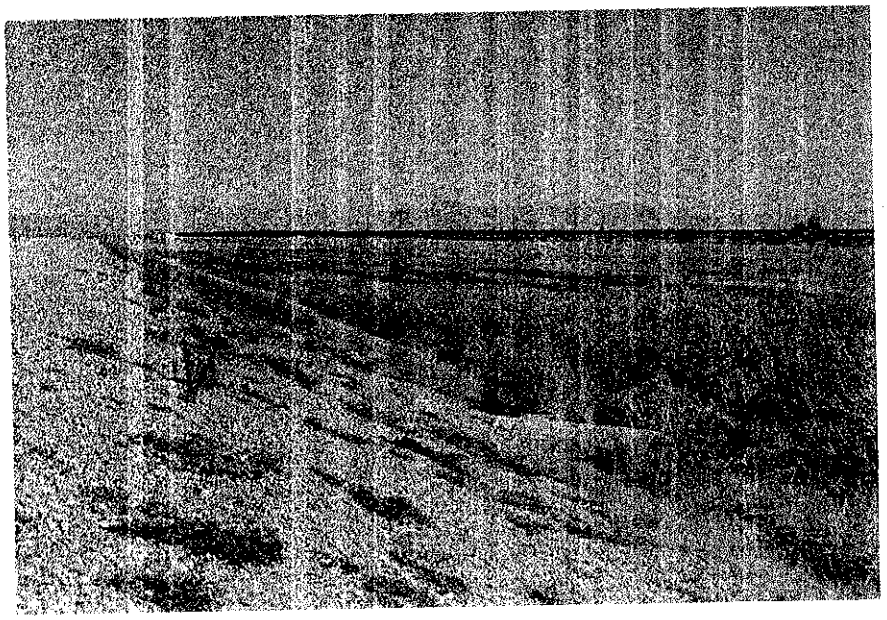

Photo 27

The EMF just north of Hunt Highway. Bed material is soil with thick, tall grass. Bank material is gravel with some grass.

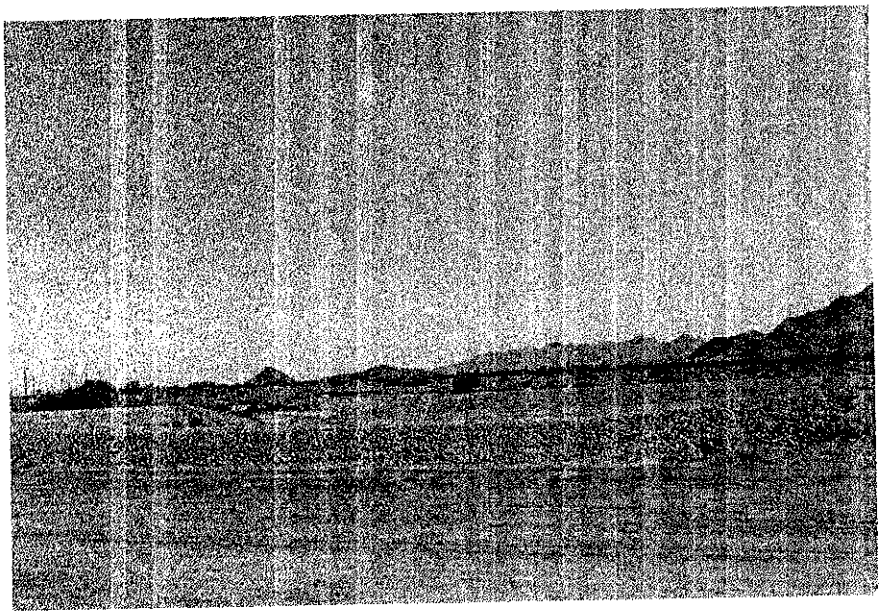

Photo 28

The EMF just south of Hunt Highway. Bed material is soil with grass. Bank material is gravel with some grass and small bushes.

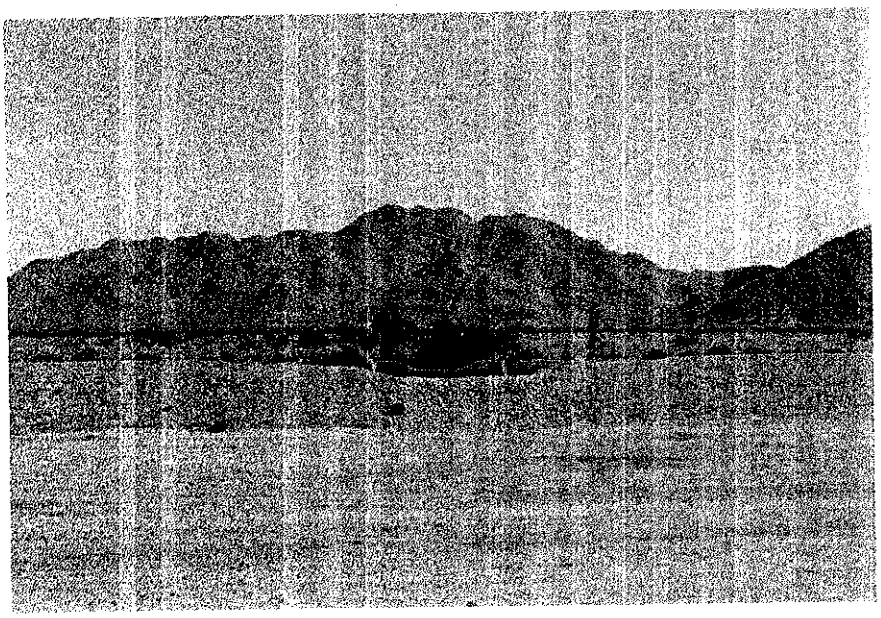

Photo 29

The EMF midway between Riggs Road and SR 87 bridges. Bed material is soil with grass. Bank material is gravel with some grass and small bushes.

Photo 30

The EMF midway between Riggs Road and SR 87 bridges. Bed material is soil with grass. Bank material is gravel with bushes and some grass.

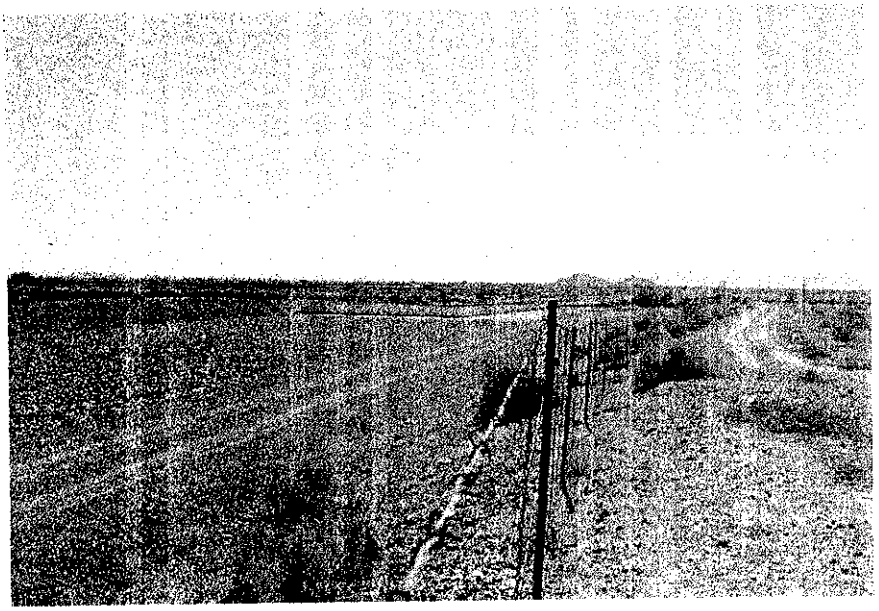

Photo 31

The EMF east of SR 87, east of Lindsey Road. Bed material is cobble. Bank material is cobble.

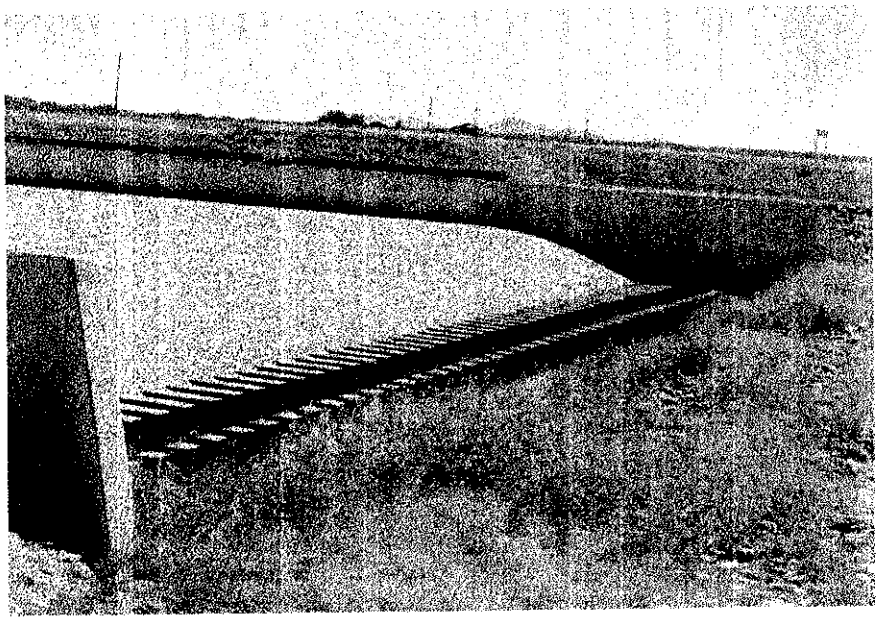

Photo 32

The EMF east of SR 87, just west of Lindsey Road. The rectangular channel's bed and banks are lined with concrete.

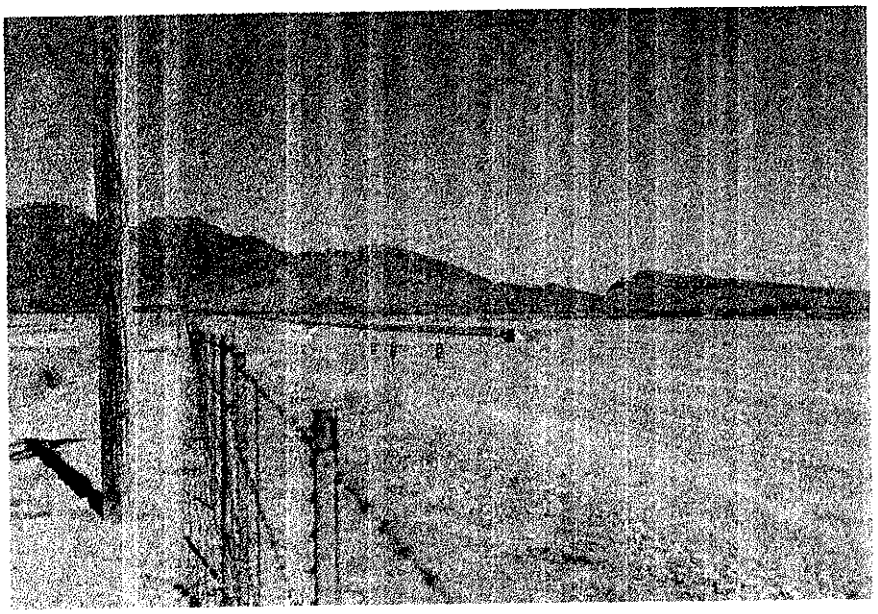

Photo 33

The EMF east of SR 87, just west of Lindsey Road. Bed material is soil with some grass. Bank material is gravel.

Photo 34

The EMF south of SR 87. Bed material is soil. Bank material is soil.

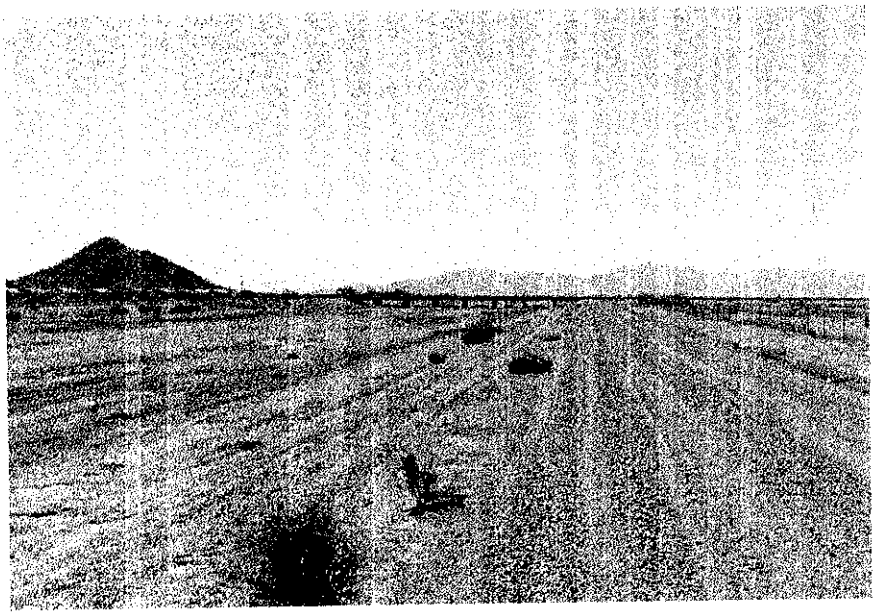

Photo 35

The EMF just east of SR 587. Bed material is soil with some grass and small bushes. Bank material is soil with small bushes.

Photo 36

The EMF just north of Gila River. Bed material is soil with some grass. Bank material is soil with grass and some small bushes.

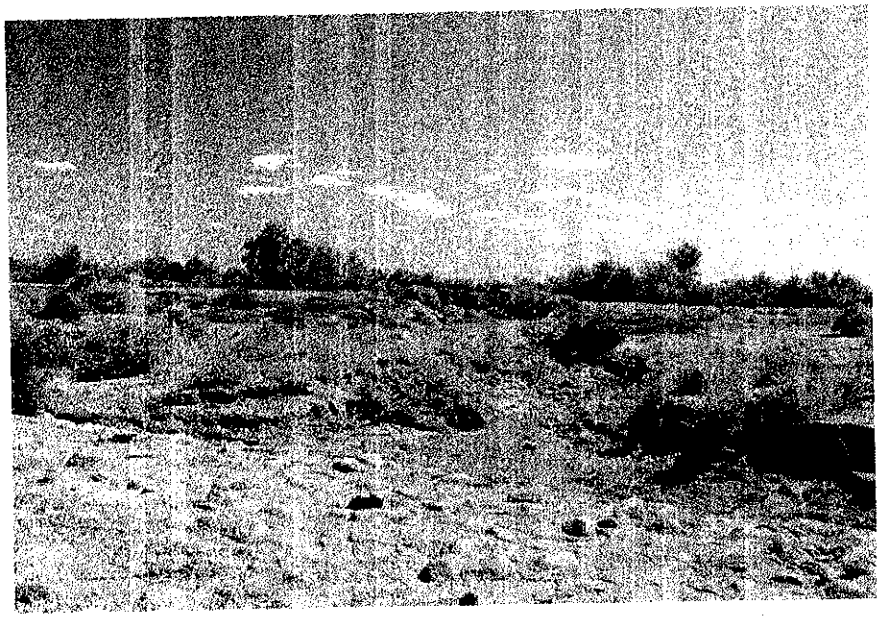

Photo 37

The EMF outlet channel to Gila River. The bed and bank material is cobble that is roughly cemented together.

APPENDIX C

HYDRAULIC ASSESSMENT REULTS

1. HEC-RAS Model Output

HEC-RAS Plan: REACH6 River: EMF Reach: Reach 6

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 6	27.39	900.00	1338.00	1346.24	1340.72	1346.29	0.000135	1.75	515.58	95.63	0.13
Reach 6	27.39	780.00	1338.00	1345.51	1340.51	1345.56	0.000141	1.73	449.80	86.85	0.13
Reach 6	27.39	920.00	1338.00	1347.03	1340.76	1347.07	0.000110	1.54	597.22	114.50	0.12
Reach 6	27.371	900.00	1338.02	1346.23	1340.69	1346.28	0.000121	1.64	547.14	101.96	0.13
Reach 6	27.371	780.00	1338.02	1345.50	1340.51	1345.55	0.000123	1.63	477.67	91.29	0.13
Reach 6	27.371	920.00	1338.02	1347.03	1340.72	1347.06	0.000092	1.45	634.32	116.78	0.11
Reach 6	27.295	900.00	1337.80	1346.20	1340.43	1346.23	0.000090	1.49	604.18	104.53	0.11
Reach 6	27.295	780.00	1337.80	1345.47	1340.24	1345.50	0.000098	1.47	529.43	99.74	0.11
Reach 6	27.295	920.00	1337.80	1347.00	1340.46	1347.03	0.000064	1.33	689.94	109.50	0.09
Reach 6	27.278	900.00	1337.39	1346.14		1346.22	0.000050	2.32	387.68	73.44	0.18
Reach 6	27.278	890.00	1337.39	1345.37		1345.48	0.000071	2.66	334.48	66.72	0.21
Reach 6	27.278	1110.00	1337.39	1346.92		1347.01	0.000054	2.47	448.66	82.34	0.19
Reach 6	27.274	900.00	1337.30	1345.27	1342.14	1346.02	0.000569	6.94	129.62	17.65	0.45
Reach 6	27.274	890.00	1337.30	1344.22	1342.09	1345.22	0.000847	8.00	111.20	17.43	0.56
Reach 6	27.274	1110.00	1337.30	1345.73	1342.81	1346.74	0.000735	8.06	137.73	17.75	0.51
Reach 6	27.261	Culvert									
Reach 6	27.248	900.00	1337.39	1344.78		1345.56	0.000612	7.11	126.66	17.48	0.47
Reach 6	27.248	890.00	1337.39	1343.37		1344.55	0.001081	8.71	102.22	17.27	0.63
Reach 6	27.248	1110.00	1337.39	1344.95		1346.09	0.000873	8.56	129.68	17.50	0.55
Reach 6	27.244	900.00	1337.80	1345.08		1345.24	0.000645	3.24	278.04	58.82	0.26
Reach 6	27.244	890.00	1337.80	1343.80		1344.07	0.001036	4.17	213.61	42.37	0.33
Reach 6	27.244	1110.00	1337.80	1345.40		1345.61	0.000836	3.73	297.30	62.03	0.30
Reach 6	27.189	1200.00	1337.78	1345.10		1345.15	0.000111	1.67	717.42	122.76	0.12
Reach 6	27.189	890.00	1337.78	1343.89		1343.93	0.000117	1.55	573.33	114.81	0.12
Reach 6	27.189	1110.00	1337.78	1345.47		1345.50	0.000079	1.45	762.95	125.16	0.10
Reach 6	27.095	1200.00	1337.86	1345.05	1339.91	1345.09	0.000110	1.66	724.89	124.57	0.12
Reach 6	27.095	890.00	1337.86	1343.83	1339.59	1343.87	0.000118	1.54	577.75	117.35	0.12
Reach 6	27.095	1110.00	1337.86	1345.43	1339.82	1345.46	0.000078	1.44	773.15	127.33	0.10
Reach 6	27	1200.00	1337.52	1345.00	1339.61	1345.04	0.000097	1.59	753.16	124.78	0.11
Reach 6	27	890.00	1337.52	1343.78	1339.28	1343.81	0.000102	1.47	605.04	117.99	0.11
Reach 6	27	1110.00	1337.52	1345.40	1339.51	1345.43	0.000068	1.38	803.17	126.80	0.10

HEC-RAS Plan: REACH6 River: EMF Reach: Reach 6 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 6	26.905	1200.00	1337.56	1344.95	1339.55	1344.99	0.000100	1.61	747.62	125.61	0.12
Reach 6	26.905	890.00	1337.56	1343.73	1339.22	1343.76	0.000105	1.49	598.89	117.73	0.12
Reach 6	26.905	1110.00	1337.56	1345.36	1339.45	1345.39	0.000070	1.39	799.99	128.31	0.10
Reach 6	26.811	1200.00	1337.40	1344.90	1339.35	1344.94	0.000091	1.56	768.98	126.20	0.11
Reach 6	26.811	890.00	1337.40	1343.68	1339.02	1343.71	0.000095	1.44	619.41	118.37	0.11
Reach 6	26.811	1110.00	1337.40	1345.33	1339.25	1345.36	0.000064	1.35	823.41	129.19	0.09
Reach 6	26.762	1200.00	1337.15	1344.88	1339.30	1344.92	0.000094	1.57	765.14	127.58	0.11
Reach 6	26.762	890.00	1337.15	1343.65	1338.96	1343.69	0.000098	1.45	614.18	118.89	0.11
Reach 6	26.762	1110.00	1337.15	1345.31	1339.20	1345.34	0.000066	1.35	821.17	130.80	0.10
Reach 6	26.727	1200.00	1337.30	1344.81	1339.86	1344.90	0.000042	2.32	517.45	87.86	0.17
Reach 6	26.727	890.00	1337.30	1343.60	1339.45	1343.67	0.000042	2.13	417.15	79.51	0.16
Reach 6	26.727	1110.00	1337.30	1345.27	1339.74	1345.33	0.000031	1.99	558.93	95.69	0.14
Reach 6	26.722	1200.00	1337.21	1344.66	1340.03	1344.86	0.000101	3.62	331.41	44.52	0.23
Reach 6	26.722	890.00	1337.21	1343.48	1339.52	1343.64	0.000094	3.19	279.09	44.51	0.22
Reach 6	26.722	1110.00	1337.21	1345.14	1339.89	1345.30	0.000071	3.14	353.18	44.52	0.20
Reach 6	26.712	Culvert									
Reach 6	26.702	1200.00	1337.17	1344.51		1344.72	0.000106	3.69	325.43	44.52	0.24
Reach 6	26.702	890.00	1337.17	1343.36		1343.53	0.000098	3.24	274.48	44.52	0.23
Reach 6	26.702	1110.00	1337.17	1345.04		1345.19	0.000074	3.18	349.09	46.13	0.20
Reach 6	26.697	1200.00	1337.18	1344.57		1344.65	0.000215	2.23	537.08	95.92	0.17
Reach 6	26.697	890.00	1337.18	1343.41		1343.48	0.000208	2.06	432.50	85.35	0.16
Reach 6	26.697	1110.00	1337.18	1345.09		1345.14	0.000147	1.89	587.85	101.86	0.14
Reach 6	26.678	1200.00	1337.17	1344.57	1339.33	1344.63	0.000134	1.84	653.26	111.24	0.13
Reach 6	26.678	890.00	1337.17	1343.41	1338.97	1343.45	0.000135	1.68	528.38	103.37	0.13
Reach 6	26.678	1110.00	1337.17	1345.09	1339.23	1345.12	0.000090	1.56	711.32	114.92	0.11
Reach 6	26.595	1200.00	1337.10	1344.53	1339.08	1344.57	0.000097	1.59	754.41	125.32	0.11
Reach 6	26.595	890.00	1337.10	1343.37	1338.76	1343.40	0.000098	1.45	612.41	118.11	0.11
Reach 6	26.595	1110.00	1337.10	1345.06	1338.99	1345.09	0.000064	1.35	821.34	128.55	0.09
Reach 6	26.5	1200.00	1336.94	1344.49	1338.94	1344.52	0.000092	1.56	767.79	125.84	0.11
Reach 6	26.5	890.00	1336.94	1343.32	1338.61	1343.35	0.000093	1.42	624.89	118.99	0.11
Reach 6	26.5	1110.00	1336.94	1345.03	1338.85	1345.06	0.000061	1.33	836.97	129.02	0.09

HEC-RAS Plan: REACH6 River: EMF Reach: Reach 6 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 6	26.385	1200.00	1336.58	1344.43	1338.65	1344.47	0.000089	1.56	768.20	123.02	0.11
Reach 6	26.385	830.00	1336.58	1343.27	1338.24	1343.30	0.000076	1.32	629.67	115.78	0.10
Reach 6	26.385	1080.00	1336.58	1345.00	1338.52	1345.02	0.000056	1.29	838.51	126.53	0.09
Reach 6	26.311	1200.00	1336.19	1344.40	1338.49	1344.44	0.000084	1.52	790.99	126.72	0.11
Reach 6	26.311	830.00	1336.19	1343.24	1338.08	1343.27	0.000071	1.28	648.93	119.11	0.10
Reach 6	26.311	1080.00	1336.19	1344.98	1338.36	1345.00	0.000052	1.25	865.03	130.51	0.09
Reach 6	26.228	1200.00	1336.68	1344.36	1338.79	1344.40	0.000098	1.61	744.54	122.77	0.12
Reach 6	26.228	830.00	1336.68	1343.21	1338.39	1343.24	0.000085	1.37	607.66	115.53	0.10
Reach 6	26.228	1080.00	1336.68	1344.95	1338.66	1344.97	0.000060	1.32	818.41	126.53	0.09
Reach 6	26.187	1200.00	1336.77	1344.35	1338.65	1344.37	0.000068	1.36	879.20	142.06	0.10
Reach 6	26.187	1620.00	1336.77	1343.11	1339.00	1343.20	0.000237	2.28	709.01	134.58	0.18
Reach 6	26.187	1600.00	1336.77	1344.91	1338.98	1344.96	0.000093	1.67	960.88	145.57	0.11
Reach 6	26.171	1200.00	1336.67	1344.34	1338.44	1344.37	0.000080	1.30	919.66	142.41	0.09
Reach 6	26.171	1620.00	1336.67	1343.10	1338.78	1343.17	0.000275	2.17	746.74	135.92	0.16
Reach 6	26.171	1600.00	1336.67	1344.91	1338.77	1344.95	0.000111	1.60	1001.14	145.37	0.11
Reach 6	26.163	Bridge									
Reach 6	26.154	1200.00	1336.58	1344.15		1344.17	0.000081	1.31	917.82	141.55	0.09
Reach 6	26.154	1620.00	1336.58	1342.87		1342.94	0.000282	2.19	740.73	135.49	0.16
Reach 6	26.154	1600.00	1336.58	1344.70		1344.74	0.000112	1.60	997.28	144.19	0.11
Reach 6	26.133	1200.00	1336.51	1344.14		1344.16	0.000056	1.26	953.19	149.72	0.09
Reach 6	26.133	1620.00	1336.51	1342.84		1342.91	0.000201	2.12	763.55	142.84	0.16
Reach 6	26.133	1600.00	1336.51	1344.69		1344.73	0.000078	1.54	1036.97	152.82	0.10
Reach 6	26.047	1200.00	1336.61	1344.11	1338.35	1344.14	0.000060	1.28	936.58	151.74	0.09
Reach 6	26.047	1620.00	1336.61	1342.74	1338.69	1342.82	0.000222	2.20	736.79	141.29	0.17
Reach 6	26.047	1600.00	1336.61	1344.65	1338.67	1344.69	0.000085	1.57	1020.63	157.93	0.11
Reach 6	25.939	1200.00	1336.46	1344.08	1338.15	1344.10	0.000052	1.22	985.02	153.60	0.08
Reach 6	25.939	1620.00	1336.46	1342.62	1338.48	1342.69	0.000202	2.11	767.15	145.42	0.16
Reach 6	25.939	1600.00	1336.46	1344.61	1338.46	1344.65	0.000073	1.50	1067.59	157.72	0.10
Reach 6	25.844	1200.00	1336.30	1344.06	1338.13	1344.08	0.000053	1.22	980.59	155.35	0.09
Reach 6	25.844	1620.00	1336.30	1342.52	1338.46	1342.59	0.000218	2.16	749.11	145.44	0.17
Reach 6	25.844	1600.00	1336.30	1344.57	1338.45	1344.61	0.000075	1.51	1062.21	158.70	0.10

HEC-RAS Plan: REACH6 River: EMF Reach: Reach 6 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 6	25.749	1200.00	1336.53	1344.03	1338.21	1344.05	0.000057	1.26	949.29	150.97	0.09
Reach 6	25.749	1620.00	1336.53	1342.39	1338.55	1342.47	0.000251	2.28	710.00	141.51	0.18
Reach 6	25.749	1600.00	1336.53	1344.53	1338.53	1344.57	0.000080	1.56	1026.67	153.85	0.11
Reach 6	25.647	1200.00	1336.60	1343.99	1338.48	1344.02	0.000068	1.34	894.67	147.66	0.10
Reach 6	25.647	1620.00	1336.60	1342.21	1338.82	1342.31	0.000336	2.52	642.13	137.07	0.21
Reach 6	25.647	1600.00	1336.60	1344.48	1338.80	1344.52	0.000095	1.65	968.12	150.60	0.11
Reach 6	25.598	2000.00	1335.97	1343.85	1338.76	1343.97	0.000266	2.80	715.37	198.92	0.19
Reach 6	25.598	1610.00	1335.97	1342.07	1338.40	1342.21	0.000423	3.03	530.79	100.14	0.23
Reach 6	25.598	2520.00	1335.97	1344.29	1339.19	1344.46	0.000350	3.30	763.16	236.73	0.22
Reach 6	25.597	2000.00	1335.97	1343.78	1338.85	1343.96	0.000076	3.46	578.79	161.71	0.22
Reach 6	25.597	1610.00	1335.97	1342.00	1338.47	1342.20	0.000113	3.61	445.59	74.93	0.26
Reach 6	25.597	2520.00	1335.97	1344.18	1339.31	1344.45	0.000103	4.14	609.31	199.74	0.26
Reach 6	25.578	2000.00	1335.86	1343.52	1339.45	1343.89	0.000174	4.92	406.19	53.69	0.32
Reach 6	25.578	1610.00	1335.86	1341.70	1338.98	1342.12	0.000263	5.22	308.44	53.68	0.38
Reach 6	25.578	2520.00	1335.86	1343.79	1340.03	1344.35	0.000248	5.99	420.84	53.69	0.38
Reach 6	25.565	Culvert									
Reach 6	25.508	2000.00	1335.30	1342.93		1343.31	0.000171	4.90	408.30	53.69	0.31
Reach 6	25.508	1610.00	1335.30	1341.35		1341.74	0.000225	4.98	323.37	53.68	0.36
Reach 6	25.508	2520.00	1335.30	1342.82		1343.43	0.000284	6.26	402.30	53.69	0.40
Reach 6	25.49	2000.00	1335.32	1342.96	1338.62	1343.22	0.000641	4.05	493.73	74.91	0.28
Reach 6	25.49	1610.00	1335.32	1341.37	1338.20	1341.65	0.000870	4.24	380.03	68.67	0.32
Reach 6	25.49	2520.00	1335.32	1342.87	1339.15	1343.29	0.001062	5.18	486.76	74.74	0.36
Reach 6	25.463	2000.00	1334.94	1342.98	1338.19	1343.12	0.000317	3.00	667.76	102.23	0.21
Reach 6	25.463	1610.00	1334.94	1341.36	1337.82	1341.52	0.000471	3.18	507.02	96.37	0.24
Reach 6	25.463	2520.00	1334.94	1342.90	1338.62	1343.13	0.000522	3.82	659.41	101.93	0.26
Reach 6	25.4	2300.00	1335.39	1342.91	1338.07	1343.02	0.000257	2.66	864.98	138.85	0.19
Reach 6	25.4	1610.00	1335.39	1341.28	1337.54	1341.38	0.000300	2.49	647.06	129.13	0.20
Reach 6	25.4	2520.00	1335.39	1342.83	1338.22	1342.97	0.000321	2.95	854.06	138.37	0.21
Reach 6	25.3	2300.00	1334.14	1342.82	1336.97	1342.90	0.000170	2.34	982.67	139.45	0.16
Reach 6	25.3	1610.00	1334.14	1341.18	1336.43	1341.25	0.000178	2.11	761.24	131.02	0.15
Reach 6	25.3	2520.00	1334.14	1342.71	1337.14	1342.82	0.000213	2.60	968.42	138.95	0.17

HEC-RAS Plan: REACH6 River: EMF Reach: Reach 6 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 6	25.2	2300.00	1333.22	1342.74	1336.20	1342.82	0.000140	2.20	1046.86	141.60	0.14
Reach 6	25.2	1610.00	1333.22	1341.11	1335.64	1341.16	0.000138	1.95	823.67	131.12	0.14
Reach 6	25.2	2520.00	1333.22	1342.62	1336.37	1342.71	0.000177	2.45	1029.66	140.80	0.16
Reach 6	25.1	2300.00	1332.84	1342.67	1336.01	1342.74	0.000140	2.20	1045.42	140.32	0.14
Reach 6	25.1	1610.00	1332.84	1341.03	1335.45	1341.09	0.000134	1.95	825.53	129.07	0.14
Reach 6	25.1	2520.00	1332.84	1342.53	1336.18	1342.62	0.000177	2.46	1025.59	139.29	0.16
Reach 6	25.028	2300.00	1332.55	1342.63	1335.51	1342.69	0.000114	2.06	1117.69	200.27	0.13
Reach 6	25.028	1610.00	1332.55	1340.99	1334.93	1341.05	0.000109	1.81	890.46	133.82	0.12
Reach 6	25.028	2520.00	1332.55	1342.47	1335.68	1342.56	0.000146	2.30	1095.77	173.97	0.15
Reach 6	24.987	2300.00	1332.02	1342.60	1335.16	1342.67	0.000110	2.04	1129.06	196.28	0.13
Reach 6	24.987	1610.00	1332.02	1340.97	1334.56	1341.02	0.000101	1.78	905.76	131.37	0.12
Reach 6	24.987	2520.00	1332.02	1342.44	1335.33	1342.52	0.000140	2.28	1106.14	141.06	0.14
Reach 6	24.957	2300.00	1332.02	1342.42	1336.23	1342.62	0.000444	3.61	636.66	93.26	0.24
Reach 6	24.957	1610.00	1332.02	1340.83	1335.37	1340.98	0.000326	3.14	512.40	72.79	0.21
Reach 6	24.957	2520.00	1332.02	1342.21	1336.47	1342.47	0.000529	4.08	617.76	85.58	0.27
Reach 6	24.946	2300.00	1331.70	1341.99	1337.30	1342.50	0.001174	5.70	403.81	58.12	0.38
Reach 6	24.946	1610.00	1331.70	1340.52	1336.19	1340.89	0.000884	4.90	328.50	47.51	0.33
Reach 6	24.946	2520.00	1331.70	1341.62	1337.60	1342.30	0.001553	6.58	382.80	54.46	0.44
Reach 6	24.936	Bridge									
Reach 6	24.926	2300.00	1331.58	1341.31		1341.88	0.001297	6.07	379.16	53.41	0.40
Reach 6	24.926	1610.00	1331.58	1339.99		1340.40	0.001011	5.12	314.26	47.43	0.35
Reach 6	24.926	2520.00	1331.58	1340.73		1341.53	0.001829	7.20	350.11	49.20	0.48
Reach 6	24.9	2300.00	1330.99	1341.49	1334.49	1341.59	0.000172	2.46	943.73	146.91	0.16
Reach 6	24.9	1610.00	1330.99	1340.12	1333.84	1340.19	0.000134	2.08	774.25	108.25	0.14
Reach 6	24.9	2520.00	1330.99	1340.99	1334.68	1341.12	0.000249	2.89	873.18	119.00	0.19
Reach 6	24.862	2300.00	1331.09	1341.50	1334.11	1341.55	0.000093	1.89	1224.50	181.54	0.12
Reach 6	24.862	1610.00	1331.09	1340.12	1333.57	1340.16	0.000079	1.59	1010.86	144.45	0.11
Reach 6	24.862	2520.00	1331.09	1341.00	1334.28	1341.07	0.000137	2.21	1140.04	149.99	0.14
Reach 6	24.723	3100.00	1328.84	1341.38	1333.16	1341.47	0.000135	2.34	1323.80	158.20	0.14
Reach 6	24.723	2440.00	1328.84	1340.00	1332.62	1340.07	0.000135	2.19	1113.42	146.69	0.14
Reach 6	24.723	3120.00	1328.84	1340.86	1333.18	1340.96	0.000163	2.51	1242.66	153.86	0.16

HEC-RAS Version 2.1 October 1997
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: EMF Reach 6 (1-12-99), FCD 97-06
Project File : emfr6.prj
Run Date and Time: 1/12/99 8:30:06 PM

Project in English units

Project Description:
EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT
FCDMC Contract No. 97-06
Prepared by HNTB Corporation, January 1999
Contact: B. Gary Sun
HNTB Corporation
40 North Central Avenue, Suite 300
Phoenix, Arizona 85004
(602) 528-4300

REACH 6
Princess Park to Broadway Channel
(River Mile 27.39 to Mile 24.723)

The Purpose of the Study is to Determine Channel Capacity for
Three Given 100-Year Discharges.
The Water Surface Profiles Were Calculated
Using the U.S. Army Corps of Engineers' HEC-RAS Computer Program, Version 2.1,
Dated October 1997, as Implemented by Haestad Methods, Inc.

Subcritical Flow Run
3 Water Surface Profiles with 100-Year Discharges Provided by FCDMC (Dated 6-10-98)
Profile 1 - Design Discharges
Profile 2 - Future Discharges, Future Land Use with Retention and without Proposed FCD CIPs
Profile 3 - Existing Conditions

The Control Line on the Thalweg of East Maricopa Floodway is Station 5,000, and All Cross Section Data were Stationed Looking Downstream. Cross Section Numbers Indicate in River Miles above the Top of Drop Structure at the Downstream of the East Maricopa Floodway.

Starting Water Surface Elevations Used are the Calculated Water Surface Elevations from Each of Three Water Surface Profiles Calculated at River Mile 24.723 from Reach 5 HEC-RAS Runs.

Manning's n Values of 0.030 Were Used for Channel in Reach 6.

PLAN DATA

Plan Title: EMF Reach 6
Plan File : j:\27559\CADD\CIVIL\DATA\emfr6.p01

Geometry Title: EMF Reach 6
Geometry File : j:\27559\CADD\CIVIL\DATA\emfr6.g01

Flow Title : Profiles: 1-Design, 2-Future & 3-Existing
Flow File : j:\27559\CADD\CIVIL\DATA\emfr6.f01

Plan Summary Information:
Number of: Cross Sections = 50 Mulitple Openings = 0
Culverts = 3 Inline Weirs = 0
Bridges = 2

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

Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Profiles: 1-Design, 2-Future & 3-Existing
Flow File : j:\27559\CADD\CIVIL\DATA\emfr6.f01

Flow Data (cfs)

River	Reach	RS	Design	Future	Existing
EMF	Reach 6	27.39	900	780	920
EMF	Reach 6	27.278	900	890	1110
EMF	Reach 6	27.189	1200	890	1110
EMF	Reach 6	26.385	1200	830	1080
EMF	Reach 6	26.187	1200	1620	1600
EMF	Reach 6	25.598	2000	1610	2520
EMF	Reach 6	25.4	2300	1610	2520
EMF	Reach 6	24.723	3100	2440	3120

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
EMF	Reach 6	Design		Known WS = 1341.38
EMF	Reach 6	Future		Known WS = 1340
EMF	Reach 6	Existing		Known WS = 1340.86

GEOMETRY DATA

Geometry Title: EMF Reach 6
Geometry File : j:\27559\CADD\CIVIL\DATA\emfr6.g01

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 27.39

INPUT
Description: Upstream Limit of the Study at Princess Park
Q(D) = 900 cfs, Q(F)
= 780 cfs & Q(E) = 920 cfs
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4800	1347.4	4811.03	1347.3	4824.71	1347.02	4847.42	1346.73	4885.78	1347.06
4927.92	1347.3	4944.97	1347.04	4951.76	1346.73	4958.82	1344.35	4972.16	1340.6
4980.91	1338.9	4989.37	1338	5009.06	1338.12	5014.93	1338.06	5019.38	1339.07
5023.91	1340.5	5032.77	1342.5	5043.21	1345.83	5060.53	1347.1	5064.54	1347.32
5073.13	1348.6	5092.38	1348.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4800	.04	4944.97	.03	5073.13	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4944.97	5073.13	100.04	100.04	100.04	.1	.3

Left Levee Station= 4927.92 Elevation= 1347.3
Right Levee Station= 5073.13 Elevation= 1348.6

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1346.24	Element			
Vel Head (ft)	0.05	Wt. n-Val.		0.030	
E.G. Elev (ft)	1346.29	Reach Len. (ft)	100.04	100.04	100.04
Crit W.S. (ft)	1340.72	Flow Area (sq ft)		515.58	
E.G. Slope (ft/ft)	0.000135	Area (sq ft)		515.58	
Q Total (cfs)	900.00	Flow (cfs)		900.00	
Top Width (ft)	95.63	Top Width (ft)		95.63	
Vel Total (ft/s)	1.75	Avg. Vel. (ft/s)		1.75	
Max Chl Dpth (ft)	8.24	Hydr. Depth (ft)		5.39	
Conv. Total (cfs)	77371.4	Conv. (cfs)		77371.4	
Length Wtd. (ft)	100.04	Wetted Per. (ft)		97.76	
Min Ch El (ft)	1338.00	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.76	266.84	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	40.87	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1345.51	Element			
Vel Head (ft)	0.05	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.56	Reach Len. (ft)	100.04	100.04	100.04
Crit W.S. (ft)	1340.51	Flow Area (sq ft)		449.80	
E.G. Slope (ft/ft)	0.000141	Area (sq ft)		449.80	
Q Total (cfs)	780.00	Flow (cfs)		780.00	
Top Width (ft)	86.85	Top Width (ft)		86.85	
Vel Total (ft/s)	1.73	Avg. Vel. (ft/s)		1.73	
Max Chl Dpth (ft)	7.51	Hydr. Depth (ft)		5.18	
Conv. Total (cfs)	65709.9	Conv. (cfs)		65709.9	
Length Wtd. (ft)	100.04	Wetted Per. (ft)		88.80	
Min Ch El (ft)	1338.00	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)		212.34	
C & E Loss (ft)	0.00	Cum SA (acres)		38.21	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1347.03	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1347.07	Reach Len. (ft)	100.04	100.04	100.04
Crit W.S. (ft)	1340.76	Flow Area (sq ft)		597.22	
E.G. Slope (ft/ft)	0.000110	Area (sq ft)		597.22	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	114.50	Top Width (ft)		114.50	
Vel Total (ft/s)	1.54	Avg. Vel. (ft/s)		1.54	
Max Chl Dpth (ft)	9.03	Hydr. Depth (ft)		5.22	
Conv. Total (cfs)	87825.2	Conv. (cfs)		87825.2	
Length Wtd. (ft)	100.04	Wetted Per. (ft)		116.74	
Min Ch El (ft)	1338.00	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.65	278.37	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	41.54	0.00

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 27.371

INPUT

Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4800	1347.4	4847.31	1346.93	4884.99	1346.7	4900.34	1346.54	4933.85	1346.45
4946.69	1347.8	4954.6	1344.76	4973.75	1339.58	4975.55	1339.03	5020.63	1338.02
5044.87	1345.8	5064.8	1346.9	5072.18	1348.25	5086.24	1348.41	5091.53	1348.69

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4800	.04	4946.69	.03	5072.18	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4946.69	5072.18	405	403.94	402	.1	.3

Left Levee Station= 4946.69 Elevation= 1347.8
Right Levee Station= 5072.18 Elevation= 1348.25

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1346.23	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1346.28	Reach Len. (ft)	405.00	403.94	402.00
Crit W.S. (ft)	1340.69	Flow Area (sq ft)		547.14	
E.G. Slope (ft/ft)	0.000121	Area (sq ft)		547.14	
Q Total (cfs)	900.00	Flow (cfs)		900.00	
Top Width (ft)	101.96	Top Width (ft)		101.96	
Vel Total (ft/s)	1.64	Avg. Vel. (ft/s)		1.64	
Max Chl Dpth (ft)	8.21	Hydr. Depth (ft)		5.37	
Conv. Total (cfs)	81845.3	Conv. (cfs)		81845.3	
Length Wtd. (ft)	403.94	Wetted Per. (ft)		104.25	
Min Ch El (ft)	1338.02	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.76	265.62	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	40.65	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1345.50	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.55	Reach Len. (ft)	405.00	403.94	402.00
Crit W.S. (ft)	1340.51	Flow Area (sq ft)		477.67	
E.G. Slope (ft/ft)	0.000123	Area (sq ft)		477.67	
Q Total (cfs)	780.00	Flow (cfs)		780.00	
Top Width (ft)	91.29	Top Width (ft)		91.29	
Vel Total (ft/s)	1.63	Avg. Vel. (ft/s)		1.63	
Max Chl Dpth (ft)	7.48	Hydr. Depth (ft)		5.23	
Conv. Total (cfs)	70240.2	Conv. (cfs)		70240.2	
Length Wtd. (ft)	403.94	Wetted Per. (ft)		93.38	
Min Ch El (ft)	1338.02	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		211.28	
C & E Loss (ft)	0.00	Cum SA (acres)		38.01	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1347.03	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1347.06	Reach Len. (ft)	405.00	403.94	402.00
Crit W.S. (ft)	1340.72	Flow Area (sq ft)		634.32	
E.G. Slope (ft/ft)	0.000092	Area (sq ft)		634.32	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	116.78	Top Width (ft)		116.78	
Vel Total (ft/s)	1.45	Avg. Vel. (ft/s)		1.45	
Max Chl Dpth (ft)	9.01	Hydr. Depth (ft)		5.43	
Conv. Total (cfs)	95739.9	Conv. (cfs)		95739.9	
Length Wtd. (ft)	403.94	Wetted Per. (ft)		119.25	
Min Ch El (ft)	1338.02	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.65	276.95	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	41.28	0.00

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 27.295

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4900	1347.3	4920.78	1347.12	4930.87	1345.36	4936.36	1346.67	4950.45	1347.4
4978.5	1338.6	4986.66	1338.38	5020.14	1337.8	5024.3	1339	5042.84	1341.47
5048.23	1343.5	5057.28	1345.69	5062.05	1347.27	5074.81	1346.81	5079.3	1346.36
5090.67	1348.6	5110.51	1349.17	5119.45	1349.29				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4900	.04	4950.45	.03	5062.05	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4950.45	5062.05	88.7	88.7	88.7	.1	.3

Left Levee Station= 4950.45 Elevation= 1347.4
Right Levee Station= 5062.05 Elevation= 1347.27

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1346.20	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1346.23	Reach Len. (ft)	88.70	88.70	88.70
Crit W.S. (ft)	1340.43	Flow Area (sq ft)		604.18	
E.G. Slope (ft/ft)	0.000090	Area (sq ft)		604.18	
Q Total (cfs)	900.00	Flow (cfs)		900.00	
Top Width (ft)	104.53	Top Width (ft)		104.53	
Vel Total (ft/s)	1.49	Avg. Vel. (ft/s)		1.49	
Max Chl Dpth (ft)	8.40	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	95044.0	Conv. (cfs)		95044.0	
Length Wtd. (ft)	88.70	Wetted Per. (ft)		106.75	
Min Ch El (ft)	1337.80	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.76	260.28	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	39.69	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1345.47	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.50	Reach Len. (ft)	88.70	88.70	88.70
Crit W.S. (ft)	1340.24	Flow Area (sq ft)		529.43	
E.G. Slope (ft/ft)	0.000098	Area (sq ft)		529.43	
Q Total (cfs)	780.00	Flow (cfs)		780.00	
Top Width (ft)	99.74	Top Width (ft)		99.74	
Vel Total (ft/s)	1.47	Avg. Vel. (ft/s)		1.47	
Max Chl Dpth (ft)	7.67	Hydr. Depth (ft)		5.31	
Conv. Total (cfs)	78747.6	Conv. (cfs)		78747.6	
Length Wtd. (ft)	88.70	Wetted Per. (ft)		101.74	
Min Ch El (ft)	1337.80	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)		206.61	
C & E Loss (ft)	0.01	Cum SA (acres)		37.12	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1347.00	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1347.03	Reach Len. (ft)	88.70	88.70	88.70
Crit W.S. (ft)	1340.46	Flow Area (sq ft)		689.94	
E.G. Slope (ft/ft)	0.000064	Area (sq ft)		689.94	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	109.50	Top Width (ft)		109.50	
Vel Total (ft/s)	1.33	Avg. Vel. (ft/s)		1.33	

Max Chl Dpth (ft)	9.20	Hydr. Depth (ft)		6.30	
Conv. Total (cfs)	114858.0	Conv. (cfs)		114858.0	
Length Wtd. (ft)	88.70	Wetted Per. (ft)		111.97	
Min Ch El (ft)	1337.80	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.65	270.81	0.00
C & E Loss (ft)	0.01	Cum SA (acres)	0.78	40.23	0.00

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 27.278

INPUT
Description: Just Upstream End of Brown Road Box Wingwalls
Manning's n Value =
0.013
Q(D) = 900 cfs, Q(F) = 890 cfs & Q(E) = 1,110 cfs
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4948.1	1347.75	4951.32	1347.48	4961.91	1345.92	4971.33	1342.6	4976.43	1341.19
4980.55	1340.84	4982.56	1337.85	5014.42	1337.39	5015.73	1342.4	5036.85	1346.75
5039.18	1347.39	5054.93	1348.11	5081.06	1348.44	5097.41	1348.8	5110	1348.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4948.1	.04	4951.32	.013	5039.18	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4951.32	5039.18	30	19.5	15	.3	.5

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1346.14	Element			
Vel Head (ft)	0.08	Wt. n-Val.		0.013	
E.G. Elev (ft)	1346.22	Reach Len. (ft)	30.00	19.50	15.00
Crit W.S. (ft)		Flow Area (sq ft)		387.68	
E.G. Slope (ft/ft)	0.000050	Area (sq ft)		387.68	
Q Total (cfs)	900.00	Flow (cfs)		900.00	
Top Width (ft)	73.44	Top Width (ft)		73.44	
Vel Total (ft/s)	2.32	Avg. Vel. (ft/s)		2.32	
Max Chl Dpth (ft)	8.75	Hydr. Depth (ft)		5.28	
Conv. Total (cfs)	126818.1	Conv. (cfs)		126818.1	
Length Wtd. (ft)	19.50	Wetted Per. (ft)		80.08	
Min Ch El (ft)	1337.39	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.76	259.28	0.11
C & E Loss (ft)	0.20	Cum SA (acres)	1.09	39.51	0.35

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.

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1345.37	Element			
Vel Head (ft)	0.11	Wt. n-Val.		0.013	
E.G. Elev (ft)	1345.48	Reach Len. (ft)	30.00	19.50	15.00
Crit W.S. (ft)		Flow Area (sq ft)		334.48	
E.G. Slope (ft/ft)	0.000071	Area (sq ft)		334.48	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	66.72	Top Width (ft)		66.72	
Vel Total (ft/s)	2.66	Avg. Vel. (ft/s)		2.66	
Max Chl Dpth (ft)	7.98	Hydr. Depth (ft)		5.01	
Conv. Total (cfs)	105309.7	Conv. (cfs)		105309.7	
Length Wtd. (ft)	19.50	Wetted Per. (ft)		73.16	
Min Ch El (ft)	1337.39	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		205.73	
C & E Loss (ft)	0.27	Cum SA (acres)		36.95	

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.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1346.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.013	
E.G. Elev (ft)	1347.01	Reach Len. (ft)	30.00	19.50	15.00
Crit W.S. (ft)		Flow Area (sq ft)		448.66	
E.G. Slope (ft/ft)	0.000054	Area (sq ft)		448.66	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	82.34	Top Width (ft)		82.34	
Vel Total (ft/s)	2.47	Avg. Vel. (ft/s)		2.47	
Max Chl Dpth (ft)	9.53	Hydr. Depth (ft)		5.45	
Conv. Total (cfs)	150636.4	Conv. (cfs)		150636.4	
Length Wtd. (ft)	19.50	Wetted Per. (ft)		89.12	
Min Ch El (ft)	1337.39	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.65	269.65	0.00
C & E Loss (ft)	0.27	Cum SA (acres)	0.78	40.03	0.00

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 27.274

INPUT
Description: Brown Road 2 - 8' X 8' X 128.89' RCBC Upstream Face
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4952.31	1349.13	4959.47	1347.99	4970.42	1347.22	4983.79	1347	4991.22	1346.122
4991.91	1346.04	4992.6	1337.48	4996.76	1337.44	5001.3	1337.89	5008.61	1337.3
5009.71	1345.94	5010.38	1345.95	5023.81	1346.16	5033.81	1347.41	5044.66	1347.67
5054.93	1348	5074.09	1347.91	5083.66	1348.28	5087.92	1348.04	5109.78	1348.17

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4952.31	.04	4991.22	.013	5009.71	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4991.22	5009.71	138.89	138.89	138.89	.3	.5

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1345.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.		0.013	
E.G. Elev (ft)	1346.02	Reach Len. (ft)	138.89	138.89	138.89
Crit W.S. (ft)	1342.14	Flow Area (sq ft)		129.62	
E.G. Slope (ft/ft)	0.000569	Area (sq ft)		129.62	
Q Total (cfs)	900.00	Flow (cfs)		900.00	
Top Width (ft)	17.65	Top Width (ft)		17.65	
Vel Total (ft/s)	6.94	Avg. Vel. (ft/s)		6.94	
Max Chl Dpth (ft)	7.97	Hydr. Depth (ft)		7.34	
Conv. Total (cfs)	37721.2	Conv. (cfs)		37721.2	
Length Wtd. (ft)	138.89	Wetted Per. (ft)		31.90	
Min Ch El (ft)	1337.30	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		1.00	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.76	259.16	0.11
C & E Loss (ft)		Cum SA (acres)	1.09	39.49	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1344.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.99	Wt. n-Val.		0.013	
E.G. Elev (ft)	1345.22	Reach Len. (ft)	138.89	138.89	138.89
Crit W.S. (ft)	1342.09	Flow Area (sq ft)		111.20	
E.G. Slope (ft/ft)	0.000847	Area (sq ft)		111.20	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	17.43	Top Width (ft)		17.43	
Vel Total (ft/s)	8.00	Avg. Vel. (ft/s)		8.00	
Max Chl Dpth (ft)	6.92	Hydr. Depth (ft)		6.38	
Conv. Total (cfs)	30583.0	Conv. (cfs)		30583.0	
Length Wtd. (ft)	138.89	Wetted Per. (ft)		29.80	
Min Ch El (ft)	1337.30	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		1.58	
Frctn Loss (ft)		Cum Volume (acre-ft)		205.63	
C & E Loss (ft)		Cum SA (acres)		36.94	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.		0.013	
E.G. Elev (ft)	1346.74	Reach Len. (ft)	138.89	138.89	138.89
Crit W.S. (ft)	1342.81	Flow Area (sq ft)		137.73	
E.G. Slope (ft/ft)	0.000735	Area (sq ft)		137.73	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	17.75	Top Width (ft)		17.75	
Vel Total (ft/s)	8.06	Avg. Vel. (ft/s)		8.06	
Max Chl Dpth (ft)	8.43	Hydr. Depth (ft)		7.76	
Conv. Total (cfs)	40951.6	Conv. (cfs)		40951.6	
Length Wtd. (ft)	138.89	Wetted Per. (ft)		32.83	
Min Ch El (ft)	1337.30	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		1.55	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.65	269.52	0.00
C & E Loss (ft)		Cum SA (acres)	0.78	40.01	0.00

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CULVERT                    RIVER: EMF
REACH: Reach 6               RS: 27.261

INPUT
Description: Brown Road 2 - 8' X 8' X 138.89' RCBC
Distance from Upstream XS =       0
Deck/Roadway Width        =  138.89
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=        6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 4952.31  1349.3    1349 4964.36 1349.18    1346 4991.22 1348.88 1345.94
 5009.71 1348.79 1345.94  5092.4  1348.7    1346 5109.78 1348.55    1348

Upstream Bridge Cross Section Data
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4952.31 1349.13 4959.47 1347.99 4970.42 1347.22 4983.79    1347 4991.221346.122
 4991.91 1346.04  4992.6 1337.48 4996.76 1337.44  5001.3 1337.89 5008.61  1337.3
 5009.71 1345.94 5010.38 1345.95 5023.81 1346.16 5033.81 1347.41 5044.66 1347.67
 5054.93    1348 5074.09 1347.91 5083.66 1348.28 5087.92 1348.04 5109.78 1348.17

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4952.31     .04 4991.22    .013 5009.71     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4991.22 5009.71             .3       .5

Downstream  Deck/Roadway Coordinates
    num=        7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 4896.34  1349.4    1345 4911.22 1349.36    1345 4964.36    1349    1345
 4991.41 1348.88 1345.89 5009.13 1348.79 1345.89  5092.4  1348.7    1348
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 5109.78 1348.55    1348

Downstream Bridge Cross Section Data
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4935.92 1349.01 4942.03  1348.9 4955.81 1347.83 4959.69 1347.37  4967.8  1347.5
 4977.94 1346.42 4991.41  1346.4 4991.89 1342.53  4991.9 1337.39 5002.24 1337.39
  5008.9 1337.39 5009.13  1346.4 5026.78  1348.7 5040.44 1348.68 5053.52  1348.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4935.92     .04 4991.41    .013 5009.13     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4991.41 5009.13             .3       .5

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

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1          Box       8       8
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  0  138.89       .013                   .2                1
Number of Barrels =  2
Upstream   Elevation =  1337.44
Centerline Stations
    Sta.    Sta.
 4995.84 5004.16
Downstream Elevation =  1337.39
Centerline Stations
    Sta.    Sta.
 4995.84 5004.16

CULVERT OUTPUT    Profile #Design
Culvert ID : Culvert #1

  Culv Q (cfs)            900.00   Culv Vel In (ft/s)        7.46
  # Barrels                    2   Culv Vel Out (ft/s)       7.61
  Q Barrel (cfs)          450.00   Culv Inv El Up (ft)    1337.44
  W.S. US. (ft)          1345.27   Culv Inv El Dn (ft)    1337.39
  E.G. US. (ft)          1346.02   Culv Frctn Ls (ft)        0.17
  Delta WS (ft)             0.49   Culv Ext Lss (ft)         0.12
  Delta EG (ft)             0.46   Culv Ent Lss (ft)         0.17
  E.G. IC (ft)           1344.88   Q Weir (cfs)
  E.G. OC (ft)           1346.02   Weir Sta Lft (ft)
  Culv WS In (ft)        1344.98   Weir Sta Rgt (ft)
  Culv WS Out (ft)       1344.78   Weir Submerg
  Culv Nml Depth (ft)       8.00   Weir Max Depth (ft)
  Culv Crt Depth (ft)       4.61   Weir Avg Depth (ft)
  Culv Ful Lngh (ft)               Min Top Rd (ft)        1348.74


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

CULVERT OUTPUT    Profile #Future
Culvert ID : Culvert #1

  Culv Q (cfs)            890.00   Culv Vel In (ft/s)        8.76
  # Barrels                    2   Culv Vel Out (ft/s)       9.30
  Q Barrel (cfs)          445.00   Culv Inv El Up (ft)    1337.44
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W.S. US. (ft)	1344.22	Culv Inv El Dn (ft)	1337.39
E.G. US. (ft)	1345.22	Culv Frctn Ls (ft)	0.27
Delta WS (ft)	0.85	Culv Ext Lss (ft)	0.17
Delta EG (ft)	0.67	Culv Ent Lss (ft)	0.24
E.G. IC (ft)	1344.82	Q Weir (cfs)	
E.G. OC (ft)	1345.22	Weir Sta Lft (ft)	
Culv WS In (ft)	1343.79	Weir Sta Rgt (ft)	
Culv WS Out (ft)	1343.37	Weir Submerg	
Culv Nml Depth (ft)	8.00	Weir Max Depth (ft)	
Culv Crt Depth (ft)	4.58	Weir Avg Depth (ft)	
Culv Ful Lngh (ft)		Min Top Rd (ft)	1348.74

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

CULVERT OUTPUT Profile #Existing
Culvert ID : Culvert #1

Culv Q (cfs)	1110.00	Culv Vel In (ft/s)	8.85
# Barrels	2	Culv Vel Out (ft/s)	9.18
Q Barrel (cfs)	555.00	Culv Inv El Up (ft)	1337.44
W.S. US. (ft)	1345.73	Culv Inv El Dn (ft)	1337.39
E.G. US. (ft)	1346.74	Culv Frctn Ls (ft)	0.24
Delta WS (ft)	0.78	Culv Ext Lss (ft)	0.17
Delta EG (ft)	0.65	Culv Ent Lss (ft)	0.24
E.G. IC (ft)	1346.04	Q Weir (cfs)	
E.G. OC (ft)	1346.74	Weir Sta Lft (ft)	
Culv WS In (ft)	1345.28	Weir Sta Rgt (ft)	
Culv WS Out (ft)	1344.95	Weir Submerg	
Culv Nml Depth (ft)	8.00	Weir Max Depth (ft)	
Culv Crt Depth (ft)	5.31	Weir Avg Depth (ft)	
Culv Ful Lngh (ft)		Min Top Rd (ft)	1348.74

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 27.248

INPUT
Description: Brown Road 2 - 8' X 8' X 138.89' RCBC Downstream Face
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4935.92	1349.01	4942.03	1348.9	4955.81	1347.83	4959.69	1347.37	4967.8	1347.5
4977.94	1346.42	4991.41	1346.4	4991.89	1342.53	4991.9	1337.39	5002.24	1337.39
5008.9	1337.39	5009.13	1346.4	5026.78	1348.7	5040.44	1348.68	5053.52	1348.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4935.92	.04	4991.41	.013	5009.13	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4991.41	5009.13	8	18.04	35	.3	.5

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.78	Wt. n-Val.		0.013	
E.G. Elev (ft)	1345.56	Reach Len. (ft)	8.00	18.04	35.00
Crit W.S. (ft)		Flow Area (sq ft)		126.66	
E.G. Slope (ft/ft)	0.000612	Area (sq ft)		126.66	
Q Total (cfs)	900.00	Flow (cfs)		900.00	
Top Width (ft)	17.48	Top Width (ft)		17.48	
Vel Total (ft/s)	7.11	Avg. Vel. (ft/s)		7.11	
Max Chl Dpth (ft)	7.39	Hydr. Depth (ft)		7.25	
Conv. Total (cfs)	36384.1	Conv. (cfs)		36384.1	
Length Wtd. (ft)	18.04	Wetted Per. (ft)		31.79	
Min Ch El (ft)	1337.39	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		1.08	

Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.76	258.75	0.11
C & E Loss (ft)	0.31	Cum SA (acres)	1.09	39.43	0.35

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.		0.013	
E.G. Elev (ft)	1344.55	Reach Len. (ft)	8.00	18.04	35.00
Crit W.S. (ft)		Flow Area (sq ft)		102.22	
E.G. Slope (ft/ft)	0.001081	Area (sq ft)		102.22	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	17.27	Top Width (ft)		17.27	
Vel Total (ft/s)	8.71	Avg. Vel. (ft/s)		8.71	
Max Chl Dpth (ft)	5.98	Hydr. Depth (ft)		5.92	
Conv. Total (cfs)	27074.5	Conv. (cfs)		27074.5	
Length Wtd. (ft)	18.04	Wetted Per. (ft)		28.98	
Min Ch El (ft)	1337.39	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		2.07	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)		205.29	
C & E Loss (ft)	0.45	Cum SA (acres)		36.88	

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1344.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.14	Wt. n-Val.		0.013	
E.G. Elev (ft)	1346.09	Reach Len. (ft)	8.00	18.04	35.00
Crit W.S. (ft)		Flow Area (sq ft)		129.68	
E.G. Slope (ft/ft)	0.000873	Area (sq ft)		129.68	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	17.50	Top Width (ft)		17.50	
Vel Total (ft/s)	8.56	Avg. Vel. (ft/s)		8.56	
Max Chl Dpth (ft)	7.56	Hydr. Depth (ft)		7.41	
Conv. Total (cfs)	37569.3	Conv. (cfs)		37569.3	
Length Wtd. (ft)	18.04	Wetted Per. (ft)		32.14	
Min Ch El (ft)	1337.39	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.88	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.65	269.10	0.00
C & E Loss (ft)	0.46	Cum SA (acres)	0.78	39.95	0.00

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 27.244

INPUT
Description: Just Downstream End of Brown Road Box Wingwalls
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4943.28	1349.13	4956.78	1347.84	4961.41	1347.2	4966.07	1347.1	4980.07	1344.48
4986.24	1343.95	4986.62	1340.23	4987.22	1337.8	5018.18	1337.81	5018.53	1340.2
5021.54	1340.03	5024.65	1342.2	5029.36	1344.1	5034.19	1344.76	5041.63	1346.33
5046.48	1347.67	5051.36	1348.5	5069.58	1348.8	5086.47	1349		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4943.28	.04	4966.07	.03	5041.63	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4966.07	5041.63	290.11	290.11	290.11	.1	.3

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1345.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.24	Reach Len. (ft)	290.11	290.11	290.11
Crit W.S. (ft)		Flow Area (sq ft)		278.04	
E.G. Slope (ft/ft)	0.000645	Area (sq ft)		278.04	
Q Total (cfs)	900.00	Flow (cfs)		900.00	
Top Width (ft)	58.82	Top Width (ft)		58.82	
Vel Total (ft/s)	3.24	Avg. Vel. (ft/s)		3.24	
Max Chl Dpth (ft)	7.28	Hydr. Depth (ft)		4.73	
Conv. Total (cfs)	35437.2	Conv. (cfs)		35437.2	
Length Wtd. (ft)	290.11	Wetted Per. (ft)		67.36	
Min Ch El (ft)	1337.80	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.76	258.67	0.11
C & E Loss (ft)	0.04	Cum SA (acres)	1.09	39.42	0.35

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.07	Reach Len. (ft)	290.11	290.11	290.11
Crit W.S. (ft)		Flow Area (sq ft)		213.61	
E.G. Slope (ft/ft)	0.001036	Area (sq ft)		213.61	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	42.37	Top Width (ft)		42.37	
Vel Total (ft/s)	4.17	Avg. Vel. (ft/s)		4.17	
Max Chl Dpth (ft)	6.00	Hydr. Depth (ft)		5.04	
Conv. Total (cfs)	27647.2	Conv. (cfs)		27647.2	
Length Wtd. (ft)	290.11	Wetted Per. (ft)		50.57	
Min Ch El (ft)	1337.80	Shear (lb/sq ft)		0.27	
Alpha	1.00	Stream Power (lb/ft s)		1.14	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		205.23	
C & E Loss (ft)	0.07	Cum SA (acres)		36.87	

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.61	Reach Len. (ft)	290.11	290.11	290.11
Crit W.S. (ft)		Flow Area (sq ft)		297.30	
E.G. Slope (ft/ft)	0.000836	Area (sq ft)		297.30	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	62.03	Top Width (ft)		62.03	
Vel Total (ft/s)	3.73	Avg. Vel. (ft/s)		3.73	
Max Chl Dpth (ft)	7.60	Hydr. Depth (ft)		4.79	
Conv. Total (cfs)	38387.1	Conv. (cfs)		38387.1	
Length Wtd. (ft)	290.11	Wetted Per. (ft)		70.64	
Min Ch El (ft)	1337.80	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.82	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.65	269.01	0.00
C & E Loss (ft)	0.06	Cum SA (acres)	0.78	39.94	0.00

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 27.189

INPUT
Description: Downstream of Side Inlet (80' Wide) & 54" Storm Drain From East,
Q(D) = 1,200 cfs, Q(F) = 1,110 cfs & Q(E) = 890 cfs

Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4842.46	1352	4863.16	1350.58	4868.04	1350.17	4888.03	1347.93	4911.41	1346.86
4931.47	1346.8	4932.96	1346.78	4944.88	1343.53	4959.3	1338.95	4973.04	1337.78
4999.85	1337.8	5041.88	1338.17	5065.92	1346.51	5085.08	1346.42	5092.89	1347.46
5098.86	1348.8	5119.75	1348.83						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4842.46	.04	4932.96	.03	5065.92	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4932.96	5065.92	500	500	500	.1	.3

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1345.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.15	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)		Flow Area (sq ft)		717.42	
E.G. Slope (ft/ft)	0.000111	Area (sq ft)		717.42	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	122.76	Top Width (ft)		122.76	
Vel Total (ft/s)	1.67	Avg. Vel. (ft/s)		1.67	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.84	
Conv. Total (cfs)	113970.0	Conv. (cfs)		113970.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		124.90	
Min Ch El (ft)	1337.78	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.76	255.35	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	38.81	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.93	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)		Flow Area (sq ft)		573.33	
E.G. Slope (ft/ft)	0.000117	Area (sq ft)		573.33	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	114.81	Top Width (ft)		114.81	
Vel Total (ft/s)	1.55	Avg. Vel. (ft/s)		1.55	
Max Chl Dpth (ft)	6.11	Hydr. Depth (ft)		4.99	
Conv. Total (cfs)	82120.5	Conv. (cfs)		82120.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		116.59	
Min Ch El (ft)	1337.78	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)		202.60	
C & E Loss (ft)	0.00	Cum SA (acres)		36.34	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.50	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)		Flow Area (sq ft)		762.95	
E.G. Slope (ft/ft)	0.000079	Area (sq ft)		762.95	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	125.16	Top Width (ft)		125.16	
Vel Total (ft/s)	1.45	Avg. Vel. (ft/s)		1.45	
Max Chl Dpth (ft)	7.69	Hydr. Depth (ft)		6.10	
Conv. Total (cfs)	124609.9	Conv. (cfs)		124609.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		127.42	
Min Ch El (ft)	1337.78	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.65	265.48	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	39.31	0.00

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 27.095

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4837.35	1350	4848.89	1349.25	4863.25	1348.07	4886.88	1345.9	4898.21	1344.92
4904.66	1346.4	4928.91	1346.39	4932.12	1346.3	4938	1344.98	4946.75	1342.16
4956.96	1338.2	4973.95	1338.28	4993.71	1338.27	5015.03	1338.01	5042.35	1337.86
5050.27	1340.8	5057.61	1343.36	5067.49	1346.95	5079.29	1346.56	5100.59	1348.51
5105.83	1348.4	5119.79	1348.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4837.35	.04	4932.12	.03	5067.49	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4932.12	5067.49	500	500	500	.1	.3

Left Levee Station= 4932.12 Elevation= 1346.3
Right Levee Station= 5067.49 Elevation= 1346.95

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1345.05	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.09	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1339.91	Flow Area (sq ft)		724.89	
E.G. Slope (ft/ft)	0.000110	Area (sq ft)		724.89	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	124.57	Top Width (ft)		124.57	
Vel Total (ft/s)	1.66	Avg. Vel. (ft/s)		1.66	
Max Chl Dpth (ft)	7.19	Hydr. Depth (ft)		5.82	
Conv. Total (cfs)	114661.1	Conv. (cfs)		114661.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		127.02	
Min Ch El (ft)	1337.86	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.76	247.07	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	37.39	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1343.83	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.87	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1339.59	Flow Area (sq ft)		577.75	
E.G. Slope (ft/ft)	0.000118	Area (sq ft)		577.75	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	117.35	Top Width (ft)		117.35	
Vel Total (ft/s)	1.54	Avg. Vel. (ft/s)		1.54	
Max Chl Dpth (ft)	5.97	Hydr. Depth (ft)		4.92	
Conv. Total (cfs)	81866.7	Conv. (cfs)		81866.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		119.40	
Min Ch El (ft)	1337.86	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		196.00	
C & E Loss (ft)	0.00	Cum SA (acres)		35.01	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1345.43	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.46	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1339.82	Flow Area (sq ft)		773.15	
E.G. Slope (ft/ft)	0.000078	Area (sq ft)		773.15	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	127.33	Top Width (ft)		127.33	
Vel Total (ft/s)	1.44	Avg. Vel. (ft/s)		1.44	
Max Chl Dpth (ft)	7.57	Hydr. Depth (ft)		6.07	

Conv. Total (cfs)	125775.6	Conv. (cfs)			125775.6	
Length Wtd. (ft)	500.00	Wetted Per. (ft)			129.89	
Min Ch El (ft)	1337.86	Shear (lb/sq ft)			0.03	
Alpha	1.00	Stream Power (lb/ft s)			0.04	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		0.65	256.66	0.00
C & E Loss (ft)	0.00	Cum SA (acres)		0.78	37.87	0.00

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 27

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4853.18	1348	4878	1345.51	4881.05	1345.79	4894.22	1345.48	4904.93	1345.04
4913.37	1346.2	4923.29	1346.59	4932.23	1346.72	4947.12	1341.33	4949.72	1340.52
4959.3	1338	4969.16	1337.96	5004.13	1337.78	5041.83	1337.52	5055.04	1342.6
5061.76	1345	5066.51	1347.04	5079.34	1346.4	5083.66	1346.66	5098.86	1348.87
5112.03	1348.7	5118.43	1348.71						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4853.18	.04	4932.23	.03	5066.51	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4932.23	5066.51	500	500	500	.1	.3

Left Levee Station= 4932.23 Elevation= 1346.72
Right Levee Station= 5066.51 Elevation= 1347.04

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1345.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.04	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1339.61	Flow Area (sq ft)		753.16	
E.G. Slope (ft/ft)	0.000097	Area (sq ft)		753.16	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	124.78	Top Width (ft)		124.78	
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)		1.59	
Max Chl Dpth (ft)	7.48	Hydr. Depth (ft)		6.04	
Conv. Total (cfs)	122073.2	Conv. (cfs)		122073.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		127.23	
Min Ch El (ft)	1337.52	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.76	238.59	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	35.96	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.81	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1339.28	Flow Area (sq ft)		605.04	
E.G. Slope (ft/ft)	0.000102	Area (sq ft)		605.04	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	117.99	Top Width (ft)		117.99	
Vel Total (ft/s)	1.47	Avg. Vel. (ft/s)		1.47	
Max Chl Dpth (ft)	6.26	Hydr. Depth (ft)		5.13	
Conv. Total (cfs)	88108.6	Conv. (cfs)		88108.6	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		120.02	
Min Ch El (ft)	1337.52	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		189.21	
C & E Loss (ft)	0.00	Cum SA (acres)		33.66	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.40	Element	Left OB	Channel	Right OB

Vel Head (ft)	0.03	Wt. n-Val.			0.030	
E.G. Elev (ft)	1345.43	Reach Len. (ft)		500.00	500.00	500.00
Crit W.S. (ft)	1339.51	Flow Area (sq ft)			803.17	
E.G. Slope (ft/ft)	0.000068	Area (sq ft)			803.17	
Q Total (cfs)	1110.00	Flow (cfs)			1110.00	
Top Width (ft)	126.80	Top Width (ft)			126.80	
Vel Total (ft/s)	1.38	Avg. Vel. (ft/s)			1.38	
Max Chl Dpth (ft)	7.88	Hydr. Depth (ft)			6.33	
Conv. Total (cfs)	134353.2	Conv. (cfs)			134353.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)			129.41	
Min Ch El (ft)	1337.52	Shear (lb/sq ft)			0.03	
Alpha	1.00	Stream Power (lb/ft s)			0.04	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		0.65	247.62	0.00
C & E Loss (ft)	0.00	Cum SA (acres)		0.78	36.41	0.00

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.905

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4848.21	1348	4849.37	1347.85	4868.19	1346.99	4895.5	1345.54	4902.7	1345.49
4910.04	1345.6	4923.79	1346.35	4931.73	1346.56	4940.9	1344.01	4958.67	1337.87
5001.89	1337.7	5027.41	1337.56	5040.11	1337.63	5060.31	1344	5068.64	1346.81
5080.44	1346.7	5087.24	1347.09	5094.08	1347.79	5099.56	1348.71	5118.26	1348.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4848.21	.04	4931.73	.03	5068.64	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4931.73	5068.64	500	500	500	.1	.3

Left Levee Station= 4931.73 Elevation= 1346.56
Right Levee Station= 5068.64 Elevation= 1346.81

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.95	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.99	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1339.55	Flow Area (sq ft)		747.62	
E.G. Slope (ft/ft)	0.000100	Area (sq ft)		747.62	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	125.61	Top Width (ft)		125.61	
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)		1.61	
Max Chl Dpth (ft)	7.39	Hydr. Depth (ft)		5.95	
Conv. Total (cfs)	120158.4	Conv. (cfs)		120158.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		127.90	
Min Ch El (ft)	1337.56	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.76	229.98	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	34.52	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1343.73	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.76	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1339.22	Flow Area (sq ft)		598.89	
E.G. Slope (ft/ft)	0.000105	Area (sq ft)		598.89	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	117.73	Top Width (ft)		117.73	
Vel Total (ft/s)	1.49	Avg. Vel. (ft/s)		1.49	
Max Chl Dpth (ft)	6.17	Hydr. Depth (ft)		5.09	
Conv. Total (cfs)	86798.0	Conv. (cfs)		86798.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		119.65	
Min Ch El (ft)	1337.56	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	

Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	182.30
C & E Loss (ft)	0.00	Cum SA (acres)	32.31

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.39	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1339.45	Flow Area (sq ft)		799.99	
E.G. Slope (ft/ft)	0.000070	Area (sq ft)		799.99	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	128.31	Top Width (ft)		128.31	
Vel Total (ft/s)	1.39	Avg. Vel. (ft/s)		1.39	
Max Chl Dpth (ft)	7.80	Hydr. Depth (ft)		6.23	
Conv. Total (cfs)	132563.0	Conv. (cfs)		132563.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		130.73	
Min Ch El (ft)	1337.56	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.65	238.41	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	34.94	0.00

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.811

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4854.53	1348	4866.19	1347.14	4880.23	1346.25	4897.84	1345.46	4904.29	1345.08
4912.94	1346	4932.4	1346.05	4939.59	1344.25	4948.68	1340.82	4957.72	1337.74
4969.93	1337.6	5024.99	1337.4	5039.35	1337.41	5048.84	1340.16	5068.36	1346.62
5082.13	1346.2	5088.52	1346.59	5099.04	1348.21	5117.16	1348.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4854.53	.04	4932.4	.03	5068.36	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4932.4	5068.36	256.96	256.96	256.96	.1	.3

Left Levee Station= 4932.4 Elevation= 1346.05
Right Levee Station= 5068.36 Elevation= 1346.62

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.94	Reach Len. (ft)	256.96	256.96	256.96
Crit W.S. (ft)	1339.35	Flow Area (sq ft)		768.98	
E.G. Slope (ft/ft)	0.000091	Area (sq ft)		768.98	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	126.20	Top Width (ft)		126.20	
Vel Total (ft/s)	1.56	Avg. Vel. (ft/s)		1.56	
Max Chl Dpth (ft)	7.50	Hydr. Depth (ft)		6.09	
Conv. Total (cfs)	125499.5	Conv. (cfs)		125499.5	
Length Wtd. (ft)	256.96	Wetted Per. (ft)		128.57	
Min Ch El (ft)	1337.40	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.76	221.27	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	33.08	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.71	Reach Len. (ft)	256.96	256.96	256.96
Crit W.S. (ft)	1339.02	Flow Area (sq ft)		619.41	
E.G. Slope (ft/ft)	0.000095	Area (sq ft)		619.41	
Q Total (cfs)	890.00	Flow (cfs)		890.00	

Top Width (ft)	118.37	Top Width (ft)	118.37
Vel Total (ft/s)	1.44	Avg. Vel. (ft/s)	1.44
Max Chl Dpth (ft)	6.28	Hydr. Depth (ft)	5.23
Conv. Total (cfs)	91450.1	Conv. (cfs)	91450.1
Length Wtd. (ft)	256.96	Wetted Per. (ft)	120.36
Min Ch El (ft)	1337.40	Shear (lb/sq ft)	0.03
Alpha	1.00	Stream Power (lb/ft s)	0.04
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	175.31
C & E Loss (ft)	0.00	Cum SA (acres)	30.95

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.36	Reach Len. (ft)	256.96	256.96	256.96
Crit W.S. (ft)	1339.25	Flow Area (sq ft)		823.41	
E.G. Slope (ft/ft)	0.000064	Area (sq ft)		823.41	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	129.19	Top Width (ft)		129.19	
Vel Total (ft/s)	1.35	Avg. Vel. (ft/s)		1.35	
Max Chl Dpth (ft)	7.93	Hydr. Depth (ft)		6.37	
Conv. Total (cfs)	138426.9	Conv. (cfs)		138426.9	
Length Wtd. (ft)	256.96	Wetted Per. (ft)		131.68	
Min Ch El (ft)	1337.40	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.65	229.10	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	33.47	0.00

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.762

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4838.65	1348.4	4845	1348.13	4861.67	1347.16	4869.01	1346.86	4879.12	1346.13
4890.14	1345.6	4903.19	1345.7	4913.9	1345.95	4915.96	1346.21	4931.68	1346.19
4933.4	1345.8	4960.7	1337.89	4961.54	1337.53	4976.81	1337.65	5019.8	1337.15
5040.31	1337.5	5041.3	1337.62	5046.58	1339.45	5061.22	1344.14	5069.87	1346.32
5076.18	1346.7	5083.13	1346.94	5090.69	1346.78	5102.13	1348.27	5104.68	1348.4
5117.91	1348.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4838.65	.04	4931.68	.03	5069.87	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4931.68	5069.87	271.3	271.3	271.3	.1	.3

Left Levee Station= 4931.68 Elevation= 1346.19
Right Levee Station= 5069.87 Elevation= 1346.32

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.92	Reach Len. (ft)	271.30	271.30	271.30
Crit W.S. (ft)	1339.30	Flow Area (sq ft)		765.14	
E.G. Slope (ft/ft)	0.000094	Area (sq ft)		765.14	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	127.58	Top Width (ft)		127.58	
Vel Total (ft/s)	1.57	Avg. Vel. (ft/s)		1.57	
Max Chl Dpth (ft)	7.73	Hydr. Depth (ft)		6.00	
Conv. Total (cfs)	123674.3	Conv. (cfs)		123674.3	
Length Wtd. (ft)	271.30	Wetted Per. (ft)		129.79	
Min Ch El (ft)	1337.15	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.76	216.75	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	32.33	0.35

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.69	Reach Len. (ft)	271.30	271.30	271.30
Crit W.S. (ft)	1338.96	Flow Area (sq ft)		614.18	
E.G. Slope (ft/ft)	0.000098	Area (sq ft)		614.18	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	118.89	Top Width (ft)		118.89	
Vel Total (ft/s)	1.45	Avg. Vel. (ft/s)		1.45	
Max Chl Dpth (ft)	6.50	Hydr. Depth (ft)		5.17	
Conv. Total (cfs)	89965.8	Conv. (cfs)		89965.8	
Length Wtd. (ft)	271.30	Wetted Per. (ft)		120.76	
Min Ch El (ft)	1337.15	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)		171.67	
C & E Loss (ft)	0.00	Cum SA (acres)		30.25	

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.34	Reach Len. (ft)	271.30	271.30	271.30
Crit W.S. (ft)	1339.20	Flow Area (sq ft)		821.17	
E.G. Slope (ft/ft)	0.000066	Area (sq ft)		821.17	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	130.80	Top Width (ft)		130.80	
Vel Total (ft/s)	1.35	Avg. Vel. (ft/s)		1.35	
Max Chl Dpth (ft)	8.16	Hydr. Depth (ft)		6.28	
Conv. Total (cfs)	136801.9	Conv. (cfs)		136801.9	
Length Wtd. (ft)	271.30	Wetted Per. (ft)		133.13	
Min Ch El (ft)	1337.15	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.65	224.25	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	32.70	0.00

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.727

INPUT
Description: Downstream of Side Inlet (70' Wide) From East Side
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4837.03	1346.4	4847.53	1343.87	4866.82	1343.78	4876.32	1343.98	4893.13	1343.95
4903.46	1344.3	4917.42	1345.75	4927.01	1346.15	4929.07	1346.38	4935.34	1346
4939.58	1346	4949.19	1343.95	4963.42	1339.36	4966.74	1338.02	4984.96	1337.64
5008.93	1337.3	5028.26	1337.81	5030.06	1344.58	5044.19	1345.7	5053.37	1346.54

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4837.03	.035	4939.58	.013	5044.19	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4939.58	5044.19	40	23.4	5	.3	.5

Left Levee Station= 4939.58 Elevation= 1346
Right Levee Station= 5044.19 Elevation= 1345.7

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.013	
E.G. Elev (ft)	1344.90	Reach Len. (ft)	40.00	23.40	5.00
Crit W.S. (ft)	1339.86	Flow Area (sq ft)		517.45	
E.G. Slope (ft/ft)	0.000042	Area (sq ft)		517.45	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	87.86	Top Width (ft)		87.86	
Vel Total (ft/s)	2.32	Avg. Vel. (ft/s)		2.32	
Max Chl Dpth (ft)	7.51	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	184176.9	Conv. (cfs)		184176.9	
Length Wtd. (ft)	23.40	Wetted Per. (ft)		94.16	
Min Ch El (ft)	1337.30	Shear (lb/sq ft)		0.01	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.76	212.76	0.11
C & E Loss (ft)	0.04	Cum SA (acres)	1.09	31.66	0.35

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.013	
E.G. Elev (ft)	1343.67	Reach Len. (ft)	40.00	23.40	5.00
Crit W.S. (ft)	1339.45	Flow Area (sq ft)		417.15	
E.G. Slope (ft/ft)	0.000042	Area (sq ft)		417.15	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	79.51	Top Width (ft)		79.51	
Vel Total (ft/s)	2.13	Avg. Vel. (ft/s)		2.13	
Max Chl Dpth (ft)	6.30	Hydr. Depth (ft)		5.25	
Conv. Total (cfs)	137808.9	Conv. (cfs)		137808.9	
Length Wtd. (ft)	23.40	Wetted Per. (ft)		84.90	
Min Ch El (ft)	1337.30	Shear (lb/sq ft)		0.01	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		168.46	
C & E Loss (ft)	0.03	Cum SA (acres)		29.64	

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.013	
E.G. Elev (ft)	1345.33	Reach Len. (ft)	40.00	23.40	5.00
Crit W.S. (ft)	1339.74	Flow Area (sq ft)		558.93	
E.G. Slope (ft/ft)	0.000031	Area (sq ft)		558.93	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	95.69	Top Width (ft)		95.69	
Vel Total (ft/s)	1.99	Avg. Vel. (ft/s)		1.99	
Max Chl Dpth (ft)	7.97	Hydr. Depth (ft)		5.84	
Conv. Total (cfs)	198503.3	Conv. (cfs)		198503.3	
Length Wtd. (ft)	23.40	Wetted Per. (ft)		102.05	
Min Ch El (ft)	1337.30	Shear (lb/sq ft)		0.01	
Alpha	1.00	Stream Power (lb/ft s)		0.02	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.65	219.95	0.00
C & E Loss (ft)	0.03	Cum SA (acres)	0.78	31.99	0.00

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.722

INPUT
Description: Adobe Street 5 - 8' X 8' X 108.83' RCBC Upstream Face
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

4892.39	1345.4	4912.13	1346.18	4916.6	1346.78	4931.01	1347.62	4939.64	1347.48
4943.86	1347.2	4951.04	1347.16	4957.06	1346.8	4960.29	1346.81	4967.06	1346.46
4977.74	1346.04	4977.75	1337.21	4993.28	1337.21	5004.15	1337.21	5020.01	1337.21
5022.25	1337.21	5022.26	1345.82	5041.79	1346.41	5048.27	1346.77	5054.79	1346.82

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4892.39	.04	4977.74	.013	5022.26	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4977.74	5022.26	108.83	108.83	108.83	.3	.5

Left Levee Station= 4931.01 Elevation= 1347.62

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.66	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.013	
E.G. Elev (ft)	1344.86	Reach Len. (ft)	108.83	108.83	108.83
Crit W.S. (ft)	1340.03	Flow Area (sq ft)		331.41	
E.G. Slope (ft/ft)	0.000101	Area (sq ft)		331.41	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	44.52	Top Width (ft)		44.52	
Vel Total (ft/s)	3.62	Avg. Vel. (ft/s)		3.62	
Max Chl Dpth (ft)	7.45	Hydr. Depth (ft)		7.44	
Conv. Total (cfs)	119341.0	Conv. (cfs)		119341.0	
Length Wtd. (ft)	108.83	Wetted Per. (ft)		59.26	
Min Ch El (ft)	1337.21	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.76	212.53	0.11
C & E Loss (ft)		Cum SA (acres)	1.09	31.62	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1343.48	Element			
Vel Head (ft)	0.16	Wt. n-Val.		0.013	
E.G. Elev (ft)	1343.64	Reach Len. (ft)	108.83	108.83	108.83
Crit W.S. (ft)	1339.52	Flow Area (sq ft)		279.09	
E.G. Slope (ft/ft)	0.000094	Area (sq ft)		279.09	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	44.51	Top Width (ft)		44.51	
Vel Total (ft/s)	3.19	Avg. Vel. (ft/s)		3.19	
Max Chl Dpth (ft)	6.27	Hydr. Depth (ft)		6.27	
Conv. Total (cfs)	91832.9	Conv. (cfs)		91832.9	
Length Wtd. (ft)	108.83	Wetted Per. (ft)		57.14	
Min Ch El (ft)	1337.21	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)		Cum Volume (acre-ft)		168.27	
C & E Loss (ft)		Cum SA (acres)		29.60	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1345.14	Element			
Vel Head (ft)	0.15	Wt. n-Val.		0.013	
E.G. Elev (ft)	1345.30	Reach Len. (ft)	108.83	108.83	108.83
Crit W.S. (ft)	1339.89	Flow Area (sq ft)		353.18	
E.G. Slope (ft/ft)	0.000071	Area (sq ft)		353.18	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	44.52	Top Width (ft)		44.52	
Vel Total (ft/s)	3.14	Avg. Vel. (ft/s)		3.14	
Max Chl Dpth (ft)	7.93	Hydr. Depth (ft)		7.93	
Conv. Total (cfs)	131335.4	Conv. (cfs)		131335.4	
Length Wtd. (ft)	108.83	Wetted Per. (ft)		60.18	
Min Ch El (ft)	1337.21	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.65	219.70	0.00
C & E Loss (ft)		Cum SA (acres)	0.78	31.96	0.00

CULVERT RIVER: EMF

```
REACH: Reach 6            RS: 26.712

INPUT
Description: Adobe Street 5 - 8' X 8' X 108.83' RCBC
Distance from Upstream XS =       0
Deck/Roadway Width        =  108.83
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord    . Sta Hi Cord Lo Cord
 4863.09 1347.72    1346 4896.55 1347.99  1345.5 4925.04 1348.31  1345.5
 4977.74 1348.64 1345.21 5003.73  1348.8 1345.21 5022.26 1348.89 1345.21
 5093.49 1349.24    1346

Upstream Bridge Cross Section Data
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4892.39  1345.4 4912.13 1346.18  4916.6 1346.78 4931.01 1347.62 4939.64 1347.48
 4943.86  1347.2 4951.04 1347.16 4957.06  1346.8 4960.29 1346.81 4967.06 1346.46
 4977.74 1346.04 4977.75 1337.21 4993.28 1337.21 5004.15 1337.21 5020.01 1337.21
 5022.25 1337.21 5022.26 1345.82 5041.79 1346.41 5048.27 1346.77 5054.79 1346.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4892.39     .04 4977.74    .013 5022.26     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4977.74 5022.26             .3       .5
Left Levee      Station= 4931.01      Elevation= 1347.62

Downstream  Deck/Roadway Coordinates
    num=       8
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 4863.09 1347.72    1346 4896.55 1347.99  1345.5 4925.04 1348.31  1345.5
 4977.74 1348.64  1345.2 5003.73  1348.8  1345.2 5022.26 1348.89  1345.2
 5093.49 1349.24    1346 5120.92 1349.48    1348

Downstream Bridge Cross Section Data
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4954.36  1346.5 4958.03 1346.24 4976.21 1345.47 4977.74 1345.61 4977.75  1337.2
 4998.23  1337.2 5013.59 1337.17  5020.9 1337.25 5022.25 1337.25 5022.26 1344.86
 5038.03  1346.6 5044.11 1346.73  5053.2 1347.25 5060.63 1347.92 5070.41 1347.88
 5083.36  1348.2 5102.38 1349.03 5106.83 1349.16  5115.3 1348.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4954.36     .04 4977.74    .013 5022.26     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4977.74 5022.26             .3       .5

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

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1          Box        8       8
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  0  108.83       .013                   .2                1
Number of Barrels =  5
```

Upstream Elevation = 1337.21
Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.
4982.5	4991.25	5000	5008.75	5017.5

Downstream Elevation = 1337.2
Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.
4982.5	4991.25	5000	5008.75	5017.5

CULVERT OUTPUT Profile #Design
Culvert ID : Culvert #1

Culv Q (cfs)	1200.00	Culv Vel In (ft/s)	4.09
# Barrels	5	Culv Vel Out (ft/s)	4.10
Q Barrel (cfs)	240.00	Culv Inv El Up (ft)	1337.21
W.S. US. (ft)	1344.66	Culv Inv El Dn (ft)	1337.20
E.G. US. (ft)	1344.86	Culv Frctn Ls (ft)	0.04
Delta WS (ft)	0.15	Culv Ext Lss (ft)	0.05
Delta EG (ft)	0.14	Culv Ent Lss (ft)	0.05
E.G. IC (ft)	1342.04	Q Weir (cfs)	
E.G. OC (ft)	1344.86	Weir Sta Lft (ft)	
Culv WS In (ft)	1344.55	Weir Sta Rgt (ft)	
Culv WS Out (ft)	1344.51	Weir Submerg	
Culv Nml Depth (ft)	8.00	Weir Max Depth (ft)	
Culv Crt Depth (ft)	3.03	Weir Avg Depth (ft)	
Culv Ful Lngh (ft)		Min Top Rd (ft)	1348.49

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

CULVERT OUTPUT Profile #Future
Culvert ID : Culvert #1

Culv Q (cfs)	890.00	Culv Vel In (ft/s)	3.59
# Barrels	5	Culv Vel Out (ft/s)	3.61
Q Barrel (cfs)	178.00	Culv Inv El Up (ft)	1337.21
W.S. US. (ft)	1343.48	Culv Inv El Dn (ft)	1337.20
E.G. US. (ft)	1343.64	Culv Frctn Ls (ft)	0.03
Delta WS (ft)	0.12	Culv Ext Lss (ft)	0.04
Delta EG (ft)	0.11	Culv Ent Lss (ft)	0.04
E.G. IC (ft)	1341.14	Q Weir (cfs)	
E.G. OC (ft)	1343.64	Weir Sta Lft (ft)	
Culv WS In (ft)	1343.40	Weir Sta Rgt (ft)	
Culv WS Out (ft)	1343.36	Weir Submerg	
Culv Nml Depth (ft)	8.00	Weir Max Depth (ft)	
Culv Crt Depth (ft)	2.49	Weir Avg Depth (ft)	
Culv Ful Lngh (ft)		Min Top Rd (ft)	1348.49

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

CULVERT OUTPUT Profile #Existing
Culvert ID : Culvert #1

Culv Q (cfs)	1110.00	Culv Vel In (ft/s)	3.53
# Barrels	5	Culv Vel Out (ft/s)	3.54
Q Barrel (cfs)	222.00	Culv Inv El Up (ft)	1337.21
W.S. US. (ft)	1345.14	Culv Inv El Dn (ft)	1337.20
E.G. US. (ft)	1345.30	Culv Frctn Ls (ft)	0.03
Delta WS (ft)	0.11	Culv Ext Lss (ft)	0.04
Delta EG (ft)	0.10	Culv Ent Lss (ft)	0.04
E.G. IC (ft)	1341.79	Q Weir (cfs)	
E.G. OC (ft)	1345.30	Weir Sta Lft (ft)	
Culv WS In (ft)	1345.07	Weir Sta Rgt (ft)	
Culv WS Out (ft)	1345.04	Weir Submerg	
Culv Nml Depth (ft)	8.00	Weir Max Depth (ft)	
Culv Crt Depth (ft)	2.88	Weir Avg Depth (ft)	
Culv Ful Lngh (ft)		Min Top Rd (ft)	1348.49

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.702

INPUT
Description: Adobe Street 5 - 8' X 8' X 108.83' RCBC Downstream Face
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4954.36	1346.5	4958.03	1346.24	4976.21	1345.47	4977.74	1345.61	4977.75	1337.2
4998.23	1337.2	5013.59	1337.17	5020.9	1337.25	5022.25	1337.25	5022.26	1344.86
5038.03	1346.6	5044.11	1346.73	5053.2	1347.25	5060.63	1347.92	5070.41	1347.88
5083.36	1348.2	5102.38	1349.03	5106.83	1349.16	5115.3	1348.96		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4954.36	.04	4977.74	.013	5022.26	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4977.74	5022.26	5	26.06	45	.3	.5

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.51	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.013	
E.G. Elev (ft)	1344.72	Reach Len. (ft)	5.00	26.06	45.00
Crit W.S. (ft)		Flow Area (sq ft)		325.43	
E.G. Slope (ft/ft)	0.000106	Area (sq ft)		325.43	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	44.52	Top Width (ft)		44.52	
Vel Total (ft/s)	3.69	Avg. Vel. (ft/s)		3.69	
Max Chl Dpth (ft)	7.34	Hydr. Depth (ft)		7.31	
Conv. Total (cfs)	116284.0	Conv. (cfs)		116284.0	
Length Wtd. (ft)	26.06	Wetted Per. (ft)		58.88	
Min Ch El (ft)	1337.17	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.76	211.71	0.11
C & E Loss (ft)	0.07	Cum SA (acres)	1.09	31.51	0.35

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1343.36	Element			
Vel Head (ft)	0.16	Wt. n-Val.		0.013	
E.G. Elev (ft)	1343.53	Reach Len. (ft)	5.00	26.06	45.00
Crit W.S. (ft)		Flow Area (sq ft)		274.48	
E.G. Slope (ft/ft)	0.000098	Area (sq ft)		274.48	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	44.52	Top Width (ft)		44.52	
Vel Total (ft/s)	3.24	Avg. Vel. (ft/s)		3.24	
Max Chl Dpth (ft)	6.19	Hydr. Depth (ft)		6.17	
Conv. Total (cfs)	89723.4	Conv. (cfs)		89723.4	
Length Wtd. (ft)	26.06	Wetted Per. (ft)		56.75	
Min Ch El (ft)	1337.17	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		167.58	
C & E Loss (ft)	0.05	Cum SA (acres)		29.49	

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1345.04	Element			
Vel Head (ft)	0.16	Wt. n-Val.		0.013	0.040

E.G. Elev (ft)	1345.19	Reach Len. (ft)	5.00	26.06	45.00
Crit W.S. (ft)		Flow Area (sq ft)		348.94	0.14
E.G. Slope (ft/ft)	0.000074	Area (sq ft)		348.94	0.14
Q Total (cfs)	1110.00	Flow (cfs)		1109.99	0.01
Top Width (ft)	46.13	Top Width (ft)		44.52	1.61
Vel Total (ft/s)	3.18	Avg. Vel. (ft/s)		3.18	0.06
Max Chl Dpth (ft)	7.87	Hydr. Depth (ft)		7.84	0.09
Conv. Total (cfs)	129061.9	Conv. (cfs)		129060.9	1.1
Length Wtd. (ft)	26.06	Wetted Per. (ft)		59.95	1.62
Min Ch El (ft)	1337.17	Shear (lb/sq ft)		0.03	0.00
Alpha	1.00	Stream Power (lb/ft s)		0.09	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.65	218.83	0.00
C & E Loss (ft)	0.05	Cum SA (acres)	0.78	31.84	0.00

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.697

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4939.23	1347.32	4945.58	1345.89	4949.88	1345.52	4962.09	1343.72	4964.25	1342.5
4965.13	1340.24	4970.44	1337.77	4975.08	1337.74	5006.95	1337.18	5029.52	1337.5
5031.49	1338.33	5041.1	1341.17	5049.09	1343.77	5052.25	1344.58	5060.03	1346.2
5072.08	1346.08	5089.37	1346.28	5100.94	1347.27	5110.93	1347.87	5117.53	1347.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4939.23	.04	4945.58	.03	5060.03	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4945.58	5060.03	100	100	100	.1	.3

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.65	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		537.08	
E.G. Slope (ft/ft)	0.000215	Area (sq ft)		537.08	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	95.92	Top Width (ft)		95.92	
Vel Total (ft/s)	2.23	Avg. Vel. (ft/s)		2.23	
Max Chl Dpth (ft)	7.39	Hydr. Depth (ft)		5.60	
Conv. Total (cfs)	81862.6	Conv. (cfs)		81862.6	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		99.49	
Min Ch El (ft)	1337.18	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.76	211.45	0.11
C & E Loss (ft)	0.01	Cum SA (acres)	1.09	31.47	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.48	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		432.50	
E.G. Slope (ft/ft)	0.000208	Area (sq ft)		432.50	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	85.35	Top Width (ft)		85.35	
Vel Total (ft/s)	2.06	Avg. Vel. (ft/s)		2.06	
Max Chl Dpth (ft)	6.23	Hydr. Depth (ft)		5.07	
Conv. Total (cfs)	61637.4	Conv. (cfs)		61637.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		88.62	
Min Ch El (ft)	1337.18	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.13	

Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	167.37
C & E Loss (ft)	0.01	Cum SA (acres)	29.45

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.14	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		587.85	
E.G. Slope (ft/ft)	0.000147	Area (sq ft)		587.85	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	101.86	Top Width (ft)		101.86	
Vel Total (ft/s)	1.89	Avg. Vel. (ft/s)		1.89	
Max Chl Dpth (ft)	7.91	Hydr. Depth (ft)		5.77	
Conv. Total (cfs)	91499.8	Conv. (cfs)		91499.8	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		105.52	
Min Ch El (ft)	1337.18	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.65	218.55	
C & E Loss (ft)	0.01	Cum SA (acres)	0.78	31.80	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.678

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4839.23	1347.6	4852.32	1347.67	4855.75	1347.56	4903.87	1346.68	4912.9	1346.28
4920.37	1346.7	4939.8	1346.53	4959.59	1339.32	4963.6	1337.72	4978.6	1337.3
4996.78	1337.2	5018	1337.34	5034.78	1337.17	5050.54	1343.09	5054.49	1344.14
5063.17	1346.1	5079.65	1345.71	5089.15	1345.19	5101.78	1347.2	5117.73	1347.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4839.23	.04	4939.8	.03	5063.17	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4939.8	5063.17	439.1	439.1	439.1	.1	.3

Left Levee Station= 4939.8 Elevation= 1346.53
Right Levee Station= 5063.17 Elevation= 1346.1

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.63	Reach Len. (ft)	439.10	439.10	439.10
Crit W.S. (ft)	1339.33	Flow Area (sq ft)		653.26	
E.G. Slope (ft/ft)	0.000134	Area (sq ft)		653.26	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	111.24	Top Width (ft)		111.24	
Vel Total (ft/s)	1.84	Avg. Vel. (ft/s)		1.84	
Max Chl Dpth (ft)	7.40	Hydr. Depth (ft)		5.87	
Conv. Total (cfs)	103769.9	Conv. (cfs)		103769.9	
Length Wtd. (ft)	439.10	Wetted Per. (ft)		113.74	
Min Ch El (ft)	1337.17	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.76	210.08	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	31.23	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.45	Reach Len. (ft)	439.10	439.10	439.10
Crit W.S. (ft)	1338.97	Flow Area (sq ft)		528.38	
E.G. Slope (ft/ft)	0.000135	Area (sq ft)		528.38	
Q Total (cfs)	890.00	Flow (cfs)		890.00	

Top Width (ft)	103.37	Top Width (ft)	103.37
Vel Total (ft/s)	1.68	Avg. Vel. (ft/s)	1.68
Max Chl Dpth (ft)	6.24	Hydr. Depth (ft)	5.11
Conv. Total (cfs)	76596.9	Conv. (cfs)	76596.9
Length Wtd. (ft)	439.10	Wetted Per. (ft)	105.53
Min Ch El (ft)	1337.17	Shear (lb/sq ft)	0.04
Alpha	1.00	Stream Power (lb/ft s)	0.07
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	166.27
C & E Loss (ft)	0.00	Cum SA (acres)	29.24

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.12	Reach Len. (ft)	439.10	439.10	439.10
Crit W.S. (ft)	1339.23	Flow Area (sq ft)		711.32	
E.G. Slope (ft/ft)	0.000090	Area (sq ft)		711.32	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	114.92	Top Width (ft)		114.92	
Vel Total (ft/s)	1.56	Avg. Vel. (ft/s)		1.56	
Max Chl Dpth (ft)	7.92	Hydr. Depth (ft)		6.19	
Conv. Total (cfs)	116979.8	Conv. (cfs)		116979.8	
Length Wtd. (ft)	439.10	Wetted Per. (ft)		117.57	
Min Ch El (ft)	1337.17	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.65	217.06	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	31.55	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.595

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4837.6	1347.8	4848.53	1347.5	4879.73	1346.43	4893.42	1346.07	4903.61	1345.57
4907.55	1346.5	4917.37	1346.54	4931.68	1346.37	4942.72	1343.02	4959.3	1337.35
4974.56	1337.4	4982.78	1337.38	5015.82	1337.1	5042.03	1337.24	5063.33	1344.63
5068.62	1346.5	5083.48	1345.9	5091.87	1345.16	5104.91	1347.47	5109.43	1347.58
5118.02	1348								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4837.6	.04	4931.68	.03	5068.62	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4931.68	5068.62	500	500	500	.1	.3

Left Levee Station= 4931.68 Elevation= 1346.37
Right Levee Station= 5068.62 Elevation= 1346.5

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.57	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1339.08	Flow Area (sq ft)		754.41	
E.G. Slope (ft/ft)	0.000097	Area (sq ft)		754.41	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	125.32	Top Width (ft)		125.32	
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)		1.59	
Max Chl Dpth (ft)	7.43	Hydr. Depth (ft)		6.02	
Conv. Total (cfs)	122103.8	Conv. (cfs)		122103.8	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		127.72	
Min Ch El (ft)	1337.10	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.76	202.99	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	30.04	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.40	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1338.76	Flow Area (sq ft)		612.41	
E.G. Slope (ft/ft)	0.000098	Area (sq ft)		612.41	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	118.11	Top Width (ft)		118.11	
Vel Total (ft/s)	1.45	Avg. Vel. (ft/s)		1.45	
Max Chl Dpth (ft)	6.27	Hydr. Depth (ft)		5.19	
Conv. Total (cfs)	89843.6	Conv. (cfs)		89843.6	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		120.14	
Min Ch El (ft)	1337.10	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		160.52	
C & E Loss (ft)	0.00	Cum SA (acres)		28.12	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.09	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1338.99	Flow Area (sq ft)		821.34	
E.G. Slope (ft/ft)	0.000064	Area (sq ft)		821.34	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	128.55	Top Width (ft)		128.55	
Vel Total (ft/s)	1.35	Avg. Vel. (ft/s)		1.35	
Max Chl Dpth (ft)	7.96	Hydr. Depth (ft)		6.39	
Conv. Total (cfs)	138241.1	Conv. (cfs)		138241.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		131.12	
Min Ch El (ft)	1337.10	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.65	209.33	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	30.32	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.5

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4839.25	1349.1	4856.85	1347.99	4868.79	1346.92	4879.66	1346.35	4898.35	1345.72
4910	1345.3	4915.9	1345.75	4933.03	1345.76	4948.21	1340.65	4959.29	1337.35
4986.32	1337.2	5018.33	1336.94	5041.36	1336.96	5051.55	1340.65	5067	1345.99
5073.51	1345.8	5081.05	1345.31	5093.56	1344.05	5097.28	1344.66	5106.73	1346.49
5118.11	1347								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4839.25	.04	4933.03	.03	5067	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4933.03	5067	608.1	608.1	608.1	.1	.3

Left Levee Station= 4933.03 Elevation= 1345.76
Right Levee Station= 5067 Elevation= 1345.99

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.52	Reach Len. (ft)	608.10	608.10	608.10
Crit W.S. (ft)	1338.94	Flow Area (sq ft)		767.79	
E.G. Slope (ft/ft)	0.000092	Area (sq ft)		767.79	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	125.84	Top Width (ft)		125.84	
Vel Total (ft/s)	1.56	Avg. Vel. (ft/s)		1.56	
Max Chl Dpth (ft)	7.55	Hydr. Depth (ft)		6.10	

Conv. Total (cfs)	125388.8	Conv. (cfs)		125388.8	
Length Wtd. (ft)	608.10	Wetted Per. (ft)		128.24	
Min Ch El (ft)	1336.94	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.76	194.25	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	28.60	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1343.32	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.35	Reach Len. (ft)	608.10	608.10	608.10
Crit W.S. (ft)	1338.61	Flow Area (sq ft)		624.89	
E.G. Slope (ft/ft)	0.000093	Area (sq ft)		624.89	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	118.99	Top Width (ft)		118.99	
Vel Total (ft/s)	1.42	Avg. Vel. (ft/s)		1.42	
Max Chl Dpth (ft)	6.38	Hydr. Depth (ft)		5.25	
Conv. Total (cfs)	92469.6	Conv. (cfs)		92469.6	
Length Wtd. (ft)	608.10	Wetted Per. (ft)		121.01	
Min Ch El (ft)	1336.94	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		153.41	
C & E Loss (ft)	0.00	Cum SA (acres)		26.76	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1345.03	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.06	Reach Len. (ft)	608.10	608.10	608.10
Crit W.S. (ft)	1338.85	Flow Area (sq ft)		836.97	
E.G. Slope (ft/ft)	0.000061	Area (sq ft)		836.97	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	129.02	Top Width (ft)		129.02	
Vel Total (ft/s)	1.33	Avg. Vel. (ft/s)		1.33	
Max Chl Dpth (ft)	8.09	Hydr. Depth (ft)		6.49	
Conv. Total (cfs)	142300.2	Conv. (cfs)		142300.2	
Length Wtd. (ft)	608.10	Wetted Per. (ft)		131.61	
Min Ch El (ft)	1336.94	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.65	199.81	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	28.85	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.385

INPUT
Description: Downstream of Major Side Inlet (140' Wide) at
Transmission
Easement From East Side.
Q(D) = 1,200 cfs, Q(F) =
1,080 cfs & Q(E) = 830 cfs
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4840.79	1348	4841.89	1346.01	4884.6	1346.22	4889.88	1346.14	4902.97	1345.57
4922.54	1346	4927.83	1345.95	4933.88	1346.09	4947.32	1341.79	4959.11	1336.82
4977.87	1337	4997.89	1336.73	5028.88	1336.58	5037.45	1336.64	5057.93	1343.1
5066.96	1346	5086.04	1345.36	5094.1	1345.9	5103.17	1346.73	5106.69	1347.26
5111.86	1347.5	5117.09	1347.51						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4840.79	.04	4933.88	.03	5066.96	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4933.88	5066.96	391.9	391.9	391.9	.1	.3

Left Levee Station= 4933.88 Elevation= 1346.09
Right Levee Station= 5066.96 Elevation= 1346

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.47	Reach Len. (ft)	391.90	391.90	391.90
Crit W.S. (ft)	1338.65	Flow Area (sq ft)		768.20	
E.G. Slope (ft/ft)	0.000089	Area (sq ft)		768.20	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	123.02	Top Width (ft)		123.02	
Vel Total (ft/s)	1.56	Avg. Vel. (ft/s)		1.56	
Max Chl Dpth (ft)	7.85	Hydr. Depth (ft)		6.24	
Conv. Total (cfs)	127227.7	Conv. (cfs)		127227.7	
Length Wtd. (ft)	391.90	Wetted Per. (ft)		125.64	
Min Ch El (ft)	1336.58	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.76	183.53	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	26.86	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.30	Reach Len. (ft)	391.90	391.90	391.90
Crit W.S. (ft)	1338.24	Flow Area (sq ft)		629.67	
E.G. Slope (ft/ft)	0.000076	Area (sq ft)		629.67	
Q Total (cfs)	830.00	Flow (cfs)		830.00	
Top Width (ft)	115.78	Top Width (ft)		115.78	
Vel Total (ft/s)	1.32	Avg. Vel. (ft/s)		1.32	
Max Chl Dpth (ft)	6.69	Hydr. Depth (ft)		5.44	
Conv. Total (cfs)	95217.0	Conv. (cfs)		95217.0	
Length Wtd. (ft)	391.90	Wetted Per. (ft)		118.04	
Min Ch El (ft)	1336.58	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		144.66	
C & E Loss (ft)	0.00	Cum SA (acres)		25.12	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1345.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.02	Reach Len. (ft)	391.90	391.90	391.90
Crit W.S. (ft)	1338.52	Flow Area (sq ft)		838.51	
E.G. Slope (ft/ft)	0.000056	Area (sq ft)		838.51	
Q Total (cfs)	1080.00	Flow (cfs)		1080.00	
Top Width (ft)	126.53	Top Width (ft)		126.53	
Vel Total (ft/s)	1.29	Avg. Vel. (ft/s)		1.29	
Max Chl Dpth (ft)	8.42	Hydr. Depth (ft)		6.63	
Conv. Total (cfs)	144405.5	Conv. (cfs)		144405.5	
Length Wtd. (ft)	391.90	Wetted Per. (ft)		129.33	
Min Ch El (ft)	1336.58	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.65	188.12	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	27.06	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.311

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4838.99	1348.2	4841.29	1346.51	4858.27	1345.88	4865.86	1345.21	4887.3	1344.71
4897.66	1344.4	4903.8	1343.82	4912.83	1345.02	4923.7	1345.95	4930.08	1346.07
4931.82	1345.9	4960.66	1337.08	4966.13	1336.89	4975.98	1336.81	5031.04	1336.19
5036.17	1336.4	5038.89	1336.99	5067.19	1345.53	5073.01	1345.84	5082.77	1346
5088.04	1345.5	5102.65	1347.16	5106.26	1347.43	5117.05	1347.78		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4838.99	.04	4930.08	.03	5067.19	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4930.08	5067.19	430	438.08	445	.1	.3

Left Levee Station= 4930.08 Elevation= 1346.07
Right Levee Station= 5067.19 Elevation= 1345.53

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.40	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.44	Reach Len. (ft)	430.00	438.08	445.00
Crit W.S. (ft)	1338.49	Flow Area (sq ft)		790.99	
E.G. Slope (ft/ft)	0.000084	Area (sq ft)		790.99	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	126.72	Top Width (ft)		126.72	
Vel Total (ft/s)	1.52	Avg. Vel. (ft/s)		1.52	
Max Chl Dpth (ft)	8.21	Hydr. Depth (ft)		6.24	
Conv. Total (cfs)	131262.8	Conv. (cfs)		131262.8	
Length Wtd. (ft)	438.08	Wetted Per. (ft)		128.98	
Min Ch El (ft)	1336.19	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.76	176.52	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	25.74	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1343.24	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.27	Reach Len. (ft)	430.00	438.08	445.00
Crit W.S. (ft)	1338.08	Flow Area (sq ft)		648.93	
E.G. Slope (ft/ft)	0.000071	Area (sq ft)		648.93	
Q Total (cfs)	830.00	Flow (cfs)		830.00	
Top Width (ft)	119.11	Top Width (ft)		119.11	
Vel Total (ft/s)	1.28	Avg. Vel. (ft/s)		1.28	
Max Chl Dpth (ft)	7.05	Hydr. Depth (ft)		5.45	
Conv. Total (cfs)	98464.1	Conv. (cfs)		98464.1	
Length Wtd. (ft)	438.08	Wetted Per. (ft)		121.03	
Min Ch El (ft)	1336.19	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		138.91	
C & E Loss (ft)	0.00	Cum SA (acres)		24.06	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.98	Element			
Vel Head (ft)	0.02	Wt. n-Val.		0.030	
E.G. Elev (ft)	1345.00	Reach Len. (ft)	430.00	438.08	445.00
Crit W.S. (ft)	1338.36	Flow Area (sq ft)		865.03	
E.G. Slope (ft/ft)	0.000052	Area (sq ft)		865.03	
Q Total (cfs)	1080.00	Flow (cfs)		1080.00	
Top Width (ft)	130.51	Top Width (ft)		130.51	
Vel Total (ft/s)	1.25	Avg. Vel. (ft/s)		1.25	
Max Chl Dpth (ft)	8.79	Hydr. Depth (ft)		6.63	
Conv. Total (cfs)	149331.3	Conv. (cfs)		149331.3	
Length Wtd. (ft)	438.08	Wetted Per. (ft)		132.94	
Min Ch El (ft)	1336.19	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.65	180.46	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	25.91	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.228

INPUT
Description:

Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4846.85	1345.8	4848.22	1344.84	4856.14	1344.33	4861.37	1344.44	4869.45	1345.04
4883.51	1345.7	4900.66	1343.32	4913.07	1345.78	4932.41	1346.24	4941.48	1343.47
4954.31	1339.3	4960.13	1337.19	5007.3	1336.79	5033.99	1336.68	5038.11	1336.93
5042.15	1338.1	5066.77	1346.12	5070.29	1345.81	5080.94	1345.83	5091.58	1344.82
5109.09	1346.5	5125.03	1347.51						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4846.85	.04	4932.41	.03	5066.77	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4932.41	5066.77	221	216.32	212	.1	.3

Left Levee Station= 4932.41 Elevation= 1346.24
Right Levee Station= 5066.77 Elevation= 1346.12

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.40	Reach Len. (ft)	221.00	216.32	212.00
Crit W.S. (ft)	1338.79	Flow Area (sq ft)		744.54	
E.G. Slope (ft/ft)	0.000098	Area (sq ft)		744.54	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	122.77	Top Width (ft)		122.77	
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)		1.61	
Max Chl Dpth (ft)	7.68	Hydr. Depth (ft)		6.06	
Conv. Total (cfs)	121108.5	Conv. (cfs)		121108.5	
Length Wtd. (ft)	216.32	Wetted Per. (ft)		125.10	
Min Ch El (ft)	1336.68	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.76	168.79	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	24.48	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1343.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.24	Reach Len. (ft)	221.00	216.32	212.00
Crit W.S. (ft)	1338.39	Flow Area (sq ft)		607.66	
E.G. Slope (ft/ft)	0.000085	Area (sq ft)		607.66	
Q Total (cfs)	830.00	Flow (cfs)		830.00	
Top Width (ft)	115.53	Top Width (ft)		115.53	
Vel Total (ft/s)	1.37	Avg. Vel. (ft/s)		1.37	
Max Chl Dpth (ft)	6.53	Hydr. Depth (ft)		5.26	
Conv. Total (cfs)	90004.5	Conv. (cfs)		90004.5	
Length Wtd. (ft)	216.32	Wetted Per. (ft)		117.51	
Min Ch El (ft)	1336.68	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		132.59	
C & E Loss (ft)	0.01	Cum SA (acres)		22.88	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1344.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.97	Reach Len. (ft)	221.00	216.32	212.00
Crit W.S. (ft)	1338.66	Flow Area (sq ft)		818.41	
E.G. Slope (ft/ft)	0.000060	Area (sq ft)		818.41	
Q Total (cfs)	1080.00	Flow (cfs)		1080.00	
Top Width (ft)	126.53	Top Width (ft)		126.53	
Vel Total (ft/s)	1.32	Avg. Vel. (ft/s)		1.32	
Max Chl Dpth (ft)	8.27	Hydr. Depth (ft)		6.47	
Conv. Total (cfs)	138888.3	Conv. (cfs)		138888.3	
Length Wtd. (ft)	216.32	Wetted Per. (ft)		129.04	
Min Ch El (ft)	1336.68	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.65	171.99	

C & E Loss (ft)	0.00	Cum SA (acres)	0.78	24.61

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.187

INPUT
Description: Downstream of Side Inlet (120' Wide) From East Side
Q(D) = 1,200
cfs, Q(F) = 1,620 cfs & Q(E) = 1,600 cfs
No Ineffective Flow Area
From University Drive Bridge
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4871.15	1344.7	4882.13	1342.28	4895.52	1342.82	4896.93	1342.97	4907.15	1343.3
4916.29	1344.7	4921.84	1345.24	4937.88	1340.72	4945.35	1338.72	4952.96	1337.2
4980.26	1336.8	4985.52	1336.77	5028.47	1337.09	5042.79	1337.16	5049.04	1337.07
5065.9	1343.9	5071.11	1345.88	5089.63	1345.92	5091.51	1346.13	5107.57	1346.8
5119.27	1347	5143.08	1346.65	5151.5	1346.49	5160.65	1346.17		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4871.15	.04	4921.84	.03	5071.11	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4921.84	5071.11	120	81.22	45	.3	.5

Left Levee Station= 4921.84 Elevation= 1345.24
Right Levee Station= 5071.11 Elevation= 1345.88

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.35	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.37	Reach Len. (ft)	120.00	81.22	45.00
Crit W.S. (ft)	1338.65	Flow Area (sq ft)		879.20	
E.G. Slope (ft/ft)	0.000068	Area (sq ft)		879.20	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	142.06	Top Width (ft)		142.06	
Vel Total (ft/s)	1.36	Avg. Vel. (ft/s)		1.36	
Max Chl Dpth (ft)	7.58	Hydr. Depth (ft)		6.19	
Conv. Total (cfs)	145209.1	Conv. (cfs)		145209.1	
Length Wtd. (ft)	81.22	Wetted Per. (ft)		144.39	
Min Ch El (ft)	1336.77	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.76	164.76	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	23.83	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1343.11	Element			
Vel Head (ft)	0.08	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.20	Reach Len. (ft)	120.00	81.22	45.00
Crit W.S. (ft)	1339.00	Flow Area (sq ft)		709.01	
E.G. Slope (ft/ft)	0.000237	Area (sq ft)		709.01	
Q Total (cfs)	1620.00	Flow (cfs)		1620.00	
Top Width (ft)	134.58	Top Width (ft)		134.58	
Vel Total (ft/s)	2.28	Avg. Vel. (ft/s)		2.28	
Max Chl Dpth (ft)	6.34	Hydr. Depth (ft)		5.27	
Conv. Total (cfs)	105323.4	Conv. (cfs)		105323.4	
Length Wtd. (ft)	81.22	Wetted Per. (ft)		136.51	
Min Ch El (ft)	1336.77	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.18	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)		129.32	
C & E Loss (ft)	0.00	Cum SA (acres)		22.26	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.91	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	

E.G. Elev (ft)	1344.96	Reach Len. (ft)	120.00	81.22	45.00
Crit W.S. (ft)	1338.98	Flow Area (sq ft)		960.88	
E.G. Slope (ft/ft)	0.000093	Area (sq ft)		960.88	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	145.57	Top Width (ft)		145.57	
Vel Total (ft/s)	1.67	Avg. Vel. (ft/s)		1.67	
Max Chl Dpth (ft)	8.14	Hydr. Depth (ft)		6.60	
Conv. Total (cfs)	165572.3	Conv. (cfs)		165572.3	
Length Wtd. (ft)	81.22	Wetted Per. (ft)		148.08	
Min Ch El (ft)	1336.77	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.65	167.57	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	23.94	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.171

INPUT
Description: University Drive Bridge Upstream Face
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4897.53	1347.24	4919.77	1347.07	4924.72	1345.42	4946.26	1337.52	4948.86	1337.27
4982.22	1336.67	5014.46	1336.84	5047.22	1336.75	5052.36	1337.25	5071.97	1345.1
5077.53	1346.82	5116.38	1346.86						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4897.53	.04	4919.77	.035	5077.53	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4919.77	5077.53	88.95	88.95	88.95	.3	.5

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.34	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.035	
E.G. Elev (ft)	1344.37	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1338.44	Flow Area (sq ft)		919.66	
E.G. Slope (ft/ft)	0.000080	Area (sq ft)		919.66	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	142.41	Top Width (ft)		142.41	
Vel Total (ft/s)	1.30	Avg. Vel. (ft/s)		1.30	
Max Chl Dpth (ft)	7.67	Hydr. Depth (ft)		6.46	
Conv. Total (cfs)	133762.0	Conv. (cfs)		133762.0	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		145.03	
Min Ch El (ft)	1336.67	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.76	163.09	0.11
C & E Loss (ft)		Cum SA (acres)	1.09	23.56	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1343.10	Element			
Vel Head (ft)	0.07	Wt. n-Val.		0.035	
E.G. Elev (ft)	1343.17	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1338.78	Flow Area (sq ft)		746.74	
E.G. Slope (ft/ft)	0.000275	Area (sq ft)		746.74	
Q Total (cfs)	1620.00	Flow (cfs)		1620.00	
Top Width (ft)	135.92	Top Width (ft)		135.92	
Vel Total (ft/s)	2.17	Avg. Vel. (ft/s)		2.17	
Max Chl Dpth (ft)	6.43	Hydr. Depth (ft)		5.49	
Conv. Total (cfs)	97676.8	Conv. (cfs)		97676.8	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		138.08	
Min Ch El (ft)	1336.67	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.20	
Frctn Loss (ft)		Cum Volume (acre-ft)		127.96	
C & E Loss (ft)		Cum SA (acres)		22.01	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1344.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.035	
E.G. Elev (ft)	1344.95	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1338.77	Flow Area (sq ft)		1001.14	
E.G. Slope (ft/ft)	0.000111	Area (sq ft)		1001.14	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	145.37	Top Width (ft)		145.37	
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)		1.60	
Max Chl Dpth (ft)	8.24	Hydr. Depth (ft)		6.89	
Conv. Total (cfs)	151887.4	Conv. (cfs)		151887.4	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		148.20	
Min Ch El (ft)	1336.67	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.65	165.74	
C & E Loss (ft)		Cum SA (acres)	0.78	23.67	

BRIDGE RIVER: EMF
REACH: Reach 6 RS: 26.163

INPUT
Description: University Drive 5 Span Bridge
Distance from Upstream XS = 0
Deck/Roadway Width = 88.95
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4841.18	1347.3	1346.2	4877.18	1347.35	1346.55	4910.37	1347.22	1346.93
4919.77	1347.21	1345.49	4923.62	1347.2	1345.49	5000	1347.4	1345.51
5072.61	1347.15	1345	5077.53	1347.12	1345	5087.65	1347.05	1346
5119.93	1346.9	1346.4						

Upstream Bridge Cross Section Data
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4897.53	1347.24	4919.77	1347.07	4924.72	1345.42	4946.26	1337.52	4948.86	1337.27
4982.22	1336.67	5014.46	1336.84	5047.22	1336.75	5052.36	1337.25	5071.97	1345.1
5077.53	1346.82	5116.38	1346.86						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4897.53	.04	4919.77	.035	5077.53	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
4919.77	5077.53	.3	.5

Downstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4841.18	1347.3	1346.2	4877.18	1347.25	1346.55	4910.37	1347.22	1346.93
4916.72	1347.21	1345.21	4923.62	1347.2	1345.21	5000	1347.4	1345.62
5072.61	1347.07	1345.56	5077.57	1347.08	1345.56	5087.65	1347.05	1347.05
5119.93	1346.9	1346.4						

Downstream Bridge Cross Section Data
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4886.25	1347.02	4916.72	1347.15	4924.58	1345.03	4944.15	1336.98	4947.55	1336.93
4980.71	1336.58	5013.95	1336.84	5046.85	1336.68	5050.91	1336.63	5071.71	1345.63
5077.57	1347.08	5125.71	1346.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4886.25	.04	4916.72	.035	5077.57	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
4916.72	5077.57	.3	.5

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

Number of Piers =  4

Pier Data
Pier Station     Upstream= 4949.03    Downstream= 4947.42
Upstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.37 1336.27    2.37  1344.7    2.49 1344.71    2.49 1345.19   10.36 1345.55
Downstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.49 1335.93    2.49 1344.46    2.57 1344.47    2.57 1344.97   10.54 1345.36

Pier Data
Pier Station     Upstream= 4981.81    Downstream= 4980.36
Upstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.44 1335.67    2.44 1343.98    2.53 1343.99    2.53 1345.14   10.46 1345.59
Downstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.47 1335.58    2.47 1344.75    2.58 1344.76    2.58 1345.26   10.57 1345.57

Pier Data
Pier Station     Upstream= 5014.17    Downstream=  5013.6
Upstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.39 1335.84    2.39 1343.86    2.46 1343.87    2.46 1344.98   10.39  1345.5
Downstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.45 1335.84    2.45 1344.77    2.54 1344.78    2.54 1345.29   10.55 1345.64

Pier Data
Pier Station     Upstream= 5046.99    Downstream= 5046.66
Upstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.39 1335.75    2.39 1344.42    2.53 1344.43    2.53 1344.94   10.39 1345.32
Downstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.44 1335.68    2.44 1344.67    2.55 1344.68    2.55 1345.17   10.57 1345.56

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =     1.2
       Yarnell                 KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

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

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

BRIDGE OUTPUT    Profile #Design
Opening : Bridge #1
```

E.G. US. (ft)	1344.37	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1344.34	E.G. Elev (ft)	1344.37	1344.19
Q Total (cfs)	1200.00	W.S. Elev (ft)	1344.33	1344.16
Q Bridge (cfs)	1200.00	Crit W.S. (ft)	1338.54	1338.40
Q Weir (cfs)		Max Chl Dpth (ft)	7.66	7.57
Weir Sta Lft (ft)		Vel Total (ft/s)	1.42	1.42
Weir Sta Rgt (ft)		Flow Area (sq ft)	847.34	846.56
Weir Submerg		Froude # Chl	0.10	0.10
Weir Max Depth (ft)		Specif Force (cu ft)	3042.05	3030.53
Min Top Rd (ft)	1346.99	Hydr Depth (ft)	6.39	6.43
Min El Prs (ft)	1345.51	W.P. Total (ft)	194.94	193.93
Delta EG (ft)	0.19	Conv. Total (cfs)	95811.5	95999.1
Delta WS (ft)	0.19	Top Width (ft)	132.63	131.75
BR Open Area (sq ft)	984.33	Frctn Loss (ft)		
BR Open Vel (ft/s)	1.42	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.04	0.04
Br Sel Mthd	Momentum	Power Total (lb/ft s)	0.06	0.06

BRIDGE OUTPUT Profile #Future
Opening : Bridge #1

E.G. US. (ft)	1343.17	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1343.10	E.G. Elev (ft)	1343.16	1342.96
Q Total (cfs)	1620.00	W.S. Elev (ft)	1343.08	1342.87
Q Bridge (cfs)	1620.00	Crit W.S. (ft)	1338.90	1338.76
Q Weir (cfs)		Max Chl Dpth (ft)	6.40	6.28
Weir Sta Lft (ft)		Vel Total (ft/s)	2.37	2.38
Weir Sta Rgt (ft)		Flow Area (sq ft)	684.47	680.85
Weir Submerg		Froude # Chl	0.18	0.18
Weir Max Depth (ft)		Specif Force (cu ft)	2145.54	2114.92
Min Top Rd (ft)	1346.99	Hydr Depth (ft)	5.42	5.42
Min El Prs (ft)	1345.51	W.P. Total (ft)	177.71	177.00
Delta EG (ft)	0.23	Conv. Total (cfs)	71400.7	70962.5
Delta WS (ft)	0.23	Top Width (ft)	126.22	125.65
BR Open Area (sq ft)	984.33	Frctn Loss (ft)		
BR Open Vel (ft/s)	2.38	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.12	0.13
Br Sel Mthd	Momentum	Power Total (lb/ft s)	0.29	0.30

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

E.G. US. (ft)	1344.95	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1344.91	E.G. Elev (ft)	1344.94	1344.76
Q Total (cfs)	1600.00	W.S. Elev (ft)	1344.90	1344.71
Q Bridge (cfs)	1600.00	Crit W.S. (ft)	1338.89	1338.74
Q Weir (cfs)		Max Chl Dpth (ft)	8.22	8.13
Weir Sta Lft (ft)		Vel Total (ft/s)	1.73	1.74
Weir Sta Rgt (ft)		Flow Area (sq ft)	922.55	920.55
Weir Submerg		Froude # Chl	0.12	0.12
Weir Max Depth (ft)		Specif Force (cu ft)	3572.29	3555.40
Min Top Rd (ft)	1346.99	Hydr Depth (ft)	6.82	6.86
Min El Prs (ft)	1345.51	W.P. Total (ft)	202.80	201.39
Delta EG (ft)	0.20	Conv. Total (cfs)	107530.5	107640.5
Delta WS (ft)	0.20	Top Width (ft)	135.30	134.20
BR Open Area (sq ft)	984.33	Frctn Loss (ft)		
BR Open Vel (ft/s)	1.74	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.06	0.06
Br Sel Mthd	Momentum	Power Total (lb/ft s)	0.11	0.11

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.154

INPUT
Description: University Drive Bridge Downstream Face
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4886.25	1347.02	4916.72	1347.15	4924.58	1345.03	4944.15	1336.98	4947.55	1336.93

4980.71 1336.58 5013.95 1336.84 5046.85 1336.68 5050.91 1336.63 5071.71 1345.63
5077.57 1347.08 5125.71 1346.99

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4886.25	.04	4916.72	.035	5077.57	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4916.72	5077.57	82	115.08	145	.3	.5

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.15	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.035	
E.G. Elev (ft)	1344.17	Reach Len. (ft)	82.00	115.08	145.00
Crit W.S. (ft)		Flow Area (sq ft)		917.82	
E.G. Slope (ft/ft)	0.000081	Area (sq ft)		917.82	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	141.55	Top Width (ft)		141.55	
Vel Total (ft/s)	1.31	Avg. Vel. (ft/s)		1.31	
Max Chl Dpth (ft)	7.57	Hydr. Depth (ft)		6.48	
Conv. Total (cfs)	133624.9	Conv. (cfs)		133624.9	
Length Wtd. (ft)	115.08	Wetted Per. (ft)		144.53	
Min Ch El (ft)	1336.58	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.76	161.36	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	23.29	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.87	Element			
Vel Head (ft)	0.07	Wt. n-Val.		0.035	
E.G. Elev (ft)	1342.94	Reach Len. (ft)	82.00	115.08	145.00
Crit W.S. (ft)		Flow Area (sq ft)		740.73	
E.G. Slope (ft/ft)	0.000282	Area (sq ft)		740.73	
Q Total (cfs)	1620.00	Flow (cfs)		1620.00	
Top Width (ft)	135.49	Top Width (ft)		135.49	
Vel Total (ft/s)	2.19	Avg. Vel. (ft/s)		2.19	
Max Chl Dpth (ft)	6.29	Hydr. Depth (ft)		5.47	
Conv. Total (cfs)	96430.8	Conv. (cfs)		96430.8	
Length Wtd. (ft)	115.08	Wetted Per. (ft)		137.95	
Min Ch El (ft)	1336.58	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.21	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		126.57	
C & E Loss (ft)	0.00	Cum SA (acres)		21.75	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.70	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.035	
E.G. Elev (ft)	1344.74	Reach Len. (ft)	82.00	115.08	145.00
Crit W.S. (ft)		Flow Area (sq ft)		997.28	
E.G. Slope (ft/ft)	0.000112	Area (sq ft)		997.28	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	144.19	Top Width (ft)		144.19	
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)		1.60	
Max Chl Dpth (ft)	8.12	Hydr. Depth (ft)		6.92	
Conv. Total (cfs)	151463.4	Conv. (cfs)		151463.4	
Length Wtd. (ft)	115.08	Wetted Per. (ft)		147.39	
Min Ch El (ft)	1336.58	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.65	163.86	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	23.39	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.133

INPUT

Description: No Ineffective Flow Area From University Drive Bridge

Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4865.95	1345.6	4890.37	1346.24	4913.57	1345.96	4935.57	1337.25	4943.13	1337.01
4950.57	1337	4996.32	1336.96	5036.85	1336.51	5048.5	1336.52	5056.45	1339.95
5067.15	1343.9	5075.4	1346.58	5096.93	1346.76	5101.89	1346.72	5105.95	1346.48
5118.05	1346.7	5132.54	1347.14	5146.67	1347.07				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4865.95	.04	4913.57	.03	5075.4	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4913.57	5075.4	448	454.54	461	.1	.3

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.14	Element			
Vel Head (ft)	0.02	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.16	Reach Len. (ft)	448.00	454.54	461.00
Crit W.S. (ft)		Flow Area (sq ft)		953.19	
E.G. Slope (ft/ft)	0.000056	Area (sq ft)		953.19	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	149.72	Top Width (ft)		149.72	
Vel Total (ft/s)	1.26	Avg. Vel. (ft/s)		1.26	
Max Chl Dpth (ft)	7.63	Hydr. Depth (ft)		6.37	
Conv. Total (cfs)	160205.7	Conv. (cfs)		160205.7	
Length Wtd. (ft)	454.54	Wetted Per. (ft)		152.49	
Min Ch El (ft)	1336.51	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.76	158.88	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	22.91	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.84	Element			
Vel Head (ft)	0.07	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.91	Reach Len. (ft)	448.00	454.54	461.00
Crit W.S. (ft)		Flow Area (sq ft)		763.55	
E.G. Slope (ft/ft)	0.000201	Area (sq ft)		763.55	
Q Total (cfs)	1620.00	Flow (cfs)		1620.00	
Top Width (ft)	142.84	Top Width (ft)		142.84	
Vel Total (ft/s)	2.12	Avg. Vel. (ft/s)		2.12	
Max Chl Dpth (ft)	6.33	Hydr. Depth (ft)		5.35	
Conv. Total (cfs)	114395.5	Conv. (cfs)		114395.5	
Length Wtd. (ft)	454.54	Wetted Per. (ft)		145.14	
Min Ch El (ft)	1336.51	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		124.58	
C & E Loss (ft)	0.00	Cum SA (acres)		21.39	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.69	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.73	Reach Len. (ft)	448.00	454.54	461.00
Crit W.S. (ft)		Flow Area (sq ft)		1036.97	
E.G. Slope (ft/ft)	0.000078	Area (sq ft)		1036.97	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	152.82	Top Width (ft)		152.82	
Vel Total (ft/s)	1.54	Avg. Vel. (ft/s)		1.54	
Max Chl Dpth (ft)	8.18	Hydr. Depth (ft)		6.79	
Conv. Total (cfs)	181744.2	Conv. (cfs)		181744.2	
Length Wtd. (ft)	454.54	Wetted Per. (ft)		155.79	
Min Ch El (ft)	1336.51	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.65	161.17	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	23.00	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 26.047

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4825.69	1348.02	4843.95	1348.01	4862.29	1347.5	4863.77	1347.79	4873.76	1347.02
4891.4	1345.03	4901.46	1346.17	4917.02	1345.2	4920.3	1345.17	4932.63	1343.67
4952.94	1336.81	4980.53	1336.76	5029.87	1336.9	5038.32	1336.94	5060.62	1336.61
5069.14	1340.2	5081.68	1344.43	5087.86	1346.2	5101.62	1345.92	5107.88	1345.26
5115.83	1346.6	5121.31	1347.03	5133.63	1347.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4825.69	.04	4901.46	.03	5087.86	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4901.46	5087.86	550	570.34	588	.1	.3

Left Levee Station= 4901.46 Elevation= 1346.17
Right Levee Station= 5087.86 Elevation= 1346.2

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.11	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.14	Reach Len. (ft)	550.00	570.34	588.00
Crit W.S. (ft)	1338.35	Flow Area (sq ft)		936.58	
E.G. Slope (ft/ft)	0.000060	Area (sq ft)		936.58	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	151.74	Top Width (ft)		151.74	
Vel Total (ft/s)	1.28	Avg. Vel. (ft/s)		1.28	
Max Chl Dpth (ft)	7.50	Hydr. Depth (ft)		6.17	
Conv. Total (cfs)	154383.9	Conv. (cfs)		154383.9	
Length Wtd. (ft)	570.34	Wetted Per. (ft)		154.26	
Min Ch El (ft)	1336.61	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.76	149.03	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	21.33	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.74	Element			
Vel Head (ft)	0.08	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.82	Reach Len. (ft)	550.00	570.34	588.00
Crit W.S. (ft)	1338.69	Flow Area (sq ft)		736.79	
E.G. Slope (ft/ft)	0.000222	Area (sq ft)		736.79	
Q Total (cfs)	1620.00	Flow (cfs)		1620.00	
Top Width (ft)	141.29	Top Width (ft)		141.29	
Vel Total (ft/s)	2.20	Avg. Vel. (ft/s)		2.20	
Max Chl Dpth (ft)	6.13	Hydr. Depth (ft)		5.21	
Conv. Total (cfs)	108655.5	Conv. (cfs)		108655.5	
Length Wtd. (ft)	570.34	Wetted Per. (ft)		143.41	
Min Ch El (ft)	1336.61	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		116.75	
C & E Loss (ft)	0.00	Cum SA (acres)		19.90	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.65	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.69	Reach Len. (ft)	550.00	570.34	588.00
Crit W.S. (ft)	1338.67	Flow Area (sq ft)		1020.63	
E.G. Slope (ft/ft)	0.000085	Area (sq ft)		1020.63	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	157.93	Top Width (ft)		157.93	
Vel Total (ft/s)	1.57	Avg. Vel. (ft/s)		1.57	

Max Chl Dpth (ft)	8.04	Hydr. Depth (ft)		6.46
Conv. Total (cfs)	173462.5	Conv. (cfs)		173462.5
Length Wtd. (ft)	570.34	Wetted Per. (ft)		160.57
Min Ch El (ft)	1336.61	Shear (lb/sq ft)		0.03
Alpha	1.00	Stream Power (lb/ft s)		0.05
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.65	150.44
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	21.38

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.939

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4807.32	1348	4817.9	1348.2	4831.74	1348.3	4840.33	1348.02	4851.27	1347.8
4872.98	1346.1	4884.18	1345.18	4893.94	1344.6	4900.47	1345.93	4915.85	1346.02
4942.9	1336.7	4967.53	1336.79	5030.32	1336.46	5052.48	1336.52	5066.43	1340.89
5075.12	1344.1	5079.22	1344.93	5094.03	1344.51	5099.23	1344.55	5106.5	1345.21
5112.57	1346.9	5123.53	1347.43	5129.96	1347.59				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4807.32	.04	4915.85	.03	5079.22	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4915.85	5079.22	500	500	500	.1	.3

Left Levee Station= 4915.85 Elevation= 1346.02
Right Levee Station= 5079.22 Elevation= 1344.93

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.10	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1338.15	Flow Area (sq ft)		985.02	
E.G. Slope (ft/ft)	0.000052	Area (sq ft)		985.02	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	153.60	Top Width (ft)		153.60	
Vel Total (ft/s)	1.22	Avg. Vel. (ft/s)		1.22	
Max Chl Dpth (ft)	7.62	Hydr. Depth (ft)		6.41	
Conv. Total (cfs)	166623.3	Conv. (cfs)		166623.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		156.07	
Min Ch El (ft)	1336.46	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.02	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.76	136.45	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	19.33	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1342.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.69	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1338.48	Flow Area (sq ft)		767.15	
E.G. Slope (ft/ft)	0.000202	Area (sq ft)		767.15	
Q Total (cfs)	1620.00	Flow (cfs)		1620.00	
Top Width (ft)	145.42	Top Width (ft)		145.42	
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)		2.11	
Max Chl Dpth (ft)	6.16	Hydr. Depth (ft)		5.28	
Conv. Total (cfs)	114118.6	Conv. (cfs)		114118.6	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		147.39	
Min Ch El (ft)	1336.46	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		106.91	
C & E Loss (ft)	0.00	Cum SA (acres)		18.03	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1344.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.65	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1338.46	Flow Area (sq ft)		1067.59	
E.G. Slope (ft/ft)	0.000073	Area (sq ft)		1067.59	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	157.72	Top Width (ft)		157.72	
Vel Total (ft/s)	1.50	Avg. Vel. (ft/s)		1.50	
Max Chl Dpth (ft)	8.15	Hydr. Depth (ft)		6.77	
Conv. Total (cfs)	187153.3	Conv. (cfs)		187153.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		160.34	
Min Ch El (ft)	1336.46	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.65	136.77	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	19.31	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.844

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4856.74	1348	4858.03	1347.42	4872.44	1347.04	4895.91	1344.64	4902.54	1345.65
4910.2	1345.9	4915.81	1345.58	4943.46	1336.86	4972.75	1336.79	5035.55	1336.3
5046.68	1336.3	5051.26	1336.48	5079.57	1345.15	5093.55	1345.42	5099.66	1345.06
5103.43	1345.9	5114.48	1347	5126.11	1347.51				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4856.74	.04	4910.2	.03	5079.57	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4910.2	5079.57	500	500	500	.1	.3

Left Levee Station= 4910.2 Elevation= 1345.9
Right Levee Station= 5079.57 Elevation= 1345.15

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1344.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.08	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1338.13	Flow Area (sq ft)		980.59	
E.G. Slope (ft/ft)	0.000053	Area (sq ft)		980.59	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	155.35	Top Width (ft)		155.35	
Vel Total (ft/s)	1.22	Avg. Vel. (ft/s)		1.22	
Max Chl Dpth (ft)	7.76	Hydr. Depth (ft)		6.31	
Conv. Total (cfs)	164307.5	Conv. (cfs)		164307.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		157.60	
Min Ch El (ft)	1336.30	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.76	125.16	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	17.56	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1342.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.59	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1338.46	Flow Area (sq ft)		749.11	
E.G. Slope (ft/ft)	0.000218	Area (sq ft)		749.11	
Q Total (cfs)	1620.00	Flow (cfs)		1620.00	
Top Width (ft)	145.44	Top Width (ft)		145.44	
Vel Total (ft/s)	2.16	Avg. Vel. (ft/s)		2.16	
Max Chl Dpth (ft)	6.22	Hydr. Depth (ft)		5.15	
Conv. Total (cfs)	109764.4	Conv. (cfs)		109764.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		147.22	
Min Ch El (ft)	1336.30	Shear (lb/sq ft)		0.07	

Alpha	1.00	Stream Power (lb/ft s)	0.15
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	98.20
C & E Loss (ft)	0.00	Cum SA (acres)	16.36

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.57	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.61	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1338.45	Flow Area (sq ft)		1062.21	
E.G. Slope (ft/ft)	0.000075	Area (sq ft)		1062.21	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	158.70	Top Width (ft)		158.70	
Vel Total (ft/s)	1.51	Avg. Vel. (ft/s)		1.51	
Max Chl Dpth (ft)	8.27	Hydr. Depth (ft)		6.69	
Conv. Total (cfs)	184995.0	Conv. (cfs)		184995.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		161.10	
Min Ch El (ft)	1336.30	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.65	124.54	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	17.50	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.749

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4792.26	1345.8	4802.14	1345.55	4805.55	1346.07	4825.31	1346.75	4840.88	1347.18
4852.32	1346.9	4863.57	1346.29	4875.48	1346.03	4880.22	1346.01	4894.4	1344.45
4899.61	1345.8	4902.41	1346.31	4917.59	1346.31	4922.74	1344.87	4928.13	1342.9
4945.67	1337.2	4977.79	1336.55	5012.78	1336.53	5040.81	1336.56	5050.16	1336.76
5055.1	1337	5058.49	1338.48	5064.24	1340.02	5080.94	1345.7	5101.91	1345.81
5115.37	1347.1	5120.05	1347.3	5132.62	1347.38				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4792.26	.04	4917.59	.03	5080.94	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4917.59	5080.94	551	537.93	527	.1	.3

Left Levee Station= 4917.59 Elevation= 1346.31
Right Levee Station= 5080.94 Elevation= 1345.7

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.03	Element			
Vel Head (ft)	0.02	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.05	Reach Len. (ft)	551.00	537.93	527.00
Crit W.S. (ft)	1338.21	Flow Area (sq ft)		949.29	
E.G. Slope (ft/ft)	0.000057	Area (sq ft)		949.29	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	150.97	Top Width (ft)		150.97	
Vel Total (ft/s)	1.26	Avg. Vel. (ft/s)		1.26	
Max Chl Dpth (ft)	7.50	Hydr. Depth (ft)		6.29	
Conv. Total (cfs)	158582.6	Conv. (cfs)		158582.6	
Length Wtd. (ft)	537.93	Wetted Per. (ft)		153.26	
Min Ch El (ft)	1336.53	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.76	114.09	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	15.80	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.39	Element			
Vel Head (ft)	0.08	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.47	Reach Len. (ft)	551.00	537.93	527.00

Crit W.S. (ft)	1338.55	Flow Area (sq ft)	710.00
E.G. Slope (ft/ft)	0.000251	Area (sq ft)	710.00
Q Total (cfs)	1620.00	Flow (cfs)	1620.00
Top Width (ft)	141.51	Top Width (ft)	141.51
Vel Total (ft/s)	2.28	Avg. Vel. (ft/s)	2.28
Max Chl Dpth (ft)	5.86	Hydr. Depth (ft)	5.02
Conv. Total (cfs)	102229.4	Conv. (cfs)	102229.4
Length Wtd. (ft)	537.93	Wetted Per. (ft)	143.25
Min Ch El (ft)	1336.53	Shear (lb/sq ft)	0.08
Alpha	1.00	Stream Power (lb/ft s)	0.18
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	89.83
C & E Loss (ft)	0.00	Cum SA (acres)	14.71

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1344.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.57	Reach Len. (ft)	551.00	537.93	527.00
Crit W.S. (ft)	1338.53	Flow Area (sq ft)		1026.67	
E.G. Slope (ft/ft)	0.000080	Area (sq ft)		1026.67	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	153.85	Top Width (ft)		153.85	
Vel Total (ft/s)	1.56	Avg. Vel. (ft/s)		1.56	
Max Chl Dpth (ft)	8.00	Hydr. Depth (ft)		6.67	
Conv. Total (cfs)	178343.6	Conv. (cfs)		178343.6	
Length Wtd. (ft)	537.93	Wetted Per. (ft)		156.31	
Min Ch El (ft)	1336.53	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.65	112.56	
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	15.70	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.647

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4834.72	1345.19	4847.32	1345.04	4856.42	1345.05	4863.25	1344.55	4876.35	1346
4891.37	1346.27	4910.77	1346.31	4932.94	1339.59	4940.75	1337.27	5001.86	1336.6
5047.95	1337.2	5072.5	1346.39	5095.53	1346	5108.4	1347.67	5113.17	1347.9
5125.04	1348.03								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4834.72	.04	4910.77	.03	5072.5	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4910.77	5072.5	279	266.89	264	.1	.3

Left Levee Station= 4910.77 Elevation= 1346.31
Right Levee Station= 5072.5 Elevation= 1346.39

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1343.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.02	Reach Len. (ft)	279.00	266.89	264.00
Crit W.S. (ft)	1338.48	Flow Area (sq ft)		894.67	
E.G. Slope (ft/ft)	0.000068	Area (sq ft)		894.67	
Q Total (cfs)	1200.00	Flow (cfs)		1200.00	
Top Width (ft)	147.66	Top Width (ft)		147.66	
Vel Total (ft/s)	1.34	Avg. Vel. (ft/s)		1.34	
Max Chl Dpth (ft)	7.39	Hydr. Depth (ft)		6.06	
Conv. Total (cfs)	145817.8	Conv. (cfs)		145817.8	
Length Wtd. (ft)	266.89	Wetted Per. (ft)		149.88	
Min Ch El (ft)	1336.60	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.76	102.70	0.11
C & E Loss (ft)	0.01	Cum SA (acres)	1.09	13.96	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1342.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.31	Reach Len. (ft)	279.00	266.89	264.00
Crit W.S. (ft)	1338.82	Flow Area (sq ft)		642.13	
E.G. Slope (ft/ft)	0.000336	Area (sq ft)		642.13	
Q Total (cfs)	1620.00	Flow (cfs)		1620.00	
Top Width (ft)	137.07	Top Width (ft)		137.07	
Vel Total (ft/s)	2.52	Avg. Vel. (ft/s)		2.52	
Max Chl Dpth (ft)	5.61	Hydr. Depth (ft)		4.68	
Conv. Total (cfs)	88344.4	Conv. (cfs)		88344.4	
Length Wtd. (ft)	266.89	Wetted Per. (ft)		138.71	
Min Ch El (ft)	1336.60	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.25	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		81.48	
C & E Loss (ft)	0.00	Cum SA (acres)		12.99	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1344.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.52	Reach Len. (ft)	279.00	266.89	264.00
Crit W.S. (ft)	1338.80	Flow Area (sq ft)		968.12	
E.G. Slope (ft/ft)	0.000095	Area (sq ft)		968.12	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	150.60	Top Width (ft)		150.60	
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)		1.65	
Max Chl Dpth (ft)	7.88	Hydr. Depth (ft)		6.43	
Conv. Total (cfs)	164055.5	Conv. (cfs)		164055.5	
Length Wtd. (ft)	266.89	Wetted Per. (ft)		152.99	
Min Ch El (ft)	1336.60	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.65	100.24	
C & E Loss (ft)	0.01	Cum SA (acres)	0.78	13.82	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.598

INPUT
Description: Downstream of Major Side Inlet (160' Wide) From East Side
Q(D) =
2,000 cfs, Q(F) = 1,610 cfs & Q(E) = 2,520 cfs

Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4777.29	1344.1	4787.27	1344.2	4824.7	1343.65	4836.23	1343.55	4844.73	1343.72
4853.05	1343.73	4858.06	1342.29	4867.92	1342.47	4885.24	1342.3	4896.83	1342.45
4908.66	1345.08	4910.53	1345.64	4922.71	1345.69	4928.42	1344	4933.87	1342
4939.33	1340	4944.9	1338	4952.24	1336.1	4991.56	1335.97	5027.08	1336.12
5036.77	1344.66	5038.24	1345.75	5063.66	1345.6	5068.61	1345.51		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4777.29	.04	4922.71	.03	5038.24	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4922.71	5038.24	1	1	1	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4777.29	4922.71	1345.69	5038.24	5068.61	1345.75

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1343.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.97	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1338.76	Flow Area (sq ft)		715.37	

E.G. Slope (ft/ft)	0.000266	Area (sq ft)	72.52	715.37	
Q Total (cfs)	2000.00	Flow (cfs)		2000.00	
Top Width (ft)	198.92	Top Width (ft)	91.90	107.01	
Vel Total (ft/s)	2.80	Avg. Vel. (ft/s)		2.80	
Max Chl Dpth (ft)	7.88	Hydr. Depth (ft)		6.68	
Conv. Total (cfs)	122556.8	Conv. (cfs)		122556.8	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		111.21	
Min Ch El (ft)	1335.97	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.30	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.53	97.77	0.11
C & E Loss (ft)	0.01	Cum SA (acres)	0.79	13.18	0.35

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.07	Element			
Vel Head (ft)	0.14	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.21	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1338.40	Flow Area (sq ft)		530.79	
E.G. Slope (ft/ft)	0.000423	Area (sq ft)		530.79	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	100.14	Top Width (ft)		100.14	
Vel Total (ft/s)	3.03	Avg. Vel. (ft/s)		3.03	
Max Chl Dpth (ft)	6.10	Hydr. Depth (ft)		5.30	
Conv. Total (cfs)	78264.7	Conv. (cfs)		78264.7	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		103.34	
Min Ch El (ft)	1335.97	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.41	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		77.89	
C & E Loss (ft)	0.01	Cum SA (acres)		12.26	

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.29	Element			
Vel Head (ft)	0.17	Wt. n-Val.		0.030	
E.G. Elev (ft)	1344.46	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1339.19	Flow Area (sq ft)		763.16	
E.G. Slope (ft/ft)	0.000350	Area (sq ft)	121.45	763.16	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	236.73	Top Width (ft)	127.82	108.91	
Vel Total (ft/s)	3.30	Avg. Vel. (ft/s)		3.30	
Max Chl Dpth (ft)	8.32	Hydr. Depth (ft)		7.01	
Conv. Total (cfs)	134782.9	Conv. (cfs)		134782.9	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		113.34	
Min Ch El (ft)	1335.97	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.49	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.26	94.94	
C & E Loss (ft)	0.01	Cum SA (acres)	0.37	13.03	

Warning - Divided flow computed for this cross-section.
Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.597

INPUT
Description: Begin Concrete Apron at the Upstream of Main/Higley
RCBC
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
4777.29  1344.1 4787.27  1344.2  4824.7 1343.65 4836.23 1343.55 4844.73 1343.72
4853.05 1343.73 4858.06 1342.29 4867.92 1342.47 4885.24  1342.3 4896.83 1342.45
4908.66 1345.08 4910.53 1345.64 4922.45 1345.82 4952.15  1345.9 4952.16 1336.15
4991.56 1335.97 5027.08 1336.12 5027.09 1345.52 5037.53  1345.6 5063.66 1345.61
5068.61 1345.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4777.29     .04 4952.15    .013 5027.09     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       4952.15 5027.09              112   96.74      76              .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 4777.29 4952.15  1345.9
```

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1343.78	Element			
Vel Head (ft)	0.19	Wt. n-Val.		0.013	
E.G. Elev (ft)	1343.96	Reach Len. (ft)	112.00	96.74	76.00
Crit W.S. (ft)	1338.85	Flow Area (sq ft)		578.79	
E.G. Slope (ft/ft)	0.000076	Area (sq ft)	66.21	578.79	
Q Total (cfs)	2000.00	Flow (cfs)		2000.00	
Top Width (ft)	161.71	Top Width (ft)	86.78	74.94	
Vel Total (ft/s)	3.46	Avg. Vel. (ft/s)		3.46	
Max Chl Dpth (ft)	7.81	Hydr. Depth (ft)		7.72	
Conv. Total (cfs)	229003.2	Conv. (cfs)		229003.2	
Length Wtd. (ft)	96.74	Wetted Per. (ft)		89.87	
Min Ch El (ft)	1335.97	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.11	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.53	97.76	0.11
C & E Loss (ft)	0.06	Cum SA (acres)	0.79	13.18	0.35

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.00	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.013	
E.G. Elev (ft)	1342.20	Reach Len. (ft)	112.00	96.74	76.00
Crit W.S. (ft)	1338.47	Flow Area (sq ft)		445.59	
E.G. Slope (ft/ft)	0.000113	Area (sq ft)		445.59	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	74.93	Top Width (ft)		74.93	
Vel Total (ft/s)	3.61	Avg. Vel. (ft/s)		3.61	
Max Chl Dpth (ft)	6.03	Hydr. Depth (ft)		5.95	
Conv. Total (cfs)	151473.3	Conv. (cfs)		151473.3	
Length Wtd. (ft)	96.74	Wetted Per. (ft)		86.88	
Min Ch El (ft)	1335.97	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)		77.88	
C & E Loss (ft)	0.07	Cum SA (acres)		12.26	

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1344.18	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.013	
E.G. Elev (ft)	1344.45	Reach Len. (ft)	112.00	96.74	76.00
Crit W.S. (ft)	1339.31	Flow Area (sq ft)		609.31	
E.G. Slope (ft/ft)	0.000103	Area (sq ft)	107.93	609.31	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	199.74	Top Width (ft)	124.80	74.94	
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)		4.14	

Max Chl Dpth (ft)	8.21	Hydr. Depth (ft)			8.13
Conv. Total (cfs)	247770.3	Conv. (cfs)			247770.3
Length Wtd. (ft)	96.74	Wetted Per. (ft)			90.80
Min Ch El (ft)	1335.97	Shear (lb/sq ft)			0.04
Alpha	1.00	Stream Power (lb/ft s)			0.18
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)		0.25	94.92
C & E Loss (ft)	0.09	Cum SA (acres)		0.37	13.02

Warning - Divided flow computed for this cross-section.
Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.578

INPUT
Description: Main Street/Higley Road 5 - 10' X 7' X 370.09' RCBC
Upstream Face
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4847.6	1345	4870.03	1344.93	4887.91	1345.21	4900.06	1345.26	4917.34	1345.17
4933.08	1345.4	4936.84	1345.7	4942.88	1345.58	4947.69	1345.28	4966.67	1345.61
4970.61	1345.6	4970.62	1335.86	4981.53	1335.87	4992.45	1335.94	5003.37	1336.04
5014.29	1335.97	5024.29	1336.02	5024.3	1345.74	5051.14	1345.4	5067.72	1345.31
5071.9	1345.14	5077.62	1344.69	5086.23	1344.92				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4847.6	.04	4970.61	.013	5024.3	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4970.61	5024.3	348	370.09	397	.3	.5

Left Levee Station= 4970.61 Elevation= 1345.6
Right Levee Station= 5024.3 Elevation= 1345.74

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1343.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.		0.013	
E.G. Elev (ft)	1343.89	Reach Len. (ft)	348.00	370.09	397.00
Crit W.S. (ft)	1339.45	Flow Area (sq ft)		406.19	
E.G. Slope (ft/ft)	0.000174	Area (sq ft)		406.19	
Q Total (cfs)	2000.00	Flow (cfs)		2000.00	
Top Width (ft)	53.69	Top Width (ft)		53.69	
Vel Total (ft/s)	4.92	Avg. Vel. (ft/s)		4.92	
Max Chl Dpth (ft)	7.66	Hydr. Depth (ft)		7.57	
Conv. Total (cfs)	151619.9	Conv. (cfs)		151619.9	
Length Wtd. (ft)	370.09	Wetted Per. (ft)		68.83	
Min Ch El (ft)	1335.86	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.32	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.44	96.66	0.11
C & E Loss (ft)		Cum SA (acres)	0.68	13.03	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1341.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.		0.013	
E.G. Elev (ft)	1342.12	Reach Len. (ft)	348.00	370.09	397.00
Crit W.S. (ft)	1338.98	Flow Area (sq ft)		308.44	
E.G. Slope (ft/ft)	0.000263	Area (sq ft)		308.44	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	53.68	Top Width (ft)		53.68	
Vel Total (ft/s)	5.22	Avg. Vel. (ft/s)		5.22	
Max Chl Dpth (ft)	5.84	Hydr. Depth (ft)		5.75	
Conv. Total (cfs)	99209.0	Conv. (cfs)		99209.0	
Length Wtd. (ft)	370.09	Wetted Per. (ft)		65.34	
Min Ch El (ft)	1335.86	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.41	

Frctn Loss (ft)		Cum Volume (acre-ft)	77.04
C & E Loss (ft)		Cum SA (acres)	12.12

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1343.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.56	Wt. n-Val.		0.013	
E.G. Elev (ft)	1344.35	Reach Len. (ft)	348.00	370.09	397.00
Crit W.S. (ft)	1340.03	Flow Area (sq ft)		420.84	
E.G. Slope (ft/ft)	0.000248	Area (sq ft)		420.84	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	53.69	Top Width (ft)		53.69	
Vel Total (ft/s)	5.99	Avg. Vel. (ft/s)		5.99	
Max Chl Dpth (ft)	7.93	Hydr. Depth (ft)		7.84	
Conv. Total (cfs)	159992.8	Conv. (cfs)		159992.8	
Length Wtd. (ft)	370.09	Wetted Per. (ft)		69.38	
Min Ch El (ft)	1335.86	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.56	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.12	93.78	
C & E Loss (ft)		Cum SA (acres)	0.21	12.88	

CULVERT RIVER: EMF
REACH: Reach 6 RS: 25.565

INPUT
Description: Main Street/Higley Road 5 - 10' X 7' X 307.09' RCBC
Distance from Upstream XS = 0
Deck/Roadway Width = 370.09
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 11

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4781.05	1346.59		4844.54	1346.42		4872.15	1346.34	
4876.47	1346.31		4908.9	1346.1		4922.9	1345.98	
4970.8	1345.9		4987.01	1345.83		5064.24	1345.78	
5076.34	1345.7		5086.23	1345.6				

Upstream Bridge Cross Section Data
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4847.6	1345	4870.03	1344.93	4887.91	1345.21	4900.06	1345.26	4917.34	1345.17
4933.08	1345.4	4936.84	1345.7	4942.88	1345.58	4947.69	1345.28	4966.67	1345.61
4970.61	1345.6	4970.62	1335.86	4981.53	1335.87	4992.45	1335.94	5003.37	1336.04
5014.29	1335.97	5024.29	1336.02	5024.3	1345.74	5051.14	1345.4	5067.72	1345.31
5071.9	1345.14	5077.62	1344.69	5086.23	1344.92				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4847.6	.04	4970.61	.013	5024.3	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
4970.61	5024.3	.3	.5

Left Levee Station= 4970.61 Elevation= 1345.6
Right Levee Station= 5024.3 Elevation= 1345.74

Downstream Deck/Roadway Coordinates
num= 11

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4781.05	1346.59		4844.54	1346.42		4872.15	1346.34	
4876.47	1346.31		4908.9	1346.1		4922.9	1345.98	
4970.8	1345.9		4987.01	1345.83		5064.24	1345.78	
5076.34	1345.7		5086.23	1345.6				

Downstream Bridge Cross Section Data
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4847.6	1345.6	4890.36	1344.62	4909.29	1344.38	4956.21	1344.22	4966.73	1343.72
4970.42	1343.9	4977.07	1343.69	4977.08	1335.36	4988	1335.37	4998.91	1335.31

```
 5009.83  1335.3 5020.75  1335.3 5030.75 1335.35 5030.76 1343.68 5036.61 1343.87
 5039.27 1344.81 5047.45  1345.2 5052.71 1345.21 5053.84  1344.8 5086.47 1344.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  4847.6     .04 4977.07    .013 5030.76     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4977.07 5030.76             .3       .5

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

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       7      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  0  370.09       .013                   .2                1
Number of Barrels =  5
Upstream   Elevation =  1335.86
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
 4975.62 4986.53 4997.45 5008.37 5019.29
Downstream Elevation =  1335.3
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
 4982.08    4993 5003.91 5014.83 5025.75

CULVERT OUTPUT    Profile #Design
Culvert ID : Culvert #1

  Culv Q (cfs)           2000.00   Culv Vel In (ft/s)        5.71
  # Barrels                    5   Culv Vel Out (ft/s)       5.71
  Q Barrel (cfs)          400.00   Culv Inv El Up (ft)    1335.86
  W.S. US. (ft)          1343.52   Culv Inv El Dn (ft)    1335.30
  E.G. US. (ft)          1343.89   Culv Frctn Ls (ft)        0.35
  Delta WS (ft)             0.59   Culv Ext Lss (ft)         0.13
  Delta EG (ft)             0.59   Culv Ent Lss (ft)         0.10
  E.G. IC (ft)           1341.76   Q Weir (cfs)
  E.G. OC (ft)           1343.89   Weir Sta Lft (ft)
  Culv WS In (ft)        1342.86   Weir Sta Rgt (ft)
  Culv WS Out (ft)       1342.30   Weir Submerg
  Culv Nml Depth (ft)              Weir Max Depth (ft)
  Culv Crt Depth (ft)       3.68   Weir Avg Depth (ft)
  Culv Ful Lngh (ft)      370.09   Min Top Rd (ft)        1345.74


Note - The culvert inlet is submerged and the culvert flows full over part or all of its length.  Therefore,
                the culvert inlet equations are not valid and the supercritical result has been discarded.
                The outlet answer will be used.

CULVERT OUTPUT    Profile #Future
Culvert ID : Culvert #1

  Culv Q (cfs)           1610.00   Culv Vel In (ft/s)        5.69
  # Barrels                    5   Culv Vel Out (ft/s)       5.32
  Q Barrel (cfs)          322.00   Culv Inv El Up (ft)    1335.86
  W.S. US. (ft)          1341.70   Culv Inv El Dn (ft)    1335.30
  E.G. US. (ft)          1342.12   Culv Frctn Ls (ft)        0.23
  Delta WS (ft)             0.35   Culv Ext Lss (ft)         0.05
  Delta EG (ft)             0.38   Culv Ent Lss (ft)         0.10
  E.G. IC (ft)           1340.94   Q Weir (cfs)
```

E.G. OC (ft)	1342.12	Weir Sta Lft (ft)	
Culv WS In (ft)	1341.52	Weir Sta Rgt (ft)	
Culv WS Out (ft)	1341.35	Weir Submerg	
Culv Nml Depth (ft)	4.18	Weir Max Depth (ft)	
Culv Crt Depth (ft)	3.18	Weir Avg Depth (ft)	
Culv Ful Lngh (ft)		Min Top Rd (ft)	1345.74

CULVERT OUTPUT *Profile #Existing*
Culvert ID : Culvert #1

Culv Q (cfs)	2520.00	Culv Vel In (ft/s)	7.20
# Barrels	5	Culv Vel Out (ft/s)	7.20
Q Barrel (cfs)	504.00	Culv Inv El Up (ft)	1335.86
W.S. US. (ft)	1343.79	Culv Inv El Dn (ft)	1335.30
E.G. US. (ft)	1344.35	Culv Frctn Ls (ft)	0.56
Delta WS (ft)	0.97	Culv Ext Lss (ft)	0.20
Delta EG (ft)	0.92	Culv Ent Lss (ft)	0.16
E.G. IC (ft)	1342.78	Q Weir (cfs)	
E.G. OC (ft)	1344.35	Weir Sta Lft (ft)	
Culv WS In (ft)	1342.86	Weir Sta Rgt (ft)	
Culv WS Out (ft)	1342.30	Weir Submerg	
Culv Nml Depth (ft)		Weir Max Depth (ft)	
Culv Crt Depth (ft)	4.29	Weir Avg Depth (ft)	
Culv Ful Lngh (ft)	370.09	Min Top Rd (ft)	1345.74

Note - The culvert inlet is submerged and the culvert flows full over part or all of its length. Therefore, the culvert inlet equations are not valid and the supercritical result has been discarded. The outlet answer will be used.

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.508

INPUT
Description: Main Street/Higley Road 5 - 10' X 7' X 307.09' RCBC
Downstream
Face
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4847.6	1345.6	4890.36	1344.62	4909.29	1344.38	4956.21	1344.22	4966.73	1343.72
4970.42	1343.9	4977.07	1343.69	4977.08	1335.36	4988	1335.37	4998.91	1335.31
5009.83	1335.3	5020.75	1335.3	5030.75	1335.35	5030.76	1343.68	5036.61	1343.87
5039.27	1344.81	5047.45	1345.2	5052.71	1345.21	5053.84	1344.8	5086.47	1344.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4847.6	.04	4977.07	.013	5030.76	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4977.07	5030.76	88	94.43	101	.3	.5

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.93	Element			
Vel Head (ft)	0.37	Wt. n-Val.		0.013	
E.G. Elev (ft)	1343.31	Reach Len. (ft)	88.00	94.43	101.00
Crit W.S. (ft)		Flow Area (sq ft)		408.30	
E.G. Slope (ft/ft)	0.000171	Area (sq ft)		408.30	
Q Total (cfs)	2000.00	Flow (cfs)		2000.00	
Top Width (ft)	53.69	Top Width (ft)		53.69	
Vel Total (ft/s)	4.90	Avg. Vel. (ft/s)		4.90	
Max Chl Dpth (ft)	7.63	Hydr. Depth (ft)		7.61	
Conv. Total (cfs)	153118.0	Conv. (cfs)		153118.0	
Length Wtd. (ft)	94.43	Wetted Per. (ft)		68.70	
Min Ch El (ft)	1335.30	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.31	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.44	93.20	0.11
C & E Loss (ft)	0.06	Cum SA (acres)	0.68	12.58	0.35

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1341.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.		0.013	
E.G. Elev (ft)	1341.74	Reach Len. (ft)	88.00	94.43	101.00
Crit W.S. (ft)		Flow Area (sq ft)		323.37	
E.G. Slope (ft/ft)	0.000225	Area (sq ft)		323.37	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	53.68	Top Width (ft)		53.68	
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)		4.98	
Max Chl Dpth (ft)	6.05	Hydr. Depth (ft)		6.02	
Conv. Total (cfs)	107220.0	Conv. (cfs)		107220.0	
Length Wtd. (ft)	94.43	Wetted Per. (ft)		65.45	
Min Ch El (ft)	1335.30	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.35	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		74.36	
C & E Loss (ft)	0.05	Cum SA (acres)		11.66	

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1342.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.		0.013	
E.G. Elev (ft)	1343.43	Reach Len. (ft)	88.00	94.43	101.00
Crit W.S. (ft)		Flow Area (sq ft)		402.30	
E.G. Slope (ft/ft)	0.000284	Area (sq ft)		402.30	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	53.69	Top Width (ft)		53.69	
Vel Total (ft/s)	6.26	Avg. Vel. (ft/s)		6.26	
Max Chl Dpth (ft)	7.52	Hydr. Depth (ft)		7.49	
Conv. Total (cfs)	149493.4	Conv. (cfs)		149493.4	
Length Wtd. (ft)	94.43	Wetted Per. (ft)		68.63	
Min Ch El (ft)	1335.30	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.65	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.12	90.28	
C & E Loss (ft)	0.10	Cum SA (acres)	0.21	12.43	

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.49

INPUT
Description: End of Concrete Apron at the Downstream of Main/Higley
RCBC
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4935.32	1344	4952.46	1343.57	4955.98	1343.33	4957.22	1342.61	4960.39	1342.45
4966.89	1339.5	4968.57	1335.62	5030.29	1335.32	5031.2	1336.06	5031.54	1343.5
5039.76	1343.39	5041.26	1343.95	5072.96	1344.67	5088.52	1344.83		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4935.32	.04	4955.98	.03	5031.54	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4955.98	5031.54	142	141.76	142	.1	.3

Right Levee Station= 5031.54 Elevation= 1343.5

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1342.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.030	

E.G. Elev (ft)	1343.22	Reach Len. (ft)	142.00	141.76	142.00
Crit W.S. (ft)	1338.62	Flow Area (sq ft)		493.73	
E.G. Slope (ft/ft)	0.000641	Area (sq ft)		493.73	
Q Total (cfs)	2000.00	Flow (cfs)		2000.00	
Top Width (ft)	74.91	Top Width (ft)		74.91	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	7.64	Hydr. Depth (ft)		6.59	
Conv. Total (cfs)	78989.3	Conv. (cfs)		78989.3	
Length Wtd. (ft)	141.76	Wetted Per. (ft)		85.05	
Min Ch El (ft)	1335.32	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		0.94	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.44	92.22	0.11
C & E Loss (ft)	0.03	Cum SA (acres)	0.68	12.44	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1341.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.65	Reach Len. (ft)	142.00	141.76	142.00
Crit W.S. (ft)	1338.20	Flow Area (sq ft)		380.03	
E.G. Slope (ft/ft)	0.000870	Area (sq ft)		380.03	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	68.67	Top Width (ft)		68.67	
Vel Total (ft/s)	4.24	Avg. Vel. (ft/s)		4.24	
Max Chl Dpth (ft)	6.05	Hydr. Depth (ft)		5.53	
Conv. Total (cfs)	54589.7	Conv. (cfs)		54589.7	
Length Wtd. (ft)	141.76	Wetted Per. (ft)		76.95	
Min Ch El (ft)	1335.32	Shear (lb/sq ft)		0.27	
Alpha	1.00	Stream Power (lb/ft s)		1.14	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		73.59	
C & E Loss (ft)	0.04	Cum SA (acres)		11.53	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1342.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.29	Reach Len. (ft)	142.00	141.76	142.00
Crit W.S. (ft)	1339.15	Flow Area (sq ft)		486.76	
E.G. Slope (ft/ft)	0.001062	Area (sq ft)		486.76	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	74.74	Top Width (ft)		74.74	
Vel Total (ft/s)	5.18	Avg. Vel. (ft/s)		5.18	
Max Chl Dpth (ft)	7.55	Hydr. Depth (ft)		6.51	
Conv. Total (cfs)	77310.9	Conv. (cfs)		77310.9	
Length Wtd. (ft)	141.76	Wetted Per. (ft)		84.77	
Min Ch El (ft)	1335.32	Shear (lb/sq ft)		0.38	
Alpha	1.00	Stream Power (lb/ft s)		1.97	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.12	89.32	
C & E Loss (ft)	0.06	Cum SA (acres)	0.21	12.29	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.463

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4915.06	1344.7	4923.45	1344.78	4924.3	1344.51	4945.13	1344.03	4947.72	1343.88
4960.56	1336.5	4961.42	1335.4	4981.23	1335.59	5024.86	1335.47	5037.16	1334.94
5043.08	1338.5	5053.61	1344.1	5071	1344.91	5077.21	1345.27	5086.49	1346.29
5105.6	1346.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4915.06	.04	4947.72	.03	5053.61	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4947.72	5053.61	345	334.63	323	.1	.3

Right Levee Station= 5053.61 Elevation= 1344.1

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1342.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.12	Reach Len. (ft)	345.00	334.63	323.00
Crit W.S. (ft)	1338.19	Flow Area (sq ft)		667.76	
E.G. Slope (ft/ft)	0.000317	Area (sq ft)		667.76	
Q Total (cfs)	2000.00	Flow (cfs)		2000.00	
Top Width (ft)	102.23	Top Width (ft)		102.23	
Vel Total (ft/s)	3.00	Avg. Vel. (ft/s)		3.00	
Max Chl Dpth (ft)	8.04	Hydr. Depth (ft)		6.53	
Conv. Total (cfs)	112381.9	Conv. (cfs)		112381.9	
Length Wtd. (ft)	334.63	Wetted Per. (ft)		106.61	
Min Ch El (ft)	1334.94	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.37	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.44	90.33	0.11
C & E Loss (ft)	0.01	Cum SA (acres)	0.68	12.15	0.35

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1341.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.52	Reach Len. (ft)	345.00	334.63	323.00
Crit W.S. (ft)	1337.82	Flow Area (sq ft)		507.02	
E.G. Slope (ft/ft)	0.000471	Area (sq ft)		507.02	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	96.37	Top Width (ft)		96.37	
Vel Total (ft/s)	3.18	Avg. Vel. (ft/s)		3.18	
Max Chl Dpth (ft)	6.42	Hydr. Depth (ft)		5.26	
Conv. Total (cfs)	74156.0	Conv. (cfs)		74156.0	
Length Wtd. (ft)	334.63	Wetted Per. (ft)		99.92	
Min Ch El (ft)	1334.94	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.47	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		72.15	
C & E Loss (ft)	0.02	Cum SA (acres)		11.26	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1342.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.13	Reach Len. (ft)	345.00	334.63	323.00
Crit W.S. (ft)	1338.62	Flow Area (sq ft)		659.41	
E.G. Slope (ft/ft)	0.000522	Area (sq ft)		659.41	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	101.93	Top Width (ft)		101.93	
Vel Total (ft/s)	3.82	Avg. Vel. (ft/s)		3.82	
Max Chl Dpth (ft)	7.96	Hydr. Depth (ft)		6.47	
Conv. Total (cfs)	110283.2	Conv. (cfs)		110283.2	
Length Wtd. (ft)	334.63	Wetted Per. (ft)		106.27	
Min Ch El (ft)	1334.94	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.77	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.12	87.45	
C & E Loss (ft)	0.03	Cum SA (acres)	0.21	12.00	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.4

INPUT
Description: Q(D) = 2,300 cfs, Q(F) = 1,610 cfs & Q(E) = 2,520 cfs
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4886.13	1344.3	4889.8	1344.38	4902.8	1343.19	4914.72	1344.03	4926.75	1344.56
4953.67	1335.6	4988.52	1335.54	5023.83	1335.52	5049.15	1335.39	5067.07	1341.76
5074.78	1344.3	5086.51	1344.13	5094.72	1343.19	5099.61	1344.72	5105.4	1346.32
5116.82	1346.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4886.13	.04	4926.75	.03	5074.78	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4926.75	5074.78	528	528	528	.1	.3

Left Levee Station= 4926.75 Elevation= 1344.56
Right Levee Station= 5074.78 Elevation= 1344.3

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.91	Element			
Vel Head (ft)	0.11	Wt. n-Val.		0.030	
E.G. Elev (ft)	1343.02	Reach Len. (ft)	528.00	528.00	528.00
Crit W.S. (ft)	1338.07	Flow Area (sq ft)		864.98	
E.G. Slope (ft/ft)	0.000257	Area (sq ft)		864.98	
Q Total (cfs)	2300.00	Flow (cfs)		2300.00	
Top Width (ft)	138.85	Top Width (ft)		138.85	
Vel Total (ft/s)	2.66	Avg. Vel. (ft/s)		2.66	
Max Chl Dpth (ft)	7.52	Hydr. Depth (ft)		6.23	
Conv. Total (cfs)	143358.3	Conv. (cfs)		143358.3	
Length Wtd. (ft)	528.00	Wetted Per. (ft)		141.31	
Min Ch El (ft)	1335.39	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.26	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.44	84.45	0.11
C & E Loss (ft)	0.01	Cum SA (acres)	0.68	11.22	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1341.28	Element			
Vel Head (ft)	0.10	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.38	Reach Len. (ft)	528.00	528.00	528.00
Crit W.S. (ft)	1337.54	Flow Area (sq ft)		647.06	
E.G. Slope (ft/ft)	0.000300	Area (sq ft)		647.06	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	129.13	Top Width (ft)		129.13	
Vel Total (ft/s)	2.49	Avg. Vel. (ft/s)		2.49	
Max Chl Dpth (ft)	5.89	Hydr. Depth (ft)		5.01	
Conv. Total (cfs)	92923.8	Conv. (cfs)		92923.8	
Length Wtd. (ft)	528.00	Wetted Per. (ft)		131.06	
Min Ch El (ft)	1335.39	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.23	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		67.72	
C & E Loss (ft)	0.01	Cum SA (acres)		10.39	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.83	Element			
Vel Head (ft)	0.14	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.97	Reach Len. (ft)	528.00	528.00	528.00
Crit W.S. (ft)	1338.22	Flow Area (sq ft)		854.06	
E.G. Slope (ft/ft)	0.000321	Area (sq ft)		854.06	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	138.37	Top Width (ft)		138.37	
Vel Total (ft/s)	2.95	Avg. Vel. (ft/s)		2.95	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		6.17	
Conv. Total (cfs)	140689.0	Conv. (cfs)		140689.0	
Length Wtd. (ft)	528.00	Wetted Per. (ft)		140.81	
Min Ch El (ft)	1335.39	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.36	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.12	81.64	
C & E Loss (ft)	0.01	Cum SA (acres)	0.21	11.08	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.3

INPUT
Description:

Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4875.08	1344	4893.44	1343.5	4904.72	1342.25	4929.01	1344.15	4933.13	1342.17
4942.23	1338.5	4953.8	1334.74	4961.5	1334.42	4994.39	1334.14	5011.1	1334.18
5045.72	1334.7	5054.79	1337.23	5062.52	1339.74	5073.28	1343.54	5085.25	1342.73
5091.3	1342.9	5103.54	1345.5	5123.38	1346.03				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4875.08	.04	4929.01	.03	5073.28	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4929.01	5073.28	528	528	528	.1	.3

Left Levee Station= 4929.01 Elevation= 1344.15
Right Levee Station= 5073.28 Elevation= 1343.54

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.82	Element			
Vel Head (ft)	0.09	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.90	Reach Len. (ft)	528.00	528.00	528.00
Crit W.S. (ft)	1336.97	Flow Area (sq ft)		982.67	
E.G. Slope (ft/ft)	0.000170	Area (sq ft)		982.67	
Q Total (cfs)	2300.00	Flow (cfs)		2300.00	
Top Width (ft)	139.45	Top Width (ft)		139.45	
Vel Total (ft/s)	2.34	Avg. Vel. (ft/s)		2.34	
Max Chl Dpth (ft)	8.68	Hydr. Depth (ft)		7.05	
Conv. Total (cfs)	176595.4	Conv. (cfs)		176595.4	
Length Wtd. (ft)	528.00	Wetted Per. (ft)		142.19	
Min Ch El (ft)	1334.14	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.17	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.44	73.25	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	0.68	9.54	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1341.18	Element			
Vel Head (ft)	0.07	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.25	Reach Len. (ft)	528.00	528.00	528.00
Crit W.S. (ft)	1336.43	Flow Area (sq ft)		761.24	
E.G. Slope (ft/ft)	0.000178	Area (sq ft)		761.24	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	131.02	Top Width (ft)		131.02	
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)		2.11	
Max Chl Dpth (ft)	7.04	Hydr. Depth (ft)		5.81	
Conv. Total (cfs)	120563.1	Conv. (cfs)		120563.1	
Length Wtd. (ft)	528.00	Wetted Per. (ft)		133.13	
Min Ch El (ft)	1334.14	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		59.18	
C & E Loss (ft)	0.00	Cum SA (acres)		8.82	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.71	Element			
Vel Head (ft)	0.11	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.82	Reach Len. (ft)	528.00	528.00	528.00
Crit W.S. (ft)	1337.14	Flow Area (sq ft)		968.42	
E.G. Slope (ft/ft)	0.000213	Area (sq ft)		968.42	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	138.95	Top Width (ft)		138.95	
Vel Total (ft/s)	2.60	Avg. Vel. (ft/s)		2.60	
Max Chl Dpth (ft)	8.57	Hydr. Depth (ft)		6.97	
Conv. Total (cfs)	172787.0	Conv. (cfs)		172787.0	
Length Wtd. (ft)	528.00	Wetted Per. (ft)		141.64	
Min Ch El (ft)	1334.14	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.24	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.12	70.59	
C & E Loss (ft)	0.00	Cum SA (acres)	0.21	9.40	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.2

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4879.92	1344.7	4882.53	1344.73	4907	1342.23	4914.02	1342.85	4928.38	1343.12
4954.96	1334.1	4970.83	1333.64	4988.83	1333.48	5034.51	1333.22	5040.46	1333.31
5043.73	1334	5057.52	1338.67	5067.6	1341.77	5071.33	1342.81	5084.58	1342.54
5090.85	1342.1	5104.32	1345.27	5116.58	1345.52				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4879.92	.04	4928.38	.03	5071.33	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4928.38	5071.33	528	528	528	.1	.3

Left Levee Station= 4928.38 Elevation= 1343.12
Right Levee Station= 5071.33 Elevation= 1343.1

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.74	Element			
Vel Head (ft)	0.07	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.82	Reach Len. (ft)	528.00	528.00	528.00
Crit W.S. (ft)	1336.20	Flow Area (sq ft)		1046.86	
E.G. Slope (ft/ft)	0.000140	Area (sq ft)		1046.86	
Q Total (cfs)	2300.00	Flow (cfs)		2300.00	
Top Width (ft)	141.60	Top Width (ft)		141.60	
Vel Total (ft/s)	2.20	Avg. Vel. (ft/s)		2.20	
Max Chl Dpth (ft)	9.52	Hydr. Depth (ft)		7.39	
Conv. Total (cfs)	194160.3	Conv. (cfs)		194160.3	
Length Wtd. (ft)	528.00	Wetted Per. (ft)		144.47	
Min Ch El (ft)	1333.22	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.44	60.95	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	0.68	7.83	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1341.11	Element			
Vel Head (ft)	0.06	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.16	Reach Len. (ft)	528.00	528.00	528.00
Crit W.S. (ft)	1335.64	Flow Area (sq ft)		823.67	
E.G. Slope (ft/ft)	0.000138	Area (sq ft)		823.67	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	131.12	Top Width (ft)		131.12	
Vel Total (ft/s)	1.95	Avg. Vel. (ft/s)		1.95	
Max Chl Dpth (ft)	7.89	Hydr. Depth (ft)		6.28	
Conv. Total (cfs)	137241.0	Conv. (cfs)		137241.0	
Length Wtd. (ft)	528.00	Wetted Per. (ft)		133.49	
Min Ch El (ft)	1333.22	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		49.58	
C & E Loss (ft)	0.00	Cum SA (acres)		7.23	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.62	Element			
Vel Head (ft)	0.09	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.71	Reach Len. (ft)	528.00	528.00	528.00
Crit W.S. (ft)	1336.37	Flow Area (sq ft)		1029.66	
E.G. Slope (ft/ft)	0.000177	Area (sq ft)		1029.66	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	140.80	Top Width (ft)		140.80	
Vel Total (ft/s)	2.45	Avg. Vel. (ft/s)		2.45	

Max Chl Dpth (ft)	9.40	Hydr. Depth (ft)			7.31
Conv. Total (cfs)	189601.4	Conv. (cfs)			189601.4
Length Wtd. (ft)	528.00	Wetted Per. (ft)			143.64
Min Ch El (ft)	1333.22	Shear (lb/sq ft)			0.08
Alpha	1.00	Stream Power (lb/ft s)			0.19
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		0.12	58.48
C & E Loss (ft)	0.00	Cum SA (acres)		0.21	7.70

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.1

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4842.27	1344.3	4862.24	1343.86	4868.35	1343.89	4882.95	1343.21	4905.18	1341.28
4913.8	1342.9	4927.75	1343.09	4933.6	1341.62	4955.99	1333.87	5005.2	1333.12
5011.5	1332.9	5019.97	1332.84	5028.44	1333.02	5042.08	1333.18	5057.66	1339
5071.5	1343.2	5082.05	1342.91	5091.28	1341.15	5104.54	1344.87	5122.61	1345.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4842.27	.04	4927.75	.03	5071.5	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4927.75	5071.5	375	377.6	380	.1	.3

Left Levee Station= 4927.75 Elevation= 1343.09
Right Levee Station= 5071.5 Elevation= 1343.2

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.67	Element			
Vel Head (ft)	0.08	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.74	Reach Len. (ft)	375.00	377.60	380.00
Crit W.S. (ft)	1336.01	Flow Area (sq ft)		1045.42	
E.G. Slope (ft/ft)	0.000140	Area (sq ft)		1045.42	
Q Total (cfs)	2300.00	Flow (cfs)		2300.00	
Top Width (ft)	140.32	Top Width (ft)		140.32	
Vel Total (ft/s)	2.20	Avg. Vel. (ft/s)		2.20	
Max Chl Dpth (ft)	9.83	Hydr. Depth (ft)		7.45	
Conv. Total (cfs)	194713.6	Conv. (cfs)		194713.6	
Length Wtd. (ft)	377.60	Wetted Per. (ft)		143.37	
Min Ch El (ft)	1332.84	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.44	48.27	0.11
C & E Loss (ft)	0.00	Cum SA (acres)	0.68	6.13	0.35

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1341.03	Element			
Vel Head (ft)	0.06	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.09	Reach Len. (ft)	375.00	377.60	380.00
Crit W.S. (ft)	1335.45	Flow Area (sq ft)		825.53	
E.G. Slope (ft/ft)	0.000134	Area (sq ft)		825.53	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	129.07	Top Width (ft)		129.07	
Vel Total (ft/s)	1.95	Avg. Vel. (ft/s)		1.95	
Max Chl Dpth (ft)	8.19	Hydr. Depth (ft)		6.40	
Conv. Total (cfs)	139049.2	Conv. (cfs)		139049.2	
Length Wtd. (ft)	377.60	Wetted Per. (ft)		131.64	
Min Ch El (ft)	1332.84	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		39.58	
C & E Loss (ft)	0.00	Cum SA (acres)		5.65	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.53	Element			

Vel Head (ft)	0.09	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.62	Reach Len. (ft)	375.00	377.60	380.00
Crit W.S. (ft)	1336.18	Flow Area (sq ft)		1025.59	
E.G. Slope (ft/ft)	0.000177	Area (sq ft)		1025.59	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	139.29	Top Width (ft)		139.29	
Vel Total (ft/s)	2.46	Avg. Vel. (ft/s)		2.46	
Max Chl Dpth (ft)	9.69	Hydr. Depth (ft)		7.36	
Conv. Total (cfs)	189540.9	Conv. (cfs)		189540.9	
Length Wtd. (ft)	377.60	Wetted Per. (ft)		142.30	
Min Ch El (ft)	1332.84	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.20	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.12	46.03	
C & E Loss (ft)	0.00	Cum SA (acres)	0.21	6.00	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 25.028

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4896.96	1342	4901.34	1341.82	4907.84	1341.92	4915	1341.73	4922.64	1342.16
4928.16	1342.1	4939.77	1338.4	4949.89	1335.27	4957.44	1333.31	4983.05	1332.55
5028.67	1332.6	5040.08	1332.83	5042.85	1333.63	5049.08	1335.89	5066.01	1341.17
5071.03	1342.5	5095.71	1342.19	5105.02	1344.87	5111.81	1344.68	5116.54	1344.76
5123	1345.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4896.96	.04	4928.16	.03	5071.03	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4928.16	5071.03	215	220.26	226	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4896.96	4928.16	1344	5071.03	5123	1344

Left Levee Station= 4928.16 Elevation= 1342.1
Right Levee Station= 5071.03 Elevation= 1342.5

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1342.63	Element			
Vel Head (ft)	0.07	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.69	Reach Len. (ft)	215.00	220.26	226.00
Crit W.S. (ft)	1335.51	Flow Area (sq ft)		1117.69	
E.G. Slope (ft/ft)	0.000114	Area (sq ft)	21.79	1117.69	7.32
Q Total (cfs)	2300.00	Flow (cfs)		2300.00	
Top Width (ft)	200.27	Top Width (ft)	31.20	142.87	26.20
Vel Total (ft/s)	2.06	Avg. Vel. (ft/s)		2.06	
Max Chl Dpth (ft)	10.08	Hydr. Depth (ft)		7.82	
Conv. Total (cfs)	215359.3	Conv. (cfs)		215359.3	
Length Wtd. (ft)	220.26	Wetted Per. (ft)		145.67	
Min Ch El (ft)	1332.55	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.11	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.35	38.89	0.08
C & E Loss (ft)	0.00	Cum SA (acres)	0.54	4.90	0.24

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1340.99	Element			
Vel Head (ft)	0.05	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.05	Reach Len. (ft)	215.00	220.26	226.00
Crit W.S. (ft)	1334.93	Flow Area (sq ft)		890.46	
E.G. Slope (ft/ft)	0.000109	Area (sq ft)		890.46	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	133.82	Top Width (ft)		133.82	

Vel Total (ft/s)	1.81	Avg. Vel. (ft/s)	1.81
Max Chl Dpth (ft)	8.44	Hydr. Depth (ft)	6.65
Conv. Total (cfs)	154176.6	Conv. (cfs)	154176.6
Length Wtd. (ft)	220.26	Wetted Per. (ft)	136.24
Min Ch El (ft)	1332.55	Shear (lb/sq ft)	0.04
Alpha	1.00	Stream Power (lb/ft s)	0.08
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	32.14
C & E Loss (ft)	0.00	Cum SA (acres)	4.51

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1342.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.56	Reach Len. (ft)	215.00	220.26	226.00
Crit W.S. (ft)	1335.68	Flow Area (sq ft)		1095.77	
E.G. Slope (ft/ft)	0.000146	Area (sq ft)	17.00	1095.77	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	173.97	Top Width (ft)	31.20	142.77	
Vel Total (ft/s)	2.30	Avg. Vel. (ft/s)		2.30	
Max Chl Dpth (ft)	9.92	Hydr. Depth (ft)		7.67	
Conv. Total (cfs)	208460.2	Conv. (cfs)		208460.2	
Length Wtd. (ft)	220.26	Wetted Per. (ft)		145.57	
Min Ch El (ft)	1332.55	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.04	36.83	
C & E Loss (ft)	0.00	Cum SA (acres)	0.08	4.78	

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 24.987

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4879.14	1341.57	4883.75	1341.52	4892.5	1341.72	4900.89	1341.2	4910.99	1340.78
4918.78	1341.91	4929.65	1342.69	4939.02	1342.5	4949.88	1339	4968.36	1333.03
4975.68	1332.42	4998.15	1332.02	5028.53	1332.21	5043.38	1332.4	5048.28	1332.58
5054.61	1334.63	5077.13	1341.59	5081.37	1342.75	5088.25	1342.4	5109.76	1341.71
5112.41	1341.73	5123.45	1342.94	5146.75	1343.75				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4879.14	.04	4939.02	.03	5081.37	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4939.02	5081.37	165	158.45	155	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4879.14	4929.65	1343	5081.37	5146.75	1343

Left Levee Station= 4939.02 Elevation= 1342.5
Right Levee Station= 5081.37 Elevation= 1342.75

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1342.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1342.67	Reach Len. (ft)	165.00	158.45	155.00
Crit W.S. (ft)	1335.16	Flow Area (sq ft)	0.27	1128.80	
E.G. Slope (ft/ft)	0.000110	Area (sq ft)	52.84	1128.80	
Q Total (cfs)	2300.00	Flow (cfs)	0.01	2299.99	
Top Width (ft)	196.28	Top Width (ft)	54.47	141.82	
Vel Total (ft/s)	2.04	Avg. Vel. (ft/s)	0.05	2.04	
Max Chl Dpth (ft)	10.58	Hydr. Depth (ft)	0.05	7.96	
Conv. Total (cfs)	219760.8	Conv. (cfs)	1.4	219759.4	
Length Wtd. (ft)	158.45	Wetted Per. (ft)	5.15	144.85	
Min Ch El (ft)	1332.02	Shear (lb/sq ft)	0.00	0.05	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.11	

Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.16	33.21	0.06
C & E Loss (ft)	0.01	Cum SA (acres)	0.33	4.18	0.17

Warning - Divided flow computed for this cross-section.
Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1340.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.02	Reach Len. (ft)	165.00	158.45	155.00
Crit W.S. (ft)	1334.56	Flow Area (sq ft)		905.76	
E.G. Slope (ft/ft)	0.000101	Area (sq ft)		905.76	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	131.37	Top Width (ft)		131.37	
Vel Total (ft/s)	1.78	Avg. Vel. (ft/s)		1.78	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		6.89	
Conv. Total (cfs)	160434.0	Conv. (cfs)		160434.0	
Length Wtd. (ft)	158.45	Wetted Per. (ft)		133.94	
Min Ch El (ft)	1332.02	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		27.60	
C & E Loss (ft)	0.01	Cum SA (acres)		3.84	

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1342.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.52	Reach Len. (ft)	165.00	158.45	155.00
Crit W.S. (ft)	1335.33	Flow Area (sq ft)		1106.14	
E.G. Slope (ft/ft)	0.000140	Area (sq ft)		1106.14	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	141.06	Top Width (ft)		141.06	
Vel Total (ft/s)	2.28	Avg. Vel. (ft/s)		2.28	
Max Chl Dpth (ft)	10.42	Hydr. Depth (ft)		7.84	
Conv. Total (cfs)	213230.4	Conv. (cfs)		213230.4	
Length Wtd. (ft)	158.45	Wetted Per. (ft)		144.06	
Min Ch El (ft)	1332.02	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.15	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		31.26	
C & E Loss (ft)	0.02	Cum SA (acres)		4.06	

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 24.957

INPUT
Description: Ineffective Flow Area From Broadway Road Bridge
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4893.84	1342.08	4899.18	1342.13	4910.67	1342.42	4942.79	1342.9	4960.64	1341.67
4972.59	1335.19	4979.43	1332.02	5023.08	1332.11	5031.18	1338.2	5036.86	1342.14
5046.45	1342.58	5049.33	1342.35	5057.29	1342.15	5064.88	1343.4	5077.77	1345.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4893.84	.04	4942.79	.03	5046.45	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4942.79	5046.45	89	56.56	25	.3	.5

Left Levee Station= 4942.79 Elevation= 1342.9

Right Levee Station= 5046.45 Elevation= 1342.9

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1342.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.62	Reach Len. (ft)	89.00	56.56	25.00
Crit W.S. (ft)	1336.23	Flow Area (sq ft)		636.66	
E.G. Slope (ft/ft)	0.000444	Area (sq ft)		636.66	
Q Total (cfs)	2300.00	Flow (cfs)		2300.00	
Top Width (ft)	93.26	Top Width (ft)		93.26	
Vel Total (ft/s)	3.61	Avg. Vel. (ft/s)		3.61	
Max Chl Dpth (ft)	10.40	Hydr. Depth (ft)		6.83	
Conv. Total (cfs)	109126.0	Conv. (cfs)		109126.0	
Length Wtd. (ft)	56.56	Wetted Per. (ft)		98.90	
Min Ch El (ft)	1332.02	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.64	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.06	30.00	0.06
C & E Loss (ft)	0.09	Cum SA (acres)	0.23	3.75	0.17

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1340.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.030	
E.G. Elev (ft)	1340.98	Reach Len. (ft)	89.00	56.56	25.00
Crit W.S. (ft)	1335.37	Flow Area (sq ft)		512.40	
E.G. Slope (ft/ft)	0.000326	Area (sq ft)		512.40	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	72.79	Top Width (ft)		72.79	
Vel Total (ft/s)	3.14	Avg. Vel. (ft/s)		3.14	
Max Chl Dpth (ft)	8.81	Hydr. Depth (ft)		7.04	
Conv. Total (cfs)	89193.1	Conv. (cfs)		89193.1	
Length Wtd. (ft)	56.56	Wetted Per. (ft)		77.77	
Min Ch El (ft)	1332.02	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		25.02	
C & E Loss (ft)	0.07	Cum SA (acres)		3.47	

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1342.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.47	Reach Len. (ft)	89.00	56.56	25.00
Crit W.S. (ft)	1336.47	Flow Area (sq ft)		617.76	
E.G. Slope (ft/ft)	0.000529	Area (sq ft)		617.76	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	85.58	Top Width (ft)		85.58	
Vel Total (ft/s)	4.08	Avg. Vel. (ft/s)		4.08	
Max Chl Dpth (ft)	10.19	Hydr. Depth (ft)		7.22	
Conv. Total (cfs)	109532.6	Conv. (cfs)		109532.6	
Length Wtd. (ft)	56.56	Wetted Per. (ft)		91.21	
Min Ch El (ft)	1332.02	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.91	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		28.13	
C & E Loss (ft)	0.12	Cum SA (acres)		3.65	

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 24.946

INPUT
Description: Broadway Road 3 Span Bridge Upstream Face
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4933.06	1344.72	4958.59	1344.52	4967.97	1341.7	4974.86	1341.47	4986.72	1331.7
5014.06	1331.78	5025.37	1342.22	5036.66	1342.96	5040.38	1344.72	5050	1344.67

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4933.06	.04	4958.59	.03	5040.38	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4958.59	5040.38	103.9	103.9	103.9	.3	.5

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1341.99	Element			
Vel Head (ft)	0.50	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.50	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1337.30	Flow Area (sq ft)		403.81	
E.G. Slope (ft/ft)	0.001174	Area (sq ft)		403.81	
Q Total (cfs)	2300.00	Flow (cfs)		2300.00	
Top Width (ft)	58.12	Top Width (ft)		58.12	
Vel Total (ft/s)	5.70	Avg. Vel. (ft/s)		5.70	
Max Chl Dpth (ft)	10.29	Hydr. Depth (ft)		6.95	
Conv. Total (cfs)	67134.3	Conv. (cfs)		67134.3	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		65.67	
Min Ch El (ft)	1331.70	Shear (lb/sq ft)		0.45	
Alpha	1.00	Stream Power (lb/ft s)		2.57	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.06	29.33	0.06
C & E Loss (ft)		Cum SA (acres)	0.23	3.65	0.17

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1340.52	Element			
Vel Head (ft)	0.37	Wt. n-Val.		0.030	
E.G. Elev (ft)	1340.89	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1336.19	Flow Area (sq ft)		328.50	
E.G. Slope (ft/ft)	0.000884	Area (sq ft)		328.50	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	47.51	Top Width (ft)		47.51	
Vel Total (ft/s)	4.90	Avg. Vel. (ft/s)		4.90	
Max Chl Dpth (ft)	8.82	Hydr. Depth (ft)		6.91	
Conv. Total (cfs)	54160.9	Conv. (cfs)		54160.9	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		54.09	
Min Ch El (ft)	1331.70	Shear (lb/sq ft)		0.34	
Alpha	1.00	Stream Power (lb/ft s)		1.64	
Frctn Loss (ft)		Cum Volume (acre-ft)		24.48	
C & E Loss (ft)		Cum SA (acres)		3.39	

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1341.62	Element			
Vel Head (ft)	0.67	Wt. n-Val.		0.030	
E.G. Elev (ft)	1342.30	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1337.60	Flow Area (sq ft)		382.80	
E.G. Slope (ft/ft)	0.001553	Area (sq ft)		382.80	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	54.46	Top Width (ft)		54.46	
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)		6.58	
Max Chl Dpth (ft)	9.92	Hydr. Depth (ft)		7.03	
Conv. Total (cfs)	63939.2	Conv. (cfs)		63939.2	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		61.81	

Min Ch El (ft)	1331.70	Shear (lb/sq ft)	0.60
Alpha	1.00	Stream Power (lb/ft s)	3.95
Frctn Loss (ft)		Cum Volume (acre-ft)	27.48
C & E Loss (ft)		Cum SA (acres)	3.56

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

BRIDGE RIVER: EMF
REACH: Reach 6 RS: 24.936

INPUT
Description: Broadway Road 3-Span Bridge
Distance from Upstream XS = 0
Deck/Roadway Width = 103.9
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 13

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4919.95	1344.7	1343.97	4933.06	1344.72	1344.72	4967.31	1344.95	1343.07
4982.08	1345.15	1343.18	4992.41	1345.29	1343.2	5000	1345.35	1343.25
5007.36	1345.4	1343.3	5018.04	1345.34	1343.19	5032.68	1345.2	1343.28
5032.69	1345.2	1342.22	5036.66	1345.15	1342.69	5040.38	1345.1	1344.72
5106.29	1345.05	1344						

Upstream Bridge Cross Section Data
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4933.06	1344.72	4958.59	1344.52	4967.97	1341.7	4974.86	1341.47	4986.72	1331.7
5014.06	1331.78	5025.37	1342.22	5036.66	1342.96	5040.38	1344.72	5050	1344.67

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4933.06	.04	4958.59	.03	5040.38	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
4958.59	5040.38	.3	.5

Downstream Deck/Roadway Coordinates
num= 14

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4919.95	1344.7	1343.94	4920.67	1344.71	1343.3	4958.9	1344.9	1344.26
4970.11	1345.05	1341	4970.12	1345.05	1342.63	4984.67	1345.25	1342.87
4995.31	1345.3	1343	5000	1345.35	1343.01	5010.19	1345.4	1343.03
5020.68	1345.32	1343.08	5035.45	1345.2	1343.22	5035.46	1345.2	1341.8
5047.76	1345.1	1344.82	5106.29	1345.05	1345.2			

Downstream Bridge Cross Section Data
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4920.67	1343.3	4958.9	1344.26	4969.93	1341.55	4977.3	1341.14	4987.63	1331.58
5015.04	1331.6	5028.04	1341.57	5035.6	1341.9	5046.16	1345.03	5050	1344.95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4920.67	.04	4958.9	.03	5046.16	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
4958.9	5046.16	.3	.5

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

Number of Piers = 2

Pier Data
Pier Station Upstream= 4987.18 Downstream= 4989.99
Upstream num= 5

Width	Elev	Width	Elev	Width	Elev	Width	Elev	Width	Elev
2	1330.73	2	1340.59	2.67	1340.59	2.67	1342.89	10.33	1343.2

Downstream num= 5

Width	Elev	Width	Elev	Width	Elev	Width	Elev	Width	Elev
2	1330.58	2	1340.3	2.68	1340.3	2.68	1342.66	10.64	1343

Pier Data
Pier Station Upstream= 5015.92 Downstream= 5015.53
Upstream num= 5

Width	Elev	Width	Elev	Width	Elev	Width	Elev	Width	Elev
2	1330.78	2	1340.62	2.74	1340.62	2.74	1342.95	10.68	1343.3

Downstream num= 5

Width	Elev	Width	Elev	Width	Elev	Width	Elev	Width	Elev
2	1330.59	2	1340.43	2.67	1340.43	2.67	1342.78	10.49	1343.08

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 1.2
Yarnell KVal = .9
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 downstream end
Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT Profile #Design
Opening : Bridge #1

			Inside BR US	Inside BR DS
E.G. US. (ft)	1342.50	Element		
W.S. US. (ft)	1341.99	E.G. Elev (ft)	1342.42	1341.95
Q Total (cfs)	2300.00	W.S. Elev (ft)	1341.76	1341.23
Q Bridge (cfs)	2300.00	Crit W.S. (ft)	1337.67	1337.56
Q Weir (cfs)		Max Chl Dpth (ft)	10.06	9.65
Weir Sta Lft (ft)		Vel Total (ft/s)	6.52	6.84
Weir Sta Rgt (ft)		Flow Area (sq ft)	352.53	336.04
Weir Submerg		Froude # Chl	0.50	0.52
Weir Max Depth (ft)		Specif Force (cu ft)	2055.91	1938.79
Min Top Rd (ft)	1344.72	Hydr Depth (ft)	6.82	7.23
Min El Prs (ft)	1343.30	W.P. Total (ft)	97.28	93.22
Delta EG (ft)	0.62	Conv. Total (cfs)	41194.6	39129.4
Delta WS (ft)	0.68	Top Width (ft)	51.71	46.50
BR Open Area (sq ft)	434.52	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.84	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.71	0.78
Br Sel Mthd	Momentum	Power Total (lb/ft s)	4.60	5.32

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

BRIDGE OUTPUT Profile #Future
Opening : Bridge #1

			Inside BR US	Inside BR DS
E.G. US. (ft)	1340.89	Element		
W.S. US. (ft)	1340.52	E.G. Elev (ft)	1340.84	1340.47
Q Total (cfs)	1610.00	W.S. Elev (ft)	1340.36	1339.96
Q Bridge (cfs)	1610.00	Crit W.S. (ft)	1336.48	1336.39
Q Weir (cfs)		Max Chl Dpth (ft)	8.66	8.38
Weir Sta Lft (ft)		Vel Total (ft/s)	5.55	5.74

Weir Sta Rgt (ft)		Flow Area (sq ft)	290.17	280.35
Weir Submerg		Froude # Chl	0.38	0.40
Weir Max Depth (ft)		Specif Force (cu ft)	1417.47	1347.26
Min Top Rd (ft)	1344.72	Hydr Depth (ft)	6.72	6.46
Min El Prs (ft)	1343.30	W.P. Total (ft)	79.33	81.44
Delta EG (ft)	0.49	Conv. Total (cfs)	34119.6	31658.6
Delta WS (ft)	0.53	Top Width (ft)	43.15	43.37
BR Open Area (sq ft)	434.52	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.74	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.51	0.56
Br Sel Mthd	Momentum	Power Total (lb/ft s)	2.82	3.19

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

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

E.G. US. (ft)	1342.30	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1341.62	E.G. Elev (ft)	1342.20	1341.61
Q Total (cfs)	2520.00	W.S. Elev (ft)	1341.30	1340.55
Q Bridge (cfs)	2520.00	Crit W.S. (ft)	1338.01	1337.90
Q Weir (cfs)		Max Chl Dpth (ft)	9.59	8.97
Weir Sta Lft (ft)		Vel Total (ft/s)	7.62	8.23
Weir Sta Rgt (ft)		Flow Area (sq ft)	330.66	306.20
Weir Submerg		Froude # Chl	0.62	0.67
Weir Max Depth (ft)		Specif Force (cu ft)	2027.47	1877.88
Min Top Rd (ft)	1344.72	Hydr Depth (ft)	7.53	7.05
Min El Prs (ft)	1343.30	W.P. Total (ft)	87.35	87.00
Delta EG (ft)	0.76	Conv. Total (cfs)	39780.6	35090.1
Delta WS (ft)	0.89	Top Width (ft)	43.89	43.43
BR Open Area (sq ft)	434.52	Frctn Loss (ft)		
BR Open Vel (ft/s)	8.23	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.95	1.13
Br Sel Mthd	Momentum	Power Total (lb/ft s)	7.23	9.33

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

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 24.926

INPUT
Description: Broadway Road 3 Span Bridge Downstream Face
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4920.67	1343.3	4958.9	1344.26	4969.93	1341.55	4977.3	1341.14	4987.63	1331.58
5015.04	1331.6	5028.04	1341.57	5035.6	1341.9	5046.16	1345.03	5050	1344.95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4920.67	.04	4958.9	.03	5046.16	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4958.9	5046.16	111	139.23	175	.3	.5

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1341.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.88	Reach Len. (ft)	111.00	139.23	175.00
Crit W.S. (ft)		Flow Area (sq ft)		379.16	
E.G. Slope (ft/ft)	0.001297	Area (sq ft)		379.16	
Q Total (cfs)	2300.00	Flow (cfs)		2300.00	
Top Width (ft)	53.41	Top Width (ft)		53.41	
Vel Total (ft/s)	6.07	Avg. Vel. (ft/s)		6.07	
Max Chl Dpth (ft)	9.73	Hydr. Depth (ft)		7.10	
Conv. Total (cfs)	63870.4	Conv. (cfs)		63870.4	
Length Wtd. (ft)	139.21	Wetted Per. (ft)		60.45	

Min Ch El (ft)	1331.58	Shear (lb/sq ft)		0.51	
Alpha	1.00	Stream Power (lb/ft s)		3.08	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.06	28.51	0.06
C & E Loss (ft)	0.24	Cum SA (acres)	0.23	3.54	0.17

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1339.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.030	
E.G. Elev (ft)	1340.40	Reach Len. (ft)	111.00	139.23	175.00
Crit W.S. (ft)		Flow Area (sq ft)		314.26	
E.G. Slope (ft/ft)	0.001011	Area (sq ft)		314.26	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	47.43	Top Width (ft)		47.43	
Vel Total (ft/s)	5.12	Avg. Vel. (ft/s)		5.12	
Max Chl Dpth (ft)	8.41	Hydr. Depth (ft)		6.63	
Conv. Total (cfs)	50629.4	Conv. (cfs)		50629.4	
Length Wtd. (ft)	139.23	Wetted Per. (ft)		53.57	
Min Ch El (ft)	1331.58	Shear (lb/sq ft)		0.37	
Alpha	1.00	Stream Power (lb/ft s)		1.90	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		23.80	
C & E Loss (ft)	0.17	Cum SA (acres)		3.29	

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1340.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.53	Reach Len. (ft)	111.00	139.23	175.00
Crit W.S. (ft)		Flow Area (sq ft)		350.11	
E.G. Slope (ft/ft)	0.001829	Area (sq ft)		350.11	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	49.20	Top Width (ft)		49.20	
Vel Total (ft/s)	7.20	Avg. Vel. (ft/s)		7.20	
Max Chl Dpth (ft)	9.15	Hydr. Depth (ft)		7.12	
Conv. Total (cfs)	58932.1	Conv. (cfs)		58932.1	
Length Wtd. (ft)	139.23	Wetted Per. (ft)		55.88	
Min Ch El (ft)	1331.58	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)		5.15	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		26.72	
C & E Loss (ft)	0.34	Cum SA (acres)		3.45	

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.

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 24.9

INPUT
Description: No Ineffective Flow Area From Broadway Road Bridge
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4792.24	1343.6	4800.46	1343.27	4812.9	1343.13	4834.85	1342.64	4853.66	1342.98
4881.96	1343.2	4896.16	1342.94	4909.57	1342.5	4918.22	1341.73	4934.62	1340.95
4938.92	1340.8	4947.39	1341.22	4954.64	1338.09	4962.29	1334.13	4968.51	1331.77
4983.99	1331.5	5008.63	1331.28	5030.6	1331.11	5036.81	1330.99	5053.38	1338.26
5058.66	1340.3	5066.64	1340.95	5071.24	1341.68	5086.34	1341.21	5103.24	1341.44
5123.22	1342.6	5131.08	1343.02	5147.28	1343.52				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

4792.24 .04 4947.39 .03 5071.24 .04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4947.39	5071.24	202	198.35	195	.1	.3

Left Levee Station= 4947.39 Elevation= 1341.22
Right Levee Station= 5071.24 Elevation= 1341.8

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1341.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1341.59	Reach Len. (ft)	202.00	198.35	195.00
Crit W.S. (ft)	1334.49	Flow Area (sq ft)	9.89	933.84	
E.G. Slope (ft/ft)	0.000172	Area (sq ft)	9.89	933.84	
Q Total (cfs)	2300.00	Flow (cfs)	2.65	2297.35	
Top Width (ft)	146.91	Top Width (ft)	24.22	122.68	
Vel Total (ft/s)	2.44	Avg. Vel. (ft/s)	0.27	2.46	
Max Chl Dpth (ft)	10.50	Hydr. Depth (ft)	0.41	7.61	
Conv. Total (cfs)	175372.8	Conv. (cfs)	202.1	175170.8	
Length Wtd. (ft)	198.35	Wetted Per. (ft)	24.25	126.71	
Min Ch El (ft)	1330.99	Shear (lb/sq ft)	0.00	0.08	
Alpha	1.02	Stream Power (lb/ft s)	0.00	0.19	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.05	26.41	0.06
C & E Loss (ft)	0.01	Cum SA (acres)	0.20	3.25	0.17

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1340.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.030	
E.G. Elev (ft)	1340.19	Reach Len. (ft)	202.00	198.35	195.00
Crit W.S. (ft)	1333.84	Flow Area (sq ft)		774.25	
E.G. Slope (ft/ft)	0.000134	Area (sq ft)		774.25	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	108.25	Top Width (ft)		108.25	
Vel Total (ft/s)	2.08	Avg. Vel. (ft/s)		2.08	
Max Chl Dpth (ft)	9.13	Hydr. Depth (ft)		7.15	
Conv. Total (cfs)	139215.3	Conv. (cfs)		139215.3	
Length Wtd. (ft)	198.35	Wetted Per. (ft)		111.94	
Min Ch El (ft)	1330.99	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.12	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)		22.06	
C & E Loss (ft)	0.01	Cum SA (acres)		3.04	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1340.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.12	Reach Len. (ft)	202.00	198.35	195.00
Crit W.S. (ft)	1334.68	Flow Area (sq ft)		873.18	
E.G. Slope (ft/ft)	0.000249	Area (sq ft)		873.18	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	119.00	Top Width (ft)		119.00	
Vel Total (ft/s)	2.89	Avg. Vel. (ft/s)		2.89	
Max Chl Dpth (ft)	10.00	Hydr. Depth (ft)		7.34	
Conv. Total (cfs)	159807.2	Conv. (cfs)		159807.2	
Length Wtd. (ft)	198.35	Wetted Per. (ft)		122.94	
Min Ch El (ft)	1330.99	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.32	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		24.77	
C & E Loss (ft)	0.02	Cum SA (acres)		3.19	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 24.862

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

4733.8	1342.9	4773.25	1342.76	4830.89	1342.87	4889.92	1343.38	4900.86	1341.93
4911.87	1341.3	4921.84	1341.22	4931.75	1337.82	4946.77	1333.38	4952.24	1332.05
5003.75	1331.1	5015.73	1331.09	5043.09	1331.75	5063.56	1338.37	5074	1341.44
5081.9	1340.8	5101.23	1342.47	5118.67	1343.54				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4733.8	.04	4921.84	.03	5074	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4921.84	5074	728	737.91	746	.1	.3

Left Levee Station= 4921.84 Elevation= 1341.22
Right Levee Station= 5074 Elevation= 1341.44

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1341.50	Element			
Vel Head (ft)	0.06	Wt. n-Val.	0.040	0.030	0.040
E.G. Elev (ft)	1341.55	Reach Len. (ft)	728.00	737.91	746.00
Crit W.S. (ft)	1334.11	Flow Area (sq ft)	2.70	1216.01	5.79
E.G. Slope (ft/ft)	0.000093	Area (sq ft)	2.70	1216.01	5.79
Q Total (cfs)	2300.00	Flow (cfs)	0.33	2298.61	1.06
Top Width (ft)	181.54	Top Width (ft)	13.41	152.16	15.97
Vel Total (ft/s)	1.88	Avg. Vel. (ft/s)	0.12	1.89	0.18
Max Chl Dpth (ft)	10.41	Hydr. Depth (ft)	0.20	7.99	0.36
Conv. Total (cfs)	237911.3	Conv. (cfs)	34.5	237767.6	109.1
Length Wtd. (ft)	737.91	Wetted Per. (ft)	13.42	155.03	16.02
Min Ch El (ft)	1331.09	Shear (lb/sq ft)	0.00	0.05	0.00
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.09	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.02	21.51	0.05
C & E Loss (ft)	0.00	Cum SA (acres)	0.11	2.63	0.14

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1340.12	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
E.G. Elev (ft)	1340.16	Reach Len. (ft)	728.00	737.91	746.00
Crit W.S. (ft)	1333.57	Flow Area (sq ft)		1010.86	
E.G. Slope (ft/ft)	0.000079	Area (sq ft)		1010.86	
Q Total (cfs)	1610.00	Flow (cfs)		1610.00	
Top Width (ft)	144.45	Top Width (ft)		144.45	
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)		1.59	
Max Chl Dpth (ft)	9.03	Hydr. Depth (ft)		7.00	
Conv. Total (cfs)	181099.2	Conv. (cfs)		181099.2	
Length Wtd. (ft)	737.91	Wetted Per. (ft)		146.95	
Min Ch El (ft)	1331.09	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		17.99	
C & E Loss (ft)	0.00	Cum SA (acres)		2.47	

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1341.00	Element			
Vel Head (ft)	0.08	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.07	Reach Len. (ft)	728.00	737.91	746.00
Crit W.S. (ft)	1334.28	Flow Area (sq ft)		1140.04	
E.G. Slope (ft/ft)	0.000137	Area (sq ft)		1140.04	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	149.99	Top Width (ft)		149.99	
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)		2.21	
Max Chl Dpth (ft)	9.91	Hydr. Depth (ft)		7.60	
Conv. Total (cfs)	215639.9	Conv. (cfs)		215639.9	
Length Wtd. (ft)	737.91	Wetted Per. (ft)		152.76	
Min Ch El (ft)	1331.09	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		20.18	
C & E Loss (ft)	0.00	Cum SA (acres)		2.57	

CROSS SECTION RIVER: EMF
REACH: Reach 6 RS: 24.723

INPUT
Description: Upstream End of Reach 5, Downstream of Broadway
Channel
Q(D) =
3,100 cfs, Q(F) = 2,440 cfs & Q(E) = 3,120 cfs

Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4899.22	1345.2	4900.09	1344.88	4916.99	1344.2	4920.25	1343.65	4938.38	1337.83
4948.07	1334.4	4950.31	1334.05	4960.28	1331.26	4964.64	1329.52	4993.51	1328.84
5005.5	1329.2	5031.16	1329.89	5035.77	1330.79	5047.06	1333.7	5063.05	1337.08
5088.76	1342	5093.06	1342.67	5101.67	1343.33	5103.87	1342.85	5108.94	1343.52
5123.1	1343.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4899.22	.04	4916.99	.03	5101.67	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4916.99	5101.67	0	0	0	.1	.3

Left Levee Station= 4916.99 Elevation= 1344.2
Right Levee Station= 5101.67 Elevation= 1343.33

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1341.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.47	Reach Len. (ft)			
Crit W.S. (ft)	1333.16	Flow Area (sq ft)		1323.80	
E.G. Slope (ft/ft)	0.000135	Area (sq ft)		1323.80	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	158.20	Top Width (ft)		158.20	
Vel Total (ft/s)	2.34	Avg. Vel. (ft/s)		2.34	
Max Chl Dpth (ft)	12.54	Hydr. Depth (ft)		8.37	
Conv. Total (cfs)	266749.5	Conv. (cfs)		266749.5	
Length Wtd. (ft)		Wetted Per. (ft)		161.33	
Min Ch El (ft)	1328.84	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1340.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.030	
E.G. Elev (ft)	1340.07	Reach Len. (ft)			
Crit W.S. (ft)	1332.62	Flow Area (sq ft)		1113.42	
E.G. Slope (ft/ft)	0.000135	Area (sq ft)		1113.42	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	146.69	Top Width (ft)		146.69	
Vel Total (ft/s)	2.19	Avg. Vel. (ft/s)		2.19	
Max Chl Dpth (ft)	11.16	Hydr. Depth (ft)		7.59	
Conv. Total (cfs)	210347.7	Conv. (cfs)		210347.7	
Length Wtd. (ft)		Wetted Per. (ft)		149.47	
Min Ch El (ft)	1328.84	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1340.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.030	
E.G. Elev (ft)	1340.96	Reach Len. (ft)			
Crit W.S. (ft)	1333.18	Flow Area (sq ft)		1242.66	
E.G. Slope (ft/ft)	0.000163	Area (sq ft)		1242.66	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	

Top Width (ft)	153.86	Top Width (ft)	153.86
Vel Total (ft/s)	2.51	Avg. Vel. (ft/s)	2.51
Max Chl Dpth (ft)	12.02	Hydr. Depth (ft)	8.08
Conv. Total (cfs)	244597.7	Conv. (cfs)	244597.7
Length Wtd. (ft)		Wetted Per. (ft)	156.86
Min Ch El (ft)	1328.84	Shear (lb/sq ft)	0.08
Alpha	1.00	Stream Power (lb/ft s)	0.20
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

SUMMARY OF MANNING'S N VALUES

River:EMF

Reach	River Sta.	n1	n2	n3
Reach 6	27.39	.04	.03	.04
Reach 6	27.371	.04	.03	.04
Reach 6	27.295	.04	.03	.04
Reach 6	27.278	.04	.013	.04
Reach 6	27.274	.04	.013	.04
Reach 6	27.261	Culvert		
Reach 6	27.248	.04	.013	.04
Reach 6	27.244	.04	.03	.04
Reach 6	27.189	.04	.03	.04
Reach 6	27.095	.04	.03	.04
Reach 6	27	.04	.03	.04
Reach 6	26.905	.04	.03	.04
Reach 6	26.811	.04	.03	.04
Reach 6	26.762	.04	.03	.04
Reach 6	26.727	.035	.013	.035
Reach 6	26.722	.04	.013	.04
Reach 6	26.712	Culvert		
Reach 6	26.702	.04	.013	.04
Reach 6	26.697	.04	.03	.04
Reach 6	26.678	.04	.03	.04
Reach 6	26.595	.04	.03	.04
Reach 6	26.5	.04	.03	.04
Reach 6	26.385	.04	.03	.04
Reach 6	26.311	.04	.03	.04
Reach 6	26.228	.04	.03	.04
Reach 6	26.187	.04	.03	.04
Reach 6	26.171	.04	.035	.04
Reach 6	26.163	Bridge		
Reach 6	26.154	.04	.035	.04
Reach 6	26.133	.04	.03	.04
Reach 6	26.047	.04	.03	.04
Reach 6	25.939	.04	.03	.04
Reach 6	25.844	.04	.03	.04
Reach 6	25.749	.04	.03	.04
Reach 6	25.647	.04	.03	.04
Reach 6	25.598	.04	.03	.04
Reach 6	25.597	.04	.013	.04
Reach 6	25.578	.04	.013	.04
Reach 6	25.565	Culvert		
Reach 6	25.508	.04	.013	.04
Reach 6	25.49	.04	.03	.04
Reach 6	25.463	.04	.03	.04
Reach 6	25.4	.04	.03	.04
Reach 6	25.3	.04	.03	.04
Reach 6	25.2	.04	.03	.04
Reach 6	25.1	.04	.03	.04
Reach 6	25.028	.04	.03	.04
Reach 6	24.987	.04	.03	.04
Reach 6	24.957	.04	.03	.04
Reach 6	24.946	.04	.03	.04
Reach 6	24.936	Bridge		
Reach 6	24.926	.04	.03	.04

Reach 6	24.9	.04	.03	.04
Reach 6	24.862	.04	.03	.04
Reach 6	24.723	.04	.03	.04

SUMMARY OF REACH LENGTHS

River: EMF

Reach	River Sta.	Left	Channel	Right
Reach 6	27.39	100.04	100.04	100.04
Reach 6	27.371	405	403.94	402
Reach 6	27.295	88.7	88.7	88.7
Reach 6	27.278	30	19.5	15
Reach 6	27.274	138.89	138.89	138.89
Reach 6	27.261	Culvert		
Reach 6	27.248	8	18.04	35
Reach 6	27.244	290.11	290.11	290.11
Reach 6	27.189	500	500	500
Reach 6	27.095	500	500	500
Reach 6	27	500	500	500
Reach 6	26.905	500	500	500
Reach 6	26.811	256.96	256.96	256.96
Reach 6	26.762	271.3	271.3	271.3
Reach 6	26.727	40	23.4	5
Reach 6	26.722	108.83	108.83	108.83
Reach 6	26.712	Culvert		
Reach 6	26.702	5	26.06	45
Reach 6	26.697	100	100	100
Reach 6	26.678	439.1	439.1	439.1
Reach 6	26.595	500	500	500
Reach 6	26.5	608.1	608.1	608.1
Reach 6	26.385	391.9	391.9	391.9
Reach 6	26.311	430	438.08	445
Reach 6	26.228	221	216.32	212
Reach 6	26.187	120	81.22	45
Reach 6	26.171	88.95	88.95	88.95
Reach 6	26.163	Bridge		
Reach 6	26.154	82	115.08	145
Reach 6	26.133	448	454.54	461
Reach 6	26.047	550	570.34	588
Reach 6	25.939	500	500	500
Reach 6	25.844	500	500	500
Reach 6	25.749	551	537.93	527
Reach 6	25.647	279	266.89	264
Reach 6	25.598	1	1	1
Reach 6	25.597	112	96.74	76
Reach 6	25.578	348	370.09	397
Reach 6	25.565	Culvert		
Reach 6	25.508	88	94.43	101
Reach 6	25.49	142	141.76	142
Reach 6	25.463	345	334.63	323
Reach 6	25.4	528	528	528
Reach 6	25.3	528	528	528
Reach 6	25.2	528	528	528
Reach 6	25.1	375	377.6	380
Reach 6	25.028	215	220.26	226
Reach 6	24.987	165	158.45	155
Reach 6	24.957	89	56.56	25
Reach 6	24.946	103.9	103.9	103.9
Reach 6	24.936	Bridge		
Reach 6	24.926	111	139.23	175
Reach 6	24.9	202	198.35	195
Reach 6	24.862	728	737.91	746
Reach 6	24.723	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: EMF

Reach	River Sta.	Contr.	Expan.
Reach 6	27.39	.1	.3
Reach 6	27.371	.1	.3
Reach 6	27.295	.1	.3
Reach 6	27.278	.3	.5
Reach 6	27.274	.3	.5
Reach 6	27.261	Culvert	
Reach 6	27.248	.3	.5
Reach 6	27.244	.1	.3
Reach 6	27.189	.1	.3
Reach 6	27.095	.1	.3
Reach 6	27	.1	.3
Reach 6	26.905	.1	.3
Reach 6	26.811	.1	.3
Reach 6	26.762	.1	.3
Reach 6	26.727	.3	.5
Reach 6	26.722	.3	.5
Reach 6	26.712	Culvert	
Reach 6	26.702	.3	.5
Reach 6	26.697	.1	.3
Reach 6	26.678	.1	.3
Reach 6	26.595	.1	.3
Reach 6	26.5	.1	.3
Reach 6	26.385	.1	.3
Reach 6	26.311	.1	.3
Reach 6	26.228	.1	.3
Reach 6	26.187	.3	.5
Reach 6	26.171	.3	.5
Reach 6	26.163	Bridge	
Reach 6	26.154	.3	.5
Reach 6	26.133	.1	.3
Reach 6	26.047	.1	.3
Reach 6	25.939	.1	.3
Reach 6	25.844	.1	.3
Reach 6	25.749	.1	.3
Reach 6	25.647	.1	.3
Reach 6	25.598	.1	.3
Reach 6	25.597	.3	.5
Reach 6	25.578	.3	.5
Reach 6	25.565	Culvert	
Reach 6	25.508	.3	.5
Reach 6	25.49	.1	.3
Reach 6	25.463	.1	.3
Reach 6	25.4	.1	.3
Reach 6	25.3	.1	.3
Reach 6	25.2	.1	.3
Reach 6	25.1	.1	.3
Reach 6	25.028	.1	.3
Reach 6	24.987	.1	.3
Reach 6	24.957	.3	.5
Reach 6	24.946	.3	.5
Reach 6	24.936	Bridge	
Reach 6	24.926	.3	.5
Reach 6	24.9	.1	.3
Reach 6	24.862	.1	.3
Reach 6	24.723	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 6	27.39	900.00	1338.00	1346.24	1340.72	1346.29	0.000135	1.75	515.58	95.63	0.13
Reach 6	27.39	780.00	1338.00	1345.51	1340.51	1345.56	0.000141	1.73	449.80	86.85	0.13
Reach 6	27.39	920.00	1338.00	1347.03	1340.76	1347.07	0.000110	1.54	597.22	114.50	0.12

Reach 6	27.371	900.00	1338.02	1346.23	1340.69	1346.28	0.000121	1.64	547.14	101.96	0.13
Reach 6	27.371	780.00	1338.02	1345.50	1340.51	1345.55	0.000123	1.63	477.67	91.29	0.1[illegible]
Reach 6	27.371	920.00	1338.02	1347.03	1340.72	1347.06	0.000092	1.45	634.32	116.78	0.[illegible]
Reach 6	27.295	900.00	1337.80	1346.20	1340.43	1346.23	0.000090	1.49	604.18	104.53	0.1[illegible]
Reach 6	27.295	780.00	1337.80	1345.47	1340.24	1345.50	0.000098	1.47	529.43	99.74	0.11
Reach 6	27.295	920.00	1337.80	1347.00	1340.46	1347.03	0.000064	1.33	689.94	109.50	0.09
Reach 6	27.278	900.00	1337.39	1346.14		1346.22	0.000050	2.32	387.68	73.44	0.18
Reach 6	27.278	890.00	1337.39	1345.37		1345.48	0.000071	2.66	334.48	66.72	0.21
Reach 6	27.278	1110.00	1337.39	1346.92		1347.01	0.000054	2.47	448.66	82.34	0.19
Reach 6	27.274	900.00	1337.30	1345.27	1342.14	1346.02	0.000569	6.94	129.62	17.65	0.45
Reach 6	27.274	890.00	1337.30	1344.22	1342.09	1345.22	0.000847	8.00	111.20	17.43	0.56
Reach 6	27.274	1110.00	1337.30	1345.73	1342.81	1346.74	0.000735	8.06	137.73	17.75	0.51
Reach 6	27.261	Culvert									
Reach 6	27.248	900.00	1337.39	1344.78		1345.56	0.000612	7.11	126.66	17.48	0.47
Reach 6	27.248	890.00	1337.39	1343.37		1344.55	0.001081	8.71	102.22	17.27	0.63
Reach 6	27.248	1110.00	1337.39	1344.95		1346.09	0.000873	8.56	129.68	17.50	0.55
Reach 6	27.244	900.00	1337.80	1345.08		1345.24	0.000645	3.24	278.04	58.82	0.26
Reach 6	27.244	890.00	1337.80	1343.80		1344.07	0.001036	4.17	213.61	42.37	0.33
Reach 6	27.244	1110.00	1337.80	1345.40		1345.61	0.000836	3.73	297.30	62.03	0.30
Reach 6	27.189	1200.00	1337.78	1345.10		1345.15	0.000111	1.67	717.42	122.76	0.12
Reach 6	27.189	890.00	1337.78	1343.89		1343.93	0.000117	1.55	573.33	114.81	0.12
Reach 6	27.189	1110.00	1337.78	1345.47		1345.50	0.000079	1.45	762.95	125.16	0.10
Reach 6	27.095	1200.00	1337.86	1345.05	1339.91	1345.09	0.000110	1.66	724.89	124.57	0.12
Reach 6	27.095	890.00	1337.86	1343.83	1339.59	1343.87	0.000118	1.54	577.75	117.35	0.12
Reach 6	27.095	1110.00	1337.86	1345.43	1339.82	1345.46	0.000078	1.44	773.15	127.33	0.10
Reach 6	27	1200.00	1337.52	1345.00	1339.61	1345.04	0.000097	1.59	753.16	124.78	0.11
Reach 6	27	890.00	1337.52	1343.78	1339.28	1343.81	0.000102	1.47	605.04	117.99	0.11
Reach 6	27	1110.00	1337.52	1345.40	1339.51	1345.43	0.000068	1.38	803.17	126.80	0.10
Reach 6	26.905	1200.00	1337.56	1344.95	1339.55	1344.99	0.000100	1.61	747.62	125.61	0.12
Reach 6	26.905	890.00	1337.56	1343.73	1339.22	1343.76	0.000105	1.49	598.89	117.73	0.12
Reach 6	26.905	1110.00	1337.56	1345.36	1339.45	1345.39	0.000070	1.39	799.99	128.31	0.10
Reach 6	26.811	1200.00	1337.40	1344.90	1339.35	1344.94	0.000091	1.56	768.98	126.20	0.11
Reach 6	26.811	890.00	1337.40	1343.68	1339.02	1343.71	0.000095	1.44	619.41	118.37	0.11
Reach 6	26.811	1110.00	1337.40	1345.33	1339.25	1345.36	0.000064	1.35	823.41	129.19	0.09
Reach 6	26.762	1200.00	1337.15	1344.88	1339.30	1344.92	0.000094	1.57	765.14	127.58	0.11
Reach 6	26.762	890.00	1337.15	1343.65	1338.96	1343.69	0.000098	1.45	614.18	118.89	0.[illegible]
Reach 6	26.762	1110.00	1337.15	1345.31	1339.20	1345.34	0.000066	1.35	821.17	130.80	0[illegible]
Reach 6	26.727	1200.00	1337.30	1344.81	1339.86	1344.90	0.000042	2.32	517.45	87.86	0.17
Reach 6	26.727	890.00	1337.30	1343.60	1339.45	1343.67	0.000042	2.13	417.15	79.51	0.16
Reach 6	26.727	1110.00	1337.30	1345.27	1339.74	1345.33	0.000031	1.99	558.93	95.69	0.14
Reach 6	26.722	1200.00	1337.21	1344.66	1340.03	1344.86	0.000101	3.62	331.41	44.52	0.23
Reach 6	26.722	890.00	1337.21	1343.48	1339.52	1343.64	0.000094	3.19	279.09	44.51	0.22
Reach 6	26.722	1110.00	1337.21	1345.14	1339.89	1345.30	0.000071	3.14	353.18	44.52	0.20
Reach 6	26.712	Culvert									
Reach 6	26.702	1200.00	1337.17	1344.51		1344.72	0.000106	3.69	325.43	44.52	0.24
Reach 6	26.702	890.00	1337.17	1343.36		1343.53	0.000098	3.24	274.48	44.52	0.23
Reach 6	26.702	1110.00	1337.17	1345.04		1345.19	0.000074	3.18	349.09	46.13	0.20
Reach 6	26.697	1200.00	1337.18	1344.57		1344.65	0.000215	2.23	537.08	95.92	0.17
Reach 6	26.697	890.00	1337.18	1343.41		1343.48	0.000208	2.06	432.50	85.35	0.16
Reach 6	26.697	1110.00	1337.18	1345.09		1345.14	0.000147	1.89	587.85	101.86	0.14
Reach 6	26.678	1200.00	1337.17	1344.57	1339.33	1344.63	0.000134	1.84	653.26	111.24	0.13
Reach 6	26.678	890.00	1337.17	1343.41	1338.97	1343.45	0.000135	1.68	528.38	103.37	0.13
Reach 6	26.678	1110.00	1337.17	1345.09	1339.23	1345.12	0.000090	1.56	711.32	114.92	0.11
Reach 6	26.595	1200.00	1337.10	1344.53	1339.08	1344.57	0.000097	1.59	754.41	125.32	0.11
Reach 6	26.595	890.00	1337.10	1343.37	1338.76	1343.40	0.000098	1.45	612.41	118.11	0.11
Reach 6	26.595	1110.00	1337.10	1345.06	1338.99	1345.09	0.000064	1.35	821.34	128.55	0.09
Reach 6	26.5	1200.00	1336.94	1344.49	1338.94	1344.52	0.000092	1.56	767.79	125.84	0.11
Reach 6	26.5	890.00	1336.94	1343.32	1338.61	1343.35	0.000093	1.42	624.89	118.99	0.11
Reach 6	26.5	1110.00	1336.94	1345.03	1338.85	1345.06	0.000061	1.33	836.97	129.02	0.09
Reach 6	26.385	1200.00	1336.58	1344.43	1338.65	1344.47	0.000089	1.56	768.20	123.02	0.11
Reach 6	26.385	830.00	1336.58	1343.27	1338.24	1343.30	0.000076	1.32	629.67	115.78	0.10
Reach 6	26.385	1080.00	1336.58	1345.00	1338.52	1345.02	0.000056	1.29	838.51	126.53	0.09
Reach 6	26.311	1200.00	1336.19	1344.40	1338.49	1344.44	0.000084	1.52	790.99	126.72	0.11
Reach 6	26.311	830.00	1336.19	1343.24	1338.08	1343.27	0.000071	1.28	648.93	119.11	0.10
Reach 6	26.311	1080.00	1336.19	1344.98	1338.36	1345.00	0.000052	1.25	865.03	130.51	0.09
Reach 6	26.228	1200.00	1336.68	1344.36	1338.79	1344.40	0.000098	1.61	744.54	122.77	0.12
Reach 6	26.228	830.00	1336.68	1343.21	1338.39	1343.24	0.000085	1.37	607.66	115.53	0.10
Reach 6	26.228	1080.00	1336.68	1344.95	1338.66	1344.97	0.000060	1.32	818.41	126.53	0.09
Reach 6	26.187	1200.00	1336.77	1344.35	1338.65	1344.37	0.000068	1.36	879.20	142.06	0.10
Reach 6	26.187	1620.00	1336.77	1343.11	1339.00	1343.20	0.000237	2.28	709.01	134.58	0.[illegible]
Reach 6	26.187	1600.00	1336.77	1344.91	1338.98	1344.96	0.000093	1.67	960.88	145.57	0[illegible]

Reach 6	26.171	1200.00	1336.67	1344.34	1338.44	1344.37	0.000080	1.30	919.66	142.41	0.09
Reach 6	26.171	1620.00	1336.67	1343.10	1338.78	1343.17	0.000275	2.17	746.74	135.92	0.16
Reach 6	26.171	1600.00	1336.67	1344.91	1338.77	1344.95	0.000111	1.60	1001.14	145.37	0.11
Reach 6	26.163	Bridge									
Reach 6	26.154	1200.00	1336.58	1344.15		1344.17	0.000081	1.31	917.82	141.55	0.09
Reach 6	26.154	1620.00	1336.58	1342.87		1342.94	0.000282	2.19	740.73	135.49	0.16
Reach 6	26.154	1600.00	1336.58	1344.70		1344.74	0.000112	1.60	997.28	144.19	0.11
Reach 6	26.133	1200.00	1336.51	1344.14		1344.16	0.000056	1.26	953.19	149.72	0.09
Reach 6	26.133	1620.00	1336.51	1342.84		1342.91	0.000201	2.12	763.55	142.84	0.16
Reach 6	26.133	1600.00	1336.51	1344.69		1344.73	0.000078	1.54	1036.97	152.82	0.10
Reach 6	26.047	1200.00	1336.61	1344.11	1338.35	1344.14	0.000060	1.28	936.58	151.74	0.09
Reach 6	26.047	1620.00	1336.61	1342.74	1338.69	1342.82	0.000222	2.20	736.79	141.29	0.17
Reach 6	26.047	1600.00	1336.61	1344.65	1338.67	1344.69	0.000085	1.57	1020.63	157.93	0.11
Reach 6	25.939	1200.00	1336.46	1344.08	1338.15	1344.10	0.000052	1.22	985.02	153.60	0.08
Reach 6	25.939	1620.00	1336.46	1342.62	1338.48	1342.69	0.000202	2.11	767.15	145.42	0.16
Reach 6	25.939	1600.00	1336.46	1344.61	1338.46	1344.65	0.000073	1.50	1067.59	157.72	0.10
Reach 6	25.844	1200.00	1336.30	1344.06	1338.13	1344.08	0.000053	1.22	980.59	155.35	0.09
Reach 6	25.844	1620.00	1336.30	1342.52	1338.46	1342.59	0.000218	2.16	749.11	145.44	0.17
Reach 6	25.844	1600.00	1336.30	1344.57	1338.45	1344.61	0.000075	1.51	1062.21	158.70	0.10
Reach 6	25.749	1200.00	1336.53	1344.03	1338.21	1344.05	0.000057	1.26	949.29	150.97	0.09
Reach 6	25.749	1620.00	1336.53	1342.39	1338.55	1342.47	0.000251	2.28	710.00	141.51	0.18
Reach 6	25.749	1600.00	1336.53	1344.53	1338.53	1344.57	0.000080	1.56	1026.67	153.85	0.11
Reach 6	25.647	1200.00	1336.60	1343.99	1338.48	1344.02	0.000068	1.34	894.67	147.66	0.10
Reach 6	25.647	1620.00	1336.60	1342.21	1338.82	1342.31	0.000336	2.52	642.13	137.07	0.21
Reach 6	25.647	1600.00	1336.60	1344.48	1338.80	1344.52	0.000095	1.65	968.12	150.60	0.11
Reach 6	25.598	2000.00	1335.97	1343.85	1338.76	1343.97	0.000266	2.80	715.37	198.92	0.19
Reach 6	25.598	1610.00	1335.97	1342.07	1338.40	1342.21	0.000423	3.03	530.79	100.14	0.23
Reach 6	25.598	2520.00	1335.97	1344.29	1339.19	1344.46	0.000350	3.30	763.16	236.73	0.22
Reach 6	25.597	2000.00	1335.97	1343.78	1338.85	1343.96	0.000076	3.46	578.79	161.71	0.22
Reach 6	25.597	1610.00	1335.97	1342.00	1338.47	1342.20	0.000113	3.61	445.59	74.93	0.26
Reach 6	25.597	2520.00	1335.97	1344.18	1339.31	1344.45	0.000103	4.14	609.31	199.74	0.26
Reach 6	25.578	2000.00	1335.86	1343.52	1339.45	1343.89	0.000174	4.92	406.19	53.69	0.32
Reach 6	25.578	1610.00	1335.86	1341.70	1338.98	1342.12	0.000263	5.22	308.44	53.68	0.38
Reach 6	25.578	2520.00	1335.86	1343.79	1340.03	1344.35	0.000248	5.99	420.84	53.69	0.38
Reach 6	25.565	Culvert									
Reach 6	25.508	2000.00	1335.30	1342.93		1343.31	0.000171	4.90	408.30	53.69	0.31
Reach 6	25.508	1610.00	1335.30	1341.35		1341.74	0.000225	4.98	323.37	53.68	0.36
Reach 6	25.508	2520.00	1335.30	1342.82		1343.43	0.000284	6.26	402.30	53.69	0.40
Reach 6	25.49	2000.00	1335.32	1342.96	1338.62	1343.22	0.000641	4.05	493.73	74.91	0.28
Reach 6	25.49	1610.00	1335.32	1341.37	1338.20	1341.65	0.000870	4.24	380.03	68.67	0.32
Reach 6	25.49	2520.00	1335.32	1342.87	1339.15	1343.29	0.001062	5.18	486.76	74.74	0.36
Reach 6	25.463	2000.00	1334.94	1342.98	1338.19	1343.12	0.000317	3.00	667.76	102.23	0.21
Reach 6	25.463	1610.00	1334.94	1341.36	1337.82	1341.52	0.000471	3.18	507.02	96.37	0.24
Reach 6	25.463	2520.00	1334.94	1342.90	1338.62	1343.13	0.000522	3.82	659.41	101.93	0.26
Reach 6	25.4	2300.00	1335.39	1342.91	1338.07	1343.02	0.000257	2.66	864.98	138.85	0.19
Reach 6	25.4	1610.00	1335.39	1341.28	1337.54	1341.38	0.000300	2.49	647.06	129.13	0.20
Reach 6	25.4	2520.00	1335.39	1342.83	1338.22	1342.97	0.000321	2.95	854.06	138.37	0.21
Reach 6	25.3	2300.00	1334.14	1342.82	1336.97	1342.90	0.000170	2.34	982.67	139.45	0.16
Reach 6	25.3	1610.00	1334.14	1341.18	1336.43	1341.25	0.000178	2.11	761.24	131.02	0.15
Reach 6	25.3	2520.00	1334.14	1342.71	1337.14	1342.82	0.000213	2.60	968.42	138.95	0.17
Reach 6	25.2	2300.00	1333.22	1342.74	1336.20	1342.82	0.000140	2.20	1046.86	141.60	0.14
Reach 6	25.2	1610.00	1333.22	1341.11	1335.64	1341.16	0.000138	1.95	823.67	131.12	0.14
Reach 6	25.2	2520.00	1333.22	1342.62	1336.37	1342.71	0.000177	2.45	1029.66	140.80	0.16
Reach 6	25.1	2300.00	1332.84	1342.67	1336.01	1342.74	0.000140	2.20	1045.42	140.32	0.14
Reach 6	25.1	1610.00	1332.84	1341.03	1335.45	1341.09	0.000134	1.95	825.53	129.07	0.14
Reach 6	25.1	2520.00	1332.84	1342.53	1336.18	1342.62	0.000177	2.46	1025.59	139.29	0.16
Reach 6	25.028	2300.00	1332.55	1342.63	1335.51	1342.69	0.000114	2.06	1117.69	200.27	0.13
Reach 6	25.028	1610.00	1332.55	1340.99	1334.93	1341.05	0.000109	1.81	890.46	133.82	0.12
Reach 6	25.028	2520.00	1332.55	1342.47	1335.68	1342.56	0.000146	2.30	1095.77	173.97	0.15
Reach 6	24.987	2300.00	1332.02	1342.60	1335.16	1342.67	0.000110	2.04	1129.06	196.28	0.13
Reach 6	24.987	1610.00	1332.02	1340.97	1334.56	1341.02	0.000101	1.78	905.76	131.37	0.12
Reach 6	24.987	2520.00	1332.02	1342.44	1335.33	1342.52	0.000140	2.28	1106.14	141.06	0.14
Reach 6	24.957	2300.00	1332.02	1342.42	1336.23	1342.62	0.000444	3.61	636.66	93.26	0.24
Reach 6	24.957	1610.00	1332.02	1340.83	1335.37	1340.98	0.000326	3.14	512.40	72.79	0.21
Reach 6	24.957	2520.00	1332.02	1342.21	1336.47	1342.47	0.000529	4.08	617.76	85.58	0.27
Reach 6	24.946	2300.00	1331.70	1341.99	1337.30	1342.50	0.001174	5.70	403.81	58.12	0.38
Reach 6	24.946	1610.00	1331.70	1340.52	1336.19	1340.89	0.000884	4.90	328.50	47.51	0.33
Reach 6	24.946	2520.00	1331.70	1341.62	1337.60	1342.30	0.001553	6.58	382.80	54.46	0.44
Reach 6	24.936	Bridge									
Reach 6	24.926	2300.00	1331.58	1341.31		1341.88	0.001297	6.07	379.16	53.41	0.40
Reach 6	24.926	1610.00	1331.58	1339.99		1340.40	0.001011	5.12	314.26	47.43	0.35

Reach 6	24.926	2520.00	1331.58	1340.73		1341.53	0.001829	7.20	350.11	49.20	0.48
Reach 6	24.9	2300.00	1330.99	1341.49	1334.49	1341.59	0.000172	2.46	943.73	146.91	0[illegible]
Reach 6	24.9	1610.00	1330.99	1340.12	1333.84	1340.19	0.000134	2.08	774.25	108.25	0[illegible]
Reach 6	24.9	2520.00	1330.99	1340.99	1334.68	1341.12	0.000249	2.89	873.18	119.00	0.1[illegible]
Reach 6	24.862	2300.00	1331.09	1341.50	1334.11	1341.55	0.000093	1.89	1224.50	181.54	0.12
Reach 6	24.862	1610.00	1331.09	1340.12	1333.57	1340.16	0.000079	1.59	1010.86	144.45	0.11
Reach 6	24.862	2520.00	1331.09	1341.00	1334.28	1341.07	0.000137	2.21	1140.04	149.99	0.14
Reach 6	24.723	3100.00	1328.84	1341.38	1333.16	1341.47	0.000135	2.34	1323.80	158.20	0.14
Reach 6	24.723	2440.00	1328.84	1340.00	1332.62	1340.07	0.000135	2.19	1113.42	146.69	0.14
Reach 6	24.723	3120.00	1328.84	1340.86	1333.18	1340.96	0.000163	2.51	1242.66	153.86	0.16

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach 6	27.39	1346.29	1346.24	0.05	0.01	0.00		900.00		95.63
Reach 6	27.39	1345.56	1345.51	0.05	0.01	0.00		780.00		86.85
Reach 6	27.39	1347.07	1347.03	0.04	0.01	0.00		920.00		114.50
Reach 6	27.371	1346.28	1346.23	0.04	0.04	0.00		900.00		101.96
Reach 6	27.371	1345.55	1345.50	0.04	0.04	0.00		780.00		91.29
Reach 6	27.371	1347.06	1347.03	0.03	0.03	0.00		920.00		116.78
Reach 6	27.295	1346.23	1346.20	0.03	0.01	0.00		900.00		104.53
Reach 6	27.295	1345.50	1345.47	0.03	0.01	0.01		780.00		99.74
Reach 6	27.295	1347.03	1347.00	0.03	0.01	0.01		920.00		109.50
Reach 6	27.278	1346.22	1346.14	0.08	0.00	0.20		900.00		73.44
Reach 6	27.278	1345.48	1345.37	0.11	0.00	0.27		890.00		66.72
Reach 6	27.278	1347.01	1346.92	0.10	0.00	0.27		1110.00		82.34
Reach 6	27.274	1346.02	1345.27	0.75				900.00		17.65
Reach 6	27.274	1345.22	1344.22	0.99				890.00		17.43
Reach 6	27.274	1346.74	1345.73	1.01				1110.00		17.75
Reach 6	27.261	Culvert								
Reach 6	27.248	1345.56	1344.78	0.78	0.01	0.31		900.00		17.48
Reach 6	27.248	1344.55	1343.37	1.18	0.02	0.45		890.00		17.27
Reach 6	27.248	1346.09	1344.95	1.14	0.02	0.46		1110.00		17.50
Reach 6	27.244	1345.24	1345.08	0.16	0.06	0.04		900.00		58.82
Reach 6	27.244	1344.07	1343.80	0.27	0.08	0.07		890.00		42.37
Reach 6	27.244	1345.61	1345.40	0.22	0.05	0.06		1110.00		62.03
Reach 6	27.189	1345.15	1345.10	0.04	0.06	0.00		1200.00		122.76
Reach 6	27.189	1343.93	1343.89	0.04	0.06	0.00		890.00		114.81
Reach 6	27.189	1345.50	1345.47	0.03	0.04	0.00		1110.00		125.16
Reach 6	27.095	1345.09	1345.05	0.04	0.05	0.00		1200.00		124.57
Reach 6	27.095	1343.87	1343.83	0.04	0.05	0.00		890.00		117.35
Reach 6	27.095	1345.46	1345.43	0.03	0.04	0.00		1110.00		127.33
Reach 6	27	1345.04	1345.00	0.04	0.05	0.00		1200.00		124.78
Reach 6	27	1343.81	1343.78	0.03	0.05	0.00		890.00		117.99
Reach 6	27	1345.43	1345.40	0.03	0.03	0.00		1110.00		126.80
Reach 6	26.905	1344.99	1344.95	0.04	0.05	0.00		1200.00		125.61
Reach 6	26.905	1343.76	1343.73	0.03	0.05	0.00		890.00		117.73
Reach 6	26.905	1345.39	1345.36	0.03	0.03	0.00		1110.00		128.31
Reach 6	26.811	1344.94	1344.90	0.04	0.02	0.00		1200.00		126.20
Reach 6	26.811	1343.71	1343.68	0.03	0.02	0.00		890.00		118.37
Reach 6	26.811	1345.36	1345.33	0.03	0.02	0.00		1110.00		129.19
Reach 6	26.762	1344.92	1344.88	0.04	0.02	0.00		1200.00		127.58
Reach 6	26.762	1343.69	1343.65	0.03	0.02	0.00		890.00		118.89
Reach 6	26.762	1345.34	1345.31	0.03	0.01	0.00		1110.00		130.80
Reach 6	26.727	1344.90	1344.81	0.08	0.00	0.04		1200.00		87.86
Reach 6	26.727	1343.67	1343.60	0.07	0.00	0.03		890.00		79.51
Reach 6	26.727	1345.33	1345.27	0.06	0.00	0.03		1110.00		95.69
Reach 6	26.722	1344.86	1344.66	0.20				1200.00		44.52
Reach 6	26.722	1343.64	1343.48	0.16				890.00		44.51
Reach 6	26.722	1345.30	1345.14	0.15				1110.00		44.52
Reach 6	26.712	Culvert								
Reach 6	26.702	1344.72	1344.51	0.21	0.00	0.07		1200.00		44.52
Reach 6	26.702	1343.53	1343.36	0.16	0.00	0.05		890.00		44.52
Reach 6	26.702	1345.19	1345.04	0.16	0.00	0.05		1109.99	0.01	46.13
Reach 6	26.697	1344.65	1344.57	0.08	0.02	0.01		1200.00		95.92
Reach 6	26.697	1343.48	1343.41	0.07	0.02	0.01		890.00		85.35
Reach 6	26.697	1345.14	1345.09	0.06	0.01	0.01		1110.00		101.86
Reach 6	26.678	1344.63	1344.57	0.05	0.05	0.00		1200.00		111.24
Reach 6	26.678	1343.45	1343.41	0.04	0.05	0.00		890.00		103.37
Reach 6	26.678	1345.12	1345.09	0.04	0.03	0.00		1110.00		114.92

Reach 6	26.595	1344.57	1344.53	0.04	0.05	0.00	1200.00	125.32
Reach 6	26.595	1343.40	1343.37	0.03	0.05	0.00	890.00	118.11
Reach 6	26.595	1345.09	1345.06	0.03	0.03	0.00	1110.00	128.55
Reach 6	26.5	1344.52	1344.49	0.04	0.05	0.00	1200.00	125.84
Reach 6	26.5	1343.35	1343.32	0.03	0.05	0.00	890.00	118.99
Reach 6	26.5	1345.06	1345.03	0.03	0.04	0.00	1110.00	129.02
Reach 6	26.385	1344.47	1344.43	0.04	0.03	0.00	1200.00	123.02
Reach 6	26.385	1343.30	1343.27	0.03	0.03	0.00	830.00	115.78
Reach 6	26.385	1345.02	1345.00	0.03	0.02	0.00	1080.00	126.53
Reach 6	26.311	1344.44	1344.40	0.04	0.04	0.00	1200.00	126.72
Reach 6	26.311	1343.27	1343.24	0.03	0.03	0.00	830.00	119.11
Reach 6	26.311	1345.00	1344.98	0.02	0.02	0.00	1080.00	130.51
Reach 6	26.228	1344.40	1344.36	0.04	0.02	0.00	1200.00	122.77
Reach 6	26.228	1343.24	1343.21	0.03	0.03	0.01	830.00	115.53
Reach 6	26.228	1344.97	1344.95	0.03	0.02	0.00	1080.00	126.53
Reach 6	26.187	1344.37	1344.35	0.03	0.01	0.00	1200.00	142.06
Reach 6	26.187	1343.20	1343.11	0.08	0.02	0.00	1620.00	134.58
Reach 6	26.187	1344.96	1344.91	0.04	0.01	0.00	1600.00	145.57
Reach 6	26.171	1344.37	1344.34	0.03			1200.00	142.41
Reach 6	26.171	1343.17	1343.10	0.07			1620.00	135.92
Reach 6	26.171	1344.95	1344.91	0.04			1600.00	145.37
Reach 6	26.163	Bridge						
Reach 6	26.154	1344.17	1344.15	0.03	0.01	0.00	1200.00	141.55
Reach 6	26.154	1342.94	1342.87	0.07	0.03	0.00	1620.00	135.49
Reach 6	26.154	1344.74	1344.70	0.04	0.01	0.00	1600.00	144.19
Reach 6	26.133	1344.16	1344.14	0.02	0.03	0.00	1200.00	149.72
Reach 6	26.133	1342.91	1342.84	0.07	0.10	0.00	1620.00	142.84
Reach 6	26.133	1344.73	1344.69	0.04	0.04	0.00	1600.00	152.82
Reach 6	26.047	1344.14	1344.11	0.03	0.03	0.00	1200.00	151.74
Reach 6	26.047	1342.82	1342.74	0.08	0.12	0.00	1620.00	141.29
Reach 6	26.047	1344.69	1344.65	0.04	0.04	0.00	1600.00	157.93
Reach 6	25.939	1344.10	1344.08	0.02	0.03	0.00	1200.00	153.60
Reach 6	25.939	1342.69	1342.62	0.07	0.10	0.00	1620.00	145.42
Reach 6	25.939	1344.65	1344.61	0.03	0.04	0.00	1600.00	157.72
Reach 6	25.844	1344.08	1344.06	0.02	0.03	0.00	1200.00	155.35
Reach 6	25.844	1342.59	1342.52	0.07	0.12	0.00	1620.00	145.44
Reach 6	25.844	1344.61	1344.57	0.04	0.04	0.00	1600.00	158.70
Reach 6	25.749	1344.05	1344.03	0.02	0.03	0.00	1200.00	150.97
Reach 6	25.749	1342.47	1342.39	0.08	0.16	0.00	1620.00	141.51
Reach 6	25.749	1344.57	1344.53	0.04	0.05	0.00	1600.00	153.85
Reach 6	25.647	1344.02	1343.99	0.03	0.04	0.01	1200.00	147.66
Reach 6	25.647	1342.31	1342.21	0.10	0.10	0.00	1620.00	137.07
Reach 6	25.647	1344.52	1344.48	0.04	0.05	0.01	1600.00	150.60
Reach 6	25.598	1343.97	1343.85	0.12	0.00	0.01	2000.00	198.92
Reach 6	25.598	1342.21	1342.07	0.14	0.00	0.01	1610.00	100.14
Reach 6	25.598	1344.46	1344.29	0.17	0.00	0.01	2520.00	236.73
Reach 6	25.597	1343.96	1343.78	0.19	0.01	0.06	2000.00	161.71
Reach 6	25.597	1342.20	1342.00	0.20	0.02	0.07	1610.00	74.93
Reach 6	25.597	1344.45	1344.18	0.27	0.01	0.09	2520.00	199.74
Reach 6	25.578	1343.89	1343.52	0.38			2000.00	53.69
Reach 6	25.578	1342.12	1341.70	0.42			1610.00	53.68
Reach 6	25.578	1344.35	1343.79	0.56			2520.00	53.69
Reach 6	25.565	Culvert						
Reach 6	25.508	1343.31	1342.93	0.37	0.03	0.06	2000.00	53.69
Reach 6	25.508	1341.74	1341.35	0.38	0.04	0.05	1610.00	53.68
Reach 6	25.508	1343.43	1342.82	0.61	0.05	0.10	2520.00	53.69
Reach 6	25.49	1343.22	1342.96	0.25	0.06	0.03	2000.00	74.91
Reach 6	25.49	1341.65	1341.37	0.28	0.09	0.04	1610.00	68.67
Reach 6	25.49	1343.29	1342.87	0.42	0.10	0.06	2520.00	74.74
Reach 6	25.463	1343.12	1342.98	0.14	0.09	0.01	2000.00	102.23
Reach 6	25.463	1341.52	1341.36	0.16	0.12	0.02	1610.00	96.37
Reach 6	25.463	1343.13	1342.90	0.23	0.13	0.03	2520.00	101.93
Reach 6	25.4	1343.02	1342.91	0.11	0.11	0.01	2300.00	138.85
Reach 6	25.4	1341.38	1341.28	0.10	0.12	0.01	1610.00	129.13
Reach 6	25.4	1342.97	1342.83	0.14	0.14	0.01	2520.00	138.37
Reach 6	25.3	1342.90	1342.82	0.09	0.08	0.00	2300.00	139.45
Reach 6	25.3	1341.25	1341.18	0.07	0.08	0.00	1610.00	131.02
Reach 6	25.3	1342.82	1342.71	0.11	0.10	0.00	2520.00	138.95
Reach 6	25.2	1342.82	1342.74	0.07	0.07	0.00	2300.00	141.60
Reach 6	25.2	1341.16	1341.11	0.06	0.07	0.00	1610.00	131.12
Reach 6	25.2	1342.71	1342.62	0.09	0.09	0.00	2520.00	140.80

Reach 6	25.1	1342.74	1342.67	0.08	0.05	0.00		2300.00		140.32
Reach 6	25.1	1341.09	1341.03	0.06	0.05	0.00		1610.00		129.07
Reach 6	25.1	1342.62	1342.53	0.09	0.06	0.00		2520.00		139.29
Reach 6	25.028	1342.69	1342.63	0.07	0.02	0.00		2300.00		200.27
Reach 6	25.028	1341.05	1340.99	0.05	0.02	0.00		1610.00		133.82
Reach 6	25.028	1342.56	1342.47	0.08	0.03	0.00		2520.00		173.97
Reach 6	24.987	1342.67	1342.60	0.06	0.03	0.01	0.01	2299.99		196.28
Reach 6	24.987	1341.02	1340.97	0.05	0.03	0.01		1610.00		131.37
Reach 6	24.987	1342.52	1342.44	0.08	0.04	0.02		2520.00		141.06
Reach 6	24.957	1342.62	1342.42	0.20	0.04	0.09		2300.00		93.26
Reach 6	24.957	1340.98	1340.83	0.15	0.03	0.07		1610.00		72.79
Reach 6	24.957	1342.47	1342.21	0.26	0.05	0.12		2520.00		85.58
Reach 6	24.946	1342.50	1341.99	0.50				2300.00		58.12
Reach 6	24.946	1340.89	1340.52	0.37				1610.00		47.51
Reach 6	24.946	1342.30	1341.62	0.67				2520.00		54.46
Reach 6	24.936	Bridge								
Reach 6	24.926	1341.88	1341.31	0.57	0.05	0.24		2300.00		53.41
Reach 6	24.926	1340.40	1339.99	0.41	0.04	0.17		1610.00		47.43
Reach 6	24.926	1341.53	1340.73	0.80	0.07	0.34		2520.00		49.20
Reach 6	24.9	1341.59	1341.49	0.09	0.02	0.01	2.65	2297.35		146.91
Reach 6	24.9	1340.19	1340.12	0.07	0.02	0.01		1610.00		108.25
Reach 6	24.9	1341.12	1340.99	0.13	0.04	0.02		2520.00		119.00
Reach 6	24.862	1341.55	1341.50	0.06	0.08	0.00	0.33	2298.61	1.06	181.54
Reach 6	24.862	1340.16	1340.12	0.04	0.08	0.00		1610.00		144.45
Reach 6	24.862	1341.07	1341.00	0.08	0.11	0.00		2520.00		149.99
Reach 6	24.723	1341.47	1341.38	0.09				3100.00		158.20
Reach 6	24.723	1340.07	1340.00	0.07				2440.00		146.69
Reach 6	24.723	1340.96	1340.86	0.10				3120.00		153.86

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : REACH6

River: EMF Reach: Reach 6 RS: 27.278 Profile: Design
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: EMF Reach: Reach 6 RS: 27.278 Profile: Future
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: EMF Reach: Reach 6 RS: 27.278 Profile: Existing
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: EMF Reach: Reach 6 RS: 27.261 Profile: Design Culv: Culvert #1
Note - The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.
River: EMF Reach: Reach 6 RS: 27.261 Profile: Future Culv: Culvert #1
Note - The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.
River: EMF Reach: Reach 6 RS: 27.261 Profile: Existing Culv: Culvert #1
Note - The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.
River: EMF Reach: Reach 6 RS: 27.248 Profile: Design
Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: EMF Reach: Reach 6 RS: 27.248 Profile: Future
Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: EMF Reach: Reach 6 RS: 27.248 Profile: Existing
Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: EMF Reach: Reach 6 RS: 27.244 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 27.244 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 27.244 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 26.762 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 26.762 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 26.762 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 26.727 Profile: Design

Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 26.727 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 26.727 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 26.712 Profile: Design Culv: Culvert #1
Note - The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.
River: EMF Reach: Reach 6 RS: 26.712 Profile: Future Culv: Culvert #1
Note - The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.
River: EMF Reach: Reach 6 RS: 26.712 Profile: Existing Culv: Culvert #1
Note - The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.
River: EMF Reach: Reach 6 RS: 26.702 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 26.702 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 26.702 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 25.598 Profile: Design
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: EMF Reach: Reach 6 RS: 25.598 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 25.598 Profile: Existing
Warning - Divided flow computed for this cross-section.
Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: EMF Reach: Reach 6 RS: 25.597 Profile: Design
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: EMF Reach: Reach 6 RS: 25.597 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 25.597 Profile: Existing
Warning - Divided flow computed for this cross-section.
Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: EMF Reach: Reach 6 RS: 25.565 Profile: Design Culv: Culvert #1
Note - The culvert inlet is submerged and the culvert flows full over part or all of its length. Therefore, the culvert inlet equations are not valid and the supercritical result has been discarded. The outlet answer will be used.
River: EMF Reach: Reach 6 RS: 25.565 Profile: Existing Culv: Culvert #1
Note - The culvert inlet is submerged and the culvert flows full over part or all of its length. Therefore, the culvert inlet equations are not valid and the supercritical result has been discarded. The outlet answer will be used.
River: EMF Reach: Reach 6 RS: 25.508 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 25.508 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 25.508 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 25.028 Profile: Design
Warning - The cross-section end points had to be extended vertically for the computed water surface.
River: EMF Reach: Reach 6 RS: 25.028 Profile: Existing
Warning - The cross-section end points had to be extended vertically for the computed water surface.
River: EMF Reach: Reach 6 RS: 24.987 Profile: Design
Warning - Divided flow computed for this cross-section.
Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: EMF Reach: Reach 6 RS: 24.987 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 24.987 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 24.957 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 24.957 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 24.957 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 24.946 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 24.946 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 24.946 Profile: Existing

Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 24.936 Profile: Design 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.
River: EMF Reach: Reach 6 RS: 24.936 Profile: Future 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.
River: EMF Reach: Reach 6 RS: 24.936 Profile: Existing 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.
River: EMF Reach: Reach 6 RS: 24.926 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 24.926 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 6 RS: 24.926 Profile: Existing
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.

HEC-RAS Plan: Reach 5 River: EMF Reach: Reach 5

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 5	24.723	3100.00	1328.84	1341.38	1333.17	1341.47	0.000135	2.34	1324.24	158.22	0.14
Reach 5	24.723	2440.00	1328.84	1340.00	1332.63	1340.08	0.000134	2.19	1113.73	146.71	0.14
Reach 5	24.723	3120.00	1328.84	1340.86	1333.19	1340.96	0.000163	2.51	1243.17	153.89	0.16
Reach 5	24.621	3100.00	1329.41	1341.30	1334.18	1341.36	0.000282	1.97	1571.92	232.92	0.13
Reach 5	24.621	2440.00	1329.41	1339.91	1333.75	1339.97	0.000287	1.91	1277.92	201.40	0.13
Reach 5	24.621	3120.00	1329.41	1340.76	1334.19	1340.83	0.000331	2.15	1453.43	213.71	0.15
Reach 5	24.535	3100.00	1329.50	1341.24	1333.76	1341.27	0.000124	1.42	2180.84	285.49	0.09
Reach 5	24.535	2440.00	1329.50	1339.84	1333.36	1339.87	0.000139	1.36	1792.12	272.58	0.09
Reach 5	24.535	3120.00	1329.50	1340.69	1333.77	1340.72	0.000157	1.54	2024.56	280.37	0.10
Reach 5	24.454	3100.00	1332.11	1341.15	1336.08	1341.19	0.000328	1.62	1914.41	427.85	0.13
Reach 5	24.454	2440.00	1332.11	1339.73	1335.72	1339.78	0.000373	1.72	1414.70	316.86	0.14
Reach 5	24.454	3120.00	1332.11	1340.57	1336.09	1340.62	0.000402	1.85	1687.49	360.17	0.15
Reach 5	24.32	3100.00	1330.52	1340.95	1334.71	1340.99	0.000232	1.57	1974.08	356.49	0.12
Reach 5	24.32	2440.00	1330.52	1339.49	1334.27	1339.53	0.000326	1.65	1476.78	319.54	0.14
Reach 5	24.32	3120.00	1330.52	1340.31	1334.72	1340.36	0.000333	1.78	1748.97	342.94	0.14
Reach 5	24.247	3100.00	1329.56	1340.90	1334.38	1340.92	0.000124	1.22	2538.71	418.44	0.09
Reach 5	24.247	2440.00	1329.56	1339.41	1333.78	1339.44	0.000176	1.26	1933.39	394.45	0.10
Reach 5	24.247	3120.00	1329.56	1340.23	1334.39	1340.26	0.000178	1.38	2262.42	407.93	0.10
Reach 5	24.13	3100.00	1330.19	1340.79	1334.49	1340.82	0.000218	1.46	2128.09	411.25	0.11
Reach 5	24.13	2440.00	1330.19	1339.24	1334.07	1339.28	0.000379	1.61	1513.72	380.38	0.14
Reach 5	24.13	3120.00	1330.19	1340.07	1334.52	1340.11	0.000347	1.70	1834.89	397.70	0.14
Reach 5	24.1	3100.00	1332.95	1340.70	1336.32	1340.77	0.000596	2.09	1482.06	353.40	0.18
Reach 5	24.1	2440.00	1332.95	1339.07	1335.88	1339.17	0.001334	2.57	948.29	303.45	0.26
Reach 5	24.1	3120.00	1332.95	1339.91	1336.33	1340.02	0.001062	2.57	1214.48	328.05	0.24
Reach 5	24.06	3100.00	1332.60	1340.58	1336.52	1340.65	0.000535	2.01	1541.08	359.12	0.17
Reach 5	24.06	2440.00	1332.60	1338.79	1335.95	1338.89	0.001311	2.57	948.24	299.53	0.25
Reach 5	24.06	3120.00	1332.60	1339.69	1336.53	1339.79	0.001026	2.53	1234.48	333.01	0.23
Reach 5	23.962	3100.00	1331.20	1340.33	1335.46	1340.39	0.000461	2.00	1547.51	324.63	0.16
Reach 5	23.962	2440.00	1331.20	1338.04	1335.03	1338.17	0.001483	2.83	862.28	258.82	0.27
Reach 5	23.962	3120.00	1331.20	1339.13	1335.47	1339.24	0.001087	2.66	1172.91	305.96	0.24
Reach 5	23.911	3100.00	1330.30	1340.17	1335.25	1340.24	0.000628	2.25	1380.01	307.00	0.19
Reach 5	23.911	2440.00	1330.30	1337.62	1334.87	1337.78	0.001414	3.21	759.39	181.32	0.28

HEC-RAS Plan: Reach 5 River: EMF Reach: Reach 5 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 5	23.911	3120.00	1330.30	1338.77	1335.26	1338.92	0.001342	3.15	989.03	233.43	0.27
Reach 5	23.827	3500.00	1328.70	1340.03	1332.77	1340.18	0.000058	3.12	1123.08	128.90	0.19
Reach 5	23.827	2440.00	1328.70	1337.56	1331.97	1337.69	0.000067	2.96	824.76	114.25	0.19
Reach 5	23.827	3260.00	1328.70	1338.65	1332.61	1338.83	0.000078	3.42	952.19	119.51	0.21
Reach 5	23.825	3500.00	1328.39	1340.03	1332.49	1340.18	0.000055	3.08	1134.60	126.88	0.18
Reach 5	23.825	2440.00	1328.39	1337.56	1331.65	1337.69	0.000063	2.91	838.30	113.68	0.19
Reach 5	23.825	3260.00	1328.39	1338.65	1332.31	1338.83	0.000075	3.38	965.28	118.88	0.21
Reach 5	23.815	Bridge									
Reach 5	23.804	3500.00	1328.24	1339.98	1332.47	1340.13	0.000055	3.09	1131.72	126.81	0.18
Reach 5	23.804	2440.00	1328.24	1337.51	1331.64	1337.65	0.000063	2.92	836.80	113.69	0.19
Reach 5	23.804	3260.00	1328.24	1338.60	1332.29	1338.78	0.000075	3.39	962.94	118.81	0.21
Reach 5	23.803	3500.00	1328.80	1339.97	1332.64	1340.12	0.000062	3.16	1108.34	129.12	0.19
Reach 5	23.803	2440.00	1328.80	1337.50	1331.85	1337.64	0.000069	3.00	813.95	111.13	0.20
Reach 5	23.803	3260.00	1328.80	1338.59	1332.47	1338.77	0.000083	3.48	937.34	117.30	0.22
Reach 5	23.758	4800.00	1328.32	1340.00	1331.30	1340.05	0.000173	1.79	2688.12	321.27	0.11
Reach 5	23.758	2440.00	1328.32	1337.54	1330.24	1337.57	0.000108	1.25	1948.26	276.98	0.08
Reach 5	23.758	3260.00	1328.32	1338.64	1330.64	1338.67	0.000131	1.44	2264.51	302.53	0.09
Reach 5	23.712	4800.00	1328.32	1339.80	1333.96	1339.96	0.000836	3.15	1521.78	251.70	0.23
Reach 5	23.712	2440.00	1328.32	1337.41	1332.19	1337.50	0.000673	2.48	983.89	198.33	0.20
Reach 5	23.712	3260.00	1328.32	1338.49	1332.86	1338.60	0.000699	2.69	1212.55	222.82	0.20
Reach 5	23.604	4800.00	1328.94	1339.46	1333.71	1339.55	0.000563	2.47	1946.08	347.07	0.18
Reach 5	23.604	2440.00	1328.94	1337.09	1332.48	1337.16	0.000532	2.03	1203.60	275.93	0.17
Reach 5	23.604	3260.00	1328.94	1338.18	1332.95	1338.25	0.000514	2.14	1520.23	312.26	0.17
Reach 5	23.45	4800.00	1328.56	1339.29	1332.35	1339.32	0.000148	1.48	3252.60	460.17	0.10
Reach 5	23.45	2440.00	1328.56	1336.95	1331.57	1336.97	0.000117	1.10	2228.18	413.56	0.08
Reach 5	23.45	3260.00	1328.56	1338.04	1331.86	1338.06	0.000119	1.21	2690.45	436.02	0.09
Reach 5	23.315	4800.00	1327.54	1339.01	1333.30	1339.12	0.000685	2.65	1810.34	335.00	0.20
Reach 5	23.315	2440.00	1327.54	1336.73	1331.60	1336.80	0.000540	2.17	1123.40	234.33	0.17
Reach 5	23.315	3260.00	1327.54	1337.80	1332.23	1337.88	0.000659	2.30	1417.10	315.58	0.19
Reach 5	23.274	4800.00	1328.46	1338.89	1331.96	1339.00	0.000428	2.65	1812.37	234.68	0.17
Reach 5	23.274	2440.00	1328.46	1336.67	1330.81	1336.72	0.000253	1.83	1331.07	201.80	0.13

HEC-RAS Plan: Reach 5 River: EMF Reach: Reach 5 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 5	23.274	3260.00	1328.46	1337.72	1331.24	1337.79	0.000296	2.10	1550.10	214.97	0.14
Reach 5	23.219	4800.00	1326.60	1338.84	1330.77	1338.92	0.000163	2.35	2043.02	222.42	0.14
Reach 5	23.219	2740.00	1326.60	1336.63	1329.81	1336.67	0.000111	1.74	1577.02	203.20	0.11
Reach 5	23.219	3530.00	1326.60	1337.67	1330.20	1337.73	0.000126	1.97	1793.00	209.65	0.12
Reach 5	23.206	Bridge									
Reach 5	23.193	4800.00	1326.10	1338.19	1330.22	1338.28	0.000163	2.35	2039.93	221.50	0.14
Reach 5	23.193	2740.00	1326.10	1336.00	1329.30	1336.05	0.000113	1.74	1576.12	205.01	0.11
Reach 5	23.193	3530.00	1326.10	1337.03	1329.67	1337.09	0.000127	1.97	1791.18	211.24	0.12
Reach 5	23.166	4800.00	1327.40	1338.12	1331.23	1338.23	0.000452	2.72	1766.69	229.51	0.17
Reach 5	23.166	2740.00	1327.40	1335.95	1330.15	1336.02	0.000340	2.11	1300.47	200.13	0.15
Reach 5	23.166	3530.00	1327.40	1336.97	1330.60	1337.06	0.000373	2.33	1513.36	214.27	0.15
Reach 5	23.135	4800.00	1324.83	1338.09	1329.71	1338.16	0.000275	2.19	2193.53	309.39	0.14
Reach 5	23.135	2740.00	1324.83	1335.92	1328.34	1335.96	0.000220	1.69	1620.35	250.44	0.12
Reach 5	23.135	3530.00	1324.83	1336.95	1328.90	1337.00	0.000237	1.87	1886.70	276.51	0.12
Reach 5	23.087	4800.00	1324.80	1337.98	1330.25	1338.06	0.000589	2.27	2113.99	440.46	0.18
Reach 5	23.087	2740.00	1324.80	1335.81	1328.76	1335.88	0.000494	2.13	1287.13	258.27	0.17
Reach 5	23.087	3530.00	1324.80	1336.84	1329.38	1336.91	0.000622	2.15	1638.85	385.23	0.18
Reach 5	23.009	4800.00	1327.11	1337.87	1330.78	1337.91	0.000214	1.60	3006.13	498.27	0.11
Reach 5	23.009	2740.00	1327.11	1335.71	1329.69	1335.74	0.000207	1.35	2030.63	422.46	0.11
Reach 5	23.009	3530.00	1327.11	1336.73	1330.14	1336.77	0.000191	1.43	2473.25	445.62	0.11
Reach 5	22.944	4800.00	1327.70	1337.48	1333.30	1337.74	0.001351	4.07	1179.14	189.96	0.29
Reach 5	22.944	2740.00	1327.70	1335.40	1332.02	1335.58	0.001357	3.40	805.55	170.82	0.28
Reach 5	22.944	3530.00	1327.70	1336.41	1332.52	1336.61	0.001237	3.59	982.56	178.92	0.27
Reach 5	22.866	4800.00	1326.20	1337.13	1332.41	1337.28	0.000824	3.21	1527.46	284.46	0.23
Reach 5	22.866	2740.00	1326.20	1335.01	1331.44	1335.12	0.000857	2.71	1010.25	213.43	0.22
Reach 5	22.866	3530.00	1326.20	1336.07	1331.83	1336.20	0.000765	2.84	1250.87	242.95	0.21
Reach 5	22.797	4800.00	1326.57	1336.92	1331.90	1337.02	0.000566	2.50	1920.00	336.65	0.18
Reach 5	22.797	2740.00	1326.57	1334.77	1331.03	1334.85	0.000620	2.20	1247.06	284.29	0.18
Reach 5	22.797	3530.00	1326.57	1335.87	1331.41	1335.95	0.000541	2.24	1576.56	315.31	0.18
Reach 5	22.74	4800.00	1326.29	1336.73	1330.54	1336.84	0.000634	2.67	1798.64	311.00	0.20
Reach 5	22.74	2740.00	1326.29	1334.58	1329.46	1334.66	0.000587	2.29	1194.17	244.21	0.18

HEC-RAS Plan: Reach 5 River: EMF Reach: Reach 5 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 5	22.74	3530.00	1326.29	1335.69	1329.91	1335.78	0.000570	2.38	1485.30	282.11	0.18
Reach 5	22.68	4800.00	1326.34	1336.54	1330.59	1336.65	0.000556	2.61	1838.06	297.66	0.19
Reach 5	22.68	2740.00	1326.34	1334.40	1329.49	1334.48	0.000583	2.22	1235.09	264.87	0.18
Reach 5	22.68	3530.00	1326.34	1335.53	1329.94	1335.61	0.000509	2.29	1541.87	284.95	0.17
Reach 5	22.615	4900.00	1326.91	1336.33	1330.37	1336.49	0.000352	3.21	1528.75	185.42	0.20
Reach 5	22.615	2740.00	1326.91	1334.26	1329.36	1334.35	0.000265	2.38	1152.35	177.49	0.16
Reach 5	22.615	3530.00	1326.91	1335.38	1329.75	1335.48	0.000266	2.61	1353.19	181.77	0.17
Reach 5	22.608	Bridge									
Reach 5	22.599	4900.00	1326.67	1336.24	1330.38	1336.41	0.000368	3.25	1507.66	185.57	0.20
Reach 5	22.599	2740.00	1326.67	1334.20	1329.35	1334.29	0.000276	2.41	1137.14	177.24	0.17
Reach 5	22.599	3530.00	1326.67	1335.32	1329.76	1335.42	0.000277	2.64	1337.01	182.02	0.17
Reach 5	22.557	4900.00	1325.50	1336.26	1327.89	1336.30	0.000130	1.69	2891.66	548.49	0.10
Reach 5	22.557	2740.00	1325.50	1334.21	1327.14	1334.23	0.000086	1.20	2281.96	486.10	0.08
Reach 5	22.557	3530.00	1325.50	1335.32	1327.43	1335.35	0.000093	1.35	2611.37	515.22	0.08
Reach 5	22.475	4900.00	1325.50	1336.22	1328.16	1336.25	0.000112	1.31	3791.76	578.11	0.09
Reach 5	22.475	2740.00	1325.50	1334.18	1327.37	1334.19	0.000078	0.99	2771.08	440.62	0.07
Reach 5	22.475	3530.00	1325.50	1335.29	1327.68	1335.31	0.000078	1.08	3271.45	455.67	0.07
Reach 5	22.436	4900.00	1325.51	1336.20	1328.01	1336.22	0.000099	1.32	3708.28	458.27	0.08
Reach 5	22.436	2740.00	1325.51	1334.16	1327.31	1334.18	0.000069	0.97	2814.35	421.74	0.07
Reach 5	22.436	3530.00	1325.51	1335.28	1327.58	1335.30	0.000072	1.07	3296.19	441.22	0.07
Reach 5	22.348	4900.00	1326.63	1336.11	1330.62	1336.15	0.000238	1.74	2811.77	442.89	0.12
Reach 5	22.348	2740.00	1326.63	1334.09	1329.89	1334.12	0.000238	1.41	1940.98	419.17	0.12
Reach 5	22.348	3530.00	1326.63	1335.21	1330.18	1335.24	0.000198	1.46	2418.54	432.91	0.11
Reach 5	22.263	4900.00	1325.29	1335.86	1330.90	1335.97	0.000828	2.64	1855.63	397.52	0.22
Reach 5	22.263	2740.00	1325.29	1333.86	1329.49	1333.94	0.000711	2.28	1204.31	287.93	0.20
Reach 5	22.263	3530.00	1325.29	1335.01	1330.16	1335.09	0.000621	2.27	1552.55	335.51	0.19
Reach 5	22.189	4900.00	1324.50	1335.35	1329.99	1335.55	0.001333	3.57	1371.20	266.66	0.28
Reach 5	22.189	2740.00	1324.50	1333.52	1328.51	1333.65	0.000775	2.85	959.81	173.62	0.21
Reach 5	22.189	3530.00	1324.50	1334.66	1329.10	1334.80	0.000911	2.96	1192.19	231.03	0.23
Reach 5	22.107	4900.00	1326.00	1335.03	1330.39	1335.15	0.000623	2.72	1804.13	299.17	0.19
Reach 5	22.107	2740.00	1326.00	1333.30	1329.52	1333.36	0.000498	2.09	1309.11	271.47	0.17

HEC-RAS Plan: Reach 5 River: EMF Reach: Reach 5 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 5	22.107	3530.00	1326.00	1334.44	1329.86	1334.51	0.000435	2.17	1629.57	289.91	0.16
Reach 5	22.022	4900.00	1325.91	1334.50	1331.50	1334.70	0.001700	3.62	1351.81	307.79	0.30
Reach 5	22.022	2740.00	1325.91	1332.81	1330.60	1332.97	0.001865	3.17	865.61	258.74	0.30
Reach 5	22.022	3530.00	1325.91	1334.07	1330.96	1334.20	0.001194	2.89	1222.02	300.07	0.25
Reach 5	21.947	4900.00	1325.42	1333.28	1331.01	1333.67	0.004247	5.03	974.51	271.40	0.47
Reach 5	21.947	2740.00	1325.42	1331.67	1329.99	1331.97	0.003466	4.36	628.29	185.94	0.42
Reach 5	21.947	3530.00	1325.42	1333.40	1330.39	1333.59	0.002055	3.51	1006.46	279.14	0.33
Reach 5	21.839	4900.00	1324.20	1333.24	1326.91	1333.29	0.000178	1.65	2966.73	406.27	0.11
Reach 5	21.839	2740.00	1324.20	1331.67	1326.10	1331.69	0.000119	1.17	2335.57	395.92	0.09
Reach 5	21.839	3530.00	1324.20	1333.38	1326.43	1333.40	0.000087	1.17	3020.40	407.14	0.08
Reach 5	21.745	4900.00	1324.22	1333.11	1326.65	1333.18	0.000280	2.13	2301.12	301.62	0.14
Reach 5	21.745	2740.00	1324.22	1331.59	1325.88	1331.62	0.000168	1.48	1853.89	287.18	0.10
Reach 5	21.745	3530.00	1324.22	1333.31	1326.18	1333.34	0.000134	1.49	2362.85	303.30	0.09
Reach 5	21.713	4900.00	1324.20	1332.79	1328.14	1333.06	0.001483	4.22	1162.16	186.83	0.30
Reach 5	21.713	2740.00	1324.20	1331.42	1326.90	1331.56	0.000939	3.00	914.54	174.08	0.23
Reach 5	21.713	3530.00	1324.20	1333.16	1327.38	1333.29	0.000647	2.86	1233.44	190.36	0.20
Reach 5	21.656	4900.00	1314.40	1332.93	1319.48	1332.96	0.000034	1.17	4170.48	328.58	0.06
Reach 5	21.656	2740.00	1314.40	1331.49	1318.34	1331.50	0.000015	0.74	3705.58	317.00	0.04
Reach 5	21.656	3530.00	1314.40	1333.23	1318.80	1333.24	0.000017	0.83	4268.67	331.83	0.04
Reach 5	21.633	4900.00	1315.40	1332.93	1318.69	1332.95	0.000042	1.15	4251.14	337.72	0.06
Reach 5	21.633	2740.00	1315.40	1331.49	1317.66	1331.50	0.000018	0.73	3775.60	323.58	0.04
Reach 5	21.633	3530.00	1315.40	1333.23	1318.06	1333.24	0.000020	0.81	4352.73	340.76	0.04
Reach 5	21.591	4900.00	1315.45	1332.92	1320.91	1332.94	0.000052	1.20	4078.11	356.06	0.06
Reach 5	21.591	2740.00	1315.45	1331.49	1319.01	1331.49	0.000024	0.77	3578.07	342.48	0.04
Reach 5	21.591	3530.00	1315.45	1333.22	1319.59	1333.23	0.000025	0.84	4187.52	358.97	0.04
Reach 5	21.531	4900.00	1315.45	1332.91	1317.85	1332.93	0.000024	0.91	5375.88	394.67	0.04
Reach 5	21.531	2740.00	1315.45	1331.48	1317.09	1331.49	0.000010	0.57	4822.75	379.49	0.03
Reach 5	21.531	3530.00	1315.45	1333.22	1317.39	1333.23	0.000012	0.64	5498.00	397.98	0.03
Reach 5	21.485	4900.00	1315.40	1332.88	1319.72	1332.91	0.000090	1.50	3268.13	308.23	0.08
Reach 5	21.485	2740.00	1315.40	1331.47	1318.43	1331.48	0.000042	0.96	2844.59	292.58	0.05
Reach 5	21.485	3530.00	1315.40	1333.20	1318.94	1333.22	0.000043	1.05	3369.11	311.84	0.06

HEC-RAS Plan: Reach 5 River: EMF Reach: Reach 5 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 5	21.439	4900.00	1315.40	1332.82	1320.21	1332.88	0.000144	1.99	2468.07	215.82	0.10
Reach 5	21.439	2740.00	1315.40	1331.45	1318.78	1331.47	0.000063	1.26	2179.56	202.65	0.07
Reach 5	21.439	3530.00	1315.40	1333.18	1319.34	1333.21	0.000069	1.39	2545.19	218.96	0.07
Reach 5	21.418	4900.00	1324.17	1332.05	1329.22	1332.78	0.001653	6.83	716.99	111.60	0.48
Reach 5	21.418	2740.00	1324.17	1331.12	1327.75	1331.42	0.000823	4.46	614.02	107.63	0.33
Reach 5	21.418	3530.00	1324.17	1332.87	1328.33	1333.16	0.000602	4.36	809.29	115.65	0.29
Reach 5	21.413	4900.00	1322.28	1332.21	1327.46	1332.67	0.000759	5.41	905.73	107.89	0.33
Reach 5	21.413	2740.00	1322.28	1331.19	1325.93	1331.37	0.000358	3.45	795.12	107.86	0.22
Reach 5	21.413	3530.00	1322.28	1332.92	1326.53	1333.12	0.000306	3.59	982.28	107.92	0.21
Reach 5	21.407	Bridge									
Reach 5	21.402	4900.00	1322.54	1332.03	1327.65	1332.52	0.000877	5.66	865.30	108.11	0.35
Reach 5	21.402	2740.00	1322.54	1331.11	1326.13	1331.31	0.000402	3.57	766.73	108.07	0.24
Reach 5	21.402	3530.00	1322.54	1332.86	1326.73	1333.07	0.000334	3.70	955.00	108.15	0.22
Reach 5	21.391	4900.00	1322.68	1331.93	1327.82	1332.46	0.001003	5.84	838.97	112.64	0.38
Reach 5	21.391	2740.00	1322.68	1331.07	1326.31	1331.29	0.000445	3.68	744.11	108.64	0.25
Reach 5	21.391	3530.00	1322.68	1332.83	1326.90	1333.05	0.000373	3.75	941.78	116.81	0.23
Reach 5	21.355	4900.00	1322.56	1331.79	1327.36	1332.25	0.000822	5.46	897.90	113.38	0.34
Reach 5	21.355	2740.00	1322.56	1331.01	1325.89	1331.19	0.000354	3.38	810.01	112.78	0.22
Reach 5	21.355	3530.00	1322.56	1332.78	1326.47	1332.97	0.000295	3.50	1009.93	113.39	0.21
Reach 5	21.339	Bridge									
Reach 5	21.326	4900.00	1322.60	1330.95	1327.47	1331.57	0.001253	6.29	779.21	110.99	0.42
Reach 5	21.326	2740.00	1322.60	1330.76	1325.98	1330.96	0.000425	3.62	757.94	110.24	0.24
Reach 5	21.326	3530.00	1322.60	1332.55	1326.56	1332.76	0.000343	3.68	959.27	113.26	0.22
Reach 5	21.282	4900.00	1322.47	1330.98	1326.37	1331.25	0.000373	4.15	1181.65	169.58	0.28
Reach 5	21.282	4180.00	1322.47	1330.67	1326.01	1330.88	0.000311	3.70	1128.46	167.54	0.25
Reach 5	21.282	5220.00	1322.47	1332.49	1326.52	1332.69	0.000234	3.61	1444.88	179.49	0.22
Reach 5	21.188	4900.00	1322.28	1330.83	1326.32	1331.06	0.000332	3.81	1287.05	192.96	0.26
Reach 5	21.188	4180.00	1322.28	1330.54	1326.00	1330.72	0.000276	3.40	1231.07	190.85	0.24
Reach 5	21.188	5220.00	1322.28	1332.41	1326.46	1332.57	0.000197	3.26	1599.62	204.36	0.21
Reach 5	21.093	4900.00	1321.82	1330.70	1325.83	1330.90	0.000281	3.61	1355.62	193.64	0.24
Reach 5	21.093	4180.00	1321.82	1330.43	1325.51	1330.59	0.000230	3.21	1304.17	191.92	0.22

HEC-RAS Plan: Reach 5 River: EMF Reach: Reach 5 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 5	21.093	5220.00	1321.82	1332.33	1325.97	1332.48	0.000168	3.11	1679.84	204.15	0.19
Reach 5	21	4900.00	1321.41	1330.58	1325.35	1330.77	0.000246	3.47	1411.50	193.91	0.23
Reach 5	21	4180.00	1321.41	1330.34	1325.03	1330.48	0.000198	3.06	1364.40	192.28	0.20
Reach 5	21	5220.00	1321.41	1332.26	1325.50	1332.40	0.000148	2.99	1746.37	205.12	0.18
Reach 5	20.894	4900.00	1321.60	1330.43	1325.30	1330.62	0.000264	3.55	1378.60	192.71	0.23
Reach 5	20.894	4180.00	1321.60	1330.22	1324.97	1330.37	0.000210	3.12	1337.92	191.23	0.21
Reach 5	20.894	5220.00	1321.60	1332.17	1325.44	1332.31	0.000154	3.03	1724.95	204.81	0.18
Reach 5	20.799	5100.00	1321.43	1330.28	1325.17	1330.49	0.000275	3.67	1389.67	190.93	0.24
Reach 5	20.799	4180.00	1321.43	1330.12	1324.77	1330.26	0.000197	3.08	1358.94	189.88	0.20
Reach 5	20.799	5220.00	1321.43	1332.10	1325.24	1332.24	0.000146	2.99	1747.81	202.77	0.18
Reach 5	20.704	5100.00	1321.02	1330.16	1324.79	1330.35	0.000251	3.57	1429.12	191.29	0.23
Reach 5	20.704	4180.00	1321.02	1330.03	1324.37	1330.17	0.000177	2.97	1405.29	190.46	0.19
Reach 5	20.704	5220.00	1321.02	1332.03	1324.84	1332.16	0.000133	2.90	1800.27	203.82	0.17
Reach 5	20.61	5100.00	1321.01	1330.03	1324.69	1330.23	0.000253	3.57	1426.61	191.60	0.23
Reach 5	20.61	4180.00	1321.01	1329.94	1324.27	1330.08	0.000176	2.96	1410.21	191.03	0.19
Reach 5	20.61	5220.00	1321.01	1331.97	1324.74	1332.10	0.000131	2.88	1811.12	204.66	0.17
Reach 5	20.517	5100.00	1320.90	1329.90	1324.57	1330.10	0.000254	3.58	1426.10	192.09	0.23
Reach 5	20.517	4180.00	1320.90	1329.86	1324.15	1329.99	0.000174	2.95	1417.25	191.78	0.19
Reach 5	20.517	5220.00	1320.90	1331.91	1324.63	1332.03	0.000129	2.86	1824.54	205.81	0.17
Reach 5	20.428	5100.00	1321.04	1329.79	1324.51	1329.98	0.000255	3.57	1429.90	193.63	0.23
Reach 5	20.428	4180.00	1321.04	1329.78	1324.10	1329.91	0.000172	2.93	1428.48	193.58	0.19
Reach 5	20.428	5220.00	1321.04	1331.85	1324.56	1331.97	0.000126	2.83	1843.72	207.49	0.17
Reach 5	20.353	5100.00	1320.90	1329.67	1324.49	1329.88	0.000270	3.64	1399.84	191.92	0.24
Reach 5	20.353	4100.00	1320.90	1329.71	1324.03	1329.84	0.000172	2.91	1407.36	192.20	0.19
Reach 5	20.353	5220.00	1320.90	1331.80	1324.54	1331.92	0.000127	2.84	1925.35	300.14	0.17
Reach 5	20.334	5100.00	1320.59	1329.64	1324.46	1329.85	0.000275	3.68	1386.20	189.99	0.24
Reach 5	20.334	4100.00	1320.59	1329.69	1323.99	1329.83	0.000174	2.94	1395.99	190.35	0.19
Reach 5	20.334	5220.00	1320.59	1331.78	1324.51	1331.91	0.000132	2.89	1809.05	205.06	0.17
Reach 5	20.328	5100.00	1320.85	1329.64	1324.44	1329.84	0.000259	3.60	1418.34	191.92	0.23
Reach 5	20.328	4100.00	1320.85	1329.69	1323.99	1329.82	0.000164	2.87	1428.37	192.16	0.19
Reach 5	20.328	5220.00	1320.85	1331.78	1324.49	1331.90	0.000122	2.84	1839.61	200.72	0.17

HEC-RAS Plan: Reach 5 River: EMF Reach: Reach 5 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 5	20.323	Bridge									
Reach 5	20.316	5100.00	1320.83	1329.56	1324.45	1329.77	0.000273	3.65	1395.58	192.03	0.24
Reach 5	20.316	4100.00	1320.83	1329.64	1324.01	1329.78	0.000170	2.91	1411.28	192.40	0.19
Reach 5	20.316	5220.00	1320.83	1331.74	1324.51	1331.87	0.000125	2.86	1824.23	200.98	0.17
Reach 5	20.306	5100.00	1320.70	1329.55	1324.45	1329.75	0.000274	3.63	1405.66	196.39	0.24
Reach 5	20.306	4100.00	1320.70	1329.64	1323.99	1329.76	0.000171	2.88	1422.76	197.05	0.19
Reach 5	20.306	5220.00	1320.70	1331.73	1324.50	1331.86	0.000128	2.82	1852.91	212.87	0.17
Reach 5	20.247	5100.00	1320.62	1329.47	1324.19	1329.67	0.000256	3.56	1430.67	194.44	0.23
Reach 5	20.247	4100.00	1320.62	1329.59	1323.73	1329.71	0.000158	2.82	1453.53	195.27	0.18
Reach 5	20.247	5220.00	1320.62	1331.70	1324.24	1331.82	0.000113	2.71	2107.75	375.48	0.16
Reach 5	20.058	5100.00	1320.10	1329.23	1323.71	1329.42	0.000232	3.46	1473.99	203.95	0.22
Reach 5	20.058	4100.00	1320.10	1329.45	1323.26	1329.56	0.000138	2.71	1519.91	226.03	0.17
Reach 5	20.058	5220.00	1320.10	1331.61	1323.76	1331.71	0.000096	2.56	2324.42	386.98	0.15
Reach 5	19.863	5100.00	1319.74	1329.01	1323.34	1329.19	0.000217	3.38	1509.27	222.62	0.21
Reach 5	19.863	4100.00	1319.74	1329.32	1322.89	1329.42	0.000124	2.61	1581.09	242.75	0.16
Reach 5	19.863	5220.00	1319.74	1331.52	1323.39	1331.61	0.000089	2.51	2290.48	353.31	0.14
Reach 5	19.745	5100.00	1319.61	1328.87	1323.23	1329.05	0.000220	3.39	1506.12	240.58	0.22
Reach 5	19.745	4100.00	1319.61	1329.24	1322.76	1329.35	0.000123	2.60	1606.20	289.19	0.16
Reach 5	19.745	5220.00	1319.61	1331.47	1323.28	1331.56	0.000085	2.46	2421.94	398.75	0.14
Reach 5	19.592	5100.00	1319.50	1328.69	1323.18	1328.87	0.000232	3.44	1482.27	197.44	0.22
Reach 5	19.592	4100.00	1319.50	1329.14	1322.72	1329.25	0.000126	2.61	1582.52	247.77	0.16
Reach 5	19.592	5220.00	1319.50	1331.40	1323.23	1331.49	0.000085	2.47	2394.47	394.66	0.14
Reach 5	19.541	5300.00	1319.56	1328.60	1323.21	1328.80	0.000250	3.57	1483.73	197.75	0.23
Reach 5	19.541	4100.00	1319.56	1329.11	1322.68	1329.21	0.000123	2.59	1587.85	224.42	0.16
Reach 5	19.541	5220.00	1319.56	1331.37	1323.18	1331.46	0.000084	2.46	2375.27	389.90	0.14
Reach 5	19.489	5300.00	1319.60	1328.53	1323.22	1328.73	0.000258	3.61	1469.64	197.76	0.23
Reach 5	19.489	4100.00	1319.60	1329.07	1322.69	1329.18	0.000125	2.60	1577.70	201.54	0.16
Reach 5	19.489	5220.00	1319.60	1331.35	1323.19	1331.44	0.000084	2.46	2389.59	391.45	0.14
Reach 5	19.458	5300.00	1319.39	1328.49	1323.11	1328.69	0.000252	3.59	1477.70	197.01	0.23
Reach 5	19.458	4100.00	1319.39	1329.05	1322.57	1329.16	0.000122	2.58	1590.04	208.46	0.16
Reach 5	19.458	5220.00	1319.39	1331.34	1323.07	1331.43	0.000083	2.47	2345.45	388.16	0.14

HEC-RAS Plan: Reach 5 River: EMF Reach: Reach 5 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 5	19.408	5300.00	1319.19	1328.44	1322.76	1328.62	0.000226	3.46	1532.59	214.82	0.22
Reach 5	19.408	4100.00	1319.19	1329.03	1322.23	1329.13	0.000108	2.48	1672.62	258.98	0.15
Reach 5	19.408	5220.00	1319.19	1331.32	1322.73	1331.40	0.000072	2.35	2577.81	419.61	0.13
Reach 5	19.298	5900.00	1319.02	1328.24	1322.88	1328.47	0.000287	3.87	1523.92	199.57	0.25
Reach 5	19.298	4120.00	1319.02	1328.97	1322.10	1329.06	0.000106	2.47	1671.37	204.74	0.15
Reach 5	19.298	5860.00	1319.02	1331.27	1322.87	1331.36	0.000081	2.51	3218.59	915.80	0.14
Reach 5	19.109	5900.00	1318.80	1327.94	1322.71	1328.18	0.000295	3.90	1512.56	200.19	0.25
Reach 5	19.109	4120.00	1318.80	1328.87	1321.92	1328.96	0.000101	2.42	1700.91	213.51	0.15
Reach 5	19.109	5860.00	1318.80	1331.19	1322.68	1331.28	0.000075	2.44	3418.28	1033.41	0.13
Reach 5	18.97	6500.00	1318.41	1327.67	1322.66	1327.94	0.000344	4.18	1553.36	207.69	0.27
Reach 5	18.97	4690.00	1318.41	1328.77	1321.93	1328.88	0.000118	2.63	1786.17	219.28	0.16
Reach 5	18.97	7400.00	1318.41	1331.09	1323.01	1331.21	0.000109	2.93	3657.49	1172.95	0.16
Reach 5	18.782	6500.00	1318.05	1327.37	1322.02	1327.62	0.000297	3.98	1632.24	210.24	0.25
Reach 5	18.782	4690.00	1318.05	1328.67	1321.29	1328.77	0.000095	2.44	1980.38	272.67	0.15
Reach 5	18.782	7400.00	1318.05	1331.02	1322.35	1331.11	0.000076	2.54	4866.01	1570.22	0.13
Reach 5	18.535	6500.00	1317.85	1326.91	1322.00	1327.19	0.000358	4.25	1530.52	206.05	0.27
Reach 5	18.535	4690.00	1317.85	1328.54	1321.27	1328.64	0.000102	2.50	1875.65	217.59	0.15
Reach 5	18.535	7400.00	1317.85	1330.97	1322.34	1331.01	0.000052	2.10	6788.92	1777.09	0.11
Reach 5	18.345	6500.00	1317.07	1326.53	1321.24	1326.78	0.000441	4.05	1605.11	206.25	0.26
Reach 5	18.345	4700.00	1317.07	1328.44	1320.53	1328.52	0.000117	2.33	2058.88	281.36	0.14
Reach 5	18.345	7840.00	1317.07	1330.80	1321.75	1330.93	0.000139	2.95	3128.28	565.69	0.15

HEC-RAS Version 2.1 October 1997
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: EMF Reach 5 (1--12-99), FCD 97-06
Project File : emfr5.prj
Run Date and Time: 1/12/99 8:27:12 PM

Project in English units

Project Description:
EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT (Reach 5)
FCDMC Contract No. 97-06
Prepared by HNTB Corporation, January 1999
Contact: B. Gary Sun
HNTB Corporation
40 North Central Avenue, Suite 300
Phoenix, Arizona 85004
(602) 528-4300

REACH 5
Broadway Road Channel to Powerline Channel
(River Mile 24.723 to Mile 18.345)

The Purpose of the Study is to Determine Channel
Capacity for Three Given 100-Year Discharges.
The Water Surface Profiles Were Calculated Using the U.S. Army Corps of Engineers' HEC-RAS Computer Program, Version 2.1, Dated October 1997, as Implemented by Haestad Methods, Inc.

Subcritical Flow Run
3 Water Surface Profiles with 100-Year Discharges Provided by FCDMC (Dated 6-10-98)
Profile 1 - Design Discharges
Profile 2 - Future Discharges, Future Land Use with Retention and without Proposed FCD CIPs
Profile 3 - Existing Conditions

The Control Line on the Thalweg of
East Maricopa Floodway is Station 5,000, and All CrossSection Data were
Stationed Looking Downstream. Cross Section Numbers Indicate in River Miles
above the Top of Drop Structure at the Downstream of the East Maricopa Floodway.

Starting Water Surface Elevations Used are the Calculated Water
Surface Elevations from Each of Three Water Surface Profiles Calculated at River Mile 18.345 from Reach 4 HEC-RAS Runs.

Manning's n Values of 0.025
Were Used for the Reach 5 Channel South of Guadalupe Road. The n Values of
0.045 Were Used for the Channel Through the Golf Courses Because FCDMC Does Not
Have the Maintenance Responsibilities for These Golf Courses. Typically, a
Value of 0.030 or 0.035 is More Reasonable for the Well-Maintained Golf Courses.

PLAN DATA

Plan Title: EMF Reach 5
Plan File : j:\27559\CADD\CIVIL\DATA\emfr5.p01

Geometry Title: EMF Reach 5
Geometry File : j:\27559\CADD\CIVIL\DATA\emfr5.g01

Flow Title : Profiles 1-Design, 2-Future, 3-Exist.
Flow File : j:\27559\CADD\CIVIL\DATA\emfr5.f01

Plan Summary Information:
Number of: Cross Sections = 88 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 6

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

Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Profiles 1-Design, 2-Future, 3-Exist.
Flow File : j:\27559\CADD\CIVIL\DATA\emfr5.f01

Flow Data (cfs)

River	Reach	RS	Design	Future	Existing
EMF	Reach 5	24.723	3100	2440	3120
EMF	Reach 5	23.827	3500	2440	3260
EMF	Reach 5	23.758	4800	2440	3260
EMF	Reach 5	23.219	4800	2740	3530
EMF	Reach 5	22.615	4900	2740	3530
EMF	Reach 5	21.282	4900	4180	5220
EMF	Reach 5	20.799	5100	4180	5220
EMF	Reach 5	20.353	5100	4100	5220
EMF	Reach 5	19.541	5300	4100	5220
EMF	Reach 5	19.298	5900	4120	5860
EMF	Reach 5	18.97	6500	4690	7400
EMF	Reach 5	18.345	6500	4700	7840

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
EMF	Reach 5	Design		Known WS = 1326.53
EMF	Reach 5	Future		Known WS = 1328.44
EMF	Reach 5	Existing		Known WS = 1330.8

GEOMETRY DATA

Geometry Title: EMF Reach 5
Geometry File : j:\27559\CADD\CIVIL\DATA\emfr5.g01

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 24.723

INPUT
Description: Just Downstream of Broadway Channel
Upstream End of Reach
5
Q(D)=3,100 cfs, Q(F)=2,440 cfs & Q(E)=3,120 cfs
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4899.22	1345.2	4900.09	1344.88	4916.99	1344.2	4920.25	1343.65	4938.38	1337.83
4948.07	1334.4	4950.31	1334.05	4960.28	1331.26	4964.64	1329.52	4993.51	1328.84
5005.5	1329.2	5031.16	1329.89	5035.77	1330.79	5047.06	1333.7	5063.05	1337.08
5088.76	1342	5093.06	1342.67	5101.67	1343.33	5103.87	1342.85	5108.94	1343.52
5123.1	1343.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4899.22	.04	4916.99	.03	5101.67	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4916.99	5101.67	550	536.64	480	.1	.3

Left Levee Station= 4916.99 Elevation= 1344.2
Right Levee Station= 5101.67 Elevation= 1343.33

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1341.38	Element			
Vel Head (ft)	0.09	Wt. n-Val.		0.030	
E.G. Elev (ft)	1341.47	Reach Len. (ft)	550.00	536.64	480.00
Crit W.S. (ft)	1333.17	Flow Area (sq ft)		1324.24	
E.G. Slope (ft/ft)	0.000135	Area (sq ft)		1324.24	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	158.22	Top Width (ft)		158.22	
Vel Total (ft/s)	2.34	Avg. Vel. (ft/s)		2.34	
Max Chl Dpth (ft)	12.54	Hydr. Depth (ft)		8.37	
Conv. Total (cfs)	266872.1	Conv. (cfs)		266872.1	
Length Wtd. (ft)	536.64	Wetted Per. (ft)		161.35	
Min Ch El (ft)	1328.84	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.56	1414.09	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	205.10	0.38

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1340.00	Element			
Vel Head (ft)	0.07	Wt. n-Val.		0.030	
E.G. Elev (ft)	1340.08	Reach Len. (ft)	550.00	536.64	480.00
Crit W.S. (ft)	1332.63	Flow Area (sq ft)		1113.73	
E.G. Slope (ft/ft)	0.000134	Area (sq ft)		1113.73	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	146.71	Top Width (ft)		146.71	
Vel Total (ft/s)	2.19	Avg. Vel. (ft/s)		2.19	
Max Chl Dpth (ft)	11.16	Hydr. Depth (ft)		7.59	
Conv. Total (cfs)	210426.9	Conv. (cfs)		210426.9	
Length Wtd. (ft)	536.64	Wetted Per. (ft)		149.49	
Min Ch El (ft)	1328.84	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	1.58	1216.17	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	187.06	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1340.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.030	
E.G. Elev (ft)	1340.96	Reach Len. (ft)	550.00	536.64	480.00
Crit W.S. (ft)	1333.19	Flow Area (sq ft)		1243.17	
E.G. Slope (ft/ft)	0.000163	Area (sq ft)		1243.17	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	153.89	Top Width (ft)		153.89	
Vel Total (ft/s)	2.51	Avg. Vel. (ft/s)		2.51	
Max Chl Dpth (ft)	12.02	Hydr. Depth (ft)		8.08	
Conv. Total (cfs)	244734.6	Conv. (cfs)		244734.6	
Length Wtd. (ft)	536.64	Wetted Per. (ft)		156.89	
Min Ch El (ft)	1328.84	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.20	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	249.08	1516.94	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	201.76	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 24.621

INPUT
Description: Begin of Leisure World Golf Course
Use n Values of .045 for
Channel and .05 for Overbamks
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4889.28	1344	4909.13	1341.31	4913.31	1340.69	4960.24	1334.12	4978.06	1332.11
4990.1	1330.5	4998.25	1329.41	5005.58	1330.12	5019.29	1330.2	5041.6	1331.37
5062.16	1332.3	5080.56	1332.83	5092.4	1335.03	5119.61	1339.78	5122.82	1340.43
5130.36	1341.1	5161.72	1341.63	5182.09	1341.7	5183.89	1341.44	5205.63	1341.89
5217.34	1341.9	5224.8	1343.26	5234.28	1342.21	5247.28	1341.96	5255.78	1343.11
5263.38	1342.5	5270.64	1343.41	5278.35	1343.6	5284.8	1343.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4889.28	.05	4889.28	.045	5224.8	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4889.28	5224.8	350	451.83	530	.1	.3

Left Levee Station= 4889.28 Elevation= 1344
Right Levee Station= 5224.8 Elevation= 1343.26

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1341.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.045	
E.G. Elev (ft)	1341.36	Reach Len. (ft)	350.00	451.83	530.00
Crit W.S. (ft)	1334.18	Flow Area (sq ft)		1571.92	
E.G. Slope (ft/ft)	0.000282	Area (sq ft)		1571.92	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	232.92	Top Width (ft)		232.92	
Vel Total (ft/s)	1.97	Avg. Vel. (ft/s)		1.97	
Max Chl Dpth (ft)	11.89	Hydr. Depth (ft)		6.75	
Conv. Total (cfs)	184522.2	Conv. (cfs)		184522.2	
Length Wtd. (ft)	451.83	Wetted Per. (ft)		234.52	
Min Ch El (ft)	1329.41	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.23	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.56	1396.25	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	202.69	0.38

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1339.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.97	Reach Len. (ft)	350.00	451.83	530.00
Crit W.S. (ft)	1333.75	Flow Area (sq ft)		1277.92	
E.G. Slope (ft/ft)	0.000287	Area (sq ft)		1277.92	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	201.40	Top Width (ft)		201.40	
Vel Total (ft/s)	1.91	Avg. Vel. (ft/s)		1.91	
Max Chl Dpth (ft)	10.50	Hydr. Depth (ft)		6.35	
Conv. Total (cfs)	143949.8	Conv. (cfs)		143949.8	
Length Wtd. (ft)	451.83	Wetted Per. (ft)		202.82	
Min Ch El (ft)	1329.41	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.22	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	1.58	1201.44	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	184.91	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1340.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.83	Reach Len. (ft)	350.00	451.83	530.00
Crit W.S. (ft)	1334.19	Flow Area (sq ft)		1453.43	
E.G. Slope (ft/ft)	0.000331	Area (sq ft)		1453.43	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	213.71	Top Width (ft)		213.71	
Vel Total (ft/s)	2.15	Avg. Vel. (ft/s)		2.15	
Max Chl Dpth (ft)	11.35	Hydr. Depth (ft)		6.80	
Conv. Total (cfs)	171448.8	Conv. (cfs)		171448.8	
Length Wtd. (ft)	451.83	Wetted Per. (ft)		215.26	
Min Ch El (ft)	1329.41	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.30	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	249.08	1500.33	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	199.50	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 24.535

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4788.8	1346.4	4791.95	1345.56	4798.22	1344.8	4809.76	1342.99	4847.79	1336.85
4871.6	1335.1	4876.83	1335.09	4890.24	1334.15	4897.69	1333.79	4903.64	1333.22
4936.09	1330.5	4950.72	1329.5	4959.43	1330.43	4965.52	1330.45	4991.84	1330.84
5011.65	1331.3	5027.44	1332.18	5050.25	1333.33	5087.09	1335.05	5108.29	1341.95
5120.01	1343	5124	1343.17	5143.95	1343.71	5165.85	1343.76		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4788.8	.05	4788.8	.045	5165.85	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4788.8	5165.85	530	431.07	330	.1	.3

Left Levee Station= 4788.8 Elevation= 1346.4
Right Levee Station= 5165.85 Elevation= 1343.76

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1341.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1341.27	Reach Len. (ft)	530.00	431.07	330.00

Crit W.S. (ft)	1333.76	Flow Area (sq ft)		2180.84	
E.G. Slope (ft/ft)	0.000124	Area (sq ft)		2180.84	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	285.49	Top Width (ft)		285.49	
Vel Total (ft/s)	1.42	Avg. Vel. (ft/s)		1.42	
Max Chl Dpth (ft)	11.74	Hydr. Depth (ft)		7.64	
Conv. Total (cfs)	278168.7	Conv. (cfs)		278168.7	
Length Wtd. (ft)	431.07	Wetted Per. (ft)		287.26	
Min Ch El (ft)	1329.50	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.56	1376.78	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	200.01	0.38

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1339.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.87	Reach Len. (ft)	530.00	431.07	330.00
Crit W.S. (ft)	1333.36	Flow Area (sq ft)		1792.12	
E.G. Slope (ft/ft)	0.000139	Area (sq ft)		1792.12	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	272.58	Top Width (ft)		272.58	
Vel Total (ft/s)	1.36	Avg. Vel. (ft/s)		1.36	
Max Chl Dpth (ft)	10.34	Hydr. Depth (ft)		6.57	
Conv. Total (cfs)	206956.2	Conv. (cfs)		206956.2	
Length Wtd. (ft)	431.07	Wetted Per. (ft)		274.02	
Min Ch El (ft)	1329.50	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	1.58	1185.52	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	182.45	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1340.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.72	Reach Len. (ft)	530.00	431.07	330.00
Crit W.S. (ft)	1333.77	Flow Area (sq ft)		2024.56	
E.G. Slope (ft/ft)	0.000157	Area (sq ft)		2024.56	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	280.37	Top Width (ft)		280.37	
Vel Total (ft/s)	1.54	Avg. Vel. (ft/s)		1.54	
Max Chl Dpth (ft)	11.19	Hydr. Depth (ft)		7.22	
Conv. Total (cfs)	248786.4	Conv. (cfs)		248786.4	
Length Wtd. (ft)	431.07	Wetted Per. (ft)		282.01	
Min Ch El (ft)	1329.50	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.11	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	249.08	1482.29	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	196.94	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 24.454

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4781.59	1351.5	4799.04	1345.06	4803.46	1343.05	4830.21	1339.33	4857.75	1335.67

4862.8	1335.2	4904.47	1335.04	4907.76	1335	4925.19	1336.08	4940.23	1336.85
4950.9	1337.8	4959.97	1337.18	4979.14	1335.05	4981.12	1334.7	4992.68	1332.11
4998.43	1332.3	5027.47	1332.48	5049.15	1332.61	5055.34	1332.44	5078.83	1334.91
5086.37	1335.1	5102.19	1335.78	5111.16	1336.02	5119.85	1336.56	5140.01	1339.44
5146.53	1339.9	5150.22	1340.39	5174.17	1340.48	5200.87	1340.79	5204.48	1340.98
5228.55	1340.9	5242.28	1341.16	5246.42	1341.11	5255.13	1341.69	5266.15	1342.61
5283.53	1343.7	5286.58	1344.01						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4781.59	.05	4781.59	.045	5286.58	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4781.59	5286.58	700	706.15	700	.1	.3

Left Levee Station= 4781.59 Elevation= 1351.5
Right Levee Station= 5286.58 Elevation= 1344.01

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1341.15	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.045	
E.G. Elev (ft)	1341.19	Reach Len. (ft)	700.00	706.15	700.00
Crit W.S. (ft)	1336.08	Flow Area (sq ft)		1914.41	
E.G. Slope (ft/ft)	0.000328	Area (sq ft)		1914.41	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	427.85	Top Width (ft)		427.85	
Vel Total (ft/s)	1.62	Avg. Vel. (ft/s)		1.62	
Max Chl Dpth (ft)	9.04	Hydr. Depth (ft)		4.47	
Conv. Total (cfs)	171283.8	Conv. (cfs)		171283.8	
Length Wtd. (ft)	706.15	Wetted Per. (ft)		429.23	
Min Ch El (ft)	1332.11	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.15	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.56	1356.52	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	196.48	0.38

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1339.73	Element			
Vel Head (ft)	0.05	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.78	Reach Len. (ft)	700.00	706.15	700.00
Crit W.S. (ft)	1335.72	Flow Area (sq ft)		1414.70	
E.G. Slope (ft/ft)	0.000373	Area (sq ft)		1414.70	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	316.86	Top Width (ft)		316.86	
Vel Total (ft/s)	1.72	Avg. Vel. (ft/s)		1.72	
Max Chl Dpth (ft)	7.62	Hydr. Depth (ft)		4.46	
Conv. Total (cfs)	126334.4	Conv. (cfs)		126334.4	
Length Wtd. (ft)	706.15	Wetted Per. (ft)		318.09	
Min Ch El (ft)	1332.11	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.18	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	1.58	1169.65	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	179.54	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1340.57	Element			
Vel Head (ft)	0.05	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.62	Reach Len. (ft)	700.00	706.15	700.00
Crit W.S. (ft)	1336.09	Flow Area (sq ft)		1687.49	
E.G. Slope (ft/ft)	0.000402	Area (sq ft)		1687.49	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	360.17	Top Width (ft)		360.17	
Vel Total (ft/s)	1.85	Avg. Vel. (ft/s)		1.85	
Max Chl Dpth (ft)	8.46	Hydr. Depth (ft)		4.69	
Conv. Total (cfs)	155637.2	Conv. (cfs)		155637.2	

Length Wtd. (ft)	706.15	Wetted Per. (ft)		361.50	
Min Ch El (ft)	1332.11	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.22	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	249.08	1463.92	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	193.77	16.51

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 24.32

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4768.54	1350.3	4782.89	1344.89	4798.11	1342.84	4811.94	1341.14	4825.71	1339.88
4843.15	1338.9	4864.84	1337.84	4883.04	1336.83	4887.4	1336.8	4898.01	1336.39
4915.76	1335.2	4931.92	1335.04	4943.76	1334.75	4961.67	1333.6	4971.49	1332.7
4991.73	1332	5025.56	1330.52	5027.52	1330.61	5050.11	1330.99	5061.27	1332.38
5082.2	1334.3	5091.15	1334.98	5102.99	1336.21	5132.23	1338.26	5145.43	1339.13
5152.38	1339.5	5163.95	1340.31	5168.95	1340.87	5178.65	1341.41	5194.98	1342.08
5233.35	1343.2	5238.18	1343.68	5241.38	1344.38				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4768.54	.05	4768.54	.045	5241.38	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4768.54	5241.38	345	383.58	415	.1	.3

Left Levee Station= 4768.54 Elevation= 1350.3
Right Levee Station= 5241.38 Elevation= 1344.38

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1340.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.99	Reach Len. (ft)	345.00	383.58	415.00
Crit W.S. (ft)	1334.71	Flow Area (sq ft)		1974.08	
E.G. Slope (ft/ft)	0.000232	Area (sq ft)		1974.08	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	356.49	Top Width (ft)		356.49	
Vel Total (ft/s)	1.57	Avg. Vel. (ft/s)		1.57	
Max Chl Dpth (ft)	10.43	Hydr. Depth (ft)		5.54	
Conv. Total (cfs)	203743.3	Conv. (cfs)		203743.3	
Length Wtd. (ft)	383.58	Wetted Per. (ft)		357.24	
Min Ch El (ft)	1330.52	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.56	1325.00	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	190.12	0.38

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1339.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.53	Reach Len. (ft)	345.00	383.58	415.00
Crit W.S. (ft)	1334.27	Flow Area (sq ft)		1476.78	
E.G. Slope (ft/ft)	0.000326	Area (sq ft)		1476.78	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	319.54	Top Width (ft)		319.54	
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)		1.65	
Max Chl Dpth (ft)	8.97	Hydr. Depth (ft)		4.62	
Conv. Total (cfs)	135122.1	Conv. (cfs)		135122.1	
Length Wtd. (ft)	383.58	Wetted Per. (ft)		320.17	
Min Ch El (ft)	1330.52	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	1.58	1146.21	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	174.38	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1340.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.36	Reach Len. (ft)	345.00	383.58	415.00
Crit W.S. (ft)	1334.72	Flow Area (sq ft)		1748.97	
E.G. Slope (ft/ft)	0.000333	Area (sq ft)		1748.97	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	342.94	Top Width (ft)		342.94	
Vel Total (ft/s)	1.78	Avg. Vel. (ft/s)		1.78	
Max Chl Dpth (ft)	9.79	Hydr. Depth (ft)		5.10	
Conv. Total (cfs)	170884.1	Conv. (cfs)		170884.1	
Length Wtd. (ft)	383.58	Wetted Per. (ft)		343.62	
Min Ch El (ft)	1330.52	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.19	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	249.08	1436.07	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	188.07	16.51

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 24.247

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4748.61	1344	4757.64	1342.97	4801.04	1337.33	4806.47	1336.63	4830.22	1334.92
4847.6	1333.9	4853.29	1333.8	4878.97	1334.13	4886.3	1334.27	4907.53	1334.39
4945.85	1332.8	4965.07	1330.9	4980.29	1329.56	5000.48	1329.94	5006.71	1330.15
5022.07	1331.7	5054.91	1333.26	5075.3	1335.69	5082.32	1336.26	5090.83	1336.73
5114.68	1337.4	5123.92	1337.69	5130.48	1337.82	5159.21	1338.11	5170.14	1338.38
5184.77	1340	5200.88	1342.01						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4748.61	.05	4748.61	.045	5200.88	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4748.61	5200.88	580	620.69	645	.1	.3

Left Levee Station= 4748.61 Elevation= 1344
Right Levee Station= 5200.88 Elevation= 1342.01

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1340.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.92	Reach Len. (ft)	580.00	620.69	645.00
Crit W.S. (ft)	1334.38	Flow Area (sq ft)		2538.71	
E.G. Slope (ft/ft)	0.000124	Area (sq ft)		2538.71	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	418.44	Top Width (ft)		418.44	
Vel Total (ft/s)	1.22	Avg. Vel. (ft/s)		1.22	
Max Chl Dpth (ft)	11.34	Hydr. Depth (ft)		6.07	
Conv. Total (cfs)	278404.8	Conv. (cfs)		278404.8	
Length Wtd. (ft)	620.69	Wetted Per. (ft)		419.46	
Min Ch El (ft)	1329.56	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.56	1305.13	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	186.71	0.38

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1339.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.44	Reach Len. (ft)	580.00	620.69	645.00
Crit W.S. (ft)	1333.78	Flow Area (sq ft)		1933.39	
E.G. Slope (ft/ft)	0.000176	Area (sq ft)		1933.39	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	

Top Width (ft)	394.45	Top Width (ft)		394.45	
Vel Total (ft/s)	1.26	Avg. Vel. (ft/s)		1.26	
Max Chl Dpth (ft)	9.85	Hydr. Depth (ft)		4.90	
Conv. Total (cfs)	183950.8	Conv. (cfs)		183950.8	
Length Wtd. (ft)	620.69	Wetted Per. (ft)		395.29	
Min Ch El (ft)	1329.56	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	1.58	1131.20	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	171.23	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1340.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.26	Reach Len. (ft)	580.00	620.69	645.00
Crit W.S. (ft)	1334.39	Flow Area (sq ft)		2262.42	
E.G. Slope (ft/ft)	0.000178	Area (sq ft)		2262.42	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	407.93	Top Width (ft)		407.93	
Vel Total (ft/s)	1.38	Avg. Vel. (ft/s)		1.38	
Max Chl Dpth (ft)	10.67	Hydr. Depth (ft)		5.55	
Conv. Total (cfs)	233710.6	Conv. (cfs)		233710.6	
Length Wtd. (ft)	620.69	Wetted Per. (ft)		408.87	
Min Ch El (ft)	1329.56	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	249.08	1418.41	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	184.76	16.51

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 24.13

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4733.87	1344	4752.74	1341.68	4760.65	1340.64	4785.05	1337.61	4810.16	1337.57
4838.61	1337.1	4854.17	1337.54	4863.9	1336.94	4873.16	1337.13	4885.02	1336.93
4900.51	1336.5	4913.8	1336.88	4938.74	1337.22	4959.6	1335.71	4973.9	1335.01
4987.23	1332	4996.88	1330.77	5006.18	1330.19	5013.96	1330.75	5027.53	1331.1
5036.78	1331	5048.84	1331.52	5073.13	1332.23	5083.25	1332.87	5093.65	1333.33
5107.11	1334.4	5127.75	1336.94	5147.58	1338.91	5159.69	1339.76	5178.48	1341.51
5194.35	1342.3	5218.85	1343.26	5227.46	1343.36				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4733.87	.05	4733.87	.045	5227.46	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4733.87	5227.46	95	156.83	170	.1	.3

Left Levee Station= 4733.87 Elevation= 1344
Right Levee Station= 5227.46 Elevation= 1343.36

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1340.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.82	Reach Len. (ft)	95.00	156.83	170.00
Crit W.S. (ft)	1334.49	Flow Area (sq ft)		2128.09	
E.G. Slope (ft/ft)	0.000218	Area (sq ft)		2128.09	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	411.25	Top Width (ft)		411.25	
Vel Total (ft/s)	1.46	Avg. Vel. (ft/s)		1.46	
Max Chl Dpth (ft)	10.60	Hydr. Depth (ft)		5.17	
Conv. Total (cfs)	209824.1	Conv. (cfs)		209824.1	

Length Wtd. (ft)	156.83	Wetted Per. (ft)		412.45	
Min Ch El (ft)	1330.19	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.56	1271.88	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	180.80	0.38

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1339.24	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.28	Reach Len. (ft)	95.00	156.83	170.00
Crit W.S. (ft)	1334.07	Flow Area (sq ft)		1513.72	
E.G. Slope (ft/ft)	0.000379	Area (sq ft)		1513.72	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	380.38	Top Width (ft)		380.38	
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)		1.61	
Max Chl Dpth (ft)	9.05	Hydr. Depth (ft)		3.98	
Conv. Total (cfs)	125294.3	Conv. (cfs)		125294.3	
Length Wtd. (ft)	156.83	Wetted Per. (ft)		381.41	
Min Ch El (ft)	1330.19	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.15	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	1.58	1106.64	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	165.71	1.66

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1340.07	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.11	Reach Len. (ft)	95.00	156.83	170.00
Crit W.S. (ft)	1334.52	Flow Area (sq ft)		1834.89	
E.G. Slope (ft/ft)	0.000347	Area (sq ft)		1834.89	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	397.70	Top Width (ft)		397.70	
Vel Total (ft/s)	1.70	Avg. Vel. (ft/s)		1.70	
Max Chl Dpth (ft)	9.88	Hydr. Depth (ft)		4.61	
Conv. Total (cfs)	167604.4	Conv. (cfs)		167604.4	
Length Wtd. (ft)	156.83	Wetted Per. (ft)		398.82	
Min Ch El (ft)	1330.19	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.17	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	249.08	1389.21	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	179.02	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 24.1

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4785.63	1344	4795.06	1342.67	4804.54	1341.14	4811	1340.22	4824.6	1337.4
4837.02	1337.6	4857.08	1337.61	4868.93	1337.33	4880.17	1337.46	4896.24	1337.43
4904.95	1336.5	4916.52	1335.8	4936.99	1333.48	4955.97	1333.2	4991.19	1332.95
5017.58	1333.2	5024.38	1333.53	5049.3	1336.57	5075.3	1341.81	5086.67	1343.85
5092.55	1344	5095.99	1344.15	5111.81	1342.75	5121.29	1341.64	5134.81	1341.16
5143.03	1340.3	5149.33	1339.87	5157.53	1339.05	5175.29	1337.99	5200.31	1337.59
5215.9	1339.1	5230.84	1340.74	5256.35	1342.5	5264.94	1343.16	5273.82	1343.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4785.63	.05	4785.63	.045	5264.94	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4785.63	5264.94	245	212.59	220	.1	.3

Left Levee Station= 4785.63 Elevation= 1344
Right Levee Station= 5264.94 Elevation= 1343.16

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1340.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.77	Reach Len. (ft)	245.00	212.59	220.00
Crit W.S. (ft)	1336.32	Flow Area (sq ft)		1482.06	
E.G. Slope (ft/ft)	0.000596	Area (sq ft)		1482.06	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	353.40	Top Width (ft)		353.40	
Vel Total (ft/s)	2.09	Avg. Vel. (ft/s)		2.09	
Max Chl Dpth (ft)	7.75	Hydr. Depth (ft)		4.19	
Conv. Total (cfs)	126930.6	Conv. (cfs)		126930.6	
Length Wtd. (ft)	212.59	Wetted Per. (ft)		354.81	
Min Ch El (ft)	1332.95	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.33	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.56	1265.39	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	179.42	0.38

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1339.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.17	Reach Len. (ft)	245.00	212.59	220.00
Crit W.S. (ft)	1335.88	Flow Area (sq ft)		948.29	
E.G. Slope (ft/ft)	0.001334	Area (sq ft)		948.29	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	303.45	Top Width (ft)		303.45	
Vel Total (ft/s)	2.57	Avg. Vel. (ft/s)		2.57	
Max Chl Dpth (ft)	6.12	Hydr. Depth (ft)		3.13	
Conv. Total (cfs)	66794.1	Conv. (cfs)		66794.1	
Length Wtd. (ft)	212.59	Wetted Per. (ft)		304.38	
Min Ch El (ft)	1332.95	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)		0.67	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	1.58	1102.21	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	164.48	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1339.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.02	Reach Len. (ft)	245.00	212.59	220.00
Crit W.S. (ft)	1336.33	Flow Area (sq ft)		1214.48	
E.G. Slope (ft/ft)	0.001062	Area (sq ft)		1214.48	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	328.05	Top Width (ft)		328.05	
Vel Total (ft/s)	2.57	Avg. Vel. (ft/s)		2.57	
Max Chl Dpth (ft)	6.96	Hydr. Depth (ft)		3.70	
Conv. Total (cfs)	95738.6	Conv. (cfs)		95738.6	
Length Wtd. (ft)	212.59	Wetted Per. (ft)		329.24	
Min Ch El (ft)	1332.95	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		0.63	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	249.08	1383.72	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	177.72	16.51

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 24.06

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4842.79	1344	4848.35	1342.62	4864.05	1339.58	4872.71	1339.08	4881.58	1338.29
4905.47	1336.5	4936.78	1334.91	4940.32	1334.81	4980.05	1332.6	5021.49	1332.81
5027.94	1333.3	5042.28	1334.76	5050.81	1335.52	5079.87	1340.39	5093.34	1341.56
5103.62	1341	5111.64	1339.83	5134.78	1336.12	5137.6	1336.11	5174.58	1336.63
5195.11	1337.3	5209.96	1337.88	5223.61	1338.81	5237.97	1340.13	5239.85	1340.48
5262.63	1341.4	5267.28	1341.69	5277.27	1342.71	5298.26	1342.78	5311.29	1343.22
5334.57	1343.5	5341.52	1343.62	5366.31	1343.32	5395.68	1342.89	5408.43	1341.69
5411.61	1341.4	5412.61	1340.8	5428.71	1341.34				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4842.79	.05	4842.79	.045	5341.52	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4842.79	5341.52	515	518.73	420	.1	.3

Left Levee Station= 4842.79 Elevation= 1344
Right Levee Station= 5341.52 Elevation= 1343.62

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1340.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.65	Reach Len. (ft)	515.00	518.73	420.00
Crit W.S. (ft)	1336.52	Flow Area (sq ft)		1541.08	
E.G. Slope (ft/ft)	0.000535	Area (sq ft)		1541.08	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	359.12	Top Width (ft)		359.12	
Vel Total (ft/s)	2.01	Avg. Vel. (ft/s)		2.01	
Max Chl Dpth (ft)	7.98	Hydr. Depth (ft)		4.29	
Conv. Total (cfs)	134042.0	Conv. (cfs)		134042.0	
Length Wtd. (ft)	518.73	Wetted Per. (ft)		360.47	
Min Ch El (ft)	1332.60	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.29	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	0.56	1258.01	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	177.68	0.38

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1338.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.045	
E.G. Elev (ft)	1338.89	Reach Len. (ft)	515.00	518.73	420.00
Crit W.S. (ft)	1335.95	Flow Area (sq ft)		948.24	
E.G. Slope (ft/ft)	0.001311	Area (sq ft)		948.24	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	299.53	Top Width (ft)		299.53	
Vel Total (ft/s)	2.57	Avg. Vel. (ft/s)		2.57	
Max Chl Dpth (ft)	6.19	Hydr. Depth (ft)		3.17	
Conv. Total (cfs)	67378.0	Conv. (cfs)		67378.0	
Length Wtd. (ft)	518.73	Wetted Per. (ft)		300.39	
Min Ch El (ft)	1332.60	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)		0.67	
Frctn Loss (ft)	0.72	Cum Volume (acre-ft)	1.58	1097.58	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	163.01	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1339.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.79	Reach Len. (ft)	515.00	518.73	420.00
Crit W.S. (ft)	1336.53	Flow Area (sq ft)		1234.48	
E.G. Slope (ft/ft)	0.001026	Area (sq ft)		1234.48	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	333.01	Top Width (ft)		333.01	
Vel Total (ft/s)	2.53	Avg. Vel. (ft/s)		2.53	
Max Chl Dpth (ft)	7.09	Hydr. Depth (ft)		3.71	
Conv. Total (cfs)	97425.2	Conv. (cfs)		97425.2	
Length Wtd. (ft)	518.73	Wetted Per. (ft)		334.10	
Min Ch El (ft)	1332.60	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		0.60	
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	249.08	1377.75	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	176.10	16.51

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.962

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4749.72	1345.2	4753.42	1345.24	4766.27	1344.84	4780.74	1344.62	4786.63	1344.61
4797	1344.3	4799.75	1344.14	4812.9	1342.57	4823.06	1340.39	4827.42	1339.91
4836.48	1337.5	4844.07	1336.27	4860.4	1335.9	4865.68	1336.55	4879.99	1337.57
4885.7	1338.5	4895.35	1338.76	4901.2	1338.58	4910.53	1338.45	4918.33	1337.73
4925.23	1337.2	4938.85	1336.55	4948.14	1336.27	4950.9	1336.31	4982.85	1332.7
4995.98	1331.2	5002.33	1331.4	5029.3	1331.45	5055.27	1333.37	5081.71	1334.42
5098.49	1335.5	5122.67	1337.78	5168.64	1342.35	5185.4	1343.54	5192.39	1343.68

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4749.72	.04	4749.72	.045	5192.39	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4749.72	5192.39	245	265.27	280	.1	.3

Left Levee Station= 4749.72 Elevation= 1345.2
Right Levee Station= 5192.39 Elevation= 1343.68

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1340.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.39	Reach Len. (ft)	245.00	265.27	280.00
Crit W.S. (ft)	1335.46	Flow Area (sq ft)		1547.51	
E.G. Slope (ft/ft)	0.000461	Area (sq ft)		1547.51	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	324.63	Top Width (ft)		324.63	
Vel Total (ft/s)	2.00	Avg. Vel. (ft/s)		2.00	
Max Chl Dpth (ft)	9.13	Hydr. Depth (ft)		4.77	
Conv. Total (cfs)	144344.4	Conv. (cfs)		144344.4	
Length Wtd. (ft)	265.27	Wetted Per. (ft)		325.95	
Min Ch El (ft)	1331.20	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.27	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.56	1239.62	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	173.61	0.38

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1338.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.045	

E.G. Elev (ft)	1338.17	Reach Len. (ft)	245.00	265.27	280.00
Crit W.S. (ft)	1335.03	Flow Area (sq ft)		862.28	
E.G. Slope (ft/ft)	0.001483	Area (sq ft)		862.28	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	258.82	Top Width (ft)		258.82	
Vel Total (ft/s)	2.83	Avg. Vel. (ft/s)		2.83	
Max Chl Dpth (ft)	6.84	Hydr. Depth (ft)		3.33	
Conv. Total (cfs)	63370.6	Conv. (cfs)		63370.6	
Length Wtd. (ft)	265.27	Wetted Per. (ft)		259.70	
Min Ch El (ft)	1331.20	Shear (lb/sq ft)		0.31	
Alpha	1.00	Stream Power (lb/ft s)		0.87	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	1.58	1086.80	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	159.69	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1339.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.24	Reach Len. (ft)	245.00	265.27	280.00
Crit W.S. (ft)	1335.47	Flow Area (sq ft)		1172.91	
E.G. Slope (ft/ft)	0.001087	Area (sq ft)		1172.91	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	305.96	Top Width (ft)		305.96	
Vel Total (ft/s)	2.66	Avg. Vel. (ft/s)		2.66	
Max Chl Dpth (ft)	7.93	Hydr. Depth (ft)		3.83	
Conv. Total (cfs)	94631.5	Conv. (cfs)		94631.5	
Length Wtd. (ft)	265.27	Wetted Per. (ft)		307.10	
Min Ch El (ft)	1331.20	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)		0.69	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	249.08	1363.41	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	172.30	16.51

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.911

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4803.98	1342	4817.36	1340.51	4820.64	1340.33	4823.17	1339.41	4836	1339.63
4840.28	1339.6	4847.55	1339.29	4858.33	1339.09	4872.79	1338.19	4876.21	1338.09
4894.94	1338.5	4912.01	1339.28	4917.81	1339.4	4925.17	1338.79	4929.62	1338.57
4939.82	1336.9	4945.18	1335.76	4956.56	1334.06	4971.23	1332.7	4977.4	1331.95
4989.54	1330.3	5018.96	1331.16	5033.69	1332.75	5043.3	1334.28	5062.16	1334.47
5071.58	1334.4	5081.24	1334.12	5094.45	1333.61	5105.29	1335.31	5115.29	1337.29
5140.71	1343	5146.74	1343.75	5160.96	1343.81				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4803.98	.05	4803.98	.045	5146.74	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4803.98	5146.74	510	447.42	375	.1	.3

Left Levee Station= 4803.98 Elevation= 1342
Right Levee Station= 5146.74 Elevation= 1343.75

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1340.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.24	Reach Len. (ft)	510.00	447.42	375.00
Crit W.S. (ft)	1335.25	Flow Area (sq ft)		1380.01	
E.G. Slope (ft/ft)	0.000628	Area (sq ft)		1380.01	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	307.00	Top Width (ft)		307.00	

Vel Total (ft/s)	2.25	Avg. Vel. (ft/s)		2.25	
Max Chl Dpth (ft)	9.87	Hydr. Depth (ft)		4.50	
Conv. Total (cfs)	123657.2	Conv. (cfs)		123657.2	
Length Wtd. (ft)	447.42	Wetted Per. (ft)		308.71	
Min Ch El (ft)	1330.30	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.39	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.56	1230.70	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	171.69	0.38

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1337.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.78	Reach Len. (ft)	510.00	447.42	375.00
Crit W.S. (ft)	1334.87	Flow Area (sq ft)		759.39	
E.G. Slope (ft/ft)	0.001414	Area (sq ft)		759.39	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	181.32	Top Width (ft)		181.32	
Vel Total (ft/s)	3.21	Avg. Vel. (ft/s)		3.21	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		4.19	
Conv. Total (cfs)	64883.9	Conv. (cfs)		64883.9	
Length Wtd. (ft)	447.42	Wetted Per. (ft)		182.45	
Min Ch El (ft)	1330.30	Shear (lb/sq ft)		0.37	
Alpha	1.00	Stream Power (lb/ft s)		1.18	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	1.58	1081.86	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	158.35	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1338.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.045	
E.G. Elev (ft)	1338.92	Reach Len. (ft)	510.00	447.42	375.00
Crit W.S. (ft)	1335.26	Flow Area (sq ft)		989.03	
E.G. Slope (ft/ft)	0.001342	Area (sq ft)		989.03	
Q Total (cfs)	3120.00	Flow (cfs)		3120.00	
Top Width (ft)	233.43	Top Width (ft)		233.43	
Vel Total (ft/s)	3.15	Avg. Vel. (ft/s)		3.15	
Max Chl Dpth (ft)	8.47	Hydr. Depth (ft)		4.24	
Conv. Total (cfs)	85181.5	Conv. (cfs)		85181.5	
Length Wtd. (ft)	447.42	Wetted Per. (ft)		234.79	
Min Ch El (ft)	1330.30	Shear (lb/sq ft)		0.35	
Alpha	1.00	Stream Power (lb/ft s)		1.11	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	249.08	1356.83	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	170.66	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.827

INPUT
Description: End of Leisure World Golf Course
Just Upstream of Southern Avenue
Bridge
Q(D)=3,500 cfs, Q(F)=2,440 cfs & Q(E)=3,260 cfs
No
Ineffective Flow Area From Southern Avenue Bridge
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4793.18	1342	4807.5	1341.8	4814.46	1341.82	4819.36	1341.61	4832.27	1341.46
4851.69	1341.2	4886.12	1341.14	4888.69	1341.29	4906.55	1341.27	4915.49	1341.19
4928.45	1340.8	4935.18	1340.54	4941.2	1339.41	4960.44	1330.73	4966.5	1328.94
4969.84	1328.7	5038.64	1329	5046.6	1331.42	5060.79	1338.14	5067.51	1340.25
5079.22	1341.3	5137.35	1341.43	5154.37	1342.11	5161.72	1342.07		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4793.18	.04	4915.49	.015	5079.22	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4915.49	5079.22	9.08	9.08	9.08	.1	.3

Left Levee Station= 4915.79 Elevation= 1341.19
Right Levee Station= 5079.22 Elevation= 1341.3

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1340.03	Element			
Vel Head (ft)	0.15	Wt. n-Val.		0.015	
E.G. Elev (ft)	1340.18	Reach Len. (ft)	9.08	9.08	9.08
Crit W.S. (ft)	1332.77	Flow Area (sq ft)		1123.08	
E.G. Slope (ft/ft)	0.000058	Area (sq ft)		1123.08	
Q Total (cfs)	3500.00	Flow (cfs)		3500.00	
Top Width (ft)	128.90	Top Width (ft)		128.90	
Vel Total (ft/s)	3.12	Avg. Vel. (ft/s)		3.12	
Max Chl Dpth (ft)	11.33	Hydr. Depth (ft)		8.71	
Conv. Total (cfs)	460746.8	Conv. (cfs)		460746.8	
Length Wtd. (ft)	9.08	Wetted Per. (ft)		133.26	
Min Ch El (ft)	1328.70	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.56	1217.85	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	169.45	0.38

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1337.56	Element			
Vel Head (ft)	0.14	Wt. n-Val.		0.015	
E.G. Elev (ft)	1337.69	Reach Len. (ft)	9.08	9.08	9.08
Crit W.S. (ft)	1331.97	Flow Area (sq ft)		824.76	
E.G. Slope (ft/ft)	0.000067	Area (sq ft)		824.76	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	114.25	Top Width (ft)		114.25	
Vel Total (ft/s)	2.96	Avg. Vel. (ft/s)		2.96	
Max Chl Dpth (ft)	8.86	Hydr. Depth (ft)		7.22	
Conv. Total (cfs)	299142.7	Conv. (cfs)		299142.7	
Length Wtd. (ft)	9.08	Wetted Per. (ft)		117.72	
Min Ch El (ft)	1328.70	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	1073.73	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	156.83	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1338.65	Element			
Vel Head (ft)	0.18	Wt. n-Val.		0.015	
E.G. Elev (ft)	1338.83	Reach Len. (ft)	9.08	9.08	9.08
Crit W.S. (ft)	1332.61	Flow Area (sq ft)		952.19	
E.G. Slope (ft/ft)	0.000078	Area (sq ft)		952.19	
Q Total (cfs)	3260.00	Flow (cfs)		3260.00	
Top Width (ft)	119.51	Top Width (ft)		119.51	
Vel Total (ft/s)	3.42	Avg. Vel. (ft/s)		3.42	
Max Chl Dpth (ft)	9.95	Hydr. Depth (ft)		7.97	
Conv. Total (cfs)	368260.0	Conv. (cfs)		368260.0	
Length Wtd. (ft)	9.08	Wetted Per. (ft)		123.43	
Min Ch El (ft)	1328.70	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.13	

Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	249.08	1346.86	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	168.84	16.51

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.825

INPUT
Description: Southern Avenue Bridge Upstream Face
4 Span Bridge with Concrete
Apron and Slopes
Manning's n Value of .015 used for Channel
Use
Field Survey Data for this Cross Section
Skew Angle 8.64 Degrees,
Cross Section Data Adjust
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4901.27	1341.83	4933.68	1342.02	4941.42	1339.71	4967.86	1328.49	5002.45	1328.39
5038.36	1328.5	5063.4	1338.9	5071.08	1341.17	5110.78	1341.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4901.27	.04	4933.68	.015	5071.08	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4933.68	5071.08	108.37	108.37	108.37	.3	.5

Left Levee Station= 4933.68 Elevation= 1342.02
Right Levee Station= 5071.08 Elevation= 1341.17

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1340.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.015	
E.G. Elev (ft)	1340.18	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1332.49	Flow Area (sq ft)		1134.60	
E.G. Slope (ft/ft)	0.000055	Area (sq ft)		1134.60	
Q Total (cfs)	3500.00	Flow (cfs)		3500.00	
Top Width (ft)	126.88	Top Width (ft)		126.88	
Vel Total (ft/s)	3.08	Avg. Vel. (ft/s)		3.08	
Max Chl Dpth (ft)	11.64	Hydr. Depth (ft)		8.94	
Conv. Total (cfs)	472948.9	Conv. (cfs)		472948.9	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		131.45	
Min Ch El (ft)	1328.39	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.56	1217.61	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	169.42	0.38

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1337.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.015	
E.G. Elev (ft)	1337.69	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1331.65	Flow Area (sq ft)		838.30	
E.G. Slope (ft/ft)	0.000063	Area (sq ft)		838.30	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	113.68	Top Width (ft)		113.68	
Vel Total (ft/s)	2.91	Avg. Vel. (ft/s)		2.91	
Max Chl Dpth (ft)	9.17	Hydr. Depth (ft)		7.37	
Conv. Total (cfs)	308056.9	Conv. (cfs)		308056.9	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		117.33	
Min Ch El (ft)	1328.39	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)		Cum Volume (acre-ft)	1.58	1073.55	1.81
C & E Loss (ft)		Cum SA (acres)	4.83	156.81	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1338.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.015	
E.G. Elev (ft)	1338.83	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1332.31	Flow Area (sq ft)		965.28	
E.G. Slope (ft/ft)	0.000075	Area (sq ft)		965.28	
Q Total (cfs)	3260.00	Flow (cfs)		3260.00	
Top Width (ft)	118.88	Top Width (ft)		118.88	
Vel Total (ft/s)	3.38	Avg. Vel. (ft/s)		3.38	
Max Chl Dpth (ft)	10.26	Hydr. Depth (ft)		8.12	
Conv. Total (cfs)	377678.2	Conv. (cfs)		377678.2	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		122.97	
Min Ch El (ft)	1328.39	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.12	
Frctn Loss (ft)		Cum Volume (acre-ft)	249.08	1346.66	34.95
C & E Loss (ft)		Cum SA (acres)	127.06	168.82	16.51

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

BRIDGE RIVER: EMF
REACH: Reach 5 RS: 23.815

INPUT
Description: Southern Avenue 4-Span Bridge
Used Field Survey Data for Cross Sections
Bridge Skew 8.76 Degrees, Cross Section Data Adjusted
Distance from Upstream XS = 0
Deck/Roadway Width = 108.37
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 19

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4876.79	1342.36	1342.36	4901.27	1342.22	1341.8	4922.64	1342.09	1341.91
4933.68	1342.06	1342.02	4940	1342.03	1339.98	4962.31	1341.97	1339.87
4967.72	1341.95	1339.8	4973.47	1341.93	1339.73	4996.96	1341.83	1339.77
5007.99	1341.79	1339.67	5015.93	1341.76	1339.66	5031.58	1341.75	1339.64
5042.59	1341.74	1339.56	5063.3	1341.73	1339.57	5068	1341.73	1339.58
5071.08	1341.71	1340	5105.93	1341.58	1340	5152.47	1341.54	1341
5200.12	1341.37	1341						

Upstream Bridge Cross Section Data
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4901.27	1341.83	4933.68	1342.02	4941.42	1339.71	4967.86	1328.49	5002.45	1328.39
5038.36	1328.5	5063.4	1338.9	5071.08	1341.17	5110.78	1341.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4901.27	.04	4933.68	.015	5071.08	.04

Bank Sta: Left Right Coeff Contr. Expan.
4933.68 5071.08 .3 .5
Left Levee Station= 4933.68 Elevation= 1342.02
Right Levee Station= 5071.08 Elevation= 1341.17

Downstream Deck/Roadway Coordinates
num= 19

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4876.79	1342.36	1342.36	4885.07	1342.24	1340	4922.64	1342.09	1341

```
 4930.3 1342.07    1341    4936 1342.04 1339.95 4959.89 1341.98 1339.91
4967.72 1341.95 1339.82 4970.91 1341.94  1339.8  4994.4 1341.84 1339.82
5005.41  1341.8 1339.77 5015.93 1341.76 1339.72 5029.12 1341.75 1339.68
5040.14 1341.74 1339.69 5060.76 1341.73 1339.65 5064.42 1341.73 1339.68
5070.06 1341.71    1340 5105.93 1341.58    1340 5152.47 1341.54    1341
5200.12 1341.37    1341

Downstream Bridge Cross Section Data
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4885.07 1340.97  4930.3 1341.91 4938.94 1339.44 4965.47 1328.24 5000.53 1328.53
 5035.99 1328.49  5061.3 1339.26 5070.06  1341.7 5124.39  1341.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4885.07     .04  4930.3    .015 5070.06     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        4930.3 5070.06             .3       .5
Left Levee      Station=  4930.3      Elevation= 1341.91
Right Levee     Station= 5070.06      Elevation=  1341.7

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

Number of Piers =  3

Pier Data
Pier Station     Upstream= 4967.89    Downstream=  4965.4
Upstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
        2 1327.49       2 1338.75    2.93 1338.75    3.09 1339.48   11.16    1340
Downstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
        2 1327.24       2 1338.75    2.97 1338.75    3.03 1339.51   11.02    1340

Pier Data
Pier Station     Upstream= 5002.47    Downstream=  4999.9
Upstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
        2 1327.39       2 1338.68     2.9 1338.68    3.04 1339.39   11.03    1340
Downstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
        2 1327.53       2 1338.72    2.93 1338.72    3.03 1339.56   11.01    1340

Pier Data
Pier Station     Upstream= 5037.09    Downstream= 5034.63
Upstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
        2  1327.5       2 1338.55    2.86 1338.55       3 1339.25   11.01    1340
Downstream     num=       5
    Width   Elev    Width   Elev    Width   Elev    Width   Elev    Width   Elev
        2 1327.49       2  1338.6    2.95  1338.6    3.04 1339.35   11.02    1340

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =     1.2
       Yarnell                 KVal =      .9
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 downstream end
Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT Profile #Design
Opening : Bridge #1

E.G. US. (ft)	1340.18	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1340.03	E.G. Elev (ft)	1340.17	1340.14
Q Total (cfs)	3500.00	W.S. Elev (ft)	1339.99	1339.96
Q Bridge (cfs)	3500.00	Crit W.S. (ft)	1332.71	1332.69
Q Weir (cfs)		Max Chl Dpth (ft)	11.59	11.71
Weir Sta Lft (ft)		Vel Total (ft/s)	3.42	3.39
Weir Sta Rgt (ft)		Flow Area (sq ft)	1022.41	1033.50
Weir Submerg		Froude # Chl	0.20	0.20
Weir Max Depth (ft)		Specif Force (cu ft)	5869.48	5867.85
Min Top Rd (ft)	1341.70	Hydr Depth (ft)		
Min El Prs (ft)	1339.98	W.P. Total (ft)	307.54	309.44
Delta EG (ft)	0.05	Conv. Total (cfs)	225599.9	228756.0
Delta WS (ft)	0.05	Top Width (ft)		
BR Open Area (sq ft)	1022.41	Frctn Loss (ft)	0.03	0.00
BR Open Vel (ft/s)	3.42	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.05	0.05
Br Sel Mthd	Energy only	Power Total (lb/ft s)	0.17	0.17

Note - Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #Future
Opening : Bridge #1

E.G. US. (ft)	1337.69	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1337.56	E.G. Elev (ft)	1337.68	1337.65
Q Total (cfs)	2440.00	W.S. Elev (ft)	1337.53	1337.49
Q Bridge (cfs)	2440.00	Crit W.S. (ft)	1331.82	1331.83
Q Weir (cfs)		Max Chl Dpth (ft)	9.13	9.25
Weir Sta Lft (ft)		Vel Total (ft/s)	3.13	3.13
Weir Sta Rgt (ft)		Flow Area (sq ft)	780.59	780.42
Weir Submerg		Froude # Chl	0.20	0.20
Weir Max Depth (ft)		Specif Force (cu ft)	3486.22	3476.44
Min Top Rd (ft)	1341.70	Hydr Depth (ft)	7.26	7.25
Min El Prs (ft)	1339.98	W.P. Total (ft)	165.08	165.22
Delta EG (ft)	0.04	Conv. Total (cfs)	217839.9	217643.3
Delta WS (ft)	0.04	Top Width (ft)	107.53	107.60
BR Open Area (sq ft)	1022.41	Frctn Loss (ft)		
BR Open Vel (ft/s)	3.13	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.04	0.04
Br Sel Mthd	Momentum	Power Total (lb/ft s)	0.12	0.12

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

E.G. US. (ft)	1338.83	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1338.65	E.G. Elev (ft)	1338.81	1338.78
Q Total (cfs)	3260.00	W.S. Elev (ft)	1338.61	1338.57
Q Bridge (cfs)	3260.00	Crit W.S. (ft)	1332.52	1332.51
Q Weir (cfs)		Max Chl Dpth (ft)	10.22	10.32
Weir Sta Lft (ft)		Vel Total (ft/s)	3.62	3.63
Weir Sta Rgt (ft)		Flow Area (sq ft)	899.62	899.09
Weir Submerg		Froude # Chl	0.23	0.23
Weir Max Depth (ft)		Specif Force (cu ft)	4524.36	4510.96

Min Top Rd (ft)	1341.70	Hydr Depth (ft)	8.05	7.98
Min El Prs (ft)	1339.98	W.P. Total (ft)	178.02	177.20
Delta EG (ft)	0.05	Conv. Total (cfs)	262435.4	262985.2
Delta WS (ft)	0.05	Top Width (ft)	111.81	112.69
BR Open Area (sq ft)	1022.41	Frctn Loss (ft)		
BR Open Vel (ft/s)	3.63	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.05	0.05
Br Sel Mthd	Momentum	Power Total (lb/ft s)	0.18	0.18

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.804

INPUT
Description: Southern Avenue Bridge Downstream Face
4 Span Bridge with
Concrete Apron and Slopes
Manning's n value of .015 used for
Channel
Use Field Survey Data for this Cross Section
Skew Angle
8.37 Degrees, Cross Section Data Adjusted
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4885.07	1340.97	4930.3	1341.91	4938.94	1339.44	4965.47	1328.24	5000.53	1328.53
5035.99	1328.49	5061.3	1339.26	5070.06	1341.7	5124.39	1341.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4885.07	.04	4930.3	.015	5070.06	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4930.3	5070.06	8.41	8.41	8.41	.3	.5

Left Levee Station= 4930.3 Elevation= 1341.91
Right Levee Station= 5070.06 Elevation= 1341.7

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1339.98	Element			
Vel Head (ft)	0.15	Wt. n-Val.		0.015	
E.G. Elev (ft)	1340.13	Reach Len. (ft)	8.41	8.41	8.41
Crit W.S. (ft)	1332.47	Flow Area (sq ft)		1131.72	
E.G. Slope (ft/ft)	0.000055	Area (sq ft)		1131.72	
Q Total (cfs)	3500.00	Flow (cfs)		3500.00	
Top Width (ft)	126.81	Top Width (ft)		126.81	
Vel Total (ft/s)	3.09	Avg. Vel. (ft/s)		3.09	
Max Chl Dpth (ft)	11.74	Hydr. Depth (ft)		8.92	
Conv. Total (cfs)	470937.1	Conv. (cfs)		470937.1	
Length Wtd. (ft)	8.41	Wetted Per. (ft)		131.45	
Min Ch El (ft)	1328.24	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.56	1215.06	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	169.42	0.38

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1337.51	Element			
Vel Head (ft)	0.13	Wt. n-Val.		0.015	
E.G. Elev (ft)	1337.65	Reach Len. (ft)	8.41	8.41	8.41
Crit W.S. (ft)	1331.64	Flow Area (sq ft)		836.80	
E.G. Slope (ft/ft)	0.000063	Area (sq ft)		836.80	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	113.69	Top Width (ft)		113.69	
Vel Total (ft/s)	2.92	Avg. Vel. (ft/s)		2.92	
Max Chl Dpth (ft)	9.27	Hydr. Depth (ft)		7.36	
Conv. Total (cfs)	307001.2	Conv. (cfs)		307001.2	
Length Wtd. (ft)	8.41	Wetted Per. (ft)		117.41	
Min Ch El (ft)	1328.24	Shear (lb/sq ft)		0.03	

Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	1071.61	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	156.54	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1338.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.015	
E.G. Elev (ft)	1338.78	Reach Len. (ft)	8.41	8.41	8.41
Crit W.S. (ft)	1332.29	Flow Area (sq ft)		962.94	
E.G. Slope (ft/ft)	0.000075	Area (sq ft)		962.94	
Q Total (cfs)	3260.00	Flow (cfs)		3260.00	
Top Width (ft)	118.81	Top Width (ft)		118.81	
Vel Total (ft/s)	3.39	Avg. Vel. (ft/s)		3.39	
Max Chl Dpth (ft)	10.36	Hydr. Depth (ft)		8.10	
Conv. Total (cfs)	376158.9	Conv. (cfs)		376158.9	
Length Wtd. (ft)	8.41	Wetted Per. (ft)		122.97	
Min Ch El (ft)	1328.24	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.12	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	249.08	1344.42	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	168.54	16.51

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.803

INPUT
Description: Begin of Supersition Springs Golf Club
No Ineffective Flow Area
From Southern Avenue Bridge
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4807.85	1342	4842.41	1340.54	4863.98	1340.22	4867.21	1340.1	4879.58	1340.05
4884.91	1340.2	4907.22	1340.55	4927.74	1340.78	4932.82	1341.01	4939.25	1339.2
4951.75	1335.3	4953.68	1330.13	4954.49	1329.48	4960.54	1329.07	4968.66	1329.04
4975.31	1328.8	5024.46	1328.86	5036.01	1328.92	5037.62	1329.31	5047.34	1333.53
5057.95	1338.5	5062.33	1339.15	5065.81	1340.01	5073.38	1340.49	5103.77	1340.34
5121.09	1340.7	5151.31	1341.02	5171.31	1341.26				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4807.85	.04	4932.82	.015	5073.38	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4932.82	5073.38	160	235.63	310	.3	.5

Left Levee Station= 4932.82 Elevation= 1341.01
Right Levee Station= 5073.38 Elevation= 1340.49

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1339.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.015	
E.G. Elev (ft)	1340.12	Reach Len. (ft)	160.00	235.63	310.00
Crit W.S. (ft)	1332.64	Flow Area (sq ft)		1108.34	
E.G. Slope (ft/ft)	0.000062	Area (sq ft)		1108.34	
Q Total (cfs)	3500.00	Flow (cfs)		3500.00	
Top Width (ft)	129.12	Top Width (ft)		129.12	
Vel Total (ft/s)	3.16	Avg. Vel. (ft/s)		3.16	
Max Chl Dpth (ft)	11.17	Hydr. Depth (ft)		8.58	
Conv. Total (cfs)	444987.8	Conv. (cfs)		444987.8	
Length Wtd. (ft)	235.63	Wetted Per. (ft)		135.84	
Min Ch El (ft)	1328.80	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.56	1214.84	0.32
C & E Loss (ft)	0.05	Cum SA (acres)	2.02	169.40	0.38

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1337.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.015	
E.G. Elev (ft)	1337.64	Reach Len. (ft)	160.00	235.63	310.00
Crit W.S. (ft)	1331.85	Flow Area (sq ft)		813.95	
E.G. Slope (ft/ft)	0.000069	Area (sq ft)		813.95	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	111.13	Top Width (ft)		111.13	
Vel Total (ft/s)	3.00	Avg. Vel. (ft/s)		3.00	
Max Chl Dpth (ft)	8.70	Hydr. Depth (ft)		7.32	
Conv. Total (cfs)	293652.0	Conv. (cfs)		293652.0	
Length Wtd. (ft)	235.63	Wetted Per. (ft)		117.11	
Min Ch El (ft)	1328.80	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	1.58	1071.45	1.81
C & E Loss (ft)	0.06	Cum SA (acres)	4.83	156.52	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1338.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.		0.015	
E.G. Elev (ft)	1338.77	Reach Len. (ft)	160.00	235.63	310.00
Crit W.S. (ft)	1332.47	Flow Area (sq ft)		937.34	
E.G. Slope (ft/ft)	0.000083	Area (sq ft)		937.34	
Q Total (cfs)	3260.00	Flow (cfs)		3260.00	
Top Width (ft)	117.30	Top Width (ft)		117.30	
Vel Total (ft/s)	3.48	Avg. Vel. (ft/s)		3.48	
Max Chl Dpth (ft)	9.79	Hydr. Depth (ft)		7.99	
Conv. Total (cfs)	358272.6	Conv. (cfs)		358272.6	
Length Wtd. (ft)	235.63	Wetted Per. (ft)		123.67	
Min Ch El (ft)	1328.80	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	249.08	1344.24	34.95
C & E Loss (ft)	0.08	Cum SA (acres)	127.06	168.52	16.51

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.758

INPUT
Description: Just Downstream of Southern Avenue
Q(D)=4,800 cfs, Q(F)=2,440 cfs
& Q(E)=3,260 cfs
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4594.99	1342	4605.62	1341.71	4617.71	1341.54	4622.76	1341.76	4632.97	1341.78
4647.24	1341.6	4670.71	1341.25	4752.43	1340.66	4770.97	1340.18	4785.24	1339.76
4793.75	1340.4	4795.23	1340.27	4806.61	1338.65	4822.98	1337.92	4835.68	1336.42
4868.49	1333.1	4890.7	1329.4	4895.56	1328.32	5052.17	1328.32	5056.2	1329.33
5068.05	1331.5	5101.87	1337.31	5109.27	1338.62	5126.55	1341.22	5130.01	1341.54
5141.35	1341.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4594.99	.05	4793.75	.045	5130.01	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4793.75	5130.01	190	243.17	300	.1	.3

Left Levee Station= 4793.75 Elevation= 1340.5
Right Levee Station= 5130.01 Elevation= 1341.54

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1340.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.045	
E.G. Elev (ft)	1340.05	Reach Len. (ft)	190.00	243.17	300.00
Crit W.S. (ft)	1331.30	Flow Area (sq ft)		2688.12	
E.G. Slope (ft/ft)	0.000173	Area (sq ft)		2688.12	

Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	321.27	Top Width (ft)		321.27	
Vel Total (ft/s)	1.79	Avg. Vel. (ft/s)		1.79	
Max Chl Dpth (ft)	11.68	Hydr. Depth (ft)		8.37	
Conv. Total (cfs)	364455.7	Conv. (cfs)		364455.7	
Length Wtd. (ft)	243.17	Wetted Per. (ft)		323.09	
Min Ch El (ft)	1328.32	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.56	1204.57	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	168.18	0.38

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1337.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.57	Reach Len. (ft)	190.00	243.17	300.00
Crit W.S. (ft)	1330.24	Flow Area (sq ft)		1948.26	
E.G. Slope (ft/ft)	0.000108	Area (sq ft)		1948.26	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	276.98	Top Width (ft)		276.98	
Vel Total (ft/s)	1.25	Avg. Vel. (ft/s)		1.25	
Max Chl Dpth (ft)	9.22	Hydr. Depth (ft)		7.03	
Conv. Total (cfs)	235326.4	Conv. (cfs)		235326.4	
Length Wtd. (ft)	243.17	Wetted Per. (ft)		278.48	
Min Ch El (ft)	1328.32	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	1.58	1063.98	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	155.47	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1338.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1338.67	Reach Len. (ft)	190.00	243.17	300.00
Crit W.S. (ft)	1330.64	Flow Area (sq ft)		2264.51	
E.G. Slope (ft/ft)	0.000131	Area (sq ft)		2264.51	
Q Total (cfs)	3260.00	Flow (cfs)		3260.00	
Top Width (ft)	302.53	Top Width (ft)		302.53	
Vel Total (ft/s)	1.44	Avg. Vel. (ft/s)		1.44	
Max Chl Dpth (ft)	10.32	Hydr. Depth (ft)		7.49	
Conv. Total (cfs)	285105.1	Conv. (cfs)		285105.1	
Length Wtd. (ft)	243.17	Wetted Per. (ft)		304.16	
Min Ch El (ft)	1328.32	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	249.08	1335.58	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	167.38	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.712

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4853.52	1343	4859.6	1342.14	4870.53	1341.01	4883.82	1339.98	4892.07	1339.51
4898.51	1339	4909.42	1337.66	4912.99	1337.62	4922.17	1336.33	4928.6	1334.99
4945.21	1333.6	4958.77	1331.87	4974.48	1330.06	4979.57	1328.32	5025.95	1328.32

5045.38	1331.9	5049.72	1332.87	5059.2	1334.41	5081.29	1335.41	5096.21	1336.44
5098.72	1336.1	5113.8	1337.5	5122.39	1338.15	5134.56	1339.48	5150.37	1340.72
5163.89	1341.7	5177.19	1342.06						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4853.52	.05	4853.52	.045	5177.19	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4853.52	5177.19	555	569	550	.1	.3

Left Levee Station= 4853.52 Elevation= 1343
Right Levee Station= 5177.19 Elevation= 1342.06

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1339.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.96	Reach Len. (ft)	555.00	569.00	550.00
Crit W.S. (ft)	1333.96	Flow Area (sq ft)		1521.78	
E.G. Slope (ft/ft)	0.000836	Area (sq ft)		1521.78	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	251.70	Top Width (ft)		251.70	
Vel Total (ft/s)	3.15	Avg. Vel. (ft/s)		3.15	
Max Chl Dpth (ft)	11.48	Hydr. Depth (ft)		6.05	
Conv. Total (cfs)	166014.7	Conv. (cfs)		166014.7	
Length Wtd. (ft)	569.00	Wetted Per. (ft)		253.42	
Min Ch El (ft)	1328.32	Shear (lb/sq ft)		0.31	
Alpha	1.00	Stream Power (lb/ft s)		0.99	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	0.56	1192.82	0.32
C & E Loss (ft)	0.02	Cum SA (acres)	2.02	166.58	0.38

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1337.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.50	Reach Len. (ft)	555.00	569.00	550.00
Crit W.S. (ft)	1332.19	Flow Area (sq ft)		983.89	
E.G. Slope (ft/ft)	0.000673	Area (sq ft)		983.89	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	198.33	Top Width (ft)		198.33	
Vel Total (ft/s)	2.48	Avg. Vel. (ft/s)		2.48	
Max Chl Dpth (ft)	9.09	Hydr. Depth (ft)		4.96	
Conv. Total (cfs)	94035.3	Conv. (cfs)		94035.3	
Length Wtd. (ft)	569.00	Wetted Per. (ft)		199.80	
Min Ch El (ft)	1328.32	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.51	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	1.58	1055.80	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	154.14	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1338.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
E.G. Elev (ft)	1338.60	Reach Len. (ft)	555.00	569.00	550.00
Crit W.S. (ft)	1332.86	Flow Area (sq ft)		1212.55	
E.G. Slope (ft/ft)	0.000699	Area (sq ft)		1212.55	
Q Total (cfs)	3260.00	Flow (cfs)		3260.00	
Top Width (ft)	222.82	Top Width (ft)		222.82	
Vel Total (ft/s)	2.69	Avg. Vel. (ft/s)		2.69	
Max Chl Dpth (ft)	10.17	Hydr. Depth (ft)		5.44	
Conv. Total (cfs)	123290.3	Conv. (cfs)		123290.3	
Length Wtd. (ft)	569.00	Wetted Per. (ft)		224.40	
Min Ch El (ft)	1328.32	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		0.63	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	249.08	1325.88	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	165.92	16.51

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.604

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4823.51	1344.5	4825.09	1344.6	4835.96	1343.49	4841.04	1342.87	4866.05	1339
4891.21	1338.1	4901.23	1337.83	4912.48	1337.45	4930.85	1335.91	4946.89	1334.22
4960.68	1332.4	4973.78	1329.87	4977.22	1329.32	5000.66	1328.94	5015.14	1329.98
5037.67	1330.3	5058.85	1331.36	5065.13	1331.07	5080.83	1330.56	5100.53	1331.78
5114.84	1333.3	5126.19	1334.45	5134.25	1335.94	5143.47	1336.83	5147.67	1337.03
5152.47	1336.2	5165.22	1335.39	5190.45	1336.81	5205.8	1338.75	5216.44	1340.47
5234.57	1341.5	5250.55	1341.65						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4823.51	.05	4823.51	.045	5234.57	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4823.51	5234.57	1040	814.02	650	.1	.3

Left Levee Station= 4823.51 Elevation= 1344.5
Right Levee Station= 5234.57 Elevation= 1341.5

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1339.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.55	Reach Len. (ft)	1040.00	814.02	650.00
Crit W.S. (ft)	1333.71	Flow Area (sq ft)		1946.08	
E.G. Slope (ft/ft)	0.000563	Area (sq ft)		1946.08	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	347.07	Top Width (ft)		347.07	
Vel Total (ft/s)	2.47	Avg. Vel. (ft/s)		2.47	
Max Chl Dpth (ft)	10.52	Hydr. Depth (ft)		5.61	
Conv. Total (cfs)	202279.1	Conv. (cfs)		202279.1	
Length Wtd. (ft)	814.02	Wetted Per. (ft)		348.45	
Min Ch El (ft)	1328.94	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.48	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.56	1170.17	0.32
C & E Loss (ft)	0.02	Cum SA (acres)	2.02	162.67	0.38

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1337.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.16	Reach Len. (ft)	1040.00	814.02	650.00
Crit W.S. (ft)	1332.48	Flow Area (sq ft)		1203.60	
E.G. Slope (ft/ft)	0.000532	Area (sq ft)		1203.60	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	275.93	Top Width (ft)		275.93	
Vel Total (ft/s)	2.03	Avg. Vel. (ft/s)		2.03	
Max Chl Dpth (ft)	8.15	Hydr. Depth (ft)		4.36	
Conv. Total (cfs)	105809.7	Conv. (cfs)		105809.7	
Length Wtd. (ft)	814.02	Wetted Per. (ft)		277.07	
Min Ch El (ft)	1328.94	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.29	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	1.58	1041.51	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	151.04	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1338.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1338.25	Reach Len. (ft)	1040.00	814.02	650.00
Crit W.S. (ft)	1332.95	Flow Area (sq ft)		1520.23	
E.G. Slope (ft/ft)	0.000514	Area (sq ft)		1520.23	
Q Total (cfs)	3260.00	Flow (cfs)		3260.00	
Top Width (ft)	312.26	Top Width (ft)		312.26	
Vel Total (ft/s)	2.14	Avg. Vel. (ft/s)		2.14	
Max Chl Dpth (ft)	9.24	Hydr. Depth (ft)		4.87	
Conv. Total (cfs)	143817.8	Conv. (cfs)		143817.8	
Length Wtd. (ft)	814.02	Wetted Per. (ft)		313.50	
Min Ch El (ft)	1328.94	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.33	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	249.08	1308.03	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	162.42	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.45

INPUT
Description:
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4627.63	1342.5	4640.71	1342.61	4658.04	1342.5	4690.82	1342.51	4705.43	1342.82
4714.64	1342.4	4719.18	1342.48	4725.04	1343.73	4729.99	1344.6	4741.57	1346.44
4753.14	1346.3	4760.63	1345.31	4770.16	1343.85	4774.18	1342.63	4784.43	1340.21
4791.88	1339.1	4797.79	1338.41	4821.52	1336.07	4835.77	1335.65	4842.15	1336.28
4850.87	1335.9	4865.49	1334.15	4867.95	1333.62	4874.78	1332.77	4891.29	1331.45
4943.43	1330.2	4965.66	1330	4995.31	1329.09	4999.92	1329.04	5018.31	1328.56
5028.24	1329.4	5037.31	1329.71	5044.15	1330.32	5053.68	1330.97	5060.28	1331.27
5074.09	1330.9	5091.01	1330.89	5099.53	1330.57	5105.28	1330.13	5114.94	1330.14
5127.28	1330	5145.35	1330.25	5154.09	1330.38	5179.2	1332.25	5196.06	1333.18
5198.02	1333.1	5207.28	1334.13	5210.36	1334.7	5218.9	1335.67	5226.2	1336.95
5261.41	1340.3	5272.92	1340.58	5281.45	1341.32	5289.04	1341.37		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4627.63	.05	4753.14	.045	5281.45	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4753.14	5281.45	615	715.61	730	.1	.3

Left Levee Station= 4741.57 Elevation= 1346.44
Right Levee Station= 5281.45 Elevation= 1341.32

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1339.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.32	Reach Len. (ft)	615.00	715.61	730.00
Crit W.S. (ft)	1332.35	Flow Area (sq ft)		3252.60	
E.G. Slope (ft/ft)	0.000148	Area (sq ft)		3252.60	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	460.17	Top Width (ft)		460.17	
Vel Total (ft/s)	1.48	Avg. Vel. (ft/s)		1.48	
Max Chl Dpth (ft)	10.73	Hydr. Depth (ft)		7.07	
Conv. Total (cfs)	394921.9	Conv. (cfs)		394921.9	
Length Wtd. (ft)	715.61	Wetted Per. (ft)		461.30	
Min Ch El (ft)	1328.56	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.56	1121.60	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	155.13	0.38

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1336.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.97	Reach Len. (ft)	615.00	715.61	730.00
Crit W.S. (ft)	1331.57	Flow Area (sq ft)		2228.18	
E.G. Slope (ft/ft)	0.000117	Area (sq ft)		2228.18	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	413.56	Top Width (ft)		413.56	
Vel Total (ft/s)	1.10	Avg. Vel. (ft/s)		1.10	
Max Chl Dpth (ft)	8.39	Hydr. Depth (ft)		5.39	
Conv. Total (cfs)	225796.0	Conv. (cfs)		225796.0	
Length Wtd. (ft)	715.61	Wetted Per. (ft)		414.45	
Min Ch El (ft)	1328.56	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	1.58	1009.44	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	144.60	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1338.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1338.06	Reach Len. (ft)	615.00	715.61	730.00
Crit W.S. (ft)	1331.86	Flow Area (sq ft)		2690.45	
E.G. Slope (ft/ft)	0.000119	Area (sq ft)		2690.45	
Q Total (cfs)	3260.00	Flow (cfs)		3260.00	
Top Width (ft)	436.02	Top Width (ft)		436.02	
Vel Total (ft/s)	1.21	Avg. Vel. (ft/s)		1.21	
Max Chl Dpth (ft)	9.48	Hydr. Depth (ft)		6.17	
Conv. Total (cfs)	298418.1	Conv. (cfs)		298418.1	
Length Wtd. (ft)	715.61	Wetted Per. (ft)		437.02	
Min Ch El (ft)	1328.56	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	249.08	1268.68	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	155.43	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.315

INPUT
Description:
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4581.49	1342.83	4589.56	1342.77	4611.59	1342.23	4622.73	1341.38	4632.39	1341.5
4646.5	1342.52	4650	1341.9	4657.16	1341.45	4666.09	1340.32	4675.27	1338.6
4689.26	1337.61	4698.32	1337.67	4715.39	1337.12	4728.75	1338.41	4732.93	1340.9
4735.22	1342.07	4747.04	1342.43	4754.64	1340.16	4761.02	1340.07	4766.42	1339.8
4772.45	1341.36	4776.44	1341.69	4783.9	1340.41	4786.4	1338.85	4797.14	1337.7
4810.13	1337.63	4832.64	1336.97	4853.47	1336.16	4867.72	1334.78	4875.88	1332.5
4885.08	1332.49	4896.11	1334.3	4905.71	1334.4	4921.57	1333.29	4927.46	1332.7
4941.15	1331.14	4962.2	1327.99	4993.48	1327.54	5001.53	1327.91	5025.25	1330.2
5029.26	1330.59	5053.41	1334	5069.38	1336.38	5075.54	1336.96	5085.4	1337
5109.58	1337.52	5126.12	1339.65	5131.33	1340.4	5143.39	1340.23	5158.64	1341.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4581.49	.05	4776.44	.045	5131.33	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4776.44	5131.33	180	215.71	235	.1	.3

Left Levee Station= 4776.44 Elevation= 1341.69
Right Levee Station= 5131.33 Elevation= 1340.4

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1339.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.12	Reach Len. (ft)	180.00	215.71	235.00
Crit W.S. (ft)	1333.30	Flow Area (sq ft)		1810.34	
E.G. Slope (ft/ft)	0.000685	Area (sq ft)		1810.34	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	335.00	Top Width (ft)		335.00	
Vel Total (ft/s)	2.65	Avg. Vel. (ft/s)		2.65	
Max Chl Dpth (ft)	11.47	Hydr. Depth (ft)		5.40	
Conv. Total (cfs)	183453.7	Conv. (cfs)		183453.7	
Length Wtd. (ft)	215.71	Wetted Per. (ft)		336.73	
Min Ch El (ft)	1327.54	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		0.61	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.56	1080.01	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	148.59	0.38

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1336.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.80	Reach Len. (ft)	180.00	215.71	235.00
Crit W.S. (ft)	1331.60	Flow Area (sq ft)		1123.40	
E.G. Slope (ft/ft)	0.000540	Area (sq ft)		1123.40	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	234.33	Top Width (ft)		234.33	
Vel Total (ft/s)	2.17	Avg. Vel. (ft/s)		2.17	
Max Chl Dpth (ft)	9.19	Hydr. Depth (ft)		4.79	
Conv. Total (cfs)	105018.0	Conv. (cfs)		105018.0	
Length Wtd. (ft)	215.71	Wetted Per. (ft)		235.84	
Min Ch El (ft)	1327.54	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.35	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	1.58	981.91	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	139.28	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1337.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.88	Reach Len. (ft)	180.00	215.71	235.00
Crit W.S. (ft)	1332.23	Flow Area (sq ft)		1417.10	
E.G. Slope (ft/ft)	0.000659	Area (sq ft)		1417.10	
Q Total (cfs)	3260.00	Flow (cfs)		3260.00	
Top Width (ft)	315.58	Top Width (ft)		315.58	
Vel Total (ft/s)	2.30	Avg. Vel. (ft/s)		2.30	
Max Chl Dpth (ft)	10.26	Hydr. Depth (ft)		4.49	
Conv. Total (cfs)	126945.5	Conv. (cfs)		126945.5	
Length Wtd. (ft)	215.71	Wetted Per. (ft)		317.14	
Min Ch El (ft)	1327.54	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	249.08	1234.94	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	149.26	16.51

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

CROSS SECTION RIVER: EMF

REACH: Reach 5 RS: 23.274

INPUT
Description: No Ineffective Flow Area From US 60 Bridge
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4700	1341.8	4705.5	1341.36	4711.52	1340.48	4715.52	1340.3	4735.92	1339.83
4748.01	1338.9	4760.86	1338.7	4802.18	1339.53	4828.79	1339.5	4834.7	1339.29
4838.07	1339.39	4843.91	1338.9	4860.84	1339.34	4871.1	1339.4	4888.37	1338.36
4902.11	1336.35	4911.74	1334.77	4918.35	1333.41	4929.41	1330.2	4933.47	1328.82
4943.55	1328.65	4983.35	1329.05	5026.45	1328.46	5038.29	1328.7	5077.43	1328.85
5095.15	1335.53	5106.01	1337.41	5122.43	1340.39	5138.26	1340.4	5145.71	1340.81
5151.31	1341.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4700	.05	4871.1	.045	5122.43	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4871.1	5122.43	330	289.25	225	.1	.3

Left Levee Station= 4871.1 Elevation= 1340
Right Levee Station= 5122.43 Elevation= 1340.39

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1338.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
E.G. Elev (ft)	1339.00	Reach Len. (ft)	330.00	289.25	225.00
Crit W.S. (ft)	1331.96	Flow Area (sq ft)		1812.37	
E.G. Slope (ft/ft)	0.000428	Area (sq ft)		1812.37	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	234.68	Top Width (ft)		234.68	
Vel Total (ft/s)	2.65	Avg. Vel. (ft/s)		2.65	
Max Chl Dpth (ft)	10.43	Hydr. Depth (ft)		7.72	
Conv. Total (cfs)	232079.5	Conv. (cfs)		232079.5	
Length Wtd. (ft)	289.25	Wetted Per. (ft)		237.32	
Min Ch El (ft)	1328.46	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.56	1071.04	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	147.18	0.38

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1336.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.72	Reach Len. (ft)	330.00	289.25	225.00
Crit W.S. (ft)	1330.81	Flow Area (sq ft)		1331.07	
E.G. Slope (ft/ft)	0.000253	Area (sq ft)		1331.07	
Q Total (cfs)	2440.00	Flow (cfs)		2440.00	
Top Width (ft)	201.80	Top Width (ft)		201.80	
Vel Total (ft/s)	1.83	Avg. Vel. (ft/s)		1.83	
Max Chl Dpth (ft)	8.21	Hydr. Depth (ft)		6.60	
Conv. Total (cfs)	153422.5	Conv. (cfs)		153422.5	
Length Wtd. (ft)	289.25	Wetted Per. (ft)		204.10	
Min Ch El (ft)	1328.46	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.19	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	1.58	975.84	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	138.20	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1337.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.79	Reach Len. (ft)	330.00	289.25	225.00
Crit W.S. (ft)	1331.24	Flow Area (sq ft)		1550.10	
E.G. Slope (ft/ft)	0.000296	Area (sq ft)		1550.10	
Q Total (cfs)	3260.00	Flow (cfs)		3260.00	
Top Width (ft)	214.97	Top Width (ft)		214.97	
Vel Total (ft/s)	2.10	Avg. Vel. (ft/s)		2.10	
Max Chl Dpth (ft)	9.26	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	189592.1	Conv. (cfs)		189592.1	
Length Wtd. (ft)	289.25	Wetted Per. (ft)		217.44	
Min Ch El (ft)	1328.46	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.28	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	249.08	1227.60	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	147.94	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.219

INPUT
Description: US 60 WB Bridge Upstream Face
7 Span Bridge with Walk Paths and
Dirt
3' Thick Riprap Protection Exists under the Bridge
Manning
n Value of .035 used for Channel
Use ADOT As-Built Plans for this
Cross Section
Skew Angle 26.78 Degrees, Cross Section Data
Adjusted
At just Downstream of Superstition Freeway
Channel
Q(D)=4,800 cfs, Q(F)=2,740 cfs & Q(E)=3,530 cfs
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4738.71	1357.7	4766.34	1357.79	4797.2	1358.06	4811.43	1358.02	4835.19	1357.88
4836.64	1357.5	4849.04	1357.86	4849.58	1354.01	4878.78	1338.96	4887.67	1338.23
4917.62	1328.1	4922.19	1327.28	4928.63	1326.6	4934.64	1327.79	4950.76	1327.92
4974.53	1327.5	5067.49	1327.84	5106.31	1339.97	5113.64	1340.39	5116.67	1339.83
5119.6	1340	5134.87	1340.05	5147.34	1340.96	5154.22	1337.52	5180.06	1337.52
5185.43	1338.4	5201.12	1338.16	5211.49	1338.11	5216.92	1338.23	5244.73	1352.57
5245.03	1354.4	5253.74	1356.83	5259.96	1356.99	5261.67	1357.46	5298.2	1356.91
5331.05	1356.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4738.71	.04	4849.04	.035	5261.67	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4849.04	5261.67	135.92	135.92	135.92	.3	.5

Left Levee Station= 4849.04 Elevation= 1357.86
Right Levee Station= 5113.64 Elevation= 1340.39

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1338.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.035	
E.G. Elev (ft)	1338.92	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1330.77	Flow Area (sq ft)		2043.02	
E.G. Slope (ft/ft)	0.000163	Area (sq ft)		2043.02	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	222.42	Top Width (ft)		222.42	
Vel Total (ft/s)	2.35	Avg. Vel. (ft/s)		2.35	
Max Chl Dpth (ft)	12.24	Hydr. Depth (ft)		9.19	
Conv. Total (cfs)	376366.9	Conv. (cfs)		376366.9	

Length Wtd. (ft)	0.00	Wetted Per. (ft)		226.02	
Min Ch El (ft)	1326.60	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.22	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.56	1058.24	0.32
C & E Loss (ft)		Cum SA (acres)	2.02	145.67	0.38

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1336.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.035	
E.G. Elev (ft)	1336.67	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1329.81	Flow Area (sq ft)		1577.02	
E.G. Slope (ft/ft)	0.000111	Area (sq ft)		1577.02	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	203.20	Top Width (ft)		203.20	
Vel Total (ft/s)	1.74	Avg. Vel. (ft/s)		1.74	
Max Chl Dpth (ft)	10.03	Hydr. Depth (ft)		7.76	
Conv. Total (cfs)	259913.2	Conv. (cfs)		259913.2	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		206.18	
Min Ch El (ft)	1326.60	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)		Cum Volume (acre-ft)	1.58	966.18	1.81
C & E Loss (ft)		Cum SA (acres)	4.83	136.85	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1337.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.035	
E.G. Elev (ft)	1337.73	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1330.20	Flow Area (sq ft)		1793.00	
E.G. Slope (ft/ft)	0.000126	Area (sq ft)		1793.00	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	209.65	Top Width (ft)		209.65	
Vel Total (ft/s)	1.97	Avg. Vel. (ft/s)		1.97	
Max Chl Dpth (ft)	11.07	Hydr. Depth (ft)		8.55	
Conv. Total (cfs)	315044.5	Conv. (cfs)		315044.5	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		212.95	
Min Ch El (ft)	1326.60	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)		Cum Volume (acre-ft)	249.08	1216.50	34.95
C & E Loss (ft)		Cum SA (acres)	127.06	146.53	16.51

BRIDGE RIVER: EMF
REACH: Reach 5 RS: 23.206

INPUT
Description: US 60 (Superstition Fwy) EB & WB 7-Span Bridges
Distance from Upstream XS = 0
Deck/Roadway Width = 135.92
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 13

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4740	1358.29	1357	4847.67	1358.71	1356	4849.14	1358.7	1352.63
4905.48	1358.69	1352.7	4962.24	1358.67	1352.65	5018.75	1358.65	1352.85
5057.03	1358.63	1352.8	5132.56	1358.6	1352.55	5189.34	1358.58	1352.5
5244.57	1358.56	1352.35	5246.89	1358.51	1352	5290.97	1358.4	1355
5411.46	1358	1355						

Upstream Bridge Cross Section Data
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4738.71	1357.7	4766.34	1357.79	4797.2	1358.06	4811.43	1358.02	4835.19	1357.88
4836.64	1357.5	4849.04	1357.86	4849.58	1354.01	4878.78	1338.96	4887.67	1338.23
4917.62	1328.1	4922.19	1327.28	4928.63	1326.6	4934.64	1327.79	4950.76	1327.92

4974.53	1327.5	5067.49	1327.84	5106.31	1339.97	5113.64	1340.39	5116.67	1339.83
5119.6	1340	5134.87	1340.05	5147.34	1340.96	5154.22	1337.52	5180.06	1337.52
5185.43	1338.4	5201.12	1338.16	5211.49	1338.11	5216.92	1338.23	5244.73	1352.57
5245.03	1354.4	5253.74	1356.83	5259.96	1356.99	5261.67	1357.46	5298.2	1356.91
5331.05	1356.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4738.71	.04	4849.04	.035	5261.67	.04

Bank Sta: Left Right Coeff Contr. Expan.
4849.04 5261.67 .3 .5
Left Levee Station= 4849.04 Elevation= 1357.86
Right Levee Station= 5113.64 Elevation= 1340.39

Downstream Deck/Roadway Coordinates
num= 14

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4740	1358.29	1357	4847.21	1358.72	1352.63	4847.67	1358.71	1352.64
4903.3	1358.69	1352.7	4960.06	1358.67	1352.65	5016.81	1358.65	1352.85
5073.58	1358.62	1352.8	5130.36	1358.6	1352.55	5187.13	1358.58	1352.5
5242.37	1358.56	1352.35	5244.39	1358.56	1352	5246.89	1358.51	1352
5290.97	1358.4	1352	5411.46	1358	1352			

Downstream Bridge Cross Section Data
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4798.31	1357.6	4832.49	1357.7	4833.41	1357.36	4844.21	1357.91	4848.4	1355.99
4849.07	1353.2	4878.5	1338.5	4886.28	1337.74	4914.19	1328.14	4921.14	1326.32
4927.96	1326.1	4934.86	1327.67	4948.94	1327.21	4983.78	1326.6	5023.81	1327.43
5070.73	1327.8	5105.52	1338.94	5114.93	1339.8	5118.48	1340.14	5134.02	1339.26
5148.39	1340.1	5152.68	1337.52	5178.75	1337.53	5184.55	1338.14	5191.27	1337.92
5201.02	1338.2	5215.69	1337.94	5243.06	1352.68	5245.58	1353.56	5259.85	1357.92
5264.02	1357.7	5268.16	1358.01	5319.96	1357.23	5325.51	1357.27	5352.79	1357.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4798.31	.04	4844.21	.035	5259.85	.04

Bank Sta: Left Right Coeff Contr. Expan.
4844.21 5259.85 .3 .5
Left Levee Station= 4844.21 Elevation= 1357.91
Right Levee Station= 5118.48 Elevation= 1340.14

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

Number of Piers = 6

Pier Data
Pier Station Upstream= 4905.48 Downstream= 4903.3
Upstream num= 4

Width	Elev	Width	Elev	Width	Elev	Width	Elev
3	1327.1	3	1349.2	3.5	1349.2	3.5	1352.7

Downstream num= 4

Width	Elev	Width	Elev	Width	Elev	Width	Elev
3	1327.1	3	1349.2	3.5	1349.2	3.5	1352.7

Pier Data
Pier Station Upstream= 4962.24 Downstream= 4960.06
Upstream num= 4

Width	Elev	Width	Elev	Width	Elev	Width	Elev
3	1325.6	3	1349.15	3.5	1349.15	3.5	1352.65

Downstream num= 4

```
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       3  1325.6       3 1349.15     3.5 1349.15     3.5 1352.65

Pier Data
Pier Station     Upstream= 5018.75    Downstream= 5016.81
Upstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       3  1325.6       3 1349.35     3.5 1349.35     3.5 1352.85
Downstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       3  1325.6       3 1349.35     3.5 1349.35     3.5 1352.85

Pier Data
Pier Station     Upstream= 5075.77    Downstream= 5073.58
Upstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       3  1325.6       3  1349.3     3.5  1349.3     3.5  1352.8
Downstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       3  1325.6       3  1349.3     3.5  1349.3     3.5  1352.8

Pier Data
Pier Station     Upstream= 5132.56    Downstream= 5130.36
Upstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       3  1325.6       3 1349.05     3.5 1349.05     3.5 1352.55
Downstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       3  1325.6       3 1349.05     3.5 1349.05     3.5 1352.55

Pier Data
Pier Station     Upstream= 5189.34    Downstream= 5187.13
Upstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       3  1325.6       3 1348.85     3.5 1348.85     3.5 1352.35
Downstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       3  1325.6       3 1348.85     3.5 1348.85     3.5 1352.35

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =      1.2
       Yarnell                 KVal =       .9
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 downstream end
       Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT    Profile #Design
Opening : Bridge #1

  E.G. US. (ft)                1338.92   Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                1338.84   E.G. Elev (ft)               1338.92       1338.31
  Q Total (cfs)                4800.00   W.S. Elev (ft)               1338.82       1338.22
  Q Bridge (cfs)               4800.00   Crit W.S. (ft)               1330.84       1330.33
  Q Weir (cfs)                           Max Chl Dpth (ft)              12.22         12.12
  Weir Sta Lft (ft)                      Vel Total (ft/s)                2.49          2.48
  Weir Sta Rgt (ft)                      Flow Area (sq ft)           1928.17       1932.46
  Weir Submerg                           Froude # Chl                   0.14          0.14
  Weir Max Depth (ft)                    Specif Force (cu ft)        10509.89      10447.44
```

Min Top Rd (ft)	1358.19	Hydr Depth (ft)	9.17	9.21
Min El Prs (ft)	1352.85	W.P. Total (ft)	288.08	289.21
Delta EG (ft)	0.65	Conv. Total (cfs)	290735.3	291053.7
Delta WS (ft)	0.65	Top Width (ft)	210.22	209.89
BR Open Area (sq ft)	6722.32	Frctn Loss (ft)		
BR Open Vel (ft/s)	2.49	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.11	0.11
Br Sel Mthd	Momentum	Power Total (lb/ft s)	0.28	0.28

BRIDGE OUTPUT Profile #Future
Opening : Bridge #1

E.G. US. (ft)	1336.67	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1336.63	E.G. Elev (ft)	1336.67	1336.09
Q Total (cfs)	2740.00	W.S. Elev (ft)	1336.62	1336.04
Q Bridge (cfs)	2740.00	Crit W.S. (ft)	1329.85	1329.34
Q Weir (cfs)		Max Chl Dpth (ft)	10.02	9.94
Weir Sta Lft (ft)		Vel Total (ft/s)	1.84	1.83
Weir Sta Rgt (ft)		Flow Area (sq ft)	1490.01	1495.82
Weir Submerg		Froude # Chl	0.12	0.12
Weir Max Depth (ft)		Specif Force (cu ft)	6533.16	6500.24
Min Top Rd (ft)	1358.19	Hydr Depth (ft)	7.79	7.74
Min El Prs (ft)	1352.85	W.P. Total (ft)	250.75	254.45
Delta EG (ft)	0.63	Conv. Total (cfs)	207533.6	206853.4
Delta WS (ft)	0.63	Top Width (ft)	191.15	193.23
BR Open Area (sq ft)	6722.32	Frctn Loss (ft)		
BR Open Vel (ft/s)	1.84	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.06	0.06
Br Sel Mthd	Momentum	Power Total (lb/ft s)	0.12	0.12

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

E.G. US. (ft)	1337.73	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1337.67	E.G. Elev (ft)	1337.73	1337.14
Q Total (cfs)	3530.00	W.S. Elev (ft)	1337.66	1337.07
Q Bridge (cfs)	3530.00	Crit W.S. (ft)	1330.26	1329.75
Q Weir (cfs)		Max Chl Dpth (ft)	11.06	10.97
Weir Sta Lft (ft)		Vel Total (ft/s)	2.09	2.08
Weir Sta Rgt (ft)		Flow Area (sq ft)	1692.85	1698.54
Weir Submerg		Froude # Chl	0.13	0.13
Weir Max Depth (ft)		Specif Force (cu ft)	8265.48	8220.69
Min Top Rd (ft)	1358.19	Hydr Depth (ft)	8.57	8.52
Min El Prs (ft)	1352.85	W.P. Total (ft)	265.85	269.27
Delta EG (ft)	0.64	Conv. Total (cfs)	246906.9	246185.6
Delta WS (ft)	0.64	Top Width (ft)	197.58	199.45
BR Open Area (sq ft)	6722.32	Frctn Loss (ft)		
BR Open Vel (ft/s)	2.09	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.08	0.08
Br Sel Mthd	Momentum	Power Total (lb/ft s)	0.17	0.17

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.193

INPUT
Description: US 60 EB Bridge Downstream Face
7 Span Bridge with Walk Paths and
Dirt
3' Thick Riprap Protection Exists under the Bridge
Manning
n Value of .035 used for Channel
Use ADOT As-Built Plans for this
Cross Section
Skew Angle 26.67 Degrees, Cross Section Data
Adjusted
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4798.31	1357.6	4832.49	1357.7	4833.41	1357.36	4844.21	1357.91	4848.4	1355.99
4849.07	1353.2	4878.5	1338.5	4886.28	1337.74	4914.19	1328.14	4921.14	1326.32
4927.96	1326.1	4934.86	1327.67	4948.94	1327.21	4983.78	1326.6	5023.81	1327.43
5070.73	1327.8	5105.52	1338.94	5114.93	1339.8	5118.48	1340.14	5134.02	1339.26
5148.39	1340.1	5152.68	1337.52	5178.75	1337.53	5184.55	1338.14	5191.27	1337.92
5201.02	1338.2	5215.69	1337.94	5243.06	1352.68	5245.58	1353.56	5259.85	1357.92
5264.02	1357.7	5268.16	1358.01	5319.96	1357.23	5325.51	1357.27	5352.79	1357.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4798.31	.04	4844.21	.035	5259.85	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4844.21	5259.85	70	144.31	200	.3	.5

Left Levee Station= 4844.21 Elevation= 1357.91
Right Levee Station= 5118.48 Elevation= 1340.14

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1338.19	Element			
Vel Head (ft)	0.09	Wt. n-Val.		0.035	
E.G. Elev (ft)	1338.28	Reach Len. (ft)	70.00	144.31	200.00
Crit W.S. (ft)	1330.22	Flow Area (sq ft)		2039.93	
E.G. Slope (ft/ft)	0.000163	Area (sq ft)		2039.93	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	221.50	Top Width (ft)		221.50	
Vel Total (ft/s)	2.35	Avg. Vel. (ft/s)		2.35	
Max Chl Dpth (ft)	12.09	Hydr. Depth (ft)		9.21	
Conv. Total (cfs)	376352.4	Conv. (cfs)		376352.4	
Length Wtd. (ft)	144.31	Wetted Per. (ft)		225.18	
Min Ch El (ft)	1326.10	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.22	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.56	1052.22	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	145.01	0.38

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1336.00	Element			
Vel Head (ft)	0.05	Wt. n-Val.		0.035	
E.G. Elev (ft)	1336.05	Reach Len. (ft)	70.00	144.31	200.00
Crit W.S. (ft)	1329.30	Flow Area (sq ft)		1576.12	
E.G. Slope (ft/ft)	0.000113	Area (sq ft)		1576.12	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	205.01	Top Width (ft)		205.01	
Vel Total (ft/s)	1.74	Avg. Vel. (ft/s)		1.74	
Max Chl Dpth (ft)	9.90	Hydr. Depth (ft)		7.69	
Conv. Total (cfs)	258116.0	Conv. (cfs)		258116.0	
Length Wtd. (ft)	144.31	Wetted Per. (ft)		208.04	
Min Ch El (ft)	1326.10	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	1.58	961.52	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	136.25	1.66

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1337.03	Element			
Vel Head (ft)	0.06	Wt. n-Val.		0.035	
E.G. Elev (ft)	1337.09	Reach Len. (ft)	70.00	144.31	200.00
Crit W.S. (ft)	1329.67	Flow Area (sq ft)		1791.18	
E.G. Slope (ft/ft)	0.000127	Area (sq ft)		1791.18	

Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	211.24	Top Width (ft)		211.24	
Vel Total (ft/s)	1.97	Avg. Vel. (ft/s)		1.97	
Max Chl Dpth (ft)	10.93	Hydr. Depth (ft)		8.48	
Conv. Total (cfs)	312897.5	Conv. (cfs)		312897.5	
Length Wtd. (ft)	144.31	Wetted Per. (ft)		214.60	
Min Ch El (ft)	1326.10	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	249.08	1211.21	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	145.91	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.166

INPUT
Description: No Ineffective Flow Area From US 60 Bridge
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4817.48	1355.9	4840.61	1353.6	4842.68	1352.89	4847.72	1352.54	4851.6	1351.73
4874.99	1342.5	4883.79	1338.92	4888.01	1337.94	4903.4	1332.59	4913.13	1328.94
4920.62	1327.7	4936.79	1327.57	4968.45	1327.75	4987.79	1327.4	5010.6	1327.56
5022.71	1327.5	5027.57	1327.92	5032.55	1328.06	5051.77	1330.3	5058.16	1330.81
5063.57	1331.7	5076.96	1334.23	5082.7	1334.92	5108.29	1337.27	5125.73	1339.01
5132.69	1339.5	5140.18	1339.74	5146.43	1340.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4817.48	.05	4847.72	.045	5146.43	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4847.72	5146.43	105	165.24	180	.1	.3

Left Levee Station= 4847.72 Elevation= 1352.54
Right Levee Station= 5146.43 Elevation= 1340.2

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1338.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
E.G. Elev (ft)	1338.23	Reach Len. (ft)	105.00	165.24	180.00
Crit W.S. (ft)	1331.23	Flow Area (sq ft)		1766.69	
E.G. Slope (ft/ft)	0.000452	Area (sq ft)		1766.69	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	229.51	Top Width (ft)		229.51	
Vel Total (ft/s)	2.72	Avg. Vel. (ft/s)		2.72	
Max Chl Dpth (ft)	10.72	Hydr. Depth (ft)		7.70	
Conv. Total (cfs)	225881.7	Conv. (cfs)		225881.7	
Length Wtd. (ft)	165.24	Wetted Per. (ft)		231.87	
Min Ch El (ft)	1327.40	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.58	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.56	1045.91	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	144.26	0.38

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1335.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.02	Reach Len. (ft)	105.00	165.24	180.00
Crit W.S. (ft)	1330.15	Flow Area (sq ft)		1300.47	
E.G. Slope (ft/ft)	0.000340	Area (sq ft)		1300.47	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	200.13	Top Width (ft)		200.13	
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)		2.11	
Max Chl Dpth (ft)	8.55	Hydr. Depth (ft)		6.50	
Conv. Total (cfs)	148592.6	Conv. (cfs)		148592.6	

Length Wtd. (ft)	165.24	Wetted Per. (ft)		202.04	
Min Ch El (ft)	1327.40	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.29	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	1.58	956.76	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	135.58	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1336.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.06	Reach Len. (ft)	105.00	165.24	180.00
Crit W.S. (ft)	1330.60	Flow Area (sq ft)		1513.36	
E.G. Slope (ft/ft)	0.000373	Area (sq ft)		1513.36	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	214.27	Top Width (ft)		214.27	
Vel Total (ft/s)	2.33	Avg. Vel. (ft/s)		2.33	
Max Chl Dpth (ft)	9.57	Hydr. Depth (ft)		7.06	
Conv. Total (cfs)	182746.5	Conv. (cfs)		182746.5	
Length Wtd. (ft)	165.24	Wetted Per. (ft)		216.40	
Min Ch El (ft)	1327.40	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.38	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	249.08	1205.73	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	145.21	16.51

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.135

INPUT
Description: Ineffective Flow Area From US 60 Bridge
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4761.79	1350	4775.67	1348.1	4836.22	1338.74	4841	1338.28	4873.34	1336.82
4879.32	1336.3	4897.94	1335.29	4908.13	1334.36	4917.6	1333.84	4932.62	1330.12
4942.76	1327.8	4953.11	1325.18	4959.44	1324.83	5017.97	1324.83	5025.79	1326.26
5034	1327.1	5056.65	1329.86	5071.39	1331.3	5080.19	1331.16	5097.02	1330.87
5109.33	1331.7	5137.64	1336.05	5148.77	1337.11	5158.46	1338.71	5163.19	1338.91
5173.19	1339.7	5181.94	1339.04	5186.14	1339.55	5191.73	1339.64	5197.47	1340

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4761.79	.05	4761.79	.045	5173.19	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4761.79	5173.19	250	249.49	300	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev
4761.79	4882	1341

Left Levee Station= 4761.79 Elevation= 1350
Right Levee Station= 5173.19 Elevation= 1339.7

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1338.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1338.16	Reach Len. (ft)	250.00	249.49	300.00
Crit W.S. (ft)	1329.71	Flow Area (sq ft)		2193.53	
E.G. Slope (ft/ft)	0.000275	Area (sq ft)		2225.40	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	309.39	Top Width (ft)		309.39	
Vel Total (ft/s)	2.19	Avg. Vel. (ft/s)		2.19	
Max Chl Dpth (ft)	13.26	Hydr. Depth (ft)		8.04	
Conv. Total (cfs)	289353.7	Conv. (cfs)		289353.7	
Length Wtd. (ft)	249.49	Wetted Per. (ft)		274.72	
Min Ch El (ft)	1324.83	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.30	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.56	1038.34	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	143.24	0.38

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1335.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.96	Reach Len. (ft)	250.00	249.49	300.00
Crit W.S. (ft)	1328.34	Flow Area (sq ft)		1620.35	
E.G. Slope (ft/ft)	0.000220	Area (sq ft)		1620.35	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	250.44	Top Width (ft)		250.44	
Vel Total (ft/s)	1.69	Avg. Vel. (ft/s)		1.69	
Max Chl Dpth (ft)	11.09	Hydr. Depth (ft)		6.47	
Conv. Total (cfs)	184851.1	Conv. (cfs)		184851.1	
Length Wtd. (ft)	249.49	Wetted Per. (ft)		252.33	
Min Ch El (ft)	1324.83	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.15	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	1.58	951.22	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	134.73	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1336.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.00	Reach Len. (ft)	250.00	249.49	300.00
Crit W.S. (ft)	1328.90	Flow Area (sq ft)		1886.70	
E.G. Slope (ft/ft)	0.000237	Area (sq ft)		1891.11	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	276.51	Top Width (ft)		276.51	
Vel Total (ft/s)	1.87	Avg. Vel. (ft/s)		1.87	
Max Chl Dpth (ft)	12.12	Hydr. Depth (ft)		7.12	
Conv. Total (cfs)	229408.9	Conv. (cfs)		229408.9	
Length Wtd. (ft)	249.49	Wetted Per. (ft)		267.00	
Min Ch El (ft)	1324.83	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.20	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	249.08	1199.28	34.95
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	144.28	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.087

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4764.02	1338.54	4775.29	1338.21	4779.35	1338.39	4781.84	1338.19	4800.67	1338.3
4807.2	1338.08	4822.34	1336.1	4831.75	1335.81	4846.44	1335.86	4853.26	1335
4889.71	1334.3	4899.71	1332.51	4925.8	1327.73	4931.99	1327.5	4941.67	1324.83
4996.16	1324.8	5002.15	1326.95	5014.42	1329	5024.01	1330.47	5030.62	1331.26
5039.7	1332.7	5050.52	1335.43	5063.18	1336.52	5070.74	1337.74	5076.47	1338.39
5090.19	1338.8	5096.64	1338.73	5107.14	1337.93	5121.75	1337.22	5150.08	1336.12
5173.68	1336.1	5177.34	1336.08	5186.4	1335.55	5191.58	1335	5193.48	1335.17
5202.93	1334.9	5232.59	1335.84	5253.15	1336.06	5261.8	1336.45	5274.47	1337.19
5287.22	1338.54								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4764.02	.05	4800.67	.045	5287.22	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4800.67	5287.22	500	415.87	200	.1	.3

Left Levee Station= 4800.67 Elevation= 1338.3
Right Levee Station= 5287.22 Elevation= 1338.54

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1337.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.045	
E.G. Elev (ft)	1338.06	Reach Len. (ft)	500.00	415.87	200.00
Crit W.S. (ft)	1330.25	Flow Area (sq ft)		2113.99	
E.G. Slope (ft/ft)	0.000589	Area (sq ft)		2113.99	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	440.46	Top Width (ft)		440.46	
Vel Total (ft/s)	2.27	Avg. Vel. (ft/s)		2.27	
Max Chl Dpth (ft)	13.18	Hydr. Depth (ft)		4.80	
Conv. Total (cfs)	197824.6	Conv. (cfs)		197824.6	
Length Wtd. (ft)	415.87	Wetted Per. (ft)		443.11	
Min Ch El (ft)	1324.80	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.40	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.56	1025.91	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	141.09	0.38

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1335.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.88	Reach Len. (ft)	500.00	415.87	200.00
Crit W.S. (ft)	1328.76	Flow Area (sq ft)		1287.13	
E.G. Slope (ft/ft)	0.000494	Area (sq ft)		1287.13	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	258.27	Top Width (ft)		258.27	
Vel Total (ft/s)	2.13	Avg. Vel. (ft/s)		2.13	
Max Chl Dpth (ft)	11.01	Hydr. Depth (ft)		4.98	
Conv. Total (cfs)	123287.8	Conv. (cfs)		123287.8	
Length Wtd. (ft)	415.87	Wetted Per. (ft)		260.52	
Min Ch El (ft)	1324.80	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.32	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	1.58	942.89	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	133.27	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1336.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.91	Reach Len. (ft)	500.00	415.87	200.00
Crit W.S. (ft)	1329.38	Flow Area (sq ft)		1638.85	
E.G. Slope (ft/ft)	0.000622	Area (sq ft)		1638.85	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	385.23	Top Width (ft)		385.23	
Vel Total (ft/s)	2.15	Avg. Vel. (ft/s)		2.15	
Max Chl Dpth (ft)	12.04	Hydr. Depth (ft)		4.25	
Conv. Total (cfs)	141492.7	Conv. (cfs)		141492.7	
Length Wtd. (ft)	415.87	Wetted Per. (ft)		387.64	
Min Ch El (ft)	1324.80	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.35	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	249.08	1189.17	34.95
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	142.38	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 23.009

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4688.14	1338.7	4701.26	1338.2	4706.63	1337.71	4725.85	1337.53	4739.79	1337.15
4745.78	1336.8	4769.05	1335.04	4770.93	1335.08	4791.18	1334.28	4809.38	1333.76
4822.87	1332.7	4862.78	1331.45	4866.52	1331.31	4891.29	1331.13	4903.77	1331.38
4911.66	1331.4	4918.52	1330.78	4925.93	1330.59	4934.77	1330.12	4938.74	1330.02
4962.73	1327.8	4968.17	1327.11	5073.26	1327.11	5075.16	1327.99	5081.59	1328.16
5111.63	1332.9	5119.44	1334.04	5122.22	1334.21	5146.86	1334.2	5155.14	1333.64
5160.43	1333.8	5175.35	1334.95	5210.01	1338.6	5214.84	1339.02	5222.14	1338.93
5239.42	1339.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4688.14	.05	4688.14	.045	5214.84	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4688.14	5214.84	260	340.47	420	.1	.3

Left Levee Station= 4688.14 Elevation= 1338.7
Right Levee Station= 5214.84 Elevation= 1339.02

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1337.87	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.91	Reach Len. (ft)	260.00	340.47	420.00
Crit W.S. (ft)	1330.78	Flow Area (sq ft)		3006.13	
E.G. Slope (ft/ft)	0.000214	Area (sq ft)		3006.13	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	498.27	Top Width (ft)		498.27	
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)		1.60	
Max Chl Dpth (ft)	10.76	Hydr. Depth (ft)		6.03	
Conv. Total (cfs)	328420.6	Conv. (cfs)		328420.6	
Length Wtd. (ft)	340.47	Wetted Per. (ft)		499.51	
Min Ch El (ft)	1327.11	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.56	1001.47	0.32
C & E Loss (ft)	0.02	Cum SA (acres)	2.02	136.61	0.38

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1335.71	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.74	Reach Len. (ft)	260.00	340.47	420.00
Crit W.S. (ft)	1329.69	Flow Area (sq ft)		2030.63	
E.G. Slope (ft/ft)	0.000207	Area (sq ft)		2030.63	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	422.46	Top Width (ft)		422.46	
Vel Total (ft/s)	1.35	Avg. Vel. (ft/s)		1.35	
Max Chl Dpth (ft)	8.60	Hydr. Depth (ft)		4.81	
Conv. Total (cfs)	190654.2	Conv. (cfs)		190654.2	
Length Wtd. (ft)	340.47	Wetted Per. (ft)		423.53	
Min Ch El (ft)	1327.11	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.08	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	1.58	927.06	1.81

C & E Loss (ft)	0.02	Cum SA (acres)	4.83	130.02	1.66

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1336.73	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.77	Reach Len. (ft)	260.00	340.47	420.00
Crit W.S. (ft)	1330.14	Flow Area (sq ft)		2473.25	
E.G. Slope (ft/ft)	0.000191	Area (sq ft)		2473.25	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	445.62	Top Width (ft)		445.62	
Vel Total (ft/s)	1.43	Avg. Vel. (ft/s)		1.43	
Max Chl Dpth (ft)	9.62	Hydr. Depth (ft)		5.55	
Conv. Total (cfs)	255562.9	Conv. (cfs)		255562.9	
Length Wtd. (ft)	340.47	Wetted Per. (ft)		446.78	
Min Ch El (ft)	1327.11	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	249.08	1169.54	34.95
C & E Loss (ft)	0.02	Cum SA (acres)	127.06	138.42	16.51

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.944

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4743.96	1339.5	4762.16	1339.04	4787.5	1338.1	4789.82	1339.34	4801.52	1343.35
4802.59	1343.4	4810.43	1345	4820.88	1345.34	4827.82	1344.66	4834.56	1344.57
4851.28	1344.8	4857.87	1344.36	4862	1343.91	4873.64	1341.51	4885.42	1337.24
4900.54	1334.3	4908.32	1333.07	4921.13	1331.48	4928.35	1331.1	4937.04	1330.89
4946.88	1331.3	4955.55	1330.74	4969.32	1329.25	4975.42	1328.04	4978.64	1328.07
5008.76	1327.7	5025	1328.48	5028.14	1329.33	5035.05	1331.96	5039.74	1332.68
5054.94	1333.4	5061.37	1334.28	5064.84	1335.1	5070.86	1337.21	5075.06	1337.51
5126.96	1338.5	5132.46	1338.32	5150.79	1338.48	5157.12	1338.75	5170	1338.31
5183.31	1337.4	5191.03	1338.37	5208.55	1338.34	5221.4	1339.03	5225.38	1339.41
5232.69	1339.9	5253.3	1339.3	5262.9	1338.94	5281.2	1339.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4743.96	.05	4851.28	.045	5075.06	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4851.28	5075.06	445	411.54	370	.1	.3

Left Levee Station= 4851.28 Elevation= 1344.8
Right Levee Station= 5157.12 Elevation= 1338.75

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1337.48	Element			
Vel Head (ft)	0.26	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.74	Reach Len. (ft)	445.00	411.54	370.00
Crit W.S. (ft)	1333.30	Flow Area (sq ft)		1179.14	
E.G. Slope (ft/ft)	0.001351	Area (sq ft)		1179.14	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	189.96	Top Width (ft)		189.96	
Vel Total (ft/s)	4.07	Avg. Vel. (ft/s)		4.07	
Max Chl Dpth (ft)	9.78	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	130604.3	Conv. (cfs)		130604.3	
Length Wtd. (ft)	411.41	Wetted Per. (ft)		191.94	
Min Ch El (ft)	1327.70	Shear (lb/sq ft)		0.52	

Alpha	1.00	Stream Power (lb/ft s)		2.11	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	0.56	985.12	0.32
C & E Loss (ft)	0.03	Cum SA (acres)	2.02	133.92	0.38

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1335.40	Element			
Vel Head (ft)	0.18	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.58	Reach Len. (ft)	445.00	411.54	370.00
Crit W.S. (ft)	1332.02	Flow Area (sq ft)		805.55	
E.G. Slope (ft/ft)	0.001357	Area (sq ft)		805.55	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	170.82	Top Width (ft)		170.82	
Vel Total (ft/s)	3.40	Avg. Vel. (ft/s)		3.40	
Max Chl Dpth (ft)	7.70	Hydr. Depth (ft)		4.72	
Conv. Total (cfs)	74384.5	Conv. (cfs)		74384.5	
Length Wtd. (ft)	411.54	Wetted Per. (ft)		172.26	
Min Ch El (ft)	1327.70	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)		1.35	
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	1.58	915.97	1.81
C & E Loss (ft)	0.02	Cum SA (acres)	4.83	127.70	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1336.41	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.61	Reach Len. (ft)	445.00	411.54	370.00
Crit W.S. (ft)	1332.52	Flow Area (sq ft)		982.56	
E.G. Slope (ft/ft)	0.001237	Area (sq ft)		982.56	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	178.92	Top Width (ft)		178.92	
Vel Total (ft/s)	3.59	Avg. Vel. (ft/s)		3.59	
Max Chl Dpth (ft)	8.71	Hydr. Depth (ft)		5.49	
Conv. Total (cfs)	100352.8	Conv. (cfs)		100352.8	
Length Wtd. (ft)	411.52	Wetted Per. (ft)		180.62	
Min Ch El (ft)	1327.70	Shear (lb/sq ft)		0.42	
Alpha	1.00	Stream Power (lb/ft s)		1.51	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	249.08	1156.03	34.95
C & E Loss (ft)	0.02	Cum SA (acres)	127.06	135.97	16.51

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.866

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4894.2	1350	4931.09	1338.08	4937.91	1336.58	4972.59	1328.57	4980.64	1326.93
4996.63	1326.2	5000.32	1326.3	5007.65	1326.81	5011.81	1327.42	5030.49	1330.64
5039.08	1330.7	5051.87	1331	5084.68	1330.09	5109.97	1330.1	5117.27	1330.15
5128.84	1331.9	5146.76	1333.77	5151.89	1334.51	5156.45	1334.78	5163.38	1335.72
5173.16	1337.2	5184.95	1336.68	5195.17	1336.3	5197.65	1335.85	5204.53	1335.3
5213.22	1336	5224.27	1337.41	5226.08	1337.88	5234.2	1337.05	5243.54	1335.74
5260.91	1336.3	5264.48	1337.09	5267.95	1337.32	5272.55	1337.25	5278.2	1337.77
5281.11	1337.8	5287.94	1338.58	5295.93	1338.57	5302.88	1338.35	5316.15	1339.22

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4894.2	.05	4931.09	.045	5173.16	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4931.09	5173.16	370	364.49	330	.1	.3

Left Levee Station= 4931.09 Elevation= 1338.08
Right Levee Station= 5226.08 Elevation= 1337.88

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1337.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.045	0.050
E.G. Elev (ft)	1337.28	Reach Len. (ft)	370.00	364.49	330.00
Crit W.S. (ft)	1332.41	Flow Area (sq ft)		1487.62	39.84
E.G. Slope (ft/ft)	0.000824	Area (sq ft)		1487.62	39.84
Q Total (cfs)	4800.00	Flow (cfs)		4769.72	30.28
Top Width (ft)	284.46	Top Width (ft)		237.25	47.21
Vel Total (ft/s)	3.14	Avg. Vel. (ft/s)		3.21	0.76
Max Chl Dpth (ft)	10.93	Hydr. Depth (ft)		6.27	0.84
Conv. Total (cfs)	167170.1	Conv. (cfs)		166115.7	1054.4
Length Wtd. (ft)	364.38	Wetted Per. (ft)		239.22	47.39
Min Ch El (ft)	1326.20	Shear (lb/sq ft)		0.32	0.04
Alpha	1.03	Stream Power (lb/ft s)		1.03	0.03
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.56	972.52	0.15
C & E Loss (ft)	0.02	Cum SA (acres)	2.02	131.90	0.18

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1335.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.12	Reach Len. (ft)	370.00	364.49	330.00
Crit W.S. (ft)	1331.44	Flow Area (sq ft)		1010.25	
E.G. Slope (ft/ft)	0.000857	Area (sq ft)		1010.25	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	213.43	Top Width (ft)		213.43	
Vel Total (ft/s)	2.71	Avg. Vel. (ft/s)		2.71	
Max Chl Dpth (ft)	8.81	Hydr. Depth (ft)		4.73	
Conv. Total (cfs)	93584.2	Conv. (cfs)		93584.2	
Length Wtd. (ft)	364.49	Wetted Per. (ft)		215.00	
Min Ch El (ft)	1326.20	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	1.58	907.39	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	125.89	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1336.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.045	0.050
E.G. Elev (ft)	1336.20	Reach Len. (ft)	370.00	364.49	330.00
Crit W.S. (ft)	1331.83	Flow Area (sq ft)		1243.63	7.24
E.G. Slope (ft/ft)	0.000765	Area (sq ft)		1243.63	7.24
Q Total (cfs)	3530.00	Flow (cfs)		3526.69	3.31
Top Width (ft)	242.95	Top Width (ft)		225.59	17.35
Vel Total (ft/s)	2.82	Avg. Vel. (ft/s)		2.84	0.46
Max Chl Dpth (ft)	9.87	Hydr. Depth (ft)		5.51	0.42
Conv. Total (cfs)	127602.5	Conv. (cfs)		127482.8	119.7
Length Wtd. (ft)	364.47	Wetted Per. (ft)		227.37	17.43
Min Ch El (ft)	1326.20	Shear (lb/sq ft)		0.26	0.02
Alpha	1.01	Stream Power (lb/ft s)		0.74	0.01
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	249.08	1145.52	34.92
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	134.06	16.43

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.797

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4815.33	1351.64	4823.27	1351.39	4825.85	1350.9	4837.76	1347.75	4857.58	1343.39
4877.54	1340.35	4882.02	1340.06	4884.26	1339.4	4905.3	1336.68	4909.06	1335.99

4925.75	1334.69	4935.18	1334.06	4946.18	1332.7	4950.01	1332.34	4958.49	1332.07
4973.05	1332.51	4982.46	1330.11	4997.08	1328	4998.24	1327.44	5005.51	1327.03
5016.95	1326.57	5051.95	1327.07	5071.8	1330	5094	1330.6	5129.69	1330.49
5174.88	1331.17	5197.39	1333.6	5209.25	1334.8	5236.41	1336.55	5246.73	1337.6
5263.76	1339.46	5270.86	1338.99	5281.62	1339.5	5287.57	1339.61		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4815.33	.05	4823.27	.045	5263.76	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4823.27	5263.76	302.84	302.84	302.84	.1	.3

Left Levee Station= 4823.27 Elevation= 1351.39
Right Levee Station= 5263.76 Elevation= 1339.46

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1336.92	Element			
Vel Head (ft)	0.10	Wt. n-Val.		0.045	
E.G. Elev (ft)	1337.02	Reach Len. (ft)	302.84	302.84	302.84
Crit W.S. (ft)	1331.90	Flow Area (sq ft)		1920.00	
E.G. Slope (ft/ft)	0.000566	Area (sq ft)		1920.00	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	336.65	Top Width (ft)		336.65	
Vel Total (ft/s)	2.50	Avg. Vel. (ft/s)		2.50	
Max Chl Dpth (ft)	10.35	Hydr. Depth (ft)		5.70	
Conv. Total (cfs)	201834.7	Conv. (cfs)		201834.7	
Length Wtd. (ft)	302.84	Wetted Per. (ft)		338.01	
Min Ch El (ft)	1326.57	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.50	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.56	958.26	
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	129.50	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1334.77	Element			
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.85	Reach Len. (ft)	302.84	302.84	302.84
Crit W.S. (ft)	1331.03	Flow Area (sq ft)		1247.06	
E.G. Slope (ft/ft)	0.000620	Area (sq ft)		1247.06	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	284.29	Top Width (ft)		284.29	
Vel Total (ft/s)	2.20	Avg. Vel. (ft/s)		2.20	
Max Chl Dpth (ft)	8.20	Hydr. Depth (ft)		4.39	
Conv. Total (cfs)	110045.8	Conv. (cfs)		110045.8	
Length Wtd. (ft)	302.84	Wetted Per. (ft)		285.45	
Min Ch El (ft)	1326.57	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.37	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	1.58	897.95	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	123.81	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1335.87	Element			
Vel Head (ft)	0.08	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.95	Reach Len. (ft)	302.84	302.84	302.84
Crit W.S. (ft)	1331.41	Flow Area (sq ft)		1576.56	
E.G. Slope (ft/ft)	0.000541	Area (sq ft)		1576.56	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	315.31	Top Width (ft)		315.31	
Vel Total (ft/s)	2.24	Avg. Vel. (ft/s)		2.24	
Max Chl Dpth (ft)	9.30	Hydr. Depth (ft)		5.00	
Conv. Total (cfs)	151824.4	Conv. (cfs)		151824.4	
Length Wtd. (ft)	302.84	Wetted Per. (ft)		316.55	
Min Ch El (ft)	1326.57	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.38	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	249.08	1133.72	34.89

C & E Loss (ft)	0.00	Cum SA (acres)	127.06	131.80	16.37

CROSS SECTION *RIVER: EMF*
REACH: Reach 5 RS: 22.74

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4779.9	1353.7	4786.57	1352.93	4794.12	1352.7	4808.55	1350.9	4816.55	1350.27
4820.45	1349.78	4826.02	1348.36	4836.28	1346.1	4840.15	1345.78	4853.81	1343.17
4887.42	1337.06	4899.87	1334.64	4907.47	1334.6	4911.39	1334.36	4919.81	1333.27
4924.55	1331.91	4935.44	1330.92	4950.11	1328.7	4959.33	1327.04	5003.36	1326.29
5016.32	*1326.44*	*5034.41*	*1327.19*	*5047.08*	*1327.2*	*5066.58*	*1327.93*	*5078.95*	*1327.87*
5089.82	1330.89	5105.14	1334.31	5117.04	1334.6	5139.25	1334.07	5143.89	1333.51
5156.41	1334.92	5169.02	1335.92	5181.55	1335.7	5191.13	1335.61	5193.59	1335.74
5208.13	1337.93	5211.36	1338.24	5214.72	1339	5220.99	1339.5	5228.25	1339.11
5243.7	1339.56								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4779.9	.05	4794.12	.045	5220.99	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4794.12	5220.99	*280*	*318.21*	*320*	*.1*	*.3*

Left Levee Station= 4794.12 Elevation= 1352.7
Right Levee Station= 5220.99 Elevation= 1339.5

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1336.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.84	Reach Len. (ft)	280.00	318.21	320.00
Crit W.S. (ft)	1330.54	Flow Area (sq ft)		1798.64	
E.G. Slope (ft/ft)	0.000634	Area (sq ft)		1798.64	
Q Total (cfs)	4800.00	Flow (cfs)		*4800.00*	
Top Width (ft)	311.00	Top Width (ft)		311.00	
Vel Total (ft/s)	2.67	Avg. Vel. (ft/s)		2.67	
Max Chl Dpth (ft)	10.44	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	190583.0	Conv. (cfs)		190583.0	
Length Wtd. (ft)	318.21	Wetted Per. (ft)		312.90	
Min Ch El (ft)	1326.29	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		0.61	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.56	945.34	
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	127.25	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1334.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.66	Reach Len. (ft)	280.00	318.21	320.00
Crit W.S. (ft)	1329.46	Flow Area (sq ft)		1194.17	
E.G. Slope (ft/ft)	0.000587	Area (sq ft)		1194.17	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	244.21	Top Width (ft)		244.21	
Vel Total (ft/s)	2.29	Avg. Vel. (ft/s)		2.29	
Max Chl Dpth (ft)	8.29	Hydr. Depth (ft)		4.89	
Conv. Total (cfs)	113121.0	Conv. (cfs)		113121.0	
Length Wtd. (ft)	318.21	Wetted Per. (ft)		245.77	
Min Ch El (ft)	1326.29	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.41	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	1.58	889.46	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	121.97	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1335.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.78	Reach Len. (ft)	280.00	318.21	320.00
Crit W.S. (ft)	1329.91	Flow Area (sq ft)		1485.30	
E.G. Slope (ft/ft)	0.000570	Area (sq ft)		1485.30	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	282.11	Top Width (ft)		282.11	
Vel Total (ft/s)	2.38	Avg. Vel. (ft/s)		2.38	
Max Chl Dpth (ft)	9.40	Hydr. Depth (ft)		5.26	
Conv. Total (cfs)	147832.4	Conv. (cfs)		147832.4	
Length Wtd. (ft)	318.21	Wetted Per. (ft)		283.83	
Min Ch El (ft)	1326.29	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.44	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	249.08	1123.07	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	129.72	16.37

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.68

INPUT
Description: No Ineffective Flow Area From Baseline Road Bridge
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4820.29	1355.16	4837.61	1351.14	4846.91	1348.72	4867.46	1345.4	4875.21	1343.9
4880.33	1342.37	4883.62	1341.98	4894.71	1338.61	4910.31	1334.6	4917.44	1333.3
4924.06	1331.95	4937.48	1329.48	4940.1	1329.34	4948.16	1327.5	4966.75	1326.82
4988.65	1326.45	5004.51	1326.34	5019.66	1326.78	5022.95	1327.1	5039.13	1326.58
5044.01	1327.16	5049.28	1327.3	5062.59	1328.12	5081.4	1330	5095.53	1331.41
5103.61	1331.83	5110.13	1332.69	5130.8	1333.2	5135.38	1333.3	5155.47	1334.14
5161.82	1333.97	5167.51	1333.41	5172.6	1334.04	5179.33	1334.7	5181.01	1335.29
5190.11	1335.37	5200.11	1336.38	5202.85	1337.83	5219.42	1340.2	5229.88	1341.34
5232.78	1341.28	5245	1340	5255.43	1339.42	5265.45	1339.4	5278.06	1340
5280.61	1340.38								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4820.29	.05	4820.29	.045	5229.88	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4820.29	5229.88	400	342.12	260	.1	.3

Left Levee Station= 4820.29 Elevation= 1355.16
Right Levee Station= 5229.88 Elevation= 1341.34

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1336.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.65	Reach Len. (ft)	400.00	342.12	260.00
Crit W.S. (ft)	1330.59	Flow Area (sq ft)		1838.06	
E.G. Slope (ft/ft)	0.000556	Area (sq ft)		1838.06	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	297.66	Top Width (ft)		297.66	
Vel Total (ft/s)	2.61	Avg. Vel. (ft/s)		2.61	
Max Chl Dpth (ft)	10.20	Hydr. Depth (ft)		6.18	
Conv. Total (cfs)	203560.4	Conv. (cfs)		203560.4	
Length Wtd. (ft)	342.12	Wetted Per. (ft)		299.25	
Min Ch El (ft)	1326.34	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.56	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.56	932.05	
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	125.03	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1334.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.48	Reach Len. (ft)	400.00	342.12	260.00
Crit W.S. (ft)	1329.49	Flow Area (sq ft)		1235.09	
E.G. Slope (ft/ft)	0.000583	Area (sq ft)		1235.09	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	264.87	Top Width (ft)		264.87	
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)		2.22	
Max Chl Dpth (ft)	8.06	Hydr. Depth (ft)		4.66	
Conv. Total (cfs)	113510.3	Conv. (cfs)		113510.3	
Length Wtd. (ft)	342.12	Wetted Per. (ft)		265.99	
Min Ch El (ft)	1326.34	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.37	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	1.58	880.59	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	120.11	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1335.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.61	Reach Len. (ft)	400.00	342.12	260.00
Crit W.S. (ft)	1329.94	Flow Area (sq ft)		1541.87	
E.G. Slope (ft/ft)	0.000509	Area (sq ft)		1541.87	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	284.95	Top Width (ft)		284.95	
Vel Total (ft/s)	2.29	Avg. Vel. (ft/s)		2.29	
Max Chl Dpth (ft)	9.19	Hydr. Depth (ft)		5.41	
Conv. Total (cfs)	156416.4	Conv. (cfs)		156416.4	
Length Wtd. (ft)	342.12	Wetted Per. (ft)		286.33	
Min Ch El (ft)	1326.34	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.39	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	249.08	1112.02	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	127.65	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.615

INPUT
Description: Baseline Road Bridge Upstream Face
6-Span Bridge
Manning n Value
of .035 used for Channel
Use Field Survey Data for this Cross
Section
Skew Angle 18.81 Degrees, Cross Section Data
Adjusted
Q(D)=4,900 cfs, Q(F)=2,740 cfs & Q(E)=3,530 cfs
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4851.73	1338.13	4907.6	1338.5	4908.11	1336.66	4915.2	1332.91	4927.2	1327.83
4939.32	1327.7	4970.41	1327.01	5002.31	1326.91	5034.04	1326.97	5064.98	1327.32
5078.98	1328.14	5089.82	1334.09	5100.41	1339.58	5146.01	1339.57		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4851.73	.055	4907.6	.035	5100.41	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4907.6	5100.41	85.17	85.17	85.17	.3	.5

Left Levee Station= 4907.6 Elevation= 1338.5
Right Levee Station= 5100.41 Elevation= 1339.58

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1336.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.035	
E.G. Elev (ft)	1336.49	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1330.37	Flow Area (sq ft)		1528.75	
E.G. Slope (ft/ft)	0.000352	Area (sq ft)		1528.75	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	185.42	Top Width (ft)		185.42	
Vel Total (ft/s)	3.21	Avg. Vel. (ft/s)		3.21	
Max Chl Dpth (ft)	9.42	Hydr. Depth (ft)		8.24	
Conv. Total (cfs)	261153.0	Conv. (cfs)		261153.0	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		189.41	
Min Ch El (ft)	1326.91	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.57	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.56	918.83	
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	123.13	

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1334.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.035	
E.G. Elev (ft)	1334.35	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1329.36	Flow Area (sq ft)		1152.35	
E.G. Slope (ft/ft)	0.000265	Area (sq ft)		1152.35	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	177.49	Top Width (ft)		177.49	
Vel Total (ft/s)	2.38	Avg. Vel. (ft/s)		2.38	
Max Chl Dpth (ft)	7.35	Hydr. Depth (ft)		6.49	
Conv. Total (cfs)	168388.6	Conv. (cfs)		168388.6	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		180.46	
Min Ch El (ft)	1326.91	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.25	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	871.22	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	118.37	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1335.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.035	
E.G. Elev (ft)	1335.48	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1329.75	Flow Area (sq ft)		1353.19	
E.G. Slope (ft/ft)	0.000266	Area (sq ft)		1353.19	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	181.77	Top Width (ft)		181.77	
Vel Total (ft/s)	2.61	Avg. Vel. (ft/s)		2.61	
Max Chl Dpth (ft)	8.47	Hydr. Depth (ft)		7.44	
Conv. Total (cfs)	216255.5	Conv. (cfs)		216255.5	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		185.28	
Min Ch El (ft)	1326.91	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.32	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	249.08	1100.65	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	125.82	16.37

BRIDGE RIVER: EMF
REACH: Reach 5 RS: 22.608

INPUT
Description: Baseline Road 6-Span Bridge
Used Field Survey Data for Cross Sections
Bridge Skew 19.10 Degrees, Cross Section Data Adjusted
Distance from Upstream XS = 0
Deck/Roadway Width = 85.17
Weir Coefficient = 2.6

Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 24

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4823.59	1337.96	1337.96	4851.73	1338.13	1338.13	4870.9	1338.34	1333
4915.2	1338.91	1332.91	4915.21	1338.91	1336.92	4916.6	1338.92	1336.92
4934.6	1339.11	1337.13	4944.69	1339.22	1337.21	4962.51	1339.41	1337.4
4966.15	1339.43	1337.42	4976.23	1339.5	1337.5	4997.64	1339.65	1337.6
5007.81	1339.72	1337.71	5009.42	1339.73	1337.72	5029.08	1339.8	1337.74
5039.27	1339.83	1337.75	5055.57	1339.89	1337.78	5060.65	1339.89	1337.79
5070.79	1339.9	1337.77	5089.93	1339.91	1337.75	5089.94	1339.91	1334.09
5102.83	1339.92	1334.5	5143.95	1339.57	1337	5190.09	1339.44	1339.44

Upstream Bridge Cross Section Data
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4851.73	1338.13	4907.6	1338.5	4908.11	1336.66	4915.2	1332.91	4927.2	1327.83
4939.32	1327.7	4970.41	1327.01	5002.31	1326.91	5034.04	1326.97	5064.98	1327.32
5078.98	1328.14	5089.82	1334.09	5100.41	1339.58	5146.01	1339.57		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4851.73	.055	4907.6	.035	5100.41	.045

Bank Sta: Left Right Coeff Contr. Expan.
4907.6 5100.41 .3 .5
Left Levee Station= 4907.6 Elevation= 1338.5
Right Levee Station= 5100.41 Elevation= 1339.58

Downstream Deck/Roadway Coordinates
num= 24

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4823.59	1337.96	1337	4854.73	1338.13	1337	4870.9	1338.34	1333
4908.83	1338.8	1332.9	4908.84	1338.8	1336.32	4916.6	1338.92	1336.42
4927.83	1339.04	1336.52	4937.92	1339.15	1336.66	4959.29	1339.38	1336.93
4962.51	1339.41	1336.96	4969.48	1339.46	1337.02	4990.76	1339.6	1337.2
5000.93	1339.67	1337.28	5009.42	1339.73	1337.33	5022.23	1339.77	1337.4
5032.38	1339.81	1337.46	5053.69	1339.88	1337.51	5055.57	1339.89	1337.51
5063.84	1339.9	1337.53	5083.14	1339.91	1337.56	5083.15	1339.91	1334.34
5102.83	1339.92	1334.5	5143.95	1339.93	1339.57	5190.09	1339.95	1339.44

Downstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4842.08	1337.27	4899.61	1337.75	4901.5	1335.92	4908.83	1332.9	4922.93	1328.05
4933.66	1327.3	4964.53	1326.75	4996.82	1326.67	5027.71	1327.06	5059.12	1327.98
5068.42	1328.04	5073.56	1328.84	5083.14	1334.34	5092.79	1339.45	5131.14	1339.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4842.08	.045	4899.61	.035	5092.79	.045

Bank Sta: Left Right Coeff Contr. Expan.
4899.61 5092.79 .3 .5
Left Levee Station= 4899.61 Elevation= 1337.75
Right Levee Station= 5092.79 Elevation= 1339.45

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

Number of Piers = 5

Pier Data
Pier Station Upstream= 4939.65 Downstream= 4932.88

```
Upstream      num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2  1326.7       2 1336.55    2.54 1336.56   10.09 1337.22
Downstream      num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2  1326.3       2 1336.07    2.59 1336.08   10.09 1336.67

Pier Data
Pier Station      Upstream= 4971.19    Downstream= 4964.39
Upstream      num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2 1326.01       2 1336.82    2.57 1336.83   10.08 1337.51
Downstream      num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2 1325.75       2 1336.37    2.56 1336.38   10.19 1337.03

Pier Data
Pier Station      Upstream= 5002.73    Downstream= 4995.85
Upstream      num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2 1325.91       2 1337.06     2.5 1337.07   10.17 1337.72
Downstream      num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2 1325.67       2 1336.64    2.55 1336.65   10.17 1337.29

Pier Data
Pier Station      Upstream= 5034.18    Downstream= 5027.31
Upstream      num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2 1325.97       2 1337.12    2.53 1337.13   10.19 1337.76
Downstream      num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2 1326.06       2 1336.84    2.53 1336.85   10.15 1337.47

Pier Data
Pier Station      Upstream= 5065.72    Downstream= 5058.77
Upstream      num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2 1326.32       2 1337.14    2.57 1337.15   10.14  1337.8
Downstream      num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2 1326.98       2 1336.93    2.53 1336.94   10.15 1337.52

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =      1.2
       Yarnell                 KVal =       .9
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 downstream end
       Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT    Profile #Design
Opening : Bridge #1

  E.G. US. (ft)              1336.49   Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)              1336.33   E.G. Elev (ft)               1336.48       1336.42
  Q Total (cfs)              4900.00   W.S. Elev (ft)               1336.30       1336.23
  Q Bridge (cfs)             4900.00   Crit W.S. (ft)               1330.52       1330.52
  Q Weir (cfs)                         Max Chl Dpth (ft)               9.39          9.56
```

Weir Sta Lft (ft)		Vel Total (ft/s)	3.46	3.51
Weir Sta Rgt (ft)		Flow Area (sq ft)	1415.97	1397.48
Weir Submerg		Froude # Chl	0.21	0.21
Weir Max Depth (ft)		Specif Force (cu ft)	6773.40	6666.68
Min Top Rd (ft)	1338.50	Hydr Depth (ft)	8.60	8.64
Min El Prs (ft)	1337.79	W.P. Total (ft)	263.97	262.83
Delta EG (ft)	0.08	Conv. Total (cfs)	184210.8	180740.3
Delta WS (ft)	0.09	Top Width (ft)	164.73	161.80
BR Open Area (sq ft)	1533.83	Frctn Loss (ft)	0.06	0.00
BR Open Vel (ft/s)	3.51	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.24	0.24
Br Sel Mthd	Energy only	Power Total (lb/ft s)	0.82	0.86

BRIDGE OUTPUT Profile #Future
Opening : Bridge #1

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	1334.35	E.G. Elev (ft)	1334.34	1334.30
W.S. US. (ft)	1334.26	W.S. Elev (ft)	1334.24	1334.20
Q Total (cfs)	2740.00	Crit W.S. (ft)	1329.46	1329.46
Q Bridge (cfs)	2740.00	Max Chl Dpth (ft)	7.33	7.53
Q Weir (cfs)		Vel Total (ft/s)	2.54	2.58
Weir Sta Lft (ft)		Flow Area (sq ft)	1077.26	1063.63
Weir Sta Rgt (ft)		Froude # Chl	0.18	0.18
Weir Submerg		Specif Force (cu ft)	3900.00	3849.84
Weir Max Depth (ft)		Hydr Depth (ft)	6.54	6.48
Min Top Rd (ft)	1338.50	W.P. Total (ft)	239.35	238.12
Min El Prs (ft)	1337.79	Conv. Total (cfs)	124674.0	122475.5
Delta EG (ft)	0.05	Top Width (ft)	164.74	164.06
Delta WS (ft)	0.06	Frctn Loss (ft)	0.04	0.00
BR Open Area (sq ft)	1533.83	C & E Loss (ft)	0.00	0.01
BR Open Vel (ft/s)	2.58	Shear Total (lb/sq ft)	0.14	0.14
Coef of Q		Power Total (lb/ft s)	0.35	0.36
Br Sel Mthd	Energy only			

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	1335.48	E.G. Elev (ft)	1335.48	1335.43
W.S. US. (ft)	1335.38	W.S. Elev (ft)	1335.36	1335.31
Q Total (cfs)	3530.00	Crit W.S. (ft)	1329.87	1329.87
Q Bridge (cfs)	3530.00	Max Chl Dpth (ft)	8.44	8.64
Q Weir (cfs)		Vel Total (ft/s)	2.80	2.83
Weir Sta Lft (ft)		Flow Area (sq ft)	1260.72	1246.17
Weir Sta Rgt (ft)		Froude # Chl	0.18	0.18
Weir Submerg		Specif Force (cu ft)	5292.36	5224.35
Weir Max Depth (ft)		Hydr Depth (ft)	7.65	7.58
Min Top Rd (ft)	1338.50	W.P. Total (ft)	252.60	250.54
Min El Prs (ft)	1337.79	Conv. Total (cfs)	156314.7	154158.8
Delta EG (ft)	0.06	Top Width (ft)	164.73	164.30
Delta WS (ft)	0.06	Frctn Loss (ft)	0.04	0.00
BR Open Area (sq ft)	1533.83	C & E Loss (ft)	0.00	0.01
BR Open Vel (ft/s)	2.83	Shear Total (lb/sq ft)	0.16	0.16
Coef of Q		Power Total (lb/ft s)	0.44	0.46
Br Sel Mthd	Energy only			

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.599

INPUT
Description: Baseline Road Bridge Downstream Face
6-Span Bridge
Manning n
Value of .035 used for Channel
Use Field Survey Data for this
Cross Section
Skew Angle 18.75 Degrees, Cross Section Data

Adjusted
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4842.08	1337.27	4899.61	1337.75	4901.5	1335.92	4908.83	1332.9	4922.93	1328.05
4933.66	1327.3	4964.53	1326.75	4996.82	1326.67	5027.71	1327.06	5059.12	1327.98
5068.42	1328.04	5073.56	1328.84	5083.14	1334.34	5092.79	1339.45	5131.14	1339.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4842.08	.045	4899.61	.035	5092.79	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4899.61	5092.79	190	222.25	200	.3	.5

Left Levee Station= 4899.61 Elevation= 1337.75
Right Levee Station= 5092.79 Elevation= 1339.45

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1336.24	Element			
Vel Head (ft)	0.16	Wt. n-Val.		0.035	
E.G. Elev (ft)	1336.41	Reach Len. (ft)	190.00	222.25	200.00
Crit W.S. (ft)	1330.38	Flow Area (sq ft)		1507.66	
E.G. Slope (ft/ft)	0.000368	Area (sq ft)		1507.66	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	185.57	Top Width (ft)		185.57	
Vel Total (ft/s)	3.25	Avg. Vel. (ft/s)		3.25	
Max Chl Dpth (ft)	9.57	Hydr. Depth (ft)		8.12	
Conv. Total (cfs)	255397.6	Conv. (cfs)		255397.6	
Length Wtd. (ft)	222.25	Wetted Per. (ft)		189.16	
Min Ch El (ft)	1326.67	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.60	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.56	916.08	
C & E Loss (ft)	0.06	Cum SA (acres)	2.02	122.81	

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1334.20	Element			
Vel Head (ft)	0.09	Wt. n-Val.		0.035	
E.G. Elev (ft)	1334.29	Reach Len. (ft)	190.00	222.25	200.00
Crit W.S. (ft)	1329.35	Flow Area (sq ft)		1137.14	
E.G. Slope (ft/ft)	0.000276	Area (sq ft)		1137.14	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	177.24	Top Width (ft)		177.24	
Vel Total (ft/s)	2.41	Avg. Vel. (ft/s)		2.41	
Max Chl Dpth (ft)	7.53	Hydr. Depth (ft)		6.42	
Conv. Total (cfs)	165076.0	Conv. (cfs)		165076.0	
Length Wtd. (ft)	222.25	Wetted Per. (ft)		179.84	
Min Ch El (ft)	1326.67	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.26	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	1.58	869.12	1.81
C & E Loss (ft)	0.03	Cum SA (acres)	4.83	118.05	1.66

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1335.32	Element			
Vel Head (ft)	0.11	Wt. n-Val.		0.035	
E.G. Elev (ft)	1335.42	Reach Len. (ft)	190.00	222.25	200.00
Crit W.S. (ft)	1329.76	Flow Area (sq ft)		1337.01	
E.G. Slope (ft/ft)	0.000277	Area (sq ft)		1337.01	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	182.02	Top Width (ft)		182.02	

Vel Total (ft/s)	2.64	Avg. Vel. (ft/s)		2.64	
Max Chl Dpth (ft)	8.65	Hydr. Depth (ft)		7.35	
Conv. Total (cfs)	212084.6	Conv. (cfs)		212084.6	
Length Wtd. (ft)	222.25	Wetted Per. (ft)		185.13	
Min Ch El (ft)	1326.67	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.33	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	249.08	1098.20	34.89
C & E Loss (ft)	0.04	Cum SA (acres)	127.06	125.50	16.37

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.557

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4557.97	1338.3	4584.43	1337.58	4592.05	1337.51	4594.25	1337.65	4608.71	1337.18
4615.54	1337.1	4624.6	1336.52	4633.04	1335.55	4641.65	1335.66	4652.78	1335.46
4671.47	1334.8	4675.29	1334.46	4686.13	1333.85	4692.57	1333.8	4703.73	1333.25
4732.67	1332.4	4744.42	1332.1	4757.12	1332.7	4773.8	1332.2	4817.63	1331.72
4831.21	1330.9	4840.57	1330.47	4860.11	1328.72	4863.58	1328.69	4871.67	1327.74
4875.24	1327.7	4879.74	1326.98	4884.89	1326.87	4887.15	1325.51	4992.02	1325.51
5007.31	1325.5	5118.17	1325.51	5121.73	1326.76	5143.31	1331.27	5153.53	1332.27
5164.8	1334	5172.45	1335.43	5177.35	1336.82	5179.43	1336.97	5194.52	1337.19
5207.22	1337.2	5231.17	1338.67	5248.42	1338.19	5259.87	1337.87	5269.46	1338.02
5271.11	1338.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4557.97	.05	4615.54	.045	5179.43	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4615.54	5179.43	370	428.43	340	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4557.97	4874	1338	5241	5271.11	1338

Left Levee Station= 4615.54 Elevation= 1337.1
Right Levee Station= 5179.43 Elevation= 1336.97

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1336.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.30	Reach Len. (ft)	370.00	428.43	340.00
Crit W.S. (ft)	1327.89	Flow Area (sq ft)		2891.66	
E.G. Slope (ft/ft)	0.000130	Area (sq ft)		3811.59	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	548.49	Top Width (ft)		548.49	
Vel Total (ft/s)	1.69	Avg. Vel. (ft/s)		1.69	
Max Chl Dpth (ft)	10.76	Hydr. Depth (ft)		9.60	
Conv. Total (cfs)	429682.5	Conv. (cfs)		429682.5	
Length Wtd. (ft)	428.27	Wetted Per. (ft)		302.91	
Min Ch El (ft)	1325.50	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.56	902.51	
C & E Loss (ft)	0.01	Cum SA (acres)	2.02	120.94	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1334.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.23	Reach Len. (ft)	370.00	428.43	340.00
Crit W.S. (ft)	1327.14	Flow Area (sq ft)		2281.96	
E.G. Slope (ft/ft)	0.000086	Area (sq ft)		2751.79	

Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	486.10	Top Width (ft)		486.10	
Vel Total (ft/s)	1.20	Avg. Vel. (ft/s)		1.20	
Max Chl Dpth (ft)	8.71	Hydr. Depth (ft)		7.82	
Conv. Total (cfs)	295917.5	Conv. (cfs)		295917.5	
Length Wtd. (ft)	428.43	Wetted Per. (ft)		293.22	
Min Ch El (ft)	1325.50	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	1.58	859.20	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	116.36	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1335.32	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.35	Reach Len. (ft)	370.00	428.43	340.00
Crit W.S. (ft)	1327.43	Flow Area (sq ft)		2611.37	
E.G. Slope (ft/ft)	0.000093	Area (sq ft)		3309.11	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	515.22	Top Width (ft)		515.22	
Vel Total (ft/s)	1.35	Avg. Vel. (ft/s)		1.35	
Max Chl Dpth (ft)	9.82	Hydr. Depth (ft)		8.77	
Conv. Total (cfs)	365451.4	Conv. (cfs)		365451.4	
Length Wtd. (ft)	428.43	Wetted Per. (ft)		299.30	
Min Ch El (ft)	1325.50	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	249.08	1086.34	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	123.72	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.475

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4691.96	1336.7	4692.96	1336.61	4700.34	1334.9	4715.37	1335.24	4722.79	1335.16
4736.31	1334.1	4743.92	1334.97	4752.94	1335.31	4759.77	1335.7	4765.93	1335.89
4771.36	1335.8	4782.24	1334.84	4792.67	1333.47	4802.79	1332.93	4809.99	1333.88
4817.93	1333.1	4822.5	1332.75	4829.53	1331.54	4841.3	1330.8	4850	1330.94
4852.29	1331	4857.01	1331.61	4872.06	1330.37	4872.24	1329.81	4875.74	1325.51
5066.41	1325.5	5069.59	1326.7	5084.39	1328.4	5105.11	1328.47	5109.08	1328.37
5138.01	1326.6	5148.3	1326.6	5165.22	1327.29	5179.31	1328.55	5205.06	1330.42
5211.36	1330.7	5216.63	1332.08	5224.46	1333.38	5234.45	1335.68	5237.84	1336.02
5248.61	1336.2	5253.25	1335.62	5258.56	1335.61	5272.06	1336.18	5284.31	1336.86
5294.63	1337.2	5302.82	1338.24	5311.36	1337.8	5329.17	1337.81	5340.16	1338.18
5341.87	1338.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4691.96	.05	4765.93	.045	5302.82	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4765.93	5302.82	140	209.8	370	.1	.3

Left Levee Station= 4765.93 Elevation= 1335.89
Right Levee Station= 5302.82 Elevation= 1338.24

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1336.22	Element			
Vel Head (ft)	0.03	Wt. n-Val.	0.050	0.045	
E.G. Elev (ft)	1336.25	Reach Len. (ft)	140.00	209.80	370.00
Crit W.S. (ft)	1328.16	Flow Area (sq ft)	80.10	3711.66	
E.G. Slope (ft/ft)	0.000112	Area (sq ft)	80.10	3711.66	
Q Total (cfs)	4900.00	Flow (cfs)	27.20	4872.79	
Top Width (ft)	578.11	Top Width (ft)	71.28	506.83	
Vel Total (ft/s)	1.29	Avg. Vel. (ft/s)	0.34	1.31	

Max Chl Dpth (ft)	10.72	Hydr. Depth (ft)	1.12	7.32
Conv. Total (cfs)	462302.8	Conv. (cfs)	2566.7	459736.0
Length Wtd. (ft)	209.61	Wetted Per. (ft)	71.55	510.89
Min Ch El (ft)	1325.50	Shear (lb/sq ft)	0.01	0.05
Alpha	1.03	Stream Power (lb/ft s)	0.00	0.07
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.22	865.51
C & E Loss (ft)	0.00	Cum SA (acres)	1.71	115.75

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1334.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.19	Reach Len. (ft)	140.00	209.80	370.00
Crit W.S. (ft)	1327.37	Flow Area (sq ft)		2771.08	
E.G. Slope (ft/ft)	0.000078	Area (sq ft)		2771.08	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	440.62	Top Width (ft)		440.62	
Vel Total (ft/s)	0.99	Avg. Vel. (ft/s)		0.99	
Max Chl Dpth (ft)	8.68	Hydr. Depth (ft)		6.29	
Conv. Total (cfs)	310009.5	Conv. (cfs)		310009.5	
Length Wtd. (ft)	209.80	Wetted Per. (ft)		444.36	
Min Ch El (ft)	1325.50	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	1.58	832.04	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	111.80	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1335.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.31	Reach Len. (ft)	140.00	209.80	370.00
Crit W.S. (ft)	1327.68	Flow Area (sq ft)		3271.45	
E.G. Slope (ft/ft)	0.000078	Area (sq ft)		3271.45	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	455.67	Top Width (ft)		455.67	
Vel Total (ft/s)	1.08	Avg. Vel. (ft/s)		1.08	
Max Chl Dpth (ft)	9.79	Hydr. Depth (ft)		7.18	
Conv. Total (cfs)	399726.8	Conv. (cfs)		399726.8	
Length Wtd. (ft)	209.80	Wetted Per. (ft)		459.60	
Min Ch El (ft)	1325.50	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	249.08	1053.98	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	118.95	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.436

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4858.95	1336.38	4864.63	1336.01	4870.42	1335.89	4883.68	1336.2	4891.19	1336.53
4905.87	1336.32	4913.17	1336.06	4927.73	1332.64	4946.03	1329.7	4955.41	1328.01
4965.16	1325.92	4968.39	1325.51	5170.71	1325.51	5174.56	1326.4	5178.83	1326.84
5201.38	1327.18	5222.17	1326.84	5225.83	1326.84	5244.8	1328	5268.24	1329.21
5284.31	1329.81	5299.91	1330.93	5322.1	1332.88	5334.29	1333.5	5340.59	1333.97
5355.6	1335.16	5359.9	1335.4	5376.65	1337.13	5382.39	1337.6	5390.01	1339.73

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4858.95	.05	4891.19	.045	5390.01	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4891.19	5390.01	480	462.54	470	.1	.3

Left Levee Station= 4891.19 Elevation= 1336.53
Right Levee Station= 5390.01 Elevation= 1339.73

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1336.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.22	Reach Len. (ft)	480.00	462.54	470.00
Crit W.S. (ft)	1328.01	Flow Area (sq ft)		3708.28	
E.G. Slope (ft/ft)	0.000099	Area (sq ft)		3708.28	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	458.27	Top Width (ft)		458.27	
Vel Total (ft/s)	1.32	Avg. Vel. (ft/s)		1.32	
Max Chl Dpth (ft)	10.69	Hydr. Depth (ft)		8.09	
Conv. Total (cfs)	492470.9	Conv. (cfs)		492470.9	
Length Wtd. (ft)	462.54	Wetted Per. (ft)		459.76	
Min Ch El (ft)	1325.51	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.09	847.64	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	113.43	

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1334.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.18	Reach Len. (ft)	480.00	462.54	470.00
Crit W.S. (ft)	1327.31	Flow Area (sq ft)		2814.35	
E.G. Slope (ft/ft)	0.000069	Area (sq ft)		2814.35	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	421.74	Top Width (ft)		421.74	
Vel Total (ft/s)	0.97	Avg. Vel. (ft/s)		0.97	
Max Chl Dpth (ft)	8.65	Hydr. Depth (ft)		6.67	
Conv. Total (cfs)	328780.4	Conv. (cfs)		328780.4	
Length Wtd. (ft)	462.54	Wetted Per. (ft)		422.92	
Min Ch El (ft)	1325.51	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	1.58	818.59	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	109.72	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1335.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.30	Reach Len. (ft)	480.00	462.54	470.00
Crit W.S. (ft)	1327.58	Flow Area (sq ft)		3296.19	
E.G. Slope (ft/ft)	0.000072	Area (sq ft)		3296.19	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	441.22	Top Width (ft)		441.22	
Vel Total (ft/s)	1.07	Avg. Vel. (ft/s)		1.07	
Max Chl Dpth (ft)	9.77	Hydr. Depth (ft)		7.47	
Conv. Total (cfs)	415093.4	Conv. (cfs)		415093.4	
Length Wtd. (ft)	462.54	Wetted Per. (ft)		442.57	
Min Ch El (ft)	1325.51	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	249.08	1038.17	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	116.79	16.37

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.348

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4725.1	1342.2	4738.31	1341.92	4745.62	1342.07	4748.83	1341.91	4758.93	1341.89
4765.19	1341.4	4773.25	1340.39	4777.13	1340.17	4781.03	1339.63	4785.86	1338.4
4793.76	1335.8	4806.6	1334.22	4813.39	1333.5	4817.9	1332.75	4844.24	1330.31
4848.87	1329.8	4885.08	1329.22	4896.91	1329.17	4915.15	1331.55	4921.16	1332.25
4939.02	1330.4	4949.41	1329.97	4960.65	1329.11	4968.12	1328.77	4980.64	1327.81
4984.61	1327.6	4988.08	1327	4993.57	1326.76	5005.66	1326.63	5028.63	1327.32
5044.14	1327.9	5052.64	1328.06	5065.4	1328.17	5071.27	1328.23	5079.11	1328.58
5093.72	1328.7	5123.38	1328.51	5144.2	1328.38	5189.9	1330.56	5196.44	1330.96
5202.12	1331.5	5209.24	1331.87	5215.84	1333.07	5226.34	1333.92	5232.9	1335.57
5241.47	1337.2	5265.92	1336.62	5281.63	1337.09	5288.32	1336.47	5309.08	1337.54
5321.71	1337.3	5325.24	1337.59						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4725.1	.05	4777.13	.045	5241.47	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4777.13	5241.47	410	447.01	480	.1	.3

Left Levee Station= 4777.13 Elevation= 1340.17
Right Levee Station= 5241.47 Elevation= 1337.2

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1336.11	Element			
Vel Head (ft)	0.05	Wt. n-Val.		0.045	
E.G. Elev (ft)	1336.15	Reach Len. (ft)	410.00	447.01	480.00
Crit W.S. (ft)	1330.62	Flow Area (sq ft)		2811.77	
E.G. Slope (ft/ft)	0.000238	Area (sq ft)		2811.77	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	442.89	Top Width (ft)		442.89	
Vel Total (ft/s)	1.74	Avg. Vel. (ft/s)		1.74	
Max Chl Dpth (ft)	9.48	Hydr. Depth (ft)		6.35	
Conv. Total (cfs)	317682.4	Conv. (cfs)		317682.4	
Length Wtd. (ft)	447.01	Wetted Per. (ft)		444.26	
Min Ch El (ft)	1326.63	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.09	813.03	
C & E Loss (ft)	0.01	Cum SA (acres)	1.60	108.64	

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1334.09	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.12	Reach Len. (ft)	410.00	447.01	480.00
Crit W.S. (ft)	1329.89	Flow Area (sq ft)		1940.98	
E.G. Slope (ft/ft)	0.000238	Area (sq ft)		1940.98	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	419.17	Top Width (ft)		419.17	
Vel Total (ft/s)	1.41	Avg. Vel. (ft/s)		1.41	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		4.63	
Conv. Total (cfs)	177780.0	Conv. (cfs)		177780.0	
Length Wtd. (ft)	447.01	Wetted Per. (ft)		420.15	
Min Ch El (ft)	1326.63	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	1.58	793.34	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	105.26	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1335.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.24	Reach Len. (ft)	410.00	447.01	480.00
Crit W.S. (ft)	1330.18	Flow Area (sq ft)		2418.54	
E.G. Slope (ft/ft)	0.000198	Area (sq ft)		2418.54	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	432.91	Top Width (ft)		432.91	
Vel Total (ft/s)	1.46	Avg. Vel. (ft/s)		1.46	
Max Chl Dpth (ft)	8.58	Hydr. Depth (ft)		5.59	
Conv. Total (cfs)	250987.6	Conv. (cfs)		250987.6	
Length Wtd. (ft)	447.01	Wetted Per. (ft)		434.09	
Min Ch El (ft)	1326.63	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	249.08	1007.83	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	112.14	16.37

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.263

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4660.57	1341.5	4664.8	1341.34	4672.8	1341.43	4687.78	1341.12	4699.09	1340.53
4702.51	1339.9	4707.85	1337.35	4719.98	1333.19	4725.07	1332.41	4728.37	1332.14
4733.58	1332.1	4737.73	1331.47	4750.43	1330.31	4758.36	1330.49	4766.1	1332.68
4769.67	1334	4777.28	1335.13	4781.88	1336.22	4791.34	1336.4	4796.98	1335.91
4807.39	1334.7	4822.42	1333.03	4830.95	1332.83	4837.15	1333.5	4840.81	1333.37
4857.39	1332.1	4870.2	1330.61	4886.94	1329.63	4892.46	1329.87	4901.69	1329.8
4904.81	1330	4926.68	1328.83	4938.06	1327.93	4945.64	1327.03	4951.52	1326.12
4969.48	1325.5	4980.06	1325.84	4987.93	1325.89	5000.82	1325.29	5012.3	1326.58
5023.71	1328.6	5055.78	1334.66	5059.2	1334.95	5072.07	1335.06	5083.96	1334.77
5093.28	1336	5119.97	1335.63	5136.83	1335.78	5145	1336.33	5159.28	1336.74
5178.88	1336.9	5187.15	1337.43	5193.64	1337.69	5198.5	1337.12	5210.52	1336.78
5214.32	1338.3	5217.67	1337.85	5220.24	1336.82	5225.54	1336.87	5241.96	1336.61
5250.21	1336.3	5254.49	1337.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4660.57	.05	4699.09	.045	5193.64	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4699.09	5193.64	420	392.17	280	.1	.3

Left Levee Station= 4699.09 Elevation= 1340.53
Right Levee Station= 5193.64 Elevation= 1337.69

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1335.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.97	Reach Len. (ft)	420.00	392.17	280.00
Crit W.S. (ft)	1330.90	Flow Area (sq ft)		1855.63	
E.G. Slope (ft/ft)	0.000828	Area (sq ft)		1855.63	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	397.52	Top Width (ft)		397.52	
Vel Total (ft/s)	2.64	Avg. Vel. (ft/s)		2.64	
Max Chl Dpth (ft)	10.57	Hydr. Depth (ft)		4.67	
Conv. Total (cfs)	170337.4	Conv. (cfs)		170337.4	
Length Wtd. (ft)	392.17	Wetted Per. (ft)		400.35	
Min Ch El (ft)	1325.29	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		0.63	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	0.09	789.08	

C & E Loss (ft)	0.01	Cum SA (acres)	1.60	104.33

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1333.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.94	Reach Len. (ft)	420.00	392.17	280.00
Crit W.S. (ft)	1329.49	Flow Area (sq ft)		1204.31	
E.G. Slope (ft/ft)	0.000711	Area (sq ft)		1204.31	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	287.93	Top Width (ft)		287.93	
Vel Total (ft/s)	2.28	Avg. Vel. (ft/s)		2.28	
Max Chl Dpth (ft)	8.57	Hydr. Depth (ft)		4.18	
Conv. Total (cfs)	102751.6	Conv. (cfs)		102751.6	
Length Wtd. (ft)	392.17	Wetted Per. (ft)		289.96	
Min Ch El (ft)	1325.29	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	1.58	777.21	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	101.63	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1335.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.09	Reach Len. (ft)	420.00	392.17	280.00
Crit W.S. (ft)	1330.16	Flow Area (sq ft)		1552.55	
E.G. Slope (ft/ft)	0.000621	Area (sq ft)		1552.55	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	335.51	Top Width (ft)		335.51	
Vel Total (ft/s)	2.27	Avg. Vel. (ft/s)		2.27	
Max Chl Dpth (ft)	9.72	Hydr. Depth (ft)		4.63	
Conv. Total (cfs)	141659.6	Conv. (cfs)		141659.6	
Length Wtd. (ft)	392.17	Wetted Per. (ft)		338.00	
Min Ch El (ft)	1325.29	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.40	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	249.08	987.45	34.89
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	108.20	16.37

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.189

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4809.04	1342	4831.81	1341.85	4844.28	1341.71	4849.89	1342.46	4853.9	1341.84
4855.91	1341.8	4867.99	1340.99	4870.94	1341.09	4873.55	1340.07	4879.31	1339.18
4889.82	1338.2	4904.39	1335.89	4911.52	1334.52	4924.01	1332.88	4932.14	1332.2
4947.34	1330.1	4953.48	1329.5	4972.25	1324.57	4979.13	1324.69	4990.83	1324.5
5000.64	1324.6	5022.97	1326.11	5026.65	1324.86	5029.88	1325.09	5043.21	1326.5
5047.01	1327.1	5060.89	1329.07	5075.49	1331.31	5079.74	1331.31	5093.14	1333.59
5104.79	1333.7	5148.43	1334.83	5160.38	1334.71	5169.82	1334.89	5179.09	1335.96
5194.11	1336.2	5201.56	1336.45	5220.29	1337.64	5227.77	1338.46	5239.42	1338.29
5247.95	1338.8	5260.62	1337.7	5268.38	1337.48	5279.21	1336.85	5281.86	1337.8
5286.9	1338.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4809.04	.05	4870.94	.045	5227.77	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4870.94	5227.77	428	434.03	410	.1	.3

Left Levee Station= 4870.94 Elevation= 1341.09
Right Levee Station= 5227.77 Elevation= 1338.46

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1335.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.55	Reach Len. (ft)	428.00	434.03	410.00
Crit W.S. (ft)	1329.99	Flow Area (sq ft)		1371.20	
E.G. Slope (ft/ft)	0.001333	Area (sq ft)		1371.20	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	266.66	Top Width (ft)		266.66	
Vel Total (ft/s)	3.57	Avg. Vel. (ft/s)		3.57	
Max Chl Dpth (ft)	10.85	Hydr. Depth (ft)		5.14	
Conv. Total (cfs)	134230.7	Conv. (cfs)		134230.7	
Length Wtd. (ft)	434.03	Wetted Per. (ft)		268.62	
Min Ch El (ft)	1324.50	Shear (lb/sq ft)		0.42	
Alpha	1.00	Stream Power (lb/ft s)		1.52	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	0.09	774.55	
C & E Loss (ft)	0.03	Cum SA (acres)	1.60	101.34	

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1333.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.65	Reach Len. (ft)	428.00	434.03	410.00
Crit W.S. (ft)	1328.51	Flow Area (sq ft)		959.81	
E.G. Slope (ft/ft)	0.000775	Area (sq ft)		959.81	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	173.62	Top Width (ft)		173.62	
Vel Total (ft/s)	2.85	Avg. Vel. (ft/s)		2.85	
Max Chl Dpth (ft)	9.02	Hydr. Depth (ft)		5.53	
Conv. Total (cfs)	98422.5	Conv. (cfs)		98422.5	
Length Wtd. (ft)	434.03	Wetted Per. (ft)		175.38	
Min Ch El (ft)	1324.50	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)		0.76	
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	1.58	767.46	1.81
C & E Loss (ft)	0.02	Cum SA (acres)	4.83	99.55	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1334.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.80	Reach Len. (ft)	428.00	434.03	410.00
Crit W.S. (ft)	1329.10	Flow Area (sq ft)		1192.19	
E.G. Slope (ft/ft)	0.000911	Area (sq ft)		1192.19	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	231.03	Top Width (ft)		231.03	
Vel Total (ft/s)	2.96	Avg. Vel. (ft/s)		2.96	
Max Chl Dpth (ft)	10.16	Hydr. Depth (ft)		5.16	
Conv. Total (cfs)	116926.1	Conv. (cfs)		116926.1	
Length Wtd. (ft)	434.03	Wetted Per. (ft)		232.90	
Min Ch El (ft)	1324.50	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)		0.86	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	249.08	975.10	34.89
C & E Loss (ft)	0.02	Cum SA (acres)	127.06	105.65	16.37

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

CROSS SECTION RIVER: EMF

REACH: Reach 5 RS: 22.107

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4868.29	1342.7	4870.8	1342.56	4873.12	1341.83	4876.47	1341.38	4891.52	1340.77
4903.88	1338.8	4916	1337.05	4919.84	1336.77	4923.9	1336	4947.32	1333.12
4956.23	1331.4	4961.21	1329.53	4975.37	1326.36	4997.36	1326	5002.83	1326.45
5011.12	1326.9	5014.44	1327.67	5019.62	1329.32	5023.51	1329.93	5033.66	1330.35
5042.56	1329.3	5055.6	1328.31	5056.7	1327.46	5073.76	1327.93	5081.26	1327.94
5130.6	1327.6	5173.72	1328.68	5187.36	1328.44	5205.98	1331.12	5218.32	1333.48
5229.58	1334.8	5238.89	1336.38	5243.98	1336.77	5252.34	1336.42	5270.48	1337.31
5280.21	1337.4	5286.68	1337.19	5301.52	1336.09	5331.91	1335.54	5345.6	1336.18
5350.06	1336.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4868.29	.05	4891.52	.045	5243.98	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4891.52	5243.98	455	448.38	420	.1	.3

Left Levee Station= 4891.52 Elevation= 1340.77
Right Levee Station= 5243.98 Elevation= 1336.77

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1335.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
E.G. Elev (ft)	1335.15	Reach Len. (ft)	455.00	448.38	420.00
Crit W.S. (ft)	1330.39	Flow Area (sq ft)		1804.13	
E.G. Slope (ft/ft)	0.000623	Area (sq ft)		1804.13	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	299.17	Top Width (ft)		299.17	
Vel Total (ft/s)	2.72	Avg. Vel. (ft/s)		2.72	
Max Chl Dpth (ft)	9.03	Hydr. Depth (ft)		6.03	
Conv. Total (cfs)	196353.3	Conv. (cfs)		196353.3	
Length Wtd. (ft)	448.38	Wetted Per. (ft)		301.50	
Min Ch El (ft)	1326.00	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		0.63	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	0.09	758.73	
C & E Loss (ft)	0.01	Cum SA (acres)	1.60	98.52	

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1333.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.36	Reach Len. (ft)	455.00	448.38	420.00
Crit W.S. (ft)	1329.52	Flow Area (sq ft)		1309.11	
E.G. Slope (ft/ft)	0.000498	Area (sq ft)		1309.11	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	271.47	Top Width (ft)		271.47	
Vel Total (ft/s)	2.09	Avg. Vel. (ft/s)		2.09	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		4.82	
Conv. Total (cfs)	122748.1	Conv. (cfs)		122748.1	
Length Wtd. (ft)	448.38	Wetted Per. (ft)		273.59	
Min Ch El (ft)	1326.00	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.31	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	1.58	756.16	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	97.34	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1334.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.51	Reach Len. (ft)	455.00	448.38	420.00
Crit W.S. (ft)	1329.86	Flow Area (sq ft)		1629.57	
E.G. Slope (ft/ft)	0.000435	Area (sq ft)		1629.57	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	289.91	Top Width (ft)		289.91	
Vel Total (ft/s)	2.17	Avg. Vel. (ft/s)		2.17	
Max Chl Dpth (ft)	8.44	Hydr. Depth (ft)		5.62	
Conv. Total (cfs)	169233.7	Conv. (cfs)		169233.7	
Length Wtd. (ft)	448.38	Wetted Per. (ft)		292.16	
Min Ch El (ft)	1326.00	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.33	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)	249.08	961.04	34.89
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	103.06	16.37

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 22.022

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4902.75	1343	4905.84	1341.95	4918.86	1338.46	4935.46	1334.86	4939.64	1334.18
4945.29	1333.9	4949.78	1332.7	4955.74	1331.87	4965.55	1329.89	4975.98	1329.28
4986.61	1326.8	5000.69	1325.91	5014.5	1326.61	5028.01	1328.05	5039.42	1329.96
5062.38	1329.6	5075.03	1330.23	5100.79	1332.26	5112.63	1333.54	5118.44	1333.01
5124.18	1332.8	5126.4	1331.64	5136.61	1327	5145.29	1327.13	5149.76	1328.39
5154.01	1329.8	5157.51	1330.56	5162.45	1330.69	5180.53	1329.4	5194.4	1329.27
5204.67	1329.7	5221.75	1332.06	5228.15	1333.17	5238.3	1333.65	5259.97	1336.22
5268.65	1336	5278.69	1336.16	5298.8	1336.34	5306.56	1336.34	5314.35	1336.1
5319.17	1336.5	5321.61	1336.89						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4902.75	.05	4905.84	.045	5259.97	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4905.84	5259.97	295	397.01	350	.1	.3

Left Levee Station= 4905.84 Elevation= 1341.95
Right Levee Station= 5259.97 Elevation= 1336.22

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1334.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.70	Reach Len. (ft)	295.00	397.01	350.00
Crit W.S. (ft)	1331.50	Flow Area (sq ft)		1351.81	
E.G. Slope (ft/ft)	0.001700	Area (sq ft)		1351.81	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	307.79	Top Width (ft)		307.79	
Vel Total (ft/s)	3.62	Avg. Vel. (ft/s)		3.62	
Max Chl Dpth (ft)	8.59	Hydr. Depth (ft)		4.39	
Conv. Total (cfs)	118845.8	Conv. (cfs)		118845.8	
Length Wtd. (ft)	397.01	Wetted Per. (ft)		311.16	
Min Ch El (ft)	1325.91	Shear (lb/sq ft)		0.46	
Alpha	1.00	Stream Power (lb/ft s)		1.67	
Frctn Loss (ft)	1.01	Cum Volume (acre-ft)	0.09	742.49	
C & E Loss (ft)	0.02	Cum SA (acres)	1.60	95.40	

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

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1332.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.045	
E.G. Elev (ft)	1332.97	Reach Len. (ft)	295.00	397.01	350.00
Crit W.S. (ft)	1330.60	Flow Area (sq ft)		865.61	
E.G. Slope (ft/ft)	0.001865	Area (sq ft)		865.61	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	258.74	Top Width (ft)		258.74	
Vel Total (ft/s)	3.17	Avg. Vel. (ft/s)		3.17	
Max Chl Dpth (ft)	6.90	Hydr. Depth (ft)		3.35	
Conv. Total (cfs)	63438.9	Conv. (cfs)		63438.9	
Length Wtd. (ft)	397.01	Wetted Per. (ft)		261.79	
Min Ch El (ft)	1325.91	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)		1.22	
Frctn Loss (ft)	0.99	Cum Volume (acre-ft)	1.58	744.97	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	94.61	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1334.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.045	
E.G. Elev (ft)	1334.20	Reach Len. (ft)	295.00	397.01	350.00
Crit W.S. (ft)	1330.96	Flow Area (sq ft)		1222.02	
E.G. Slope (ft/ft)	0.001194	Area (sq ft)		1222.02	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	300.07	Top Width (ft)		300.07	
Vel Total (ft/s)	2.89	Avg. Vel. (ft/s)		2.89	
Max Chl Dpth (ft)	8.16	Hydr. Depth (ft)		4.07	
Conv. Total (cfs)	102149.8	Conv. (cfs)		102149.8	
Length Wtd. (ft)	397.01	Wetted Per. (ft)		303.40	
Min Ch El (ft)	1325.91	Shear (lb/sq ft)		0.30	
Alpha	1.00	Stream Power (lb/ft s)		0.87	
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	249.08	946.36	34.89
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	100.02	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.947

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4684.53	1343.1	4686.29	1342.45	4696.45	1340.94	4698.9	1340.33	4712.17	1335.49
4721.53	1334.5	4724.9	1333.44	4732.13	1332.33	4736.48	1332.01	4744.47	1332.15
4748.72	1332.5	4755.6	1333.89	4761.18	1334.17	4787.52	1333.76	4796.04	1333.47
4812.97	1333.1	4832.63	1332.94	4842.93	1333.1	4851.06	1331.87	4864.32	1330.49
4879.43	1329.2	4895.76	1328.07	4908.01	1327.85	4912.83	1328.17	4924.1	1329.03
4929.57	1329.2	4938.45	1328.31	4949.98	1328.1	4965.53	1328.45	4971.12	1328.37
4979.24	1327.5	4991.1	1325.94	5001.98	1325.42	5012	1326.03	5018.74	1327.13
5029.98	1329.5	5042.38	1332.52	5052.68	1333.61	5059.4	1333.85	5066.18	1334.61
5071.62	1334.9	5077.9	1334.76	5085.06	1335.04	5102.51	1336.16	5104.11	1337.71
5107.14	1338.4	5113.99	1338.61	5117.8	1338.45	5126.73	1336.54	5131	1336.02
5135.94	1336.2	5153.02	1336.04	5155.95	1335.99	5173.36	1336.56	5176.96	1337.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4684.53	.05	4696.45	.045	5113.99	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4696.45	5113.99	480	569.26	480	.1	.3

Left Levee Station= 4696.45 Elevation= 1340.94

Right Levee Station= 5113.99 Elevation= 1338.61

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1333.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.67	Reach Len. (ft)	480.00	569.26	480.00
Crit W.S. (ft)	1331.01	Flow Area (sq ft)		974.51	
E.G. Slope (ft/ft)	0.004247	Area (sq ft)		974.51	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	271.40	Top Width (ft)		271.40	
Vel Total (ft/s)	5.03	Avg. Vel. (ft/s)		5.03	
Max Chl Dpth (ft)	7.86	Hydr. Depth (ft)		3.59	
Conv. Total (cfs)	75186.3	Conv. (cfs)		75186.3	
Length Wtd. (ft)	569.26	Wetted Per. (ft)		272.85	
Min Ch El (ft)	1325.42	Shear (lb/sq ft)		0.95	
Alpha	1.00	Stream Power (lb/ft s)		4.76	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	0.09	731.89	
C & E Loss (ft)	0.11	Cum SA (acres)	1.60	92.76	

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1331.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.045	
E.G. Elev (ft)	1331.97	Reach Len. (ft)	480.00	569.26	480.00
Crit W.S. (ft)	1329.99	Flow Area (sq ft)		628.29	
E.G. Slope (ft/ft)	0.003466	Area (sq ft)		628.29	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	185.94	Top Width (ft)		185.94	
Vel Total (ft/s)	4.36	Avg. Vel. (ft/s)		4.36	
Max Chl Dpth (ft)	6.25	Hydr. Depth (ft)		3.38	
Conv. Total (cfs)	46543.5	Conv. (cfs)		46543.5	
Length Wtd. (ft)	569.26	Wetted Per. (ft)		186.97	
Min Ch El (ft)	1325.42	Shear (lb/sq ft)		0.73	
Alpha	1.00	Stream Power (lb/ft s)		3.17	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	1.58	738.16	1.81
C & E Loss (ft)	0.08	Cum SA (acres)	4.83	92.58	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1333.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.59	Reach Len. (ft)	480.00	569.26	480.00
Crit W.S. (ft)	1330.39	Flow Area (sq ft)		1006.46	
E.G. Slope (ft/ft)	0.002055	Area (sq ft)		1006.46	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	279.14	Top Width (ft)		279.14	
Vel Total (ft/s)	3.51	Avg. Vel. (ft/s)		3.51	
Max Chl Dpth (ft)	7.97	Hydr. Depth (ft)		3.61	
Conv. Total (cfs)	77869.2	Conv. (cfs)		77869.2	
Length Wtd. (ft)	569.26	Wetted Per. (ft)		280.62	
Min Ch El (ft)	1325.42	Shear (lb/sq ft)		0.46	
Alpha	1.00	Stream Power (lb/ft s)		1.61	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	249.08	936.21	34.89
C & E Loss (ft)	0.05	Cum SA (acres)	127.06	97.38	16.37

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.839

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4869.12	1341.74	4875.66	1340.92	4891.9	1340.4	4900.1	1340.01	4903.96	1339.2
4915.63	1337.32	4931.5	1333.61	4936.96	1331.21	4938.78	1330.77	4951.09	1329
4967.37	1326.51	4970.27	1326.15	4981.65	1325.41	4988.37	1325.14	4994.44	1324.2
5026.79	1324.22	5038.4	1325.5	5039.39	1325.72	5046.74	1326.18	5054.56	1326.4
5063.5	1327.21	5073.45	1328.31	5090.37	1327.66	5126.26	1326.62	5127.45	1326.7
5146.18	1325.6	5154.07	1324.22	5295.15	1324.22	5305.62	1325.99	5313.4	1327.2
5320.67	1329.08	5339.83	1333.53	5349.72	1334.82	5357.78	1335.31	5376.22	1335.3
5380.57	1335.24	5387.46	1335.81	5402.5	1336.89	5411.82	1336.11	5418.31	1336.3
5425.74	1336.71	5428.92	1336.57	5449.22	1336.55	5451.04	1337.11		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4869.12	.05	4891.9	.045	5357.78	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4891.9	5357.78	515	494.43	375	.1	.3

Left Levee Station= 4891.9 Elevation= 1340.4
Right Levee Station= 5357.78 Elevation= 1335.31

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1333.24	Element			
Vel Head (ft)	0.04	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.29	Reach Len. (ft)	515.00	494.43	375.00
Crit W.S. (ft)	1326.91	Flow Area (sq ft)		2966.73	
E.G. Slope (ft/ft)	0.000178	Area (sq ft)		2966.73	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	406.27	Top Width (ft)		406.27	
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)		1.65	
Max Chl Dpth (ft)	9.04	Hydr. Depth (ft)		7.30	
Conv. Total (cfs)	367357.6	Conv. (cfs)		367357.6	
Length Wtd. (ft)	494.43	Wetted Per. (ft)		408.54	
Min Ch El (ft)	1324.20	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.09	706.14	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	88.33	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.67	Element			
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1331.69	Reach Len. (ft)	515.00	494.43	375.00
Crit W.S. (ft)	1326.10	Flow Area (sq ft)		2335.57	
E.G. Slope (ft/ft)	0.000119	Area (sq ft)		2335.57	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	395.92	Top Width (ft)		395.92	
Vel Total (ft/s)	1.17	Avg. Vel. (ft/s)		1.17	
Max Chl Dpth (ft)	7.47	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	251044.5	Conv. (cfs)		251044.5	
Length Wtd. (ft)	494.43	Wetted Per. (ft)		397.68	
Min Ch El (ft)	1324.20	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	1.58	718.79	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	88.78	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1333.38	Element			
Vel Head (ft)	0.02	Wt. n-Val.		0.045	

E.G. Elev (ft)	1333.40	Reach Len. (ft)	515.00	494.43	375.00
Crit W.S. (ft)	1326.43	Flow Area (sq ft)		3020.40	
E.G. Slope (ft/ft)	0.000087	Area (sq ft)		3020.40	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	407.14	Top Width (ft)		407.14	
Vel Total (ft/s)	1.17	Avg. Vel. (ft/s)		1.17	
Max Chl Dpth (ft)	9.18	Hydr. Depth (ft)		7.42	
Conv. Total (cfs)	377938.3	Conv. (cfs)		377938.3	
Length Wtd. (ft)	494.43	Wetted Per. (ft)		409.45	
Min Ch El (ft)	1324.20	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	249.08	909.89	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	92.90	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.745

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4835.5	1340.07	4842.8	1339.24	4852.38	1339.38	4860.95	1338.07	4876.75	1338.5
4885.92	1336.23	4896.19	1332.84	4903.74	1330.91	4913.47	1328.1	4921.8	1325.9
4927.1	1325.07	4929.46	1324.22	5151.38	1324.22	5168.62	1328.55	5175.76	1330.7
5181.01	1330.89	5186.7	1331.37	5191.3	1332.01	5205	1334.64	5214.44	1334
5220.85	1333.4	5224.45	1333.62	5235.95	1334.68	5240.62	1334.79	5255.96	1335.7
5261.54	1336.07	5265.22	1335.87	5272.05	1336.25	5294.37	1336.47	5308.01	1336.5
5311.61	1337.05								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4835.5	.05	4876.75	.045	5205	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4876.75	5205	145	169.59	200	.1	.3

Left Levee Station= 4876.75 Elevation= 1338.5
Right Levee Station= 5205 Elevation= 1334.64

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1333.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.18	Reach Len. (ft)	145.00	169.59	200.00
Crit W.S. (ft)	1326.65	Flow Area (sq ft)		2301.12	
E.G. Slope (ft/ft)	0.000280	Area (sq ft)		2301.12	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	301.62	Top Width (ft)		301.62	
Vel Total (ft/s)	2.13	Avg. Vel. (ft/s)		2.13	
Max Chl Dpth (ft)	8.89	Hydr. Depth (ft)		7.63	
Conv. Total (cfs)	293044.6	Conv. (cfs)		293044.6	
Length Wtd. (ft)	169.59	Wetted Per. (ft)		303.82	
Min Ch El (ft)	1324.22	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.28	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.09	676.24	
C & E Loss (ft)	0.02	Cum SA (acres)	1.60	84.31	

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1331.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1331.62	Reach Len. (ft)	145.00	169.59	200.00
Crit W.S. (ft)	1325.88	Flow Area (sq ft)		1853.89	
E.G. Slope (ft/ft)	0.000168	Area (sq ft)		1853.89	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	

Top Width (ft)	287.18	Top Width (ft)		287.18	
Vel Total (ft/s)	1.48	Avg. Vel. (ft/s)		1.48	
Max Chl Dpth (ft)	7.37	Hydr. Depth (ft)		6.46	
Conv. Total (cfs)	211318.7	Conv. (cfs)		211318.7	
Length Wtd. (ft)	169.59	Wetted Per. (ft)		289.05	
Min Ch El (ft)	1324.22	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	1.58	695.02	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	84.90	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1333.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.34	Reach Len. (ft)	145.00	169.59	200.00
Crit W.S. (ft)	1326.18	Flow Area (sq ft)		2362.85	
E.G. Slope (ft/ft)	0.000134	Area (sq ft)		2362.85	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	303.30	Top Width (ft)		303.30	
Vel Total (ft/s)	1.49	Avg. Vel. (ft/s)		1.49	
Max Chl Dpth (ft)	9.09	Hydr. Depth (ft)		7.79	
Conv. Total (cfs)	305104.6	Conv. (cfs)		305104.6	
Length Wtd. (ft)	169.59	Wetted Per. (ft)		305.56	
Min Ch El (ft)	1324.22	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.10	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	249.08	879.34	34.89
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	88.86	16.37

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.713

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4829.55	1341.17	4836.43	1340.34	4849.07	1340.64	4858.3	1339.1	4869.31	1337.55
4895.79	1331.99	4897.25	1331.5	4906.83	1330.84	4916.88	1330.7	4924.43	1330.81
4940.73	1326.89	4946.73	1325.51	4952.47	1325.06	4955.31	1324.2	5060.06	1324.22
5060.74	1329.21	5063.94	1329.41	5067.91	1330.4	5082.55	1333.6	5115.12	1333.67
5132.19	1333.66	5150.84	1333.85	5154.83	1333.71	5163.9	1334.2	5166.51	1333.59
5174.28	1333.96	5176.58	1335.85	5186.28	1337.42	5211.07	1337.2	5225.36	1339.44
5233.05	1338.04	5243.75	1335.78	5252.37	1336.03	5258.24	1336.1	5266.51	1336.29
5270.82	1336.19	5288.98	1336.73						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4829.55	.05	4849.07	.045	5225.36	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4849.07	5225.36	275	301.25	275	.1	.3

Left Levee Station= 4849.07 Elevation= 1340.64
Right Levee Station= 5225.36 Elevation= 1339.44

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1332.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.06	Reach Len. (ft)	275.00	301.25	275.00
Crit W.S. (ft)	1328.14	Flow Area (sq ft)		1162.16	
E.G. Slope (ft/ft)	0.001483	Area (sq ft)		1162.16	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	

Top Width (ft)	186.83	Top Width (ft)		186.83
Vel Total (ft/s)	4.22	Avg. Vel. (ft/s)		4.22
Max Chl Dpth (ft)	8.59	Hydr. Depth (ft)		6.22
Conv. Total (cfs)	127223.1	Conv. (cfs)		127223.1
Length Wtd. (ft)	301.25	Wetted Per. (ft)		192.53
Min Ch El (ft)	1324.20	Shear (lb/sq ft)		0.56
Alpha	1.00	Stream Power (lb/ft s)		2.36
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.09	669.50
C & E Loss (ft)	0.08	Cum SA (acres)	1.60	83.36

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.42	Element			
Vel Head (ft)	0.14	Wt. n-Val.		0.045	
E.G. Elev (ft)	1331.56	Reach Len. (ft)	275.00	301.25	275.00
Crit W.S. (ft)	1326.90	Flow Area (sq ft)		914.54	
E.G. Slope (ft/ft)	0.000939	Area (sq ft)		914.54	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	174.08	Top Width (ft)		174.08	
Vel Total (ft/s)	3.00	Avg. Vel. (ft/s)		3.00	
Max Chl Dpth (ft)	7.22	Hydr. Depth (ft)		5.25	
Conv. Total (cfs)	89427.7	Conv. (cfs)		89427.7	
Length Wtd. (ft)	301.25	Wetted Per. (ft)		179.46	
Min Ch El (ft)	1324.20	Shear (lb/sq ft)		0.30	
Alpha	1.00	Stream Power (lb/ft s)		0.89	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.58	689.63	1.81
C & E Loss (ft)	0.04	Cum SA (acres)	4.83	84.00	1.66

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1333.16	Element			
Vel Head (ft)	0.13	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.29	Reach Len. (ft)	275.00	301.25	275.00
Crit W.S. (ft)	1327.38	Flow Area (sq ft)		1233.44	
E.G. Slope (ft/ft)	0.000647	Area (sq ft)		1233.44	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	190.36	Top Width (ft)		190.36	
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)		2.86	
Max Chl Dpth (ft)	8.96	Hydr. Depth (ft)		6.48	
Conv. Total (cfs)	138763.0	Conv. (cfs)		138763.0	
Length Wtd. (ft)	301.25	Wetted Per. (ft)		196.14	
Min Ch El (ft)	1324.20	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		0.73	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	249.08	872.34	34.89
C & E Loss (ft)	0.03	Cum SA (acres)	127.06	87.90	16.37

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.656

INPUT
Description: Channel Profile from Sec. 21.656 to 21.439 is Lower
Than the
Downstream Channel
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4734.86	1341.59	4743.03	1340.85	4747.74	1341.55	4755.04	1340.4	4768.85	1337.46
4790.06	1331.98	4807.36	1327.26	4814.51	1325.49	4824.06	1322.8	4834.23	1320.15

4845.41	1317.89	4852.02	1317.93	4855.46	1318.34	4862.68	1318.3	4878.14	1319.61
4884.7	1319.79	4895.55	1319.07	4906.15	1318.69	4910.09	1318.2	4929.93	1317.38
4939.53	1316.88	4949.52	1316.51	4962.27	1315.13	4974.47	1314.4	4984.35	1314.85
4999.17	1314.48	5019.36	1314.6	5020.3	1314.7	5033.65	1317.2	5040.33	1318.22
5048.07	1319.95	5055.28	1320.89	5083.04	1326.01	5090.8	1327.7	5102.06	1329.84
5114.5	1332.87	5128.76	1334.89	5138.61	1334.48	5151.7	1336.1	5155.35	1336.35
5162.05	1336.15	5170.67	1335.68	5192.22	1336.03	5195.14	1336.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4734.86	.045	4747.74	.04	5128.76	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4747.74	5128.76	121.32	121.32	121.32	.1	.3

Left Levee Station= 4747.74 Elevation= 1341.55
Right Levee Station= 5128.76 Elevation= 1334.89

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.93	Element			
Vel Head (ft)	0.02	Wt. n-Val.		0.040	
E.G. Elev (ft)	1332.96	Reach Len. (ft)	121.32	121.32	121.32
Crit W.S. (ft)	1319.48	Flow Area (sq ft)		4170.48	
E.G. Slope (ft/ft)	0.000034	Area (sq ft)		4170.48	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	328.58	Top Width (ft)		328.58	
Vel Total (ft/s)	1.17	Avg. Vel. (ft/s)		1.17	
Max Chl Dpth (ft)	18.53	Hydr. Depth (ft)		12.69	
Conv. Total (cfs)	836231.4	Conv. (cfs)		836231.4	
Length Wtd. (ft)	121.32	Wetted Per. (ft)		332.57	
Min Ch El (ft)	1314.40	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.09	651.06	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	81.58	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.49	Element			
Vel Head (ft)	0.01	Wt. n-Val.		0.040	
E.G. Elev (ft)	1331.50	Reach Len. (ft)	121.32	121.32	121.32
Crit W.S. (ft)	1318.34	Flow Area (sq ft)		3705.58	
E.G. Slope (ft/ft)	0.000015	Area (sq ft)		3705.58	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	317.00	Top Width (ft)		317.00	
Vel Total (ft/s)	0.74	Avg. Vel. (ft/s)		0.74	
Max Chl Dpth (ft)	17.09	Hydr. Depth (ft)		11.69	
Conv. Total (cfs)	703655.1	Conv. (cfs)		703655.1	
Length Wtd. (ft)	121.32	Wetted Per. (ft)		320.63	
Min Ch El (ft)	1314.40	Shear (lb/sq ft)		0.01	
Alpha	1.00	Stream Power (lb/ft s)		0.01	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	673.65	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	82.31	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1333.23	Element			
Vel Head (ft)	0.01	Wt. n-Val.		0.040	
E.G. Elev (ft)	1333.24	Reach Len. (ft)	121.32	121.32	121.32
Crit W.S. (ft)	1318.80	Flow Area (sq ft)		4268.67	
E.G. Slope (ft/ft)	0.000017	Area (sq ft)		4268.67	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	331.83	Top Width (ft)		331.83	
Vel Total (ft/s)	0.83	Avg. Vel. (ft/s)		0.83	
Max Chl Dpth (ft)	18.83	Hydr. Depth (ft)		12.86	
Conv. Total (cfs)	863584.0	Conv. (cfs)		863584.0	
Length Wtd. (ft)	121.32	Wetted Per. (ft)		335.87	
Min Ch El (ft)	1314.40	Shear (lb/sq ft)		0.01	

Alpha	1.00	Stream Power (lb/ft s)		0.01	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	249.08	853.32	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	86.10	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.633

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4728.79	1341.71	4737.45	1340.65	4748.13	1340.67	4763.35	1337.6	4798.72	1328.79
4812.72	1325.71	4831.85	1322.07	4835.91	1321.36	4855	1320.1	4862.58	1320.08
4873.45	1319	4884.32	1317.48	4891.99	1315.45	5031.33	1315.4	5036.89	1316.71
5042.12	1318.24	5060.7	1322.32	5065.72	1323.55	5081.67	1325.8	5091.2	1327.79
5097.67	1329.36	5102.75	1330.36	5107.42	1330.78	5117.19	1332.5	5136.57	1335.66
5164.17	1335.89	5182.42	1335.66	5188.75	1336.26				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4728.79	.05	4748.13	.045	5136.57	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4748.13	5136.57	185	225.22	245	.1	.3

Left Levee Station= 4748.13 Elevation= 1340.67
Right Levee Station= 5136.57 Elevation= 1335.66

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1332.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1332.95	Reach Len. (ft)	185.00	225.22	245.00
Crit W.S. (ft)	1318.69	Flow Area (sq ft)		4251.14	
E.G. Slope (ft/ft)	0.000042	Area (sq ft)		4251.14	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	337.72	Top Width (ft)		337.72	
Vel Total (ft/s)	1.15	Avg. Vel. (ft/s)		1.15	
Max Chl Dpth (ft)	17.53	Hydr. Depth (ft)		12.59	
Conv. Total (cfs)	754353.6	Conv. (cfs)		754353.6	
Length Wtd. (ft)	225.22	Wetted Per. (ft)		341.25	
Min Ch El (ft)	1315.40	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.09	639.33	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	80.65	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1331.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.045	
E.G. Elev (ft)	1331.50	Reach Len. (ft)	185.00	225.22	245.00
Crit W.S. (ft)	1317.66	Flow Area (sq ft)		3775.60	
E.G. Slope (ft/ft)	0.000018	Area (sq ft)		3775.60	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	323.58	Top Width (ft)		323.58	
Vel Total (ft/s)	0.73	Avg. Vel. (ft/s)		0.73	
Max Chl Dpth (ft)	16.09	Hydr. Depth (ft)		11.67	
Conv. Total (cfs)	637129.1	Conv. (cfs)		637129.1	
Length Wtd. (ft)	225.22	Wetted Per. (ft)		326.81	
Min Ch El (ft)	1315.40	Shear (lb/sq ft)		0.01	
Alpha	1.00	Stream Power (lb/ft s)		0.01	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	663.23	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	81.41	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1333.23	Element	Left OB	Channel	Right OB

Vel Head (ft)	0.01	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.24	Reach Len. (ft)	185.00	225.22	245.00
Crit W.S. (ft)	1318.06	Flow Area (sq ft)		4352.73	
E.G. Slope (ft/ft)	0.000020	Area (sq ft)		4352.73	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	340.76	Top Width (ft)		340.76	
Vel Total (ft/s)	0.81	Avg. Vel. (ft/s)		0.81	
Max Chl Dpth (ft)	17.83	Hydr. Depth (ft)		12.77	
Conv. Total (cfs)	779919.1	Conv. (cfs)		779919.1	
Length Wtd. (ft)	225.22	Wetted Per. (ft)		344.35	
Min Ch El (ft)	1315.40	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.01	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	249.08	841.31	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	85.16	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.591

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4705.36	1340.66	4714.29	1340.35	4719.78	1340.53	4728.57	1339.61	4733.94	1339.3
4748.49	1337.09	4752.79	1336.26	4770.34	1333.3	4786.01	1329.91	4801.7	1326.8
4811.74	1325.23	4828.06	1321.96	4836.57	1321.53	4855.16	1321.07	4859.91	1321.3
4882.9	1320.56	4887.32	1320.65	4908.68	1320.02	4919.61	1320.62	4933.19	1320.8
4943.57	1320.86	4948.13	1320.57	4951.85	1320.01	4959.06	1319.53	4975.86	1317.3
4982.71	1315.45	5045.67	1315.45	5052.73	1316.75	5088.79	1324.82	5141.71	1335.7
5164.86	1335.71	5174.63	1335.92	5180.61	1336.28				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4705.36	.05	4719.78	.045	5141.71	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4719.78	5141.71	400	315.77	220	.1	.3

Left Levee Station= 4719.78 Elevation= 1340.53
Right Levee Station= 5141.71 Elevation= 1335.7

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.92	Element			
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1332.94	Reach Len. (ft)	400.00	315.77	220.00
Crit W.S. (ft)	1320.91	Flow Area (sq ft)		4078.11	
E.G. Slope (ft/ft)	0.000052	Area (sq ft)		4078.11	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	356.06	Top Width (ft)		356.06	
Vel Total (ft/s)	1.20	Avg. Vel. (ft/s)		1.20	
Max Chl Dpth (ft)	17.47	Hydr. Depth (ft)		11.45	
Conv. Total (cfs)	679859.5	Conv. (cfs)		679859.5	
Length Wtd. (ft)	315.77	Wetted Per. (ft)		359.49	
Min Ch El (ft)	1315.45	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.09	617.80	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	78.86	

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.49	Element			
Vel Head (ft)	0.01	Wt. n-Val.		0.045	
E.G. Elev (ft)	1331.49	Reach Len. (ft)	400.00	315.77	220.00
Crit W.S. (ft)	1319.01	Flow Area (sq ft)		3578.07	
E.G. Slope (ft/ft)	0.000024	Area (sq ft)		3578.07	

Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	342.48	Top Width (ft)		342.48	
Vel Total (ft/s)	0.77	Avg. Vel. (ft/s)		0.77	
Max Chl Dpth (ft)	16.04	Hydr. Depth (ft)		10.45	
Conv. Total (cfs)	561224.6	Conv. (cfs)		561224.6	
Length Wtd. (ft)	315.77	Wetted Per. (ft)		345.61	
Min Ch El (ft)	1315.45	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.01	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	644.22	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	79.69	1.66

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1333.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.23	Reach Len. (ft)	400.00	315.77	220.00
Crit W.S. (ft)	1319.59	Flow Area (sq ft)		4187.52	
E.G. Slope (ft/ft)	0.000025	Area (sq ft)		4187.52	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	358.97	Top Width (ft)		358.97	
Vel Total (ft/s)	0.84	Avg. Vel. (ft/s)		0.84	
Max Chl Dpth (ft)	17.77	Hydr. Depth (ft)		11.67	
Conv. Total (cfs)	706647.4	Conv. (cfs)		706647.4	
Length Wtd. (ft)	315.77	Wetted Per. (ft)		362.46	
Min Ch El (ft)	1315.45	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.02	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	249.08	819.23	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	83.35	16.37

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.531

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4797.53	1336.37	4802.02	1334.35	4815.75	1331.7	4862.46	1322.28	4876.65	1319.7
4885.01	1318.32	4896.01	1315.45	5121.02	1315.45	5127.06	1316.72	5131.83	1317.4
5147.44	1321.55	5153.52	1322.82	5197.53	1331.73	5218.07	1335.41	5238.68	1335.6
5252.17	1335.9	5256.39	1336.17						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4797.53	.05	4797.53	.045	5218.07	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4797.53	5218.07	220	243.38	270	.1	.3

Left Levee Station= 4797.53 Elevation= 1336.37
Right Levee Station= 5218.07 Elevation= 1335.41

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1332.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.045	
E.G. Elev (ft)	1332.93	Reach Len. (ft)	220.00	243.38	270.00
Crit W.S. (ft)	1317.85	Flow Area (sq ft)		5375.88	
E.G. Slope (ft/ft)	0.000024	Area (sq ft)		5375.88	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	394.67	Top Width (ft)		394.67	
Vel Total (ft/s)	0.91	Avg. Vel. (ft/s)		0.91	
Max Chl Dpth (ft)	17.46	Hydr. Depth (ft)		13.62	

Conv. Total (cfs)	1006311.6	Conv. (cfs)		1006311.6
Length Wtd. (ft)	243.38	Wetted Per. (ft)		398.29
Min Ch El (ft)	1315.45	Shear (lb/sq ft)		0.02
Alpha	1.00	Stream Power (lb/ft s)		0.02
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.09	583.53
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	76.14

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.48	Element			
Vel Head (ft)	0.01	Wt. n-Val.		0.045	
E.G. Elev (ft)	1331.49	Reach Len. (ft)	220.00	243.38	270.00
Crit W.S. (ft)	1317.09	Flow Area (sq ft)		4822.75	
E.G. Slope (ft/ft)	0.000010	Area (sq ft)		4822.75	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	379.49	Top Width (ft)		379.49	
Vel Total (ft/s)	0.57	Avg. Vel. (ft/s)		0.57	
Max Chl Dpth (ft)	16.03	Hydr. Depth (ft)		12.71	
Conv. Total (cfs)	862164.6	Conv. (cfs)		862164.6	
Length Wtd. (ft)	243.38	Wetted Per. (ft)		382.85	
Min Ch El (ft)	1315.45	Shear (lb/sq ft)		0.01	
Alpha	1.00	Stream Power (lb/ft s)		0.00	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	613.77	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	77.08	1.66

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1333.22	Element			
Vel Head (ft)	0.01	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.23	Reach Len. (ft)	220.00	243.38	270.00
Crit W.S. (ft)	1317.39	Flow Area (sq ft)		5498.00	
E.G. Slope (ft/ft)	0.000012	Area (sq ft)		5498.00	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	397.98	Top Width (ft)		397.98	
Vel Total (ft/s)	0.64	Avg. Vel. (ft/s)		0.64	
Max Chl Dpth (ft)	17.77	Hydr. Depth (ft)		13.81	
Conv. Total (cfs)	1038838.6	Conv. (cfs)		1038838.6	
Length Wtd. (ft)	243.38	Wetted Per. (ft)		401.66	
Min Ch El (ft)	1315.45	Shear (lb/sq ft)		0.01	
Alpha	1.00	Stream Power (lb/ft s)		0.01	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	249.08	784.13	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	80.61	16.37

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.485

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4808.83	1335.3	4814.36	1333.73	4834.71	1330.29	4844.04	1329.58	4852.46	1328.4
4877.88	1326.2	4891.89	1325.58	4893.87	1325.4	4906.85	1324.79	4920.91	1323.38
4926.81	1322.6	4939.62	1320.37	4943.39	1319.13	4954.73	1317.5	4962.04	1315.45
5048.37	1315.4	5060.29	1318.13	5063.41	1319.53	5092.54	1325.49	5114.25	1330.3
5139.14	1335.1	5161.01	1335.71	5174.43	1335.64				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4808.83	.05	4808.83	.045	5139.14	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4808.83	5139.14	230	241.5	255	.1	.3

Left Levee Station= 4808.83 Elevation= 1335.3
Right Levee Station= 5139.14 Elevation= 1335.1

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.88	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1332.91	Reach Len. (ft)	230.00	241.50	255.00
Crit W.S. (ft)	1319.72	Flow Area (sq ft)		3268.13	
E.G. Slope (ft/ft)	0.000090	Area (sq ft)		3268.13	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	308.23	Top Width (ft)		308.23	
Vel Total (ft/s)	1.50	Avg. Vel. (ft/s)		1.50	
Max Chl Dpth (ft)	17.48	Hydr. Depth (ft)		10.60	
Conv. Total (cfs)	517091.6	Conv. (cfs)		517091.6	
Length Wtd. (ft)	241.50	Wetted Per. (ft)		311.58	
Min Ch El (ft)	1315.40	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.09	559.39	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	74.17	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.47	Element			
Vel Head (ft)	0.01	Wt. n-Val.		0.045	
E.G. Elev (ft)	1331.48	Reach Len. (ft)	230.00	241.50	255.00
Crit W.S. (ft)	1318.43	Flow Area (sq ft)		2844.59	
E.G. Slope (ft/ft)	0.000042	Area (sq ft)		2844.59	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	292.58	Top Width (ft)		292.58	
Vel Total (ft/s)	0.96	Avg. Vel. (ft/s)		0.96	
Max Chl Dpth (ft)	16.07	Hydr. Depth (ft)		9.72	
Conv. Total (cfs)	424884.8	Conv. (cfs)		424884.8	
Length Wtd. (ft)	241.50	Wetted Per. (ft)		295.68	
Min Ch El (ft)	1315.40	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.02	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.58	592.35	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	75.20	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1333.20	Element			
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.22	Reach Len. (ft)	230.00	241.50	255.00
Crit W.S. (ft)	1318.94	Flow Area (sq ft)		3369.11	
E.G. Slope (ft/ft)	0.000043	Area (sq ft)		3369.11	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	311.84	Top Width (ft)		311.84	
Vel Total (ft/s)	1.05	Avg. Vel. (ft/s)		1.05	
Max Chl Dpth (ft)	17.80	Hydr. Depth (ft)		10.80	
Conv. Total (cfs)	539757.2	Conv. (cfs)		539757.2	
Length Wtd. (ft)	241.50	Wetted Per. (ft)		315.26	
Min Ch El (ft)	1315.40	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	249.08	759.36	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	78.63	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.439

INPUT

Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4864.58	1333.9	4871.84	1332.06	4921.13	1323.08	4941.93	1319.03	4950.33	1317.33
4956.57	1315.4	5027.73	1315.45	5040.06	1318.23	5053.75	1323.08	5070.74	1329.19
5077.15	1331.3	5094.38	1334.8	5103.71	1334.88	5112.51	1335.25	5130.47	1335.66
5149.6	1336.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4864.58	.05	4864.58	.045	5094.38	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4864.58	5094.38	110	109.17	110	.1	.3

Left Levee Station= 4864.58 Elevation= 1333.9
Right Levee Station= 5094.38 Elevation= 1334.8

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.82	Element			
Vel Head (ft)	0.06	Wt. n-Val.		0.045	
E.G. Elev (ft)	1332.88	Reach Len. (ft)	110.00	109.17	110.00
Crit W.S. (ft)	1320.21	Flow Area (sq ft)		2468.07	
E.G. Slope (ft/ft)	0.000144	Area (sq ft)		2468.07	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	215.82	Top Width (ft)		215.82	
Vel Total (ft/s)	1.99	Avg. Vel. (ft/s)		1.99	
Max Chl Dpth (ft)	17.42	Hydr. Depth (ft)		11.44	
Conv. Total (cfs)	408071.0	Conv. (cfs)		408071.0	
Length Wtd. (ft)	109.17	Wetted Per. (ft)		220.28	
Min Ch El (ft)	1315.40	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.20	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.09	543.48	
C & E Loss (ft)	0.07	Cum SA (acres)	1.60	72.72	

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.

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.45	Element			
Vel Head (ft)	0.02	Wt. n-Val.		0.045	
E.G. Elev (ft)	1331.47	Reach Len. (ft)	110.00	109.17	110.00
Crit W.S. (ft)	1318.78	Flow Area (sq ft)		2179.56	
E.G. Slope (ft/ft)	0.000063	Area (sq ft)		2179.56	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	202.65	Top Width (ft)		202.65	
Vel Total (ft/s)	1.26	Avg. Vel. (ft/s)		1.26	
Max Chl Dpth (ft)	16.05	Hydr. Depth (ft)		10.76	
Conv. Total (cfs)	345934.7	Conv. (cfs)		345934.7	
Length Wtd. (ft)	109.17	Wetted Per. (ft)		206.82	
Min Ch El (ft)	1315.40	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	1.58	578.43	1.81
C & E Loss (ft)	0.03	Cum SA (acres)	4.83	73.83	1.66

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1333.18	Element			
Vel Head (ft)	0.03	Wt. n-Val.		0.045	
E.G. Elev (ft)	1333.21	Reach Len. (ft)	110.00	109.17	110.00
Crit W.S. (ft)	1319.34	Flow Area (sq ft)		2545.19	

E.G. Slope (ft/ft)	0.000069	Area (sq ft)		2545.19	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	218.96	Top Width (ft)		218.96	
Vel Total (ft/s)	1.39	Avg. Vel. (ft/s)		1.39	
Max Chl Dpth (ft)	17.78	Hydr. Depth (ft)		11.62	
Conv. Total (cfs)	425398.9	Conv. (cfs)		425398.9	
Length Wtd. (ft)	109.17	Wetted Per. (ft)		223.50	
Min Ch El (ft)	1315.40	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	249.08	742.96	34.89
C & E Loss (ft)	0.03	Cum SA (acres)	127.06	77.15	16.37

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.418

INPUT
Description: Just Upstream of Guadalupe Road Bridge
Manning's n Value of .030
used for Channel
No Ineffective Flow Area From Guadalupe Road
Bridge
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4895.27	1334	4896.73	1333.42	4903.98	1332.16	4906.48	1332.47	4916.43	1332.63
4920.49	1332.7	4936.13	1333.6	4948.56	1333.47	4952.45	1331.34	4960.82	1327.34
4965.46	1325.6	4967.33	1324.71	4973.65	1324.81	4993.02	1324.51	5006.93	1324.17
5021.53	1324.4	5041.71	1324.38	5044.96	1324.75	5056.48	1329.38	5063.95	1332.57
5065.91	1333	5069.99	1335.15	5079.72	1335.64	5086.91	1335.64		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4895.27	.04	4948.56	.03	5069.99	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4948.56	5069.99	42	28.49	10	.1	.3

Left Levee Station= 4948.56 Elevation= 1333.47
Right Levee Station= 5069.99 Elevation= 1335.15

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.05	Element			
Vel Head (ft)	0.73	Wt. n-Val.		0.030	
E.G. Elev (ft)	1332.78	Reach Len. (ft)	42.00	28.49	10.00
Crit W.S. (ft)	1329.22	Flow Area (sq ft)		716.99	
E.G. Slope (ft/ft)	0.001653	Area (sq ft)		716.99	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	111.60	Top Width (ft)		111.60	
Vel Total (ft/s)	6.83	Avg. Vel. (ft/s)		6.83	
Max Chl Dpth (ft)	7.88	Hydr. Depth (ft)		6.42	
Conv. Total (cfs)	120523.7	Conv. (cfs)		120523.7	
Length Wtd. (ft)	28.49	Wetted Per. (ft)		114.68	
Min Ch El (ft)	1324.17	Shear (lb/sq ft)		0.65	
Alpha	1.00	Stream Power (lb/ft s)		4.41	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.09	539.49	
C & E Loss (ft)	0.08	Cum SA (acres)	1.60	72.31	

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

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.12	Element			
Vel Head (ft)	0.31	Wt. n-Val.		0.030	
E.G. Elev (ft)	1331.42	Reach Len. (ft)	42.00	28.49	10.00

Crit W.S. (ft)	1327.75	Flow Area (sq ft)		614.02	
E.G. Slope (ft/ft)	0.000823	Area (sq ft)		614.02	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	107.63	Top Width (ft)		107.63	
Vel Total (ft/s)	4.46	Avg. Vel. (ft/s)		4.46	
Max Chl Dpth (ft)	6.95	Hydr. Depth (ft)		5.71	
Conv. Total (cfs)	95539.1	Conv. (cfs)		95539.1	
Length Wtd. (ft)	28.49	Wetted Per. (ft)		110.28	
Min Ch El (ft)	1324.17	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)		1.28	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.58	574.93	1.81
C & E Loss (ft)	0.04	Cum SA (acres)	4.83	73.44	1.66

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.87	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.030	
E.G. Elev (ft)	1333.16	Reach Len. (ft)	42.00	28.49	10.00
Crit W.S. (ft)	1328.33	Flow Area (sq ft)		809.29	
E.G. Slope (ft/ft)	0.000602	Area (sq ft)		809.29	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	115.65	Top Width (ft)		115.65	
Vel Total (ft/s)	4.36	Avg. Vel. (ft/s)		4.36	
Max Chl Dpth (ft)	8.70	Hydr. Depth (ft)		7.00	
Conv. Total (cfs)	143822.4	Conv. (cfs)		143822.4	
Length Wtd. (ft)	28.49	Wetted Per. (ft)		119.08	
Min Ch El (ft)	1324.17	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)		1.11	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	249.08	738.76	34.89
C & E Loss (ft)	0.03	Cum SA (acres)	127.06	76.73	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.413

INPUT
Description: Guadalupe Road Bridge, Upstream Face
3-Span Bridge with Riprap
Protection
Manning n Value of .030 used for Channel
Use Field
Survey Data for This Cross Section
Skew Angle 15.69 Degrees,
Cross Section Data Adjusted
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4924.86	1335.51	4953.45	1335.69	4953.6	1330.24	4971.33	1322.61	4987.99	1322.28
5026.09	1322.61	5044.33	1322.87	5061.43	1330.41	5061.46	1335.9	5113.66	1335.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4924.86	.04	4953.45	.03	5061.46	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4953.45	5061.46	57.77	57.77	57.77	.3	.5

Left Levee Station= 4953.45 Elevation= 1335.69
Right Levee Station= 5061.46 Elevation= 1335.9

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.21	Element			
Vel Head (ft)	0.45	Wt. n-Val.		0.030	
E.G. Elev (ft)	1332.67	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1327.46	Flow Area (sq ft)		905.73	
E.G. Slope (ft/ft)	0.000759	Area (sq ft)		905.73	

Q Total (cfs)	4900.00	Flow (cfs)		4900.00
Top Width (ft)	107.89	Top Width (ft)		107.89
Vel Total (ft/s)	5.41	Avg. Vel. (ft/s)		5.41
Max Chl Dpth (ft)	9.93	Hydr. Depth (ft)		8.39
Conv. Total (cfs)	177824.6	Conv. (cfs)		177824.6
Length Wtd. (ft)	0.00	Wetted Per. (ft)		114.77
Min Ch El (ft)	1322.28	Shear (lb/sq ft)		0.37
Alpha	1.00	Stream Power (lb/ft s)		2.02
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.09	538.96
C & E Loss (ft)	0.02	Cum SA (acres)	1.60	72.24

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1331.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.030	
E.G. Elev (ft)	1331.37	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1325.93	Flow Area (sq ft)		795.12	
E.G. Slope (ft/ft)	0.000358	Area (sq ft)		795.12	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	107.86	Top Width (ft)		107.86	
Vel Total (ft/s)	3.45	Avg. Vel. (ft/s)		3.45	
Max Chl Dpth (ft)	8.91	Hydr. Depth (ft)		7.37	
Conv. Total (cfs)	144827.4	Conv. (cfs)		144827.4	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		112.75	
Min Ch El (ft)	1322.28	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	574.47	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	73.37	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1332.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
E.G. Elev (ft)	1333.12	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1326.53	Flow Area (sq ft)		982.28	
E.G. Slope (ft/ft)	0.000306	Area (sq ft)		982.28	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	107.92	Top Width (ft)		107.92	
Vel Total (ft/s)	3.59	Avg. Vel. (ft/s)		3.59	
Max Chl Dpth (ft)	10.64	Hydr. Depth (ft)		9.10	
Conv. Total (cfs)	201896.2	Conv. (cfs)		201896.2	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		116.20	
Min Ch El (ft)	1322.28	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.58	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	249.08	738.17	34.89
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	76.66	16.37

BRIDGE RIVER: EMF
REACH: Reach 5 RS: 21.407

INPUT
Description: Guadalupe Road 3-Span Bridge
Used Field Survey Data for Cross
Sections
Bridge Skew 15.94 Degrees, Cross Section Data Adjusted
Distance from Upstream XS = 0
Deck/Roadway Width = 57.77
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 14

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4883.87	1335.6	1335.6	4907.63	1335.98	1335.98	4917.84	1335.75	1335.75
4953.45	1336.11	1334.01	4964.29	1336.22	1334.07	4984.22	1336.27	1334.19
4992.02	1336.29	1334.19	5010.61	1336.33	1334.2	5022.65	1336.35	1334.2
5030.53	1336.36	1334.23	5058.65	1336.4	1334.24	5061.46	1336.39	1334.24

```
 5106.06 1336.33    1335 5152.47 1336.11 1336.11

Upstream Bridge Cross Section Data
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4924.86 1335.51 4953.45 1335.69  4953.6 1330.24 4971.33 1322.61 4987.99 1322.28
 5026.09 1322.61 5044.33 1322.87 5061.43 1330.41 5061.46  1335.9 5113.66 1335.71

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4924.86     .04 4953.45     .03 5061.46     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4953.45 5061.46              .3       .5
Left Levee      Station= 4953.45      Elevation= 1335.69
Right Levee     Station= 5061.46      Elevation=  1335.9

Downstream  Deck/Roadway Coordinates
    num=      14
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 4883.87  1335.6  1335.6 4907.63 1335.98 1335.54 4917.84 1335.75 1335.54
 4953.71 1336.11 1333.92 4964.29 1336.22 1333.98 4984.66 1336.27  1334.1
 4992.47 1336.29 1334.15 5010.61 1336.33 1334.17 5023.28 1336.35 1334.18
 5031.12 1336.36 1334.21 5058.65  1336.4 1334.23    5062 1336.39 1334.24
 5106.06 1336.33    1335 5152.47 1336.11 1336.11

Downstream Bridge Cross Section Data
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4930.92 1335.54 4953.71 1335.63  4953.8 1330.78  4969.8 1323.35 4989.39 1322.77
  5027.4 1322.54 5045.35 1322.86 5061.85 1330.69    5062 1335.88 5107.55 1335.72

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4930.92     .04 4953.71     .03    5062     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4953.71    5062              .3       .5
Left Levee      Station= 4953.71      Elevation= 1335.63
Right Levee     Station=    5062      Elevation= 1335.88

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

Number of Piers =  2

Pier Data
Pier Station     Upstream= 4988.12    Downstream= 4988.56
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1321.28     2.5 1333.52    3.98 1333.52     7.8 1334.19
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1321.77     2.5 1333.46    3.98 1333.46    7.81 1334.15

Pier Data
Pier Station     Upstream= 5026.59    Downstream=  5027.2
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1321.61     2.5 1333.58    3.98 1333.58    7.88 1334.23
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1321.54     2.5  1333.6    3.95  1333.6    7.84 1334.21
```

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 1.2
Yarnell KVal = .9
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 downstream end
Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT Profile #Design
Opening : Bridge #1

E.G. US. (ft)	1332.67	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1332.21	E.G. Elev (ft)	1332.65	1332.56
Q Total (cfs)	4900.00	W.S. Elev (ft)	1332.13	1331.99
Q Bridge (cfs)	4900.00	Crit W.S. (ft)	1327.69	1327.85
Q Weir (cfs)		Max Chl Dpth (ft)	9.84	9.45
Weir Sta Lft (ft)		Vel Total (ft/s)	5.78	6.01
Weir Sta Rgt (ft)		Flow Area (sq ft)	848.43	815.28
Weir Submerg		Froude # Chl	0.35	0.38
Weir Max Depth (ft)		Specif Force (cu ft)	4647.97	4410.78
Min Top Rd (ft)	1335.88	Hydr Depth (ft)	8.25	7.91
Min El Prs (ft)	1334.24	W.P. Total (ft)	148.27	146.26
Delta EG (ft)	0.14	Conv. Total (cfs)	134439.6	126946.9
Delta WS (ft)	0.19	Top Width (ft)	102.89	103.11
BR Open Area (sq ft)	1031.90	Frctn Loss (ft)	0.08	0.00
BR Open Vel (ft/s)	6.01	C & E Loss (ft)	0.01	0.03
Coef of Q		Shear Total (lb/sq ft)	0.47	0.52
Br Sel Mthd	Energy only	Power Total (lb/ft s)	2.74	3.12

BRIDGE OUTPUT Profile #Future
Opening : Bridge #1

E.G. US. (ft)	1331.37	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1331.19	E.G. Elev (ft)	1331.37	1331.32
Q Total (cfs)	2740.00	W.S. Elev (ft)	1331.16	1331.10
Q Bridge (cfs)	2740.00	Crit W.S. (ft)	1326.10	1326.28
Q Weir (cfs)		Max Chl Dpth (ft)	8.87	8.55
Weir Sta Lft (ft)		Vel Total (ft/s)	3.66	3.79
Weir Sta Rgt (ft)		Flow Area (sq ft)	748.24	723.27
Weir Submerg		Froude # Chl	0.24	0.25
Weir Max Depth (ft)		Specif Force (cu ft)	3303.23	3132.00
Min Top Rd (ft)	1335.88	Hydr Depth (ft)	7.27	7.02
Min El Prs (ft)	1334.24	W.P. Total (ft)	142.42	140.89
Delta EG (ft)	0.06	Conv. Total (cfs)	112004.8	106608.0
Delta WS (ft)	0.07	Top Width (ft)	102.86	103.07
BR Open Area (sq ft)	1031.90	Frctn Loss (ft)	0.04	0.00
BR Open Vel (ft/s)	3.79	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.20	0.21
Br Sel Mthd	Energy only	Power Total (lb/ft s)	0.72	0.80

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

E.G. US. (ft)	1333.12	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1332.92	E.G. Elev (ft)	1333.12	1333.08
Q Total (cfs)	3530.00	W.S. Elev (ft)	1332.89	1332.84
Q Bridge (cfs)	3530.00	Crit W.S. (ft)	1326.72	1326.90

Q Weir (cfs)		Max Chl Dpth (ft)	10.60	10.29
Weir Sta Lft (ft)		Vel Total (ft/s)	3.81	3.91
Weir Sta Rgt (ft)		Flow Area (sq ft)	926.60	902.80
Weir Submerg		Froude # Chl	0.22	0.23
Weir Max Depth (ft)		Specif Force (cu ft)	4860.94	4653.83
Min Top Rd (ft)	1335.88	Hydr Depth (ft)	9.00	8.75
Min El Prs (ft)	1334.24	W.P. Total (ft)	152.87	151.35
Delta EG (ft)	0.06	Conv. Total (cfs)	152576.3	147074.0
Delta WS (ft)	0.07	Top Width (ft)	102.92	103.15
BR Open Area (sq ft)	1031.90	Frctn Loss (ft)	0.03	0.00
BR Open Vel (ft/s)	3.91	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.20	0.21
Br Sel Mthd	Energy only	Power Total (lb/ft s)	0.77	0.84

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.402

INPUT
Description: Guadalupe Road Bridge, Downstream Face
3-Span Bridge with Riprap
Protection
Manning n Value of .030 used for Channel
Use Field
Survey Data for This Cross Section
Skew Angle 15.49 Degrees,
Cross Section Data Adjusted
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4930.92	1335.54	4953.71	1335.63	4953.8	1330.78	4969.8	1323.35	4989.39	1322.77
5027.4	1322.54	5045.35	1322.86	5061.85	1330.69	5062	1335.88	5107.55	1335.72

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4930.92	.04	4953.71	.03	5062	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4953.71	5062	40	56.27	80	.3	.5

Left Levee Station= 4953.71 Elevation= 1335.63
Right Levee Station= 5062 Elevation= 1335.88

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1332.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.030	
E.G. Elev (ft)	1332.52	Reach Len. (ft)	40.00	56.27	80.00
Crit W.S. (ft)	1327.65	Flow Area (sq ft)		865.30	
E.G. Slope (ft/ft)	0.000877	Area (sq ft)		865.30	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	108.11	Top Width (ft)		108.11	
Vel Total (ft/s)	5.66	Avg. Vel. (ft/s)		5.66	
Max Chl Dpth (ft)	9.49	Hydr. Depth (ft)		8.00	
Conv. Total (cfs)	165490.1	Conv. (cfs)		165490.1	
Length Wtd. (ft)	56.27	Wetted Per. (ft)		114.04	
Min Ch El (ft)	1322.54	Shear (lb/sq ft)		0.42	
Alpha	1.00	Stream Power (lb/ft s)		2.35	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.09	537.86	
C & E Loss (ft)	0.01	Cum SA (acres)	1.60	72.10	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1331.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
E.G. Elev (ft)	1331.31	Reach Len. (ft)	40.00	56.27	80.00
Crit W.S. (ft)	1326.13	Flow Area (sq ft)		766.73	
E.G. Slope (ft/ft)	0.000402	Area (sq ft)		766.73	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	108.07	Top Width (ft)		108.07	

Vel Total (ft/s)	3.57	Avg. Vel. (ft/s)		3.57	
Max Chl Dpth (ft)	8.57	Hydr. Depth (ft)		7.09	
Conv. Total (cfs)	136738.4	Conv. (cfs)		136738.4	
Length Wtd. (ft)	56.27	Wetted Per. (ft)		112.22	
Min Ch El (ft)	1322.54	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.61	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	1.58	573.49	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	73.23	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.86	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.030	
E.G. Elev (ft)	1333.07	Reach Len. (ft)	40.00	56.27	80.00
Crit W.S. (ft)	1326.73	Flow Area (sq ft)		955.00	
E.G. Slope (ft/ft)	0.000334	Area (sq ft)		955.00	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	108.15	Top Width (ft)		108.15	
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)		3.70	
Max Chl Dpth (ft)	10.32	Hydr. Depth (ft)		8.83	
Conv. Total (cfs)	193184.7	Conv. (cfs)		193184.7	
Length Wtd. (ft)	56.27	Wetted Per. (ft)		115.71	
Min Ch El (ft)	1322.54	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.64	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	249.08	736.96	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	76.52	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.391

INPUT
Description: No Ineffective Flow Area From Guadalupe Road and Power Road

Bridges
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4911.73	1335.6	4942.93	1334.53	4946.02	1334.18	4970.51	1322.99	5006.63	1322.68
5009.87	1322.8	5043.75	1323.12	5049.66	1326.07	5051.31	1325.81	5060.71	1330.77
5066.46	1333.1	5083.95	1333.84	5098.37	1334.53	5107.21	1335.23	5126.1	1335.9
5128.35	1336.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4911.73	.04	4942.93	.03	5066.46	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4942.93	5066.46	50	193.75	320	.3	.5

Left Levee Station= 4942.93 Elevation= 1334.53
Right Levee Station= 5066.46 Elevation= 1333.1

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.93	Element			
Vel Head (ft)	0.53	Wt. n-Val.		0.030	
E.G. Elev (ft)	1332.46	Reach Len. (ft)	50.00	193.75	320.00
Crit W.S. (ft)	1327.82	Flow Area (sq ft)		838.97	
E.G. Slope (ft/ft)	0.001003	Area (sq ft)		838.97	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	112.64	Top Width (ft)		112.64	
Vel Total (ft/s)	5.84	Avg. Vel. (ft/s)		5.84	
Max Chl Dpth (ft)	9.25	Hydr. Depth (ft)		7.45	
Conv. Total (cfs)	154736.7	Conv. (cfs)		154736.7	
Length Wtd. (ft)	193.75	Wetted Per. (ft)		116.76	
Min Ch El (ft)	1322.68	Shear (lb/sq ft)		0.45	
Alpha	1.00	Stream Power (lb/ft s)		2.63	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.09	536.76	
C & E Loss (ft)	0.03	Cum SA (acres)	1.60	71.96	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1331.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.030	
E.G. Elev (ft)	1331.29	Reach Len. (ft)	50.00	193.75	320.00
Crit W.S. (ft)	1326.31	Flow Area (sq ft)		744.11	
E.G. Slope (ft/ft)	0.000445	Area (sq ft)		744.11	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	108.64	Top Width (ft)		108.64	
Vel Total (ft/s)	3.68	Avg. Vel. (ft/s)		3.68	
Max Chl Dpth (ft)	8.39	Hydr. Depth (ft)		6.85	
Conv. Total (cfs)	129933.6	Conv. (cfs)		129933.6	
Length Wtd. (ft)	193.75	Wetted Per. (ft)		112.41	
Min Ch El (ft)	1322.68	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	1.58	572.51	1.81
C & E Loss (ft)	0.02	Cum SA (acres)	4.83	73.09	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1332.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.		0.030	
E.G. Elev (ft)	1333.05	Reach Len. (ft)	50.00	193.75	320.00
Crit W.S. (ft)	1326.90	Flow Area (sq ft)		941.78	
E.G. Slope (ft/ft)	0.000373	Area (sq ft)		941.78	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	116.81	Top Width (ft)		116.81	
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)		3.75	
Max Chl Dpth (ft)	10.15	Hydr. Depth (ft)		8.06	
Conv. Total (cfs)	182898.9	Conv. (cfs)		182898.9	
Length Wtd. (ft)	193.75	Wetted Per. (ft)		121.30	
Min Ch El (ft)	1322.68	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	249.08	735.73	34.89
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	76.38	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.355

INPUT
Description: Power Road Bridge Upstream Face
(South of Guadalupe Road)
6-Span
Bridge with Riprap Protection
Manning n Value of .030 used for
Channel
Used Field Survey Data for This Cross Section
Skew Angle
58.33 Degrees (Cross Section Data Adjusted)
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4932.59	1336.2	4943.85	1336.16	4943.86	1329.95	4960.19	1323.83	4963.21	1322.6
4982.36	1322.65	5002.95	1322.66	5022.62	1322.56	5040.01	1322.75	5042.94	1323.37
5057.24	1331.35	5057.25	1337.9	5073.6	1337.38				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4932.59	.04	4943.85	.03	5057.25	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4943.85	5057.25	150.66	150.66	150.66	.3	.5

Left Levee Station= 4943.85 Elevation= 1336.16
Right Levee Station= 5057.25 Elevation= 1337.9

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1331.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.		0.030	
E.G. Elev (ft)	1332.25	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1327.36	Flow Area (sq ft)		897.90	
E.G. Slope (ft/ft)	0.000822	Area (sq ft)		897.90	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	113.38	Top Width (ft)		113.38	
Vel Total (ft/s)	5.46	Avg. Vel. (ft/s)		5.46	
Max Chl Dpth (ft)	9.23	Hydr. Depth (ft)		7.92	
Conv. Total (cfs)	170944.1	Conv. (cfs)		170944.1	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		119.15	
Min Ch El (ft)	1322.56	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)		2.11	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.09	532.90	
C & E Loss (ft)	0.05	Cum SA (acres)	1.60	71.46	

Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1331.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.030	
E.G. Elev (ft)	1331.19	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1325.89	Flow Area (sq ft)		810.01	
E.G. Slope (ft/ft)	0.000354	Area (sq ft)		810.01	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	112.78	Top Width (ft)		112.78	
Vel Total (ft/s)	3.38	Avg. Vel. (ft/s)		3.38	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		7.18	
Conv. Total (cfs)	145529.8	Conv. (cfs)		145529.8	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		117.25	
Min Ch El (ft)	1322.56	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.52	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	569.06	1.81
C & E Loss (ft)	0.02	Cum SA (acres)	4.83	72.60	1.66

Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1332.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.		0.030	
E.G. Elev (ft)	1332.97	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1326.47	Flow Area (sq ft)		1009.93	
E.G. Slope (ft/ft)	0.000295	Area (sq ft)		1009.93	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	113.39	Top Width (ft)		113.39	
Vel Total (ft/s)	3.50	Avg. Vel. (ft/s)		3.50	
Max Chl Dpth (ft)	10.22	Hydr. Depth (ft)		8.91	
Conv. Total (cfs)	205681.9	Conv. (cfs)		205681.9	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		121.13	
Min Ch El (ft)	1322.56	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	249.08	731.39	34.89
C & E Loss (ft)	0.02	Cum SA (acres)	127.06	75.87	16.37

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.

BRIDGE RIVER: EMF

REACH: Reach 5 RS: 21.339

INPUT
Description: Power Road 6-Span Bridge (South of Guadalupe Road)
Used Field
Survey Data for Cross Sections
Bridge Skew 58.92 Degrees, Cross
Section Data Adjusted
Distance from Upstream XS = 0
Deck/Roadway Width = 150.66
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 22

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4854.42	1336	1336	4868.37	1336.33	1336.33	4932.59	1337	1336.2
4934.78	1337.02	1336.2	4943.85	1337.2	1334.58	4944.54	1337.21	1334.63
4955.71	1337.35	1334.7	4963.66	1337.45	1334.83	4976.5	1337.68	1335.05
4981.27	1337.72	1335.12	4984.12	1337.75	1335.16	4996.73	1337.9	1335.29
5004.56	1338.03	1335.41	5006.59	1338.08	1335.43	5017.28	1338.26	1335.54
5025.04	1338.38	1335.76	5032.04	1338.49	1335.83	5037.87	1338.6	1335.88
5045.68	1338.74	1336.08	5055.75	1338.92	1336.17	5057.13	1338.94	1336.18
5083.46	1339.22	1337.38						

Upstream Bridge Cross Section Data
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4932.59	1336.2	4943.85	1336.16	4943.86	1329.95	4960.19	1323.83	4963.21	1322.6
4982.36	1322.65	5002.95	1322.66	5022.62	1322.56	5040.01	1322.75	5042.94	1323.37
5057.24	1331.35	5057.25	1337.9	5073.6	1337.38				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4932.59	.04	4943.85	.03	5057.25	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
4943.85	5057.25	.3	.5

Left Levee Station= 4943.85 Elevation= 1336.16
Right Levee Station= 5057.25 Elevation= 1337.9

Downstream Deck/Roadway Coordinates
num= 21

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4854.42	1336	1336	4868.37	1336.33	1336.33	4934.78	1337.02	1336.72
4943.51	1337.2	1335.74	4944.54	1337.21	1335.75	4955.26	1337.35	1335.85
4963	1337.45	1335.96	4975.79	1337.67	1336.14	4981.27	1337.72	1336.24
4983.53	1337.75	1336.28	4996.19	1337.96	1336.46	5003.99	1338.05	1336.52
5006.59	1338.08	1336.56	5016.67	1338.25	1336.7	5024.29	1338.33	1336.82
5032.04	1338.49	1336.9	5037.14	1338.58	1336.96	5044.95	1338.73	1337.03
5055.75	1338.92	1337.13	5056.79	1338.95	1337.14	5083.46	1339.22	1338

Downstream Bridge Cross Section Data
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4918.73	1336.72	4943.56	1336.7	4943.57	1331.69	4957.22	1324.46	4961.4	1323.05
4978.51	1322.6	4999.6	1322.78	5019.8	1322.62	5038.35	1322.63	5040.83	1323.62
5056.82	1331.37	5056.85	1338.77	5080.51	1338.61				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4918.73	.04	4943.56	.03	5056.85	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
4943.56	5056.85	.3	.5

Left Levee Station= 4943.56 Elevation= 1336.7
Right Levee Station= 5056.85 Elevation= 1338.77

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical

```
Maximum allowable submergence for weir flow =      .95
Elevation at which weir flow begins          =
Energy head used in spillway design          =
Spillway height used in design               =
Weir crest shape                             = Broad Crested

Number of Piers =  5

Pier Data
Pier Station     Upstream= 4959.69    Downstream= 4959.13
Upstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1322.83     2.5 1334.12    4.05 1334.12    7.95 1334.85
Downstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1323.46     2.5 1335.24    4.01 1335.24    7.74 1335.96

Pier Data
Pier Station     Upstream= 4980.31    Downstream= 4979.66
Upstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1321.65     2.5 1334.42    4.03 1334.42    7.62 1335.16
Downstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5  1321.6     2.5 1335.58    4.08 1335.58    7.74 1336.28

Pier Data
Pier Station     Upstream= 5000.65    Downstream= 5000.09
Upstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1321.66     2.5  1334.7       4  1334.7    7.83 1335.41
Downstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1321.78     2.5 1335.93       4 1335.93     7.8 1336.54

Pier Data
Pier Station     Upstream= 5021.16    Downstream= 5020.48
Upstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1321.56     2.5 1335.04    3.98 1335.04    7.76 1335.76
Downstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1321.62     2.5 1336.09    4.01 1336.09    7.62 1336.82

Pier Data
Pier Station     Upstream= 5041.78    Downstream= 5041.05
Upstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1322.37     2.5 1335.34    4.05 1335.34    7.81 1336.08
Downstream     num=        4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
     2.5 1322.62     2.5 1336.39    4.06 1336.39    7.81 1337.03

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =     1.2
       Yarnell                 KVal =      .9
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 downstream end
```

Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT Profile #Design
Opening : Bridge #1

E.G. US. (ft)	1332.25	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1331.79	E.G. Elev (ft)	1332.20	1331.67
Q Total (cfs)	4900.00	W.S. Elev (ft)	1331.56	1330.84
Q Bridge (cfs)	4900.00	Crit W.S. (ft)	1327.80	1327.91
Q Weir (cfs)		Max Chl Dpth (ft)	9.00	8.24
Weir Sta Lft (ft)		Vel Total (ft/s)	6.40	7.31
Weir Sta Rgt (ft)		Flow Area (sq ft)	765.17	670.66
Weir Submerg		Froude # Chl	0.41	0.49
Weir Max Depth (ft)		Specif Force (cu ft)	4154.47	3675.36
Min Top Rd (ft)	1337.00	Hydr Depth (ft)	7.58	6.84
Min El Prs (ft)	1336.19	W.P. Total (ft)	191.58	178.63
Delta EG (ft)	0.69	Conv. Total (cfs)	95404.1	80243.0
Delta WS (ft)	0.84	Top Width (ft)	100.88	98.07
BR Open Area (sq ft)	1138.95	Frctn Loss (ft)	0.47	0.00
BR Open Vel (ft/s)	7.31	C & E Loss (ft)	0.06	0.11
Coef of Q		Shear Total (lb/sq ft)	0.66	0.87
Br Sel Mthd	Energy only	Power Total (lb/ft s)	4.21	6.39

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

BRIDGE OUTPUT Profile #Future
Opening : Bridge #1

E.G. US. (ft)	1331.19	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1331.01	E.G. Elev (ft)	1331.17	1331.00
Q Total (cfs)	2740.00	W.S. Elev (ft)	1330.94	1330.73
Q Bridge (cfs)	2740.00	Crit W.S. (ft)	1326.19	1326.28
Q Weir (cfs)		Max Chl Dpth (ft)	8.38	8.12
Weir Sta Lft (ft)		Vel Total (ft/s)	3.90	4.16
Weir Sta Rgt (ft)		Flow Area (sq ft)	702.21	659.16
Weir Submerg		Froude # Chl	0.26	0.28
Weir Max Depth (ft)		Specif Force (cu ft)	3053.03	2839.10
Min Top Rd (ft)	1337.00	Hydr Depth (ft)	7.01	6.75
Min El Prs (ft)	1336.19	W.P. Total (ft)	183.56	176.93
Delta EG (ft)	0.23	Conv. Total (cfs)	85075.3	78460.3
Delta WS (ft)	0.25	Top Width (ft)	100.14	97.61
BR Open Area (sq ft)	1138.95	Frctn Loss (ft)	0.17	0.00
BR Open Vel (ft/s)	4.16	C & E Loss (ft)	0.01	0.03
Coef of Q		Shear Total (lb/sq ft)	0.25	0.28
Br Sel Mthd	Energy only	Power Total (lb/ft s)	0.97	1.18

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

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

E.G. US. (ft)	1332.97	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1332.78	E.G. Elev (ft)	1332.95	1332.79
Q Total (cfs)	3530.00	W.S. Elev (ft)	1332.70	1332.52
Q Bridge (cfs)	3530.00	Crit W.S. (ft)	1326.83	1326.92
Q Weir (cfs)		Max Chl Dpth (ft)	10.14	9.91
Weir Sta Lft (ft)		Vel Total (ft/s)	4.01	4.21
Weir Sta Rgt (ft)		Flow Area (sq ft)	879.83	838.05
Weir Submerg		Froude # Chl	0.24	0.26
Weir Max Depth (ft)		Specif Force (cu ft)	4554.57	4285.19
Min Top Rd (ft)	1337.00	Hydr Depth (ft)	8.72	8.32
Min El Prs (ft)	1336.19	W.P. Total (ft)	205.05	200.21
Delta EG (ft)	0.21	Conv. Total (cfs)	115069.1	107812.7
Delta WS (ft)	0.23	Top Width (ft)	100.89	100.76
BR Open Area (sq ft)	1138.95	Frctn Loss (ft)	0.15	0.00

BR Open Vel (ft/s)	4.21	C & E Loss (ft)	0.01	0.03
Coef of Q		Shear Total (lb/sq ft)	0.25	0.28
Br Sel Mthd	Energy only	Power Total (lb/ft s)	1.01	1.18

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.326

INPUT
Description: Power Road Bridge Downstream Face
(South of Guadalupe
Road)
6-Span Bridge with Riprap Protection
Manning n Value of
.030 used for Channel
Used Field Survey Data for This Cross
Section
Skew Angle 58.35 Degrees (Cross Section Data Adjusted)
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4918.73	1336.72	4943.56	1336.7	4943.57	1331.69	4957.22	1324.46	4961.4	1323.05
4978.51	1322.6	4999.6	1322.78	5019.8	1322.62	5038.35	1322.63	5040.83	1323.62
5056.82	1331.37	5056.85	1338.77	5080.51	1338.61				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4918.73	.04	4943.56	.03	5056.85	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4943.56	5056.85	125	231.38	335	.3	.5

Left Levee Station= 4943.56 Elevation= 1336.7
Right Levee Station= 5056.85 Elevation= 1338.77

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1330.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.		0.030	
E.G. Elev (ft)	1331.57	Reach Len. (ft)	125.00	231.38	335.00
Crit W.S. (ft)	1327.47	Flow Area (sq ft)		779.21	
E.G. Slope (ft/ft)	0.001253	Area (sq ft)		779.21	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	110.99	Top Width (ft)		110.99	
Vel Total (ft/s)	6.29	Avg. Vel. (ft/s)		6.29	
Max Chl Dpth (ft)	8.35	Hydr. Depth (ft)		7.02	
Conv. Total (cfs)	138421.5	Conv. (cfs)		138421.5	
Length Wtd. (ft)	231.38	Wetted Per. (ft)		114.72	
Min Ch El (ft)	1322.60	Shear (lb/sq ft)		0.53	
Alpha	1.00	Stream Power (lb/ft s)		3.34	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.09	530.41	
C & E Loss (ft)	0.17	Cum SA (acres)	1.60	71.11	

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1330.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
E.G. Elev (ft)	1330.96	Reach Len. (ft)	125.00	231.38	335.00
Crit W.S. (ft)	1325.98	Flow Area (sq ft)		757.94	
E.G. Slope (ft/ft)	0.000425	Area (sq ft)		757.94	
Q Total (cfs)	2740.00	Flow (cfs)		2740.00	
Top Width (ft)	110.24	Top Width (ft)		110.24	
Vel Total (ft/s)	3.62	Avg. Vel. (ft/s)		3.62	
Max Chl Dpth (ft)	8.16	Hydr. Depth (ft)		6.88	

Conv. Total (cfs)	132840.4	Conv. (cfs)		132840.4	
Length Wtd. (ft)	231.38	Wetted Per. (ft)		113.87	
Min Ch El (ft)	1322.60	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.64	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	1.58	566.70	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	72.26	1.66

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.55	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.030	
E.G. Elev (ft)	1332.76	Reach Len. (ft)	125.00	231.38	335.00
Crit W.S. (ft)	1326.56	Flow Area (sq ft)		959.27	
E.G. Slope (ft/ft)	0.000343	Area (sq ft)		959.27	
Q Total (cfs)	3530.00	Flow (cfs)		3530.00	
Top Width (ft)	113.26	Top Width (ft)		113.26	
Vel Total (ft/s)	3.68	Avg. Vel. (ft/s)		3.68	
Max Chl Dpth (ft)	9.95	Hydr. Depth (ft)		8.47	
Conv. Total (cfs)	190692.9	Conv. (cfs)		190692.9	
Length Wtd. (ft)	231.38	Wetted Per. (ft)		119.31	
Min Ch El (ft)	1322.60	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.63	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	249.08	728.42	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	75.52	16.37

Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.282

INPUT
Description: Just South of Power Road Bridge and Guadalupe Channel
Q(D)=4,900
cfs, Q(F)=4,180 cfs & Q(E)=5,220 cfs
No Ineffective Flow Area
From Power Road Bridge
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4101.77	1338	4143.05	1337.23	4148.85	1337.2	4183.72	1337.3	4200.4	1337.56
4213.66	1337.9	4220.28	1337.91	4230.28	1337.77	4263.42	1337.49	4326.48	1337.3
4360.41	1337.5	4382.06	1337.5	4402.75	1337.6	4416.09	1337.76	4420.39	1335.82
4435.94	1335.7	4441.39	1335.56	4500.71	1335.22	4541.42	1335.24	4560.03	1335.19
4605.2	1334.5	4619.36	1334.4	4678.68	1334.52	4686.25	1334.57	4726.47	1334.39
4747.13	1332.1	4762.07	1332.94	4795	1332.82	4840.26	1332.43	4862.56	1331.64
4875.69	1333.8	4896.12	1334.04	4922.27	1326.25	4932.42	1322.93	4936.1	1322.88
4975.92	1323.1	4988.97	1322.54	5034.84	1322.47	5049.3	1322.51	5067.33	1328.22
5076.03	1331	5087.92	1334.7	5106.88	1334.41	5121.28	1337.96	5142.67	1338.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4101.77	.04	4896.12	.025	5087.92	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4896.12	5087.92	500	500	500	.1	.3

Left Levee Station= 4896.12 Elevation= 1334.04
Right Levee Station= 5087.92 Elevation= 1334.7

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1330.98	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1331.25	Reach Len. (ft)	500.00	500.00	500.00

Crit W.S. (ft)	1326.37	Flow Area (sq ft)		1181.65
E.G. Slope (ft/ft)	0.000373	Area (sq ft)		1181.65
Q Total (cfs)	4900.00	Flow (cfs)		4900.00
Top Width (ft)	169.58	Top Width (ft)		169.58
Vel Total (ft/s)	4.15	Avg. Vel. (ft/s)		4.15
Max Chl Dpth (ft)	8.51	Hydr. Depth (ft)		6.97
Conv. Total (cfs)	253689.4	Conv. (cfs)		253689.4
Length Wtd. (ft)	500.00	Wetted Per. (ft)		172.13
Min Ch El (ft)	1322.47	Shear (lb/sq ft)		0.16
Alpha	1.00	Stream Power (lb/ft s)		0.66
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.09	525.21
C & E Loss (ft)	0.01	Cum SA (acres)	1.60	70.37

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1330.67	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.88	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1326.01	Flow Area (sq ft)		1128.46	
E.G. Slope (ft/ft)	0.000311	Area (sq ft)		1128.46	
Q Total (cfs)	4180.00	Flow (cfs)		4180.00	
Top Width (ft)	167.54	Top Width (ft)		167.54	
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)		3.70	
Max Chl Dpth (ft)	8.20	Hydr. Depth (ft)		6.74	
Conv. Total (cfs)	236914.2	Conv. (cfs)		236914.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		169.99	
Min Ch El (ft)	1322.47	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.48	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	1.58	561.69	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	71.52	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.49	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1332.69	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1326.52	Flow Area (sq ft)		1444.88	
E.G. Slope (ft/ft)	0.000234	Area (sq ft)		1444.88	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	179.49	Top Width (ft)		179.49	
Vel Total (ft/s)	3.61	Avg. Vel. (ft/s)		3.61	
Max Chl Dpth (ft)	10.02	Hydr. Depth (ft)		8.05	
Conv. Total (cfs)	341160.0	Conv. (cfs)		341160.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		182.48	
Min Ch El (ft)	1322.47	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	249.08	722.04	34.89
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	74.74	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.188

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4253.56	1339	4269.24	1338.45	4285.31	1338.3	4314.88	1337.5	4338.5	1337.39
4349.04	1337.6	4387.94	1337.54	4392.87	1337.08	4414.28	1336.15	4430.27	1336.1
4437.74	1336.2	4452.29	1334.84	4471.92	1334.87	4495.03	1334.98	4582.34	1335.63
4613.4	1335.6	4658.35	1335.16	4695.76	1334.77	4738.24	1334.44	4740.76	1334.95
4745.15	1335.2	4747.44	1334.88	4753.26	1332.82	4756.84	1331.83	4761.34	1332.22
4821.11	1332.6	4831.01	1332.48	4870.49	1331.29	4881.64	1333.25	4895.92	1333.05
4936.2	1322.9	4939.02	1322.92	4983.66	1322.8	4999.03	1322.55	5004.87	1322.28
5012.41	1322.5	5027.83	1323.48	5059.92	1323.54	5073.88	1323.46	5085.93	1327.25
5104.11	1332.8	5116.35	1332.56	5126.38	1330.89	5142.67	1333.77		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4253.56	.04	4895.92	.025	5104.11	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4895.92	5104.11	500	500	500	.1	.3

Left Levee Station= 4895.92 Elevation= 1333.05
Right Levee Station= 5104.11 Elevation= 1332.8

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1330.83	Element			
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
E.G. Elev (ft)	1331.06	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1326.32	Flow Area (sq ft)		1287.05	
E.G. Slope (ft/ft)	0.000332	Area (sq ft)		1287.05	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	192.96	Top Width (ft)		192.96	
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)		3.81	
Max Chl Dpth (ft)	8.55	Hydr. Depth (ft)		6.67	
Conv. Total (cfs)	269071.3	Conv. (cfs)		269071.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		195.11	
Min Ch El (ft)	1322.28	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.52	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.09	511.04	
C & E Loss (ft)	0.01	Cum SA (acres)	1.60	68.29	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1330.54	Element			
Vel Head (ft)	0.18	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.72	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1326.00	Flow Area (sq ft)		1231.07	
E.G. Slope (ft/ft)	0.000276	Area (sq ft)		1231.07	
Q Total (cfs)	4180.00	Flow (cfs)		4180.00	
Top Width (ft)	190.85	Top Width (ft)		190.85	
Vel Total (ft/s)	3.40	Avg. Vel. (ft/s)		3.40	
Max Chl Dpth (ft)	8.26	Hydr. Depth (ft)		6.45	
Conv. Total (cfs)	251737.5	Conv. (cfs)		251737.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		192.91	
Min Ch El (ft)	1322.28	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.37	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	1.58	548.15	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	69.46	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.41	Element			
Vel Head (ft)	0.17	Wt. n-Val.		0.025	
E.G. Elev (ft)	1332.57	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1326.46	Flow Area (sq ft)		1599.62	
E.G. Slope (ft/ft)	0.000197	Area (sq ft)		1599.62	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	204.36	Top Width (ft)		204.36	
Vel Total (ft/s)	3.26	Avg. Vel. (ft/s)		3.26	
Max Chl Dpth (ft)	10.13	Hydr. Depth (ft)		7.83	
Conv. Total (cfs)	371701.4	Conv. (cfs)		371701.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		206.93	
Min Ch El (ft)	1322.28	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.31	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	249.08	704.56	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	72.54	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21.093

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3648.76	1337.97	3715.49	1337.6	3777.53	1337.34	3834.03	1337.31	3850.15	1337.28
3922.56	1336.97	3952.79	1337	4022.81	1336.77	4042.11	1336.65	4080.55	1336.81
4110.49	1335.69	4127	1335.5	4157.11	1335.16	4182.97	1335.18	4213.11	1335.36
4249.22	1335.03	4260.8	1335.2	4265.25	1335.49	4277.68	1336.81	4302.17	1336.93
4331.96	1336.59	4376.1	1336.4	4403.12	1336.29	4437.86	1336.48	4455.64	1334.99
4476.98	1334.88	4506.43	1334.5	4546	1334.51	4664.64	1335.09	4710.83	1335.38
4726.66	1335.14	4738.12	1334.8	4747.85	1335.52	4754.11	1332.62	4758.23	1331.17
4761.94	1331.63	4787.57	1331.6	4797.38	1331.65	4839.79	1331.72	4858.36	1331.56
4870.56	1331.02	4882.44	1333.2	4896.31	1332.93	4907.2	1329.66	4932.69	1322.54
4967.24	1323.1	4974.53	1323	4986.91	1322.45	5003.89	1321.82	5025.89	1322.42
5037.61	1322.63	5048.67	1322.6	5072.29	1322.71	5080.41	1325.26	5103.72	1332.73
5117.13	1332.45	5128.43	1330.5	5136.2	1331.59	5152.28	1334.2	5166.17	1334.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3648.76	.04	4896.31	.025	5103.72	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4896.31	5103.72	490.19	490.19	490.19	.1	.3

Left Levee Station= 4896.31 Elevation= 1332.93
Right Levee Station= 5103.72 Elevation= 1332.73

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1330.70	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.90	Reach Len. (ft)	490.19	490.19	490.19
Crit W.S. (ft)	1325.83	Flow Area (sq ft)		1355.62	
E.G. Slope (ft/ft)	0.000281	Area (sq ft)		1355.62	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	193.64	Top Width (ft)		193.64	
Vel Total (ft/s)	3.61	Avg. Vel. (ft/s)		3.61	
Max Chl Dpth (ft)	8.88	Hydr. Depth (ft)		7.00	
Conv. Total (cfs)	292444.2	Conv. (cfs)		292444.2	
Length Wtd. (ft)	490.19	Wetted Per. (ft)		196.05	
Min Ch El (ft)	1321.82	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.44	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.09	495.87	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	66.07	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1330.43	Element			
Vel Head (ft)	0.16	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.59	Reach Len. (ft)	490.19	490.19	490.19
Crit W.S. (ft)	1325.51	Flow Area (sq ft)		1304.17	
E.G. Slope (ft/ft)	0.000230	Area (sq ft)		1304.17	
Q Total (cfs)	4180.00	Flow (cfs)		4180.00	
Top Width (ft)	191.92	Top Width (ft)		191.92	
Vel Total (ft/s)	3.21	Avg. Vel. (ft/s)		3.21	
Max Chl Dpth (ft)	8.61	Hydr. Depth (ft)		6.80	
Conv. Total (cfs)	275877.2	Conv. (cfs)		275877.2	
Length Wtd. (ft)	490.19	Wetted Per. (ft)		194.24	
Min Ch El (ft)	1321.82	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.31	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	1.58	533.60	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	67.26	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.33	Element			
Vel Head (ft)	0.15	Wt. n-Val.		0.025	
E.G. Elev (ft)	1332.48	Reach Len. (ft)	490.19	490.19	490.19

Crit W.S. (ft)	1325.97	Flow Area (sq ft)		1679.84		
E.G. Slope (ft/ft)	0.000168	Area (sq ft)		1679.84		
Q Total (cfs)	5220.00	Flow (cfs)		5220.00		
Top Width (ft)	204.15	Top Width (ft)		204.15		
Vel Total (ft/s)	3.11	Avg. Vel. (ft/s)		3.11		
Max Chl Dpth (ft)	10.51	Hydr. Depth (ft)		8.23		
Conv. Total (cfs)	403128.1	Conv. (cfs)		403128.1		
Length Wtd. (ft)	490.19	Wetted Per. (ft)		207.06		
Min Ch El (ft)	1321.82	Shear (lb/sq ft)		0.08		
Alpha	1.00	Stream Power (lb/ft s)		0.26		
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	249.08	685.74	34.89	
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	70.19	16.37	

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 21

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3698.03	1336.89	3715.68	1336.85	3742.01	1336.7	3791.2	1336.42	3850.82	1336.24
3909.83	1336.09	3959.25	1336.07	4036.63	1335.8	4104.07	1335.55	4176.48	1335.51
4222.42	1335.42	4265.78	1335.29	4342.39	1335.1	4413.25	1334.98	4447.03	1334.96
4464.83	1334.99	4476.98	1335.67	4502.4	1335.9	4526.34	1335.88	4541.6	1334.73
4559.56	1334.68	4588.99	1334.89	4622.94	1334.5	4686.76	1334.71	4691.41	1334.65
4714.06	1336.34	4723.04	1334.8	4737.92	1334.8	4748.26	1335	4758.6	1329.99
4762.21	1330.42	4787.42	1330.57	4832.02	1330.9	4846	1330.74	4862.23	1330.73
4870.77	1330.2	4878.03	1332.07	4881.87	1332.9	4891.01	1332.85	4896.78	1332.65
4926.36	1324.45	4933.45	1322.31	4966.56	1322.3	4981.91	1322.39	5003.69	1321.41
5029.41	1322.09	5036.63	1322.17	5052.11	1321.9	5071.07	1321.93	5082.27	1325.41
5104.11	1332.52	5116.68	1331.97	5127.44	1330	5131.06	1330.66	5153.79	1334.04
5162.21	1333.96	5166.88	1334.06						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3698.03	.04	4896.78	.025	5104.11	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4896.78	5104.11	760	561.05	530	.1	.3

Left Levee Station= 4896.78 Elevation= 1332.65
Right Levee Station= 5104.11 Elevation= 1332.52

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1330.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.77	Reach Len. (ft)	760.00	561.05	530.00
Crit W.S. (ft)	1325.35	Flow Area (sq ft)		1411.50	
E.G. Slope (ft/ft)	0.000246	Area (sq ft)		1411.50	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	193.91	Top Width (ft)		193.91	
Vel Total (ft/s)	3.47	Avg. Vel. (ft/s)		3.47	
Max Chl Dpth (ft)	9.17	Hydr. Depth (ft)		7.28	
Conv. Total (cfs)	312393.7	Conv. (cfs)		312393.7	
Length Wtd. (ft)	561.05	Wetted Per. (ft)		196.44	
Min Ch El (ft)	1321.41	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.38	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.09	480.30	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	63.89	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1330.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.48	Reach Len. (ft)	760.00	561.05	530.00
Crit W.S. (ft)	1325.03	Flow Area (sq ft)		1364.40	
E.G. Slope (ft/ft)	0.000198	Area (sq ft)		1364.40	

Q Total (cfs)	4180.00	Flow (cfs)		4180.00	
Top Width (ft)	192.28	Top Width (ft)		192.28	
Vel Total (ft/s)	3.06	Avg. Vel. (ft/s)		3.06	
Max Chl Dpth (ft)	8.93	Hydr. Depth (ft)		7.10	
Conv. Total (cfs)	296932.3	Conv. (cfs)		296932.3	
Length Wtd. (ft)	561.05	Wetted Per. (ft)		194.74	
Min Ch El (ft)	1321.41	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.27	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	1.58	518.59	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	65.10	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.26	Element			
Vel Head (ft)	0.14	Wt. n-Val.		0.025	
E.G. Elev (ft)	1332.40	Reach Len. (ft)	760.00	561.05	530.00
Crit W.S. (ft)	1325.50	Flow Area (sq ft)		1746.37	
E.G. Slope (ft/ft)	0.000148	Area (sq ft)		1746.37	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	205.12	Top Width (ft)		205.12	
Vel Total (ft/s)	2.99	Avg. Vel. (ft/s)		2.99	
Max Chl Dpth (ft)	10.85	Hydr. Depth (ft)		8.51	
Conv. Total (cfs)	428588.0	Conv. (cfs)		428588.0	
Length Wtd. (ft)	561.05	Wetted Per. (ft)		208.14	
Min Ch El (ft)	1321.41	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.23	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	249.08	666.46	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	67.89	16.37

CROSS SECTION *RIVER: EMF*
REACH: Reach 5 RS: 20.894

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3655.19	1337.1	3672.67	1336.98	3698.4	1336.78	3778.23	1336.24	3816.12	1336.03
3880.82	1335.8	3983.41	1335.26	4085.99	1334.81	4117.05	1334.61	4188.59	1333.97
4233.44	1333.8	4291.21	1333.48	4316.95	1333.37	4393.76	1332.9	4429.32	1332.9
4483.87	1332.9	4516.29	1332.83	4598.94	1332.63	4638.39	1332.59	4685.23	1332.67
4700.35	1332.8	4711.7	1333.03	4712.82	1333.36	4724.69	1333.14	4740.78	1330.2
4755.37	1329.8	4757.32	1330.73	4794.43	1330.77	4806.49	1330.86	4822.65	1330.71
4866.37	1330.1	4875.62	1332.91	4892.71	1332.57	4902.26	1329.76	4931.31	1322.09
4953.35	1322.2	4976.82	1321.73	5003.68	1321.6	5020.66	1321.69	5033.49	1322.08
5062.78	1322	5099.2	1332.26	5112.87	1331.89	5123.42	1329.76	5149.05	1334.21
5164.71	1334.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3655.19	.04	4892.71	.025	5099.2	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4892.71	5099.2	500	500	500	.1	.3

Left Levee Station= 4892.71 Elevation= 1332.57
Right Levee Station= 5099.2 Elevation= 1332.26

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1330.43	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.62	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1325.30	Flow Area (sq ft)		1378.60	
E.G. Slope (ft/ft)	0.000264	Area (sq ft)		1378.60	
Q Total (cfs)	4900.00	Flow (cfs)		4900.00	
Top Width (ft)	192.71	Top Width (ft)		192.71	
Vel Total (ft/s)	3.55	Avg. Vel. (ft/s)		3.55	
Max Chl Dpth (ft)	8.83	Hydr. Depth (ft)		7.15	

Conv. Total (cfs)	301858.4	Conv. (cfs)		301858.4
Length Wtd. (ft)	500.00	Wetted Per. (ft)		194.97
Min Ch El (ft)	1321.60	Shear (lb/sq ft)		0.12
Alpha	1.00	Stream Power (lb/ft s)		0.41
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.09	462.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	61.40

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1330.22	Element			
Vel Head (ft)	0.15	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.37	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1324.97	Flow Area (sq ft)		1337.92	
E.G. Slope (ft/ft)	0.000210	Area (sq ft)		1337.92	
Q Total (cfs)	4180.00	Flow (cfs)		4180.00	
Top Width (ft)	191.23	Top Width (ft)		191.23	
Vel Total (ft/s)	3.12	Avg. Vel. (ft/s)		3.12	
Max Chl Dpth (ft)	8.62	Hydr. Depth (ft)		7.00	
Conv. Total (cfs)	288672.9	Conv. (cfs)		288672.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		193.44	
Min Ch El (ft)	1321.60	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.28	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	1.58	501.18	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	62.63	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1332.17	Element			
Vel Head (ft)	0.14	Wt. n-Val.		0.025	
E.G. Elev (ft)	1332.31	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1325.44	Flow Area (sq ft)		1724.95	
E.G. Slope (ft/ft)	0.000154	Area (sq ft)		1724.95	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	204.81	Top Width (ft)		204.81	
Vel Total (ft/s)	3.03	Avg. Vel. (ft/s)		3.03	
Max Chl Dpth (ft)	10.57	Hydr. Depth (ft)		8.42	
Conv. Total (cfs)	420632.1	Conv. (cfs)		420632.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		207.57	
Min Ch El (ft)	1321.60	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.24	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	249.08	644.11	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	65.25	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.799

INPUT
Description: Downstream of Side Inlet (50' Wide)
Q(D)=5,100 cfs, Q(F)=4,180
cfs & Q(E)=5,220 cfs
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3724.67	1336.38	3790.19	1335.6	3849.62	1335.3	3892.77	1335.12	4015.57	1334.5
4051.5	1334.53	4129.64	1334.32	4154.02	1335.04	4192.9	1334.82	4200.62	1334.7
4225.71	1334.54	4286.78	1334.49	4303.67	1334.43	4459.02	1334.6	4532.85	1334.7
4659.06	1333.96	4691.63	1333.94	4704.54	1334.19	4712.41	1334.71	4721.89	1334
4740.81	1331.19	4745.44	1330.44	4754.47	1330.03	4757.88	1330.34	4820.48	1330.1
4867.84	1329.99	4877.64	1333.03	4892.11	1333.12	4920.44	1324.25	4927.58	1322.1
4935.85	1321.93	4956.82	1321.43	4991.16	1321.86	5002.57	1321.95	5010.12	1321.8
5039.65	1321.55	5045.44	1321.71	5063.22	1321.87	5090.69	1329.85	5099.81	1332.6
5102.91	1332.59	5108.75	1332.08	5112.16	1332.39	5125.13	1329.86	5130.76	1329.8
5135.07	1330.42	5151.26	1333.64	5165.22	1333.71				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3724.67	.04	4892.11	.025	5099.81	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4892.11	5099.81	500	500	500	.1	.3

Left Levee Station= 4892.11 Elevation= 1333.12
Right Levee Station= 5099.81 Elevation= 1332.6

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1330.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.49	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1325.17	Flow Area (sq ft)		1389.67	
E.G. Slope (ft/ft)	0.000275	Area (sq ft)		1389.67	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	190.93	Top Width (ft)		190.93	
Vel Total (ft/s)	3.67	Avg. Vel. (ft/s)		3.67	
Max Chl Dpth (ft)	8.85	Hydr. Depth (ft)		7.28	
Conv. Total (cfs)	307584.5	Conv. (cfs)		307584.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		193.38	
Min Ch El (ft)	1321.43	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.45	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.09	446.44	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	59.20	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1330.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.26	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1324.77	Flow Area (sq ft)		1358.94	
E.G. Slope (ft/ft)	0.000197	Area (sq ft)		1358.94	
Q Total (cfs)	4180.00	Flow (cfs)		4180.00	
Top Width (ft)	189.88	Top Width (ft)		189.88	
Vel Total (ft/s)	3.08	Avg. Vel. (ft/s)		3.08	
Max Chl Dpth (ft)	8.69	Hydr. Depth (ft)		7.16	
Conv. Total (cfs)	297461.5	Conv. (cfs)		297461.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		192.28	
Min Ch El (ft)	1321.43	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.27	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	1.58	485.71	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	60.45	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1332.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.025	
E.G. Elev (ft)	1332.24	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1325.24	Flow Area (sq ft)		1747.81	
E.G. Slope (ft/ft)	0.000146	Area (sq ft)		1747.81	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	202.77	Top Width (ft)		202.77	
Vel Total (ft/s)	2.99	Avg. Vel. (ft/s)		2.99	
Max Chl Dpth (ft)	10.67	Hydr. Depth (ft)		8.62	
Conv. Total (cfs)	432466.1	Conv. (cfs)		432466.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		205.77	
Min Ch El (ft)	1321.43	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.23	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	249.08	624.18	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	62.91	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.704

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3776.25	1335.85	3804.72	1335.7	3810.8	1336.35	3819.55	1336.05	3822.73	1336.08
3830.81	1334.7	3874.11	1334.8	4002.2	1334.87	4061.58	1334.89	4185.7	1334.95
4201	1334.91	4259.62	1334.9	4418.28	1334.79	4495.52	1334.78	4652.95	1334.58
4660.94	1334.54	4703.06	1334	4713.91	1334.6	4720.91	1333.98	4729.11	1332.5
4743.62	1330.21	4753.18	1330.1	4758.19	1330.46	4815.77	1330.3	4866.46	1330.08
4879.51	1332.75	4892.07	1332.7	4928.42	1321.81	4960.57	1321.14	5012.05	1321.38
5030.2	1321.02	5035.18	1321.1	5062.99	1321.64	5081.55	1327.06	5099.53	1332.46
5104.98	1332.15	5112.56	1332.1	5124.93	1329.56	5135.12	1329.72	5142.69	1331.58
5151.09	1333.4	5164.94	1333.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3776.25	.04	4892.07	.025	5099.53	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4892.07	5099.53	500	500	500	.1	.3

Left Levee Station= 4892.07 Elevation= 1332.7
Right Levee Station= 5099.53 Elevation= 1332.46

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1330.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.35	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1324.79	Flow Area (sq ft)		1429.12	
E.G. Slope (ft/ft)	0.000251	Area (sq ft)		1429.12	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	191.29	Top Width (ft)		191.29	
Vel Total (ft/s)	3.57	Avg. Vel. (ft/s)		3.57	
Max Chl Dpth (ft)	9.14	Hydr. Depth (ft)		7.47	
Conv. Total (cfs)	321851.5	Conv. (cfs)		321851.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		193.76	
Min Ch El (ft)	1321.02	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.41	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.09	430.27	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	57.00	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1330.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.17	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1324.37	Flow Area (sq ft)		1405.29	
E.G. Slope (ft/ft)	0.000177	Area (sq ft)		1405.29	
Q Total (cfs)	4180.00	Flow (cfs)		4180.00	
Top Width (ft)	190.46	Top Width (ft)		190.46	
Vel Total (ft/s)	2.97	Avg. Vel. (ft/s)		2.97	
Max Chl Dpth (ft)	9.01	Hydr. Depth (ft)		7.38	
Conv. Total (cfs)	313894.2	Conv. (cfs)		313894.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		192.89	
Min Ch El (ft)	1321.02	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.24	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	1.58	469.84	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	58.26	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1332.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1332.16	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1324.84	Flow Area (sq ft)		1800.27	
E.G. Slope (ft/ft)	0.000133	Area (sq ft)		1800.27	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	203.82	Top Width (ft)		203.82	
Vel Total (ft/s)	2.90	Avg. Vel. (ft/s)		2.90	
Max Chl Dpth (ft)	11.01	Hydr. Depth (ft)		8.83	

Conv. Total (cfs)	452748.7	Conv. (cfs)			452748.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)			206.84	
Min Ch El (ft)	1321.02	Shear (lb/sq ft)			0.07	
Alpha	1.00	Stream Power (lb/ft s)			0.21	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		249.08	603.82	34.89
C & E Loss (ft)	0.00	Cum SA (acres)		127.06	60.58	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.61

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3700.97	1336	3918.15	1335.63	3929.49	1335.52	3941.42	1335.08	4341.46	1333.87
4342.4	1333.4	4374.41	1334.2	4496.86	1334.6	4521.44	1334.6	4640.59	1334.29
4672.48	1334.2	4699.84	1333.97	4706.29	1334.4	4719.23	1334.2	4741.19	1330.3
4754.05	1330.1	4757.26	1331.21	4780.63	1330.85	4814.01	1330.4	4832.68	1330.49
4864.78	1330.4	4879.22	1332.56	4892.76	1332.26	4928.34	1321.8	4939.79	1321.39
4993.04	1321.2	5006.28	1321.01	5045.35	1321.14	5056.79	1321.2	5063.7	1321.47
5077.55	1325.7	5099.18	1332.2	5106.22	1332.02	5111.42	1332.1	5122.5	1329.71
5130.71	1329.9	5150.26	1333.58	5163.61	1333.75				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3700.97	.04	4892.76	.025	5099.18	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4892.76	5099.18	490.01	490.01	490.01	.1	.3

Left Levee Station= 4892.76 Elevation= 1332.26
Right Levee Station= 5099.18 Elevation= 1332.2

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1330.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.23	Reach Len. (ft)	490.01	490.01	490.01
Crit W.S. (ft)	1324.69	Flow Area (sq ft)		1426.61	
E.G. Slope (ft/ft)	0.000253	Area (sq ft)		1426.61	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	191.60	Top Width (ft)		191.60	
Vel Total (ft/s)	3.57	Avg. Vel. (ft/s)		3.57	
Max Chl Dpth (ft)	9.02	Hydr. Depth (ft)		7.45	
Conv. Total (cfs)	320567.8	Conv. (cfs)		320567.8	
Length Wtd. (ft)	490.01	Wetted Per. (ft)		194.07	
Min Ch El (ft)	1321.01	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.09	413.88	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	54.80	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1329.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.08	Reach Len. (ft)	490.01	490.01	490.01
Crit W.S. (ft)	1324.27	Flow Area (sq ft)		1410.21	
E.G. Slope (ft/ft)	0.000176	Area (sq ft)		1410.21	
Q Total (cfs)	4180.00	Flow (cfs)		4180.00	
Top Width (ft)	191.03	Top Width (ft)		191.03	
Vel Total (ft/s)	2.96	Avg. Vel. (ft/s)		2.96	
Max Chl Dpth (ft)	8.93	Hydr. Depth (ft)		7.38	
Conv. Total (cfs)	315103.0	Conv. (cfs)		315103.0	
Length Wtd. (ft)	490.01	Wetted Per. (ft)		193.47	
Min Ch El (ft)	1321.01	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.24	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	1.58	453.68	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	56.07	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1332.10	Reach Len. (ft)	490.01	490.01	490.01
Crit W.S. (ft)	1324.74	Flow Area (sq ft)		1811.12	
E.G. Slope (ft/ft)	0.000131	Area (sq ft)		1811.12	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	204.66	Top Width (ft)		204.66	
Vel Total (ft/s)	2.88	Avg. Vel. (ft/s)		2.88	
Max Chl Dpth (ft)	10.96	Hydr. Depth (ft)		8.85	
Conv. Total (cfs)	456053.5	Conv. (cfs)		456053.5	
Length Wtd. (ft)	490.01	Wetted Per. (ft)		207.70	
Min Ch El (ft)	1321.01	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.21	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	249.08	583.09	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	58.23	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.517

INPUT
Description:
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3673.7	1336.16	3710.56	1335.82	3730.07	1335.52	3761.45	1335.33	3803.36	1335.3
3924.66	1334.94	3943.25	1334.74	4012.69	1334.16	4018.55	1335.06	4029.67	1335
4035.53	1334.13	4077.63	1334.2	4122.64	1334.37	4172.09	1334.29	4231.3	1334.2
4333.17	1334.4	4354.13	1334.45	4439.52	1334.46	4485.88	1334.45	4523.26	1334.3
4621.96	1334.26	4651.22	1334.14	4700.98	1333.67	4708	1334.31	4714.69	1333.8
4720.23	1333.74	4734.32	1331.13	4742.5	1329.7	4754.77	1329.85	4758.33	1330.7
4788.01	1330.35	4845.23	1330.17	4865.17	1330.19	4876.15	1332.39	4879.65	1332.4
4891.09	1331.99	4928.01	1321.19	4990.96	1321.1	5007.27	1321.2	5034.56	1320.9
5058.89	1321.08	5060.3	1321.16	5097.71	1332.06	5112.11	1331.79	5115.9	1331.2
5126.9	1329.14	5151.85	1333.07	5157.74	1333.64				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3673.7	.04	4891.09	.025	5097.71	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4891.09	5097.71	455	467.89	460	.1	.3

Left Levee Station= 4891.09 Elevation= 1331.99
Right Levee Station= 5097.71 Elevation= 1332.06

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1329.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1330.10	Reach Len. (ft)	455.00	467.89	460.00
Crit W.S. (ft)	1324.57	Flow Area (sq ft)		1426.10	
E.G. Slope (ft/ft)	0.000254	Area (sq ft)		1426.10	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	192.09	Top Width (ft)		192.09	
Vel Total (ft/s)	3.58	Avg. Vel. (ft/s)		3.58	
Max Chl Dpth (ft)	9.00	Hydr. Depth (ft)		7.42	
Conv. Total (cfs)	319807.6	Conv. (cfs)		319807.6	
Length Wtd. (ft)	467.89	Wetted Per. (ft)		194.59	
Min Ch El (ft)	1320.90	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.09	397.83	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	52.65	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1329.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.99	Reach Len. (ft)	455.00	467.89	460.00
Crit W.S. (ft)	1324.15	Flow Area (sq ft)		1417.25	
E.G. Slope (ft/ft)	0.000174	Area (sq ft)		1417.25	
Q Total (cfs)	4180.00	Flow (cfs)		4180.00	
Top Width (ft)	191.78	Top Width (ft)		191.78	
Vel Total (ft/s)	2.95	Avg. Vel. (ft/s)		2.95	
Max Chl Dpth (ft)	8.96	Hydr. Depth (ft)		7.39	
Conv. Total (cfs)	316862.1	Conv. (cfs)		316862.1	
Length Wtd. (ft)	467.89	Wetted Per. (ft)		194.26	
Min Ch El (ft)	1320.90	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.23	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	1.58	437.78	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	53.92	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1332.03	Reach Len. (ft)	455.00	467.89	460.00
Crit W.S. (ft)	1324.63	Flow Area (sq ft)		1824.54	
E.G. Slope (ft/ft)	0.000129	Area (sq ft)		1824.54	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	205.81	Top Width (ft)		205.81	
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)		2.86	
Max Chl Dpth (ft)	11.01	Hydr. Depth (ft)		8.87	
Conv. Total (cfs)	459944.8	Conv. (cfs)		459944.8	
Length Wtd. (ft)	467.89	Wetted Per. (ft)		208.89	
Min Ch El (ft)	1320.90	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.20	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	249.08	562.64	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	55.92	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.428

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3742.05	1335.8	3763.59	1335.74	3792.52	1335.56	3859.12	1334.98	3930.69	1334.82
3975.51	1334.6	4124.03	1333.7	4150.82	1333.98	4161.33	1334.09	4167.56	1334.66
4177.44	1334.7	4183.6	1333.82	4209.63	1333.79	4272.18	1333.93	4311.56	1333.97
4397.15	1334	4445.65	1334.01	4510.28	1333.93	4581.48	1333.89	4591.27	1333.91
4636.64	1333.8	4701.53	1333.69	4752.92	1333.42	4757.95	1334.02	4771.47	1333.53
4793.23	1329.8	4806.31	1329.92	4810.82	1330.83	4865.39	1330.36	4877.07	1331.84
4891.55	1332	4930.2	1321.09	4970.4	1321.04	5002.68	1321.08	5014.25	1321.06
5065.75	1321.2	5100.05	1332	5112.6	1331.39	5123.1	1329.86	5126.24	1329.3
5139.77	1329.7	5154.24	1330.02	5164.31	1330.43	5186.17	1331.09	5191.28	1331.89
5203.47	1333.2	5216.5	1333.31						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3742.05	.04	4891.55	.025	5100.05	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4891.55	5100.05	540	396.78	350	.1	.3

Left Levee Station= 4891.55 Elevation= 1332
Right Levee Station= 5100.05 Elevation= 1332

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1329.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.98	Reach Len. (ft)	540.00	396.78	350.00
Crit W.S. (ft)	1324.51	Flow Area (sq ft)		1429.90	

E.G. Slope (ft/ft)	0.000255	Area (sq ft)		1429.90
Q Total (cfs)	5100.00	Flow (cfs)		5100.00
Top Width (ft)	193.63	Top Width (ft)		193.63
Vel Total (ft/s)	3.57	Avg. Vel. (ft/s)		3.57
Max Chl Dpth (ft)	8.75	Hydr. Depth (ft)		7.38
Conv. Total (cfs)	319527.0	Conv. (cfs)		319527.0
Length Wtd. (ft)	396.78	Wetted Per. (ft)		196.15
Min Ch El (ft)	1321.04	Shear (lb/sq ft)		0.12
Alpha	1.00	Stream Power (lb/ft s)		0.41
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.09	382.49
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	50.58

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1329.78	Element			
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.91	Reach Len. (ft)	540.00	396.78	350.00
Crit W.S. (ft)	1324.10	Flow Area (sq ft)		1428.48	
E.G. Slope (ft/ft)	0.000172	Area (sq ft)		1428.48	
Q Total (cfs)	4180.00	Flow (cfs)		4180.00	
Top Width (ft)	193.58	Top Width (ft)		193.58	
Vel Total (ft/s)	2.93	Avg. Vel. (ft/s)		2.93	
Max Chl Dpth (ft)	8.74	Hydr. Depth (ft)		7.38	
Conv. Total (cfs)	319054.7	Conv. (cfs)		319054.7	
Length Wtd. (ft)	396.78	Wetted Per. (ft)		196.10	
Min Ch El (ft)	1321.04	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.23	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	1.58	422.50	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	51.85	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.85	Element			
Vel Head (ft)	0.12	Wt. n-Val.		0.025	
E.G. Elev (ft)	1331.97	Reach Len. (ft)	540.00	396.78	350.00
Crit W.S. (ft)	1324.56	Flow Area (sq ft)		1843.72	
E.G. Slope (ft/ft)	0.000126	Area (sq ft)		1843.72	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	207.49	Top Width (ft)		207.49	
Vel Total (ft/s)	2.83	Avg. Vel. (ft/s)		2.83	
Max Chl Dpth (ft)	10.81	Hydr. Depth (ft)		8.89	
Conv. Total (cfs)	465465.6	Conv. (cfs)		465465.6	
Length Wtd. (ft)	396.58	Wetted Per. (ft)		210.61	
Min Ch El (ft)	1321.04	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.19	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	249.08	542.94	34.89
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	53.71	16.37

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.353

INPUT
Description: Downstream of Side Inlet (204' Wide) from Left Overbank
Q(D)=5,100 cfs, Q(F)=4,100 cfs & Q(E)=5,220 cfs
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3706.75	1335.9	3732.55	1335.8	3755.4	1335.93	3759.18	1335.87	3823.68	1335.42
3916.09	1334.8	3942.76	1334.7	4058.44	1334.35	4111.01	1333.99	4195.55	1333.34
4230.15	1333.5	4249.1	1333.53	4253.69	1334.08	4264.35	1334.27	4271.59	1333.28
4303.86	1333.6	4429.96	1333.77	4511.81	1333.72	4537.64	1333.64	4613.82	1333.47
4673.11	1333.5	4730.31	1333.4	4764.47	1333.28	4769.14	1333.83	4781.35	1333.42
4798.9	1330.3	4820.52	1329.84	4851.1	1329.71	4864.1	1329.86	4879.09	1332.03
4892.7	1332.2	4912.83	1326.47	4932.33	1321.12	4972.59	1321.12	4999.49	1320.95
5038.39	1320.9	5063.39	1320.94	5100.36	1331.66	5112.35	1331.27	5123.23	1329.85
5168.31	1330.7	5191.16	1331.59	5202.34	1332.35	5224.02	1333.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3706.75	.04	4892.7	.025	5100.36	..04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4892.7	5100.36	130	102.92	100	.1	.3

Left Levee Station= 4892.7 Elevation= 1332.2
Right Levee Station= 5100.36 Elevation= 1331.66

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1329.67	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.88	Reach Len. (ft)	130.00	102.92	100.00
Crit W.S. (ft)	1324.49	Flow Area (sq ft)		1399.84	
E.G. Slope (ft/ft)	0.000270	Area (sq ft)		1399.84	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	191.92	Top Width (ft)		191.92	
Vel Total (ft/s)	3.64	Avg. Vel. (ft/s)		3.64	
Max Chl Dpth (ft)	8.77	Hydr. Depth (ft)		7.29	
Conv. Total (cfs)	310326.4	Conv. (cfs)		310326.4	
Length Wtd. (ft)	102.92	Wetted Per. (ft)		194.33	
Min Ch El (ft)	1320.90	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.44	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.09	369.61	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	48.82	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1329.71	Element			
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.84	Reach Len. (ft)	130.00	102.92	100.00
Crit W.S. (ft)	1324.03	Flow Area (sq ft)		1407.36	
E.G. Slope (ft/ft)	0.000172	Area (sq ft)		1407.36	
Q Total (cfs)	4100.00	Flow (cfs)		4100.00	
Top Width (ft)	192.20	Top Width (ft)		192.20	
Vel Total (ft/s)	2.91	Avg. Vel. (ft/s)		2.91	
Max Chl Dpth (ft)	8.81	Hydr. Depth (ft)		7.32	
Conv. Total (cfs)	312807.3	Conv. (cfs)		312807.3	
Length Wtd. (ft)	102.92	Wetted Per. (ft)		194.62	
Min Ch El (ft)	1320.90	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.23	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	1.58	409.58	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	50.09	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.80	Element			
Vel Head (ft)	0.12	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1331.92	Reach Len. (ft)	130.00	102.92	100.00
Crit W.S. (ft)	1324.54	Flow Area (sq ft)		1823.84	101.51
E.G. Slope (ft/ft)	0.000127	Area (sq ft)		1823.84	101.51
Q Total (cfs)	5220.00	Flow (cfs)		5175.27	44.73
Top Width (ft)	300.14	Top Width (ft)		206.25	93.88
Vel Total (ft/s)	2.71	Avg. Vel. (ft/s)		2.84	0.44
Max Chl Dpth (ft)	10.90	Hydr. Depth (ft)		8.84	1.08
Conv. Total (cfs)	463097.6	Conv. (cfs)		459129.0	3968.6
Length Wtd. (ft)	102.91	Wetted Per. (ft)		209.24	94.01
Min Ch El (ft)	1320.90	Shear (lb/sq ft)		0.07	0.01
Alpha	1.09	Stream Power (lb/ft s)		0.20	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	249.08	526.24	34.48
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	51.82	15.99

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.334

INPUT
Description: No Ineffective Flow Area From Elliot Road Bridge
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3677.15	1335.8	3732.58	1335.54	3738.44	1335.58	3791.87	1335.46	3980.49	1334.74
4027.29	1334.4	4068.69	1334.36	4115.27	1333.99	4170.96	1333.77	4202.68	1333.57
4238.16	1333.1	4244.15	1332.94	4248.88	1333.99	4261.21	1334.28	4270.63	1333.32
4288.83	1333.3	4297.57	1333.37	4615.27	1333.27	4655.46	1333.29	4699.62	1333.45
4716.7	1333.9	4736.73	1334.12	4755.32	1332.22	4757.98	1331.83	4763.3	1333.52
4772.69	1333.7	4790.33	1333.36	4792.49	1333.39	4797.23	1331.73	4801.96	1330.38
4826.42	1330.1	4840.3	1329.75	4855.81	1329.92	4879.15	1330.01	4882.33	1330.56
4884.71	1332.5	4897	1332.37	4919.11	1325.73	4934.41	1321.31	4972.3	1320.98
5003.4	1320.9	5038.88	1320.59	5064.81	1321.16	5072.9	1323.4	5112.83	1334.15
5137.43	1333.7	5172.58	1333.74	5181	1333.69	5222.03	1333.6	5224.19	1333.68

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3677.15	.04	4897	.025	5112.83	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4897	5112.83	32.13	32.13	32.13	.1	.3

Left Levee Station= 4897 Elevation= 1332.37
Right Levee Station= 5112.83 Elevation= 1334.15

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1329.64	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.85	Reach Len. (ft)	32.13	32.13	32.13
Crit W.S. (ft)	1324.46	Flow Area (sq ft)		1386.20	
E.G. Slope (ft/ft)	0.000275	Area (sq ft)		1386.20	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	189.99	Top Width (ft)		189.99	
Vel Total (ft/s)	3.68	Avg. Vel. (ft/s)		3.68	
Max Chl Dpth (ft)	9.05	Hydr. Depth (ft)		7.30	
Conv. Total (cfs)	307425.8	Conv. (cfs)		307425.8	
Length Wtd. (ft)	32.13	Wetted Per. (ft)		192.32	
Min Ch El (ft)	1320.59	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.46	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.09	366.31	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	48.37	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1329.69	Element			
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.83	Reach Len. (ft)	32.13	32.13	32.13
Crit W.S. (ft)	1323.99	Flow Area (sq ft)		1395.99	
E.G. Slope (ft/ft)	0.000174	Area (sq ft)		1395.99	
Q Total (cfs)	4100.00	Flow (cfs)		4100.00	
Top Width (ft)	190.35	Top Width (ft)		190.35	
Vel Total (ft/s)	2.94	Avg. Vel. (ft/s)		2.94	
Max Chl Dpth (ft)	9.10	Hydr. Depth (ft)		7.33	
Conv. Total (cfs)	310649.2	Conv. (cfs)		310649.2	
Length Wtd. (ft)	32.13	Wetted Per. (ft)		192.70	
Min Ch El (ft)	1320.59	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.23	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.58	406.27	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	49.64	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.78	Element			
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1331.91	Reach Len. (ft)	32.13	32.13	32.13
Crit W.S. (ft)	1324.51	Flow Area (sq ft)		1809.05	

E.G. Slope (ft/ft)	0.000132	Area (sq ft)		1809.05	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	205.06	Top Width (ft)		205.06	
Vel Total (ft/s)	2.89	Avg. Vel. (ft/s)		2.89	
Max Chl Dpth (ft)	11.19	Hydr. Depth (ft)		8.82	
Conv. Total (cfs)	454737.2	Conv. (cfs)		454737.2	
Length Wtd. (ft)	32.13	Wetted Per. (ft)		208.00	
Min Ch El (ft)	1320.59	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.21	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	249.08	521.94	34.37
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	51.34	15.88

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.328

INPUT
Description: Elliot Road Bridge, Upstream Face
6-Span Bridge
Used Field

Survey Data for This Cross Section
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4860.15	1334.63	4898.32	1335.22	4906.1	1329.53	4929.19	1321.69	4933.58	1321.37
4968.87	1320.92	5004.41	1321.01	5040.17	1320.85	5067.14	1321.33	5075.41	1322.77
5102.72	1331.12	5110.7	1336.28	5155.04	1335.53				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4860.15	.04	4898.32	.025	5110.7	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4898.32	5110.7	58.98	58.98	58.98	.3	.5

Left Levee Station= 4898.32 Elevation= 1335.22
Right Levee Station= 5110.7 Elevation= 1336.28

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1329.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.84	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1324.44	Flow Area (sq ft)		1418.34	
E.G. Slope (ft/ft)	0.000259	Area (sq ft)		1418.34	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	191.92	Top Width (ft)		191.92	
Vel Total (ft/s)	3.60	Avg. Vel. (ft/s)		3.60	
Max Chl Dpth (ft)	8.79	Hydr. Depth (ft)		7.39	
Conv. Total (cfs)	317098.2	Conv. (cfs)		317098.2	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		194.42	
Min Ch El (ft)	1320.85	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.09	365.28	
C & E Loss (ft)	0.01	Cum SA (acres)	1.60	48.23	

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1329.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.82	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1323.99	Flow Area (sq ft)		1428.37	
E.G. Slope (ft/ft)	0.000164	Area (sq ft)		1428.37	
Q Total (cfs)	4100.00	Flow (cfs)		4100.00	
Top Width (ft)	192.16	Top Width (ft)		192.16	
Vel Total (ft/s)	2.87	Avg. Vel. (ft/s)		2.87	
Max Chl Dpth (ft)	8.84	Hydr. Depth (ft)		7.43	

Conv. Total (cfs)	320552.1	Conv. (cfs)		320552.1	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		194.69	
Min Ch El (ft)	1320.85	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.22	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	405.23	1.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	49.50	1.66

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.78	Element			
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1331.90	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1324.49	Flow Area (sq ft)		1839.61	
E.G. Slope (ft/ft)	0.000122	Area (sq ft)		1839.61	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	200.72	Top Width (ft)		200.72	
Vel Total (ft/s)	2.84	Avg. Vel. (ft/s)		2.84	
Max Chl Dpth (ft)	10.93	Hydr. Depth (ft)		9.17	
Conv. Total (cfs)	473197.6	Conv. (cfs)		473197.6	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		204.33	
Min Ch El (ft)	1320.85	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.19	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	249.08	520.60	34.37
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	51.19	15.88

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

BRIDGE RIVER: EMF
REACH: Reach 5 RS: 20.323

INPUT
Description: Elliot Road 6-Span Bridge
Used Filed Survey Data for Cross Sections
Distance from Upstream XS = 0
Deck/Roadway Width = 58.98
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 22

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4855.8	1335.23	1334	4886.09	1335.64	1334.6	4903.63	1335.83	1329
4906	1335.85	1329	4906.01	1335.85	1333.8	4928.33	1336.05	1334.01
4938.3	1336.14	1334.08	4953.1	1336.27	1334.22	4963.73	1336.34	1334.32
4973.87	1336.41	1334.41	4999.34	1336.59	1334.57	5003.34	1336.62	1334.59
5009.36	1336.64	1334.61	5034.85	1336.7	1334.68	5044.91	1336.73	1334.7
5057.16	1336.76	1334.74	5070.34	1336.78	1334.78	5080.31	1336.78	1334.78
5102.67	1336.79	1334.79	5102.68	1336.79	1330	5119.25	1336.8	1330
5163.97	1336.67	1335						

Upstream Bridge Cross Section Data
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4860.15	1334.63	4898.32	1335.22	4906.1	1329.53	4929.19	1321.69	4933.58	1321.37
4968.87	1320.92	5004.41	1321.01	5040.17	1320.85	5067.14	1321.33	5075.41	1322.77
5102.72	1331.12	5110.7	1336.28	5155.04	1335.53				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4860.15	.04	4898.32	.025	5110.7	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
4898.32	5110.7	.3	.5

```
Left Levee       Station= 4898.32      Elevation= 1335.22
Right Levee      Station=  5110.7      Elevation= 1336.28

Downstream  Deck/Roadway Coordinates
    num=       23
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  4855.8 1335.23    1333 4886.09 1335.64    1333 4903.63 1335.83    1329
 4906.47 1335.86    1329 4906.48 1335.86 1333.58 4928.82 1336.05 1333.86
 4938.79 1336.14 1333.95  4953.1 1336.27 1334.06 4964.26 1336.35 1334.14
 4974.24 1336.42 1334.21 4999.72 1336.59 1334.32 5003.34 1336.62 1334.34
 5009.77 1336.64 1334.37 5035.27  1336.7 1334.52 5045.28 1336.73 1334.53
 5057.16 1336.76 1334.56 5070.83 1336.77  1334.6 5080.78 1336.78 1334.59
 5103.04 1336.79 1334.59 5103.05 1336.79    1329 5119.25  1336.8    1320
 5163.97 1336.67    1334    5168 1336.67    1334

Downstream Bridge Cross Section Data
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4857.63 1333.28 4898.49 1335.04 4906.54  1329.4 4933.95  1321.7 4969.22 1320.92
  5004.6 1320.83 5040.72  1320.9 5070.03 1321.21 5075.63 1322.48 5103.07 1331.04
 5111.14 1336.11  5167.5 1334.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4857.63     .04 4898.49    .025 5111.14     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4898.49 5111.14              .3       .5
Left Levee       Station= 4898.49      Elevation= 1335.04
Right Levee      Station= 5111.14      Elevation= 1336.11

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

Number of Piers =  5

Pier Data
Pier Station     Upstream= 4933.32    Downstream= 4933.81
Upstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
        3 1320.37       3 1333.48    9.97 1334.08
Downstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
        3  1320.7       3 1333.32    9.97 1333.95

Pier Data
Pier Station     Upstream=  4968.8    Downstream= 4969.25
Upstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
        3 1319.92       3 1333.79   10.14 1334.45
Downstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
        3 1319.92       3 1333.65    9.98 1334.21

Pier Data
Pier Station     Upstream= 5004.35    Downstream= 5004.75
Upstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
        3 1320.01       3 1334.07   10.02 1334.61
Downstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
        3 1319.83       3 1333.81   10.05 1334.37

Pier Data
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```
Pier Station     Upstream= 5039.88    Downstream= 5040.28
Upstream     num=        3
    Width   Elev    Width   Elev    Width   Elev
       3 1319.85       3 1334.12   10.06 1334.71
Downstream     num=        3
    Width   Elev    Width   Elev    Width   Elev
       3  1319.9       3 1334.06   10.01 1334.53

Pier Data
Pier Station     Upstream= 5075.33    Downstream= 5075.81
Upstream     num=        3
    Width   Elev    Width   Elev    Width   Elev
       3 1321.77       3  1334.2    9.97 1334.78
Downstream     num=        3
    Width   Elev    Width   Elev    Width   Elev
       3 1321.48       3    1334    9.95  1334.6

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =     1.2
       Yarnell                 KVal =      .9
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 downstream end
       Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT    Profile #Design
Opening : Bridge #1

  E.G. US. (ft)                1329.84   Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                1329.64   E.G. Elev (ft)               1329.83       1329.79
  Q Total (cfs)                5100.00   W.S. Elev (ft)               1329.58       1329.54
  Q Bridge (cfs)               5100.00   Crit W.S. (ft)               1324.66       1324.67
  Q Weir (cfs)                           Max Chl Dpth (ft)               8.72          8.71
  Weir Sta Lft (ft)                      Vel Total (ft/s)                3.97          4.02
  Weir Sta Rgt (ft)                      Flow Area (sq ft)            1284.66       1269.47
  Weir Submerg                           Froude # Chl                    0.26          0.27
  Weir Max Depth (ft)                    Specif Force (cu ft)         5798.94       5716.35
  Min Top Rd (ft)              1335.29   Hydr Depth (ft)                 7.27          7.18
  Min El Prs (ft)              1334.79   W.P. Total (ft)               260.69        259.97
  Delta EG (ft)                   0.07   Conv. Total (cfs)           221117.6      217173.2
  Delta WS (ft)                   0.08   Top Width (ft)               176.65        176.79
  BR Open Area (sq ft)         2117.75   Frctn Loss (ft)                 0.03          0.00
  BR Open Vel (ft/s)              4.02   C & E Loss (ft)                 0.00          0.02
  Coef of Q                              Shear Total (lb/sq ft)          0.16          0.17
  Br Sel Mthd              Energy only   Power Total (lb/ft s)           0.65          0.68


BRIDGE OUTPUT    Profile #Future
Opening : Bridge #1

  E.G. US. (ft)                1329.82   Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                1329.69   E.G. Elev (ft)               1329.81       1329.79
  Q Total (cfs)                4100.00   W.S. Elev (ft)               1329.65       1329.63
  Q Bridge (cfs)               4100.00   Crit W.S. (ft)               1324.17       1324.19
  Q Weir (cfs)                           Max Chl Dpth (ft)               8.80          8.80
  Weir Sta Lft (ft)                      Vel Total (ft/s)                3.16          3.19
  Weir Sta Rgt (ft)                      Flow Area (sq ft)            1297.78       1285.33
  Weir Submerg                           Froude # Chl                    0.21          0.21
  Weir Max Depth (ft)                    Specif Force (cu ft)         5668.26       5600.66
```

Min Top Rd (ft)	1335.29	Hydr Depth (ft)	7.34	7.26
Min El Prs (ft)	1334.79	W.P. Total (ft)	261.72	261.40
Delta EG (ft)	0.04	Conv. Total (cfs)	224302.6	220905.2
Delta WS (ft)	0.05	Top Width (ft)	176.93	177.08
BR Open Area (sq ft)	2117.75	Frctn Loss (ft)	0.02	0.00
BR Open Vel (ft/s)	3.19	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.10	0.11
Br Sel Mthd	Energy only	Power Total (lb/ft s)	0.33	0.34

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	1331.90	E.G. Elev (ft)	1331.90	1331.88
W.S. US. (ft)	1331.78	W.S. Elev (ft)	1331.75	1331.73
Q Total (cfs)	5220.00	Crit W.S. (ft)	1324.70	1324.73
Q Bridge (cfs)	5220.00	Max Chl Dpth (ft)	10.89	10.89
Q Weir (cfs)		Vel Total (ft/s)	3.12	3.14
Weir Sta Lft (ft)		Flow Area (sq ft)	1674.18	1662.74
Weir Sta Rgt (ft)		Froude # Chl	0.18	0.18
Weir Submerg		Specif Force (cu ft)	8876.43	8791.10
Weir Max Depth (ft)		Hydr Depth (ft)	9.22	9.16
Min Top Rd (ft)	1335.29	W.P. Total (ft)	290.33	289.73
Min El Prs (ft)	1334.79	Conv. Total (cfs)	319985.3	316788.8
Delta EG (ft)	0.04	Top Width (ft)	181.67	181.57
Delta WS (ft)	0.04	Frctn Loss (ft)	0.02	0.00
BR Open Area (sq ft)	2117.75	C & E Loss (ft)	0.00	0.01
BR Open Vel (ft/s)	3.14	Shear Total (lb/sq ft)	0.10	0.10
Coef of Q		Power Total (lb/ft s)	0.30	0.31
Br Sel Mthd	Energy only			

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.316

INPUT
Description: Elliot Road Bridge, Downstream Face
6-Span Bridge
Used Field

Survey Data for This Cross Section
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4857.63	1333.28	4898.49	1335.04	4906.54	1329.4	4933.95	1321.7	4969.22	1320.92
5004.6	1320.83	5040.72	1320.9	5070.03	1321.21	5075.63	1322.48	5103.07	1331.04
5111.14	1336.11	5167.5	1334.97						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4857.63	.04	4898.49	.025	5111.14	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4898.49	5111.14	55.66	55.66	55.66	.3	.5

Left Levee Station= 4898.49 Elevation= 1335.04
Right Levee Station= 5111.14 Elevation= 1336.11

CROSS SECTION OUTPUT Profile #Design

		Element	Left OB	Channel	Right OB
W.S. Elev (ft)	1329.56				
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.77	Reach Len. (ft)	55.66	55.66	55.66
Crit W.S. (ft)	1324.45	Flow Area (sq ft)		1395.58	
E.G. Slope (ft/ft)	0.000273	Area (sq ft)		1395.58	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	192.03	Top Width (ft)		192.03	
Vel Total (ft/s)	3.65	Avg. Vel. (ft/s)		3.65	
Max Chl Dpth (ft)	8.73	Hydr. Depth (ft)		7.27	

Conv. Total (cfs)	308716.8	Conv. (cfs)		308716.8
Length Wtd. (ft)	55.66	Wetted Per. (ft)		194.37
Min Ch El (ft)	1320.83	Shear (lb/sq ft)		0.12
Alpha	1.00	Stream Power (lb/ft s)		0.45
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.09	363.55
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	47.99

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1329.64	Element			
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.78	Reach Len. (ft)	55.66	55.66	55.66
Crit W.S. (ft)	1324.01	Flow Area (sq ft)		1411.28	
E.G. Slope (ft/ft)	0.000170	Area (sq ft)		1411.28	
Q Total (cfs)	4100.00	Flow (cfs)		4100.00	
Top Width (ft)	192.40	Top Width (ft)		192.40	
Vel Total (ft/s)	2.91	Avg. Vel. (ft/s)		2.91	
Max Chl Dpth (ft)	8.81	Hydr. Depth (ft)		7.33	
Conv. Total (cfs)	314076.9	Conv. (cfs)		314076.9	
Length Wtd. (ft)	55.66	Wetted Per. (ft)		194.79	
Min Ch El (ft)	1320.83	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.22	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.58	403.48	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	49.26	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.74	Element			
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1331.87	Reach Len. (ft)	55.66	55.66	55.66
Crit W.S. (ft)	1324.51	Flow Area (sq ft)		1824.23	
E.G. Slope (ft/ft)	0.000125	Area (sq ft)		1824.23	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	200.98	Top Width (ft)		200.98	
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)		2.86	
Max Chl Dpth (ft)	10.91	Hydr. Depth (ft)		9.08	
Conv. Total (cfs)	466454.3	Conv. (cfs)		466454.3	
Length Wtd. (ft)	55.66	Wetted Per. (ft)		204.44	
Min Ch El (ft)	1320.83	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.20	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	249.08	518.34	34.37
C & E Loss (ft)	0.00	Cum SA (acres)	127.06	50.94	15.88

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.306

INPUT
Description: No Ineffective Flow Area From Elliot Road Bridge
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3726.31	1335.99	3814.36	1335.8	3833.2	1335.69	3852.91	1335.55	3885.9	1335.45
3905.59	1335.44	3929.97	1335.3	3990.94	1335.04	4018.54	1335.05	4050.29	1334.98
4089.34	1334.95	4217.74	1334.8	4242.24	1334.75	4262.21	1334.4	4282.87	1334.35
4303.59	1333.73	4310.27	1335.4	4319.12	1332.98	4368.99	1332.58	4456.92	1332.17
4482.51	1332.24	4550.41	1332.2	4595.38	1331.98	4641.92	1331.84	4665.43	1331.7
4745.24	1331.64	4766.63	1331.7	4833.03	1332.23	4849.61	1331.12	4862.23	1332.05
4893.05	1332.22	4935.2	1321.2	4996.45	1320.88	5007.5	1320.7	5046.71	1321.08
5064.73	1321.21	5069.71	1321.3	5084.84	1325.56	5109.69	1332.25	5121.39	1332.37
5127.25	1331.41	5166.09	1332.4	5205.81	1333.16	5216.11	1333.23	5221.23	1333.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3726.31	.04	4893.05	.025	5109.69	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4893.05	5109.69	310.56	310.56	310.56	.3	.5

Left Levee Station= 4893.05 Elevation= 1332.22
Right Levee Station= 5109.69 Elevation= 1332.25

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1329.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.75	Reach Len. (ft)	310.56	310.56	310.56
Crit W.S. (ft)	1324.45	Flow Area (sq ft)		1405.66	
E.G. Slope (ft/ft)	0.000274	Area (sq ft)		1405.66	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	196.39	Top Width (ft)		196.39	
Vel Total (ft/s)	3.63	Avg. Vel. (ft/s)		3.63	
Max Chl Dpth (ft)	8.85	Hydr. Depth (ft)		7.16	
Conv. Total (cfs)	308005.2	Conv. (cfs)		308005.2	
Length Wtd. (ft)	310.56	Wetted Per. (ft)		198.59	
Min Ch El (ft)	1320.70	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.44	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.09	361.76	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	47.74	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1329.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.76	Reach Len. (ft)	310.56	310.56	310.56
Crit W.S. (ft)	1323.99	Flow Area (sq ft)		1422.76	
E.G. Slope (ft/ft)	0.000171	Area (sq ft)		1422.76	
Q Total (cfs)	4100.00	Flow (cfs)		4100.00	
Top Width (ft)	197.05	Top Width (ft)		197.05	
Vel Total (ft/s)	2.88	Avg. Vel. (ft/s)		2.88	
Max Chl Dpth (ft)	8.94	Hydr. Depth (ft)		7.22	
Conv. Total (cfs)	313561.3	Conv. (cfs)		313561.3	
Length Wtd. (ft)	310.56	Wetted Per. (ft)		199.26	
Min Ch El (ft)	1320.70	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.22	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	1.58	401.67	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	49.01	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.025	
E.G. Elev (ft)	1331.86	Reach Len. (ft)	310.56	310.56	310.56
Crit W.S. (ft)	1324.50	Flow Area (sq ft)		1852.91	
E.G. Slope (ft/ft)	0.000128	Area (sq ft)		1852.91	
Q Total (cfs)	5220.00	Flow (cfs)		5220.00	
Top Width (ft)	212.87	Top Width (ft)		212.87	
Vel Total (ft/s)	2.82	Avg. Vel. (ft/s)		2.82	
Max Chl Dpth (ft)	11.03	Hydr. Depth (ft)		8.70	
Conv. Total (cfs)	462028.8	Conv. (cfs)		462028.8	
Length Wtd. (ft)	310.56	Wetted Per. (ft)		215.63	
Min Ch El (ft)	1320.70	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.19	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	249.08	515.99	34.37
C & E Loss (ft)	0.01	Cum SA (acres)	127.06	50.68	15.88

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.247

INPUT
Description: Begin of 8' High Levee on Left Overbank
from Sec. 20.247 to 19.863
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3651.24	1336.6	3664.99	1334.42	3687.11	1335.96	3704.66	1335.89	3736.48	1335.93

3769.47	1335.8	3792.05	1335.75	3825.73	1335.65	3851.08	1335.63	3873.54	1335.57
3900.53	1335.3	3945.97	1335.16	3962.45	1335.24	4004.19	1335.13	4036.42	1335.08
4055.21	1335	4091.83	1334.94	4110.13	1334.86	4145.39	1334.9	4163.36	1334.82
4197.03	1334.8	4225.89	1334.84	4253.38	1334.81	4279.17	1334.19	4295.06	1333.77
4327.96	1333.5	4331.76	1334.44	4335.99	1335.87	4343.64	1332.95	4359.34	1332.79
4363.38	1332.7	4404.17	1332.07	4435.42	1332.03	4464.89	1331.91	4496.41	1331.87
4528.19	1331.7	4588.34	1331.67	4651.55	1331.9	4654.13	1331.94	4685.21	1337.1
4700	1339.3	4704.14	1340.16	4707.28	1340.29	4749.79	1340.42	4772.22	1340.16
4806.44	1331.8	4812.71	1331.32	4860.14	1330.12	4865.43	1329.93	4878.45	1331.85
4892.28	1332.3	4932.68	1320.74	4945.99	1320.62	4961.56	1320.69	4990.5	1320.75
5015.64	1320.7	5029.3	1320.79	5058.24	1320.83	5066.55	1320.88	5080.04	1324.76
5102.7	1331.2	5115.53	1330.96	5119.53	1330.46	5125.23	1329.45	5142.35	1329.58
5172.67	1329.9	5193.26	1330.15	5208.73	1333.66	5219.27	1334		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3651.24	.04	4892.28	.025	5102.7	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4892.28	5102.7	1000	1000	1000	.1	.3

Left Levee Station= 4749.79 Elevation= 1340.42
Right Levee Station= 5102.7 Elevation= 1331.2

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1329.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.67	Reach Len. (ft)	1000.00	1000.00	1000.00
Crit W.S. (ft)	1324.19	Flow Area (sq ft)		1430.67	
E.G. Slope (ft/ft)	0.000256	Area (sq ft)		1430.67	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	194.44	Top Width (ft)		194.44	
Vel Total (ft/s)	3.56	Avg. Vel. (ft/s)		3.56	
Max Chl Dpth (ft)	8.85	Hydr. Depth (ft)		7.36	
Conv. Total (cfs)	319028.6	Conv. (cfs)		319028.6	
Length Wtd. (ft)	1000.00	Wetted Per. (ft)		196.87	
Min Ch El (ft)	1320.62	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.41	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.09	351.65	
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	46.35	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1329.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.71	Reach Len. (ft)	1000.00	1000.00	1000.00
Crit W.S. (ft)	1323.73	Flow Area (sq ft)		1453.53	
E.G. Slope (ft/ft)	0.000158	Area (sq ft)		1453.53	
Q Total (cfs)	4100.00	Flow (cfs)		4100.00	
Top Width (ft)	195.27	Top Width (ft)		195.27	
Vel Total (ft/s)	2.82	Avg. Vel. (ft/s)		2.82	
Max Chl Dpth (ft)	8.97	Hydr. Depth (ft)		7.44	
Conv. Total (cfs)	326623.4	Conv. (cfs)		326623.4	
Length Wtd. (ft)	1000.00	Wetted Per. (ft)		197.73	
Min Ch El (ft)	1320.62	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.20	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	1.58	391.41	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.83	47.61	1.66

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.82	Reach Len. (ft)	1000.00	1000.00	1000.00
Crit W.S. (ft)	1324.24	Flow Area (sq ft)	67.12	1881.86	158.77
E.G. Slope (ft/ft)	0.000113	Area (sq ft)	67.12	1881.86	158.77
Q Total (cfs)	5220.00	Flow (cfs)	25.79	5107.56	86.65

Top Width (ft)	375.48	Top Width (ft)	69.75	208.33	97.40
Vel Total (ft/s)	2.48	Avg. Vel. (ft/s)	0.38	2.71	0.55
Max Chl Dpth (ft)	11.08	Hydr. Depth (ft)	0.96	9.03	1.63
Conv. Total (cfs)	491135.1	Conv. (cfs)	2426.5	480556.2	8152.3
Length Wtd. (ft)	1000.00	Wetted Per. (ft)	69.91	211.32	97.70
Min Ch El (ft)	1320.62	Shear (lb/sq ft)	0.01	0.06	0.01
Alpha	1.18	Stream Power (lb/ft s)	0.00	0.17	0.01
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	248.84	502.68	33.80
C & E Loss (ft)	0.00	Cum SA (acres)	126.81	49.17	15.53

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 20.058

INPUT
Description: 8' High Levee on Left Overbank
from Sec. 20.247 to 19.863
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3595.29	1338.3	3611.33	1338.23	3669.23	1335.43	3731.73	1335.25	3759.43	1335.04
3828.42	1335	3859.43	1334.83	3970.62	1334.32	4003.39	1334.22	4126	1333.55
4159.45	1333.4	4203.79	1333.37	4226.59	1333.29	4254.41	1333.04	4270.51	1326.57
4278.44	1326.6	4285.63	1331.98	4297.81	1331.88	4352.15	1331.83	4357.44	1331.85
4363.39	1333.6	4385.02	1333.55	4394.05	1330.9	4424.08	1330.79	4448.49	1330.76
4458.52	1330.9	4494.16	1330.89	4523.95	1330.82	4571.81	1330.61	4590.17	1330.65
4616.32	1330.6	4629.15	1330.58	4638.85	1330.43	4698.66	1339.25	4736.66	1340.38
4743.77	1340.4	4760.19	1340.02	4790.58	1334.11	4810.82	1330.08	4829.77	1329.65
4838.68	1329.4	4865.71	1329.15	4880.45	1331.91	4893.19	1331.79	4932.96	1320.54
4938.54	1320.5	4959.47	1320.1	4967.22	1320.16	4996.41	1320.17	5031.95	1320.32
5046.46	1320.2	5057.81	1320.55	5069.36	1320.53	5101.95	1330.97	5114.32	1330.58
5122.89	1328.9	5137.96	1328.86	5192.39	1328.85	5201.9	1330.96	5209.49	1332.5
5220.96	1332.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3595.29	.04	4893.19	.025	5101.95	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4893.19	5101.95	1027.32	1027.32	1027.32	.1	.3

Left Levee Station= 4743.77 Elevation= 1340.4
Right Levee Station= 5101.95 Elevation= 1330.97

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1329.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1329.42	Reach Len. (ft)	1027.32	1027.32	1027.32
Crit W.S. (ft)	1323.71	Flow Area (sq ft)	0.41	1473.58	
E.G. Slope (ft/ft)	0.000232	Area (sq ft)	0.41	1473.58	
Q Total (cfs)	5100.00	Flow (cfs)	0.03	5099.97	
Top Width (ft)	203.95	Top Width (ft)	9.64	194.31	
Vel Total (ft/s)	3.46	Avg. Vel. (ft/s)	0.07	3.46	
Max Chl Dpth (ft)	9.14	Hydr. Depth (ft)	0.04	7.58	
Conv. Total (cfs)	335119.7	Conv. (cfs)	1.9	335117.8	
Length Wtd. (ft)	1027.32	Wetted Per. (ft)	9.65	196.89	
Min Ch El (ft)	1320.10	Shear (lb/sq ft)	0.00	0.11	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.37	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	0.09	318.31	
C & E Loss (ft)	0.00	Cum SA (acres)	1.49	41.88	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1329.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.040	0.025	

E.G. Elev (ft)	1329.56	Reach Len. (ft)	1027.32	1027.32	1027.32
Crit W.S. (ft)	1323.26	Flow Area (sq ft)	4.93	1514.98	
E.G. Slope (ft/ft)	0.000138	Area (sq ft)	4.93	1514.98	
Q Total (cfs)	4100.00	Flow (cfs)	0.64	4099.36	
Top Width (ft)	226.03	Top Width (ft)	30.30	195.73	
Vel Total (ft/s)	2.70	Avg. Vel. (ft/s)	0.13	2.71	
Max Chl Dpth (ft)	9.35	Hydr. Depth (ft)	0.16	7.74	
Conv. Total (cfs)	349267.3	Conv. (cfs)	54.6	349212.7	
Length Wtd. (ft)	1027.32	Wetted Per. (ft)	30.33	198.36	
Min Ch El (ft)	1320.10	Shear (lb/sq ft)	0.00	0.07	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.18	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	1.52	357.34	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.48	43.13	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.71	Reach Len. (ft)	1027.32	1027.32	1027.32
Crit W.S. (ft)	1323.76	Flow Area (sq ft)	136.74	1953.05	234.63
E.G. Slope (ft/ft)	0.000096	Area (sq ft)	136.74	1953.05	234.63
Q Total (cfs)	5220.00	Flow (cfs)	73.42	4999.60	146.98
Top Width (ft)	386.98	Top Width (ft)	75.70	208.12	103.15
Vel Total (ft/s)	2.25	Avg. Vel. (ft/s)	0.54	2.56	0.63
Max Chl Dpth (ft)	11.51	Hydr. Depth (ft)	1.81	9.38	2.27
Conv. Total (cfs)	533804.8	Conv. (cfs)	7508.2	511266.5	15030.1
Length Wtd. (ft)	1027.32	Wetted Per. (ft)	76.09	211.30	103.62
Min Ch El (ft)	1320.10	Shear (lb/sq ft)	0.01	0.06	0.01
Alpha	1.25	Stream Power (lb/ft s)	0.01	0.14	0.01
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	246.50	458.66	29.29
C & E Loss (ft)	0.00	Cum SA (acres)	125.14	44.39	13.23

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 19.863

INPUT
Description: End of 8' High Levee on Left Overbank
from Sec. 20.247 to 19.863
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3506.91	1337.9	3564.47	1337.95	3572.17	1337.8	3581.78	1335.52	3586.75	1335.3
3608.5	1335.1	3623.44	1335.01	3640.16	1334.76	3655.01	1334.67	3671.66	1334.49
3715.54	1334.3	3724.13	1334.12	3758.49	1334.05	3775.83	1333.97	3782.05	1334.08
3805.16	1333.9	3824.1	1333.63	3828.34	1333.52	3861.38	1333.4	3879.06	1333.31
3899.51	1333.3	3911.91	1333.4	3942.86	1333.15	3977.32	1333.12	3983.66	1333.15
4006.07	1332.9	4024.69	1332.86	4031.26	1332.75	4061.34	1332.62	4069.52	1332.69
4090.79	1332.7	4120.85	1332.57	4131.33	1332.58	4136.34	1332.72	4151.32	1332.7
4169.36	1332.8	4175.6	1332.65	4182.95	1333.12	4186.51	1332.95	4194.99	1333.63
4207.77	1333.8	4227.7	1333.68	4232.28	1331.63	4237.53	1329.04	4241.87	1326.57
4326.73	1326.6	4335.55	1331.96	4349.02	1332.34	4356.29	1332.33	4366.55	1330.56
4373.59	1330.5	4444.43	1330.53	4460.03	1330.57	4543.24	1330.71	4559.8	1330.62
4625.18	1330.6	4634.26	1330.77	4665.61	1335.41	4680.82	1337.75	4689.84	1337.96
4733.87	1338.5	4750.2	1338.59	4772.9	1334.38	4797.08	1329.95	4829.25	1329.16
4840.25	1329	4866.05	1329	4878.17	1331.6	4891.27	1331.53	4905.02	1327.46
4929.23	1320.2	4997.05	1319.74	5026.18	1319.85	5055.1	1320.07	5066.77	1320.01
5081.1	1324.4	5100.75	1330.57	5113.46	1330.21	5121.24	1329.33	5142.05	1328.91
5162.97	1333								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3506.91	.04	4891.27	.025	5100.75	.04

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

4891.27 5100.75 550 622.24 640 .1 .3

Left Levee Station= 4750.2 Elevation= 1338.59
Right Levee Station= 5100.75 Elevation= 1330.57

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1329.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1329.19	Reach Len. (ft)	550.00	622.24	640.00
Crit W.S. (ft)	1323.34	Flow Area (sq ft)	0.29	1508.98	
E.G. Slope (ft/ft)	0.000217	Area (sq ft)	0.29	1508.98	
Q Total (cfs)	5100.00	Flow (cfs)	0.01	5099.99	
Top Width (ft)	222.62	Top Width (ft)	26.62	196.01	
Vel Total (ft/s)	3.38	Avg. Vel. (ft/s)	0.03	3.38	
Max Chl Dpth (ft)	9.27	Hydr. Depth (ft)	0.01	7.70	
Conv. Total (cfs)	346563.3	Conv. (cfs)	0.5	346562.8	
Length Wtd. (ft)	622.24	Wetted Per. (ft)	26.62	198.66	
Min Ch El (ft)	1319.74	Shear (lb/sq ft)	0.00	0.10	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.35	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.08	283.14	
C & E Loss (ft)	0.00	Cum SA (acres)	1.06	37.28	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1329.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1329.42	Reach Len. (ft)	550.00	622.24	640.00
Crit W.S. (ft)	1322.89	Flow Area (sq ft)	11.58	1569.51	
E.G. Slope (ft/ft)	0.000124	Area (sq ft)	11.58	1569.51	
Q Total (cfs)	4100.00	Flow (cfs)	1.95	4098.05	
Top Width (ft)	242.75	Top Width (ft)	44.73	198.02	
Vel Total (ft/s)	2.59	Avg. Vel. (ft/s)	0.17	2.61	
Max Chl Dpth (ft)	9.58	Hydr. Depth (ft)	0.26	7.93	
Conv. Total (cfs)	367621.6	Conv. (cfs)	174.7	367446.9	
Length Wtd. (ft)	622.17	Wetted Per. (ft)	44.77	200.77	
Min Ch El (ft)	1319.74	Shear (lb/sq ft)	0.00	0.06	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.16	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	1.33	320.97	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	3.60	38.48	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.61	Reach Len. (ft)	550.00	622.24	640.00
Crit W.S. (ft)	1323.39	Flow Area (sq ft)	176.24	2019.11	95.12
E.G. Slope (ft/ft)	0.000089	Area (sq ft)	176.24	2019.11	95.12
Q Total (cfs)	5220.00	Flow (cfs)	96.90	5075.04	48.06
Top Width (ft)	353.31	Top Width (ft)	89.25	209.43	54.63
Vel Total (ft/s)	2.28	Avg. Vel. (ft/s)	0.55	2.51	0.51
Max Chl Dpth (ft)	11.78	Hydr. Depth (ft)	1.97	9.64	1.74
Conv. Total (cfs)	553418.6	Conv. (cfs)	10272.9	538050.6	5095.2
Length Wtd. (ft)	620.55	Wetted Per. (ft)	89.67	212.69	54.94
Min Ch El (ft)	1319.74	Shear (lb/sq ft)	0.01	0.05	0.01
Alpha	1.18	Stream Power (lb/ft s)	0.01	0.13	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	242.81	411.82	25.40
C & E Loss (ft)	0.00	Cum SA (acres)	123.20	39.47	11.37

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 19.745

INPUT
Description: Begin of Levee on Left Overbank
from Sec. 19.745 to 19.408
6'
High Levee at this Cross Section

Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3523.73	1337.8	3564.96	1337.81	3607.56	1336.82	3610.31	1336.91	3612.52	1336.38
3634.94	1335.8	3664.74	1334.31	3673.53	1334.09	3690.56	1334.18	3739.27	1334.04
3803.43	1333.7	3873.55	1333.64	3901.01	1333.63	3991.15	1332.96	4004.82	1332.9
4105.98	1333.5	4189.31	1332.81	4209.84	1332.85	4250.02	1332.96	4263.72	1332.45
4275.31	1332.3	4283.38	1326.57	4370.46	1326.57	4377.16	1329.68	4382.19	1332.41
4399.34	1332.8	4405.61	1330.69	4467.94	1330.71	4480.61	1330.68	4545.04	1330.36
4560.69	1330.3	4631.02	1329.96	4659.36	1330.01	4697.41	1337.34	4714.92	1337.11
4756.01	1329.5	4811.07	1328.72	4862.96	1328.96	4867.66	1329.85	4874.1	1331.51
4877.54	1331.1	4886.36	1331.29	4925.09	1319.79	4959.85	1319.83	4996.15	1319.81
5000.53	1319.7	5030.54	1319.61	5036.38	1319.67	5061.44	1320.21	5074.74	1324.26
5096.63	1330.5	5103.29	1329.78	5108.36	1330.15	5116.92	1328.89	5132.33	1328.47
5149.78	1332.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3523.73	.04	4886.36	.025	5096.63	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4886.36	5096.63	810.92	810.92	810.92	.1	.3

Left Levee Station= 4697.41 Elevation= 1337.34
Right Levee Station= 5096.63 Elevation= 1330.5

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1328.87	Element			
Vel Head (ft)	0.18	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1329.05	Reach Len. (ft)	810.92	810.92	810.92
Crit W.S. (ft)	1323.23	Flow Area (sq ft)	3.40	1502.72	
E.G. Slope (ft/ft)	0.000220	Area (sq ft)	3.40	1502.72	
Q Total (cfs)	5100.00	Flow (cfs)	0.34	5099.66	
Top Width (ft)	240.58	Top Width (ft)	44.15	196.43	
Vel Total (ft/s)	3.39	Avg. Vel. (ft/s)	0.10	3.39	
Max Chl Dpth (ft)	9.26	Hydr. Depth (ft)	0.08	7.65	
Conv. Total (cfs)	343799.2	Conv. (cfs)	22.8	343776.3	
Length Wtd. (ft)	810.92	Wetted Per. (ft)	44.15	199.00	
Min Ch El (ft)	1319.61	Shear (lb/sq ft)	0.00	0.10	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.35	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.06	261.63	
C & E Loss (ft)	0.00	Cum SA (acres)	0.61	34.48	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1329.24	Element			
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1329.35	Reach Len. (ft)	810.92	810.92	810.92
Crit W.S. (ft)	1322.76	Flow Area (sq ft)	30.70	1575.50	
E.G. Slope (ft/ft)	0.000123	Area (sq ft)	30.70	1575.50	
Q Total (cfs)	4100.00	Flow (cfs)	6.17	4093.83	
Top Width (ft)	289.19	Top Width (ft)	90.23	198.96	
Vel Total (ft/s)	2.55	Avg. Vel. (ft/s)	0.20	2.60	
Max Chl Dpth (ft)	9.63	Hydr. Depth (ft)	0.34	7.92	
Conv. Total (cfs)	369279.6	Conv. (cfs)	555.5	368724.1	
Length Wtd. (ft)	810.92	Wetted Per. (ft)	90.26	201.64	
Min Ch El (ft)	1319.61	Shear (lb/sq ft)	0.00	0.06	
Alpha	1.03	Stream Power (lb/ft s)	0.00	0.16	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	1.06	298.51	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	2.75	35.65	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.56	Reach Len. (ft)	810.92	810.92	810.92
Crit W.S. (ft)	1323.28	Flow Area (sq ft)	294.12	2033.28	94.54
E.G. Slope (ft/ft)	0.000085	Area (sq ft)	294.12	2033.28	94.54
Q Total (cfs)	5220.00	Flow (cfs)	171.66	4997.95	50.39
Top Width (ft)	398.75	Top Width (ft)	140.42	210.27	48.06
Vel Total (ft/s)	2.16	Avg. Vel. (ft/s)	0.58	2.46	0.53
Max Chl Dpth (ft)	11.86	Hydr. Depth (ft)	2.09	9.67	1.97
Conv. Total (cfs)	567239.1	Conv. (cfs)	18653.8	543109.8	5475.5
Length Wtd. (ft)	810.92	Wetted Per. (ft)	140.92	213.42	48.57
Min Ch El (ft)	1319.61	Shear (lb/sq ft)	0.01	0.05	0.01
Alpha	1.25	Stream Power (lb/ft s)	0.01	0.12	0.01
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	239.84	382.87	24.00
C & E Loss (ft)	0.00	Cum SA (acres)	121.75	36.47	10.62

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 19.592

INPUT
Description: Levee on Left Overbank
from Sec. 19.745 to 19.408
6' High Levee
at this Cross Section
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3556.77	1337.5	3568.24	1337.54	3585.77	1337.13	3591.35	1337.41	3623.78	1336.77
3627.82	1337.1	3638.95	1335.78	3645.27	1335.61	3652.38	1335.64	3720.31	1335.45
3745.18	1335.2	3775.16	1334.98	3801.17	1334.84	3823.52	1335.62	3832.19	1335.58
3865.28	1334.9	3876.18	1334.51	3889.89	1334.38	3904.13	1334.55	3909.59	1334.52
3951.21	1333.9	3993.07	1333.33	4043.61	1333.3	4073.02	1333.35	4097.94	1332.73
4105.59	1332.7	4134.79	1332.98	4155.77	1332.77	4183.76	1332.39	4250.28	1332.18
4268.61	1331.9	4330.6	1332.2	4331.29	1332.14	4363.72	1331.3	4380.58	1328.79
4388.01	1331.5	4394.52	1331.46	4400.4	1319.32	4411.76	1319.11	4423.22	1318.7
4434.39	1324	4438.16	1325.68	4441.9	1326.02	4444.11	1324.65	4445.58	1327.6
4449.55	1331.3	4477.7	1330.88	4504.29	1330.56	4538.43	1330.19	4611.62	1330.28
4645.81	1335.3	4662.59	1337.55	4678.89	1337.17	4713.78	1336.17	4719.15	1336.13
4727.16	1334.8	4757.27	1329.34	4807.15	1329.21	4817.73	1329.14	4862.98	1328.73
4871.16	1330.6	4886.1	1331.1	4927.08	1319.84	4955.56	1319.74	4983.23	1319.79
5001.49	1319.5	5019.72	1319.61	5062.55	1320.04	5096.1	1329.78	5108.42	1330.4
5117.06	1328.4	5129.1	1328.87	5147.35	1332.88	5158.85	1333.18		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3556.77	.04	4886.1	.025	5096.1	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4886.1	5096.1	269.16	269.16	269.16	.1	.3

Left Levee Station= 4662.59 Elevation= 1337.55
Right Levee Station= 5108.42 Elevation= 1330.4

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1328.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.025	
E.G. Elev (ft)	1328.87	Reach Len. (ft)	269.16	269.16	269.16
Crit W.S. (ft)	1323.18	Flow Area (sq ft)		1482.27	
E.G. Slope (ft/ft)	0.000232	Area (sq ft)		1482.27	
Q Total (cfs)	5100.00	Flow (cfs)		5100.00	
Top Width (ft)	197.44	Top Width (ft)		197.44	
Vel Total (ft/s)	3.44	Avg. Vel. (ft/s)		3.44	

Max Chl Dpth (ft)	9.99	Hydr. Depth (ft)		7.51
Conv. Total (cfs)	335044.9	Conv. (cfs)		335044.9
Length Wtd. (ft)	269.16	Wetted Per. (ft)		199.87
Min Ch El (ft)	1319.50	Shear (lb/sq ft)		0.11
Alpha	1.00	Stream Power (lb/ft s)		0.37
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.03	233.85
C & E Loss (ft)	0.00	Cum SA (acres)	0.20	30.81

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1329.14	Element			
Vel Head (ft)	0.11	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1329.25	Reach Len. (ft)	269.16	269.16	269.16
Crit W.S. (ft)	1322.72	Flow Area (sq ft)	9.66	1572.85	
E.G. Slope (ft/ft)	0.000126	Area (sq ft)	9.66	1572.85	
Q Total (cfs)	4100.00	Flow (cfs)	1.40	4098.60	
Top Width (ft)	247.77	Top Width (ft)	47.10	200.67	
Vel Total (ft/s)	2.59	Avg. Vel. (ft/s)	0.14	2.61	
Max Chl Dpth (ft)	10.44	Hydr. Depth (ft)	0.21	7.84	
Conv. Total (cfs)	365910.1	Conv. (cfs)	124.8	365785.4	
Length Wtd. (ft)	269.16	Wetted Per. (ft)	47.15	203.22	
Min Ch El (ft)	1319.50	Shear (lb/sq ft)	0.00	0.06	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.16	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.69	269.20	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	1.47	31.93	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.40	Element			
Vel Head (ft)	0.09	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.49	Reach Len. (ft)	269.16	269.16	269.16
Crit W.S. (ft)	1323.23	Flow Area (sq ft)	274.59	2038.79	81.09
E.G. Slope (ft/ft)	0.000085	Area (sq ft)	274.59	2038.79	81.09
Q Total (cfs)	5220.00	Flow (cfs)	146.79	5032.15	41.06
Top Width (ft)	394.66	Top Width (ft)	140.17	210.00	44.50
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)	0.53	2.47	0.51
Max Chl Dpth (ft)	12.70	Hydr. Depth (ft)	1.96	9.71	1.82
Conv. Total (cfs)	566843.2	Conv. (cfs)	15939.9	546444.4	4458.9
Length Wtd. (ft)	269.16	Wetted Per. (ft)	140.57	212.91	45.02
Min Ch El (ft)	1319.50	Shear (lb/sq ft)	0.01	0.05	0.01
Alpha	1.24	Stream Power (lb/ft s)	0.01	0.13	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	234.55	344.97	22.37
C & E Loss (ft)	0.00	Cum SA (acres)	119.14	32.56	9.76

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 19.541

INPUT
Description: Levee on Left Overbank
from Sec. 19.745 to 19.408
12' High Levee
at this Cross Section
Downstream of Side Inlet (60' Wide) from
left Overbank
Q(D)=5,300 cfs, Q(F)=4,100 cfs & Q(E)=5,220 cfs
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3605.13	1339.01	3621.2	1336.84	3624.68	1336.85	3627.13	1336.1	3634.96	1335.9
3652.26	1335.79	3666.96	1335.59	3683.78	1335.49	3700.63	1335.16	3722.1	1335
3734.79	1334.82	3759.3	1335.39	3771.8	1335.58	3811.46	1337.07	3816.67	1336.7
3824.1	1334.08	3829.28	1333.63	3851.9	1333.66	3865.3	1333.77	3890.89	1333.8
3900.12	1333.64	3918.41	1333.58	3962.02	1333.88	4008.72	1333.2	4034.86	1333.3
4062.6	1333.4	4068.46	1333.77	4074.15	1335.67	4078.52	1335.65	4108.08	1331.9
4124.05	1331.67	4124.88	1332.24	4136.36	1337.27	4147.8	1331.55	4153.76	1331.4

4173.63	1331.41	4216.14	1331.63	4225.1	1335.92	4230.18	1338.06	4238.62	1336.2
4241.32	1335.48	4249.72	1331.59	4275.57	1331.8	4286.68	1333.11	4293.85	1335.4
4302.38	1334.41	4308.64	1332.57	4315.19	1332.4	4333.73	1331.28	4349.45	1330.8
4390.36	1331.48	4426.85	1331.44	4437.36	1331.39	4480.57	1331.77	4522.39	1332.8
4564.72	1342.64	4593.92	1342.55	4611.4	1342.68	4664.72	1342.66	4700.53	1342
4708.36	1340.27	4755.54	1330.28	4787.44	1329.81	4813.79	1329.58	4845.87	1329.1
4864.92	1328.78	4886.77	1330.73	4893.38	1328.76	4925.31	1319.57	4962.45	1319.9
4997.77	1319.56	5037.6	1319.78	5061.61	1319.83	5096.14	1329.91	5100.35	1330.1
5107.73	1329.96	5117.6	1328.26	5128.37	1328.6	5147.4	1333.03	5158.38	1333.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3605.13	.04	4886.77	.025	5096.14	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4886.77	5096.14	270.65	270.65	270.65	.1	.3

Left Levee Station= 4611.4 Elevation= 1342.68
Right Levee Station= 5096.14 Elevation= 1329.91

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1328.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1328.80	Reach Len. (ft)	270.65	270.65	270.65
Crit W.S. (ft)	1323.21	Flow Area (sq ft)		1483.73	
E.G. Slope (ft/ft)	0.000250	Area (sq ft)		1483.73	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	197.75	Top Width (ft)		197.75	
Vel Total (ft/s)	3.57	Avg. Vel. (ft/s)		3.57	
Max Chl Dpth (ft)	9.04	Hydr. Depth (ft)		7.50	
Conv. Total (cfs)	335134.5	Conv. (cfs)		335134.5	
Length Wtd. (ft)	270.65	Wetted Per. (ft)		200.28	
Min Ch El (ft)	1319.56	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.41	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.03	224.69	
C & E Loss (ft)	0.00	Cum SA (acres)	0.20	29.59	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1329.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1329.21	Reach Len. (ft)	270.65	270.65	270.65
Crit W.S. (ft)	1322.68	Flow Area (sq ft)	3.80	1584.05	
E.G. Slope (ft/ft)	0.000123	Area (sq ft)	3.80	1584.05	
Q Total (cfs)	4100.00	Flow (cfs)	0.47	4099.53	
Top Width (ft)	224.42	Top Width (ft)	23.24	201.18	
Vel Total (ft/s)	2.58	Avg. Vel. (ft/s)	0.12	2.59	
Max Chl Dpth (ft)	9.55	Hydr. Depth (ft)	0.16	7.87	
Conv. Total (cfs)	369407.1	Conv. (cfs)	42.2	369364.9	
Length Wtd. (ft)	270.65	Wetted Per. (ft)	23.26	203.86	
Min Ch El (ft)	1319.56	Shear (lb/sq ft)	0.00	0.06	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.15	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.64	259.45	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	1.25	30.69	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.46	Reach Len. (ft)	270.65	270.65	270.65
Crit W.S. (ft)	1323.18	Flow Area (sq ft)	236.29	2052.76	86.21
E.G. Slope (ft/ft)	0.000084	Area (sq ft)	236.29	2052.76	86.21
Q Total (cfs)	5220.00	Flow (cfs)	115.59	5059.01	45.40
Top Width (ft)	389.90	Top Width (ft)	136.39	209.37	44.14
Vel Total (ft/s)	2.20	Avg. Vel. (ft/s)	0.49	2.46	0.53

Max Chl Dpth (ft)	11.81	Hydr. Depth (ft)	1.73	9.80	1.95
Conv. Total (cfs)	571203.4	Conv. (cfs)	12648.7	553586.4	4968.3
Length Wtd. (ft)	270.65	Wetted Per. (ft)	136.60	212.40	44.62
Min Ch El (ft)	1319.56	Shear (lb/sq ft)	0.01	0.05	0.01
Alpha	1.22	Stream Power (lb/ft s)	0.00	0.12	0.01
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	232.97	332.33	21.85
C & E Loss (ft)	0.00	Cum SA (acres)	118.28	31.26	9.48

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 19.489

INPUT
Description: Levee on Left Overbank
from Sec. 19.745 to 19.408
12' High Levee
at this Cross Section
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3610.54	1339.92	3616.4	1334.6	3617.35	1333.91	3648.43	1334.51	3675.24	1334.45
3836.1	1334.45	3843.9	1336.6	3845.19	1335.96	3853.56	1333.05	3863.73	1333.47
3868.15	1333.55	3874.1	1336.3	3881.13	1339.93	3909.41	1335.46	3910.41	1335.45
3945.24	1339.76	3974.99	1338.4	3993.71	1335.48	4025.09	1334.24	4042.52	1334.19
4070.54	1335.69	4081.57	1336.7	4087.6	1336.03	4097.48	1335.32	4114.51	1333.79
4125.6	1333.75	4157.47	1332.9	4162.25	1333.03	4165.86	1332.83	4174.73	1331.9
4214.87	1331.74	4242.69	1331.4	4291.82	1331.42	4320.08	1331.36	4337.72	1331.93
4346.93	1332.46	4356.73	1332.8	4362.31	1332.71	4376.61	1332.88	4400.81	1332.72
4422.11	1332.48	4445.31	1332.3	4454.69	1333.74	4463.14	1336.17	4466.4	1335.15
4475.06	1335.04	4488.04	1335.2	4500.03	1334.46	4514.86	1334.99	4535.48	1332.49
4537.61	1332.13	4545.42	1332.2	4558.55	1333.57	4562.99	1333.6	4569.35	1334.49
4589.56	1337.69	4614.79	1342.1	4619.25	1342.92	4633.65	1342.63	4645.28	1342.29
4684.21	1342.18	4699.25	1342	4721.74	1337.15	4755.98	1329.61	4777.35	1329.46
4861.93	1329.08	4886.24	1330.6	4894.94	1328.19	4925.14	1319.82	4948.07	1319.76
4984.16	1319.6	4996.3	1319.7	5023.37	1319.69	5042.79	1319.77	5062.63	1319.99
5096.59	1330.05	5108.28	1330	5116.35	1328.44	5130.13	1328.97	5147.85	1333.46
5157.4	1333.54								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3610.54	.04	4886.24	.025	5096.59	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4886.24	5096.59	164.38	164.38	164.38	.1	.3

Left Levee Station= 4619.25 Elevation= 1342.92
Right Levee Station= 5096.59 Elevation= 1330.05

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1328.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1328.73	Reach Len. (ft)	164.38	164.38	164.38
Crit W.S. (ft)	1323.22	Flow Area (sq ft)		1469.64	
E.G. Slope (ft/ft)	0.000258	Area (sq ft)		1469.64	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	197.76	Top Width (ft)		197.76	
Vel Total (ft/s)	3.61	Avg. Vel. (ft/s)		3.61	
Max Chl Dpth (ft)	8.93	Hydr. Depth (ft)		7.43	
Conv. Total (cfs)	329952.7	Conv. (cfs)		329952.7	
Length Wtd. (ft)	164.38	Wetted Per. (ft)		200.19	
Min Ch El (ft)	1319.60	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.43	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.03	215.51	
C & E Loss (ft)	0.00	Cum SA (acres)	0.20	28.36	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1329.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.025	

E.G. Elev (ft)	1329.18	Reach Len. (ft)	164.38	164.38	164.38
Crit W.S. (ft)	1322.69	Flow Area (sq ft)		1577.70	
E.G. Slope (ft/ft)	0.000125	Area (sq ft)		1577.70	
Q Total (cfs)	4100.00	Flow (cfs)		4100.00	
Top Width (ft)	201.54	Top Width (ft)		201.54	
Vel Total (ft/s)	2.60	Avg. Vel. (ft/s)		2.60	
Max Chl Dpth (ft)	9.47	Hydr. Depth (ft)		7.83	
Conv. Total (cfs)	366585.8	Conv. (cfs)		366585.8	
Length Wtd. (ft)	164.38	Wetted Per. (ft)		204.12	
Min Ch El (ft)	1319.60	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.63	249.63	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	1.18	29.43	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.35	Element			
Vel Head (ft)	0.09	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.44	Reach Len. (ft)	164.38	164.38	164.38
Crit W.S. (ft)	1323.19	Flow Area (sq ft)	258.37	2050.90	80.32
E.G. Slope (ft/ft)	0.000084	Area (sq ft)	258.37	2050.90	80.32
Q Total (cfs)	5220.00	Flow (cfs)	133.19	5045.63	41.18
Top Width (ft)	391.45	Top Width (ft)	138.16	210.35	42.94
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)	0.52	2.46	0.51
Max Chl Dpth (ft)	11.75	Hydr. Depth (ft)	1.87	9.75	1.87
Conv. Total (cfs)	570280.5	Conv. (cfs)	14551.1	551230.8	4498.6
Length Wtd. (ft)	164.38	Wetted Per. (ft)	138.40	213.28	43.39
Min Ch El (ft)	1319.60	Shear (lb/sq ft)	0.01	0.05	0.01
Alpha	1.23	Stream Power (lb/ft s)	0.01	0.12	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	231.43	319.58	21.34
C & E Loss (ft)	0.00	Cum SA (acres)	117.43	29.96	9.21

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 19.458

INPUT
Description: Levee on Left Overbank
from Sec. 19.745 to 19.408
8' High Levee
at this Cross Section
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3642.36	1340	3648.34	1334.45	3876.72	1334.45	3886.16	1336.69	3896.99	1332.7
3907.03	1332.81	3913.2	1333.23	3932.7	1339.77	3933.85	1339.57	3953.93	1334.7
3992.49	1334.37	4182.14	1333.31	4201.1	1333.09	4241.66	1332.83	4260.56	1332.9
4278.25	1332.83	4290.47	1331.38	4306.9	1331.37	4312.38	1333.08	4314.51	1331.6
4320.85	1331.68	4357.76	1331.97	4374.3	1336.76	4379.19	1334.89	4382.34	1334.2
4392.35	1332.48	4430.03	1332.36	4433.2	1333.53	4437.49	1334.51	4446.18	1331.7
4681.81	1331.75	4709.29	1338.36	4711.03	1338.4	4721.22	1337.84	4755.37	1330.2
4798.82	1329.77	4819.78	1329.51	4852.21	1328.94	4859.65	1329.72	4872.81	1330.9
4886.14	1330.57	4890.65	1329.39	4924.65	1319.83	4988.73	1319.39	4994.95	1319.4
5028.8	1319.74	5061.73	1319.71	5095.33	1329.84	5107.56	1329.93	5117.24	1328.3
5128.72	1328.95	5134.87	1330.42	5147.21	1333.57	5156.53	1333.82		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3642.36	.04	4886.14	.025	5095.33	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4886.14	5095.33	350	263.11	250	.1	.3

Left Levee Station= 4711.03 Elevation= 1338.4
Right Levee Station= 5095.33 Elevation= 1329.84

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1328.49	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.025	

E.G. Elev (ft)	1328.69	Reach Len. (ft)	350.00	263.11	250.00
Crit W.S. (ft)	1323.11	Flow Area (sq ft)		1477.70	
E.G. Slope (ft/ft)	0.000252	Area (sq ft)		1477.70	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	197.01	Top Width (ft)		197.01	
Vel Total (ft/s)	3.59	Avg. Vel. (ft/s)		3.59	
Max Chl Dpth (ft)	9.10	Hydr. Depth (ft)		7.50	
Conv. Total (cfs)	333729.2	Conv. (cfs)		333729.2	
Length Wtd. (ft)	263.11	Wetted Per. (ft)		199.51	
Min Ch El (ft)	1319.39	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.03	209.95	
C & E Loss (ft)	0.00	Cum SA (acres)	0.20	27.62	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1329.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1329.16	Reach Len. (ft)	350.00	263.11	250.00
Crit W.S. (ft)	1322.57	Flow Area (sq ft)	0.43	1589.60	
E.G. Slope (ft/ft)	0.000122	Area (sq ft)	0.43	1589.60	
Q Total (cfs)	4100.00	Flow (cfs)	0.03	4099.97	
Top Width (ft)	208.46	Top Width (ft)	7.58	200.88	
Vel Total (ft/s)	2.58	Avg. Vel. (ft/s)	0.06	2.58	
Max Chl Dpth (ft)	9.66	Hydr. Depth (ft)	0.06	7.91	
Conv. Total (cfs)	371921.5	Conv. (cfs)	2.4	371919.2	
Length Wtd. (ft)	263.17	Wetted Per. (ft)	7.59	203.53	
Min Ch El (ft)	1319.39	Shear (lb/sq ft)	0.00	0.06	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.15	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.63	243.65	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	1.17	28.68	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.43	Reach Len. (ft)	350.00	263.11	250.00
Crit W.S. (ft)	1323.07	Flow Area (sq ft)	201.92	2061.39	82.13
E.G. Slope (ft/ft)	0.000083	Area (sq ft)	201.92	2061.39	82.13
Q Total (cfs)	5220.00	Flow (cfs)	89.01	5088.53	42.46
Top Width (ft)	388.16	Top Width (ft)	135.84	209.19	43.13
Vel Total (ft/s)	2.23	Avg. Vel. (ft/s)	0.44	2.47	0.52
Max Chl Dpth (ft)	11.95	Hydr. Depth (ft)	1.49	9.85	1.90
Conv. Total (cfs)	572307.3	Conv. (cfs)	9758.8	557892.8	4655.7
Length Wtd. (ft)	265.29	Wetted Per. (ft)	136.08	212.16	43.57
Min Ch El (ft)	1319.39	Shear (lb/sq ft)	0.01	0.05	0.01
Alpha	1.20	Stream Power (lb/ft s)	0.00	0.12	0.01
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	230.56	311.82	21.03
C & E Loss (ft)	0.00	Cum SA (acres)	116.91	29.17	9.05

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 19.408

INPUT
Description: End of Levee on Left Overbank
from Sec. 19.745 to 19.408
8' High
Levee at this Cross Section
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3687.28	1339.88	3688.26	1339.8	3705.43	1334.38	3723.57	1333.93	3733.45	1338.32
3745.42	1334.45	3968.61	1334.5	3973.23	1335.93	3982.07	1332.34	3990.92	1332.41
3999.75	1332.65	4011.43	1332.7	4017.45	1333.24	4054.15	1333.29	4073.27	1333.02
4131.3	1331.77	4208.64	1331.3	4244.5	1331.34	4302.84	1331.33	4372.25	1331.18

4385.21	1336.44	4389.55	1338.9	4400.81	1334.25	4405.43	1331.63	4425.95	1331.22
4442.3	1331.25	4458.21	1331.6	4464.93	1333.18	4470.87	1331.75	4664.18	1331.75
4688.92	1338.31	4699.68	1337.9	4702.33	1338.02	4708.87	1335.53	4723.51	1330.18
4754.27	1329.13	4792.48	1329.2	4808.68	1329.08	4860.76	1328.19	4885.1	1330.8
4898.76	1326.73	4923.22	1319.3	4945.32	1319.35	4993.95	1319.19	5042.16	1319.23
5059.5	1319.35	5078.87	1325	5094.18	1329.34	5104.65	1329.66	5113.84	1328.06
5127.92	1328.63	5147.07	1332.9	5157.53	1333.12				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3687.28	.04	4885.1	.025	5094.18	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4885.1	5094.18	700	583.23	560	.1	.3

Left Levee Station= 4688.92 Elevation= 1338.31
Right Levee Station= 5104.65 Elevation= 1329.66

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1328.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1328.62	Reach Len. (ft)	700.00	583.23	560.00
Crit W.S. (ft)	1322.76	Flow Area (sq ft)	2.09	1530.50	
E.G. Slope (ft/ft)	0.000226	Area (sq ft)	2.09	1530.50	
Q Total (cfs)	5300.00	Flow (cfs)	0.29	5299.71	
Top Width (ft)	214.82	Top Width (ft)	16.84	197.97	
Vel Total (ft/s)	3.46	Avg. Vel. (ft/s)	0.14	3.46	
Max Chl Dpth (ft)	9.25	Hydr. Depth (ft)	0.12	7.73	
Conv. Total (cfs)	352559.3	Conv. (cfs)	19.3	352540.0	
Length Wtd. (ft)	583.23	Wetted Per. (ft)	16.86	200.61	
Min Ch El (ft)	1319.19	Shear (lb/sq ft)	0.00	0.11	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.37	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.02	200.86	
C & E Loss (ft)	0.00	Cum SA (acres)	0.14	26.43	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1329.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1329.13	Reach Len. (ft)	700.00	583.23	560.00
Crit W.S. (ft)	1322.23	Flow Area (sq ft)	23.90	1648.72	
E.G. Slope (ft/ft)	0.000108	Area (sq ft)	23.90	1648.72	
Q Total (cfs)	4100.00	Flow (cfs)	5.17	4094.83	
Top Width (ft)	258.98	Top Width (ft)	56.94	202.04	
Vel Total (ft/s)	2.45	Avg. Vel. (ft/s)	0.22	2.48	
Max Chl Dpth (ft)	9.84	Hydr. Depth (ft)	0.42	8.16	
Conv. Total (cfs)	394057.1	Conv. (cfs)	497.3	393559.8	
Length Wtd. (ft)	583.30	Wetted Per. (ft)	56.99	204.85	
Min Ch El (ft)	1319.19	Shear (lb/sq ft)	0.00	0.05	
Alpha	1.03	Stream Power (lb/ft s)	0.00	0.14	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.53	233.87	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	0.91	27.46	1.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.40	Reach Len. (ft)	700.00	583.23	560.00
Crit W.S. (ft)	1322.73	Flow Area (sq ft)	355.26	2122.67	99.87
E.G. Slope (ft/ft)	0.000072	Area (sq ft)	355.26	2122.67	99.87
Q Total (cfs)	5220.00	Flow (cfs)	187.04	4980.27	52.69
Top Width (ft)	419.61	Top Width (ft)	164.72	209.08	45.81
Vel Total (ft/s)	2.02	Avg. Vel. (ft/s)	0.53	2.35	0.53

Max Chl Dpth (ft)	12.13	Hydr. Depth (ft)	2.16	10.15	2.18
Conv. Total (cfs)	613946.6	Conv. (cfs)	21998.1	585751.3	6197.1
Length Wtd. (ft)	589.50	Wetted Per. (ft)	165.08	212.19	46.26
Min Ch El (ft)	1319.19	Shear (lb/sq ft)	0.01	0.05	0.01
Alpha	1.28	Stream Power (lb/ft s)	0.01	0.11	0.01
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	228.32	299.19	20.51
C & E Loss (ft)	0.00	Cum SA (acres)	115.71	27.91	8.79

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 19.298

INPUT
Description: Downstream of Side Inlet (208' Wide) from the Left Overbank Just
Upstream of Future Warner Road Alignment
Q(D)=5,900 cfs,
Q(F)=4,120 cfs & Q(E)=5,860 cfs

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3539.55	1337.6	3568.57	1336.81	3569.88	1334.49	3578.71	1334.58	3589.55	1334.21
3595.46	1334.2	3612.88	1333.79	3646.47	1333.52	3659.39	1333.57	3762.17	1333.07
3787.15	1333	3857.42	1332.48	3895.67	1332.33	3952.66	1332.15	3967.73	1332.15
3987.93	1332.1	4069.32	1331.87	4080.93	1332.05	4105.58	1331.97	4152.14	1331.47
4154.69	1331.3	4158.14	1331.51	4165.34	1331.32	4178.26	1331.52	4251.06	1331.13
4321.96	1330.9	4367.94	1330.75	4451.16	1330.19	4481.42	1330.02	4617.18	1329.39
4687.22	1329.1	4728.45	1328.91	4730.89	1327.95	4736.81	1328.86	4790.63	1328.57
4860.34	1328.3	4869.38	1330.31	4883.97	1330.27	4900.27	1325.49	4921.78	1319.1
4935.91	1319.1	4997.29	1319.14	5020.59	1319.02	5038.5	1319.1	5056.61	1319.28
5079.99	1325.4	5093.46	1329.05	5107.23	1329.44	5116.33	1328.35	5133.09	1330.08
5143.35	1331.6	5154.2	1332.09						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3539.55	.04	4883.97	.025	5093.46	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4883.97	5093.46	1000	1000	1000	.1	.3

Left Levee Station= 4869.38 Elevation= 1330.31
Right Levee Station= 5107.23 Elevation= 1329.44

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1328.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
E.G. Elev (ft)	1328.47	Reach Len. (ft)	1000.00	1000.00	1000.00
Crit W.S. (ft)	1322.88	Flow Area (sq ft)		1523.92	
E.G. Slope (ft/ft)	0.000287	Area (sq ft)		1523.92	
Q Total (cfs)	5900.00	Flow (cfs)		5900.00	
Top Width (ft)	199.57	Top Width (ft)		199.57	
Vel Total (ft/s)	3.87	Avg. Vel. (ft/s)		3.87	
Max Chl Dpth (ft)	9.22	Hydr. Depth (ft)		7.64	
Conv. Total (cfs)	348347.3	Conv. (cfs)		348347.3	
Length Wtd. (ft)	1000.00	Wetted Per. (ft)		202.06	
Min Ch El (ft)	1319.02	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.52	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)		180.42	
C & E Loss (ft)	0.00	Cum SA (acres)		23.76	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1328.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.025	
E.G. Elev (ft)	1329.06	Reach Len. (ft)	1000.00	1000.00	1000.00
Crit W.S. (ft)	1322.10	Flow Area (sq ft)		1671.37	
E.G. Slope (ft/ft)	0.000106	Area (sq ft)		1671.37	
Q Total (cfs)	4120.00	Flow (cfs)		4120.00	
Top Width (ft)	204.74	Top Width (ft)		204.74	

Vel Total (ft/s)	2.47	Avg. Vel. (ft/s)		2.47	
Max Chl Dpth (ft)	9.95	Hydr. Depth (ft)		8.16	
Conv. Total (cfs)	399256.7	Conv. (cfs)		399256.7	
Length Wtd. (ft)	1000.00	Wetted Per. (ft)		207.44	
Min Ch El (ft)	1319.02	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.34	211.64	1.81
C & E Loss (ft)	0.00	Cum SA (acres)	0.45	24.74	1.66

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.27	Element			
Vel Head (ft)	0.09	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.36	Reach Len. (ft)	1000.00	1000.00	1000.00
Crit W.S. (ft)	1322.87	Flow Area (sq ft)	979.62	2150.35	88.62
E.G. Slope (ft/ft)	0.000081	Area (sq ft)	979.62	2150.35	88.62
Q Total (cfs)	5860.00	Flow (cfs)	426.91	5388.39	44.70
Top Width (ft)	915.80	Top Width (ft)	658.66	209.49	47.65
Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)	0.44	2.51	0.50
Max Chl Dpth (ft)	12.25	Hydr. Depth (ft)	1.49	10.26	1.86
Conv. Total (cfs)	650530.4	Conv. (cfs)	47392.6	598176.1	4961.7
Length Wtd. (ft)	1000.00	Wetted Per. (ft)	659.14	212.38	47.90
Min Ch El (ft)	1319.02	Shear (lb/sq ft)	0.01	0.05	0.01
Alpha	1.75	Stream Power (lb/ft s)	0.00	0.13	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	217.60	270.58	19.29
C & E Loss (ft)	0.00	Cum SA (acres)	109.09	25.10	8.19

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 19.109

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3359.54	1335.1	3428.68	1333.31	3453.54	1333.21	3504.97	1333.53	3524.63	1333.39
3582.34	1333.1	3627.43	1332.85	3655.2	1332.85	3730.19	1332.64	3756.62	1332.52
3825.87	1332.3	3904.41	1331.91	3986.83	1331.61	4038.54	1331.54	4141.34	1331.03
4153.51	1331	4244.11	1330.71	4256.37	1330.66	4346.91	1330.44	4449.69	1330.06
4568.79	1329.4	4658.78	1329.17	4725.97	1328.79	4730.63	1328.22	4741.04	1328.76
4778.68	1328.5	4857.18	1327.75	4870.53	1330.13	4884.15	1329.99	4894.08	1326.97
4922.02	1318.8	4948.23	1319.1	4956.54	1319.27	4993.02	1318.8	5004.13	1318.8
5033.14	1319	5058.33	1318.98	5093.73	1328.67	5105.8	1328.98	5114.16	1327.54
5127.67	1328.3	5134.77	1329.87	5143.19	1331.46	5154.88	1332		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3359.54	.04	4884.15	.025	5093.73	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4884.15	5093.73	610	731.32	750	.1	.3

Left Levee Station= 4870.53 Elevation= 1330.13
Right Levee Station= 5105.8 Elevation= 1328.98

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1327.94	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1328.18	Reach Len. (ft)	610.00	731.32	750.00
Crit W.S. (ft)	1322.71	Flow Area (sq ft)		1512.56	
E.G. Slope (ft/ft)	0.000295	Area (sq ft)		1512.56	
Q Total (cfs)	5900.00	Flow (cfs)		5900.00	
Top Width (ft)	200.19	Top Width (ft)		200.19	
Vel Total (ft/s)	3.90	Avg. Vel. (ft/s)		3.90	
Max Chl Dpth (ft)	9.14	Hydr. Depth (ft)		7.56	
Conv. Total (cfs)	343273.9	Conv. (cfs)		343273.9	
Length Wtd. (ft)	731.32	Wetted Per. (ft)		202.72	
Min Ch El (ft)	1318.80	Shear (lb/sq ft)		0.14	

Alpha	1.00	Stream Power (lb/ft s)	0.54
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	145.56
C & E Loss (ft)	0.00	Cum SA (acres)	19.18

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1328.87	Element			
Vel Head (ft)	0.09	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1328.96	Reach Len. (ft)	610.00	731.32	750.00
Crit W.S. (ft)	1321.92	Flow Area (sq ft)		1700.17	0.75
E.G. Slope (ft/ft)	0.000101	Area (sq ft)		1700.17	0.75
Q Total (cfs)	4120.00	Flow (cfs)		4119.94	0.06
Top Width (ft)	213.51	Top Width (ft)		205.88	7.63
Vel Total (ft/s)	2.42	Avg. Vel. (ft/s)		2.42	0.08
Max Chl Dpth (ft)	10.07	Hydr. Depth (ft)		8.26	0.10
Conv. Total (cfs)	409204.9	Conv. (cfs)		409199.0	5.9
Length Wtd. (ft)	731.32	Wetted Per. (ft)		208.65	7.63
Min Ch El (ft)	1318.80	Shear (lb/sq ft)		0.05	0.00
Alpha	1.00	Stream Power (lb/ft s)		0.12	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.34	172.94	1.80
C & E Loss (ft)	0.00	Cum SA (acres)	0.45	20.02	1.57

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1331.19	Element			
Vel Head (ft)	0.08	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.28	Reach Len. (ft)	610.00	731.32	750.00
Crit W.S. (ft)	1322.68	Flow Area (sq ft)	1115.41	2185.92	116.95
E.G. Slope (ft/ft)	0.000075	Area (sq ft)	1115.41	2185.92	116.95
Q Total (cfs)	5860.00	Flow (cfs)	458.07	5334.11	67.82
Top Width (ft)	1033.41	Top Width (ft)	775.78	209.58	48.05
Vel Total (ft/s)	1.71	Avg. Vel. (ft/s)	0.41	2.44	0.58
Max Chl Dpth (ft)	12.39	Hydr. Depth (ft)	1.44	10.43	2.43
Conv. Total (cfs)	675090.8	Conv. (cfs)	52771.5	614506.3	7812.9
Length Wtd. (ft)	721.71	Wetted Per. (ft)	776.05	212.51	48.49
Min Ch El (ft)	1318.80	Shear (lb/sq ft)	0.01	0.05	0.01
Alpha	1.85	Stream Power (lb/ft s)	0.00	0.12	0.01
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	193.55	220.81	16.94
C & E Loss (ft)	0.00	Cum SA (acres)	92.62	20.29	7.09

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 18.97

INPUT
Description: Downstream of Side Inlet (229' Wide) from Left Overbank
Q(D)=6,500 cfs, Q(F)=4,690 cfs & Q(E)=7,400 cfs
Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3267.03	1333.9	3326.17	1332.35	3365.98	1332.17	3418	1332.4	3433.62	1333.45
3450.76	1333.3	3486.46	1333.3	3492.99	1333.23	3503.2	1332.84	3538.31	1332.79
3578.13	1332.6	3603.61	1332.64	3643.82	1332.44	3803.03	1331.78	3903.39	1331.44
3988.05	1331	4003.74	1330.98	4104.11	1330.87	4206.43	1330.39	4300.35	1329.99
4310.38	1330	4349.08	1329.97	4404.2	1329.97	4417.57	1330.11	4439.31	1330.1
4479.55	1330.3	4510.13	1330.05	4520.23	1330.34	4528.89	1330.38	4552.01	1328.75
4604.24	1328.4	4609.03	1328.32	4644.43	1328.2	4663.24	1328.18	4688.83	1328.27
4699.51	1327.9	4718.65	1328.8	4721.46	1328.65	4733.61	1330.41	4742.91	1328.83
4747.38	1328.6	4848.87	1327.83	4855.72	1328.43	4864.53	1329.76	4873.6	1329.95
4879.22	1330	4895.64	1325.73	4921.68	1318.87	4949.78	1319.21	4994.04	1318.41
5022.39	1318.6	5066.29	1319.16	5098.89	1328.54	5109.76	1329.11	5119.23	1327.9
5129.79	1328.5	5140.89	1330.4	5147.27	1331.66	5161.16	1332.18		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3267.03	.04	4879.22	.025	5098.89	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4879.22	5098.89	840	994.23	1020	.1	.3

Left Levee Station= 4879.22 Elevation= 1330
Right Levee Station= 5109.76 Elevation= 1329.11

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1327.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1327.94	Reach Len. (ft)	840.00	994.23	1020.00
Crit W.S. (ft)	1322.66	Flow Area (sq ft)		1553.36	
E.G. Slope (ft/ft)	0.000344	Area (sq ft)		1553.36	
Q Total (cfs)	6500.00	Flow (cfs)		6500.00	
Top Width (ft)	207.69	Top Width (ft)		207.69	
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)		4.18	
Max Chl Dpth (ft)	9.26	Hydr. Depth (ft)		7.48	
Conv. Total (cfs)	350461.5	Conv. (cfs)		350461.5	
Length Wtd. (ft)	994.23	Wetted Per. (ft)		210.04	
Min Ch El (ft)	1318.41	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.66	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)		119.83	
C & E Loss (ft)	0.01	Cum SA (acres)		15.75	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1328.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1328.88	Reach Len. (ft)	840.00	994.23	1020.00
Crit W.S. (ft)	1321.93	Flow Area (sq ft)		1785.68	0.50
E.G. Slope (ft/ft)	0.000118	Area (sq ft)		1785.68	0.50
Q Total (cfs)	4690.00	Flow (cfs)		4689.95	0.05
Top Width (ft)	219.28	Top Width (ft)		214.93	4.35
Vel Total (ft/s)	2.63	Avg. Vel. (ft/s)		2.63	0.09
Max Chl Dpth (ft)	10.36	Hydr. Depth (ft)		8.31	0.11
Conv. Total (cfs)	431879.8	Conv. (cfs)		431875.4	4.3
Length Wtd. (ft)	994.31	Wetted Per. (ft)		217.55	4.36
Min Ch El (ft)	1318.41	Shear (lb/sq ft)		0.06	0.00
Alpha	1.00	Stream Power (lb/ft s)		0.16	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.34	143.68	1.79
C & E Loss (ft)	0.00	Cum SA (acres)	0.45	16.49	1.47

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.21	Reach Len. (ft)	840.00	994.23	1020.00
Crit W.S. (ft)	1323.01	Flow Area (sq ft)	1266.62	2292.01	98.87
E.G. Slope (ft/ft)	0.000109	Area (sq ft)	1266.62	2292.01	98.87
Q Total (cfs)	7400.00	Flow (cfs)	612.17	6723.90	63.93
Top Width (ft)	1172.95	Top Width (ft)	907.80	219.67	45.48
Vel Total (ft/s)	2.02	Avg. Vel. (ft/s)	0.48	2.93	0.65
Max Chl Dpth (ft)	12.68	Hydr. Depth (ft)	1.40	10.43	2.17
Conv. Total (cfs)	709930.4	Conv. (cfs)	58729.9	645067.4	6133.1
Length Wtd. (ft)	976.87	Wetted Per. (ft)	908.30	222.44	45.81
Min Ch El (ft)	1318.41	Shear (lb/sq ft)	0.01	0.07	0.01
Alpha	1.92	Stream Power (lb/ft s)	0.00	0.21	0.01
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	176.87	183.22	15.08
C & E Loss (ft)	0.01	Cum SA (acres)	80.84	16.69	6.29

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 18.782

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

3375	1332.2	3421.58	1330.96	3454.66	1330.8	3615.49	1331.45	3620.46	1331.77
3624.87	1331.4	3653.21	1331.39	3671.14	1331.15	3750.36	1330.78	3848.29	1330.52
3899.8	1330.3	3972.21	1330.27	4033.27	1330.06	4119.17	1329.81	4172.93	1329.59
4218.28	1329.5	4273.29	1329.29	4338.53	1329.09	4373.65	1328.9	4474.02	1328.44
4495.77	1328.4	4574.37	1328.03	4674.71	1327.83	4751.74	1327.65	4777.28	1327.56
4823.75	1327.3	4840.43	1326.96	4854.55	1326.61	4863.11	1329.1	4882.98	1329.36
4922.45	1318.1	4968.99	1318.28	4992.37	1318.34	5032.22	1318.23	5053.98	1318.05
5067.99	1318.1	5103.59	1328.35	5116.94	1328.34	5127.48	1326.5	5151.67	1327.07
5164.52	1330.3	5177.11	1330.77						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3375	.04	4882.98	.025	5103.59	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4882.98	5103.59	1510	1300.18	1250	.1	.3

Left Levee Station= 4882.98 Elevation= 1329.36
Right Levee Station= 5103.59 Elevation= 1328.35

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1327.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1327.62	Reach Len. (ft)	1510.00	1300.18	1250.00
Crit W.S. (ft)	1322.02	Flow Area (sq ft)		1632.24	
E.G. Slope (ft/ft)	0.000297	Area (sq ft)		1632.24	
Q Total (cfs)	6500.00	Flow (cfs)		6500.00	
Top Width (ft)	210.24	Top Width (ft)		210.24	
Vel Total (ft/s)	3.98	Avg. Vel. (ft/s)		3.98	
Max Chl Dpth (ft)	9.32	Hydr. Depth (ft)		7.76	
Conv. Total (cfs)	377270.3	Conv. (cfs)		377270.3	
Length Wtd. (ft)	1300.18	Wetted Per. (ft)		212.84	
Min Ch El (ft)	1318.05	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.57	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		83.47	
C & E Loss (ft)	0.00	Cum SA (acres)		10.98	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1328.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1328.77	Reach Len. (ft)	1510.00	1300.18	1250.00
Crit W.S. (ft)	1321.29	Flow Area (sq ft)		1911.94	68.43
E.G. Slope (ft/ft)	0.000095	Area (sq ft)		1911.94	68.43
Q Total (cfs)	4690.00	Flow (cfs)		4661.30	28.70
Top Width (ft)	272.67	Top Width (ft)		218.21	54.46
Vel Total (ft/s)	2.37	Avg. Vel. (ft/s)		2.44	0.42
Max Chl Dpth (ft)	10.62	Hydr. Depth (ft)		8.76	1.26
Conv. Total (cfs)	481663.4	Conv. (cfs)		478716.3	2947.1
Length Wtd. (ft)	1300.03	Wetted Per. (ft)		221.13	54.83
Min Ch El (ft)	1318.05	Shear (lb/sq ft)		0.05	0.01
Alpha	1.05	Stream Power (lb/ft s)		0.12	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.34	101.48	0.98
C & E Loss (ft)	0.00	Cum SA (acres)	0.45	11.55	0.78

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1331.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.11	Reach Len. (ft)	1510.00	1300.18	1250.00
Crit W.S. (ft)	1322.35	Flow Area (sq ft)	2223.80	2429.65	212.55
E.G. Slope (ft/ft)	0.000076	Area (sq ft)	2223.80	2429.65	212.55
Q Total (cfs)	7400.00	Flow (cfs)	1087.03	6174.35	138.63
Top Width (ft)	1570.22	Top Width (ft)	1276.09	220.61	73.52
Vel Total (ft/s)	1.52	Avg. Vel. (ft/s)	0.49	2.54	0.65
Max Chl Dpth (ft)	12.97	Hydr. Depth (ft)	1.74	11.01	2.89
Conv. Total (cfs)	849011.4	Conv. (cfs)	124715.9	708390.5	15905.0

Length Wtd. (ft)	1346.51	Wetted Per. (ft)	1276.46	223.63	74.35
Min Ch El (ft)	1318.05	Shear (lb/sq ft)	0.01	0.05	0.01
Alpha	2.35	Stream Power (lb/ft s)	0.00	0.13	0.01
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	143.22	129.33	11.43
C & E Loss (ft)	0.01	Cum SA (acres)	59.78	11.67	4.90

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

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 18.535

INPUT
Description:
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3243.29	1328	3257.88	1327.57	3274.2	1327.49	3349.86	1327.83	3384.64	1327.94
3425.41	1327.9	3484.39	1328.34	3550.81	1328.94	3607.45	1330.14	3656.19	1330.66
3670.85	1331.4	3701.15	1332.03	3750.92	1331.83	3780.9	1331.63	3802.74	1331.47
3837.42	1330.8	3862.4	1330.25	3870.06	1329.47	3878.1	1330.05	3904.23	1329.57
3958.2	1329.4	3997.88	1329.2	4056.5	1329	4109.48	1328.94	4158.92	1328.77
4229.87	1328.4	4263.86	1328.18	4311.15	1327.98	4332.72	1327.99	4362.08	1327.86
4381.9	1327.8	4424.57	1327.52	4467.23	1327.38	4511.45	1327.36	4515.43	1326.86
4530.5	1325.4	4535.68	1325.03	4548.86	1326.27	4554.53	1326.38	4565.02	1327.14
4585.44	1327.2	4592.58	1327.05	4616.71	1327.31	4648.52	1327.15	4668.95	1326.97
4718.6	1326.7	4774.78	1326.5	4820.44	1326.75	4857.35	1326.65	4868.73	1327.35
4880	1328.3	4894.05	1329.14	4900.61	1327.26	4932.85	1318.2	4967.55	1317.85
4994.05	1318.2	5010.41	1318.26	5020.07	1318.21	5032.98	1317.93	5077.93	1318.66
5094.6	1323.2	5114.7	1328.81	5126.94	1328.09	5135.21	1326.46	5165.84	1327.87
5175.21	1330	5181.96	1330.34	5187.94	1331.09				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3243.29	.04	4894.05	.025	5114.7	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4894.05	5114.7	620	1007.73	1080	.1	.3

Left Levee Station= 4894.05 Elevation= 1329.14
Right Levee Station= 5114.7 Elevation= 1328.81

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1326.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
E.G. Elev (ft)	1327.19	Reach Len. (ft)	620.00	1007.73	1080.00
Crit W.S. (ft)	1322.00	Flow Area (sq ft)		1530.52	
E.G. Slope (ft/ft)	0.000358	Area (sq ft)		1530.52	
Q Total (cfs)	6500.00	Flow (cfs)		6500.00	
Top Width (ft)	206.05	Top Width (ft)		206.05	
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)		4.25	
Max Chl Dpth (ft)	9.06	Hydr. Depth (ft)		7.43	
Conv. Total (cfs)	343734.8	Conv. (cfs)		343734.8	
Length Wtd. (ft)	1007.73	Wetted Per. (ft)		208.38	
Min Ch El (ft)	1317.85	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.70	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		36.27	
C & E Loss (ft)	0.01	Cum SA (acres)		4.77	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1328.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.025	
E.G. Elev (ft)	1328.64	Reach Len. (ft)	620.00	1007.73	1080.00
Crit W.S. (ft)	1321.27	Flow Area (sq ft)		1875.65	
E.G. Slope (ft/ft)	0.000102	Area (sq ft)		1875.65	
Q Total (cfs)	4690.00	Flow (cfs)		4690.00	
Top Width (ft)	217.59	Top Width (ft)		217.59	

Vel Total (ft/s)	2.50	Avg. Vel. (ft/s)		2.50
Max Chl Dpth (ft)	10.69	Hydr. Depth (ft)		8.62
Conv. Total (cfs)	464731.5	Conv. (cfs)		464731.5
Length Wtd. (ft)	1007.07	Wetted Per. (ft)		220.37
Min Ch El (ft)	1317.85	Shear (lb/sq ft)		0.05
Alpha	1.00	Stream Power (lb/ft s)		0.14
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.34	44.96
C & E Loss (ft)	0.00	Cum SA (acres)	0.45	5.04

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1330.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1331.01	Reach Len. (ft)	620.00	1007.73	1080.00
Crit W.S. (ft)	1322.34	Flow Area (sq ft)	4175.11	2410.09	203.72
E.G. Slope (ft/ft)	0.000052	Area (sq ft)	4175.11	2410.09	203.72
Q Total (cfs)	7400.00	Flow (cfs)	2239.96	5051.40	108.64
Top Width (ft)	1777.09	Top Width (ft)	1484.19	220.65	72.25
Vel Total (ft/s)	1.09	Avg. Vel. (ft/s)	0.54	2.10	0.53
Max Chl Dpth (ft)	13.12	Hydr. Depth (ft)	2.81	10.92	2.82
Conv. Total (cfs)	1024104.3	Conv. (cfs)	309993.9	699076.1	15034.3
Length Wtd. (ft)	945.70	Wetted Per. (ft)	1487.56	223.55	72.75
Min Ch El (ft)	1317.85	Shear (lb/sq ft)	0.01	0.04	0.01
Alpha	2.60	Stream Power (lb/ft s)	0.00	0.07	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	32.31	57.10	5.46
C & E Loss (ft)	0.01	Cum SA (acres)	11.94	5.08	2.80

Warning - Divided flow computed for this cross-section.
Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 5 RS: 18.345

INPUT
Description: Upstream End of Reach 4
Downstream of Two Side Inlets (62' & 20' Wide) from
Left Overbank
Q(D)=6,500 cfs, Q(F)=4,700 cfs & Q(E)=7,840 cfs
Loose Large Rock Riprap in the Channel (n=0.04)
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3841.38	1331.58	3849.58	1331.57	3894.44	1331.91	3906.41	1331.9	3947.49	1331.98
4006.22	1331.91	4053.6	1332.15	4106.64	1332.29	4153.05	1332.2	4162.85	1332.18
4171.78	1332.23	4202.02	1332.28	4265.93	1332.19	4321.29	1332.5	4371.91	1332.7
4397.82	1332.35	4424.96	1332.18	4478.01	1332.26	4515.3	1332.2	4554.47	1332.09
4584.17	1332.09	4632.78	1331.73	4671.94	1331.24	4690.23	1331.1	4711.1	1330.55
4743.29	1329.54	4769.93	1329.36	4796.33	1329.26	4828.58	1328.6	4849.42	1327.54
4865.72	1327.17	4878.12	1327.26	4883.44	1328.06	4894.77	1328.3	4923.5	1319.17
4930.14	1317.69	4935.01	1317.65	4968.48	1317.84	4998.42	1317.3	5006.57	1317.07
5038.12	1317.26	5075.18	1317.25	5082.12	1319.33	5113.29	1328.5	5125.51	1328.25
5136.68	1326.19	5148.84	1326.14	5159.57	1330	5171.83	1330	5182.91	1329.88
5221.95	1330.17	5262.22	1329.96	5268.09	1330.93	5285.13	1331.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3841.38	.04	4894.77	.03	5113.29	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4894.77	5113.29	0	0	0	.1	.3

Left Levee Station= 4894.77 Elevation= 1328.3
Right Levee Station= 5113.29 Elevation= 1328.5

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1326.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.030	
E.G. Elev (ft)	1326.78	Reach Len. (ft)			
Crit W.S. (ft)	1321.24	Flow Area (sq ft)		1605.11	
E.G. Slope (ft/ft)	0.000441	Area (sq ft)		1605.11	
Q Total (cfs)	6500.00	Flow (cfs)		6500.00	
Top Width (ft)	206.25	Top Width (ft)		206.25	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	9.46	Hydr. Depth (ft)		7.78	
Conv. Total (cfs)	309560.1	Conv. (cfs)		309560.1	
Length Wtd. (ft)		Wetted Per. (ft)		208.91	
Min Ch El (ft)	1317.07	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.86	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1328.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1328.52	Reach Len. (ft)			
Crit W.S. (ft)	1320.53	Flow Area (sq ft)	47.93	2010.95	
E.G. Slope (ft/ft)	0.000117	Area (sq ft)	47.93	2010.95	
Q Total (cfs)	4700.00	Flow (cfs)	16.01	4683.99	
Top Width (ft)	281.36	Top Width (ft)	63.04	218.32	
Vel Total (ft/s)	2.28	Avg. Vel. (ft/s)	0.33	2.33	
Max Chl Dpth (ft)	11.37	Hydr. Depth (ft)	0.76	9.21	
Conv. Total (cfs)	434925.2	Conv. (cfs)	1481.6	433443.6	
Length Wtd. (ft)		Wetted Per. (ft)	63.13	221.52	
Min Ch El (ft)	1317.07	Shear (lb/sq ft)	0.01	0.07	
Alpha	1.04	Stream Power (lb/ft s)	0.00	0.15	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1330.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.040	0.030	0.040
E.G. Elev (ft)	1330.93	Reach Len. (ft)			
Crit W.S. (ft)	1321.75	Flow Area (sq ft)	364.99	2526.68	236.61
E.G. Slope (ft/ft)	0.000139	Area (sq ft)	364.99	2526.68	236.61
Q Total (cfs)	7840.00	Flow (cfs)	243.82	7459.00	137.19
Top Width (ft)	565.69	Top Width (ft)	193.16	218.52	154.01
Vel Total (ft/s)	2.51	Avg. Vel. (ft/s)	0.67	2.95	0.58
Max Chl Dpth (ft)	13.73	Hydr. Depth (ft)	1.89	11.56	1.54
Conv. Total (cfs)	666096.1	Conv. (cfs)	20715.1	633725.6	11655.5
Length Wtd. (ft)		Wetted Per. (ft)	193.28	221.73	154.95
Min Ch El (ft)	1317.07	Shear (lb/sq ft)	0.02	0.10	0.01
Alpha	1.32	Stream Power (lb/ft s)	0.01	0.29	0.01
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:EMF

Reach	River Sta.	n1	n2	n3
Reach 5	24.723	.04	.03	.04
Reach 5	24.621	.05	.045	.05
Reach 5	24.535	.05	.045	.05
Reach 5	24.454	.05	.045	.05
Reach 5	24.32	.05	.045	.05

Reach 5	24.247	.05	.045	.05
Reach 5	24.13	.05	.045	.05
Reach 5	24.1	.05	.045	.05
Reach 5	24.06	.05	.045	.05
Reach 5	23.962	.04	.045	.05
Reach 5	23.911	.05	.045	.05
Reach 5	23.827	.04	.015	.04
Reach 5	23.825	.04	.015	.04
Reach 5	23.815	Bridge		
Reach 5	23.804	.04	.015	.04
Reach 5	23.803	.04	.015	.04
Reach 5	23.758	.05	.045	.05
Reach 5	23.712	.05	.045	.05
Reach 5	23.604	.05	.045	.05
Reach 5	23.45	.05	.045	.05
Reach 5	23.315	.05	.045	.05
Reach 5	23.274	.05	.045	.05
Reach 5	23.219	.04	.035	.04
Reach 5	23.206	Bridge		
Reach 5	23.193	.04	.035	.04
Reach 5	23.166	.05	.045	.05
Reach 5	23.135	.05	.045	.05
Reach 5	23.087	.05	.045	.05
Reach 5	23.009	.05	.045	.05
Reach 5	22.944	.05	.045	.05
Reach 5	22.866	.05	.045	.05
Reach 5	22.797	.05	.045	.05
Reach 5	22.74	.05	.045	.05
Reach 5	22.68	.05	.045	.05
Reach 5	22.615	.055	.035	.045
Reach 5	22.608	Bridge		
Reach 5	22.599	.045	.035	.045
Reach 5	22.557	.05	.045	.05
Reach 5	22.475	.05	.045	.05
Reach 5	22.436	.05	.045	.05
Reach 5	22.348	.05	.045	.05
Reach 5	22.263	.05	.045	.05
Reach 5	22.189	.05	.045	.05
Reach 5	22.107	.05	.045	.05
Reach 5	22.022	.05	.045	.05
Reach 5	21.947	.05	.045	.05
Reach 5	21.839	.05	.045	.05
Reach 5	21.745	.05	.045	.05
Reach 5	21.713	.05	.045	.05
Reach 5	21.656	.045	.04	.045
Reach 5	21.633	.05	.045	.05
Reach 5	21.591	.05	.045	.05
Reach 5	21.531	.05	.045	.05
Reach 5	21.485	.05	.045	.05
Reach 5	21.439	.05	.045	.05
Reach 5	21.418	.04	.03	.04
Reach 5	21.413	.04	.03	.04
Reach 5	21.407	Bridge		
Reach 5	21.402	.04	.03	.04
Reach 5	21.391	.04	.03	.04
Reach 5	21.355	.04	.03	.04
Reach 5	21.339	Bridge		
Reach 5	21.326	.04	.03	.04
Reach 5	21.282	.04	.025	.04
Reach 5	21.188	.04	.025	.04
Reach 5	21.093	.04	.025	.04
Reach 5	21	.04	.025	.04
Reach 5	20.894	.04	.025	.04
Reach 5	20.799	.04	.025	.04
Reach 5	20.704	.04	.025	.04
Reach 5	20.61	.04	.025	.04
Reach 5	20.517	.04	.025	.04
Reach 5	20.428	.04	.025	.04
Reach 5	20.353	.04	.025	.04

Reach 5	20.334	.04	.025	.04
Reach 5	20.328	.04	.025	.04
Reach 5	20.323	Bridge		
Reach 5	20.316	.04	.025	.04
Reach 5	20.306	.04	.025	.04
Reach 5	20.247	.04	.025	.04
Reach 5	20.058	.04	.025	.04
Reach 5	19.863	.04	.025	.04
Reach 5	19.745	.04	.025	.04
Reach 5	19.592	.04	.025	.04
Reach 5	19.541	.04	.025	.04
Reach 5	19.489	.04	.025	.04
Reach 5	19.458	.04	.025	.04
Reach 5	19.408	.04	.025	.04
Reach 5	19.298	.04	.025	.04
Reach 5	19.109	.04	.025	.04
Reach 5	18.97	.04	.025	.04
Reach 5	18.782	.04	.025	.04
Reach 5	18.535	.04	.025	.04
Reach 5	18.345	.04	.03	.04

SUMMARY OF REACH LENGTHS

River: EMF

Reach	River Sta.	Left	Channel	Right
Reach 5	24.723	550	536.64	480
Reach 5	24.621	350	451.83	530
Reach 5	24.535	530	431.07	330
Reach 5	24.454	700	706.15	700
Reach 5	24.32	345	383.58	415
Reach 5	24.247	580	620.69	645
Reach 5	24.13	95	156.83	170
Reach 5	24.1	245	212.59	220
Reach 5	24.06	515	518.73	420
Reach 5	23.962	245	265.27	280
Reach 5	23.911	510	447.42	375
Reach 5	23.827	9.08	9.08	9.08
Reach 5	23.825	108.37	108.37	108.37
Reach 5	23.815	Bridge		
Reach 5	23.804	8.41	8.41	8.41
Reach 5	23.803	160	235.63	310
Reach 5	23.758	190	243.17	300
Reach 5	23.712	555	569	550
Reach 5	23.604	1040	814.02	650
Reach 5	23.45	615	715.61	730
Reach 5	23.315	180	215.71	235
Reach 5	23.274	330	289.25	225
Reach 5	23.219	135.92	135.92	135.92
Reach 5	23.206	Bridge		
Reach 5	23.193	70	144.31	200
Reach 5	23.166	105	165.24	180
Reach 5	23.135	250	249.49	300
Reach 5	23.087	500	415.87	200
Reach 5	23.009	260	340.47	420
Reach 5	22.944	445	411.54	370
Reach 5	22.866	370	364.49	330
Reach 5	22.797	302.84	302.84	302.84
Reach 5	22.74	280	318.21	320
Reach 5	22.68	400	342.12	260
Reach 5	22.615	85.17	85.17	85.17
Reach 5	22.608	Bridge		
Reach 5	22.599	190	222.25	200
Reach 5	22.557	370	428.43	340
Reach 5	22.475	140	209.8	370

Reach 5	22.436	480	462.54	470
Reach 5	22.348	410	447.01	480
Reach 5	22.263	420	392.17	280
Reach 5	22.189	428	434.03	410
Reach 5	22.107	455	448.38	420
Reach 5	22.022	295	397.01	350
Reach 5	21.947	480	569.26	480
Reach 5	21.839	515	494.43	375
Reach 5	21.745	145	169.59	200
Reach 5	21.713	275	301.25	275
Reach 5	21.656	121.32	121.32	121.32
Reach 5	21.633	185	225.22	245
Reach 5	21.591	400	315.77	220
Reach 5	21.531	220	243.38	270
Reach 5	21.485	230	241.5	255
Reach 5	21.439	110	109.17	110
Reach 5	21.418	42	28.49	10
Reach 5	21.413	57.77	57.77	57.77
Reach 5	21.407	Bridge		
Reach 5	21.402	40	56.27	80
Reach 5	21.391	50	193.75	320
Reach 5	21.355	150.66	150.66	150.66
Reach 5	21.339	Bridge		
Reach 5	21.326	125	231.38	335
Reach 5	21.282	500	500	500
Reach 5	21.188	500	500	500
Reach 5	21.093	490.19	490.19	490.19
Reach 5	21	760	561.05	530
Reach 5	20.894	500	500	500
Reach 5	20.799	500	500	500
Reach 5	20.704	500	500	500
Reach 5	20.61	490.01	490.01	490.01
Reach 5	20.517	455	467.89	460
Reach 5	20.428	540	396.78	350
Reach 5	20.353	130	102.92	100
Reach 5	20.334	32.13	32.13	32.13
Reach 5	20.328	58.98	58.98	58.98
Reach 5	20.323	Bridge		
Reach 5	20.316	55.66	55.66	55.66
Reach 5	20.306	310.56	310.56	310.56
Reach 5	20.247	1000	1000	1000
Reach 5	20.058	1027.32	1027.32	1027.32
Reach 5	19.863	550	622.24	640
Reach 5	19.745	810.92	810.92	810.92
Reach 5	19.592	269.16	269.16	269.16
Reach 5	19.541	270.65	270.65	270.65
Reach 5	19.489	164.38	164.38	164.38
Reach 5	19.458	350	263.11	250
Reach 5	19.408	700	583.23	560
Reach 5	19.298	1000	1000	1000
Reach 5	19.109	610	731.32	750
Reach 5	18.97	840	994.23	1020
Reach 5	18.782	1510	1300.18	1250
Reach 5	18.535	620	1007.73	1080
Reach 5	18.345	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: EMF

Reach	River Sta.	Contr.	Expan.
Reach 5	24.723	.1	.3
Reach 5	24.621	.1	.3
Reach 5	24.535	.1	.3
Reach 5	24.454	.1	.3

Reach 5	24.32		.1	.3
Reach 5	24.247		.1	.3
Reach 5	24.13		.1	.3
Reach 5	24.1		.1	.3
Reach 5	24.06		.1	.3
Reach 5	23.962		.1	.3
Reach 5	23.911		.1	.3
Reach 5	23.827		.1	.3
Reach 5	23.825		.3	.5
Reach 5	23.815	Bridge		
Reach 5	23.804		.3	.5
Reach 5	23.803		.3	.5
Reach 5	23.758		.1	.3
Reach 5	23.712		.1	.3
Reach 5	23.604		.1	.3
Reach 5	23.45		.1	.3
Reach 5	23.315		.1	.3
Reach 5	23.274		.1	.3
Reach 5	23.219		.3	.5
Reach 5	23.206	Bridge		
Reach 5	23.193		.3	.5
Reach 5	23.166		.1	.3
Reach 5	23.135		.1	.3
Reach 5	23.087		.1	.3
Reach 5	23.009		.1	.3
Reach 5	22.944		.1	.3
Reach 5	22.866		.1	.3
Reach 5	22.797		.1	.3
Reach 5	22.74		.1	.3
Reach 5	22.68		.1	.3
Reach 5	22.615		.3	.5
Reach 5	22.608	Bridge		
Reach 5	22.599		.3	.5
Reach 5	22.557		.1	.3
Reach 5	22.475		.1	.3
Reach 5	22.436		.1	.3
Reach 5	22.348		.1	.3
Reach 5	22.263		.1	.3
Reach 5	22.189		.1	.3
Reach 5	22.107		.1	.3
Reach 5	22.022		.1	.3
Reach 5	21.947		.1	.3
Reach 5	21.839		.1	.3
Reach 5	21.745		.1	.3
Reach 5	21.713		.1	.3
Reach 5	21.656		.1	.3
Reach 5	21.633		.1	.3
Reach 5	21.591		.1	.3
Reach 5	21.531		.1	.3
Reach 5	21.485		.1	.3
Reach 5	21.439		.1	.3
Reach 5	21.418		.1	.3
Reach 5	21.413		.3	.5
Reach 5	21.407	Bridge		
Reach 5	21.402		.3	.5
Reach 5	21.391		.3	.5
Reach 5	21.355		.3	.5
Reach 5	21.339	Bridge		
Reach 5	21.326		.3	.5
Reach 5	21.282		.1	.3
Reach 5	21.188		.1	.3
Reach 5	21.093		.1	.3
Reach 5	21		.1	.3
Reach 5	20.894		.1	.3
Reach 5	20.799		.1	.3
Reach 5	20.704		.1	.3
Reach 5	20.61		.1	.3
Reach 5	20.517		.1	.3
Reach 5	20.428		.1	.3

Reach 5	20.353	.1	.3
Reach 5	20.334	.1	.3
Reach 5	20.328	.3	.5
Reach 5	20.323	Bridge	
Reach 5	20.316	.3	.5
Reach 5	20.306	.3	.5
Reach 5	20.247	.1	.3
Reach 5	20.058	.1	.3
Reach 5	19.863	.1	.3
Reach 5	19.745	.1	.3
Reach 5	19.592	.1	.3
Reach 5	19.541	.1	.3
Reach 5	19.489	.1	.3
Reach 5	19.458	.1	.3
Reach 5	19.408	.1	.3
Reach 5	19.298	.1	.3
Reach 5	19.109	.1	.3
Reach 5	18.97	.1	.3
Reach 5	18.782	.1	.3
Reach 5	18.535	.1	.3
Reach 5	18.345	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 5	24.723	3100.00	1328.84	1341.38	1333.17	1341.47	0.000135	2.34	1324.24	158.22	0.14
Reach 5	24.723	2440.00	1328.84	1340.00	1332.63	1340.08	0.000134	2.19	1113.73	146.71	0.14
Reach 5	24.723	3120.00	1328.84	1340.86	1333.19	1340.96	0.000163	2.51	1243.17	153.89	0.16
Reach 5	24.621	3100.00	1329.41	1341.30	1334.18	1341.36	0.000282	1.97	1571.92	232.92	0.13
Reach 5	24.621	2440.00	1329.41	1339.91	1333.75	1339.97	0.000287	1.91	1277.92	201.40	0.13
Reach 5	24.621	3120.00	1329.41	1340.76	1334.19	1340.83	0.000331	2.15	1453.43	213.71	0.15
Reach 5	24.535	3100.00	1329.50	1341.24	1333.76	1341.27	0.000124	1.42	2180.84	285.49	0.09
Reach 5	24.535	2440.00	1329.50	1339.84	1333.36	1339.87	0.000139	1.36	1792.12	272.58	0.09
Reach 5	24.535	3120.00	1329.50	1340.69	1333.77	1340.72	0.000157	1.54	2024.56	280.37	0.10
Reach 5	24.454	3100.00	1332.11	1341.15	1336.08	1341.19	0.000328	1.62	1914.41	427.85	0.13
Reach 5	24.454	2440.00	1332.11	1339.73	1335.72	1339.78	0.000373	1.72	1414.70	316.86	0.14
Reach 5	24.454	3120.00	1332.11	1340.57	1336.09	1340.62	0.000402	1.85	1687.49	360.17	0.15
Reach 5	24.32	3100.00	1330.52	1340.95	1334.71	1340.99	0.000232	1.57	1974.08	356.49	0.12
Reach 5	24.32	2440.00	1330.52	1339.49	1334.27	1339.53	0.000326	1.65	1476.78	319.54	0.14
Reach 5	24.32	3120.00	1330.52	1340.31	1334.72	1340.36	0.000333	1.78	1748.97	342.94	0.14
Reach 5	24.247	3100.00	1329.56	1340.90	1334.38	1340.92	0.000124	1.22	2538.71	418.44	0.09
Reach 5	24.247	2440.00	1329.56	1339.41	1333.78	1339.44	0.000176	1.26	1933.39	394.45	0.10
Reach 5	24.247	3120.00	1329.56	1340.23	1334.39	1340.26	0.000178	1.38	2262.42	407.93	0.10
Reach 5	24.13	3100.00	1330.19	1340.79	1334.49	1340.82	0.000218	1.46	2128.09	411.25	0.11
Reach 5	24.13	2440.00	1330.19	1339.24	1334.07	1339.28	0.000379	1.61	1513.72	380.38	0.14
Reach 5	24.13	3120.00	1330.19	1340.07	1334.52	1340.11	0.000347	1.70	1834.89	397.70	0.14
Reach 5	24.1	3100.00	1332.95	1340.70	1336.32	1340.77	0.000596	2.09	1482.06	353.40	0.18
Reach 5	24.1	2440.00	1332.95	1339.07	1335.88	1339.17	0.001334	2.57	948.29	303.45	0.26
Reach 5	24.1	3120.00	1332.95	1339.91	1336.33	1340.02	0.001062	2.57	1214.48	328.05	0.24
Reach 5	24.06	3100.00	1332.60	1340.58	1336.52	1340.65	0.000535	2.01	1541.08	359.12	0.17
Reach 5	24.06	2440.00	1332.60	1338.79	1335.95	1338.89	0.001311	2.57	948.24	299.53	0.25
Reach 5	24.06	3120.00	1332.60	1339.69	1336.53	1339.79	0.001026	2.53	1234.48	333.01	0.23
Reach 5	23.962	3100.00	1331.20	1340.33	1335.46	1340.39	0.000461	2.00	1547.51	324.63	0.16
Reach 5	23.962	2440.00	1331.20	1338.04	1335.03	1338.17	0.001483	2.83	862.28	258.82	0.27
Reach 5	23.962	3120.00	1331.20	1339.13	1335.47	1339.24	0.001087	2.66	1172.91	305.96	0.24
Reach 5	23.911	3100.00	1330.30	1340.17	1335.25	1340.24	0.000628	2.25	1380.01	307.00	0.19
Reach 5	23.911	2440.00	1330.30	1337.62	1334.87	1337.78	0.001414	3.21	759.39	181.32	0.28
Reach 5	23.911	3120.00	1330.30	1338.77	1335.26	1338.92	0.001342	3.15	989.03	233.43	0.27
Reach 5	23.827	3500.00	1328.70	1340.03	1332.77	1340.18	0.000058	3.12	1123.08	128.90	0.19
Reach 5	23.827	2440.00	1328.70	1337.56	1331.97	1337.69	0.000067	2.96	824.76	114.25	0.19
Reach 5	23.827	3260.00	1328.70	1338.65	1332.61	1338.83	0.000078	3.42	952.19	119.51	0.21
Reach 5	23.825	3500.00	1328.39	1340.03	1332.49	1340.18	0.000055	3.08	1134.60	126.88	0.18
Reach 5	23.825	2440.00	1328.39	1337.56	1331.65	1337.69	0.000063	2.91	838.30	113.68	0.19
Reach 5	23.825	3260.00	1328.39	1338.65	1332.31	1338.83	0.000075	3.38	965.28	118.88	0.21
Reach 5	23.815	Bridge									
Reach 5	23.804	3500.00	1328.24	1339.98	1332.47	1340.13	0.000055	3.09	1131.72	126.81	0.18
Reach 5	23.804	2440.00	1328.24	1337.51	1331.64	1337.65	0.000063	2.92	836.80	113.69	0.19
Reach 5	23.804	3260.00	1328.24	1338.60	1332.29	1338.78	0.000075	3.39	962.94	118.81	0.21

Reach 5	23.803	3500.00	1328.80	1339.97	1332.64	1340.12	0.000062	3.16	1108.34	129.12	0.19
Reach 5	23.803	2440.00	1328.80	1337.50	1331.85	1337.64	0.000069	3.00	813.95	111.13	0.[illegible]
Reach 5	23.803	3260.00	1328.80	1338.59	1332.47	1338.77	0.000083	3.48	937.34	117.30	0[illegible]
Reach 5	23.758	4800.00	1328.32	1340.00	1331.30	1340.05	0.000173	1.79	2688.12	321.27	0.1[illegible]
Reach 5	23.758	2440.00	1328.32	1337.54	1330.24	1337.57	0.000108	1.25	1948.26	276.98	0.08
Reach 5	23.758	3260.00	1328.32	1338.64	1330.64	1338.67	0.000131	1.44	2264.51	302.53	0.09
Reach 5	23.712	4800.00	1328.32	1339.80	1333.96	1339.96	0.000836	3.15	1521.78	251.70	0.23
Reach 5	23.712	2440.00	1328.32	1337.41	1332.19	1337.50	0.000673	2.48	983.89	198.33	0.20
Reach 5	23.712	3260.00	1328.32	1338.49	1332.86	1338.60	0.000699	2.69	1212.55	222.82	0.20
Reach 5	23.604	4800.00	1328.94	1339.46	1333.71	1339.55	0.000563	2.47	1946.08	347.07	0.18
Reach 5	23.604	2440.00	1328.94	1337.09	1332.48	1337.16	0.000532	2.03	1203.60	275.93	0.17
Reach 5	23.604	3260.00	1328.94	1338.18	1332.95	1338.25	0.000514	2.14	1520.23	312.26	0.17
Reach 5	23.45	4800.00	1328.56	1339.29	1332.35	1339.32	0.000148	1.48	3252.60	460.17	0.10
Reach 5	23.45	2440.00	1328.56	1336.95	1331.57	1336.97	0.000117	1.10	2228.18	413.56	0.08
Reach 5	23.45	3260.00	1328.56	1338.04	1331.86	1338.06	0.000119	1.21	2690.45	436.02	0.09
Reach 5	23.315	4800.00	1327.54	1339.01	1333.30	1339.12	0.000685	2.65	1810.34	335.00	0.20
Reach 5	23.315	2440.00	1327.54	1336.73	1331.60	1336.80	0.000540	2.17	1123.40	234.33	0.17
Reach 5	23.315	3260.00	1327.54	1337.80	1332.23	1337.88	0.000659	2.30	1417.10	315.58	0.19
Reach 5	23.274	4800.00	1328.46	1338.89	1331.96	1339.00	0.000428	2.65	1812.37	234.68	0.17
Reach 5	23.274	2440.00	1328.46	1336.67	1330.81	1336.72	0.000253	1.83	1331.07	201.80	0.13
Reach 5	23.274	3260.00	1328.46	1337.72	1331.24	1337.79	0.000296	2.10	1550.10	214.97	0.14
Reach 5	23.219	4800.00	1326.60	1338.84	1330.77	1338.92	0.000163	2.35	2043.02	222.42	0.14
Reach 5	23.219	2740.00	1326.60	1336.63	1329.81	1336.67	0.000111	1.74	1577.02	203.20	0.11
Reach 5	23.219	3530.00	1326.60	1337.67	1330.20	1337.73	0.000126	1.97	1793.00	209.65	0.12
Reach 5	23.206	Bridge									
Reach 5	23.193	4800.00	1326.10	1338.19	1330.22	1338.28	0.000163	2.35	2039.93	221.50	0.14
Reach 5	23.193	2740.00	1326.10	1336.00	1329.30	1336.05	0.000113	1.74	1576.12	205.01	0.11
Reach 5	23.193	3530.00	1326.10	1337.03	1329.67	1337.09	0.000127	1.97	1791.18	211.24	0.12
Reach 5	23.166	4800.00	1327.40	1338.12	1331.23	1338.23	0.000452	2.72	1766.69	229.51	0.17
Reach 5	23.166	2740.00	1327.40	1335.95	1330.15	1336.02	0.000340	2.11	1300.47	200.13	0.15
Reach 5	23.166	3530.00	1327.40	1336.97	1330.60	1337.06	0.000373	2.33	1513.36	214.27	0.15
Reach 5	23.135	4800.00	1324.83	1338.09	1329.71	1338.16	0.000275	2.19	2193.53	309.39	0.14
Reach 5	23.135	2740.00	1324.83	1335.92	1328.34	1335.96	0.000220	1.69	1620.35	250.44	0.12
Reach 5	23.135	3530.00	1324.83	1336.95	1328.90	1337.00	0.000237	1.87	1886.70	276.51	0.12
Reach 5	23.087	4800.00	1324.80	1337.98	1330.25	1338.06	0.000589	2.27	2113.99	440.46	0.1[illegible]
Reach 5	23.087	2740.00	1324.80	1335.81	1328.76	1335.88	0.000494	2.13	1287.13	258.27	0[illegible]
Reach 5	23.087	3530.00	1324.80	1336.84	1329.38	1336.91	0.000622	2.15	1638.85	385.23	0[illegible]
Reach 5	23.009	4800.00	1327.11	1337.87	1330.78	1337.91	0.000214	1.60	3006.13	498.27	0.1[illegible]
Reach 5	23.009	2740.00	1327.11	1335.71	1329.69	1335.74	0.000207	1.35	2030.63	422.46	0.11
Reach 5	23.009	3530.00	1327.11	1336.73	1330.14	1336.77	0.000191	1.43	2473.25	445.62	0.11
Reach 5	22.944	4800.00	1327.70	1337.48	1333.30	1337.74	0.001351	4.07	1179.14	189.96	0.29
Reach 5	22.944	2740.00	1327.70	1335.40	1332.02	1335.58	0.001357	3.40	805.55	170.82	0.28
Reach 5	22.944	3530.00	1327.70	1336.41	1332.52	1336.61	0.001237	3.59	982.56	178.92	0.27
Reach 5	22.866	4800.00	1326.20	1337.13	1332.41	1337.28	0.000824	3.21	1527.46	284.46	0.23
Reach 5	22.866	2740.00	1326.20	1335.01	1331.44	1335.12	0.000857	2.71	1010.25	213.43	0.22
Reach 5	22.866	3530.00	1326.20	1336.07	1331.83	1336.20	0.000765	2.84	1250.87	242.95	0.21
Reach 5	22.797	4800.00	1326.57	1336.92	1331.90	1337.02	0.000566	2.50	1920.00	336.65	0.18
Reach 5	22.797	2740.00	1326.57	1334.77	1331.03	1334.85	0.000620	2.20	1247.06	284.29	0.18
Reach 5	22.797	3530.00	1326.57	1335.87	1331.41	1335.95	0.000541	2.24	1576.56	315.31	0.18
Reach 5	22.74	4800.00	1326.29	1336.73	1330.54	1336.84	0.000634	2.67	1798.64	311.00	0.20
Reach 5	22.74	2740.00	1326.29	1334.58	1329.46	1334.66	0.000587	2.29	1194.17	244.21	0.18
Reach 5	22.74	3530.00	1326.29	1335.69	1329.91	1335.78	0.000570	2.38	1485.30	282.11	0.18
Reach 5	22.68	4800.00	1326.34	1336.54	1330.59	1336.65	0.000556	2.61	1838.06	297.66	0.19
Reach 5	22.68	2740.00	1326.34	1334.40	1329.49	1334.48	0.000583	2.22	1235.09	264.87	0.18
Reach 5	22.68	3530.00	1326.34	1335.53	1329.94	1335.61	0.000509	2.29	1541.87	284.95	0.17
Reach 5	22.615	4900.00	1326.91	1336.33	1330.37	1336.49	0.000352	3.21	1528.75	185.42	0.20
Reach 5	22.615	2740.00	1326.91	1334.26	1329.36	1334.35	0.000265	2.38	1152.35	177.49	0.16
Reach 5	22.615	3530.00	1326.91	1335.38	1329.75	1335.48	0.000266	2.61	1353.19	181.77	0.17
Reach 5	22.608	Bridge									
Reach 5	22.599	4900.00	1326.67	1336.24	1330.38	1336.41	0.000368	3.25	1507.66	185.57	0.20
Reach 5	22.599	2740.00	1326.67	1334.20	1329.35	1334.29	0.000276	2.41	1137.14	177.24	0.17
Reach 5	22.599	3530.00	1326.67	1335.32	1329.76	1335.42	0.000277	2.64	1337.01	182.02	0.17
Reach 5	22.557	4900.00	1325.50	1336.26	1327.89	1336.30	0.000130	1.69	2891.66	548.49	0.10
Reach 5	22.557	2740.00	1325.50	1334.21	1327.14	1334.23	0.000086	1.20	2281.96	486.10	0.08
Reach 5	22.557	3530.00	1325.50	1335.32	1327.43	1335.35	0.000093	1.35	2611.37	515.22	0.08
Reach 5	22.475	4900.00	1325.50	1336.22	1328.16	1336.25	0.000112	1.31	3791.76	578.11	0.09
Reach 5	22.475	2740.00	1325.50	1334.18	1327.37	1334.19	0.000078	0.99	2771.08	440.62	0.07
Reach 5	22.475	3530.00	1325.50	1335.29	1327.68	1335.31	0.000078	1.08	3271.45	455.67	0.07
Reach 5	22.436	4900.00	1325.51	1336.20	1328.01	1336.22	0.000099	1.32	3708.28	458.27	0.[illegible]
Reach 5	22.436	2740.00	1325.51	1334.16	1327.31	1334.18	0.000069	0.97	2814.35	421.74	0[illegible]

Reach 5	22.436	3530.00	1325.51	1335.28	1327.58	1335.30	0.000072	1.07	3296.19	441.22	0.07
Reach 5	22.348	4900.00	1326.63	1336.11	1330.62	1336.15	0.000238	1.74	2811.77	442.89	0.12
Reach 5	22.348	2740.00	1326.63	1334.09	1329.89	1334.12	0.000238	1.41	1940.98	419.17	0.12
Reach 5	22.348	3530.00	1326.63	1335.21	1330.18	1335.24	0.000198	1.46	2418.54	432.91	0.11
Reach 5	22.263	4900.00	1325.29	1335.86	1330.90	1335.97	0.000828	2.64	1855.63	397.52	0.22
Reach 5	22.263	2740.00	1325.29	1333.86	1329.49	1333.94	0.000711	2.28	1204.31	287.93	0.20
Reach 5	22.263	3530.00	1325.29	1335.01	1330.16	1335.09	0.000621	2.27	1552.55	335.51	0.19
Reach 5	22.189	4900.00	1324.50	1335.35	1329.99	1335.55	0.001333	3.57	1371.20	266.66	0.28
Reach 5	22.189	2740.00	1324.50	1333.52	1328.51	1333.65	0.000775	2.85	959.81	173.62	0.21
Reach 5	22.189	3530.00	1324.50	1334.66	1329.10	1334.80	0.000911	2.96	1192.19	231.03	0.23
Reach 5	22.107	4900.00	1326.00	1335.03	1330.39	1335.15	0.000623	2.72	1804.13	299.17	0.19
Reach 5	22.107	2740.00	1326.00	1333.30	1329.52	1333.36	0.000498	2.09	1309.11	271.47	0.17
Reach 5	22.107	3530.00	1326.00	1334.44	1329.86	1334.51	0.000435	2.17	1629.57	289.91	0.16
Reach 5	22.022	4900.00	1325.91	1334.50	1331.50	1334.70	0.001700	3.62	1351.81	307.79	0.30
Reach 5	22.022	2740.00	1325.91	1332.81	1330.60	1332.97	0.001865	3.17	865.61	258.74	0.30
Reach 5	22.022	3530.00	1325.91	1334.07	1330.96	1334.20	0.001194	2.89	1222.02	300.07	0.25
Reach 5	21.947	4900.00	1325.42	1333.28	1331.01	1333.67	0.004247	5.03	974.51	271.40	0.47
Reach 5	21.947	2740.00	1325.42	1331.67	1329.99	1331.97	0.003466	4.36	628.29	185.94	0.42
Reach 5	21.947	3530.00	1325.42	1333.40	1330.39	1333.59	0.002055	3.51	1006.46	279.14	0.33
Reach 5	21.839	4900.00	1324.20	1333.24	1326.91	1333.29	0.000178	1.65	2966.73	406.27	0.11
Reach 5	21.839	2740.00	1324.20	1331.67	1326.10	1331.69	0.000119	1.17	2335.57	395.92	0.09
Reach 5	21.839	3530.00	1324.20	1333.38	1326.43	1333.40	0.000087	1.17	3020.40	407.14	0.08
Reach 5	21.745	4900.00	1324.22	1333.11	1326.65	1333.18	0.000280	2.13	2301.12	301.62	0.14
Reach 5	21.745	2740.00	1324.22	1331.59	1325.88	1331.62	0.000168	1.48	1853.89	287.18	0.10
Reach 5	21.745	3530.00	1324.22	1333.31	1326.18	1333.34	0.000134	1.49	2362.85	303.30	0.09
Reach 5	21.713	4900.00	1324.20	1332.79	1328.14	1333.06	0.001483	4.22	1162.16	186.83	0.30
Reach 5	21.713	2740.00	1324.20	1331.42	1326.90	1331.56	0.000939	3.00	914.54	174.08	0.23
Reach 5	21.713	3530.00	1324.20	1333.16	1327.38	1333.29	0.000647	2.86	1233.44	190.36	0.20
Reach 5	21.656	4900.00	1314.40	1332.93	1319.48	1332.96	0.000034	1.17	4170.48	328.58	0.06
Reach 5	21.656	2740.00	1314.40	1331.49	1318.34	1331.50	0.000015	0.74	3705.58	317.00	0.04
Reach 5	21.656	3530.00	1314.40	1333.23	1318.80	1333.24	0.000017	0.83	4268.67	331.83	0.04
Reach 5	21.633	4900.00	1315.40	1332.93	1318.69	1332.95	0.000042	1.15	4251.14	337.72	0.06
Reach 5	21.633	2740.00	1315.40	1331.49	1317.66	1331.50	0.000018	0.73	3775.60	323.58	0.04
Reach 5	21.633	3530.00	1315.40	1333.23	1318.06	1333.24	0.000020	0.81	4352.73	340.76	0.04
Reach 5	21.591	4900.00	1315.45	1332.92	1320.91	1332.94	0.000052	1.20	4078.11	356.06	0.06
Reach 5	21.591	2740.00	1315.45	1331.49	1319.01	1331.49	0.000024	0.77	3578.07	342.48	0.04
Reach 5	21.591	3530.00	1315.45	1333.22	1319.59	1333.23	0.000025	0.84	4187.52	358.97	0.04
Reach 5	21.531	4900.00	1315.45	1332.91	1317.85	1332.93	0.000024	0.91	5375.88	394.67	0.04
Reach 5	21.531	2740.00	1315.45	1331.48	1317.09	1331.49	0.000010	0.57	4822.75	379.49	0.03
Reach 5	21.531	3530.00	1315.45	1333.22	1317.39	1333.23	0.000012	0.64	5498.00	397.98	0.03
Reach 5	21.485	4900.00	1315.40	1332.88	1319.72	1332.91	0.000090	1.50	3268.13	308.23	0.08
Reach 5	21.485	2740.00	1315.40	1331.47	1318.43	1331.48	0.000042	0.96	2844.59	292.58	0.05
Reach 5	21.485	3530.00	1315.40	1333.20	1318.94	1333.22	0.000043	1.05	3369.11	311.84	0.06
Reach 5	21.439	4900.00	1315.40	1332.82	1320.21	1332.88	0.000144	1.99	2468.07	215.82	0.10
Reach 5	21.439	2740.00	1315.40	1331.45	1318.78	1331.47	0.000063	1.26	2179.56	202.65	0.07
Reach 5	21.439	3530.00	1315.40	1333.18	1319.34	1333.21	0.000069	1.39	2545.19	218.96	0.07
Reach 5	21.418	4900.00	1324.17	1332.05	1329.22	1332.78	0.001653	6.83	716.99	111.60	0.48
Reach 5	21.418	2740.00	1324.17	1331.12	1327.75	1331.42	0.000823	4.46	614.02	107.63	0.33
Reach 5	21.418	3530.00	1324.17	1332.87	1328.33	1333.16	0.000602	4.36	809.29	115.65	0.29
Reach 5	21.413	4900.00	1322.28	1332.21	1327.46	1332.67	0.000759	5.41	905.73	107.89	0.33
Reach 5	21.413	2740.00	1322.28	1331.19	1325.93	1331.37	0.000358	3.45	795.12	107.86	0.22
Reach 5	21.413	3530.00	1322.28	1332.92	1326.53	1333.12	0.000306	3.59	982.28	107.92	0.21
Reach 5	21.407	Bridge									
Reach 5	21.402	4900.00	1322.54	1332.03	1327.65	1332.52	0.000877	5.66	865.30	108.11	0.35
Reach 5	21.402	2740.00	1322.54	1331.11	1326.13	1331.31	0.000402	3.57	766.73	108.07	0.24
Reach 5	21.402	3530.00	1322.54	1332.86	1326.73	1333.07	0.000334	3.70	955.00	108.15	0.22
Reach 5	21.391	4900.00	1322.68	1331.93	1327.82	1332.46	0.001003	5.84	838.97	112.64	0.38
Reach 5	21.391	2740.00	1322.68	1331.07	1326.31	1331.29	0.000445	3.68	744.11	108.64	0.25
Reach 5	21.391	3530.00	1322.68	1332.83	1326.90	1333.05	0.000373	3.75	941.78	116.81	0.23
Reach 5	21.355	4900.00	1322.56	1331.79	1327.36	1332.25	0.000822	5.46	897.90	113.38	0.34
Reach 5	21.355	2740.00	1322.56	1331.01	1325.89	1331.19	0.000354	3.38	810.01	112.78	0.22
Reach 5	21.355	3530.00	1322.56	1332.78	1326.47	1332.97	0.000295	3.50	1009.93	113.39	0.21
Reach 5	21.339	Bridge									
Reach 5	21.326	4900.00	1322.60	1330.95	1327.47	1331.57	0.001253	6.29	779.21	110.99	0.42
Reach 5	21.326	2740.00	1322.60	1330.76	1325.98	1330.96	0.000425	3.62	757.94	110.24	0.24
Reach 5	21.326	3530.00	1322.60	1332.55	1326.56	1332.76	0.000343	3.68	959.27	113.26	0.22
Reach 5	21.282	4900.00	1322.47	1330.98	1326.37	1331.25	0.000373	4.15	1181.65	169.58	0.28
Reach 5	21.282	4180.00	1322.47	1330.67	1326.01	1330.88	0.000311	3.70	1128.46	167.54	0.25
Reach 5	21.282	5220.00	1322.47	1332.49	1326.52	1332.69	0.000234	3.61	1444.88	179.49	0.22

Reach 5	21.188	4900.00	1322.28	1330.83	1326.32	1331.06	0.000332	3.81	1287.05	192.96	0.26
Reach 5	21.188	4180.00	1322.28	1330.54	1326.00	1330.72	0.000276	3.40	1231.07	190.85	0.
Reach 5	21.188	5220.00	1322.28	1332.41	1326.46	1332.57	0.000197	3.26	1599.62	204.36	0.
Reach 5	21.093	4900.00	1321.82	1330.70	1325.83	1330.90	0.000281	3.61	1355.62	193.64	0.24
Reach 5	21.093	4180.00	1321.82	1330.43	1325.51	1330.59	0.000230	3.21	1304.17	191.92	0.22
Reach 5	21.093	5220.00	1321.82	1332.33	1325.97	1332.48	0.000168	3.11	1679.84	204.15	0.19
Reach 5	21	4900.00	1321.41	1330.58	1325.35	1330.77	0.000246	3.47	1411.50	193.91	0.23
Reach 5	21	4180.00	1321.41	1330.34	1325.03	1330.48	0.000198	3.06	1364.40	192.28	0.20
Reach 5	21	5220.00	1321.41	1332.26	1325.50	1332.40	0.000148	2.99	1746.37	205.12	0.18
Reach 5	20.894	4900.00	1321.60	1330.43	1325.30	1330.62	0.000264	3.55	1378.60	192.71	0.23
Reach 5	20.894	4180.00	1321.60	1330.22	1324.97	1330.37	0.000210	3.12	1337.92	191.23	0.21
Reach 5	20.894	5220.00	1321.60	1332.17	1325.44	1332.31	0.000154	3.03	1724.95	204.81	0.18
Reach 5	20.799	5100.00	1321.43	1330.28	1325.17	1330.49	0.000275	3.67	1389.67	190.93	0.24
Reach 5	20.799	4180.00	1321.43	1330.12	1324.77	1330.26	0.000197	3.08	1358.94	189.88	0.20
Reach 5	20.799	5220.00	1321.43	1332.10	1325.24	1332.24	0.000146	2.99	1747.81	202.77	0.18
Reach 5	20.704	5100.00	1321.02	1330.16	1324.79	1330.35	0.000251	3.57	1429.12	191.29	0.23
Reach 5	20.704	4180.00	1321.02	1330.03	1324.37	1330.17	0.000177	2.97	1405.29	190.46	0.19
Reach 5	20.704	5220.00	1321.02	1332.03	1324.84	1332.16	0.000133	2.90	1800.27	203.82	0.17
Reach 5	20.61	5100.00	1321.01	1330.03	1324.69	1330.23	0.000253	3.57	1426.61	191.60	0.23
Reach 5	20.61	4180.00	1321.01	1329.94	1324.27	1330.08	0.000176	2.96	1410.21	191.03	0.19
Reach 5	20.61	5220.00	1321.01	1331.97	1324.74	1332.10	0.000131	2.88	1811.12	204.66	0.17
Reach 5	20.517	5100.00	1320.90	1329.90	1324.57	1330.10	0.000254	3.58	1426.10	192.09	0.23
Reach 5	20.517	4180.00	1320.90	1329.86	1324.15	1329.99	0.000174	2.95	1417.25	191.78	0.19
Reach 5	20.517	5220.00	1320.90	1331.91	1324.63	1332.03	0.000129	2.86	1824.54	205.81	0.17
Reach 5	20.428	5100.00	1321.04	1329.79	1324.51	1329.98	0.000255	3.57	1429.90	193.63	0.23
Reach 5	20.428	4180.00	1321.04	1329.78	1324.10	1329.91	0.000172	2.93	1428.48	193.58	0.19
Reach 5	20.428	5220.00	1321.04	1331.85	1324.56	1331.97	0.000126	2.83	1843.72	207.49	0.17
Reach 5	20.353	5100.00	1320.90	1329.67	1324.49	1329.88	0.000270	3.64	1399.84	191.92	0.24
Reach 5	20.353	4100.00	1320.90	1329.71	1324.03	1329.84	0.000172	2.91	1407.36	192.20	0.19
Reach 5	20.353	5220.00	1320.90	1331.80	1324.54	1331.92	0.000127	2.84	1925.35	300.14	0.17
Reach 5	20.334	5100.00	1320.59	1329.64	1324.46	1329.85	0.000275	3.68	1386.20	189.99	0.24
Reach 5	20.334	4100.00	1320.59	1329.69	1323.99	1329.83	0.000174	2.94	1395.99	190.35	0.19
Reach 5	20.334	5220.00	1320.59	1331.78	1324.51	1331.91	0.000132	2.89	1809.05	205.06	0.17
Reach 5	20.328	5100.00	1320.85	1329.64	1324.44	1329.84	0.000259	3.60	1418.34	191.92	0.23
Reach 5	20.328	4100.00	1320.85	1329.69	1323.99	1329.82	0.000164	2.87	1428.37	192.16	0.19
Reach 5	20.328	5220.00	1320.85	1331.78	1324.49	1331.90	0.000122	2.84	1839.61	200.72	0.
Reach 5	20.323	Bridge									
Reach 5	20.316	5100.00	1320.83	1329.56	1324.45	1329.77	0.000273	3.65	1395.58	192.03	0.24
Reach 5	20.316	4100.00	1320.83	1329.64	1324.01	1329.78	0.000170	2.91	1411.28	192.40	0.19
Reach 5	20.316	5220.00	1320.83	1331.74	1324.51	1331.87	0.000125	2.86	1824.23	200.98	0.17
Reach 5	20.306	5100.00	1320.70	1329.55	1324.45	1329.75	0.000274	3.63	1405.66	196.39	0.24
Reach 5	20.306	4100.00	1320.70	1329.64	1323.99	1329.76	0.000171	2.88	1422.76	197.05	0.19
Reach 5	20.306	5220.00	1320.70	1331.73	1324.50	1331.86	0.000128	2.82	1852.91	212.87	0.17
Reach 5	20.247	5100.00	1320.62	1329.47	1324.19	1329.67	0.000256	3.56	1430.67	194.44	0.23
Reach 5	20.247	4100.00	1320.62	1329.59	1323.73	1329.71	0.000158	2.82	1453.53	195.27	0.18
Reach 5	20.247	5220.00	1320.62	1331.70	1324.24	1331.82	0.000113	2.71	2107.75	375.48	0.16
Reach 5	20.058	5100.00	1320.10	1329.23	1323.71	1329.42	0.000232	3.46	1473.99	203.95	0.22
Reach 5	20.058	4100.00	1320.10	1329.45	1323.26	1329.56	0.000138	2.71	1519.91	226.03	0.17
Reach 5	20.058	5220.00	1320.10	1331.61	1323.76	1331.71	0.000096	2.56	2324.42	386.98	0.15
Reach 5	19.863	5100.00	1319.74	1329.01	1323.34	1329.19	0.000217	3.38	1509.27	222.62	0.21
Reach 5	19.863	4100.00	1319.74	1329.32	1322.89	1329.42	0.000124	2.61	1581.09	242.75	0.16
Reach 5	19.863	5220.00	1319.74	1331.52	1323.39	1331.61	0.000089	2.51	2290.48	353.31	0.14
Reach 5	19.745	5100.00	1319.61	1328.87	1323.23	1329.05	0.000220	3.39	1506.12	240.58	0.22
Reach 5	19.745	4100.00	1319.61	1329.24	1322.76	1329.35	0.000123	2.60	1606.20	289.19	0.16
Reach 5	19.745	5220.00	1319.61	1331.47	1323.28	1331.56	0.000085	2.46	2421.94	398.75	0.14
Reach 5	19.592	5100.00	1319.50	1328.69	1323.18	1328.87	0.000232	3.44	1482.27	197.44	0.22
Reach 5	19.592	4100.00	1319.50	1329.14	1322.72	1329.25	0.000126	2.61	1582.52	247.77	0.16
Reach 5	19.592	5220.00	1319.50	1331.40	1323.23	1331.49	0.000085	2.47	2394.47	394.66	0.14
Reach 5	19.541	5300.00	1319.56	1328.60	1323.21	1328.80	0.000250	3.57	1483.73	197.75	0.23
Reach 5	19.541	4100.00	1319.56	1329.11	1322.68	1329.21	0.000123	2.59	1587.85	224.42	0.16
Reach 5	19.541	5220.00	1319.56	1331.37	1323.18	1331.46	0.000084	2.46	2375.27	389.90	0.14
Reach 5	19.489	5300.00	1319.60	1328.53	1323.22	1328.73	0.000258	3.61	1469.64	197.76	0.23
Reach 5	19.489	4100.00	1319.60	1329.07	1322.69	1329.18	0.000125	2.60	1577.70	201.54	0.16
Reach 5	19.489	5220.00	1319.60	1331.35	1323.19	1331.44	0.000084	2.46	2389.59	391.45	0.14
Reach 5	19.458	5300.00	1319.39	1328.49	1323.11	1328.69	0.000252	3.59	1477.70	197.01	0.23
Reach 5	19.458	4100.00	1319.39	1329.05	1322.57	1329.16	0.000122	2.58	1590.04	208.46	0.16
Reach 5	19.458	5220.00	1319.39	1331.34	1323.07	1331.43	0.000083	2.47	2345.45	388.16	0.14
Reach 5	19.408	5300.00	1319.19	1328.44	1322.76	1328.62	0.000226	3.46	1532.59	214.82	0.22
Reach 5	19.408	4100.00	1319.19	1329.03	1322.23	1329.13	0.000108	2.48	1672.62	250.98	0.15
Reach 5	19.408	5220.00	1319.19	1331.32	1322.73	1331.40	0.000072	2.35	2577.81	419.61	0.

Reach 5	19.298	5900.00	1319.02	1328.24	1322.88	1328.47	0.000287	3.87	1523.92	199.57	0.25
Reach 5	19.298	4120.00	1319.02	1328.97	1322.10	1329.06	0.000106	2.47	1671.37	204.74	0.15
Reach 5	19.298	5860.00	1319.02	1331.27	1322.87	1331.36	0.000081	2.51	3218.59	915.80	0.14
Reach 5	19.109	5900.00	1318.80	1327.94	1322.71	1328.18	0.000295	3.90	1512.56	200.19	0.25
Reach 5	19.109	4120.00	1318.80	1328.87	1321.92	1328.96	0.000101	2.42	1700.91	213.51	0.15
Reach 5	19.109	5860.00	1318.80	1331.19	1322.68	1331.28	0.000075	2.44	3418.28	1033.41	0.13
Reach 5	18.97	6500.00	1318.41	1327.67	1322.66	1327.94	0.000344	4.18	1553.36	207.69	0.27
Reach 5	18.97	4690.00	1318.41	1328.77	1321.93	1328.88	0.000118	2.63	1786.17	219.28	0.16
Reach 5	18.97	7400.00	1318.41	1331.09	1323.01	1331.21	0.000109	2.93	3657.49	1172.95	0.16
Reach 5	18.782	6500.00	1318.05	1327.37	1322.02	1327.62	0.000297	3.98	1632.24	210.24	0.25
Reach 5	18.782	4690.00	1318.05	1328.67	1321.29	1328.77	0.000095	2.44	1980.38	272.67	0.15
Reach 5	18.782	7400.00	1318.05	1331.02	1322.35	1331.11	0.000076	2.54	4866.01	1570.22	0.13
Reach 5	18.535	6500.00	1317.85	1326.91	1322.00	1327.19	0.000358	4.25	1530.52	206.05	0.27
Reach 5	18.535	4690.00	1317.85	1328.54	1321.27	1328.64	0.000102	2.50	1875.65	217.59	0.15
Reach 5	18.535	7400.00	1317.85	1330.97	1322.34	1331.01	0.000052	2.10	6788.92	1777.09	0.11
Reach 5	18.345	6500.00	1317.07	1326.53	1321.24	1326.78	0.000441	4.05	1605.11	206.25	0.26
Reach 5	18.345	4700.00	1317.07	1328.44	1320.53	1328.52	0.000117	2.33	2058.88	281.36	0.14
Reach 5	18.345	7840.00	1317.07	1330.80	1321.75	1330.93	0.000139	2.95	3128.28	565.69	0.15

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach 5	24.723	1341.47	1341.38	0.09	0.10	0.01		3100.00		158.22
Reach 5	24.723	1340.08	1340.00	0.07	0.10	0.01		2440.00		146.71
Reach 5	24.723	1340.96	1340.86	0.10	0.12	0.01		3120.00		153.89
Reach 5	24.621	1341.36	1341.30	0.06	0.08	0.01		3100.00		232.92
Reach 5	24.621	1339.97	1339.91	0.06	0.09	0.01		2440.00		201.40
Reach 5	24.621	1340.83	1340.76	0.07	0.10	0.01		3120.00		213.71
Reach 5	24.535	1341.27	1341.24	0.03	0.08	0.00		3100.00		285.49
Reach 5	24.535	1339.87	1339.84	0.03	0.09	0.00		2440.00		272.58
Reach 5	24.535	1340.72	1340.69	0.04	0.10	0.00		3120.00		280.37
Reach 5	24.454	1341.19	1341.15	0.04	0.19	0.00		3100.00		427.85
Reach 5	24.454	1339.78	1339.73	0.05	0.25	0.00		2440.00		316.86
Reach 5	24.454	1340.62	1340.57	0.05	0.26	0.00		3120.00		360.17
Reach 5	24.32	1340.99	1340.95	0.04	0.06	0.00		3100.00		356.49
Reach 5	24.32	1339.53	1339.49	0.04	0.09	0.01		2440.00		319.54
Reach 5	24.32	1340.36	1340.31	0.05	0.09	0.01		3120.00		342.94
Reach 5	24.247	1340.92	1340.90	0.02	0.10	0.00		3100.00		418.44
Reach 5	24.247	1339.44	1339.41	0.02	0.15	0.00		2440.00		394.45
Reach 5	24.247	1340.26	1340.23	0.03	0.15	0.00		3120.00		407.93
Reach 5	24.13	1340.82	1340.79	0.03	0.05	0.00		3100.00		411.25
Reach 5	24.13	1339.28	1339.24	0.04	0.10	0.01		2440.00		380.38
Reach 5	24.13	1340.11	1340.07	0.04	0.09	0.01		3120.00		397.70
Reach 5	24.1	1340.77	1340.70	0.07	0.12	0.00		3100.00		353.40
Reach 5	24.1	1339.17	1339.07	0.10	0.28	0.00		2440.00		303.45
Reach 5	24.1	1340.02	1339.91	0.10	0.22	0.00		3120.00		328.05
Reach 5	24.06	1340.65	1340.58	0.06	0.26	0.00		3100.00		359.12
Reach 5	24.06	1338.89	1338.79	0.10	0.72	0.00		2440.00		299.53
Reach 5	24.06	1339.79	1339.69	0.10	0.55	0.00		3120.00		333.01
Reach 5	23.962	1340.39	1340.33	0.06	0.14	0.00		3100.00		324.63
Reach 5	23.962	1338.17	1338.04	0.12	0.38	0.00		2440.00		258.82
Reach 5	23.962	1339.24	1339.13	0.11	0.32	0.00		3120.00		305.96
Reach 5	23.911	1340.24	1340.17	0.08	0.06	0.01		3100.00		307.00
Reach 5	23.911	1337.78	1337.62	0.16	0.08	0.01		2440.00		181.32
Reach 5	23.911	1338.92	1338.77	0.15	0.09	0.00		3120.00		233.43
Reach 5	23.827	1340.18	1340.03	0.15	0.00	0.00		3500.00		128.90
Reach 5	23.827	1337.69	1337.56	0.14	0.00	0.00		2440.00		114.25
Reach 5	23.827	1338.83	1338.65	0.18	0.00	0.00		3260.00		119.51
Reach 5	23.825	1340.18	1340.03	0.15	0.00	0.01		3500.00		126.88
Reach 5	23.825	1337.69	1337.56	0.13				2440.00		113.68
Reach 5	23.825	1338.83	1338.65	0.18				3260.00		118.88
Reach 5	23.815	Bridge								
Reach 5	23.804	1340.13	1339.98	0.15	0.00	0.00		3500.00		126.81
Reach 5	23.804	1337.65	1337.51	0.13	0.00	0.00		2440.00		113.69
Reach 5	23.804	1338.78	1338.60	0.18	0.00	0.00		3260.00		118.81
Reach 5	23.803	1340.12	1339.97	0.15	0.02	0.05		3500.00		129.12
Reach 5	23.803	1337.64	1337.50	0.14	0.02	0.06		2440.00		111.13
Reach 5	23.803	1338.77	1338.59	0.19	0.02	0.08		3260.00		117.30
Reach 5	23.758	1340.05	1340.00	0.05	0.08	0.01		4800.00		321.27
Reach 5	23.758	1337.57	1337.54	0.02	0.05	0.01		2440.00		276.98

Reach 5	23.758	1338.67	1338.64	0.03	0.06	0.01		3260.00		302.53
Reach 5	23.712	1339.96	1339.80	0.15	0.39	0.02		4800.00		251.70
Reach 5	23.712	1337.50	1337.41	0.10	0.34	0.01		2440.00		198.33
Reach 5	23.712	1338.60	1338.49	0.11	0.34	0.01		3260.00		222.82
Reach 5	23.604	1339.55	1339.46	0.09	0.21	0.02		4800.00		347.07
Reach 5	23.604	1337.16	1337.09	0.06	0.18	0.01		2440.00		275.93
Reach 5	23.604	1338.25	1338.18	0.07	0.18	0.01		3260.00		312.26
Reach 5	23.45	1339.32	1339.29	0.03	0.20	0.01		4800.00		460.17
Reach 5	23.45	1336.97	1336.95	0.02	0.16	0.01		2440.00		413.56
Reach 5	23.45	1338.06	1338.04	0.02	0.17	0.01		3260.00		436.02
Reach 5	23.315	1339.12	1339.01	0.11	0.12	0.00		4800.00		335.00
Reach 5	23.315	1336.80	1336.73	0.07	0.08	0.01		2440.00		234.33
Reach 5	23.315	1337.88	1337.80	0.08	0.09	0.00		3260.00		315.58
Reach 5	23.274	1339.00	1338.89	0.11	0.07	0.01		4800.00		234.68
Reach 5	23.274	1336.72	1336.67	0.05	0.05	0.00		2440.00		201.80
Reach 5	23.274	1337.79	1337.72	0.07	0.05	0.00		3260.00		214.97
Reach 5	23.219	1338.92	1338.84	0.09				4800.00		222.42
Reach 5	23.219	1336.67	1336.63	0.05				2740.00		203.20
Reach 5	23.219	1337.73	1337.67	0.06				3530.00		209.65
Reach 5	23.206	Bridge								
Reach 5	23.193	1338.28	1338.19	0.09	0.04	0.01		4800.00		221.50
Reach 5	23.193	1336.05	1336.00	0.05	0.03	0.01		2740.00		205.01
Reach 5	23.193	1337.09	1337.03	0.06	0.03	0.01		3530.00		211.24
Reach 5	23.166	1338.23	1338.12	0.11	0.06	0.01		4800.00		229.51
Reach 5	23.166	1336.02	1335.95	0.07	0.04	0.01		2740.00		200.13
Reach 5	23.166	1337.06	1336.97	0.08	0.05	0.01		3530.00		214.27
Reach 5	23.135	1338.16	1338.09	0.07	0.10	0.00		4800.00		309.39
Reach 5	23.135	1335.96	1335.92	0.04	0.08	0.00		2740.00		250.44
Reach 5	23.135	1337.00	1336.95	0.05	0.09	0.00		3530.00		276.51
Reach 5	23.087	1338.06	1337.98	0.08	0.14	0.01		4800.00		440.46
Reach 5	23.087	1335.88	1335.81	0.07	0.13	0.01		2740.00		258.27
Reach 5	23.087	1336.91	1336.84	0.07	0.13	0.01		3530.00		385.23
Reach 5	23.009	1337.91	1337.87	0.04	0.15	0.02		4800.00		498.27
Reach 5	23.009	1335.74	1335.71	0.03	0.15	0.02		2740.00		422.46
Reach 5	23.009	1336.77	1336.73	0.03	0.13	0.02		3530.00		445.62
Reach 5	22.944	1337.74	1337.48	0.26	0.43	0.03		4800.00		189.96
Reach 5	22.944	1335.58	1335.40	0.18	0.44	0.02		2740.00		170.82
Reach 5	22.944	1336.61	1336.41	0.20	0.39	0.02		3530.00		178.92
Reach 5	22.866	1337.28	1337.13	0.16	0.25	0.02		4769.72	30.28	284.46
Reach 5	22.866	1335.12	1335.01	0.11	0.26	0.01		2740.00		213.43
Reach 5	22.866	1336.20	1336.07	0.12	0.23	0.01		3526.69	3.31	242.95
Reach 5	22.797	1337.02	1336.92	0.10	0.18	0.00		4800.00		336.65
Reach 5	22.797	1334.85	1334.77	0.07	0.18	0.00		2740.00		284.29
Reach 5	22.797	1335.95	1335.87	0.08	0.17	0.00		3530.00		315.31
Reach 5	22.74	1336.84	1336.73	0.11	0.19	0.00		4800.00		311.00
Reach 5	22.74	1334.66	1334.58	0.08	0.19	0.00		2740.00		244.21
Reach 5	22.74	1335.78	1335.69	0.09	0.17	0.00		3530.00		282.11
Reach 5	22.68	1336.65	1336.54	0.11	0.15	0.01		4800.00		297.66
Reach 5	22.68	1334.48	1334.40	0.08	0.13	0.00		2740.00		264.87
Reach 5	22.68	1335.61	1335.53	0.08	0.12	0.00		3530.00		284.95
Reach 5	22.615	1336.49	1336.33	0.16	0.00	0.01		4900.00		185.42
Reach 5	22.615	1334.35	1334.26	0.09	0.00	0.00		2740.00		177.49
Reach 5	22.615	1335.48	1335.38	0.11	0.00	0.00		3530.00		181.77
Reach 5	22.608	Bridge								
Reach 5	22.599	1336.41	1336.24	0.16	0.05	0.06		4900.00		185.57
Reach 5	22.599	1334.29	1334.20	0.09	0.03	0.03		2740.00		177.24
Reach 5	22.599	1335.42	1335.32	0.11	0.03	0.04		3530.00		182.02
Reach 5	22.557	1336.30	1336.26	0.04	0.05	0.01		4900.00		548.49
Reach 5	22.557	1334.23	1334.21	0.02	0.04	0.00		2740.00		486.10
Reach 5	22.557	1335.35	1335.32	0.03	0.04	0.00		3530.00		515.22
Reach 5	22.475	1336.25	1336.22	0.03	0.02	0.00	27.20	4872.79		578.11
Reach 5	22.475	1334.19	1334.18	0.02	0.02	0.00		2740.00		440.62
Reach 5	22.475	1335.31	1335.29	0.02	0.02	0.00		3530.00		455.67
Reach 5	22.436	1336.22	1336.20	0.03	0.07	0.00		4900.00		458.27
Reach 5	22.436	1334.18	1334.16	0.01	0.05	0.00		2740.00		421.74
Reach 5	22.436	1335.30	1335.28	0.02	0.05	0.00		3530.00		441.22
Reach 5	22.348	1336.15	1336.11	0.05	0.18	0.01		4900.00		442.89
Reach 5	22.348	1334.12	1334.09	0.03	0.17	0.00		2740.00		419.17
Reach 5	22.348	1335.24	1335.21	0.03	0.14	0.00		3530.00		432.91

Reach 5	22.263	1335.97	1335.86	0.11	0.41	0.01	4900.00	397.52
Reach 5	22.263	1333.94	1333.86	0.08	0.29	0.00	2740.00	287.93
Reach 5	22.263	1335.09	1335.01	0.08	0.29	0.01	3530.00	335.51
Reach 5	22.189	1335.55	1335.35	0.20	0.38	0.03	4900.00	266.66
Reach 5	22.189	1333.65	1333.52	0.13	0.27	0.02	2740.00	173.62
Reach 5	22.189	1334.80	1334.66	0.14	0.26	0.02	3530.00	231.03
Reach 5	22.107	1335.15	1335.03	0.11	0.43	0.01	4900.00	299.17
Reach 5	22.107	1333.36	1333.30	0.07	0.39	0.01	2740.00	271.47
Reach 5	22.107	1334.51	1334.44	0.07	0.30	0.01	3530.00	289.91
Reach 5	22.022	1334.70	1334.50	0.20	1.01	0.02	4900.00	307.79
Reach 5	22.022	1332.97	1332.81	0.16	0.99	0.01	2740.00	258.74
Reach 5	22.022	1334.20	1334.07	0.13	0.61	0.01	3530.00	300.07
Reach 5	21.947	1333.67	1333.28	0.39	0.28	0.11	4900.00	271.40
Reach 5	21.947	1331.97	1331.67	0.30	0.19	0.08	2740.00	185.94
Reach 5	21.947	1333.59	1333.40	0.19	0.14	0.05	3530.00	279.14
Reach 5	21.839	1333.29	1333.24	0.04	0.11	0.00	4900.00	406.27
Reach 5	21.839	1331.69	1331.67	0.02	0.07	0.00	2740.00	395.92
Reach 5	21.839	1333.40	1333.38	0.02	0.05	0.00	3530.00	407.14
Reach 5	21.745	1333.18	1333.11	0.07	0.09	0.02	4900.00	301.62
Reach 5	21.745	1331.62	1331.59	0.03	0.06	0.01	2740.00	287.18
Reach 5	21.745	1333.34	1333.31	0.03	0.04	0.01	3530.00	303.30
Reach 5	21.713	1333.06	1332.79	0.28	0.03	0.08	4900.00	186.83
Reach 5	21.713	1331.56	1331.42	0.14	0.01	0.04	2740.00	174.08
Reach 5	21.713	1333.29	1333.16	0.13	0.01	0.03	3530.00	190.36
Reach 5	21.656	1332.96	1332.93	0.02	0.00	0.00	4900.00	328.58
Reach 5	21.656	1331.50	1331.49	0.01	0.00	0.00	2740.00	317.00
Reach 5	21.656	1333.24	1333.23	0.01	0.00	0.00	3530.00	331.83
Reach 5	21.633	1332.95	1332.93	0.02	0.01	0.00	4900.00	337.72
Reach 5	21.633	1331.50	1331.49	0.01	0.00	0.00	2740.00	323.58
Reach 5	21.633	1333.24	1333.23	0.01	0.01	0.00	3530.00	340.76
Reach 5	21.591	1332.94	1332.92	0.02	0.01	0.00	4900.00	356.06
Reach 5	21.591	1331.49	1331.49	0.01	0.00	0.00	2740.00	342.48
Reach 5	21.591	1333.23	1333.22	0.01	0.01	0.00	3530.00	358.97
Reach 5	21.531	1332.93	1332.91	0.01	0.01	0.00	4900.00	394.67
Reach 5	21.531	1331.49	1331.48	0.01	0.00	0.00	2740.00	379.49
Reach 5	21.531	1333.23	1333.22	0.01	0.00	0.00	3530.00	397.98
Reach 5	21.485	1332.91	1332.88	0.03	0.03	0.00	4900.00	308.23
Reach 5	21.485	1331.48	1331.47	0.01	0.01	0.00	2740.00	292.58
Reach 5	21.485	1333.22	1333.20	0.02	0.01	0.00	3530.00	311.84
Reach 5	21.439	1332.88	1332.82	0.06	0.04	0.07	4900.00	215.82
Reach 5	21.439	1331.47	1331.45	0.02	0.02	0.03	2740.00	202.65
Reach 5	21.439	1333.21	1333.18	0.03	0.02	0.03	3530.00	218.96
Reach 5	21.418	1332.78	1332.05	0.73	0.03	0.08	4900.00	111.60
Reach 5	21.418	1331.42	1331.12	0.31	0.01	0.04	2740.00	107.63
Reach 5	21.418	1333.16	1332.87	0.30	0.01	0.03	3530.00	115.65
Reach 5	21.413	1332.67	1332.21	0.45	0.00	0.02	4900.00	107.89
Reach 5	21.413	1331.37	1331.19	0.18	0.00	0.01	2740.00	107.86
Reach 5	21.413	1333.12	1332.92	0.20	0.00	0.01	3530.00	107.92
Reach 5	21.407	Bridge						
Reach 5	21.402	1332.52	1332.03	0.50	0.05	0.01	4900.00	108.11
Reach 5	21.402	1331.31	1331.11	0.20	0.02	0.00	2740.00	108.07
Reach 5	21.402	1333.07	1332.86	0.21	0.02	0.00	3530.00	108.15
Reach 5	21.391	1332.46	1331.93	0.53	0.18	0.03	4900.00	112.64
Reach 5	21.391	1331.29	1331.07	0.21	0.08	0.02	2740.00	108.64
Reach 5	21.391	1333.05	1332.83	0.22	0.06	0.01	3530.00	116.81
Reach 5	21.355	1332.25	1331.79	0.46	0.00	0.05	4900.00	113.38
Reach 5	21.355	1331.19	1331.01	0.18	0.00	0.02	2740.00	112.78
Reach 5	21.355	1332.97	1332.78	0.19	0.00	0.02	3530.00	113.39
Reach 5	21.339	Bridge						
Reach 5	21.326	1331.57	1330.95	0.61	0.14	0.17	4900.00	110.99
Reach 5	21.326	1330.96	1330.76	0.20	0.08	0.00	2740.00	110.24
Reach 5	21.326	1332.76	1332.55	0.21	0.06	0.00	3530.00	113.26
Reach 5	21.282	1331.25	1330.98	0.27	0.18	0.01	4900.00	169.58
Reach 5	21.282	1330.88	1330.67	0.21	0.15	0.01	4180.00	167.54
Reach 5	21.282	1332.69	1332.49	0.20	0.11	0.01	5220.00	179.49
Reach 5	21.188	1331.06	1330.83	0.23	0.15	0.01	4900.00	192.96
Reach 5	21.188	1330.72	1330.54	0.18	0.13	0.01	4180.00	190.85
Reach 5	21.188	1332.57	1332.41	0.17	0.09	0.00	5220.00	204.36
Reach 5	21.093	1330.90	1330.70	0.20	0.13	0.00	4900.00	193.64
Reach 5	21.093	1330.59	1330.43	0.16	0.10	0.00	4180.00	191.92

Reach 5	21.093	1332.48	1332.33	0.15	0.08	0.00		5220.00		204.15
Reach 5	21	1330.77	1330.58	0.19	0.14	0.00		4900.00		193.91
Reach 5	21	1330.48	1330.34	0.15	0.11	0.00		4180.00		192.28
Reach 5	21	1332.40	1332.26	0.14	0.08	0.00		5220.00		205.12
Reach 5	20.894	1330.62	1330.43	0.20	0.13	0.00		4900.00		192.71
Reach 5	20.894	1330.37	1330.22	0.15	0.10	0.00		4180.00		191.23
Reach 5	20.894	1332.31	1332.17	0.14	0.07	0.00		5220.00		204.81
Reach 5	20.799	1330.49	1330.28	0.21	0.13	0.00		5100.00		190.93
Reach 5	20.799	1330.26	1330.12	0.15	0.09	0.00		4180.00		189.88
Reach 5	20.799	1332.24	1332.10	0.14	0.07	0.00		5220.00		202.77
Reach 5	20.704	1330.35	1330.16	0.20	0.13	0.00		5100.00		191.29
Reach 5	20.704	1330.17	1330.03	0.14	0.09	0.00		4180.00		190.46
Reach 5	20.704	1332.16	1332.03	0.13	0.07	0.00		5220.00		203.82
Reach 5	20.61	1330.23	1330.03	0.20	0.12	0.00		5100.00		191.60
Reach 5	20.61	1330.08	1329.94	0.14	0.09	0.00		4180.00		191.03
Reach 5	20.61	1332.10	1331.97	0.13	0.06	0.00		5220.00		204.66
Reach 5	20.517	1330.10	1329.90	0.20	0.12	0.00		5100.00		192.09
Reach 5	20.517	1329.99	1329.86	0.14	0.08	0.00		4180.00		191.78
Reach 5	20.517	1332.03	1331.91	0.13	0.06	0.00		5220.00		205.81
Reach 5	20.428	1329.98	1329.79	0.20	0.10	0.00		5100.00		193.63
Reach 5	20.428	1329.91	1329.78	0.13	0.07	0.00		4180.00		193.58
Reach 5	20.428	1331.97	1331.85	0.12	0.05	0.00		5220.00		207.49
Reach 5	20.353	1329.88	1329.67	0.21	0.03	0.00		5100.00		191.92
Reach 5	20.353	1329.84	1329.71	0.13	0.02	0.00		4100.00		192.20
Reach 5	20.353	1331.92	1331.80	0.12	0.01	0.00		5175.27	44.73	300.14
Reach 5	20.334	1329.85	1329.64	0.21	0.01	0.00		5100.00		189.99
Reach 5	20.334	1329.83	1329.69	0.13	0.01	0.00		4100.00		190.35
Reach 5	20.334	1331.91	1331.78	0.13	0.00	0.00		5220.00		205.06
Reach 5	20.328	1329.84	1329.64	0.20	0.00	0.01		5100.00		191.92
Reach 5	20.328	1329.82	1329.69	0.13	0.00	0.01		4100.00		192.16
Reach 5	20.328	1331.90	1331.78	0.13	0.00	0.01		5220.00		200.72
Reach 5	20.323	Bridge								
Reach 5	20.316	1329.77	1329.56	0.21	0.02	0.00		5100.00		192.03
Reach 5	20.316	1329.78	1329.64	0.13	0.01	0.00		4100.00		192.40
Reach 5	20.316	1331.87	1331.74	0.13	0.01	0.00		5220.00		200.98
Reach 5	20.306	1329.75	1329.55	0.20	0.08	0.00		5100.00		196.39
Reach 5	20.306	1329.76	1329.64	0.13	0.05	0.00		4100.00		197.05
Reach 5	20.306	1331.86	1331.73	0.12	0.04	0.01		5220.00		212.87
Reach 5	20.247	1329.67	1329.47	0.20	0.24	0.00		5100.00		194.44
Reach 5	20.247	1329.71	1329.59	0.12	0.15	0.00		4100.00		195.27
Reach 5	20.247	1331.82	1331.70	0.11	0.10	0.00	25.79	5107.56	86.65	375.48
Reach 5	20.058	1329.42	1329.23	0.19	0.23	0.00	0.03	5099.97		203.95
Reach 5	20.058	1329.56	1329.45	0.11	0.13	0.00	0.64	4099.36		226.03
Reach 5	20.058	1331.71	1331.61	0.10	0.09	0.00	73.42	4999.60	146.98	386.98
Reach 5	19.863	1329.19	1329.01	0.18	0.14	0.00	0.01	5099.99		222.62
Reach 5	19.863	1329.42	1329.32	0.11	0.08	0.00	1.95	4098.05		242.75
Reach 5	19.863	1331.61	1331.52	0.10	0.05	0.00	96.90	5075.04	48.06	353.31
Reach 5	19.745	1329.05	1328.87	0.18	0.18	0.00	0.34	5099.66		240.58
Reach 5	19.745	1329.35	1329.24	0.10	0.10	0.00	6.17	4093.83		289.19
Reach 5	19.745	1331.56	1331.47	0.09	0.07	0.00	171.66	4997.95	50.39	398.75
Reach 5	19.592	1328.87	1328.69	0.18	0.06	0.00		5100.00		197.44
Reach 5	19.592	1329.25	1329.14	0.11	0.03	0.00	1.40	4098.60		247.77
Reach 5	19.592	1331.49	1331.40	0.09	0.02	0.00	146.79	5032.15	41.06	394.66
Reach 5	19.541	1328.80	1328.60	0.20	0.07	0.00		5300.00		197.75
Reach 5	19.541	1329.21	1329.11	0.10	0.03	0.00	0.47	4099.53		224.42
Reach 5	19.541	1331.46	1331.37	0.09	0.02	0.00	115.59	5059.01	45.40	389.90
Reach 5	19.489	1328.73	1328.53	0.20	0.04	0.00		5300.00		197.76
Reach 5	19.489	1329.18	1329.07	0.10	0.02	0.00		4100.00		201.54
Reach 5	19.489	1331.44	1331.35	0.09	0.01	0.00	133.19	5045.63	41.18	391.45
Reach 5	19.458	1328.69	1328.49	0.20	0.06	0.00		5300.00		197.01
Reach 5	19.458	1329.16	1329.05	0.10	0.03	0.00	0.03	4099.97		208.46
Reach 5	19.458	1331.43	1331.34	0.09	0.02	0.00	89.01	5088.53	42.46	388.16
Reach 5	19.408	1328.62	1328.44	0.19	0.15	0.00	0.29	5299.71		214.82
Reach 5	19.408	1329.13	1329.03	0.10	0.06	0.00	5.17	4094.83		258.98
Reach 5	19.408	1331.40	1331.32	0.08	0.05	0.00	187.04	4980.27	52.69	419.61
Reach 5	19.298	1328.47	1328.24	0.23	0.29	0.00		5900.00		199.57
Reach 5	19.298	1329.06	1328.97	0.09	0.10	0.00		4120.00		204.74
Reach 5	19.298	1331.36	1331.27	0.09	0.08	0.00	426.91	5388.39	44.70	915.80
Reach 5	19.109	1328.18	1327.94	0.24	0.23	0.00		5900.00		200.19
Reach 5	19.109	1328.96	1328.87	0.09	0.08	0.00		4119.94	0.06	213.51

Reach 5	19.109	1331.28	1331.19	0.08	0.07	0.00	458.07	5334.11	67.82	1033.41
Reach 5	18.97	1327.94	1327.67	0.27	0.32	0.01		6500.00		207.69
Reach 5	18.97	1328.88	1328.77	0.11	0.10	0.00		4689.95	0.05	219.28
Reach 5	18.97	1331.21	1331.09	0.12	0.09	0.01	612.17	6723.90	63.93	1172.95
Reach 5	18.782	1327.62	1327.37	0.25	0.42	0.00		6500.00		210.24
Reach 5	18.782	1328.77	1328.67	0.09	0.13	0.00		4661.30	28.70	272.67
Reach 5	18.782	1331.11	1331.02	0.08	0.08	0.01	1087.03	6174.35	138.63	1570.22
Reach 5	18.535	1327.19	1326.91	0.28	0.40	0.01		6500.00		206.05
Reach 5	18.535	1328.64	1328.54	0.10	0.11	0.00		4690.00		217.59
Reach 5	18.535	1331.01	1330.97	0.05	0.08	0.01	2239.96	5051.40	108.64	1777.09
Reach 5	18.345	1326.78	1326.53	0.25				6500.00		206.25
Reach 5	18.345	1328.52	1328.44	0.08			16.01	4683.99		281.36
Reach 5	18.345	1330.93	1330.80	0.13			243.82	7459.00	137.19	565.69

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Reach 5

River: EMF Reach: Reach 5 RS: 24.723 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.723 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.723 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.621 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.621 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.621 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.535 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.535 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.535 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.454 Profile: Design
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 24.247 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.13 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.13 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.13 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 24.1 Profile: Design
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 24.1 Profile: Future
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 24.1 Profile: Existing
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 24.06 Profile: Design
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 24.06 Profile: Future
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 24.06 Profile: Existing
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 23.962 Profile: Future
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 23.911 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.911 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.911 Profile: Existing
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: EMF Reach: Reach 5 RS: 23.825 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.825 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.825 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.815 Profile: Design
Note - Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
River: EMF Reach: Reach 5 RS: 23.815 Profile: Design 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.
River: EMF Reach: Reach 5 RS: 23.758 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.758 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.758 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.604 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.604 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.604 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.45 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.45 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.45 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.315 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.315 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.274 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.274 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.274 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.193 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.193 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.193 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.135 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.135 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.135 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.087 Profile: Design
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: EMF Reach: Reach 5 RS: 23.087 Profile: Future
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: EMF Reach: Reach 5 RS: 23.087 Profile: Existing
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: EMF Reach: Reach 5 RS: 23.009 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.009 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 23.009 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.866 Profile: Design
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 22.866 Profile: Existing

Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 22.74 Profile: Future
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 22.74 Profile: Existing
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 22.68 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.615 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.599 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.599 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.599 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.436 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.436 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.436 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.348 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.348 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.348 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.263 Profile: Design
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 22.263 Profile: Future
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 22.263 Profile: Existing
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 22.189 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.189 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.107 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.107 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.107 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 22.022 Profile: Design
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning - The energy loss was 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: EMF Reach: Reach 5 RS: 22.022 Profile: Future
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 21.947 Profile: Design
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: EMF Reach: Reach 5 RS: 21.947 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.947 Profile: Existing
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: EMF Reach: Reach 5 RS: 21.745 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.745 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.745 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.713 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.713 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.713 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.591 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.591 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.591 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.531 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.531 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.531 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.439 Profile: Design
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: EMF Reach: Reach 5 RS: 21.439 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.439 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.418 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.418 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.355 Profile: Design
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: EMF Reach: Reach 5 RS: 21.355 Profile: Future
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: EMF Reach: Reach 5 RS: 21.355 Profile: Existing
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: EMF Reach: Reach 5 RS: 21.339 Profile: Design 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.
River: EMF Reach: Reach 5 RS: 21.339 Profile: Future 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.
River: EMF Reach: Reach 5 RS: 21.339 Profile: Existing 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.
River: EMF Reach: Reach 5 RS: 21.326 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.326 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 21.326 Profile: Existing
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: EMF Reach: Reach 5 RS: 20.328 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 20.328 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 20.328 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 5 RS: 20.323 Profile: Existing 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.
River: EMF Reach: Reach 5 RS: 20.247 Profile: Existing
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 20.058 Profile: Design
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 20.058 Profile: Future
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 20.058 Profile: Existing
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 19.863 Profile: Design
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 19.863 Profile: Future
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 19.863 Profile: Existing
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 5 RS: 19.745 Profile: Design

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      Warning - Divided flow computed for this cross-section.
River: EMF  Reach: Reach 5     RS: 19.745     Profile: Future
      Warning - Divided flow computed for this cross-section.
River: EMF  Reach: Reach 5     RS: 19.745     Profile: Existing
      Warning - Divided flow computed for this cross-section.
River: EMF  Reach: Reach 5     RS: 19.592     Profile: Future
      Warning - Divided flow computed for this cross-section.
River: EMF  Reach: Reach 5     RS: 19.541     Profile: Future
      Warning - Divided flow computed for this cross-section.
River: EMF  Reach: Reach 5     RS: 19.458     Profile: Future
      Warning - Divided flow computed for this cross-section.
River: EMF  Reach: Reach 5     RS: 19.408     Profile: Design
      Warning - Divided flow computed for this cross-section.
River: EMF  Reach: Reach 5     RS: 19.408     Profile: Future
      Warning - Divided flow computed for this cross-section.
River: EMF  Reach: Reach 5     RS: 18.782     Profile: Existing
      Warning - Divided flow computed for this cross-section.
      Warning - The cross-section end points had to be extended vertically for the computed water surface.
River: EMF  Reach: Reach 5     RS: 18.535     Profile: Existing
      Warning - Divided flow computed for this cross-section.
      Warning - The cross-section end points had to be extended vertically for the computed water surface.
      Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
                This may indicate the need for additional cross sections.
```

HEC-RAS Plan: REACH 4 River: EMF Reach: Reach 4

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq.ft)	(ft)	
Reach 4	18.345	6500.00	1317.07	1326.53	1321.24	1326.78	0.000441	4.05	1605.14	206.25	0.26
Reach 4	18.345	4700.00	1317.07	1328.44	1320.52	1328.52	0.000117	2.33	2058.09	281.29	0.14
Reach 4	18.345	7840.00	1317.07	1330.80	1321.75	1330.93	0.000138	2.95	3130.97	565.90	0.15
Reach 4	18.237	6500.00	1317.30	1326.38	1321.19	1326.66	0.000120	4.28	1517.16	189.23	0.27
Reach 4	18.237	8500.00	1317.30	1328.10	1321.93	1328.43	0.000113	4.59	1851.37	198.93	0.27
Reach 4	18.237	11950.00	1317.30	1330.56	1323.05	1330.86	0.000084	4.56	4340.86	1027.78	0.24
Reach 4	18.193	6500.00	1315.38	1325.15	1322.20	1326.34	0.000537	8.75	759.59	143.93	0.55
Reach 4	18.193	8500.00	1315.38	1326.76	1323.41	1328.08	0.000508	9.31	1035.56	227.15	0.55
Reach 4	18.193	11950.00	1315.38	1329.08	1325.42	1330.48	0.000421	9.85	1665.33	289.49	0.52
Reach 4	18.087	6500.00	1315.14	1324.21	1322.42	1325.91	0.000873	10.48	619.98	87.39	0.69
Reach 4	18.087	8500.00	1315.14	1325.73	1323.67	1327.67	0.000839	11.18	787.80	135.59	0.69
Reach 4	18.087	11950.00	1315.14	1329.26	1325.95	1330.11	0.000350	8.19	3067.48	922.91	0.46
Reach 4	17.898	6500.00	1314.10	1323.33	1321.55	1325.04	0.000880	10.48	619.96	87.98	0.70
Reach 4	17.898	8500.00	1314.10	1324.88	1322.81	1326.81	0.000859	11.15	762.19	96.61	0.70
Reach 4	17.898	11950.00	1314.10	1329.15	1324.72	1329.77	0.000220	7.33	3816.15	909.63	0.38
Reach 4	17.803	6500.00	1313.58	1322.94	1321.03	1324.59	0.000835	10.30	631.27	88.43	0.68
Reach 4	17.803	8500.00	1313.58	1324.51	1322.31	1326.37	0.000834	10.95	776.00	98.91	0.69
Reach 4	17.803	11950.00	1313.58	1329.20	1324.26	1329.61	0.000150	6.30	4654.06	900.65	0.32
Reach 4	17.672	6500.00	1312.57	1322.64	1320.02	1324.00	0.000637	9.37	693.79	91.21	0.60
Reach 4	17.672	8500.00	1312.57	1324.39	1321.31	1325.77	0.000529	9.57	1289.31	753.32	0.56
Reach 4	17.672	11950.00	1312.57	1329.23	1323.15	1329.49	0.000089	5.24	6267.70	1095.32	0.25
Reach 4	17.571	6500.00	1312.05	1322.33	1319.60	1323.66	0.000606	9.24	703.69	91.03	0.59
Reach 4	17.571	8500.00	1312.05	1324.37	1320.86	1325.43	0.000407	8.66	1792.55	846.35	0.50
Reach 4	17.571	11950.00	1312.05	1329.20	1324.38	1329.43	0.000079	5.02	6147.01	1281.29	0.23
Reach 4	17.48	6500.00	1311.88	1322.03	1319.44	1323.36	0.000633	9.27	701.47	93.62	0.60
Reach 4	17.48	8500.00	1311.88	1323.89	1320.69	1325.18	0.000517	9.27	1324.29	845.78	0.55
Reach 4	17.48	11950.00	1311.88	1329.08	1322.57	1329.38	0.000098	5.40	4977.03	1230.74	0.26
Reach 4	17.339	6500.00	1311.41	1321.63	1318.80	1322.89	0.000580	9.01	721.19	93.79	0.57
Reach 4	17.339	8500.00	1311.41	1323.35	1320.05	1324.77	0.000558	9.55	890.09	102.95	0.57
Reach 4	17.339	11950.00	1311.41	1328.78	1321.92	1329.28	0.000136	6.35	3417.04	1389.21	0.30
Reach 4	17.288	6500.00	1311.13	1321.52	1318.53	1322.72	0.000544	8.77	741.58	96.06	0.56
Reach 4	17.288	8500.00	1311.13	1323.26	1319.77	1324.60	0.000521	9.28	915.90	105.04	0.55

HEC-RAS Plan: REACH 4 River: EMF Reach: Reach 4 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 4	17.288	11950.00	1311.13	1328.36	1321.65	1329.20	0.000196	7.62	2141.13	1451.52	0.37
Reach 4	17.269	6500.00	1311.04	1321.48	1318.32	1322.66	0.000520	8.70	747.22	94.32	0.54
Reach 4	17.269	8500.00	1311.04	1323.21	1319.58	1324.55	0.000504	9.26	917.51	102.71	0.55
Reach 4	17.269	11950.00	1311.04	1328.15	1321.45	1329.16	0.000245	8.07	1479.98	204.30	0.40
Reach 4	17.261	Bridge									
Reach 4	17.254	6500.00	1310.98	1321.22	1318.35	1322.50	0.000580	9.08	716.01	91.96	0.57
Reach 4	17.254	8500.00	1310.98	1322.90	1319.63	1324.36	0.000565	9.70	876.72	99.74	0.58
Reach 4	17.254	11950.00	1310.98	1326.16	1321.52	1327.62	0.000449	9.71	1230.95	155.48	0.53
Reach 4	17.25	6500.00	1311.10	1321.22	1318.40	1322.48	0.000583	9.03	719.74	93.82	0.57
Reach 4	17.25	8500.00	1311.10	1322.90	1319.64	1324.34	0.000562	9.61	884.45	101.88	0.57
Reach 4	17.25	11950.00	1311.10	1326.17	1321.53	1327.60	0.000422	9.59	1257.51	1417.34	0.52
Reach 4	17.213	6500.00	1311.10	1320.98	1318.40	1322.35	0.000643	9.39	691.92	91.23	0.60
Reach 4	17.213	8500.00	1311.10	1322.67	1319.66	1324.21	0.000612	9.98	851.34	98.42	0.60
Reach 4	17.213	11950.00	1311.10	1326.19	1321.57	1327.47	0.000379	9.31	1610.01	597.07	0.49
Reach 4	17.17	6500.00	1311.12	1320.78	1318.36	1322.20	0.000675	9.56	680.13	90.56	0.61
Reach 4	17.17	8510.00	1311.12	1322.47	1319.62	1324.07	0.000639	10.15	838.74	97.62	0.61
Reach 4	17.17	11910.00	1311.12	1326.39	1321.44	1327.27	0.000282	8.13	2599.32	921.73	0.42
Reach 4	17.101	6500.00	1310.54	1320.57	1317.95	1321.95	0.000642	9.43	689.06	90.07	0.60
Reach 4	17.101	8510.00	1310.54	1322.26	1319.23	1323.82	0.000628	10.03	848.58	99.41	0.60
Reach 4	17.101	11910.00	1310.54	1325.61	1321.10	1327.08	0.000459	9.73	1223.53	214.17	0.53
Reach 4	17.086	Bridge									
Reach 4	17.082	6500.00	1310.51	1319.53	1317.88	1321.34	0.000931	10.80	602.00	84.90	0.71
Reach 4	17.082	8510.00	1310.51	1320.59	1319.17	1322.92	0.001062	12.26	694.29	89.08	0.77
Reach 4	17.082	11910.00	1310.51	1321.65	1321.05	1325.17	0.001436	15.05	791.26	93.27	0.91
Reach 4	17.071	6500.00	1310.83	1318.80	1318.18	1321.08	0.005696	12.12	536.29	88.90	0.87
Reach 4	17.071	8510.00	1310.83	1320.02	1319.39	1322.70	0.005706	13.12	648.49	95.30	0.89
Reach 4	17.071	11910.00	1310.83	1321.51	1321.18	1324.99	0.006277	14.95	796.64	103.15	0.95
Reach 4	17.069	6500.00	1310.37	1319.64	1314.63	1319.89	0.000442	4.00	1626.38	213.19	0.26
Reach 4	17.069	8510.00	1310.37	1321.02	1315.30	1321.33	0.000451	4.42	1926.36	220.37	0.26
Reach 4	17.069	11910.00	1310.37	1322.85	1316.34	1323.25	0.000492	5.09	2348.53	487.14	0.28

HEC-RAS Plan: REACH 4 River: EMF Reach: Reach 4 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 4	16.94	6500.00	1309.91	1319.52	1313.79	1319.71	0.000222	3.49	1861.13	234.89	0.22
Reach 4	16.94	8510.00	1309.91	1320.91	1314.47	1321.14	0.000234	3.88	2194.40	246.46	0.23
Reach 4	16.94	11910.00	1309.91	1322.73	1315.46	1323.04	0.000247	4.47	2743.75	317.98	0.24
Reach 4	16.819	6500.00	1309.76	1319.38	1313.55	1319.57	0.000216	3.50	1858.99	229.37	0.22
Reach 4	16.819	8510.00	1309.76	1320.75	1314.21	1320.99	0.000229	3.90	2193.09	266.33	0.23
Reach 4	16.819	11910.00	1309.76	1322.57	1315.22	1322.89	0.000243	4.51	2743.03	319.23	0.24
Reach 4	16.63	6500.00	1309.48	1319.16	1313.40	1319.35	0.000221	3.52	1846.43	229.34	0.22
Reach 4	16.63	8510.00	1309.48	1320.52	1314.07	1320.76	0.000234	3.93	2164.01	237.86	0.23
Reach 4	16.63	11910.00	1309.48	1322.38	1315.07	1322.64	0.000218	4.22	3940.08	1262.11	0.23
Reach 4	16.468	6500.00	1309.49	1318.94	1313.49	1319.15	0.000247	3.65	1779.56	227.25	0.23
Reach 4	16.468	8510.00	1309.49	1320.29	1314.16	1320.55	0.000259	4.07	2090.86	235.49	0.24
Reach 4	16.468	11910.00	1309.49	1322.15	1315.16	1322.44	0.000243	4.45	3515.96	1059.19	0.24
Reach 4	16.389	6500.00	1309.76	1318.82	1313.67	1319.04	0.000272	3.75	1732.85	228.89	0.24
Reach 4	16.389	8510.00	1309.76	1320.16	1314.32	1320.43	0.000282	4.16	2045.34	237.41	0.25
Reach 4	16.389	11910.00	1309.76	1322.05	1315.31	1322.33	0.000252	4.43	3560.24	932.81	0.24
Reach 4	16.321	6500.00	1309.10	1318.74	1313.29	1318.95	0.000243	3.62	1796.36	230.36	0.23
Reach 4	16.321	8510.00	1309.10	1320.08	1313.95	1320.33	0.000256	4.03	2109.85	238.61	0.24
Reach 4	16.321	11910.00	1309.10	1321.94	1314.94	1322.24	0.000252	4.49	3135.00	940.47	0.24
Reach 4	16.251	6500.00	1309.50	1318.63	1313.44	1318.85	0.000272	3.73	1740.45	231.53	0.24
Reach 4	16.251	8770.00	1309.50	1319.94	1314.17	1320.23	0.000303	4.28	2049.49	240.80	0.26
Reach 4	16.251	12750.00	1309.50	1321.71	1315.32	1322.12	0.000348	5.12	2530.47	905.66	0.28
Reach 4	16.242	6500.00	1309.67	1318.62	1313.26	1318.83	0.000359	3.63	1791.15	232.98	0.23
Reach 4	16.242	8770.00	1309.67	1319.93	1313.99	1320.20	0.000403	4.17	2101.80	244.34	0.25
Reach 4	16.242	12750.00	1309.67	1321.70	1315.12	1322.09	0.000464	5.01	2588.13	299.64	0.28
Reach 4	16.240	Bridge									
Reach 4	16.238	6500.00	1309.56	1318.44	1313.14	1318.65	0.000367	3.63	1788.24	235.98	0.23
Reach 4	16.238	8770.00	1309.56	1319.73	1313.89	1320.00	0.000424	4.18	2100.46	250.97	0.25
Reach 4	16.238	12750.00	1309.56	1321.55	1315.02	1321.93	0.000486	4.97	2564.19	259.98	0.28
Reach 4	16.221	6500.00	1309.43	1318.37	1313.26	1318.60	0.000427	3.89	1672.49	223.85	0.25
Reach 4	16.221	8770.00	1309.43	1319.64	1314.03	1319.95	0.000475	4.47	1962.07	229.72	0.27
Reach 4	16.221	12750.00	1309.43	1321.42	1315.21	1321.87	0.000546	5.38	2370.68	230.48	0.30

HEC-RAS Plan: REACH 4 River: EMF Reach: Reach 4 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 4	16.213	Bridge									
Reach 4	16.205	6500.00	1309.37	1318.24	1313.21	1318.47	0.000430	3.89	1670.74	224.28	0.25
Reach 4	16.205	8770.00	1309.37	1319.50	1313.97	1319.81	0.000475	4.48	1956.09	227.20	0.27
Reach 4	16.205	12750.00	1309.37	1321.22	1315.13	1321.68	0.000557	5.43	2348.89	228.06	0.30
Reach 4	16.19	6500.00	1309.35	1318.21	1313.17	1318.44	0.000297	3.87	1680.90	226.82	0.25
Reach 4	16.19	8770.00	1309.35	1319.47	1313.93	1319.78	0.000334	4.45	1972.46	235.70	0.27
Reach 4	16.19	12750.00	1309.35	1321.20	1315.09	1321.64	0.000386	5.33	2425.80	1016.84	0.30
Reach 4	16	6900.00	1308.91	1317.88	1312.82	1318.13	0.000310	4.01	1719.97	226.96	0.26
Reach 4	16	8770.00	1308.91	1319.15	1313.43	1319.45	0.000312	4.36	2013.77	235.66	0.26
Reach 4	16	12750.00	1308.91	1320.86	1314.59	1321.25	0.000338	5.09	2893.27	941.75	0.28
Reach 4	15.811	6900.00	1308.82	1317.55	1312.68	1317.81	0.000330	4.09	1687.38	226.56	0.26
Reach 4	15.811	8770.00	1308.82	1318.82	1313.28	1319.13	0.000328	4.43	1980.31	234.30	0.27
Reach 4	15.811	12750.00	1308.82	1320.58	1314.45	1320.91	0.000304	4.79	3596.06	1368.67	0.27
Reach 4	15.806	6900.00	1308.20	1317.05	1312.53	1317.39	0.000448	4.70	1468.50	201.31	0.31
Reach 4	15.806	8770.00	1308.20	1318.31	1313.22	1318.71	0.000447	5.08	1727.60	209.96	0.31
Reach 4	15.806	12750.00	1308.20	1320.23	1314.48	1320.56	0.000341	5.02	4233.47	1476.89	0.28
Reach 4	15.483	6900.00	1307.90	1316.75	1312.26	1317.10	0.000450	4.71	1465.21	200.61	0.31
Reach 4	15.483	8770.00	1307.90	1318.01	1312.93	1318.42	0.000447	5.09	1723.40	208.94	0.31
Reach 4	15.483	12750.00	1307.90	1320.02	1314.20	1320.34	0.000327	4.94	3817.26	864.00	0.28
Reach 4	15.414	6900.00	1308.11	1316.56	1312.33	1316.92	0.000488	4.82	1430.39	200.88	0.32
Reach 4	15.414	8770.00	1308.11	1317.83	1312.99	1318.24	0.000478	5.19	1689.22	208.72	0.32
Reach 4	15.414	12750.00	1308.11	1319.85	1314.23	1320.21	0.000364	5.16	3427.99	710.14	0.29
Reach 4	15.225	6900.00	1307.00	1316.12	1311.53	1316.45	0.000438	4.67	1477.03	200.65	0.30
Reach 4	15.225	8770.00	1307.00	1317.39	1312.21	1317.78	0.000437	5.05	1737.37	209.37	0.31
Reach 4	15.225	12750.00	1307.00	1319.59	1313.49	1319.87	0.000282	4.68	4498.64	1259.13	0.26
Reach 4	15.035	6900.00	1306.87	1315.68	1311.11	1316.01	0.000442	4.67	1478.08	202.23	0.30
Reach 4	15.035	8770.00	1306.87	1316.95	1311.78	1317.34	0.000439	5.04	1741.22	211.20	0.31
Reach 4	15.035	12750.00	1306.87	1319.29	1313.05	1319.59	0.000284	4.74	4508.02	1464.08	0.26
Reach 4	14.926	6900.00	1306.28	1315.45	1310.64	1315.77	0.000398	4.52	1525.46	202.44	0.29
Reach 4	14.926	8770.00	1306.28	1316.74	1311.31	1317.09	0.000388	4.83	2023.90	591.39	0.29
Reach 4	14.926	12750.00	1306.28	1319.13	1312.58	1319.43	0.000268	4.70	4454.52	1428.57	0.25

HEC-RAS Plan: REACH 4 River: EMF Reach: Reach 4 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 4	14.823	6900.00	1306.39	1315.21	1310.58	1315.54	0.000427	4.62	1494.85	202.86	0.30
Reach 4	14.823	8770.00	1306.39	1316.48	1311.25	1316.87	0.000425	4.99	1758.70	211.57	0.30
Reach 4	14.823	12750.00	1306.39	1319.08	1312.51	1319.25	0.000187	3.89	6102.44	1631.02	0.21
Reach 4	14.764	6900.00	1306.30	1315.08	1310.49	1315.41	0.000416	4.58	1507.89	203.18	0.30
Reach 4	14.764	8770.00	1306.30	1316.36	1311.14	1316.74	0.000413	4.95	1771.45	210.60	0.30
Reach 4	14.764	12750.00	1306.30	1319.05	1312.39	1319.19	0.000152	3.57	6936.20	1761.30	0.19
Reach 4	14.754	6900.00	1306.32	1312.61	1312.61	1315.13	0.005400	12.76	540.83	106.30	1.00
Reach 4	14.754	8770.00	1306.32	1313.56	1313.56	1316.44	0.005176	13.61	644.60	111.18	1.00
Reach 4	14.754	12750.00	1306.32	1315.33	1315.33	1318.83	0.004868	15.01	849.28	120.23	1.00
Reach 4	14.738	6900.00	1302.42	1311.13	1307.17	1311.64	0.000682	5.74	1202.96	166.74	0.38
Reach 4	14.738	8770.00	1302.42	1312.44	1307.93	1313.03	0.000661	6.15	1426.41	173.48	0.38
Reach 4	14.738	12750.00	1302.42	1314.33	1309.38	1315.14	0.000741	7.24	1761.40	182.10	0.41
Reach 4	14.637	6900.00	1302.17	1311.00	1306.27	1311.31	0.000397	4.46	1545.71	208.69	0.29
Reach 4	14.637	8890.00	1302.17	1312.33	1306.95	1312.70	0.000398	4.86	1838.85	236.37	0.30
Reach 4	14.637	12830.00	1302.17	1314.37	1308.19	1314.75	0.000346	5.18	3515.26	1175.76	0.28
Reach 4	14.412	6900.00	1301.60	1310.46	1305.99	1310.80	0.000455	4.73	1460.08	200.56	0.31
Reach 4	14.412	8890.00	1301.60	1311.78	1306.72	1312.19	0.000454	5.14	1730.80	209.22	0.31
Reach 4	14.412	12830.00	1301.60	1313.81	1307.96	1314.29	0.000431	5.72	2826.42	1023.44	0.32
Reach 4	14.3	6900.00	1301.54	1310.18	1305.72	1310.53	0.000459	4.74	1456.46	200.67	0.31
Reach 4	14.3	8890.00	1301.54	1311.50	1306.43	1311.92	0.000459	5.15	1727.85	209.82	0.32
Reach 4	14.3	12830.00	1301.54	1313.54	1307.68	1314.04	0.000437	5.75	2721.22	882.95	0.32
Reach 4	14.191	6900.00	1301.20	1309.94	1305.38	1310.27	0.000433	4.66	1481.87	200.21	0.30
Reach 4	14.191	8890.00	1301.20	1311.26	1306.08	1311.66	0.000434	5.07	1753.76	216.90	0.31
Reach 4	14.191	12830.00	1301.20	1313.31	1307.31	1313.78	0.000411	5.64	2736.47	627.27	0.31
Reach 4	14	6900.00	1300.90	1309.45	1305.19	1309.81	0.000488	4.82	1430.74	200.68	0.32
Reach 4	14	8890.00	1300.90	1310.77	1305.90	1311.19	0.000480	5.22	1702.88	215.65	0.32
Reach 4	14	12830.00	1300.90	1312.81	1307.13	1313.34	0.000464	5.88	2499.59	1046.18	0.33
Reach 4	13.961	6900.00	1299.55	1309.31	1305.20	1309.68	0.000755	4.86	1420.54	208.08	0.33
Reach 4	13.961	8890.00	1299.55	1310.65	1305.89	1311.05	0.000886	5.08	1749.64	270.59	0.35
Reach 4	13.961	12830.00	1299.55	1312.72	1307.11	1313.19	0.000758	5.53	2320.69	279.42	0.34
Reach 4	13.954	Bridge									

HEC-RAS Plan: REACH 4 River: EMF Reach: Reach 4 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 4	13.946	6900.00	1299.65	1309.15	1305.09	1309.53	0.000795	4.93	1400.03	209.04	0.34
Reach 4	13.946	8890.00	1299.65	1310.46	1305.82	1310.88	0.000889	5.22	1702.12	253.71	0.36
Reach 4	13.946	12830.00	1299.65	1312.50	1307.06	1313.01	0.000814	5.72	2242.88	271.74	0.35
Reach 4	13.911	6900.00	1300.88	1309.01	1305.06	1309.40	0.000552	5.02	1375.56	199.82	0.34
Reach 4	13.911	8890.00	1300.88	1310.29	1305.75	1310.75	0.000544	5.44	1635.69	207.87	0.34
Reach 4	13.911	12830.00	1300.88	1312.27	1306.98	1312.86	0.000550	6.19	2137.45	266.18	0.35
Reach 4	13.842	6900.00	1300.89	1308.74	1305.14	1309.17	0.000642	5.27	1310.43	198.33	0.36
Reach 4	13.842	8890.00	1300.89	1310.02	1305.83	1310.52	0.000617	5.66	1570.13	206.48	0.36
Reach 4	13.842	12830.00	1300.89	1311.99	1307.04	1312.63	0.000618	6.42	2045.22	267.01	0.37
Reach 4	13.755	6900.00	1300.50	1308.48	1304.62	1308.88	0.000581	5.10	1352.28	198.84	0.34
Reach 4	13.755	8890.00	1300.50	1309.77	1305.32	1310.24	0.000565	5.51	1614.87	207.33	0.35
Reach 4	13.755	12830.00	1300.50	1311.75	1306.55	1312.35	0.000567	6.25	2125.59	270.67	0.36
Reach 4	13.661	6900.00	1299.76	1308.22	1304.14	1308.60	0.000528	4.96	1392.48	199.22	0.33
Reach 4	13.661	8890.00	1299.76	1309.52	1304.84	1309.97	0.000520	5.37	1656.74	207.55	0.33
Reach 4	13.661	12830.00	1299.76	1311.50	1306.07	1312.07	0.000529	6.11	2176.75	270.05	0.35
Reach 4	13.566	6900.00	1299.46	1307.93	1303.88	1308.33	0.000556	5.07	1359.63	195.09	0.34
Reach 4	13.566	8890.00	1299.46	1309.23	1304.60	1309.70	0.000548	5.49	1619.15	203.99	0.34
Reach 4	13.566	12830.00	1299.46	1311.19	1305.86	1311.80	0.000563	6.27	2117.22	268.50	0.36
Reach 4	13.471	6900.00	1299.43	1307.77	1303.31	1308.06	0.000397	4.33	1593.36	225.61	0.29
Reach 4	13.471	8970.00	1299.43	1309.08	1303.98	1309.43	0.000398	4.73	1895.55	243.04	0.29
Reach 4	13.471	12910.00	1299.43	1311.06	1305.13	1311.51	0.000406	5.42	2440.42	286.17	0.31

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1310.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.53	Reach Len. (ft)	840.00	571.41	525.00
Crit W.S. (ft)	1305.72	Flow Area (sq ft)		1456.46	
E.G. Slope (ft/ft)	0.000459	Area (sq ft)		1456.46	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	200.67	Top Width (ft)		200.67	
Vel Total (ft/s)	4.74	Avg. Vel. (ft/s)		4.74	
Max Chl Dpth (ft)	8.64	Hydr. Depth (ft)		7.26	
Conv. Total (cfs)	321968.7	Conv. (cfs)		321968.7	
Length Wtd. (ft)	571.41	Wetted Per. (ft)		203.05	
Min Ch El (ft)	1301.54	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.97	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)		141.88	
C & E Loss (ft)	0.00	Cum SA (acres)		20.19	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1311.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1311.92	Reach Len. (ft)	840.00	571.41	525.00
Crit W.S. (ft)	1306.43	Flow Area (sq ft)		1727.85	
E.G. Slope (ft/ft)	0.000459	Area (sq ft)		1727.85	
Q Total (cfs)	8890.00	Flow (cfs)		8890.00	
Top Width (ft)	209.82	Top Width (ft)		209.82	
Vel Total (ft/s)	5.15	Avg. Vel. (ft/s)		5.15	
Max Chl Dpth (ft)	9.96	Hydr. Depth (ft)		8.24	
Conv. Total (cfs)	415166.7	Conv. (cfs)		415166.7	
Length Wtd. (ft)	571.42	Wetted Per. (ft)		212.58	
Min Ch El (ft)	1301.54	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		1.20	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.05	169.04	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.30	21.32	0.05

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1313.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1314.04	Reach Len. (ft)	840.00	571.41	525.00
Crit W.S. (ft)	1307.68	Flow Area (sq ft)	476.43	2162.58	82.22
E.G. Slope (ft/ft)	0.000437	Area (sq ft)	476.43	2162.58	82.22
Q Total (cfs)	12830.00	Flow (cfs)	310.24	12428.72	91.04
Top Width (ft)	882.95	Top Width (ft)	620.44	214.49	48.02
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)	0.65	5.75	1.11
Max Chl Dpth (ft)	12.00	Hydr. Depth (ft)	0.77	10.08	1.71
Conv. Total (cfs)	613645.4	Conv. (cfs)	14838.3	594452.8	4354.3
Length Wtd. (ft)	578.81	Wetted Per. (ft)	620.60	217.44	48.30
Min Ch El (ft)	1301.54	Shear (lb/sq ft)	0.02	0.27	0.05
Alpha	1.44	Stream Power (lb/ft s)	0.01	1.56	0.05
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	21.94	212.82	7.03
C & E Loss (ft)	0.01	Cum SA (acres)	26.47	21.93	4.67

CROSS SECTION RIVER: EMF
REACH: Reach 4 RS: 14.191

INPUT
Description:
Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3430.03	1316.24	3445.46	1316.12	3704.18	1315.4	3730.05	1314.49	3738.54	1314.32
3866.17	1314.14	3895.73	1314.13	3950.98	1314.1	4000.68	1313.92	4021.78	1313.87
4045.25	1313.73	4092.6	1313.65	4135.18	1313.7	4194.79	1313.77	4304.97	1313.48
4357.65	1313.34	4367.36	1314.67	4373.25	1314.5	4380.86	1314.57	4390.57	1314.19
4396.55	1313.07	4409.58	1311.07	4425.32	1307.7	4443.88	1308.17	4462.94	1310.89
4479.87	1313.7	4487.26	1314.2	4495.81	1315	4518.72	1314.9	4526.13	1311.99

4535.61	1312.78	4542.14	1312.79	4565.02	1312.3	4621.05	1312.06	4648.88	1311.95
4654.03	1311.99	4673.19	1311.88	4792.91	1311.8	4807.78	1311.86	4826.92	1312.08
4832.6	1312.62	4848.48	1312.34	4862.28	1310.8	4874.59	1311.98	4890.8	1311.93
4916.27	1303.22	4921.28	1301.61	4942.73	1301.3	4985.48	1301.29	5001.69	1301.2
5070.94	1301.94	5076.1	1303.29	5098.91	1310.6	5103.47	1312.2	5117.06	1311.58
5119.73	1311.24	5142.62	1311.59	5163.38	1316.4	5179.14	1316.49		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3430.03	.04	4890.8	.025	5103.47	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4890.8	5103.47	1011.04	1011.04	1011.04	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev
3430.03	4518.72	1316

Left Levee Station= 4832.6 Elevation= 1312.62
Right Levee Station= 5103.47 Elevation= 1312.2
Blocked Obstructions num= 1

Sta L	Sta R	Elev
4367.36	4495	1314.67

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1309.94	Element			
Vel Head (ft)	0.34	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.27	Reach Len. (ft)	1011.04	1011.04	1011.04
Crit W.S. (ft)	1305.38	Flow Area (sq ft)		1481.87	
E.G. Slope (ft/ft)	0.000433	Area (sq ft)		1481.87	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	200.21	Top Width (ft)		200.21	
Vel Total (ft/s)	4.66	Avg. Vel. (ft/s)		4.66	
Max Chl Dpth (ft)	8.74	Hydr. Depth (ft)		7.40	
Conv. Total (cfs)	331666.4	Conv. (cfs)		331666.4	
Length Wtd. (ft)	1011.04	Wetted Per. (ft)		202.80	
Min Ch El (ft)	1301.20	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.92	
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)		122.61	
C & E Loss (ft)	0.00	Cum SA (acres)		17.56	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1311.26	Element			
Vel Head (ft)	0.40	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1311.66	Reach Len. (ft)	1011.04	1011.04	1011.04
Crit W.S. (ft)	1306.08	Flow Area (sq ft)	2.03	1751.73	
E.G. Slope (ft/ft)	0.000434	Area (sq ft)	2.03	1751.73	
Q Total (cfs)	8890.00	Flow (cfs)	0.59	8889.41	
Top Width (ft)	216.90	Top Width (ft)	8.88	208.02	
Vel Total (ft/s)	5.07	Avg. Vel. (ft/s)	0.29	5.07	
Max Chl Dpth (ft)	10.06	Hydr. Depth (ft)	0.23	8.42	
Conv. Total (cfs)	426854.4	Conv. (cfs)	28.1	426826.3	
Length Wtd. (ft)	1011.04	Wetted Per. (ft)	8.93	211.04	
Min Ch El (ft)	1301.20	Shear (lb/sq ft)	0.01	0.22	
Alpha	1.00	Stream Power (lb/ft s)	0.00	1.14	
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	0.03	146.22	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.21	18.58	0.05

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1313.31	Element			
Vel Head (ft)	0.48	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1313.78	Reach Len. (ft)	1011.04	1011.04	1011.04
Crit W.S. (ft)	1307.31	Flow Area (sq ft)	476.34	2186.04	74.09
E.G. Slope (ft/ft)	0.000411	Area (sq ft)	476.34	2186.04	74.09
Q Total (cfs)	12830.00	Flow (cfs)	425.79	12328.41	75.80
Top Width (ft)	627.27	Top Width (ft)	368.03	212.67	46.57

Vel Total (ft/s)	4.69	Avg. Vel. (ft/s)	0.89	5.64	1.02
Max Chl Dpth (ft)	12.11	Hydr. Depth (ft)	1.29	10.28	1.59
Conv. Total (cfs)	632726.1	Conv. (cfs)	20998.1	607989.6	3738.3
Length Wtd. (ft)	1011.04	Wetted Per. (ft)	368.49	215.97	46.80
Min Ch El (ft)	1301.20	Shear (lb/sq ft)	0.03	0.26	0.04
Alpha	1.39	Stream Power (lb/ft s)	0.03	1.47	0.04
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	12.75	184.29	6.09
C & E Loss (ft)	0.01	Cum SA (acres)	16.94	19.13	4.10

CROSS SECTION RIVER: EMF
REACH: Reach 4 RS: 14

INPUT
Description: Ineffective Flow Area Upstream of Higley Road Bridge
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4030.6	1314.7	4039.42	1313.45	4103.08	1312.8	4117.51	1312.8	4237.57	1312.63
4267.03	1312.6	4372.08	1312.42	4416.57	1312.3	4506.59	1312.26	4566.09	1312.17
4641.08	1312.11	4676.38	1312.15	4715.62	1312.1	4775.59	1311.85	4824.41	1311.6
4830.23	1312.04	4847.44	1311.64	4850.16	1312.4	4853.82	1311.53	4864.27	1310.62
4889.58	1311.4	4919.85	1302.23	4926.48	1302	4959.63	1301.27	4994.21	1301.12
5008.4	1300.9	5030.42	1301.03	5044.23	1301.2	5072.31	1301.26	5103.68	1311.78
5117.88	1311.45	5120.37	1310.48	5126.51	1312.2	5143.86	1312.6	5149.85	1312.9
5159.64	1314.87	5170.27	1315.18	5180.2	1315.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4030.6	.04	4889.58	.025	5103.68	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4889.58	5103.68	390	204.54	80	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev
4030.6	4520	1316

Left Levee Station= 4850.16 Elevation= 1312.4
Right Levee Station= 5103.68 Elevation= 1311.78

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1309.45	Element			
Vel Head (ft)	0.36	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.81	Reach Len. (ft)	390.00	204.54	80.00
Crit W.S. (ft)	1305.19	Flow Area (sq ft)		1430.74	
E.G. Slope (ft/ft)	0.000488	Area (sq ft)		1430.74	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	200.68	Top Width (ft)		200.68	
Vel Total (ft/s)	4.82	Avg. Vel. (ft/s)		4.82	
Max Chl Dpth (ft)	8.55	Hydr. Depth (ft)		7.13	
Conv. Total (cfs)	312494.8	Conv. (cfs)		312494.8	
Length Wtd. (ft)	204.54	Wetted Per. (ft)		203.10	
Min Ch El (ft)	1300.90	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		1.03	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		88.81	
C & E Loss (ft)	0.00	Cum SA (acres)		12.91	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1310.77	Element			
Vel Head (ft)	0.42	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1311.19	Reach Len. (ft)	390.00	204.54	80.00
Crit W.S. (ft)	1305.90	Flow Area (sq ft)	0.50	1702.38	
E.G. Slope (ft/ft)	0.000480	Area (sq ft)	0.50	1702.38	
Q Total (cfs)	8890.00	Flow (cfs)	0.07	8889.93	
Top Width (ft)	215.65	Top Width (ft)	6.64	209.02	
Vel Total (ft/s)	5.22	Avg. Vel. (ft/s)	0.15	5.22	
Max Chl Dpth (ft)	9.87	Hydr. Depth (ft)	0.08	8.14	
Conv. Total (cfs)	405945.9	Conv. (cfs)	3.3	405942.6	
Length Wtd. (ft)	204.54	Wetted Per. (ft)	6.65	211.85	
Min Ch El (ft)	1300.90	Shear (lb/sq ft)	0.00	0.24	

Alpha	1.00	Stream Power (lb/ft s)	0.00	1.26	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.00	106.14	0.00
C & E Loss (ft)	0.01	Cum SA (acres)	0.03	13.74	0.05

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1312.81	Element			
Vel Head (ft)	0.53	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1313.34	Reach Len. (ft)	390.00	204.54	80.00
Crit W.S. (ft)	1307.13	Flow Area (sq ft)	324.19	2137.17	38.23
E.G. Slope (ft/ft)	0.000464	Area (sq ft)	449.08	2137.17	38.23
Q Total (cfs)	12830.00	Flow (cfs)	237.60	12564.89	27.51
Top Width (ft)	1046.18	Top Width (ft)	787.67	214.10	44.41
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)	0.73	5.88	0.72
Max Chl Dpth (ft)	11.91	Hydr. Depth (ft)	0.88	9.98	0.86
Conv. Total (cfs)	595605.1	Conv. (cfs)	11030.0	583298.1	1277.0
Length Wtd. (ft)	206.13	Wetted Per. (ft)	369.86	217.19	44.84
Min Ch El (ft)	1300.90	Shear (lb/sq ft)	0.03	0.29	0.02
Alpha	1.29	Stream Power (lb/ft s)	0.02	1.68	0.02
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	2.01	134.12	4.78
C & E Loss (ft)	0.03	Cum SA (acres)	3.53	14.17	3.04

CROSS SECTION RIVER: EMF
REACH: Reach 4 RS: 13.961

INPUT
Description: Higley Road Bridge (Upstream Face)
6 Span Bridge with Riprap
Protection
Manning n Value of .030 used for Channel
Use Field
Survey Data for This Cross Section
Skew Angle 41.63 Degrees,
Cross Section Data Adjusted
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4807.89	1315.4	4840.55	1315.3	4854.42	1315.26	4855.03	1310.81	4867.07	1309.82
4898.11	1309.82	4901.46	1307.16	4917.23	1302.4	4948.05	1301.34	4994.94	1301.38
5012.22	1300.27	5024.43	1299.55	5030.47	1299.8	5042.29	1301.53	5071.67	1302.24
5089.7	1306.45	5097.72	1309.05	5123.85	1309.81	5130.25	1311.27	5133.9	1312.29
5135.84	1315.12	5165.08	1314.96						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4807.89	.04	4854.42	.03	5135.84	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4854.42	5135.84	79.19	79.19	79.19	.3	.5

Left Levee Station= 4854.42 Elevation= 1315.26
Right Levee Station= 5135.84 Elevation= 1315.12

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1309.31	Element			
Vel Head (ft)	0.37	Wt. n-Val.		0.030	
E.G. Elev (ft)	1309.68	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1305.20	Flow Area (sq ft)		1420.54	
E.G. Slope (ft/ft)	0.000755	Area (sq ft)		1420.54	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	208.08	Top Width (ft)		208.08	
Vel Total (ft/s)	4.86	Avg. Vel. (ft/s)		4.86	
Max Chl Dpth (ft)	9.76	Hydr. Depth (ft)		6.83	
Conv. Total (cfs)	251147.0	Conv. (cfs)		251147.0	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		210.65	
Min Ch El (ft)	1299.55	Shear (lb/sq ft)		0.32	
Alpha	1.00	Stream Power (lb/ft s)		1.54	
Frctn Loss (ft)		Cum Volume (acre-ft)		82.12	

C & E Loss (ft)	Cum SA (acres)	11.95	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1310.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.		0.030	
E.G. Elev (ft)	1311.05	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1305.89	Flow Area (sq ft)		1749.64	
E.G. Slope (ft/ft)	0.000886	Area (sq ft)		1749.64	
Q Total (cfs)	8890.00	Flow (cfs)		8890.00	
Top Width (ft)	270.59	Top Width (ft)		270.59	
Vel Total (ft/s)	5.08	Avg. Vel. (ft/s)		5.08	
Max Chl Dpth (ft)	11.10	Hydr. Depth (ft)		6.47	
Conv. Total (cfs)	298660.9	Conv. (cfs)		298660.9	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		273.47	
Min Ch El (ft)	1299.55	Shear (lb/sq ft)		0.35	
Alpha	1.00	Stream Power (lb/ft s)		1.80	
Frctn Loss (ft)		Cum Volume (acre-ft)		98.03	0.00
C & E Loss (ft)		Cum SA (acres)		12.61	0.05

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1312.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.		0.030	
E.G. Elev (ft)	1313.19	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1307.11	Flow Area (sq ft)		2320.69	
E.G. Slope (ft/ft)	0.000758	Area (sq ft)		2320.69	
Q Total (cfs)	12830.00	Flow (cfs)		12830.00	
Top Width (ft)	279.42	Top Width (ft)		279.42	
Vel Total (ft/s)	5.53	Avg. Vel. (ft/s)		5.53	
Max Chl Dpth (ft)	13.17	Hydr. Depth (ft)		8.31	
Conv. Total (cfs)	465881.2	Conv. (cfs)		465881.2	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		284.41	
Min Ch El (ft)	1299.55	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)		2.14	
Frctn Loss (ft)		Cum Volume (acre-ft)		123.66	4.75
C & E Loss (ft)		Cum SA (acres)		13.02	3.00

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

BRIDGE RIVER: EMF
REACH: Reach 4 RS: 13.954

INPUT
Description: Higley Road 6-Span Bridge
Use Field Survey Data for this Cross Section
Elongated Piers With Semi-Circular Ends
Distance from Upstream XS = 0
Deck/Roadway Width = 79.19
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 18

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4807.89	1315.5	1315	4855.03	1315.83	1310.81	4855.77	1315.83	1312.47
4861.52	1315.87	1312.47	4899.6	1316.03	1312.68	4901.04	1316.07	1312.69
4936.41	1316.25	1312.77	4948.05	1316.28	1312.8	4974.83	1316.34	1312.85
4995.15	1316.31	1312.8	5012.49	1316.3	1312.79	5042.39	1316.25	1312.47
5050.76	1316.23	1312.49	5088.54	1316.08	1312.53	5088.74	1316.08	1312.53
5127.12	1315.84	1312.33	5135.84	1315.75	1312.5	5165.36	1315.41	1314

Upstream Bridge Cross Section Data
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4807.89	1315.4	4840.55	1315.3	4854.42	1315.26	4855.03	1310.81	4867.07	1309.82
4898.11	1309.82	4901.46	1307.16	4917.23	1302.4	4948.05	1301.34	4994.94	1301.38

```
 5012.22 1300.27 5024.43 1299.55 5030.47  1299.8 5042.29 1301.53 5071.67 1302.24
  5089.7 1306.45 5097.72 1309.05 5123.85 1309.81 5130.25 1311.27  5133.9 1312.29
 5135.84 1315.12 5165.08 1314.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4807.89     .04 4854.42     .03 5135.84     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4854.42 5135.84              .3       .5
Left Levee      Station= 4854.42      Elevation= 1315.26
Right Levee     Station= 5135.84      Elevation= 1315.12

Downstream  Deck/Roadway Coordinates
    num=      19
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  4814.7 1315.53    1314 4861.52 1315.87    1312  4864.8 1315.88 1312.47
  4899.6 1316.03 1312.43 4903.76 1316.05 1312.42 4936.41 1316.25 1312.54
 4950.55 1316.29 1312.62 4974.83 1316.34 1312.71 4997.42 1316.31  1312.8
 5012.49  1316.3 1312.75 5044.21 1316.24 1312.67 5050.76 1316.23 1312.66
 5088.74 1316.08 1312.61 5090.93 1316.06  1312.6 5127.12 1315.84 1312.63
 5135.98 1315.75 1312.64 5136.06 1315.75 1311.47 5165.36 1315.41    1313
 5171.86  1315.3    1315

Downstream Bridge Cross Section Data
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  4814.7 1314.96 4855.13 1314.99 4857.13 1314.97 4870.98 1310.24 4892.66 1308.86
 4901.97 1306.86 4920.34 1301.82  4948.7 1301.05 4995.86 1301.72 5004.41 1300.58
 5016.54 1299.65 5027.69  1300.4 5043.04 1301.59  5068.4 1301.22 5089.23 1307.04
    5098 1309.37 5126.96 1310.58 5131.94 1311.68 5136.06 1311.47  5136.2 1315.18
 5171.86 1315.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  4814.7     .04 4857.13     .03  5136.2     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4857.13  5136.2              .3       .5
Left Levee      Station= 4857.13      Elevation= 1314.97
Right Levee     Station=  5136.2      Elevation= 1315.18

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

Number of Piers =  5

Pier Data
Pier Station     Upstream= 4901.04    Downstream= 4903.76
Upstream     num=       2
    Width   Elev    Width   Elev
    1.49 1306.16    1.49    1313
Downstream     num=       2
    Width   Elev    Width   Elev
    1.49 1306.04    1.49    1313

Pier Data
Pier Station     Upstream= 4948.05    Downstream= 4950.55
Upstream     num=       2
    Width   Elev    Width   Elev
    1.49 1300.34    1.49    1313
Downstream     num=       2
    Width   Elev    Width   Elev
    1.49 1300.59    1.49    1313

Pier Data
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Pier Station      Upstream= 4995.15    Downstream= 4997.42
Upstream      num=        2
    Width   Elev    Width   Elev
    1.49 1300.38    1.49    1313
Downstream      num=        2
    Width   Elev    Width   Elev
    1.49 1300.72    1.49    1313

Pier Data
Pier Station      Upstream= 5042.39    Downstream= 5044.21
Upstream      num=        2
    Width   Elev    Width   Elev
    1.49 1300.53    1.49    1313
Downstream      num=        2
    Width   Elev    Width   Elev
    1.49 1300.05    1.49    1313

Pier Data
Pier Station      Upstream= 5088.54    Downstream= 5090.93
Upstream      num=        2
    Width   Elev    Width   Elev
    1.49 1305.45    1.49    1313
Downstream      num=        2
    Width   Elev    Width   Elev
    1.49 1305.86    1.49    1313

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd    =    1.33
       Yarnell                 KVal =      .9
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 downstream end
       Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT     Profile #Design
Opening : Bridge #1

  E.G. US. (ft)                 1309.68   Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                 1309.31   E.G. Elev (ft)               1309.67       1309.52
  Q Total (cfs)                 6900.00   W.S. Elev (ft)               1309.27       1309.12
  Q Bridge (cfs)                6900.00   Crit W.S. (ft)               1305.24       1305.18
  Q Weir (cfs)                            Max Chl Dpth (ft)               9.72          9.47
  Weir Sta Lft (ft)                       Vel Total (ft/s)                5.04          5.10
  Weir Sta Rgt (ft)                       Flow Area (sq ft)            1369.52       1352.52
  Weir Submerg                            Froude # Chl                    0.34          0.35
  Weir Max Depth (ft)                     Specif Force (cu ft)         6339.00       6219.58
  Min Top Rd (ft)               1315.41   Hydr Depth (ft)                 6.88          6.73
  Min El Prs (ft)               1312.85   W.P. Total (ft)               258.15        258.18
  Delta EG (ft)                    0.16   Conv. Total (cfs)           206333.3      202070.0
  Delta WS (ft)                    0.17   Top Width (ft)                199.15        200.99
  BR Open Area (sq ft)          2206.18   Frctn Loss (ft)
  BR Open Vel (ft/s)               5.10   C & E Loss (ft)
  Coef of Q                               Shear Total (lb/sq ft)          0.37          0.38
  Br Sel Mthd                  Momentum   Power Total (lb/ft s)           1.87          1.95


BRIDGE OUTPUT     Profile #Future
Opening : Bridge #1

  E.G. US. (ft)                 1311.05   Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                 1310.65   E.G. Elev (ft)               1311.04       1310.88
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Q Total (cfs)	8890.00	W.S. Elev (ft)	1310.61	1310.42
Q Bridge (cfs)	8890.00	Crit W.S. (ft)	1305.97	1305.88
Q Weir (cfs)		Max Chl Dpth (ft)	11.06	10.77
Weir Sta Lft (ft)		Vel Total (ft/s)	5.28	5.41
Weir Sta Rgt (ft)		Flow Area (sq ft)	1685.01	1642.65
Weir Submerg		Froude # Chl	0.37	0.37
Weir Max Depth (ft)		Specif Force (cu ft)	8741.14	8569.77
Min Top Rd (ft)	1315.41	Hydr Depth (ft)	6.42	6.70
Min El Prs (ft)	1312.85	W.P. Total (ft)	335.05	315.70
Delta EG (ft)	0.17	Conv. Total (cfs)	244986.4	244302.4
Delta WS (ft)	0.19	Top Width (ft)	262.39	245.34
BR Open Area (sq ft)	2206.18	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.41	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.41	0.43
Br Sel Mthd	Momentum	Power Total (lb/ft s)	2.18	2.33

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	1313.19	E.G. Elev (ft)	1313.17	1313.01
W.S. US. (ft)	1312.72	W.S. Elev (ft)	1312.65	1312.46
Q Total (cfs)	12830.00	Crit W.S. (ft)	1307.19	1307.12
Q Bridge (cfs)	12830.00	Max Chl Dpth (ft)	13.10	12.81
Q Weir (cfs)		Vel Total (ft/s)	5.80	5.92
Weir Sta Lft (ft)		Flow Area (sq ft)	2211.54	2165.42
Weir Sta Rgt (ft)		Froude # Chl	0.36	0.36
Weir Submerg		Specif Force (cu ft)	13596.79	13310.29
Weir Max Depth (ft)		Hydr Depth (ft)	17.45	9.74
Min Top Rd (ft)	1315.41	W.P. Total (ft)	510.27	397.92
Min El Prs (ft)	1312.85	Conv. Total (cfs)	291182.8	331826.0
Delta EG (ft)	0.18	Top Width (ft)	126.71	222.24
Delta WS (ft)	0.22	Frctn Loss (ft)		
BR Open Area (sq ft)	2206.18	C & E Loss (ft)		
BR Open Vel (ft/s)	5.92	Shear Total (lb/sq ft)	0.53	0.51
Coef of Q		Power Total (lb/ft s)	3.05	3.01
Br Sel Mthd	Momentum			

CROSS SECTION RIVER: EMF
REACH: Reach 4 RS: 13.946

INPUT
Description: Higley Road Bridge (Downstream Face)
6 Span Bridge with Riprap
Protection
Manning n Value of .030 used for Channel
Use Field
Survey Data for This Cross Section
Skew Angle 41.71 Degrees,
Cross Section Data Adjusted
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4814.7	1314.96	4855.13	1314.99	4857.13	1314.97	4870.98	1310.24	4892.66	1308.86
4901.97	1306.86	4920.34	1301.82	4948.7	1301.05	4995.86	1301.72	5004.41	1300.58
5016.54	1299.65	5027.69	1300.4	5043.04	1301.59	5068.4	1301.22	5089.23	1307.04
5098	1309.37	5126.96	1310.58	5131.94	1311.68	5136.06	1311.47	5136.2	1315.18
5171.86	1315.16								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4814.7	.04	4857.13	.03	5136.2	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4857.13	5136.2	35	184.27	320	.3	.5

Left Levee Station= 4857.13 Elevation= 1314.97
Right Levee Station= 5136.2 Elevation= 1315.18

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1309.15	Element	Left OB	Channel	Right OB

Vel Head (ft)	0.38	Wt. n-Val.		0.030	
E.G. Elev (ft)	1309.53	Reach Len. (ft)	35.00	184.27	320.00
Crit W.S. (ft)	1305.09	Flow Area (sq ft)		1400.03	
E.G. Slope (ft/ft)	0.000795	Area (sq ft)		1400.03	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	209.04	Top Width (ft)		209.04	
Vel Total (ft/s)	4.93	Avg. Vel. (ft/s)		4.93	
Max Chl Dpth (ft)	9.50	Hydr. Depth (ft)		6.70	
Conv. Total (cfs)	244689.5	Conv. (cfs)		244689.5	
Length Wtd. (ft)	184.27	Wetted Per. (ft)		211.22	
Min Ch El (ft)	1299.65	Shear (lb/sq ft)		0.33	
Alpha	1.00	Stream Power (lb/ft s)		1.62	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		79.64	
C & E Loss (ft)	0.00	Cum SA (acres)		11.59	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1310.46	Element			
Vel Head (ft)	0.42	Wt. n-Val.		0.030	
E.G. Elev (ft)	1310.88	Reach Len. (ft)	35.00	184.27	320.00
Crit W.S. (ft)	1305.82	Flow Area (sq ft)		1702.12	
E.G. Slope (ft/ft)	0.000889	Area (sq ft)		1702.12	
Q Total (cfs)	8890.00	Flow (cfs)		8890.00	
Top Width (ft)	253.71	Top Width (ft)		253.71	
Vel Total (ft/s)	5.22	Avg. Vel. (ft/s)		5.22	
Max Chl Dpth (ft)	10.81	Hydr. Depth (ft)		6.71	
Conv. Total (cfs)	298099.4	Conv. (cfs)		298099.4	
Length Wtd. (ft)	184.27	Wetted Per. (ft)		256.00	
Min Ch El (ft)	1299.65	Shear (lb/sq ft)		0.37	
Alpha	1.00	Stream Power (lb/ft s)		1.93	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		95.01	0.00
C & E Loss (ft)	0.01	Cum SA (acres)		12.15	0.05

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1312.50	Element			
Vel Head (ft)	0.51	Wt. n-Val.		0.030	
E.G. Elev (ft)	1313.01	Reach Len. (ft)	35.00	184.27	320.00
Crit W.S. (ft)	1307.06	Flow Area (sq ft)		2242.88	
E.G. Slope (ft/ft)	0.000814	Area (sq ft)		2242.88	
Q Total (cfs)	12830.00	Flow (cfs)		12830.00	
Top Width (ft)	271.74	Top Width (ft)		271.74	
Vel Total (ft/s)	5.72	Avg. Vel. (ft/s)		5.72	
Max Chl Dpth (ft)	12.85	Hydr. Depth (ft)		8.25	
Conv. Total (cfs)	449578.2	Conv. (cfs)		449578.2	
Length Wtd. (ft)	184.76	Wetted Per. (ft)		275.50	
Min Ch El (ft)	1299.65	Shear (lb/sq ft)		0.41	
Alpha	1.00	Stream Power (lb/ft s)		2.37	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		119.68	4.75
C & E Loss (ft)	0.02	Cum SA (acres)		12.70	3.00

CROSS SECTION RIVER: EMF
REACH: Reach 4 RS: 13.911

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4841.43	1315.1	4853.38	1314.38	4870.61	1315.06	4880.66	1314.55	4906.08	1306.5
4920.61	1301.6	4938.27	1301.19	5001.12	1300.88	5069.78	1301.55	5074.56	1301.58
5104.87	1311.2	5116.39	1311.13	5120.37	1310.01	5142.7	1310.27	5166.32	1314.44
5181.39	1314.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4841.43	.04	4870.61	.025	5104.87	.04

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

4870.61 5104.87 275 368.56 380 .3 .5

Left Levee Station= 4870.61 Elevation= 1315.06
Right Levee Station= 5104.87 Elevation= 1311.2

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1309.01	Element			
Vel Head (ft)	0.39	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.40	Reach Len. (ft)	275.00	368.56	380.00
Crit W.S. (ft)	1305.06	Flow Area (sq ft)		1375.56	
E.G. Slope (ft/ft)	0.000552	Area (sq ft)		1375.56	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	199.82	Top Width (ft)		199.82	
Vel Total (ft/s)	5.02	Avg. Vel. (ft/s)		5.02	
Max Chl Dpth (ft)	8.13	Hydr. Depth (ft)		6.88	
Conv. Total (cfs)	293569.5	Conv. (cfs)		293569.5	
Length Wtd. (ft)	368.56	Wetted Per. (ft)		202.17	
Min Ch El (ft)	1300.88	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		1.18	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		73.77	
C & E Loss (ft)	0.01	Cum SA (acres)		10.72	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1310.29	Element			
Vel Head (ft)	0.46	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.75	Reach Len. (ft)	275.00	368.56	380.00
Crit W.S. (ft)	1305.75	Flow Area (sq ft)		1635.69	
E.G. Slope (ft/ft)	0.000544	Area (sq ft)		1635.69	
Q Total (cfs)	8890.00	Flow (cfs)		8890.00	
Top Width (ft)	207.87	Top Width (ft)		207.87	
Vel Total (ft/s)	5.44	Avg. Vel. (ft/s)		5.44	
Max Chl Dpth (ft)	9.41	Hydr. Depth (ft)		7.87	
Conv. Total (cfs)	381269.0	Conv. (cfs)		381269.0	
Length Wtd. (ft)	368.56	Wetted Per. (ft)		210.62	
Min Ch El (ft)	1300.88	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)		1.43	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		87.95	0.00
C & E Loss (ft)	0.01	Cum SA (acres)		11.18	0.05

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1312.27	Element			
Vel Head (ft)	0.59	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1312.86	Reach Len. (ft)	275.00	368.56	380.00
Crit W.S. (ft)	1306.98	Flow Area (sq ft)		2058.98	78.47
E.G. Slope (ft/ft)	0.000550	Area (sq ft)		2058.98	78.47
Q Total (cfs)	12830.00	Flow (cfs)		12737.06	92.94
Top Width (ft)	266.18	Top Width (ft)		217.02	49.17
Vel Total (ft/s)	6.00	Avg. Vel. (ft/s)		6.19	1.18
Max Chl Dpth (ft)	11.39	Hydr. Depth (ft)		9.49	1.60
Conv. Total (cfs)	547109.6	Conv. (cfs)		543146.3	3963.3
Length Wtd. (ft)	368.63	Wetted Per. (ft)		220.21	49.50
Min Ch El (ft)	1300.88	Shear (lb/sq ft)		0.32	0.05
Alpha	1.05	Stream Power (lb/ft s)		1.99	0.06
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		110.58	4.46
C & E Loss (ft)	0.01	Cum SA (acres)		11.66	2.82

CROSS SECTION RIVER: EMF
REACH: Reach 4 RS: 13.842

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4551.05	1318.9	4564.55	1315.12	4611.63	1314.79	4621.86	1314.82	4639.67	1314.71
4689.87	1314.2	4745.86	1313.77	4829.57	1313.67	4836.88	1313.61	4842.99	1315.71
4850.21	1313.1	4866.43	1313.27	4870.85	1314.45	4878.98	1314.74	4884.46	1314.73

4926.45 1301.7 4999.22 1300.99 5003.91 1300.89 5042.99 1301.14 5079.17 1301.41
5109.48 1311.1 5122.04 1311.27 5126.64 1310.64 5153.02 1310.57 5174.09 1314.7
5189.06 1314.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4551.05	.04	4884.46	.025	5109.48	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4884.46	5109.48	350	455.16	480	.1	.3

Left Levee Station= 4842.99 Elevation= 1315.71
Right Levee Station= 5122.04 Elevation= 1311.27

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1308.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.17	Reach Len. (ft)	350.00	455.16	480.00
Crit W.S. (ft)	1305.14	Flow Area (sq ft)		1310.43	
E.G. Slope (ft/ft)	0.000642	Area (sq ft)		1310.43	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	198.33	Top Width (ft)		198.33	
Vel Total (ft/s)	5.27	Avg. Vel. (ft/s)		5.27	
Max Chl Dpth (ft)	7.85	Hydr. Depth (ft)		6.61	
Conv. Total (cfs)	272230.6	Conv. (cfs)		272230.6	
Length Wtd. (ft)	455.16	Wetted Per. (ft)		200.55	
Min Ch El (ft)	1300.89	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)		1.38	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)		62.41	
C & E Loss (ft)	0.01	Cum SA (acres)		9.04	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1310.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.52	Reach Len. (ft)	350.00	455.16	480.00
Crit W.S. (ft)	1305.83	Flow Area (sq ft)		1570.13	
E.G. Slope (ft/ft)	0.000617	Area (sq ft)		1570.13	
Q Total (cfs)	8890.00	Flow (cfs)		8890.00	
Top Width (ft)	206.48	Top Width (ft)		206.48	
Vel Total (ft/s)	5.66	Avg. Vel. (ft/s)		5.66	
Max Chl Dpth (ft)	9.13	Hydr. Depth (ft)		7.60	
Conv. Total (cfs)	357872.3	Conv. (cfs)		357872.3	
Length Wtd. (ft)	455.16	Wetted Per. (ft)		209.09	
Min Ch El (ft)	1300.89	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)		1.64	
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)		74.39	0.00
C & E Loss (ft)	0.01	Cum SA (acres)		9.42	0.05

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1311.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1312.63	Reach Len. (ft)	350.00	455.16	480.00
Crit W.S. (ft)	1307.04	Flow Area (sq ft)		1988.44	56.78
E.G. Slope (ft/ft)	0.000618	Area (sq ft)		1988.44	56.78
Q Total (cfs)	12830.00	Flow (cfs)		12773.68	56.32
Top Width (ft)	267.01	Top Width (ft)		216.20	50.81
Vel Total (ft/s)	6.27	Avg. Vel. (ft/s)		6.42	0.99
Max Chl Dpth (ft)	11.10	Hydr. Depth (ft)		9.20	1.12
Conv. Total (cfs)	516200.4	Conv. (cfs)		513934.3	2266.1
Length Wtd. (ft)	455.32	Wetted Per. (ft)		219.28	50.99
Min Ch El (ft)	1300.89	Shear (lb/sq ft)		0.35	0.04
Alpha	1.04	Stream Power (lb/ft s)		2.25	0.04
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)		93.46	3.87
C & E Loss (ft)	0.01	Cum SA (acres)		9.83	2.38

CROSS SECTION RIVER: EMF

REACH: Reach 4 RS: 13.755

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4346.51	1317.8	4355.11	1317.63	4382.62	1316.77	4410.37	1316.4	4428.28	1316.03
4437.3	1315.95	4445.43	1315.6	4472.69	1315.58	4489.46	1315	4538.68	1314.7
4567.32	1314.37	4586.96	1313.99	4603.26	1313.78	4627.02	1314.2	4640.37	1318.68
4658.19	1317.83	4671.96	1311.78	4689.09	1311.09	4710.97	1311	4827.33	1310.97
4840.54	1316.92	4851.8	1316.56	4859.9	1312.67	4872.31	1313	4876.99	1314.4
4890.52	1314.18	4934.94	1300.77	4945.61	1300.52	4985.71	1300.5	4997.1	1300.76
5017.45	1300.74	5083.19	1300.78	5114.85	1310.51	5126.01	1310.6	5130.76	1309.68
5159.16	1309.68	5179.99	1313.96	5184.27	1314.05				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4346.51	.04	4890.52	.025	5114.85	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4890.52	5114.85	500	500	500	.1	.3

Left Levee Station= 4876.99 Elevation= 1314.4
Right Levee Station= 5126.01 Elevation= 1310.6
Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4346.51	4640	1317.8	4658	4840.54	1316.92

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1308.48	Element			
Vel Head (ft)	0.40	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.88	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1304.62	Flow Area (sq ft)		1352.28	
E.G. Slope (ft/ft)	0.000581	Area (sq ft)		1352.28	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	198.84	Top Width (ft)		198.84	
Vel Total (ft/s)	5.10	Avg. Vel. (ft/s)		5.10	
Max Chl Dpth (ft)	7.98	Hydr. Depth (ft)		6.80	
Conv. Total (cfs)	286307.5	Conv. (cfs)		286307.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		201.14	
Min Ch El (ft)	1300.50	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		1.24	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)		48.50	
C & E Loss (ft)	0.01	Cum SA (acres)		6.96	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1309.77	Element			
Vel Head (ft)	0.47	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.24	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1305.32	Flow Area (sq ft)		1614.87	
E.G. Slope (ft/ft)	0.000565	Area (sq ft)		1614.87	
Q Total (cfs)	8890.00	Flow (cfs)		8890.00	
Top Width (ft)	207.33	Top Width (ft)		207.33	
Vel Total (ft/s)	5.51	Avg. Vel. (ft/s)		5.51	
Max Chl Dpth (ft)	9.27	Hydr. Depth (ft)		7.79	
Conv. Total (cfs)	373921.5	Conv. (cfs)		373921.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		210.02	
Min Ch El (ft)	1300.50	Shear (lb/sq ft)		0.27	
Alpha	1.00	Stream Power (lb/ft s)		1.49	
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)		57.75	0.00
C & E Loss (ft)	0.01	Cum SA (acres)		7.26	0.05

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1311.75	Element			
Vel Head (ft)	0.60	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1312.35	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1306.55	Flow Area (sq ft)		2035.35	90.24

E.G. Slope (ft/ft)	0.000567	Area (sq ft)	2035.35	90.24
Q Total (cfs)	12830.00	Flow (cfs)	12718.53	111.47
Top Width (ft)	270.67	Top Width (ft)	216.28	54.39
Vel Total (ft/s)	6.04	Avg. Vel. (ft/s)	6.25	1.24
Max Chl Dpth (ft)	11.25	Hydr. Depth (ft)	9.41	1.66
Conv. Total (cfs)	538832.9	Conv. (cfs)	534151.5	4681.3
Length Wtd. (ft)	500.00	Wetted Per. (ft)	219.37	54.69
Min Ch El (ft)	1300.50	Shear (lb/sq ft)	0.33	0.06
Alpha	1.06	Stream Power (lb/ft s)	2.05	0.07
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	72.43	3.06
C & E Loss (ft)	0.01	Cum SA (acres)	7.57	1.80

CROSS SECTION RIVER: EMF
REACH: Reach 4 RS: 13.661

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4183.93	1320.3	4200.85	1319.4	4220.13	1317.94	4220.72	1318.1	4225.26	1316.78
4229.39	1315.94	4252	1315.34	4259.66	1315.4	4266.52	1315.3	4300.05	1315.43
4311.8	1316.18	4330.02	1316.77	4358.73	1317.33	4364.51	1314.5	4375.31	1314.87
4383.32	1314.66	4392.08	1314.61	4396.63	1313.39	4400.77	1314.3	4410.17	1312.9
4434.72	1313.18	4474.29	1313.4	4481.85	1313.38	4536.21	1314.3	4551.06	1313.78
4564.86	1314.24	4603.11	1315.33	4609.9	1315.25	4658.58	1313.6	4722.03	1311.7
4764.12	1311.29	4788.5	1311.63	4824.21	1312.21	4829.82	1312.3	4834.24	1311.56
4839.89	1309.92	4846.12	1310.61	4850.08	1312.53	4869.4	1313.5	4878.08	1314.17
4879.08	1314.01	4890.75	1314.09	4918.56	1305.18	4933.01	1300.7	4959.44	1300.32
4974.64	1300.06	5000.6	1299.76	5005.74	1299.76	5014.49	1300.1	5021.7	1300.13
5082.42	1300.36	5115.14	1310.3	5126.79	1310.21	5129.98	1309	5159.9	1309.36
5179.65	1314.05	5192.04	1314.13						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4183.93	.04	4890.75	.025	5115.14	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4890.75	5115.14	500	500	500	.1	.3

Left Levee Station= 4890.75 Elevation= 1314.09
Right Levee Station= 5115.14 Elevation= 1310.3

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1308.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.60	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1304.14	Flow Area (sq ft)		1392.48	
E.G. Slope (ft/ft)	0.000528	Area (sq ft)		1392.48	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	199.22	Top Width (ft)		199.22	
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)		4.96	
Max Chl Dpth (ft)	8.46	Hydr. Depth (ft)		6.99	
Conv. Total (cfs)	300226.8	Conv. (cfs)		300226.8	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		201.55	
Min Ch El (ft)	1299.76	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		1.13	
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)		32.74	
C & E Loss (ft)	0.00	Cum SA (acres)		4.68	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1309.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.97	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1304.84	Flow Area (sq ft)		1656.74	
E.G. Slope (ft/ft)	0.000520	Area (sq ft)		1656.74	
Q Total (cfs)	8890.00	Flow (cfs)		8890.00	
Top Width (ft)	207.55	Top Width (ft)		207.55	
Vel Total (ft/s)	5.37	Avg. Vel. (ft/s)		5.37	

Max Chl Dpth (ft)	9.76	Hydr. Depth (ft)	7.98	
Conv. Total (cfs)	389896.5	Conv. (cfs)	389896.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	210.28	
Min Ch El (ft)	1299.76	Shear (lb/sq ft)	0.26	
Alpha	1.00	Stream Power (lb/ft s)	1.37	
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	38.97	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	4.88	0.05

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1311.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1312.07	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1306.07	Flow Area (sq ft)		2077.36	99.39
E.G. Slope (ft/ft)	0.000529	Area (sq ft)		2077.36	99.39
Q Total (cfs)	12830.00	Flow (cfs)		12702.88	127.13
Top Width (ft)	270.05	Top Width (ft)		216.29	53.75
Vel Total (ft/s)	5.89	Avg. Vel. (ft/s)		6.11	1.28
Max Chl Dpth (ft)	11.74	Hydr. Depth (ft)		9.60	1.85
Conv. Total (cfs)	558055.2	Conv. (cfs)		552525.8	5529.4
Length Wtd. (ft)	500.00	Wetted Per. (ft)		219.45	54.23
Min Ch El (ft)	1299.76	Shear (lb/sq ft)		0.31	0.06
Alpha	1.07	Stream Power (lb/ft s)		1.91	0.08
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)		48.83	1.97
C & E Loss (ft)	0.00	Cum SA (acres)		5.09	1.18

CROSS SECTION RIVER: EMF
REACH: Reach 4 RS: 13.566

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3918.56	1324.35	3928.99	1320.83	3947.33	1320.7	3952.92	1319.33	3956.52	1319.94
3965.45	1318.17	3991.61	1317.69	4017.16	1317.2	4056.43	1316.55	4083.12	1316.2
4133.87	1315.46	4195.22	1314.48	4214.73	1314.3	4263.92	1313.7	4297.79	1313.07
4348.89	1311.95	4413.87	1311.18	4426.76	1311.2	4485.21	1310.82	4502.82	1311
4509.96	1310.86	4518.57	1310.89	4532.69	1311.2	4542.66	1311.25	4612.34	1311.97
4640.09	1312.17	4658.32	1312.21	4714.44	1312.5	4774.1	1312.84	4793.19	1313.19
4806.59	1313.71	4819.28	1314.04	4827.87	1319.2	4840.83	1318.75	4846.28	1314.81
4858.79	1314.16	4863.04	1313.27	4875.09	1314	4887.86	1314.17	4936.05	1300.44
4958.48	1300.08	5007.87	1299.75	5042.34	1299.5	5055.28	1299.46	5078.85	1299.92
5102.61	1307.25	5111.94	1310.05	5127.25	1309.7	5129.61	1309.43	5158.02	1309.17
5179.18	1314.03	5192.63	1314.37						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3918.56	.04	4887.86	.025	5111.94	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4887.86	5111.94	500	500	500	.1	.3

Left Levee Station= 4887.86 Elevation= 1314.17
Right Levee Station= 5111.94 Elevation= 1310.05

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1307.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.33	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1303.88	Flow Area (sq ft)		1359.63	
E.G. Slope (ft/ft)	0.000556	Area (sq ft)		1359.63	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	195.09	Top Width (ft)		195.09	
Vel Total (ft/s)	5.07	Avg. Vel. (ft/s)		5.07	
Max Chl Dpth (ft)	8.47	Hydr. Depth (ft)		6.97	
Conv. Total (cfs)	292590.3	Conv. (cfs)		292590.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		197.35	
Min Ch El (ft)	1299.46	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		1.21	

Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	16.95
C & E Loss (ft)	0.03	Cum SA (acres)	2.41

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1309.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.70	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1304.60	Flow Area (sq ft)		1619.15	
E.G. Slope (ft/ft)	0.000548	Area (sq ft)		1619.15	
Q Total (cfs)	8890.00	Flow (cfs)		8890.00	
Top Width (ft)	203.99	Top Width (ft)		203.99	
Vel Total (ft/s)	5.49	Avg. Vel. (ft/s)		5.49	
Max Chl Dpth (ft)	9.77	Hydr. Depth (ft)		7.94	
Conv. Total (cfs)	379673.5	Conv. (cfs)		379673.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		206.63	
Min Ch El (ft)	1299.46	Shear (lb/sq ft)		0.27	
Alpha	1.00	Stream Power (lb/ft s)		1.47	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)		20.17	0.00
C & E Loss (ft)	0.04	Cum SA (acres)		2.52	0.05

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1311.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1311.80	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1305.86	Flow Area (sq ft)		2030.63	86.59
E.G. Slope (ft/ft)	0.000563	Area (sq ft)		2030.63	86.59
Q Total (cfs)	12830.00	Flow (cfs)		12726.91	103.09
Top Width (ft)	268.50	Top Width (ft)		213.62	54.88
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)		6.27	1.19
Max Chl Dpth (ft)	11.73	Hydr. Depth (ft)		9.51	1.58
Conv. Total (cfs)	540883.1	Conv. (cfs)		536536.9	4346.2
Length Wtd. (ft)	500.00	Wetted Per. (ft)		216.65	55.13
Min Ch El (ft)	1299.46	Shear (lb/sq ft)		0.33	0.06
Alpha	1.06	Stream Power (lb/ft s)		2.06	0.07
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)		25.25	0.90
C & E Loss (ft)	0.05	Cum SA (acres)		2.62	0.56

CROSS SECTION RIVER: EMF
REACH: Reach 4 RS: 13.471

INPUT
Description: Upstream End of Reach 3
Q(D)=6,900 cfs, Q(F)=8,970 cfs &
Q(E)=12,910 cfs
Start Water Surface Elevations Used for This
Cross Section Were Calculated from Reach 3 HEC-RAS Runs
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4667.89	1313.9	4683.64	1313.52	4692	1313.4	4706.01	1315.92	4713.6	1317.19
4722.09	1316.3	4729.7	1315.93	4741.51	1316	4778.38	1315.78	4793.66	1315.55
4800.51	1313.8	4804.12	1314.99	4808.22	1313.71	4826.85	1313.28	4845.01	1313.1
4856.34	1314.5	4872.16	1314.11	4878.86	1312.25	4922.23	1300.05	4925.17	1299.94
4959.53	1299.9	5001.83	1299.57	5006.27	1299.6	5057.94	1299.43	5069.75	1299.5
5093.27	1300	5126.43	1309.5	5140.83	1309.27	5142.94	1308.93	5161.38	1309.31
5180.69	1313.6	5193.03	1314.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4667.89	.04	4872.16	.025	5126.43	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4872.16	5126.43	0	0	0	.3	.5

Left Levee Station= 4856.34 Elevation= 1314.5
Right Levee Station= 5193.03 Elevation= 1314.2

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1307.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.06	Reach Len. (ft)			
Crit W.S. (ft)	1303.31	Flow Area (sq ft)		1593.36	
E.G. Slope (ft/ft)	0.000397	Area (sq ft)		1593.36	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	225.61	Top Width (ft)		225.61	
Vel Total (ft/s)	4.33	Avg. Vel. (ft/s)		4.33	
Max Chl Dpth (ft)	8.34	Hydr. Depth (ft)		7.06	
Conv. Total (cfs)	346400.9	Conv. (cfs)		346400.9	
Length Wtd. (ft)		Wetted Per. (ft)		227.77	
Min Ch El (ft)	1299.43	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.75	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1309.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1309.43	Reach Len. (ft)			
Crit W.S. (ft)	1303.98	Flow Area (sq ft)		1894.93	0.61
E.G. Slope (ft/ft)	0.000398	Area (sq ft)		1894.93	0.61
Q Total (cfs)	8970.00	Flow (cfs)		8969.92	0.08
Top Width (ft)	243.04	Top Width (ft)		234.83	8.20
Vel Total (ft/s)	4.73	Avg. Vel. (ft/s)		4.73	0.13
Max Chl Dpth (ft)	9.65	Hydr. Depth (ft)		8.07	0.07
Conv. Total (cfs)	449888.2	Conv. (cfs)		449884.1	4.1
Length Wtd. (ft)		Wetted Per. (ft)		237.36	8.22
Min Ch El (ft)	1299.43	Shear (lb/sq ft)		0.20	0.00
Alpha	1.00	Stream Power (lb/ft s)		0.94	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1311.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1311.51	Reach Len. (ft)			
Crit W.S. (ft)	1305.13	Flow Area (sq ft)		2369.50	70.92
E.G. Slope (ft/ft)	0.000406	Area (sq ft)		2369.50	70.92
Q Total (cfs)	12910.00	Flow (cfs)		12835.97	74.03
Top Width (ft)	286.17	Top Width (ft)		243.34	42.83
Vel Total (ft/s)	5.29	Avg. Vel. (ft/s)		5.42	1.04
Max Chl Dpth (ft)	11.63	Hydr. Depth (ft)		9.74	1.66
Conv. Total (cfs)	640890.8	Conv. (cfs)		637215.9	3674.9
Length Wtd. (ft)		Wetted Per. (ft)		246.20	43.05
Min Ch El (ft)	1299.43	Shear (lb/sq ft)		0.24	0.04
Alpha	1.04	Stream Power (lb/ft s)		1.32	0.04
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:EMF

Reach	River Sta.	n1	n2	n3
Reach 4	18.345	.04	.03	.04
Reach 4	18.237	.04	.015	.04
Reach 4	18.193	.04	.015	.04
Reach 4	18.087	.04	.015	.04
Reach 4	17.898	.04	.015	.04

Reach 4	17.803	.04	.015	.04
Reach 4	17.672	.04	.015	.04
Reach 4	17.571	.04	.015	.04
Reach 4	17.48	.04	.015	.04
Reach 4	17.339	.04	.015	.04
Reach 4	17.288	.04	.015	.04
Reach 4	17.269	.04	.015	.04
Reach 4	17.261	Bridge		
Reach 4	17.254	.04	.015	.04
Reach 4	17.25	.04	.015	.04
Reach 4	17.213	.04	.015	.04
Reach 4	17.17	.04	.015	.04
Reach 4	17.101	.04	.015	.04
Reach 4	17.086	Bridge		
Reach 4	17.082	.04	.015	.04
Reach 4	17.071	.04	.03	.04
Reach 4	17.039	.04	.03	.04
Reach 4	16.94	.04	.025	.04
Reach 4	16.819	.04	.025	.04
Reach 4	16.63	.04	.025	.04
Reach 4	16.468	.04	.025	.04
Reach 4	16.389	.04	.025	.04
Reach 4	16.321	.04	.025	.04
Reach 4	16.251	.04	.025	.04
Reach 4	16.242	.04	.03	.04
Reach 4	16.240	Bridge		
Reach 4	16.238	.04	.03	.04
Reach 4	16.221	.04	.03	.04
Reach 4	16.213	Bridge		
Reach 4	16.205	.04	.03	.04
Reach 4	16.19	.04	.025	.04
Reach 4	16	.04	.025	.04
Reach 4	15.811	.04	.025	.04
Reach 4	15.606	.04	.025	.04
Reach 4	15.483	.04	.025	.04
Reach 4	15.414	.04	.025	.04
Reach 4	15.225	.04	.025	.04
Reach 4	15.035	.04	.025	.04
Reach 4	14.926	.04	.025	.04
Reach 4	14.823	.04	.025	.04
Reach 4	14.764	.04	.025	.04
Reach 4	14.754	.04	.025	.04
Reach 4	14.738	.04	.025	.04
Reach 4	14.637	.04	.025	.04
Reach 4	14.412	.04	.025	.04
Reach 4	14.3	.04	.025	.04
Reach 4	14.191	.04	.025	.04
Reach 4	14	.04	.025	.04
Reach 4	13.961	.04	.03	.04
Reach 4	13.954	Bridge		
Reach 4	13.946	.04	.03	.04
Reach 4	13.911	.04	.025	.04
Reach 4	13.842	.04	.025	.04
Reach 4	13.755	.04	.025	.04
Reach 4	13.661	.04	.025	.04
Reach 4	13.566	.04	.025	.04
Reach 4	13.471	.04	.025	.04

SUMMARY OF REACH LENGTHS

River: EMF

Reach	River Sta.	Left	Channel	Right
Reach 4	18.345	1200	569.2	425
Reach 4	18.237	230	228.85	232
Reach 4	18.193	410	560.16	580
Reach 4	18.087	1000	1000	1000

Reach 4	17.898	500	500	500
Reach 4	17.803	694.37	694.37	694.37
Reach 4	17.672	600	531.47	520
Reach 4	17.571	480	478.82	478
Reach 4	17.48	726	744.91	760
Reach 4	17.339	185	269.49	285
Reach 4	17.288	104.41	104.41	104.41
Reach 4	17.269	74.33	74.33	74.33
Reach 4	17.261	Bridge		
Reach 4	17.254	23	24.91	27
Reach 4	17.25	420	192.04	140
Reach 4	17.213	460	226.49	165
Reach 4	17.17	480	366.64	305
Reach 4	17.101	98.73	98.73	98.73
Reach 4	17.086	Bridge		
Reach 4	17.082	8	60.64	125
Reach 4	17.071	150	166.55	175
Reach 4	17.039	280	524.1	610
Reach 4	16.94	639.43	639.43	639.43
Reach 4	16.819	1000	1000	1000
Reach 4	16.63	854.21	854.21	854.21
Reach 4	16.468	630	415.71	360
Reach 4	16.389	357.08	357.08	357.08
Reach 4	16.321	325	372.72	385
Reach 4	16.251	48.64	48.64	48.64
Reach 4	16.242	17.24	17.24	17.24
Reach 4	16.240	Bridge		
Reach 4	16.238	90.08	90.08	90.08
Reach 4	16.221	83.72	83.72	83.72
Reach 4	16.213	Bridge		
Reach 4	16.205	80.36	80.36	80.36
Reach 4	16.19	1050	1004.24	990
Reach 4	16	1000	1000	1000
Reach 4	15.811	1080	1080	1080
Reach 4	15.606	647.98	647.98	647.98
Reach 4	15.483	270	365.86	400
Reach 4	15.414	1000	1000	1000
Reach 4	15.225	1000	1000	1000
Reach 4	15.035	574.6	574.6	574.6
Reach 4	14.926	915	545.66	470
Reach 4	14.823	311.48	311.48	311.48
Reach 4	14.764	52.59	52.59	52.59
Reach 4	14.754	87.83	87.83	87.83
Reach 4	14.738	528.63	528.63	528.63
Reach 4	14.637	720	1188.15	1270
Reach 4	14.412	594.77	594.77	594.77
Reach 4	14.3	840	571.41	525
Reach 4	14.191	1011.04	1011.04	1011.04
Reach 4	14	390	204.54	80
Reach 4	13.961	79.19	79.19	79.19
Reach 4	13.954	Bridge		
Reach 4	13.946	35	184.27	320
Reach 4	13.911	275	368.56	380
Reach 4	13.842	350	455.16	480
Reach 4	13.755	500	500	500
Reach 4	13.661	500	500	500
Reach 4	13.566	500	500	500
Reach 4	13.471	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: EMF

Reach	River Sta.	Contr.	Expan.
Reach 4	18.345	.1	.3
Reach 4	18.237	.3	.5
Reach 4	18.193	.1	.3

Reach 4	18.087		.1	.3
Reach 4	17.898		.1	.3
Reach 4	17.803		.1	.3
Reach 4	17.672		.1	.3
Reach 4	17.571		.1	.3
Reach 4	17.48		.1	.3
Reach 4	17.339		.1	.3
Reach 4	17.288		.1	.3
Reach 4	17.269		.3	.5
Reach 4	17.261	Bridge		
Reach 4	17.254		.3	.5
Reach 4	17.25		.1	.3
Reach 4	17.213		.1	.3
Reach 4	17.17		.1	.3
Reach 4	17.101		.3	.5
Reach 4	17.086	Bridge		
Reach 4	17.082		.3	.5
Reach 4	17.071		.3	.5
Reach 4	17.039		.1	.3
Reach 4	16.94		.1	.3
Reach 4	16.819		.1	.3
Reach 4	16.63		.1	.3
Reach 4	16.468		.1	.3
Reach 4	16.389		.1	.3
Reach 4	16.321		.1	.3
Reach 4	16.251		.3	.5
Reach 4	16.242		.3	.5
Reach 4	16.240	Bridge		
Reach 4	16.238		.3	.5
Reach 4	16.221		.3	.5
Reach 4	16.213	Bridge		
Reach 4	16.205		.3	.5
Reach 4	16.19		.3	.5
Reach 4	16		.1	.3
Reach 4	15.811		.1	.3
Reach 4	15.606		.1	.3
Reach 4	15.483		.1	.3
Reach 4	15.414		.1	.3
Reach 4	15.225		.1	.3
Reach 4	15.035		.1	.3
Reach 4	14.926		.1	.3
Reach 4	14.823		.1	.3
Reach 4	14.764		.1	.3
Reach 4	14.754		.1	.3
Reach 4	14.738		.1	.3
Reach 4	14.637		.1	.3
Reach 4	14.412		.1	.3
Reach 4	14.3		.1	.3
Reach 4	14.191		.1	.3
Reach 4	14		.3	.5
Reach 4	13.961		.3	.5
Reach 4	13.954	Bridge		
Reach 4	13.946		.3	.5
Reach 4	13.911		.3	.5
Reach 4	13.842		.1	.3
Reach 4	13.755		.1	.3
Reach 4	13.661		.1	.3
Reach 4	13.566		.1	.3
Reach 4	13.471		.3	.5

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 4	18.345	6500.00	1317.07	1326.53	1321.24	1326.78	0.000441	4.05	1605.14	206.25	0.26
Reach 4	18.345	4700.00	1317.07	1328.44	1320.52	1328.52	0.000117	2.33	2058.09	281.29	0.14
Reach 4	18.345	7840.00	1317.07	1330.80	1321.75	1330.93	0.000138	2.95	3130.97	565.90	0.15
Reach 4	18.237	6500.00	1317.30	1326.38	1321.19	1326.66	0.000120	4.28	1517.16	189.23	0.27
Reach 4	18.237	8500.00	1317.30	1328.10	1321.93	1328.43	0.000113	4.59	1851.37	198.93	0.27
Reach 4	18.237	11950.00	1317.30	1330.56	1323.05	1330.86	0.000084	4.56	4340.86	1027.78	0.24

Reach 4	18.193	6500.00	1315.38	1325.15	1322.20	1326.34	0.000537	8.75	759.59	143.93	0.55
Reach 4	18.193	8500.00	1315.38	1326.76	1323.41	1328.08	0.000508	9.31	1035.56	227.15	0.[illegible]
Reach 4	18.193	11950.00	1315.38	1329.08	1325.42	1330.48	0.000421	9.85	1665.33	289.49	0.[illegible]
Reach 4	18.087	6500.00	1315.14	1324.21	1322.42	1325.91	0.000873	10.48	619.98	87.39	0.69
Reach 4	18.087	8500.00	1315.14	1325.73	1323.67	1327.67	0.000839	11.18	787.80	135.59	0.69
Reach 4	18.087	11950.00	1315.14	1329.26	1325.95	1330.11	0.000350	8.19	3067.48	922.91	0.46
Reach 4	17.898	6500.00	1314.10	1323.33	1321.55	1325.04	0.000880	10.48	619.96	87.98	0.70
Reach 4	17.898	8500.00	1314.10	1324.88	1322.81	1326.81	0.000859	11.15	762.19	96.61	0.70
Reach 4	17.898	11950.00	1314.10	1329.15	1324.72	1329.77	0.000220	7.33	3816.15	909.63	0.38
Reach 4	17.803	6500.00	1313.58	1322.94	1321.03	1324.59	0.000835	10.30	631.27	88.43	0.68
Reach 4	17.803	8500.00	1313.58	1324.51	1322.31	1326.37	0.000834	10.95	776.00	98.91	0.69
Reach 4	17.803	11950.00	1313.58	1329.20	1324.26	1329.61	0.000150	6.30	4654.06	900.65	0.32
Reach 4	17.672	6500.00	1312.57	1322.64	1320.02	1324.00	0.000637	9.37	693.79	91.21	0.60
Reach 4	17.672	8500.00	1312.57	1324.39	1321.31	1325.77	0.000529	9.57	1289.31	753.32	0.56
Reach 4	17.672	11950.00	1312.57	1329.23	1323.15	1329.49	0.000089	5.24	6267.70	1095.32	0.25
Reach 4	17.571	6500.00	1312.05	1322.33	1319.60	1323.66	0.000606	9.24	703.69	91.03	0.59
Reach 4	17.571	8500.00	1312.05	1324.37	1320.86	1325.43	0.000407	8.66	1792.55	846.35	0.50
Reach 4	17.571	11950.00	1312.05	1329.20	1324.38	1329.43	0.000079	5.02	6147.01	1281.29	0.23
Reach 4	17.48	6500.00	1311.88	1322.03	1319.44	1323.36	0.000633	9.27	701.47	93.62	0.60
Reach 4	17.48	8500.00	1311.88	1323.89	1320.69	1325.18	0.000517	9.27	1324.29	845.78	0.55
Reach 4	17.48	11950.00	1311.88	1329.08	1322.57	1329.38	0.000098	5.40	4977.03	1230.74	0.26
Reach 4	17.339	6500.00	1311.41	1321.63	1318.80	1322.89	0.000580	9.01	721.19	93.79	0.57
Reach 4	17.339	8500.00	1311.41	1323.35	1320.05	1324.77	0.000558	9.55	890.09	102.95	0.57
Reach 4	17.339	11950.00	1311.41	1328.78	1321.92	1329.28	0.000136	6.35	3417.04	1389.21	0.30
Reach 4	17.288	6500.00	1311.13	1321.52	1318.53	1322.72	0.000544	8.77	741.58	96.06	0.56
Reach 4	17.288	8500.00	1311.13	1323.26	1319.77	1324.60	0.000521	9.28	915.90	105.04	0.55
Reach 4	17.288	11950.00	1311.13	1328.36	1321.65	1329.20	0.000196	7.62	2141.13	1451.52	0.37
Reach 4	17.269	6500.00	1311.04	1321.48	1318.32	1322.66	0.000520	8.70	747.22	94.32	0.54
Reach 4	17.269	8500.00	1311.04	1323.21	1319.58	1324.55	0.000504	9.26	917.51	102.71	0.55
Reach 4	17.269	11950.00	1311.04	1328.15	1321.45	1329.16	0.000245	8.07	1479.98	204.30	0.40
Reach 4	17.261	Bridge									
Reach 4	17.254	6500.00	1310.98	1321.22	1318.35	1322.50	0.000580	9.08	716.01	91.96	0.57
Reach 4	17.254	8500.00	1310.98	1322.90	1319.63	1324.36	0.000565	9.70	876.72	99.74	0.58
Reach 4	17.254	11950.00	1310.98	1326.16	1321.52	1327.62	0.000449	9.71	1230.95	155.48	0.53
Reach 4	17.25	6500.00	1311.10	1321.22	1318.40	1322.48	0.000583	9.03	719.74	93.82	0.57
Reach 4	17.25	8500.00	1311.10	1322.90	1319.64	1324.34	0.000562	9.61	884.45	101.88	0.[illegible]
Reach 4	17.25	11950.00	1311.10	1326.17	1321.53	1327.60	0.000422	9.59	1257.51	1417.34	0.[illegible]
Reach 4	17.213	6500.00	1311.10	1320.98	1318.40	1322.35	0.000643	9.39	691.92	91.23	0.60
Reach 4	17.213	8500.00	1311.10	1322.67	1319.66	1324.21	0.000612	9.98	851.34	98.42	0.60
Reach 4	17.213	11950.00	1311.10	1326.19	1321.57	1327.47	0.000379	9.31	1610.01	597.07	0.49
Reach 4	17.17	6500.00	1311.12	1320.78	1318.36	1322.20	0.000675	9.56	680.13	90.56	0.61
Reach 4	17.17	8510.00	1311.12	1322.47	1319.62	1324.07	0.000639	10.15	838.74	97.62	0.61
Reach 4	17.17	11910.00	1311.12	1326.39	1321.44	1327.27	0.000282	8.13	2599.32	921.73	0.42
Reach 4	17.101	6500.00	1310.54	1320.57	1317.95	1321.95	0.000642	9.43	689.06	90.07	0.60
Reach 4	17.101	8510.00	1310.54	1322.26	1319.23	1323.82	0.000628	10.03	848.58	99.41	0.60
Reach 4	17.101	11910.00	1310.54	1325.61	1321.10	1327.08	0.000459	9.73	1223.53	214.17	0.53
Reach 4	17.086	Bridge									
Reach 4	17.082	6500.00	1310.51	1319.53	1317.88	1321.34	0.000931	10.80	602.00	84.90	0.71
Reach 4	17.082	8510.00	1310.51	1320.59	1319.17	1322.92	0.001062	12.26	694.29	89.08	0.77
Reach 4	17.082	11910.00	1310.51	1321.65	1321.05	1325.17	0.001436	15.05	791.26	93.27	0.91
Reach 4	17.071	6500.00	1310.83	1318.80	1318.18	1321.08	0.005696	12.12	536.29	88.90	0.87
Reach 4	17.071	8510.00	1310.83	1320.02	1319.39	1322.70	0.005706	13.12	648.49	95.30	0.89
Reach 4	17.071	11910.00	1310.83	1321.51	1321.18	1324.99	0.006277	14.95	796.64	103.15	0.95
Reach 4	17.039	6500.00	1310.37	1319.64	1314.63	1319.89	0.000442	4.00	1626.38	213.19	0.26
Reach 4	17.039	8510.00	1310.37	1321.02	1315.30	1321.33	0.000451	4.42	1926.36	220.37	0.26
Reach 4	17.039	11910.00	1310.37	1322.85	1316.34	1323.25	0.000492	5.09	2348.53	487.14	0.28
Reach 4	16.94	6500.00	1309.91	1319.52	1313.79	1319.71	0.000222	3.49	1861.13	234.89	0.22
Reach 4	16.94	8510.00	1309.91	1320.91	1314.47	1321.14	0.000234	3.88	2194.40	246.46	0.23
Reach 4	16.94	11910.00	1309.91	1322.73	1315.46	1323.04	0.000247	4.47	2743.75	317.98	0.24
Reach 4	16.819	6500.00	1309.76	1319.38	1313.55	1319.57	0.000216	3.50	1858.99	229.37	0.22
Reach 4	16.819	8510.00	1309.76	1320.75	1314.21	1320.99	0.000229	3.90	2193.09	266.33	0.23
Reach 4	16.819	11910.00	1309.76	1322.57	1315.22	1322.89	0.000243	4.51	2743.03	319.23	0.24
Reach 4	16.63	6500.00	1309.48	1319.16	1313.40	1319.35	0.000221	3.52	1846.43	229.34	0.22
Reach 4	16.63	8510.00	1309.48	1320.52	1314.07	1320.76	0.000234	3.93	2164.01	237.86	0.23
Reach 4	16.63	11910.00	1309.48	1322.38	1315.07	1322.64	0.000218	4.22	3940.08	1262.11	0.23
Reach 4	16.468	6500.00	1309.49	1318.94	1313.49	1319.15	0.000247	3.65	1779.56	227.25	0.23
Reach 4	16.468	8510.00	1309.49	1320.29	1314.16	1320.55	0.000259	4.07	2090.86	235.49	0.24
Reach 4	16.468	11910.00	1309.49	1322.15	1315.16	1322.44	0.000243	4.45	3515.96	1059.19	0.24
Reach 4	16.389	6500.00	1309.76	1318.82	1313.67	1319.04	0.000272	3.75	1732.85	228.89	0.[illegible]
Reach 4	16.389	8510.00	1309.76	1320.16	1314.32	1320.43	0.000282	4.16	2045.34	237.41	0.[illegible]
Reach 4	16.389	11910.00	1309.76	1322.05	1315.31	1322.33	0.000252	4.43	3560.24	932.81	0.[illegible]

Reach 4	16.321	6500.00	1309.10	1318.74	1313.29	1318.95	0.000243	3.62	1796.36	230.36	0.23
Reach 4	16.321	8510.00	1309.10	1320.08	1313.95	1320.33	0.000256	4.03	2109.85	238.61	0.24
Reach 4	16.321	11910.00	1309.10	1321.94	1314.94	1322.24	0.000252	4.49	3135.00	940.47	0.24
Reach 4	16.251	6500.00	1309.50	1318.63	1313.44	1318.85	0.000272	3.73	1740.45	231.53	0.24
Reach 4	16.251	8770.00	1309.50	1319.94	1314.17	1320.23	0.000303	4.28	2049.49	240.80	0.26
Reach 4	16.251	12750.00	1309.50	1321.71	1315.32	1322.12	0.000348	5.12	2530.47	905.66	0.28
Reach 4	16.242	6500.00	1309.67	1318.62	1313.26	1318.83	0.000359	3.63	1791.15	232.98	0.23
Reach 4	16.242	8770.00	1309.67	1319.93	1313.99	1320.20	0.000403	4.17	2101.80	244.34	0.25
Reach 4	16.242	12750.00	1309.67	1321.70	1315.12	1322.09	0.000464	5.01	2588.13	299.64	0.28
Reach 4	16.240	Bridge									
Reach 4	16.238	6500.00	1309.56	1318.44	1313.14	1318.65	0.000367	3.63	1788.24	235.98	0.23
Reach 4	16.238	8770.00	1309.56	1319.73	1313.89	1320.00	0.000424	4.18	2100.46	250.97	0.25
Reach 4	16.238	12750.00	1309.56	1321.55	1315.02	1321.93	0.000486	4.97	2564.19	259.98	0.28
Reach 4	16.221	6500.00	1309.43	1318.37	1313.26	1318.60	0.000427	3.89	1672.49	223.85	0.25
Reach 4	16.221	8770.00	1309.43	1319.64	1314.03	1319.95	0.000475	4.47	1962.07	229.72	0.27
Reach 4	16.221	12750.00	1309.43	1321.42	1315.21	1321.87	0.000546	5.38	2370.68	230.48	0.30
Reach 4	16.213	Bridge									
Reach 4	16.205	6500.00	1309.37	1318.24	1313.21	1318.47	0.000430	3.89	1670.74	224.28	0.25
Reach 4	16.205	8770.00	1309.37	1319.50	1313.97	1319.81	0.000475	4.48	1956.09	227.20	0.27
Reach 4	16.205	12750.00	1309.37	1321.22	1315.13	1321.68	0.000557	5.43	2348.89	228.06	0.30
Reach 4	16.19	6500.00	1309.35	1318.21	1313.17	1318.44	0.000297	3.87	1680.90	226.82	0.25
Reach 4	16.19	8770.00	1309.35	1319.47	1313.93	1319.78	0.000334	4.45	1972.46	235.70	0.27
Reach 4	16.19	12750.00	1309.35	1321.20	1315.09	1321.64	0.000386	5.33	2425.80	1016.84	0.30
Reach 4	16	6900.00	1308.91	1317.88	1312.82	1318.13	0.000310	4.01	1719.97	226.96	0.26
Reach 4	16	8770.00	1308.91	1319.15	1313.43	1319.45	0.000312	4.36	2013.77	235.66	0.26
Reach 4	16	12750.00	1308.91	1320.86	1314.59	1321.25	0.000338	5.09	2893.27	941.75	0.28
Reach 4	15.811	6900.00	1308.82	1317.55	1312.68	1317.81	0.000330	4.09	1687.38	226.56	0.26
Reach 4	15.811	8770.00	1308.82	1318.82	1313.28	1319.13	0.000328	4.43	1980.31	234.30	0.27
Reach 4	15.811	12750.00	1308.82	1320.58	1314.45	1320.91	0.000304	4.79	3596.06	1368.67	0.27
Reach 4	15.606	6900.00	1308.20	1317.05	1312.53	1317.39	0.000448	4.70	1468.50	201.31	0.31
Reach 4	15.606	8770.00	1308.20	1318.31	1313.22	1318.71	0.000447	5.08	1727.60	209.96	0.31
Reach 4	15.606	12750.00	1308.20	1320.23	1314.48	1320.56	0.000341	5.02	4233.47	1476.89	0.28
Reach 4	15.483	6900.00	1307.90	1316.75	1312.26	1317.10	0.000450	4.71	1465.21	200.61	0.31
Reach 4	15.483	8770.00	1307.90	1318.01	1312.93	1318.42	0.000447	5.09	1723.40	208.94	0.31
Reach 4	15.483	12750.00	1307.90	1320.02	1314.20	1320.34	0.000327	4.94	3817.26	864.00	0.28
Reach 4	15.414	6900.00	1308.11	1316.56	1312.33	1316.92	0.000488	4.82	1430.39	200.88	0.32
Reach 4	15.414	8770.00	1308.11	1317.83	1312.99	1318.24	0.000478	5.19	1689.22	208.72	0.32
Reach 4	15.414	12750.00	1308.11	1319.85	1314.23	1320.21	0.000364	5.16	3427.99	710.14	0.29
Reach 4	15.225	6900.00	1307.00	1316.12	1311.53	1316.45	0.000438	4.67	1477.03	200.65	0.30
Reach 4	15.225	8770.00	1307.00	1317.39	1312.21	1317.78	0.000437	5.05	1737.37	209.37	0.31
Reach 4	15.225	12750.00	1307.00	1319.59	1313.49	1319.87	0.000282	4.68	4498.64	1259.13	0.26
Reach 4	15.035	6900.00	1306.87	1315.68	1311.11	1316.01	0.000442	4.67	1478.08	202.23	0.30
Reach 4	15.035	8770.00	1306.87	1316.95	1311.78	1317.34	0.000439	5.04	1741.22	211.20	0.31
Reach 4	15.035	12750.00	1306.87	1319.29	1313.05	1319.59	0.000284	4.74	4508.02	1464.08	0.26
Reach 4	14.926	6900.00	1306.28	1315.45	1310.64	1315.77	0.000398	4.52	1525.46	202.44	0.29
Reach 4	14.926	8770.00	1306.28	1316.74	1311.31	1317.09	0.000388	4.83	2023.90	591.39	0.29
Reach 4	14.926	12750.00	1306.28	1319.13	1312.58	1319.43	0.000268	4.70	4454.52	1428.57	0.25
Reach 4	14.823	6900.00	1306.39	1315.21	1310.58	1315.54	0.000427	4.62	1494.85	202.86	0.30
Reach 4	14.823	8770.00	1306.39	1316.48	1311.25	1316.87	0.000425	4.99	1758.70	211.57	0.30
Reach 4	14.823	12750.00	1306.39	1319.08	1312.51	1319.25	0.000187	3.89	6102.44	1631.02	0.21
Reach 4	14.764	6900.00	1306.30	1315.08	1310.49	1315.41	0.000416	4.58	1507.89	203.18	0.30
Reach 4	14.764	8770.00	1306.30	1316.36	1311.14	1316.74	0.000413	4.95	1771.45	210.60	0.30
Reach 4	14.764	12750.00	1306.30	1319.05	1312.39	1319.19	0.000152	3.57	6936.20	1761.30	0.19
Reach 4	14.754	6900.00	1306.32	1312.61	1312.61	1315.13	0.005400	12.76	540.83	106.30	1.00
Reach 4	14.754	8770.00	1306.32	1313.56	1313.56	1316.44	0.005176	13.61	644.60	111.18	1.00
Reach 4	14.754	12750.00	1306.32	1315.33	1315.33	1318.83	0.004868	15.01	849.28	120.23	1.00
Reach 4	14.738	6900.00	1302.42	1311.13	1307.17	1311.64	0.000682	5.74	1202.96	166.74	0.38
Reach 4	14.738	8770.00	1302.42	1312.44	1307.93	1313.03	0.000661	6.15	1426.41	173.48	0.38
Reach 4	14.738	12750.00	1302.42	1314.33	1309.38	1315.14	0.000741	7.24	1761.40	182.10	0.41
Reach 4	14.637	6900.00	1302.17	1311.00	1306.27	1311.31	0.000397	4.46	1548.71	208.69	0.29
Reach 4	14.637	8890.00	1302.17	1312.33	1306.95	1312.70	0.000398	4.86	1838.85	236.37	0.30
Reach 4	14.637	12830.00	1302.17	1314.37	1308.19	1314.75	0.000346	5.18	3515.26	1175.76	0.28
Reach 4	14.412	6900.00	1301.60	1310.46	1305.99	1310.80	0.000455	4.73	1460.08	200.56	0.31
Reach 4	14.412	8890.00	1301.60	1311.78	1306.72	1312.19	0.000454	5.14	1730.80	209.22	0.31
Reach 4	14.412	12830.00	1301.60	1313.81	1307.96	1314.29	0.000431	5.72	2826.42	1023.44	0.32
Reach 4	14.3	6900.00	1301.54	1310.18	1305.72	1310.53	0.000459	4.74	1456.46	200.67	0.31
Reach 4	14.3	8890.00	1301.54	1311.50	1306.43	1311.92	0.000459	5.15	1727.85	209.82	0.32
Reach 4	14.3	12830.00	1301.54	1313.54	1307.68	1314.04	0.000437	5.75	2721.22	882.95	0.32
Reach 4	14.191	6900.00	1301.20	1309.94	1305.38	1310.27	0.000433	4.66	1481.87	200.21	0.30
Reach 4	14.191	8890.00	1301.20	1311.26	1306.08	1311.66	0.000434	5.07	1753.76	216.90	0.31
Reach 4	14.191	12830.00	1301.20	1313.31	1307.31	1313.78	0.000411	5.64	2736.47	627.27	0.31

Reach 4	14	6900.00	1300.90	1309.45	1305.19	1309.81	0.000488	4.82	1430.74	200.68	0.32
Reach 4	14	8890.00	1300.90	1310.77	1305.90	1311.19	0.000480	5.22	1702.88	215.65	0
Reach 4	14	12830.00	1300.90	1312.81	1307.13	1313.34	0.000464	5.88	2499.59	1046.18	0
Reach 4	13.961	6900.00	1299.55	1309.31	1305.20	1309.68	0.000755	4.86	1420.54	208.08	0.33
Reach 4	13.961	8890.00	1299.55	1310.65	1305.89	1311.05	0.000886	5.08	1749.64	270.59	0.35
Reach 4	13.961	12830.00	1299.55	1312.72	1307.11	1313.19	0.000758	5.53	2320.69	279.42	0.34
Reach 4	13.954	Bridge									
Reach 4	13.946	6900.00	1299.65	1309.15	1305.09	1309.53	0.000795	4.93	1400.03	209.04	0.34
Reach 4	13.946	8890.00	1299.65	1310.46	1305.82	1310.88	0.000889	5.22	1702.12	253.71	0.36
Reach 4	13.946	12830.00	1299.65	1312.50	1307.06	1313.01	0.000814	5.72	2242.88	271.74	0.35
Reach 4	13.911	6900.00	1300.88	1309.01	1305.06	1309.40	0.000552	5.02	1375.56	199.82	0.34
Reach 4	13.911	8890.00	1300.88	1310.29	1305.75	1310.75	0.000544	5.44	1635.69	207.87	0.34
Reach 4	13.911	12830.00	1300.88	1312.27	1306.98	1312.86	0.000550	6.19	2137.45	266.18	0.35
Reach 4	13.842	6900.00	1300.89	1308.74	1305.14	1309.17	0.000642	5.27	1310.43	198.33	0.36
Reach 4	13.842	8890.00	1300.89	1310.02	1305.83	1310.52	0.000617	5.66	1570.13	206.46	0.36
Reach 4	13.842	12830.00	1300.89	1311.99	1307.04	1312.63	0.000618	6.42	2045.22	267.01	0.37
Reach 4	13.755	6900.00	1300.50	1308.48	1304.62	1308.88	0.000581	5.10	1352.28	198.84	0.34
Reach 4	13.755	8890.00	1300.50	1309.77	1305.32	1310.24	0.000565	5.51	1614.87	207.33	0.35
Reach 4	13.755	12830.00	1300.50	1311.75	1306.55	1312.35	0.000567	6.25	2125.59	270.67	0.36
Reach 4	13.661	6900.00	1299.76	1308.22	1304.14	1308.60	0.000528	4.96	1392.48	199.22	0.33
Reach 4	13.661	8890.00	1299.76	1309.52	1304.84	1309.97	0.000520	5.37	1656.74	207.55	0.33
Reach 4	13.661	12830.00	1299.76	1311.50	1306.07	1312.07	0.000529	6.11	2176.75	270.05	0.35
Reach 4	13.566	6900.00	1299.46	1307.93	1303.88	1308.33	0.000556	5.07	1359.63	195.09	0.34
Reach 4	13.566	8890.00	1299.46	1309.23	1304.60	1309.70	0.000548	5.49	1619.15	203.99	0.34
Reach 4	13.566	12830.00	1299.46	1311.19	1305.86	1311.80	0.000563	6.27	2117.22	268.50	0.36
Reach 4	13.471	6900.00	1299.43	1307.77	1303.31	1308.06	0.000397	4.33	1593.36	225.61	0.29
Reach 4	13.471	8970.00	1299.43	1309.08	1303.98	1309.43	0.000398	4.73	1895.55	243.04	0.29
Reach 4	13.471	12910.00	1299.43	1311.06	1305.13	1311.51	0.000406	5.42	2440.42	286.17	0.31

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach 4	18.345	1326.78	1326.53	0.25	0.12	0.00		6500.00		206.25
Reach 4	18.345	1328.52	1328.44	0.08	0.07	0.02	15.93	4684.07		281.29
Reach 4	18.345	1330.93	1330.80	0.13	0.06	0.02	244.48	7457.76	137.76	565.90
Reach 4	18.237	1326.66	1326.38	0.29	0.05	0.27		6500.00		189.23
Reach 4	18.237	1328.43	1328.10	0.33	0.05	0.30		8500.00		198.93
Reach 4	18.237	1330.86	1330.56	0.29	0.04	0.33	1191.27	10726.14	32.59	1027.78
Reach 4	18.193	1326.34	1325.15	1.19	0.38	0.05	7.88	6492.12		143.93
Reach 4	18.193	1328.08	1326.76	1.32	0.36	0.06	141.38	8358.53	0.09	227.15
Reach 4	18.193	1330.48	1329.08	1.41	0.21	0.17	810.30	11123.51	16.19	289.49
Reach 4	18.087	1325.91	1324.21	1.71	0.88	0.00		6500.00		87.39
Reach 4	18.087	1327.67	1325.73	1.93	0.85	0.00	25.39	8474.61		135.59
Reach 4	18.087	1330.11	1329.26	0.84	0.27	0.07	2324.46	9616.60	8.94	922.91
Reach 4	17.898	1325.04	1323.33	1.71	0.43	0.02		6500.00		87.98
Reach 4	17.898	1326.81	1324.88	1.93	0.42	0.02		8500.00		96.61
Reach 4	17.898	1329.77	1329.15	0.62	0.09	0.06	3142.45	8790.99	16.56	909.63
Reach 4	17.803	1324.59	1322.94	1.65	0.50	0.08		6500.00		88.43
Reach 4	17.803	1326.37	1324.51	1.86	0.46	0.15		8500.00		98.91
Reach 4	17.803	1329.61	1329.20	0.41	0.08	0.05	4044.37	7875.13	30.49	900.65
Reach 4	17.672	1324.00	1322.64	1.36	0.33	0.01		6500.00		91.21
Reach 4	17.672	1325.77	1324.39	1.38	0.25	0.09	272.50	8222.97	4.53	753.32
Reach 4	17.672	1329.49	1329.23	0.25	0.05	0.01	4964.74	6905.17	80.09	1095.32
Reach 4	17.571	1323.66	1322.33	1.32	0.30	0.00		6500.00		91.03
Reach 4	17.571	1325.43	1324.37	1.06	0.22	0.02	756.10	7742.34	1.56	846.35
Reach 4	17.571	1329.43	1329.20	0.23	0.04	0.01	5139.38	6774.15	36.46	1281.29
Reach 4	17.48	1323.36	1322.03	1.33	0.45	0.02		6500.00		93.62
Reach 4	17.48	1325.18	1323.89	1.29	0.40	0.01	303.90	8196.10		845.78
Reach 4	17.48	1329.38	1329.08	0.30	0.08	0.02	4247.79	7694.72	7.49	1230.74
Reach 4	17.339	1322.89	1321.63	1.26	0.15	0.02		6500.00		93.79
Reach 4	17.339	1324.77	1323.35	1.42	0.15	0.02		8500.00		102.95
Reach 4	17.339	1329.28	1328.78	0.50	0.04	0.03	2496.74	9383.11	70.15	1389.21
Reach 4	17.288	1322.72	1321.52	1.19	0.06	0.01		6500.00		96.06
Reach 4	17.288	1324.60	1323.26	1.34	0.05	0.00		8500.00		105.04
Reach 4	17.288	1329.20	1328.36	0.84	0.02	0.02	542.00	11181.75	226.25	1451.52
Reach 4	17.269	1322.66	1321.48	1.18	0.00	0.03		6500.00		94.32
Reach 4	17.269	1324.55	1323.21	1.33	0.00	0.04		8500.00		102.71
Reach 4	17.269	1329.16	1328.15	1.01	0.00	0.56		11950.00		204.30
Reach 4	17.261	Bridge								
Reach 4	17.254	1322.50	1321.22	1.28	0.01	0.01		6500.00		91.96
Reach 4	17.254	1324.36	1322.90	1.46	0.01	0.01		8500.00		99.74

Reach 4	17.254	1327.62	1326.16	1.46	0.01	0.02		11950.00		155.48
Reach 4	17.25	1322.48	1321.22	1.27	0.12	0.01		6500.00		93.82
Reach 4	17.25	1324.34	1322.90	1.43	0.11	0.01		8500.00		101.88
Reach 4	17.25	1327.60	1326.17	1.43	0.08	0.04	9.48	11940.04	0.49	1417.34
Reach 4	17.213	1322.35	1320.98	1.37	0.15	0.00		6500.00		91.23
Reach 4	17.213	1324.21	1322.67	1.55	0.14	0.01		8500.00		98.42
Reach 4	17.213	1327.47	1326.19	1.29	0.08	0.12	527.97	11416.89	5.15	597.07
Reach 4	17.17	1322.20	1320.78	1.42	0.24	0.01		6500.00		90.56
Reach 4	17.17	1324.07	1322.47	1.60	0.23	0.01		8510.00		97.62
Reach 4	17.17	1327.27	1326.39	0.88	0.13	0.06	1628.67	10223.44	57.88	921.73
Reach 4	17.101	1321.95	1320.57	1.38				6500.00		90.07
Reach 4	17.101	1323.82	1322.26	1.56				8510.00		99.41
Reach 4	17.101	1327.08	1325.61	1.47				11910.00		214.17
Reach 4	17.086	Bridge								
Reach 4	17.082	1321.34	1319.53	1.81	0.11	0.14		6500.00		84.90
Reach 4	17.082	1322.92	1320.59	2.33	0.13	0.10		8510.00		89.08
Reach 4	17.082	1325.17	1321.65	3.52	0.16	0.02		11910.00		93.27
Reach 4	17.071	1321.08	1318.80	2.28	0.18	1.02		6500.00		88.90
Reach 4	17.071	1322.70	1320.02	2.67	0.18	1.18		8510.00		95.30
Reach 4	17.071	1324.99	1321.51	3.47	0.20	1.53		11910.00		103.15
Reach 4	17.039	1319.89	1319.64	0.25	0.16	0.02		6500.00		213.19
Reach 4	17.039	1321.33	1321.02	0.30	0.17	0.02		8510.00		220.37
Reach 4	17.039	1323.25	1322.85	0.40	0.18	0.03		11903.29	6.71	487.14
Reach 4	16.94	1319.71	1319.52	0.19	0.14	0.00		6500.00		234.89
Reach 4	16.94	1321.14	1320.91	0.23	0.15	0.00		8510.00		246.46
Reach 4	16.94	1323.04	1322.73	0.31	0.16	0.00	45.19	11842.18	22.63	317.98
Reach 4	16.819	1319.57	1319.38	0.19	0.22	0.00		6500.00		229.37
Reach 4	16.819	1320.99	1320.75	0.24	0.23	0.00	1.68	8505.74	2.59	266.33
Reach 4	16.819	1322.89	1322.57	0.31	0.23	0.02	39.90	11809.84	60.26	319.23
Reach 4	16.63	1319.35	1319.16	0.19	0.20	0.00		6500.00		229.34
Reach 4	16.63	1320.76	1320.52	0.24	0.21	0.00		8510.00		237.86
Reach 4	16.63	1322.64	1322.38	0.26	0.20	0.00	810.59	11044.31	55.10	1262.11
Reach 4	16.468	1319.15	1318.94	0.21	0.11	0.00		6500.00		227.25
Reach 4	16.468	1320.55	1320.29	0.26	0.11	0.00		8510.00		235.49
Reach 4	16.468	1322.44	1322.15	0.29	0.11	0.00	589.29	11263.87	56.83	1059.19
Reach 4	16.389	1319.04	1318.82	0.22	0.09	0.00		6500.00		228.89
Reach 4	16.389	1320.43	1320.16	0.27	0.10	0.00		8510.00		237.41
Reach 4	16.389	1322.33	1322.05	0.28	0.09	0.00	793.62	11077.30	39.09	932.81
Reach 4	16.321	1318.95	1318.74	0.20	0.10	0.00		6500.00		230.36
Reach 4	16.321	1320.33	1320.08	0.25	0.10	0.00		8510.00		238.61
Reach 4	16.321	1322.24	1321.94	0.30	0.11	0.01	386.61	11487.70	35.69	940.47
Reach 4	16.251	1318.85	1318.63	0.22	0.02	0.01		6500.00		231.53
Reach 4	16.251	1320.23	1319.94	0.28	0.02	0.01		8770.00		240.80
Reach 4	16.251	1322.12	1321.71	0.41	0.02	0.01	4.68	12720.54	24.79	905.66
Reach 4	16.242	1318.83	1318.62	0.20				6500.00		232.98
Reach 4	16.242	1320.20	1319.93	0.27				8769.99	0.01	244.34
Reach 4	16.242	1322.09	1321.70	0.39	0.00	0.04	17.78	12707.26	24.96	299.64
Reach 4	16.240	Bridge								
Reach 4	16.238	1318.65	1318.44	0.21	0.04	0.01		6500.00		235.98
Reach 4	16.238	1320.00	1319.73	0.27	0.04	0.01		8770.00		250.97
Reach 4	16.238	1321.93	1321.55	0.38	0.05	0.02		12750.00		259.98
Reach 4	16.221	1318.60	1318.37	0.23				6500.00		223.85
Reach 4	16.221	1319.95	1319.64	0.31				8770.00		229.72
Reach 4	16.221	1321.87	1321.42	0.45				12750.00		230.48
Reach 4	16.213	Bridge								
Reach 4	16.205	1318.47	1318.24	0.24	0.03	0.00		6500.00		224.28
Reach 4	16.205	1319.81	1319.50	0.31	0.03	0.00		8770.00		227.20
Reach 4	16.205	1321.68	1321.22	0.46	0.04	0.01		12750.00		228.06
Reach 4	16.19	1318.44	1318.21	0.23	0.31	0.01		6500.00		226.82
Reach 4	16.19	1319.78	1319.47	0.31	0.32	0.01		8770.00		235.70
Reach 4	16.19	1321.64	1321.20	0.44	0.36	0.03	18.01	12724.80	7.20	1016.84
Reach 4	16	1318.13	1317.88	0.25	0.32	0.00		6900.00		226.96
Reach 4	16	1319.45	1319.15	0.29	0.32	0.00	0.00	8770.00		235.66
Reach 4	16	1321.25	1320.86	0.39	0.32	0.02	402.29	12313.74	33.96	941.75
Reach 4	15.811	1317.81	1317.55	0.26	0.41	0.01		6900.00		226.56
Reach 4	15.811	1319.13	1318.82	0.30	0.41	0.01		8770.00		234.30
Reach 4	15.811	1320.91	1320.58	0.32	0.35	0.00	1221.18	11491.04	37.77	1368.67
Reach 4	15.606	1317.39	1317.05	0.34	0.29	0.00		6900.00		201.31
Reach 4	15.606	1318.71	1318.31	0.40	0.29	0.00		8770.00		209.96
Reach 4	15.606	1320.56	1320.23	0.33	0.22	0.00	1954.92	10734.85	60.23	1476.89

Reach 4	15.483	1317.10	1316.75	0.34	0.17	0.00		6900.00		200.61
Reach 4	15.483	1318.42	1318.01	0.40	0.17	0.00		8770.00		208.94
Reach 4	15.483	1320.34	1320.02	0.32	0.12	0.00	2027.33	10634.88	87.79	864.00
Reach 4	15.414	1316.92	1316.56	0.36	0.46	0.01		6900.00		200.88
Reach 4	15.414	1318.24	1317.83	0.42	0.46	0.01		8770.00		208.72
Reach 4	15.414	1320.21	1319.85	0.36	0.32	0.02	1696.40	10959.62	93.98	710.14
Reach 4	15.225	1316.45	1316.12	0.34	0.44	0.00		6900.00		200.65
Reach 4	15.225	1317.78	1317.39	0.40	0.44	0.00		8770.00		209.37
Reach 4	15.225	1319.87	1319.59	0.28	0.28	0.00	2276.12	10338.07	135.81	1259.13
Reach 4	15.035	1316.01	1315.68	0.34	0.24	0.01		6900.00		202.23
Reach 4	15.035	1317.34	1316.95	0.39	0.24	0.01		8770.00		211.20
Reach 4	15.035	1319.59	1319.29	0.29	0.16	0.00	1984.05	10643.99	121.97	1464.08
Reach 4	14.926	1315.77	1315.45	0.32	0.23	0.00		6900.00		202.44
Reach 4	14.926	1317.09	1316.74	0.36	0.22	0.00	121.93	8648.07		591.39
Reach 4	14.926	1319.43	1319.13	0.29	0.14	0.04	1749.27	10831.88	168.85	1428.57
Reach 4	14.823	1315.54	1315.21	0.33	0.13	0.00		6900.00		202.86
Reach 4	14.823	1316.87	1316.48	0.39	0.13	0.00		8770.00		211.57
Reach 4	14.823	1319.25	1319.08	0.17	0.05	0.01	3595.44	9042.63	111.92	1631.02
Reach 4	14.764	1315.41	1315.08	0.33	0.05	0.22		6900.00		203.18
Reach 4	14.764	1316.74	1316.36	0.38	0.05	0.25		8770.00		210.60
Reach 4	14.764	1319.19	1319.05	0.14	0.02	0.34	4250.21	8395.91	103.88	1761.30
Reach 4	14.754	1315.13	1312.61	2.53	0.13	0.60		6900.00		106.30
Reach 4	14.754	1316.44	1313.56	2.87	0.13	0.69		8770.00		111.18
Reach 4	14.754	1318.83	1315.33	3.50	0.13	0.81		12750.00		120.23
Reach 4	14.738	1311.64	1311.13	0.51	0.27	0.06		6900.00		166.74
Reach 4	14.738	1313.03	1312.44	0.59	0.27	0.07		8770.00		173.48
Reach 4	14.738	1315.14	1314.33	0.81	0.26	0.13		12750.00		182.10
Reach 4	14.637	1311.31	1311.00	0.31	0.50	0.00		6900.00		208.69
Reach 4	14.637	1312.70	1312.33	0.37	0.50	0.00	4.56	8885.44		236.37
Reach 4	14.637	1314.75	1314.37	0.38	0.45	0.01	978.57	11816.87	34.56	1175.76
Reach 4	14.412	1310.80	1310.46	0.35	0.27	0.00		6900.00		200.56
Reach 4	14.412	1312.19	1311.78	0.41	0.27	0.00		8890.00		209.22
Reach 4	14.412	1314.29	1313.81	0.49	0.26	0.00	376.33	12367.10	86.57	1023.44
Reach 4	14.3	1310.53	1310.18	0.35	0.25	0.00		6900.00		200.67
Reach 4	14.3	1311.92	1311.50	0.41	0.25	0.00		8890.00		209.82
Reach 4	14.3	1314.04	1313.54	0.50	0.25	0.01	310.24	12428.72	91.04	882.95
Reach 4	14.191	1310.27	1309.94	0.34	0.46	0.00		6900.00		200.21
Reach 4	14.191	1311.66	1311.26	0.40	0.46	0.00	0.59	8889.41		216.90
Reach 4	14.191	1313.78	1313.31	0.48	0.44	0.01	425.79	12328.41	75.80	627.27
Reach 4	14	1309.81	1309.45	0.36	0.12	0.00		6900.00		200.68
Reach 4	14	1311.19	1310.77	0.42	0.13	0.01	0.07	8889.93		215.65
Reach 4	14	1313.34	1312.81	0.53	0.12	0.03	237.60	12564.89	27.51	1046.18
Reach 4	13.961	1309.68	1309.31	0.37				6900.00		208.08
Reach 4	13.961	1311.05	1310.65	0.40				8890.00		270.59
Reach 4	13.961	1313.19	1312.72	0.47				12830.00		279.42
Reach 4	13.954	Bridge								
Reach 4	13.946	1309.53	1309.15	0.38	0.12	0.00		6900.00		209.04
Reach 4	13.946	1310.88	1310.46	0.42	0.13	0.01		8890.00		253.71
Reach 4	13.946	1313.01	1312.50	0.51	0.12	0.02		12830.00		271.74
Reach 4	13.911	1309.40	1309.01	0.39	0.22	0.01		6900.00		199.82
Reach 4	13.911	1310.75	1310.29	0.46	0.21	0.01		8890.00		207.87
Reach 4	13.911	1312.86	1312.27	0.59	0.21	0.01		12737.06	92.94	266.18
Reach 4	13.842	1309.17	1308.74	0.43	0.28	0.01		6900.00		198.33
Reach 4	13.842	1310.52	1310.02	0.50	0.27	0.01		8890.00		206.48
Reach 4	13.842	1312.63	1311.99	0.64	0.27	0.01		12773.68	56.32	267.01
Reach 4	13.755	1308.88	1308.48	0.40	0.28	0.01		6900.00		198.84
Reach 4	13.755	1310.24	1309.77	0.47	0.27	0.01		8890.00		207.33
Reach 4	13.755	1312.35	1311.75	0.60	0.27	0.01		12718.53	111.47	270.67
Reach 4	13.661	1308.60	1308.22	0.38	0.27	0.00		6900.00		199.22
Reach 4	13.661	1309.97	1309.52	0.45	0.27	0.00		8890.00		207.55
Reach 4	13.661	1312.07	1311.50	0.58	0.27	0.00		12702.88	127.13	270.05
Reach 4	13.566	1308.33	1307.93	0.40	0.23	0.03		6900.00		195.09
Reach 4	13.566	1309.70	1309.23	0.47	0.23	0.04		8890.00		203.99
Reach 4	13.566	1311.80	1311.19	0.61	0.24	0.05		12726.91	103.09	268.50
Reach 4	13.471	1308.06	1307.77	0.29				6900.00		225.61
Reach 4	13.471	1309.43	1309.08	0.35				8969.92	0.08	243.04
Reach 4	13.471	1311.51	1311.06	0.45				12835.97	74.03	286.17

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : REACH 4

River: EMF Reach: Reach 4 RS: 18.345 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 18.345 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 18.345 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 18.237 Profile: Design
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: EMF Reach: Reach 4 RS: 18.237 Profile: Future
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: EMF Reach: Reach 4 RS: 18.237 Profile: Existing
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: EMF Reach: Reach 4 RS: 18.193 Profile: Design
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.
River: EMF Reach: Reach 4 RS: 18.193 Profile: Future
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.
River: EMF Reach: Reach 4 RS: 18.193 Profile: Existing
Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: EMF Reach: Reach 4 RS: 18.087 Profile: Future
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 4 RS: 18.087 Profile: Existing
Warning - The cross-section end points had to be extended vertically for the computed water surface.
River: EMF Reach: Reach 4 RS: 17.339 Profile: Existing
Warning - The cross-section end points had to be extended vertically for the computed water surface.
River: EMF Reach: Reach 4 RS: 17.288 Profile: Existing
Warning - The cross-section end points had to be extended vertically for the computed water surface.
River: EMF Reach: Reach 4 RS: 17.269 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 17.269 Profile: Existing
Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: EMF Reach: Reach 4 RS: 17.261 Profile: Existing
Note - Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.
Note - Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
River: EMF Reach: Reach 4 RS: 17.261 Profile: Existing 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.
River: EMF Reach: Reach 4 RS: 17.254 Profile: Existing
Warning - The cross-section end points had to be extended vertically for the computed water surface.
River: EMF Reach: Reach 4 RS: 17.25 Profile: Existing
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 4 RS: 17.17 Profile: Existing
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.
River: EMF Reach: Reach 4 RS: 17.101 Profile: Design
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: EMF Reach: Reach 4 RS: 17.101 Profile: Future
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: EMF Reach: Reach 4 RS: 17.101 Profile: Existing
Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: EMF Reach: Reach 4 RS: 17.086 Profile: Design
Warning - The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should be run as a mixed flow problem.
River: EMF Reach: Reach 4 RS: 17.086 Profile: Design 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.
River: EMF Reach: Reach 4 RS: 17.086 Profile: Future

Warning - The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should be run as a mixed flow problem.
River: EMF Reach: Reach 4 RS: 17.086 Profile: Future 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.
River: EMF Reach: Reach 4 RS: 17.086 Profile: Future 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.
River: EMF Reach: Reach 4 RS: 17.086 Profile: Existing
Warning - The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should be run as a mixed flow problem.
River: EMF Reach: Reach 4 RS: 17.086 Profile: Existing 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 - 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: EMF Reach: Reach 4 RS: 17.082 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 17.082 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 17.082 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 17.071 Profile: Design
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.
River: EMF Reach: Reach 4 RS: 17.071 Profile: Future
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.
River: EMF Reach: Reach 4 RS: 17.071 Profile: Existing
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.
River: EMF Reach: Reach 4 RS: 16.819 Profile: Future
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 4 RS: 16.242 Profile: Design
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 16.242 Profile: Future
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 16.242 Profile: Existing
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: EMF Reach: Reach 4 RS: 16.240 Profile: Design 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.
River: EMF Reach: Reach 4 RS: 16.240 Profile: Future 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.
River: EMF Reach: Reach 4 RS: 16.240 Profile: Existing
Note - Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
River: EMF Reach: Reach 4 RS: 16.240 Profile: Existing 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.
River: EMF Reach: Reach 4 RS: 15.811 Profile: Existing
Warning - Divided flow computed for this cross-section.
River: EMF Reach: Reach 4 RS: 15.225 Profile: Existing
Warning - The cross-section end points had to be extended vertically for the computed water surface.
River: EMF Reach: Reach 4 RS: 14.926 Profile: Existing
Warning - The cross-section end points had to be extended vertically for the computed water surface.
River: EMF Reach: Reach 4 RS: 14.823 Profile: Existing
Warning - The cross-section end points had to be extended vertically for the computed water surface.
River: EMF Reach: Reach 4 RS: 14.764 Profile: Design
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: EMF Reach: Reach 4 RS: 14.764 Profile: Future
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: EMF Reach: Reach 4 RS: 14.764 Profile: Existing

Warning - The cross-section end points had to be extended vertically for the computed water surface.
Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: EMF Reach: Reach 4 RS: 14.754 Profile: Design
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, water surface was used.

River: EMF Reach: Reach 4 RS: 14.754 Profile: Future
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, water surface was used.

River: EMF Reach: Reach 4 RS: 14.754 Profile: Existing
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 cross section had to be extended vertically during the critical depth calculations.
Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning - During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note - Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: EMF Reach: Reach 4 RS: 14.738 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 14.637 Profile: Future
Warning - Divided flow computed for this cross-section.

River: EMF Reach: Reach 4 RS: 14.191 Profile: Future
Warning - Divided flow computed for this cross-section.

River: EMF Reach: Reach 4 RS: 14 Profile: Future
Warning - Divided flow computed for this cross-section.

River: EMF Reach: Reach 4 RS: 13.961 Profile: Existing
Warning - The conveyance ratio (upstream 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: EMF Reach: Reach 4 RS: 13.471 Profile: Future
Warning - Divided flow computed for this cross-section.

HEC-RAS Plan: EMF Reach 3 River: EMF Reach: Reach 3

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 3	13.471	6900.00	1299.43	1307.77	1303.31	1308.06	0.000397	4.33	1593.11	225.60	0.29
Reach 3	13.471	8970.00	1299.43	1309.08	1303.99	1309.42	0.000398	4.74	1894.48	242.77	0.29
Reach 3	13.471	12910.00	1299.43	1311.06	1305.13	1311.51	0.000406	5.42	2439.82	286.15	0.31
Reach 3	13.439	6900.00	1299.34	1307.73	1302.90	1307.96	0.000416	3.77	1828.54	251.26	0.25
Reach 3	13.439	8970.00	1299.34	1309.05	1303.53	1309.31	0.000420	4.15	2163.46	259.32	0.25
Reach 3	13.439	12910.00	1299.34	1311.03	1304.55	1311.39	0.000452	4.80	2691.25	273.37	0.27
Reach 3	13.431	Bridge									
Reach 3	13.426	6900.00	1299.62	1307.63	1303.21	1307.88	0.000495	4.00	1723.70	246.56	0.27
Reach 3	13.426	8970.00	1299.62	1308.93	1303.81	1309.23	0.000493	4.37	2050.40	255.56	0.27
Reach 3	13.426	12910.00	1299.62	1310.90	1304.84	1311.29	0.000520	5.03	2565.73	269.44	0.29
Reach 3	13.374	6900.00	1299.45	1307.52	1303.15	1307.77	0.000350	4.00	1723.34	250.03	0.27
Reach 3	13.374	9070.00	1299.45	1308.81	1303.78	1309.12	0.000353	4.42	2051.72	257.80	0.28
Reach 3	13.374	12990.00	1299.45	1310.78	1304.80	1311.17	0.000359	5.05	2608.05	330.85	0.29
Reach 3	13.28	6900.00	1299.23	1307.34	1302.88	1307.59	0.000355	4.05	1703.47	245.45	0.27
Reach 3	13.28	9070.00	1299.23	1308.63	1303.53	1308.94	0.000362	4.48	2025.54	254.47	0.28
Reach 3	13.28	12990.00	1299.23	1310.58	1304.58	1310.99	0.000374	5.12	2536.47	327.38	0.29
Reach 3	13.232	6900.00	1299.09	1307.23	1303.00	1307.50	0.000392	4.18	1649.06	244.09	0.28
Reach 3	13.232	9070.00	1299.09	1308.51	1303.65	1308.84	0.000395	4.61	1968.84	253.28	0.29
Reach 3	13.232	12990.00	1299.09	1310.46	1304.71	1310.89	0.000402	5.25	2476.52	328.95	0.30
Reach 3	13.179	6900.00	1299.00	1307.12	1302.79	1307.39	0.000378	4.14	1665.67	243.36	0.28
Reach 3	13.179	9070.00	1299.00	1308.40	1303.44	1308.73	0.000383	4.57	1984.12	252.47	0.29
Reach 3	13.179	12990.00	1299.00	1310.35	1304.50	1310.78	0.000394	5.22	2489.34	304.86	0.30
Reach 3	13.084	6900.00	1298.67	1306.95	1302.44	1307.20	0.000348	4.02	1714.71	245.79	0.27
Reach 3	13.084	9070.00	1298.67	1308.23	1303.10	1308.54	0.000356	4.46	2035.52	254.80	0.28
Reach 3	13.084	12990.00	1298.67	1310.17	1304.15	1310.58	0.000370	5.11	2543.71	308.60	0.29
Reach 3	13.037	6900.00	1298.52	1306.87	1302.22	1307.11	0.000325	3.93	1755.78	247.77	0.26
Reach 3	13.037	9070.00	1298.52	1308.15	1302.87	1308.45	0.000336	4.36	2078.77	256.89	0.27

HEC-RAS Plan: EMF Reach 3 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 3	13.03	12990.00	1298.52	1310.09	1303.92	1310.49	0.000351	5.02	2590.06	312.81	0.28
Reach 3	12.981	6900.00	1298.62	1306.76	1302.26	1307.01	0.000345	4.02	1716.74	244.90	0.27
Reach 3	12.981	9070.00	1298.62	1308.04	1302.92	1308.35	0.000355	4.46	2034.27	253.31	0.28
Reach 3	12.981	12990.00	1298.62	1309.97	1303.98	1310.38	0.000369	5.12	2535.47	302.18	0.29
Reach 3	12.905	6900.00	1298.40	1306.62	1302.05	1306.88	0.000343	4.02	1717.14	243.92	0.27
Reach 3	12.905	9070.00	1298.40	1307.89	1302.71	1308.20	0.000355	4.46	2032.69	253.20	0.28
Reach 3	12.905	12990.00	1298.40	1309.82	1303.77	1310.23	0.000366	5.13	2531.93	311.12	0.29
Reach 3	12.88	6900.00	1298.30	1306.59	1302.05	1306.84	0.000342	4.00	1725.05	246.57	0.27
Reach 3	12.88	9070.00	1298.30	1307.86	1302.70	1308.16	0.000353	4.44	2043.73	255.71	0.28
Reach 3	12.88	12990.00	1298.30	1309.78	1303.78	1310.19	0.000371	5.09	2553.77	317.71	0.29
Reach 3	12.88	6900.00	1298.10	1306.41	1301.88	1306.66	0.000347	4.02	1715.36	245.40	0.27
Reach 3	12.88	9070.00	1298.10	1307.67	1302.54	1307.98	0.000359	4.47	2030.88	254.59	0.28
Reach 3	12.88	12990.00	1298.10	1309.59	1303.59	1310.00	0.000373	5.13	2530.04	302.50	0.29
Reach 3	12.8	6900.00	1298.04	1306.23	1301.78	1306.49	0.000354	4.04	1706.25	245.88	0.27
Reach 3	12.8	9070.00	1298.04	1307.49	1302.43	1307.80	0.000365	4.49	2020.51	254.64	0.28
Reach 3	12.8	12990.00	1298.04	1309.40	1303.48	1309.81	0.000379	5.16	2517.21	303.40	0.29
Reach 3	12.8	6900.00	1297.79	1306.04	1301.74	1306.30	0.000383	4.15	1663.96	245.03	0.28
Reach 3	12.8	9070.00	1297.79	1307.29	1302.40	1307.61	0.000392	4.59	1975.72	254.17	0.29
Reach 3	12.8	12990.00	1297.79	1309.18	1303.45	1309.61	0.000407	5.26	2471.25	300.61	0.30
Reach 3	12.8	6900.00	1297.54	1305.95	1301.49	1306.21	0.000355	4.05	1702.44	245.33	0.27
Reach 3	12.8	9070.00	1297.54	1307.20	1302.15	1307.51	0.000369	4.50	2013.89	254.45	0.28
Reach 3	12.8	12990.00	1297.54	1309.09	1303.21	1309.51	0.000387	5.18	2508.61	297.24	0.30
Reach 3	12.8	6900.00	1297.80	1305.82	1301.52	1306.08	0.000376	4.12	1675.27	245.85	0.28
Reach 3	12.8	9070.00	1297.80	1307.06	1302.17	1307.39	0.000386	4.57	1985.76	254.31	0.29
Reach 3	12.8	12990.00	1297.80	1308.95	1303.21	1309.38	0.000402	5.24	2477.75	298.59	0.30
Reach 3	12.8	6900.00	1297.71	1305.71	1301.48	1305.99	0.000392	4.18	1648.78	243.83	0.28
Reach 3	12.8	9070.00	1297.71	1306.95	1302.15	1307.29	0.000402	4.64	1955.95	252.53	0.29

HEC-RAS Plan: EMF Reach 3 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq.ft)	(ft)	
Reach 3	12.441	12990.00	1297.71	1308.83	1303.20	1309.27	0.000419	5.32	2443.34	303.41	0.31
Reach 3	12.349	6900.00	1297.66	1305.52	1301.24	1305.80	0.000397	4.23	1630.29	239.13	0.29
Reach 3	12.349	9070.00	1297.66	1306.75	1301.91	1307.09	0.000410	4.70	1929.39	247.80	0.30
Reach 3	12.349	12990.00	1297.66	1308.61	1302.98	1309.07	0.000434	5.40	2404.14	260.98	0.31
Reach 3	12.302	6900.00	1297.60	1305.41	1301.23	1305.69	0.000412	4.29	1609.10	238.11	0.29
Reach 3	12.302	9070.00	1297.60	1306.63	1301.90	1306.98	0.000425	4.76	1905.61	246.49	0.30
Reach 3	12.302	12990.00	1297.60	1308.49	1302.97	1308.95	0.000448	5.47	2375.33	259.21	0.32
Reach 3	12.245	6900.00	1297.40	1305.28	1301.04	1305.57	0.000413	4.31	1602.60	236.26	0.29
Reach 3	12.245	9070.00	1297.40	1306.50	1301.73	1306.86	0.000429	4.78	1896.00	245.50	0.30
Reach 3	12.245	12990.00	1297.40	1308.35	1302.82	1308.82	0.000456	5.50	2362.81	259.53	0.32
Reach 3	12.177	6900.00	1297.28	1305.15	1300.82	1305.42	0.000378	4.16	1659.07	240.84	0.28
Reach 3	12.177	9070.00	1297.28	1306.37	1301.48	1306.70	0.000394	4.64	1956.16	248.80	0.29
Reach 3	12.177	12990.00	1297.28	1308.21	1302.53	1308.65	0.000422	5.36	2425.24	820.09	0.31
Reach 3	12.082	6900.00	1297.29	1304.94	1300.80	1305.22	0.000417	4.28	1611.63	241.22	0.29
Reach 3	12.082	9070.00	1297.29	1306.14	1301.46	1306.49	0.000431	4.76	1907.40	249.96	0.30
Reach 3	12.082	12990.00	1297.29	1307.97	1302.53	1308.43	0.000452	5.47	2382.62	920.75	0.32
Reach 3	11.988	6900.00	1296.90	1304.75	1300.42	1305.02	0.000378	4.15	1664.55	242.98	0.28
Reach 3	11.988	9070.00	1296.90	1305.95	1301.08	1306.28	0.000397	4.63	1960.29	251.30	0.29
Reach 3	11.988	12990.00	1296.90	1307.76	1302.14	1308.21	0.000424	5.35	2430.35	277.05	0.31
Reach 3	11.893	6900.00	1296.71	1304.55	1300.34	1304.82	0.000398	4.21	1637.29	242.54	0.29
Reach 3	11.893	9070.00	1296.71	1305.73	1300.99	1306.08	0.000417	4.70	1929.80	250.78	0.30
Reach 3	11.893	12990.00	1296.71	1307.53	1302.05	1307.99	0.000447	5.43	2391.94	263.28	0.32
Reach 3	11.798	6900.00	1296.67	1304.34	1300.20	1304.62	0.000409	4.25	1622.51	241.86	0.29
Reach 3	11.798	9070.00	1296.67	1305.52	1300.86	1305.87	0.000428	4.75	1911.31	249.74	0.30
Reach 3	11.798	12990.00	1296.67	1307.29	1301.91	1307.76	0.000460	5.49	2366.17	261.68	0.32
Reach 3	11.703	6900.00	1296.68	1304.10	1300.22	1304.40	0.000463	4.42	1560.76	241.01	0.31
Reach 3	11.703	9070.00	1296.68	1305.26	1300.87	1305.64	0.000479	4.91	1845.94	249.22	0.32

HEC-RAS Plan: EMF Reach 3 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 3	11,703	12990.00	1296.68	1307.02	1301.93	1307.52	0.000508	5.66	2295.22	261.64	0.34
Reach 3	11,609	6900.00	1296.39	1303.86	1300.15	1304.17	0.000477	4.44	1555.48	244.38	0.31
Reach 3	11,609	9070.00	1296.39	1305.02	1300.78	1305.39	0.000488	4.92	1842.41	251.41	0.32
Reach 3	11,609	12990.00	1296.39	1306.76	1301.81	1307.26	0.000513	5.67	2290.25	261.94	0.34
Reach 3	11,572	6900.00	1296.51	1303.74	1300.11	1304.07	0.000513	4.58	1507.65	238.49	0.32
Reach 3	11,572	9070.00	1296.51	1304.89	1300.75	1305.29	0.000525	5.08	1786.02	245.52	0.33
Reach 3	11,572	12990.00	1296.51	1306.62	1301.80	1307.16	0.000553	5.85	2220.13	256.10	0.35
Reach 3	11,531	6900.00	1296.26	1303.63	1300.07	1303.95	0.000529	4.60	1499.89	241.03	0.32
Reach 3	11,531	9070.00	1296.26	1304.77	1300.72	1305.18	0.000538	5.09	1781.17	248.41	0.34
Reach 3	11,531	12990.00	1296.26	1306.50	1301.77	1307.03	0.000562	5.85	2219.86	259.50	0.35
Reach 3	[illegible]	6900.00	1296.57	1303.48	1300.10	1303.82	0.000572	4.70	1469.49	242.88	0.34
Reach 3	[illegible]	9070.00	1296.57	1304.63	1300.75	1305.04	0.000573	5.17	1752.86	250.34	0.34
Reach 3	[illegible]	12990.00	1296.57	1306.35	1301.78	1306.90	0.000590	5.92	2193.55	261.26	0.36
Reach 3	[illegible]	6900.00	1295.69	1303.22	1299.67	1303.54	0.000528	4.58	1505.05	242.76	0.32
Reach 3	[illegible]	9070.00	1295.69	1304.36	1300.32	1304.76	0.000536	5.07	1787.76	250.21	0.33
Reach 3	[illegible]	12990.00	1295.69	1306.07	1301.36	1306.60	0.000563	5.84	2225.44	261.31	0.35
Reach 3	[illegible]	6900.00	1294.88	1303.04	1299.34	1303.37	0.000521	4.62	1493.62	235.96	0.32
Reach 3	[illegible]	9070.00	1294.88	1304.17	1300.03	1304.58	0.000540	5.13	1766.82	244.36	0.34
Reach 3	[illegible]	12990.00	1294.88	1305.86	1301.10	1306.41	0.000578	5.93	2190.92	256.87	0.36
Reach 3	[illegible]	6900.00	1296.29	1300.86	1300.86	1302.84	0.001620	11.30	610.61	152.48	1.00
Reach 3	[illegible]	9070.00	1296.29	1301.78	1301.78	1304.01	0.001557	11.97	757.66	168.60	1.00
Reach 3	[illegible]	12990.00	1296.29	1303.13	1303.13	1305.76	0.001473	13.00	999.34	189.08	1.00
Reach 3	[illegible]	6900.00	1290.71	1300.43	1295.60	1300.81	0.000126	4.89	1412.46	186.63	0.31
Reach 3	[illegible]	9070.00	1290.71	1302.05	1296.48	1302.48	0.000122	5.26	1724.02	199.52	0.32
Reach 3	[illegible]	12990.00	1290.71	1303.96	1297.85	1304.54	0.000139	6.13	2120.41	215.12	0.34
Reach 3	[illegible]	6900.00	1290.78	1300.51	1294.86	1300.71	0.000335	3.60	1916.52	239.89	0.22
Reach 3	[illegible]	9070.00	1290.78	1302.13	1295.55	1302.37	0.000331	3.92	2316.47	252.68	0.23

HEC-RAS Plan: EMF Reach 3 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	11.297	12990.00	1290.78	1304.08	1296.62	1304.40	0.000381	4.60	2822.03	268.08	0.25
Reach 3	11.26	6900.00	1290.40	1300.48	1294.28	1300.63	0.000242	3.14	2195.70	264.44	0.19
Reach 3	11.26	10060.00	1290.40	1302.08	1295.19	1302.30	0.000303	3.83	2629.09	278.18	0.22
Reach 3	11.26	13910.00	1290.40	1304.02	1296.16	1304.32	0.000332	4.36	3187.49	296.31	0.23
Reach 3	11.254	Bridge									
Reach 3	11.249	6900.00	1290.69	1300.43	1294.47	1300.60	0.000267	3.25	2121.89	260.93	0.20
Reach 3	11.249	10060.00	1290.69	1302.02	1295.39	1302.26	0.000334	3.95	2546.30	276.47	0.23
Reach 3	11.249	13910.00	1290.69	1303.96	1296.38	1304.27	0.000361	4.48	3103.29	295.35	0.24
Reach 3	11.231	8100.00	1290.62	1300.34	1294.52	1300.55	0.000342	3.72	2178.27	273.34	0.23
Reach 3	11.231	10470.00	1290.62	1301.99	1295.18	1302.23	0.000322	3.98	2678.73	322.17	0.23
Reach 3	11.231	14320.00	1290.62	1303.93	1296.15	1304.23	0.000323	4.46	3335.33	355.66	0.23
Reach 3	11.189	8100.00	1290.70	1300.24	1294.71	1300.47	0.000375	3.84	2115.34	283.12	0.24
Reach 3	11.189	10470.00	1290.70	1301.90	1295.37	1302.15	0.000348	4.08	2633.92	337.97	0.23
Reach 3	11.189	14320.00	1290.70	1303.84	1296.33	1304.16	0.000339	4.53	3367.14	393.37	0.24
Reach 3	11.127	8100.00	1290.70	1300.12	1294.55	1300.35	0.000369	3.82	2123.71	281.55	0.24
Reach 3	11.127	10470.00	1290.70	1301.78	1295.21	1302.04	0.000342	4.06	2647.53	340.53	0.23
Reach 3	11.127	14320.00	1290.70	1303.74	1296.17	1304.05	0.000333	4.52	3376.83	393.65	0.24
Reach 3	11.033	8100.00	1290.41	1299.92	1294.44	1300.16	0.000386	3.90	2079.48	260.05	0.24
Reach 3	11.033	10470.00	1290.41	1301.60	1295.10	1301.86	0.000357	4.14	2575.55	318.24	0.24
Reach 3	11.033	14320.00	1290.41	1303.55	1296.07	1303.87	0.000352	4.61	3284.62	388.36	0.24
Reach 3	10.938	8100.00	1290.11	1299.74	1294.18	1299.97	0.000373	3.84	2117.58	284.49	0.24
Reach 3	10.938	10470.00	1290.11	1301.43	1294.85	1301.69	0.000342	4.06	2643.58	336.54	0.23
Reach 3	10.938	14320.00	1290.11	1303.39	1295.82	1303.70	0.000333	4.51	3375.55	393.46	0.24
Reach 3	10.843	8100.00	1289.90	1299.60	1293.77	1299.82	0.000236	3.74	2168.66	281.04	0.23
Reach 3	10.843	10470.00	1289.90	1301.30	1294.44	1301.55	0.000220	3.99	2686.76	326.28	0.23
Reach 3	10.843	14320.00	1289.90	1303.26	1295.40	1303.56	0.000221	4.47	3422.64	397.62	0.23

HEC-RAS Plan: EMF Reach 3 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (sq m)	Top Width (m)	Froude # Chl
Reach 3	10,749	8100.00	1289.80	1299.46	1293.88	1299.69	0.000257	3.85	2105.02	257.20	0.24
Reach 3	10,749	10470.00	1289.80	1301.17	1294.54	1301.43	0.000239	4.10	2563.29	302.09	0.23
Reach 3	10,749	14320.00	1289.80	1303.12	1295.51	1303.44	0.000241	4.60	3240.04	956.42	0.24
Reach 3	10,654	8100.00	1290.00	1299.31	1293.95	1299.56	0.000284	3.98	2036.08	255.13	0.25
Reach 3	10,654	10470.00	1290.00	1301.03	1294.62	1301.31	0.000260	4.21	2484.40	266.22	0.24
Reach 3	10,654	14320.00	1290.00	1302.96	1295.60	1303.32	0.000265	4.76	3007.99	863.78	0.25
Reach 3	10,586	8100.00	1289.50	1299.18	1293.71	1299.42	0.000275	3.94	2053.60	254.15	0.24
Reach 3	10,586	10470.00	1289.50	1300.91	1294.39	1301.19	0.000253	4.18	2503.49	265.72	0.24
Reach 3	10,586	14320.00	1289.50	1302.84	1295.37	1303.19	0.000260	4.73	3025.13	964.56	0.25
Reach 3	10,518	8100.00	1289.62	1299.11	1293.69	1299.36	0.000277	3.94	2057.00	256.42	0.25
Reach 3	[illegible]	10470.00	1289.62	1300.85	1294.37	1301.12	0.000252	4.17	2512.69	268.07	0.24
Reach 3	[illegible]	14320.00	1289.62	1302.78	1295.35	1303.13	0.000257	4.72	3036.91	686.98	0.25
Reach 3	[illegible]	8100.00	1289.06	1299.03	1293.05	1299.24	0.000230	3.70	2186.83	259.79	0.22
Reach 3	[illegible]	10790.00	1289.06	1300.76	1293.81	1301.02	0.000228	4.08	2651.76	404.70	0.23
Reach 3	[illegible]	14650.00	1289.06	1302.69	1294.80	1303.02	0.000230	4.61	3199.77	590.19	0.24
Reach 3	[illegible]	8100.00	1288.88	1298.93	1292.76	1299.13	0.000208	3.57	2270.87	264.69	0.21
Reach 3	[illegible]	10790.00	1288.88	1300.67	1293.53	1300.91	0.000211	3.94	2740.17	395.51	0.22
Reach 3	[illegible]	14650.00	1288.88	1302.60	1294.49	1302.91	0.000215	4.47	3280.02	482.32	0.23
Reach 3	[illegible]	8100.00	1288.80	1298.79	1292.96	1299.01	0.000246	3.81	2125.60	254.71	0.23
Reach 3	[illegible]	10790.00	1288.80	1300.52	1293.72	1300.79	0.000245	4.19	2575.91	266.54	0.24
Reach 3	[illegible]	14650.00	1288.80	1302.46	1294.72	1302.79	0.000240	4.64	3396.17	480.86	0.24
Reach 3	[illegible]	8100.00	1288.64	1298.75	1292.61	1298.96	0.000307	3.62	2236.03	259.14	0.22
Reach 3	[illegible]	10790.00	1288.64	1300.48	1293.36	1300.73	0.000310	4.01	2693.27	269.95	0.22
Reach 3	[illegible]	14650.00	1288.64	1302.42	1294.33	1302.74	0.000333	4.54	3228.46	283.21	0.24
Reach 3	[illegible]	Bridge									
Reach 3	[illegible]	8100.00	1288.91	1298.65	1293.00	1298.88	0.000371	3.86	2100.48	255.62	0.24
Reach 3	[illegible]	10790.00	1288.91	1300.37	1293.74	1300.65	0.000366	4.23	2550.77	267.06	0.24

HEC-RAS Plan: EMF Reach 3 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 3	10.195	14650.00	1288.91	1302.17	1294.74	1302.53	0.000398	4.81	3043.16	279.28	0.26
Reach 3	10.171	8100.00	1288.86	1298.60	1292.93	1298.84	0.000260	3.87	2091.55	255.05	0.24
Reach 3	10.171	10800.00	1288.86	1300.33	1293.71	1300.61	0.000255	4.23	2606.44	700.79	0.24
Reach 3	10.171	14660.00	1288.86	1302.14	1294.70	1302.48	0.000263	4.76	3228.90	880.56	0.25
Reach 3	10.134	8100.00	1289.47	1298.54	1293.30	1298.78	0.000290	3.96	2046.34	261.90	0.25
Reach 3	10.134	10800.00	1289.47	1300.27	1294.05	1300.55	0.000277	4.30	2509.24	273.55	0.25
Reach 3	10.134	14660.00	1289.47	1302.09	1295.00	1302.43	0.000263	4.69	3440.64	855.62	0.25
Reach 3	10.039	8100.00	1288.96	1298.40	1292.95	1298.64	0.000280	3.94	2056.04	258.21	0.25
Reach 3	10.039	10800.00	1288.96	1300.13	1293.71	1300.42	0.000272	4.29	2514.79	271.09	0.25
Reach 3	10.039	14660.00	1288.96	1301.98	1294.69	1302.29	0.000245	4.60	3733.39	843.22	0.24
Reach 3	9.944	8100.00	1288.55	1298.26	1292.74	1298.50	0.000273	3.92	2063.74	255.55	0.24
Reach 3	9.944	10800.00	1288.55	1300.00	1293.51	1300.28	0.000266	4.29	2518.93	278.64	0.25
Reach 3	9.944	14660.00	1288.55	1301.79	1294.49	1302.16	0.000275	4.88	3025.12	843.98	0.26
Reach 3	9.897	8100.00	1288.50	1298.20	1292.55	1298.43	0.000261	3.86	2101.05	258.48	0.24
Reach 3	9.897	10800.00	1288.50	1299.94	1293.31	1300.21	0.000255	4.22	2563.65	282.83	0.24
Reach 3	9.897	14660.00	1288.50	1301.73	1294.29	1302.09	0.000263	4.80	3072.97	813.75	0.25
Reach 3	9.854	8100.00	1288.40	1298.14	1292.59	1298.37	0.000268	3.89	2082.92	257.90	0.24
Reach 3	9.854	10800.00	1288.40	1299.88	1293.36	1300.16	0.000261	4.25	2542.42	270.19	0.24
Reach 3	9.854	14660.00	1288.40	1301.66	1294.34	1302.03	0.000272	4.84	3029.39	872.58	0.26
Reach 3	9.849	8100.00	1288.45	1298.00	1292.88	1298.33	0.000383	4.64	1745.54	208.90	0.28
Reach 3	9.849	10800.00	1288.45	1299.70	1293.71	1300.11	0.000383	5.13	2106.95	215.40	0.29
Reach 3	9.849	14660.00	1288.45	1301.42	1294.77	1301.96	0.000419	5.91	2480.90	270.04	0.31
Reach 3	9.844	8100.00	1288.56	1298.04	1292.60	1298.28	0.000277	3.92	2064.71	258.82	0.24
Reach 3	9.844	10800.00	1288.56	1299.75	1293.36	1300.04	0.000271	4.28	2520.96	289.79	0.25
Reach 3	9.844	14660.00	1288.56	1301.50	1294.33	1301.87	0.000283	4.89	2998.22	866.53	0.26
Reach 3	9.802	8100.00	1288.71	1297.94	1292.85	1298.21	0.000321	4.12	1967.89	256.50	0.26
Reach 3	9.802	10800.00	1288.71	1299.66	1293.62	1299.97	0.000306	4.46	2420.37	425.70	0.26

HEC-RAS Plan: EMF Reach 3 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 3	9.802	14660.00	1288.71	1301.40	1294.60	1301.80	0.000316	5.07	2892.15	862.05	0.27
Reach 3	9.708	8100.00	1287.70	1297.82	1292.13	1298.05	0.000260	3.87	2092.55	255.39	0.24
Reach 3	9.708	10800.00	1287.70	1299.54	1292.91	1299.82	0.000258	4.25	2543.36	267.93	0.24
Reach 3	9.708	14660.00	1287.70	1301.28	1293.90	1301.64	0.000275	4.87	3011.86	858.88	0.26
Reach 3	9.613	8100.00	1287.19	1297.70	1291.96	1297.92	0.000247	3.77	2146.16	265.57	0.23
Reach 3	9.613	10800.00	1287.19	1299.43	1292.70	1299.70	0.000238	4.13	2661.97	482.97	0.23
Reach 3	9.613	14660.00	1287.19	1301.16	1293.68	1301.50	0.000251	4.71	3212.57	860.13	0.25
Reach 3	9.518	8100.00	1287.94	1297.55	1291.99	1297.79	0.000274	3.93	2063.43	256.46	0.24
Reach 3	9.518	10800.00	1287.94	1299.28	1292.77	1299.57	0.000268	4.29	2518.38	483.18	0.25
Reach 3	9.518	14660.00	1287.94	1300.99	1293.76	1301.37	0.000284	4.92	2982.03	827.79	0.26
Reach 3	[illegible]	8100.00	1287.94	1297.40	1292.03	1297.65	0.000293	4.01	2018.59	255.07	0.25
Reach 3	[illegible]	10800.00	1287.94	1299.13	1292.80	1299.43	0.000283	4.37	2471.74	270.33	0.25
Reach 3	[illegible]	14660.00	1287.94	1300.83	1293.80	1301.22	0.000299	5.00	2953.79	734.18	0.27
Reach 3	[illegible]	8100.00	1288.00	1297.26	1292.03	1297.51	0.000299	4.02	2013.41	257.45	0.25
Reach 3	[illegible]	10800.00	1288.00	1299.00	1292.79	1299.30	0.000285	4.37	2471.78	405.96	0.25
Reach 3	[illegible]	14660.00	1288.00	1300.69	1293.76	1301.08	0.000301	5.00	2929.40	786.88	0.27
Reach 3	[illegible]	8100.00	1288.06	1297.09	1292.07	1297.35	0.000324	4.14	1957.70	255.05	0.26
Reach 3	[illegible]	10800.00	1288.06	1298.84	1292.84	1299.15	0.000305	4.47	2413.94	292.21	0.26
Reach 3	[illegible]	14660.00	1288.06	1300.52	1293.81	1300.92	0.000322	5.11	2866.20	389.66	0.28
Reach 3	[illegible]	8100.00	1288.14	1296.91	1292.03	1297.19	0.000340	4.21	1925.93	253.95	0.27
Reach 3	[illegible]	10800.00	1288.14	1298.67	1292.78	1298.99	0.000317	4.53	2383.12	289.94	0.27
Reach 3	[illegible]	14660.00	1288.14	1300.34	1293.74	1300.75	0.000349	5.14	2850.53	387.49	0.29
Reach 3	[illegible]	8100.00	1287.57	1296.78	1291.45	1297.03	0.000290	4.00	2026.60	255.50	0.25
Reach 3	[illegible]	10800.00	1287.57	1298.55	1292.21	1298.84	0.000276	4.34	2489.00	282.55	0.25
Reach 3	[illegible]	14660.00	1287.57	1300.20	1293.18	1300.59	0.000296	5.00	2933.74	389.12	0.27
Reach 3	[illegible]	8100.00	1287.51	1296.76	1291.33	1297.00	0.000278	3.93	2059.32	257.85	0.25
Reach 3	[illegible]	10790.00	1287.51	1298.53	1292.10	1298.81	0.000266	4.27	2526.46	310.85	0.25

HEC-RAS Plan: EMF Reach 3 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	9.036	14630.00	1287.51	1300.19	1293.07	1300.56	0.000288	4.91	2979.91	437.52	0.26
Reach 3	9.018	8700.00	1287.10	1296.72	1291.19	1296.97	0.000283	4.05	2149.39	260.97	0.25
Reach 3	9.018	11920.00	1287.10	1298.46	1292.06	1298.78	0.000293	4.56	2613.99	272.43	0.26
Reach 3	9.018	15770.00	1287.10	1300.12	1292.98	1300.53	0.000308	5.13	3073.91	404.18	0.27
Reach 3	9.001	8700.00	1286.69	1296.69	1290.96	1296.94	0.000279	4.05	2147.09	257.60	0.25
Reach 3	9.001	11920.00	1286.69	1298.43	1291.84	1298.75	0.000293	4.57	2606.68	270.48	0.26
Reach 3	9.001	15770.00	1286.69	1300.09	1292.80	1300.50	0.000311	5.15	3063.42	746.86	0.27

HEC-RAS Version 2.1 October 1997
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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: EMF Reach 3 (1-12-99), FCD 97-06
Project File : emfr3.prj
Run Date and Time: 1/12/99 8:17:26 PM

Project in English units

Project Description:
EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT (Reach 3)
FCDMC Contract No. 97-06
Prepared by HNTB Corporation, January 1999
Contact: B. Gary Sun
HNTB Corporation
40 North Central Avenue, Suite 300
Phoenix, Arizona 85004
(602) 528-4300

REACH 3
QUEEN CREEK ROAD TO HUNT HIGHWAY
(River Mile 13.471 to Mile 9.018)

The Purpose of the Study is to Determine Channel Capacity for
Three Given 100-Year Discharges.
The Water Surface Profiles Were Calculated
Using the U.S. Army Corps of Engineers' HEC-RAS Computer Program, Version 2.1,
Dated October 1997, as Implemented by Haestad Methods, Inc.

Subcritical Flow Run
3 Water Surface Profiles with 100-Year Discharges Provided by FCDMC (Dated 6-10-98)
Profile 1 - Design Discharges
Profile 2 - Future Discharges, Future Land Use with Retention and without Proposed FCD CIPs
Profile 3 - Existing Conditions

The Control Line on the Thalweg of East Maricopa
Floodway is Station 5,000, and All Cross
Section Data were Stationed Looking
Downstream. Cross Section Numbers Indicate in RiverMiles above the Top of
Drop Structure at the Downstream End of East Maricopa Floodway.

Starting Water Surface Elevationa are the Calculated Water Surface Elevations at
Cross Section Mile 9.001 from Reach 2 HEC-RAS 3 Profiles Run.

Levee, Blocked Obstructions, and Ineffective Flow Area Options Were Used
to Better Model The Floodplain Limits For Three Different Discharge Sets.

PLAN DATA

Plan Title: EMF Reach 3
Plan File : j:\27559\CADD\CIVIL\DATA\emfr3.p01

Geometry Title: EMF Reach 3
Geometry File : j:\27559\CADD\CIVIL\DATA\emfr3.g01

Flow Title : Profiles 1-Design, 2-Future, 3-Exist
Flow File : j:\27559\CADD\CIVIL\DATA\emfr3.f01

Plan Summary Information:
Number of: Cross Sections = 73
Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 3

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

Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Profiles 1-Design, 2-Future, 3-Exist
Flow File : j:\27559\CADD\CIVIL\DATA\emfr3.f01

Flow Data (cfs)

River	Reach	RS	Design	Future	Existing
EMF	Reach 3	13.471	6900	8970	12910
EMF	Reach 3	13.374	6900	9070	12990
EMF	Reach 3	11.26	6900	10060	13910
EMF	Reach 3	11.231	8100	10470	14320
EMF	Reach 3	10.441	8100	10790	14650
EMF	Reach 3	10.171	8100	10800	14660
EMF	Reach 3	9.036	8100	10790	14630
EMF	Reach 3	9.018	8700	11920	15770

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
EMF	Reach 3	Design		Known WS = 1296.69
EMF	Reach 3	Future		Known WS = 1298.43
EMF	Reach 3	Existing		Known WS = 1300.09

GEOMETRY DATA

Geometry Title: EMF Reach 3
Geometry File : j:\27559\CADD\CIVIL\DATA\emfr3.g01

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 13.471

INPUT
Description: Q(D)=6,900 cfs, Q(F)=8,970 cfs & Q(E)=12,910 cfs
Overland Flow
From Dairy Farm (East Side)
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4667.89	1313.9	4683.64	1313.52	4692	1313.4	4706.01	1315.92	4713.6	1317.19

4722.09	1316.3	4729.7	1315.93	4741.51	1316	4778.38	1315.78	4793.66	1315.55
4800.51	1313.8	4804.12	1314.99	4808.22	1313.71	4826.85	1313.28	4845.01	1313.1
4856.34	1314.5	4872.16	1314.11	4878.86	1312.25	4922.23	1300.05	4925.17	1299.94
4959.53	1299.9	5001.83	1299.57	5006.27	1299.6	5057.94	1299.43	5069.75	1299.5
5093.27	1300	5126.43	1309.5	5140.83	1309.27	5142.94	1308.93	5161.38	1309.31
5180.69	1313.6	5193.03	1314.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4667.89	.04	4872.16	.025	5126.43	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4872.16	5126.43	84	171.57	254	.3	.5

Left Levee Station= 4856.34 Elevation= 1314.5
Right Levee Station= 5193.03 Elevation= 1314.2

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1307.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.06	Reach Len. (ft)	84.00	171.57	254.00
Crit W.S. (ft)	1303.31	Flow Area (sq ft)		1593.11	
E.G. Slope (ft/ft)	0.000397	Area (sq ft)		1593.11	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	225.60	Top Width (ft)		225.60	
Vel Total (ft/s)	4.33	Avg. Vel. (ft/s)		4.33	
Max Chl Dpth (ft)	8.34	Hydr. Depth (ft)		7.06	
Conv. Total (cfs)	346319.3	Conv. (cfs)		346319.3	
Length Wtd. (ft)	171.57	Wetted Per. (ft)		227.76	
Min Ch El (ft)	1299.43	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.75	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.26	1010.52	
C & E Loss (ft)	0.04	Cum SA (acres)	0.99	135.54	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1309.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1309.42	Reach Len. (ft)	84.00	171.57	254.00
Crit W.S. (ft)	1303.99	Flow Area (sq ft)		1893.90	0.58
E.G. Slope (ft/ft)	0.000398	Area (sq ft)		1893.90	0.58
Q Total (cfs)	8970.00	Flow (cfs)		8969.92	0.07
Top Width (ft)	242.77	Top Width (ft)		234.80	7.96
Vel Total (ft/s)	4.73	Avg. Vel. (ft/s)		4.74	0.13
Max Chl Dpth (ft)	9.65	Hydr. Depth (ft)		8.07	0.07
Conv. Total (cfs)	449520.4	Conv. (cfs)		449516.6	3.7
Length Wtd. (ft)	171.57	Wetted Per. (ft)		237.33	7.98
Min Ch El (ft)	1299.43	Shear (lb/sq ft)		0.20	0.00
Alpha	1.00	Stream Power (lb/ft s)		0.94	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	15.89	1216.38	0.19
C & E Loss (ft)	0.04	Cum SA (acres)	16.54	141.00	0.66

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1311.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.		0.025	0.040
E.G. Elev (ft)	1311.51	Reach Len. (ft)	84.00	171.57	254.00
Crit W.S. (ft)	1305.13	Flow Area (sq ft)		2368.99	70.83
E.G. Slope (ft/ft)	0.000406	Area (sq ft)		2368.99	70.83
Q Total (cfs)	12910.00	Flow (cfs)		12836.09	73.91
Top Width (ft)	286.15	Top Width (ft)		243.33	42.82
Vel Total (ft/s)	5.29	Avg. Vel. (ft/s)		5.42	1.04
Max Chl Dpth (ft)	11.63	Hydr. Depth (ft)		9.74	1.65
Conv. Total (cfs)	640671.5	Conv. (cfs)		637003.8	3667.7
Length Wtd. (ft)	171.81	Wetted Per. (ft)		246.19	43.04
Min Ch El (ft)	1299.43	Shear (lb/sq ft)		0.24	0.04

Alpha	1.04	Stream Power (lb/ft s)		1.32	0.04
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	170.73	1480.92	16.92
C & E Loss (ft)	0.05	Cum SA (acres)	107.02	144.54	14.04

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 13.439

INPUT
Description: Queek Creek Road Bridge (Upstream Face)
8 Span Bridge with Riprap
Protection
Manning n Value of .030 used for Channel
Use Field
Survey Data for This Cross Section
Skew Angle 30.26 Degrees,
Cross Section Data Adjusted
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4820.22	1314.4	4854.29	1314.18	4865.21	1312.26	4895.28	1302.94	4910.85	1299.97
4934.08	1299.88	4972.2	1299.4	5011.59	1299.34	5049.94	1299.43	5089.28	1299.7
5110.4	1300.66	5127.59	1306.54	5138.88	1310.41	5150.94	1312.46	5166.8	1314.17
5190	1314.46								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4820.22	.04	4854.29	.03	5166.8	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4854.29	5166.8	64.85	64.85	64.85	.3	.5

Left Levee Station= 4854.29 Elevation= 1314.18
Right Levee Station= 5166.8 Elevation= 1314.17

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.73	Element			
Vel Head (ft)	0.22	Wt. n-Val.		0.030	
E.G. Elev (ft)	1307.96	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1302.90	Flow Area (sq ft)		1828.54	
E.G. Slope (ft/ft)	0.000416	Area (sq ft)		1828.54	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	251.26	Top Width (ft)		251.26	
Vel Total (ft/s)	3.77	Avg. Vel. (ft/s)		3.77	
Max Chl Dpth (ft)	8.39	Hydr. Depth (ft)		7.28	
Conv. Total (cfs)	338139.8	Conv. (cfs)		338139.8	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		253.47	
Min Ch El (ft)	1299.34	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.71	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.26	1003.79	
C & E Loss (ft)	0.01	Cum SA (acres)	0.99	134.60	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1309.05	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.030	
E.G. Elev (ft)	1309.31	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1303.53	Flow Area (sq ft)		2163.46	
E.G. Slope (ft/ft)	0.000420	Area (sq ft)		2163.46	
Q Total (cfs)	8970.00	Flow (cfs)		8970.00	
Top Width (ft)	259.32	Top Width (ft)		259.32	
Vel Total (ft/s)	4.15	Avg. Vel. (ft/s)		4.15	
Max Chl Dpth (ft)	9.71	Hydr. Depth (ft)		8.34	
Conv. Total (cfs)	437835.1	Conv. (cfs)		437835.1	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		261.95	
Min Ch El (ft)	1299.34	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.90	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	15.89	1208.39	0.19
C & E Loss (ft)	0.01	Cum SA (acres)	16.54	140.03	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1311.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.030	
E.G. Elev (ft)	1311.39	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1304.55	Flow Area (sq ft)		2691.25	
E.G. Slope (ft/ft)	0.000452	Area (sq ft)		2691.25	
Q Total (cfs)	12910.00	Flow (cfs)		12910.00	
Top Width (ft)	273.37	Top Width (ft)		273.37	
Vel Total (ft/s)	4.80	Avg. Vel. (ft/s)		4.80	
Max Chl Dpth (ft)	11.69	Hydr. Depth (ft)		9.84	
Conv. Total (cfs)	607553.8	Conv. (cfs)		607553.8	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		276.58	
Min Ch El (ft)	1299.34	Shear (lb/sq ft)		0.27	
Alpha	1.00	Stream Power (lb/ft s)		1.32	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	170.73	1470.96	16.71
C & E Loss (ft)	0.01	Cum SA (acres)	107.02	143.52	13.91

BRIDGE RIVER: EMF
REACH: Reach 3 RS: 13.431

INPUT
Description: Queen Creek Road 8-Span Bridge
Elongated Piers With Semi-Circular
Ends
Distance from Upstream XS = 0
Deck/Roadway Width = 64.85
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 27

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4815.11	1314.39	1312	4854.86	1314.61	1312.77	4865.21	1314.59	1312.26
4865.22	1314.59	1312.77	4889.67	1314.53	1312.42	4901	1314.52	1312.49
4902.26	1314.52	1312.48	4929.57	1314.51	1312.39	4939.94	1314.5	1312.46
4944.38	1314.5	1312.45	4967.11	1314.5	1312.45	4978.44	1314.51	1312.52
4987.24	1314.51	1312.52	5005.85	1314.51	1312.51	5017.32	1314.5	1312.51
5029.39	1314.5	1312.5	5044.87	1314.52	1312.49	5056.22	1314.53	1312.53
5072.13	1314.54	1312.53	5083.22	1314.54	1312.53	5094.63	1314.53	1312.54
5114.89	1314.53	1312.53	5122.19	1314.55	1312.53	5133.44	1314.57	1312.47
5150.94	1314.59	1312.46	5156.47	1314.6	1312.5	5196.89	1314.5	1313

Upstream Bridge Cross Section Data
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4820.22	1314.4	4854.29	1314.18	4865.21	1312.26	4895.28	1302.94	4910.85	1299.97
4934.08	1299.88	4972.2	1299.4	5011.59	1299.34	5049.94	1299.43	5089.28	1299.7
5110.4	1300.66	5127.59	1306.54	5138.88	1310.41	5150.94	1312.46	5166.8	1314.17
5190	1314.46								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4820.22	.04	4854.29	.03	5166.8	.04

Bank Sta: Left Right Coeff Contr. Expan.
4854.29 5166.8 .3 .5
Left Levee Station= 4854.29 Elevation= 1314.18
Right Levee Station= 5166.8 Elevation= 1314.17

Downstream Deck/Roadway Coordinates
num= 27

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4815.11	1314.39	1312	4854.86	1314.61	1312	4869.83	1314.58	1312.9
4873.99	1314.57	1312.49	4889.8	1314.56	1312.55	4901.2	1314.52	1312.54
4902.26	1314.52	1312.54	4928.69	1314.51	1312.53	4939.9	1314.5	1312.51
4944.38	1314.5	1312.52	4967.02	1314.5	1312.55	4978.57	1314.51	1312.48
4987.24	1314.51	1312.48	5006.01	1314.51	1312.48	5017.4	1314.5	1312.5
5029.39	1314.5	1312.5	5044.79	1314.52	1312.51	5056.3	1314.53	1312.44

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 5072.13 1314.54 1312.47 5083.53 1314.54 1312.49 5094.78 1314.53 1312.47
 5114.89 1314.53 1312.46 5122.36 1314.55 1312.45 5133.88 1314.57 1312.48
 5156.47  1314.6  1312.5 5158.52 1314.58  1312.5  5196.9 1314.43    1313

Downstream Bridge Cross Section Data
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4815.62 1313.86 4856.22 1314.24 4873.99 1312.49 4893.11 1303.52 4900.67 1301.37
 4906.29 1300.17 4932.98 1299.81 4972.27 1300.05 5013.31 1300.11 5050.65 1299.62
 5089.05 1299.83 5110.22 1300.97 5126.92  1306.8 5145.95 1310.78 5158.52  1312.5
 5165.77 1314.05  5196.9 1313.44

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4815.62     .04 4856.22     .03 5165.77     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4856.22 5165.77             .3       .5
Left Levee      Station= 4856.22      Elevation= 1314.24
Right Levee     Station= 5165.77      Elevation= 1314.05

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

Number of Piers =  7

Pier Data
Pier Station     Upstream= 4895.28    Downstream= 4893.11
Upstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
    1.38 1301.94    1.38 1311.94   11.33    1313
Downstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
    1.52 1302.52    1.52 1312.04    11.4    1313

Pier Data
Pier Station     Upstream= 4934.08    Downstream= 4932.98
Upstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
    1.45 1298.88    1.45 1312.09   10.37    1313
Downstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
    1.47 1298.81    1.47 1312.14   11.21    1313

Pier Data
Pier Station     Upstream=  4972.2    Downstream= 4972.27
Upstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
    1.46  1298.4    1.46 1312.11   11.33    1313
Downstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
    1.51 1299.05    1.51  1312.1   11.55    1313

Pier Data
Pier Station     Upstream= 5011.59    Downstream= 5013.31
Upstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
    1.45 1298.34    1.45 1312.11   11.47    1313
Downstream     num=       3
    Width   Elev    Width   Elev    Width   Elev
    1.47 1299.11    1.47 1312.11   11.39    1313

Pier Data
Pier Station     Upstream= 5049.94    Downstream= 5050.65
Upstream     num=       3
```

```
    Width   Elev    Width   Elev    Width   Elev
    1.41 1298.43    1.41 1312.08   11.35    1313
Downstream     num=        3
    Width   Elev    Width   Elev    Width   Elev
    1.43 1299.62    1.43 1311.99   11.51    1313

Pier Data
Pier Station     Upstream= 5089.28    Downstream= 5089.05
Upstream     num=        3
    Width   Elev    Width   Elev    Width   Elev
    1.51  1298.7    1.51 1312.07   11.41    1313
Downstream     num=        3
    Width   Elev    Width   Elev    Width   Elev
    1.48 1298.83    1.48 1312.02   11.25    1313

Pier Data
Pier Station     Upstream= 5127.59    Downstream= 5126.92
Upstream     num=        3
    Width   Elev    Width   Elev    Width   Elev
    1.43 1305.54    1.43 1312.05   11.25    1313
Downstream     num=        3
    Width   Elev    Width   Elev    Width   Elev
    1.49  1305.8    1.49 1312.01   11.52    1313

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =    1.33
       Yarnell                 KVal =      .9
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 downstream end
       Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT    Profile #Design
Opening : Bridge #1

  E.G. US. (ft)                1307.96   Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                1307.73   E.G. Elev (ft)              1307.95       1307.89
  Q Total (cfs)                6900.00   W.S. Elev (ft)              1307.71       1307.62
  Q Bridge (cfs)               6900.00   Crit W.S. (ft)              1302.98       1303.29
  Q Weir (cfs)                           Max Chl Dpth (ft)              8.37          8.00
  Weir Sta Lft (ft)                      Vel Total (ft/s)               3.93          4.16
  Weir Sta Rgt (ft)                      Flow Area (sq ft)           1754.91       1656.86
  Weir Submerg                           Froude # Chl                   0.26          0.28
  Weir Max Depth (ft)                    Specif Force (cu ft)        7672.64       7043.66
  Min Top Rd (ft)              1314.42   Hydr Depth (ft)                7.28          7.02
  Min El Prs (ft)              1312.77   W.P. Total (ft)              336.46        325.57
  Delta EG (ft)                   0.07   Conv. Total (cfs)          261421.0      242802.4
  Delta WS (ft)                   0.10   Top Width (ft)              241.02        236.13
  BR Open Area (sq ft)         2886.37   Frctn Loss (ft)                0.05          0.00
  BR Open Vel (ft/s)              4.16   C & E Loss (ft)                0.01          0.01
  Coef of Q                              Shear Total (lb/sq ft)         0.23          0.26
  Br Sel Mthd              Energy only   Power Total (lb/ft s)          0.89          1.07

Warning - The Yarnell method gave an invalid answer.  The upstream energy was less than the
                downstream energy.  The program defaulted to the next valid (user selected) method.  If
                the Yarnell method was the only one selected, the program will default to an energy based
                solution.

BRIDGE OUTPUT    Profile #Future
```

Opening : Bridge #1

E.G. US. (ft)	1309.31	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1309.05	E.G. Elev (ft)	1309.31	1309.24
Q Total (cfs)	8970.00	W.S. Elev (ft)	1309.02	1308.92
Q Bridge (cfs)	8970.00	Crit W.S. (ft)	1303.60	1303.90
Q Weir (cfs)		Max Chl Dpth (ft)	9.67	9.30
Weir Sta Lft (ft)		Vel Total (ft/s)	4.32	4.55
Weir Sta Rgt (ft)		Flow Area (sq ft)	2074.81	1969.41
Weir Submerg		Froude # Chl	0.26	0.28
Weir Max Depth (ft)		Specif Force (cu ft)	10533.24	9773.98
Min Top Rd (ft)	1314.42	Hydr Depth (ft)	8.33	8.03
Min El Prs (ft)	1312.77	W.P. Total (ft)	363.18	353.16
Delta EG (ft)	0.08	Conv. Total (cfs)	328418.3	306750.5
Delta WS (ft)	0.11	Top Width (ft)	249.04	245.10
BR Open Area (sq ft)	2886.37	Frctn Loss (ft)	0.05	0.00
BR Open Vel (ft/s)	4.55	C & E Loss (ft)	0.01	0.01
Coef of Q		Shear Total (lb/sq ft)	0.27	0.30
Br Sel Mthd	Energy only	Power Total (lb/ft s)	1.15	1.36

Warning - The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

E.G. US. (ft)	1311.39	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1311.03	E.G. Elev (ft)	1311.38	1311.31
Q Total (cfs)	12910.00	W.S. Elev (ft)	1310.99	1310.88
Q Bridge (cfs)	12910.00	Crit W.S. (ft)	1304.68	1304.95
Q Weir (cfs)		Max Chl Dpth (ft)	11.65	11.26
Weir Sta Lft (ft)		Vel Total (ft/s)	5.01	5.24
Weir Sta Rgt (ft)		Flow Area (sq ft)	2579.25	2463.16
Weir Submerg		Froude # Chl	0.28	0.30
Weir Max Depth (ft)		Specif Force (cu ft)	15928.03	14946.58
Min Top Rd (ft)	1314.42	Hydr Depth (ft)	9.81	9.51
Min El Prs (ft)	1312.77	W.P. Total (ft)	405.27	395.05
Delta EG (ft)	0.10	Conv. Total (cfs)	438731.5	413294.6
Delta WS (ft)	0.13	Top Width (ft)	262.90	258.92
BR Open Area (sq ft)	2886.37	Frctn Loss (ft)	0.06	0.00
BR Open Vel (ft/s)	5.24	C & E Loss (ft)	0.01	0.02
Coef of Q		Shear Total (lb/sq ft)	0.34	0.38
Br Sel Mthd	Energy only	Power Total (lb/ft s)	1.72	1.99

Warning - The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 13.426

INPUT
Description: Queen Creek Road Bridge (Downstream Face)
8 Span Bridge with
Riprap Protection
Manning n Value of .030 used for Channel
Use
Field Survey Data for This Cross Section
Skew Angle 30.34
Degrees, Cross Section Data Adjusted
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4815.62	1313.86	4856.22	1314.24	4873.99	1312.49	4893.11	1303.52	4900.67	1301.37
4906.29	1300.17	4932.98	1299.81	4972.27	1300.05	5013.31	1300.11	5050.65	1299.62
5089.05	1299.83	5110.22	1300.97	5126.92	1306.8	5145.95	1310.78	5158.52	1312.5

5165.77 1314.05 5196.9 1313.44

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4815.62	.04	4856.22	.03	5165.77	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4856.22	5165.77	366	274.54	188	.3	.5

Left Levee Station= 4856.22 Elevation= 1314.24
Right Levee Station= 5165.77 Elevation= 1314.05

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1307.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.030	
E.G. Elev (ft)	1307.88	Reach Len. (ft)	366.00	274.54	188.00
Crit W.S. (ft)	1303.21	Flow Area (sq ft)		1723.70	
E.G. Slope (ft/ft)	0.000495	Area (sq ft)		1723.70	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	246.56	Top Width (ft)		246.56	
Vel Total (ft/s)	4.00	Avg. Vel. (ft/s)		4.00	
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)		6.99	
Conv. Total (cfs)	310089.4	Conv. (cfs)		310089.4	
Length Wtd. (ft)	274.54	Wetted Per. (ft)		249.02	
Min Ch El (ft)	1299.62	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.86	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.26	1001.25	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	134.25	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1308.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.030	
E.G. Elev (ft)	1309.23	Reach Len. (ft)	366.00	274.54	188.00
Crit W.S. (ft)	1303.81	Flow Area (sq ft)		2050.40	
E.G. Slope (ft/ft)	0.000493	Area (sq ft)		2050.40	
Q Total (cfs)	8970.00	Flow (cfs)		8970.00	
Top Width (ft)	255.56	Top Width (ft)		255.56	
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)		4.37	
Max Chl Dpth (ft)	9.31	Hydr. Depth (ft)		8.02	
Conv. Total (cfs)	403983.7	Conv. (cfs)		403983.7	
Length Wtd. (ft)	274.54	Wetted Per. (ft)		258.44	
Min Ch El (ft)	1299.62	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		1.07	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	15.89	1205.38	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	139.66	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1310.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.		0.030	
E.G. Elev (ft)	1311.29	Reach Len. (ft)	366.00	274.54	188.00
Crit W.S. (ft)	1304.84	Flow Area (sq ft)		2565.73	
E.G. Slope (ft/ft)	0.000520	Area (sq ft)		2565.73	
Q Total (cfs)	12910.00	Flow (cfs)		12910.00	
Top Width (ft)	269.44	Top Width (ft)		269.44	
Vel Total (ft/s)	5.03	Avg. Vel. (ft/s)		5.03	
Max Chl Dpth (ft)	11.28	Hydr. Depth (ft)		9.52	
Conv. Total (cfs)	566017.3	Conv. (cfs)		566017.3	
Length Wtd. (ft)	274.60	Wetted Per. (ft)		272.96	
Min Ch El (ft)	1299.62	Shear (lb/sq ft)		0.31	
Alpha	1.00	Stream Power (lb/ft s)		1.54	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	170.73	1467.20	16.71
C & E Loss (ft)	0.00	Cum SA (acres)	107.02	143.13	13.91

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 13.374

INPUT
Description: Q(D)=6,900 cfs, Q(F)=9,070 cfs & Q(E)=12,990 cfs
Overland Flow
From The East Side
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4191.79	1315.8	4212.45	1315.79	4249.03	1315.91	4261.34	1316.07	4299.74	1316.21
4360.5	1316.2	4415.52	1316.14	4431.78	1316.07	4473.43	1316.1	4492.75	1316.17
4531.29	1316.5	4558.81	1316.45	4578.01	1316.47	4589.21	1316.42	4631.88	1315.64
4657.94	1315.2	4699.16	1314.9	4723.23	1314.81	4731.5	1314.79	4771.58	1314.1
4810.95	1313.35	4820.49	1312.01	4830.16	1312.83	4834.93	1310.49	4838.46	1310.2
4840.87	1309.44	4855.41	1309.1	4860.08	1310.68	4875.74	1310.5	4893.51	1304.8
4908.78	1300.1	4949.63	1299.7	4990.61	1299.45	5002.67	1299.77	5046.13	1299.9
5095.7	1300.19	5103.4	1300.54	5117.6	1301.65	5138.09	1308.54	5143.42	1310.6
5163.03	1310.42	5176.84	1312.72	5191.79	1314.18				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4191.79	.04	4875.74	.025	5143.42	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.74	5143.42	500	500	500	.1	.3

Left Levee Station= 4875.74 Elevation= 1310.5
Right Levee Station= 5143.42 Elevation= 1310.6

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.52	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.77	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1303.15	Flow Area (sq ft)		1723.34	
E.G. Slope (ft/ft)	0.000350	Area (sq ft)		1723.34	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	250.03	Top Width (ft)		250.03	
Vel Total (ft/s)	4.00	Avg. Vel. (ft/s)		4.00	
Max Chl Dpth (ft)	8.07	Hydr. Depth (ft)		6.89	
Conv. Total (cfs)	368864.2	Conv. (cfs)		368864.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		252.18	
Min Ch El (ft)	1299.45	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.60	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.26	990.38	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	132.68	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1308.81	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.12	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1303.78	Flow Area (sq ft)		2051.72	
E.G. Slope (ft/ft)	0.000353	Area (sq ft)		2051.72	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	257.80	Top Width (ft)		257.80	
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)		4.42	
Max Chl Dpth (ft)	9.36	Hydr. Depth (ft)		7.96	
Conv. Total (cfs)	482901.3	Conv. (cfs)		482901.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		260.37	
Min Ch El (ft)	1299.45	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.77	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	15.89	1192.46	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	138.04	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1310.78	Element			
Vel Head (ft)	0.39	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1311.17	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1304.80	Flow Area (sq ft)	32.99	2569.40	5.67

E.G. Slope (ft/ft)	0.000359	Area (sq ft)	32.99	2569.40	5.67
Q Total (cfs)	12990.00	Flow (cfs)	19.81	12968.56	1.62
Top Width (ft)	330.85	Top Width (ft)	41.40	267.68	21.77
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)	0.60	5.05	0.29
Max Chl Dpth (ft)	11.33	Hydr. Depth (ft)	0.80	9.60	0.26
Conv. Total (cfs)	685499.2	Conv. (cfs)	1045.5	684367.9	85.7
Length Wtd. (ft)	500.00	Wetted Per. (ft)	41.86	270.85	21.80
Min Ch El (ft)	1299.45	Shear (lb/sq ft)	0.02	0.21	0.01
Alpha	1.03	Stream Power (lb/ft s)	0.01	1.07	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	170.59	1451.02	16.70
C & E Loss (ft)	0.00	Cum SA (acres)	106.85	141.44	13.86

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 13.28

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4191.79	1316.2	4225.12	1315.75	4298.28	1315.63	4324.39	1315.64	4355.21	1315.84
4398.45	1315.7	4423.55	1315.71	4470.97	1315.88	4490.06	1316.07	4528.9	1316.17
4563.2	1316.2	4586.77	1316.09	4636.29	1315.35	4665.98	1315.26	4711.17	1315.25
4714.41	1316.5	4717.17	1315.01	4770.96	1314.72	4786.22	1314.46	4802.44	1312.52
4816.69	1311.8	4823.71	1310.6	4834.27	1312.56	4841.1	1309.88	4854.71	1309.2
4859.16	1309.7	4874.29	1310.4	4909.02	1300.34	4924.34	1299.99	4943.57	1299.24
4967.01	1299.3	4995.04	1299.4	5034.77	1299.24	5049.98	1299.23	5059.13	1299.49
5104.69	1300.2	5132.33	1307.9	5140.91	1310.34	5161.71	1309.64	5176.78	1312.49
5191.79	1313.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4191.79	.04	4874.29	.025	5140.91	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.29	5140.91	250	250	250	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4191.79	4874.29	1314	5140.91	5191.79	1314

Left Levee Station= 4874.29 Elevation= 1310.4
Right Levee Station= 5140.91 Elevation= 1310.34

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.34	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.59	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1302.88	Flow Area (sq ft)		1703.47	
E.G. Slope (ft/ft)	0.000355	Area (sq ft)		1703.47	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	245.45	Top Width (ft)		245.45	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	8.11	Hydr. Depth (ft)		6.94	
Conv. Total (cfs)	366402.4	Conv. (cfs)		366402.4	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		247.45	
Min Ch El (ft)	1299.23	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.62	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.26	970.72	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	129.84	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1308.63	Element			
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.94	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1303.53	Flow Area (sq ft)		2025.54	
E.G. Slope (ft/ft)	0.000362	Area (sq ft)		2025.54	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	254.47	Top Width (ft)		254.47	

Vel Total (ft/s)	4.48	Avg. Vel. (ft/s)		4.48	
Max Chl Dpth (ft)	9.40	Hydr. Depth (ft)		7.96	
Conv. Total (cfs)	477013.4	Conv. (cfs)		477013.4	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		256.83	
Min Ch El (ft)	1299.23	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.80	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	15.89	1169.06	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	135.10	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1310.58	Element			
Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.99	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1304.58	Flow Area (sq ft)		2536.47	
E.G. Slope (ft/ft)	0.000374	Area (sq ft)	27.90	2536.47	14.66
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	327.38	Top Width (ft)	34.98	266.62	25.78
Vel Total (ft/s)	5.12	Avg. Vel. (ft/s)		5.12	
Max Chl Dpth (ft)	11.35	Hydr. Depth (ft)		9.51	
Conv. Total (cfs)	672096.1	Conv. (cfs)		672096.1	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		269.47	
Min Ch El (ft)	1299.23	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.12	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	170.24	1421.72	16.58
C & E Loss (ft)	0.00	Cum SA (acres)	106.41	138.37	13.59

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 13.232

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4192.13	1317.2	4209.24	1317.17	4226.76	1317.26	4267.18	1317.02	4299.85	1317.05
4325.03	1317.3	4336.45	1317.39	4355.96	1317.36	4409.53	1317.04	4455.01	1317.29
4477.79	1317.4	4504.29	1317.34	4525.68	1316.82	4556.62	1316.72	4614.53	1315.97
4653.42	1315.7	4687.17	1315.39	4707.28	1315.19	4711.52	1316.57	4714.69	1315.22
4738.16	1315.4	4783.16	1314.42	4799.48	1311.83	4815.94	1311.49	4823.61	1310.35
4834.79	1311.6	4840.84	1309.45	4848.4	1308.76	4856.31	1308.63	4860.56	1309.64
4875.88	1310.1	4911.36	1300.15	4940.1	1299.79	4974.11	1299.23	4994.1	1299.09
5005.17	1299.1	5023.78	1299.42	5105.19	1300.24	5141.17	1310.28	5160.77	1309.61
5177.23	1312.8	5192.13	1314.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4192.13	.04	4875.88	.025	5141.17	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.88	5141.17	283.83	283.83	283.83	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4192.13	4875.88	1314	5141.17	5192.13	1314

Left Levee Station= 4875.88 Elevation= 1310.1
Right Levee Station= 5141.17 Elevation= 1310.28

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.23	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.50	Reach Len. (ft)	283.83	283.83	283.83
Crit W.S. (ft)	1303.00	Flow Area (sq ft)		1649.06	
E.G. Slope (ft/ft)	0.000392	Area (sq ft)		1649.06	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	244.09	Top Width (ft)		244.09	
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)		4.18	
Max Chl Dpth (ft)	8.14	Hydr. Depth (ft)		6.76	
Conv. Total (cfs)	348432.4	Conv. (cfs)		348432.4	

Length Wtd. (ft)	283.83	Wetted Per. (ft)		246.03
Min Ch El (ft)	1299.09	Shear (lb/sq ft)		0.16
Alpha	1.00	Stream Power (lb/ft s)		0.69
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.26	961.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	128.43

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1308.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.84	Reach Len. (ft)	283.83	283.83	283.83
Crit W.S. (ft)	1303.65	Flow Area (sq ft)		1968.84	
E.G. Slope (ft/ft)	0.000395	Area (sq ft)		1968.84	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	253.28	Top Width (ft)		253.28	
Vel Total (ft/s)	4.61	Avg. Vel. (ft/s)		4.61	
Max Chl Dpth (ft)	9.42	Hydr. Depth (ft)		7.77	
Conv. Total (cfs)	456445.1	Conv. (cfs)		456445.1	
Length Wtd. (ft)	283.83	Wetted Per. (ft)		255.58	
Min Ch El (ft)	1299.09	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.87	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	15.89	1157.59	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	133.65	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1310.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.89	Reach Len. (ft)	283.83	283.83	283.83
Crit W.S. (ft)	1304.71	Flow Area (sq ft)		2476.52	
E.G. Slope (ft/ft)	0.000402	Area (sq ft)	40.52	2476.52	12.02
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	328.95	Top Width (ft)	39.66	265.29	24.00
Vel Total (ft/s)	5.25	Avg. Vel. (ft/s)		5.25	
Max Chl Dpth (ft)	11.37	Hydr. Depth (ft)		9.34	
Conv. Total (cfs)	648114.1	Conv. (cfs)		648114.1	
Length Wtd. (ft)	283.83	Wetted Per. (ft)		268.05	
Min Ch El (ft)	1299.09	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		1.22	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	170.04	1407.33	16.50
C & E Loss (ft)	0.00	Cum SA (acres)	106.20	136.85	13.45

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 13.179

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4193.67	1317.4	4217.26	1317.45	4247.1	1317.51	4275.14	1317.44	4314.53	1317.71
4333.05	1317.8	4346.23	1317.83	4390.92	1317.68	4411.01	1317.45	4449.52	1316.68
4515.99	1316	4541.24	1315.46	4572.93	1315.49	4605.57	1315.44	4622.52	1315.51
4675.33	1314.9	4687.52	1314.99	4695.36	1314.96	4700.44	1316.45	4703.33	1315.12
4721.38	1315.1	4727.74	1315.2	4746.45	1314.95	4778.27	1314.31	4798.23	1311.54
4817.18	1311.1	4823.73	1310.05	4833.4	1312.06	4840.08	1309.62	4847.17	1308.77
4857.06	1308.4	4861.23	1310.09	4874.79	1309.95	4897.33	1303.87	4912.41	1299.73
4991.83	1299	5025.68	1299.36	5039.49	1299.39	5097.38	1299.77	5104.3	1299.93
5140.08	1310.5	5162.11	1309.72	5176.84	1313.03	5190.46	1313.48	5193.67	1313.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4193.67	.04	4874.79	.025	5140.08	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.79	5140.08	462	500	535	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4193.67	4874.79	1313	5140.08	5193.67	1313

Left Levee Station= 4874.79 Elevation= 1309.95
Right Levee Station= 5140.08 Elevation= 1310.5

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1307.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.39	Reach Len. (ft)	462.00	500.00	535.00
Crit W.S. (ft)	1302.79	Flow Area (sq ft)		1665.67	
E.G. Slope (ft/ft)	0.000378	Area (sq ft)		1665.67	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	243.36	Top Width (ft)		243.36	
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)		4.14	
Max Chl Dpth (ft)	8.12	Hydr. Depth (ft)		6.84	
Conv. Total (cfs)	354918.5	Conv. (cfs)		354918.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		245.39	
Min Ch El (ft)	1299.00	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.66	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.26	950.30	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	126.84	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1308.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.73	Reach Len. (ft)	462.00	500.00	535.00
Crit W.S. (ft)	1303.44	Flow Area (sq ft)		1984.12	
E.G. Slope (ft/ft)	0.000383	Area (sq ft)		1984.12	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	252.47	Top Width (ft)		252.47	
Vel Total (ft/s)	4.57	Avg. Vel. (ft/s)		4.57	
Max Chl Dpth (ft)	9.40	Hydr. Depth (ft)		7.86	
Conv. Total (cfs)	463235.9	Conv. (cfs)		463235.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		254.86	
Min Ch El (ft)	1299.00	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.85	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	15.89	1144.72	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	132.00	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1310.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.78	Reach Len. (ft)	462.00	500.00	535.00
Crit W.S. (ft)	1304.50	Flow Area (sq ft)		2489.34	
E.G. Slope (ft/ft)	0.000394	Area (sq ft)	36.09	2489.34	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	304.86	Top Width (ft)	40.07	264.79	
Vel Total (ft/s)	5.22	Avg. Vel. (ft/s)		5.22	
Max Chl Dpth (ft)	11.35	Hydr. Depth (ft)		9.40	
Conv. Total (cfs)	654322.9	Conv. (cfs)		654322.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		267.67	
Min Ch El (ft)	1299.00	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		1.19	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	169.79	1391.15	16.47
C & E Loss (ft)	0.01	Cum SA (acres)	105.94	135.12	13.37

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 13.084

INPUT
Description:

Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4173.25	1318.1	4197.76	1318	4257.3	1318.05	4289.47	1317.96	4306.33	1317.98
4345.92	1317.7	4375.98	1317.82	4405.51	1317.86	4439.89	1317.54	4457.24	1317.52
4501.55	1317.6	4510.92	1317.7	4561.45	1317.14	4613.29	1317.04	4665.28	1315.91
4692.09	1315.5	4694.93	1316.19	4698.22	1314.69	4716.08	1314.6	4738.12	1314.25
4773	1313.8	4786.12	1313.35	4799.94	1311.75	4809.74	1310.93	4814.88	1310.22
4824.76	1312	4828.67	1310.23	4843.65	1308.2	4850.57	1308.8	4856.4	1309.77
4870.91	1309.7	4895.41	1302.85	4907.5	1299.41	4938.88	1299.09	4993.67	1298.67
5026.11	1298.9	5046.1	1299.04	5066.72	1299.37	5101.62	1299.8	5111.59	1302.62
5137.76	1310.2	5157.89	1309.62	5170.75	1312.8	5173.25	1312.91		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4173.25	.04	4870.91	.025	5137.76	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4870.91	5137.76	234	250	267	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4173.25	4870.91	1313	5137.76	5173.25	1313

Left Levee Station= 4870.91 Elevation= 1309.7
Right Levee Station= 5137.76 Elevation= 1310.2

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1306.95	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.20	Reach Len. (ft)	234.00	250.00	267.00
Crit W.S. (ft)	1302.44	Flow Area (sq ft)		1714.71	
E.G. Slope (ft/ft)	0.000348	Area (sq ft)		1714.71	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	245.79	Top Width (ft)		245.79	
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)		4.02	
Max Chl Dpth (ft)	8.28	Hydr. Depth (ft)		6.98	
Conv. Total (cfs)	370042.9	Conv. (cfs)		370042.9	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		247.84	
Min Ch El (ft)	1298.67	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.60	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.26	930.90	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	124.04	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1308.23	Element			
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.54	Reach Len. (ft)	234.00	250.00	267.00
Crit W.S. (ft)	1303.10	Flow Area (sq ft)		2035.52	
E.G. Slope (ft/ft)	0.000356	Area (sq ft)		2035.52	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	254.80	Top Width (ft)		254.80	
Vel Total (ft/s)	4.46	Avg. Vel. (ft/s)		4.46	
Max Chl Dpth (ft)	9.56	Hydr. Depth (ft)		7.99	
Conv. Total (cfs)	480454.1	Conv. (cfs)		480454.1	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		257.21	
Min Ch El (ft)	1298.67	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.78	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	15.89	1121.65	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	129.09	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1310.17	Element			
Vel Head (ft)	0.40	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.58	Reach Len. (ft)	234.00	250.00	267.00
Crit W.S. (ft)	1304.15	Flow Area (sq ft)		2543.71	
E.G. Slope (ft/ft)	0.000370	Area (sq ft)	37.55	2543.71	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	

Top Width (ft)	308.60	Top Width (ft)	41.83	266.76	
Vel Total (ft/s)	5.11	Avg. Vel. (ft/s)		5.11	
Max Chl Dpth (ft)	11.50	Hydr. Depth (ft)		9.54	
Conv. Total (cfs)	674987.1	Conv. (cfs)		674987.1	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		269.66	
Min Ch El (ft)	1298.67	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.11	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	169.40	1362.27	16.47
C & E Loss (ft)	0.00	Cum SA (acres)	105.50	132.07	13.37

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 13.037

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4209.65	1317.7	4222.38	1317.91	4236.91	1317.9	4284.66	1318.03	4328.03	1318.02
4347.36	1318.2	4372.5	1318.54	4393.06	1318.59	4403.32	1318.51	4417.98	1318.25
4420.78	1318.3	4456.63	1317.76	4468.9	1317.67	4472.38	1317.49	4509.02	1317.61
4541.42	1316.9	4563.59	1316.84	4578.74	1316.7	4584.69	1316.84	4591.05	1316.77
4620.28	1317	4647.42	1316.51	4670.88	1316.14	4696.73	1315.32	4700.91	1316.84
4705.13	1315.2	4736.2	1314.59	4760.16	1314.1	4789.01	1313.54	4812.14	1310.82
4820.88	1312.2	4825.73	1310.03	4841.15	1307.91	4849.01	1308.4	4855.66	1309.46
4870.21	1309.4	4907.33	1299.19	4928.85	1299.17	4995.77	1298.52	5063.28	1298.8
5100.99	1299.4	5115.56	1303.54	5138.76	1310.2	5168.02	1309.56	5191.32	1313.71
5207.23	1313.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4209.65	.04	4870.21	.025	5138.76	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4870.21	5138.76	272	293.35	315	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4209.65	4870.21	1313	5138.76	5207.23	1313

Left Levee Station= 4870.21 Elevation= 1309.4
Right Levee Station= 5138.76 Elevation= 1310.2

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1306.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.11	Reach Len. (ft)	272.00	293.35	315.00
Crit W.S. (ft)	1302.22	Flow Area (sq ft)		1755.78	
E.G. Slope (ft/ft)	0.000325	Area (sq ft)		1755.78	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	247.77	Top Width (ft)		247.77	
Vel Total (ft/s)	3.93	Avg. Vel. (ft/s)		3.93	
Max Chl Dpth (ft)	8.35	Hydr. Depth (ft)		7.09	
Conv. Total (cfs)	382853.8	Conv. (cfs)		382853.8	
Length Wtd. (ft)	293.35	Wetted Per. (ft)		249.87	
Min Ch El (ft)	1298.52	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.56	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.26	920.94	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	122.62	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1308.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.45	Reach Len. (ft)	272.00	293.35	315.00
Crit W.S. (ft)	1302.87	Flow Area (sq ft)		2078.77	
E.G. Slope (ft/ft)	0.000336	Area (sq ft)		2078.77	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	256.89	Top Width (ft)		256.89	
Vel Total (ft/s)	4.36	Avg. Vel. (ft/s)		4.36	

Max Chl Dpth (ft)	9.63	Hydr. Depth (ft)		8.09	
Conv. Total (cfs)	494874.2	Conv. (cfs)		494874.2	
Length Wtd. (ft)	293.35	Wetted Per. (ft)		259.33	
Min Ch El (ft)	1298.52	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.73	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	15.89	1109.84	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	127.62	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1310.09	Element			
Vel Head (ft)	0.39	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.49	Reach Len. (ft)	272.00	293.35	315.00
Crit W.S. (ft)	1303.92	Flow Area (sq ft)		2590.06	
E.G. Slope (ft/ft)	0.000351	Area (sq ft)	50.01	2590.06	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	312.81	Top Width (ft)	44.62	268.18	
Vel Total (ft/s)	5.02	Avg. Vel. (ft/s)		5.02	
Max Chl Dpth (ft)	11.57	Hydr. Depth (ft)		9.66	
Conv. Total (cfs)	693189.1	Conv. (cfs)		693189.1	
Length Wtd. (ft)	293.35	Wetted Per. (ft)		271.07	
Min Ch El (ft)	1298.52	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		1.05	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	169.17	1347.53	16.47
C & E Loss (ft)	0.00	Cum SA (acres)	105.27	130.53	13.37

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.981

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4215.15	1319.1	4228.3	1319.22	4252.67	1318.98	4279.27	1318.94	4301.25	1318.85
4321.07	1318.7	4351.24	1318.22	4370.73	1318.16	4401.25	1317.83	4432.18	1317.63
4470.06	1317.6	4501.25	1317.64	4510.5	1317.3	4548.59	1317.15	4562.24	1317.17
4608.41	1317.1	4638.39	1316.79	4660.41	1316.64	4688.8	1316.36	4710.19	1316.28
4736.29	1316.5	4744.57	1316.62	4755.32	1316.34	4780.42	1315.58	4796.65	1312.78
4818.46	1310.2	4826.81	1311.99	4833.38	1309.26	4842.68	1308.07	4851.72	1308.37
4854.47	1309.3	4870.04	1309.31	4887.05	1304.36	4904.09	1299.25	4917.88	1299.24
4966.93	1299	4995.55	1298.62	5051.27	1298.8	5073.36	1299.02	5100.27	1299.22
5123.49	1306.7	5135.4	1310.46	5182.34	1308.28	5205.55	1313.56	5215.15	1313.81

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4215.15	.04	4870.04	.025	5135.4	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4870.04	5135.4	402.01	402.01	402.01	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4215.15	4870.04	1313	5135.4	5215.15	1313

Left Levee Station= 4870.04 Elevation= 1309.31
Right Levee Station= 5135.4 Elevation= 1310.46

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1306.76	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.01	Reach Len. (ft)	402.01	402.01	402.01
Crit W.S. (ft)	1302.26	Flow Area (sq ft)		1716.74	
E.G. Slope (ft/ft)	0.000345	Area (sq ft)		1716.74	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	244.90	Top Width (ft)		244.90	
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)		4.02	
Max Chl Dpth (ft)	8.14	Hydr. Depth (ft)		7.01	
Conv. Total (cfs)	371439.3	Conv. (cfs)		371439.3	
Length Wtd. (ft)	402.01	Wetted Per. (ft)		247.18	

Min Ch El (ft)	1298.62	Shear (lb/sq ft)		0.15
Alpha	1.00	Stream Power (lb/ft s)		0.60
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.26	909.24
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	120.96

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1308.04	Element			
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.35	Reach Len. (ft)	402.01	402.01	402.01
Crit W.S. (ft)	1302.92	Flow Area (sq ft)		2034.27	
E.G. Slope (ft/ft)	0.000355	Area (sq ft)		2034.27	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	253.31	Top Width (ft)		253.31	
Vel Total (ft/s)	4.46	Avg. Vel. (ft/s)		4.46	
Max Chl Dpth (ft)	9.42	Hydr. Depth (ft)		8.03	
Conv. Total (cfs)	481507.6	Conv. (cfs)		481507.6	
Length Wtd. (ft)	402.01	Wetted Per. (ft)		255.97	
Min Ch El (ft)	1298.62	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.78	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	15.89	1095.99	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	125.90	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1309.97	Element			
Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.38	Reach Len. (ft)	402.01	402.01	402.01
Crit W.S. (ft)	1303.98	Flow Area (sq ft)		2535.47	
E.G. Slope (ft/ft)	0.000369	Area (sq ft)	42.06	2535.47	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	302.18	Top Width (ft)	38.37	263.81	
Vel Total (ft/s)	5.12	Avg. Vel. (ft/s)		5.12	
Max Chl Dpth (ft)	11.35	Hydr. Depth (ft)		9.61	
Conv. Total (cfs)	675877.7	Conv. (cfs)		675877.7	
Length Wtd. (ft)	402.01	Wetted Per. (ft)		266.95	
Min Ch El (ft)	1298.62	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.12	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	168.88	1330.28	16.47
C & E Loss (ft)	0.00	Cum SA (acres)	105.01	128.74	13.37

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.905

INPUT
Description: Upstream of Side Inlet (25' Wide) from the Left Bank
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4465.77	1315.95	4498.56	1315.91	4528.13	1316.05	4548.57	1316	4598.56	1315.86
4628.79	1315.64	4648.52	1315.62	4685.8	1315.81	4724.88	1315.6	4728.8	1316.23
4730.93	1315.44	4750.99	1315.67	4779.44	1314.52	4805.25	1311.7	4818.03	1310.01
4828.38	1311.48	4834.09	1309.06	4848.52	1308.29	4851.98	1308.9	4868.2	1308.99
4907.18	1298.95	4930.34	1298.87	4967.44	1298.67	4997.34	1298.4	5029.5	1298.67
5064.45	1298.59	5076.4	1298.51	5095.31	1298.68	5119.5	1306.1	5129.72	1309.08
5150.77	1310.22	5165.28	1310.65	5174.97	1310.83	5189.76	1314.3	5216.71	1314.06

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4465.77	.04	4868.2	.025	5129.72	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4868.2	5129.72	112.17	112.17	112.17	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4465.77	4868.2	1313	5129.72	5216.71	1313

Left Levee Station= 4868.2 Elevation= 1308.99
Right Levee Station= 5129.72 Elevation= 1309.08

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1306.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.88	Reach Len. (ft)	112.17	112.17	112.17
Crit W.S. (ft)	1302.05	Flow Area (sq ft)		1717.14	
E.G. Slope (ft/ft)	0.000343	Area (sq ft)		1717.14	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	243.92	Top Width (ft)		243.92	
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)		4.02	
Max Chl Dpth (ft)	8.22	Hydr. Depth (ft)		7.04	
Conv. Total (cfs)	372688.0	Conv. (cfs)		372688.0	
Length Wtd. (ft)	112.17	Wetted Per. (ft)		246.08	
Min Ch El (ft)	1298.40	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.60	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.26	893.40	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	118.71	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1307.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.20	Reach Len. (ft)	112.17	112.17	112.17
Crit W.S. (ft)	1302.71	Flow Area (sq ft)		2032.69	
E.G. Slope (ft/ft)	0.000355	Area (sq ft)		2032.69	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	253.20	Top Width (ft)		253.20	
Vel Total (ft/s)	4.46	Avg. Vel. (ft/s)		4.46	
Max Chl Dpth (ft)	9.49	Hydr. Depth (ft)		8.03	
Conv. Total (cfs)	481223.5	Conv. (cfs)		481223.5	
Length Wtd. (ft)	112.17	Wetted Per. (ft)		255.71	
Min Ch El (ft)	1298.40	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.79	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	15.89	1077.22	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	123.56	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1309.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.23	Reach Len. (ft)	112.17	112.17	112.17
Crit W.S. (ft)	1303.77	Flow Area (sq ft)		2531.93	
E.G. Slope (ft/ft)	0.000366	Area (sq ft)	35.68	2531.93	5.08
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	311.12	Top Width (ft)	35.91	261.52	13.69
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)		5.13	
Max Chl Dpth (ft)	11.42	Hydr. Depth (ft)		9.68	
Conv. Total (cfs)	678743.6	Conv. (cfs)		678743.6	
Length Wtd. (ft)	112.17	Wetted Per. (ft)		264.33	
Min Ch El (ft)	1298.40	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.12	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	168.52	1306.89	16.44
C & E Loss (ft)	0.00	Cum SA (acres)	104.67	126.32	13.31

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.884

INPUT
Description: Downstream of Side Inlet (25' Wide) from the Left Bank
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4466.78	1316.1	4510.2	1315.93	4580.05	1315.95	4597.79	1315.99	4615.79	1315.9
4651.21	1315.6	4688.29	1315.87	4724.5	1315.58	4730.57	1316.36	4733.47	1315.37
4750.87	1315.7	4778.46	1314.45	4792.06	1312.88	4818.33	1310.01	4828.56	1311.85
4834.31	1309.1	4846.39	1307.83	4852.05	1309.12	4867.78	1309.06	4903.78	1298.95
4914.87	1299	4986.16	1298.62	4997.79	1298.48	5009.38	1298.59	5070.11	1298.56

5091.16 1298.3 5104.91 1301.58 5128.84 1308.15 5137.64 1309.27 5153.23 1309.89
5173.36 1310.9 5185.43 1313.57 5203.9 1313.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4466.78	.04	4867.78	.025	5137.64	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4867.78	5137.64	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4466.78	4867.78	1313	5137.64	5203.9	1313

Left Levee Station= 4867.78 Elevation= 1309.06
Right Levee Station= 5137.64 Elevation= 1309.27

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1306.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.84	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.05	Flow Area (sq ft)		1725.05	
E.G. Slope (ft/ft)	0.000342	Area (sq ft)		1725.05	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	246.57	Top Width (ft)		246.57	
Vel Total (ft/s)	4.00	Avg. Vel. (ft/s)		4.00	
Max Chl Dpth (ft)	8.29	Hydr. Depth (ft)		7.00	
Conv. Total (cfs)	372927.3	Conv. (cfs)		372927.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		248.69	
Min Ch El (ft)	1298.30	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.59	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	0.26	888.97	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	118.08	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1307.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.16	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.70	Flow Area (sq ft)		2043.73	
E.G. Slope (ft/ft)	0.000353	Area (sq ft)		2043.73	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	255.71	Top Width (ft)		255.71	
Vel Total (ft/s)	4.44	Avg. Vel. (ft/s)		4.44	
Max Chl Dpth (ft)	9.56	Hydr. Depth (ft)		7.99	
Conv. Total (cfs)	482488.9	Conv. (cfs)		482488.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		258.17	
Min Ch El (ft)	1298.30	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.78	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	15.89	1071.97	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	122.91	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1309.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.19	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1303.78	Flow Area (sq ft)		2553.77	
E.G. Slope (ft/ft)	0.000371	Area (sq ft)	34.78	2553.77	3.33
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	317.71	Top Width (ft)	34.90	269.86	12.95
Vel Total (ft/s)	5.09	Avg. Vel. (ft/s)		5.09	
Max Chl Dpth (ft)	11.48	Hydr. Depth (ft)		9.46	
Conv. Total (cfs)	674540.4	Conv. (cfs)		674540.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		272.60	
Min Ch El (ft)	1298.30	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.10	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	168.43	1300.34	16.43
C & E Loss (ft)	0.00	Cum SA (acres)	104.58	125.63	13.27

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.789

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4475.13	1315.48	4509.57	1315.38	4544.26	1315.81	4569.52	1315.9	4595.36	1315.84
4628.19	1315.53	4658.58	1315.46	4672.44	1315.53	4686.27	1315.7	4691.38	1315.92
4725.68	1316.04	4738.12	1315.7	4744.45	1315.71	4781.48	1314.7	4793.23	1313.01
4816.98	1309.72	4826.09	1310.91	4831.76	1308.68	4846.95	1307.3	4853.04	1308.92
4867.18	1308.56	4902.94	1298.84	4980.37	1298.22	4992.72	1298.1	5026.15	1298.54
5082.32	1298.71	5093.88	1298.73	5111.31	1303.87	5132.34	1309.7	5140.43	1309.63
5158.13	1308.72	5160.65	1308.71	5186.77	1310.99	5200.45	1312.1	5216.77	1312.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4475.13	.04	4867.18	.025	5132.34	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4867.18	5132.34	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4475.13	4867.18	1313	5132.34	5216.77	1313

Left Levee Station= 4867.18 Elevation= 1308.56
Right Levee Station= 5132.34 Elevation= 1309.7

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1306.41	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.66	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.88	Flow Area (sq ft)		1715.36	
E.G. Slope (ft/ft)	0.000347	Area (sq ft)		1715.36	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	245.40	Top Width (ft)		245.40	
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)		4.02	
Max Chl Dpth (ft)	8.31	Hydr. Depth (ft)		6.99	
Conv. Total (cfs)	370617.3	Conv. (cfs)		370617.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		247.50	
Min Ch El (ft)	1298.10	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.60	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.26	869.22	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	115.25	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.67	Element			
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.98	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.54	Flow Area (sq ft)		2030.88	
E.G. Slope (ft/ft)	0.000359	Area (sq ft)		2030.88	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	254.59	Top Width (ft)		254.59	
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)		4.47	
Max Chl Dpth (ft)	9.57	Hydr. Depth (ft)		7.98	
Conv. Total (cfs)	478844.7	Conv. (cfs)		478844.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		257.04	
Min Ch El (ft)	1298.10	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.79	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	15.89	1048.59	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	119.98	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1309.59	Element			

Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1310.00	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1303.59	Flow Area (sq ft)		2530.04	
E.G. Slope (ft/ft)	0.000373	Area (sq ft)	46.40	2530.04	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	302.50	Top Width (ft)	37.73	264.76	
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)		5.13	
Max Chl Dpth (ft)	11.49	Hydr. Depth (ft)		9.56	
Conv. Total (cfs)	672394.6	Conv. (cfs)		672394.6	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		267.59	
Min Ch El (ft)	1298.10	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.13	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	167.96	1271.17	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	104.16	122.57	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.694

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4466.87	1315.2	4508.36	1315.08	4541.04	1315.19	4573.29	1315.25	4591.05	1315.34
4609.05	1315.2	4641.07	1315.12	4659.4	1315.21	4691.09	1315.15	4709.75	1314.91
4741.08	1314.9	4763.14	1314.62	4775.25	1314.57	4815.48	1309.01	4825.06	1310.33
4847.3	1307.4	4851.16	1308.84	4865.57	1308.43	4901.96	1298.67	4952.69	1298.41
4968.02	1298.3	4999.81	1298.04	5013.4	1298.33	5029.9	1298.5	5047.59	1298.48
5080.65	1298.6	5095.12	1298.69	5131.06	1309.75	5154.12	1308.84	5159.92	1308.56
5169.2	1309.2	5200.56	1311.55	5208.8	1311.81	5217.61	1311.97		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4466.87	.04	4865.57	.025	5131.06	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4865.57	5131.06	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4466.87	4865.57	1313	5131.06	5217.61	1313

Left Levee Station= 4865.57 Elevation= 1308.43
Right Levee Station= 5131.06 Elevation= 1309.75

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1306.23	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.49	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.78	Flow Area (sq ft)		1706.25	
E.G. Slope (ft/ft)	0.000354	Area (sq ft)		1706.25	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	245.88	Top Width (ft)		245.88	
Vel Total (ft/s)	4.04	Avg. Vel. (ft/s)		4.04	
Max Chl Dpth (ft)	8.19	Hydr. Depth (ft)		6.94	
Conv. Total (cfs)	366834.0	Conv. (cfs)		366834.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		248.02	
Min Ch El (ft)	1298.04	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.61	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.26	849.58	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	112.43	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.49	Element			
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.80	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.43	Flow Area (sq ft)		2020.51	
E.G. Slope (ft/ft)	0.000365	Area (sq ft)		2020.51	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	

Top Width (ft)	254.64	Top Width (ft)		254.64	
Vel Total (ft/s)	4.49	Avg. Vel. (ft/s)		4.49	
Max Chl Dpth (ft)	9.45	Hydr. Depth (ft)		7.93	
Conv. Total (cfs)	474659.4	Conv. (cfs)		474659.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		257.13	
Min Ch El (ft)	1298.04	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.80	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	15.89	1025.34	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	117.06	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1309.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.81	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1303.48	Flow Area (sq ft)		2517.21	
E.G. Slope (ft/ft)	0.000379	Area (sq ft)	32.16	2517.21	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	303.40	Top Width (ft)	39.05	264.35	
Vel Total (ft/s)	5.16	Avg. Vel. (ft/s)		5.16	
Max Chl Dpth (ft)	11.36	Hydr. Depth (ft)		9.52	
Conv. Total (cfs)	667285.0	Conv. (cfs)		667285.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		267.25	
Min Ch El (ft)	1298.04	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.15	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	167.51	1242.20	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	103.72	119.53	13.20

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.6

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4492.04	1315.45	4552.27	1315	4569.79	1314.93	4607.79	1315.57	4620.76	1315.66
4646.32	1315.11	4664.27	1315	4687.65	1315.11	4718.96	1314.86	4737.72	1314.77
4774.97	1314.69	4815.39	1309.1	4824.77	1310.09	4827.78	1309.63	4838.7	1308.32
4845.61	1307.24	4850.13	1308.7	4864.26	1308.72	4884.43	1302.96	4898.66	1298.72
4950.51	1298.29	4980.6	1298.2	4992.04	1297.79	4998.54	1298.03	5021.45	1298.4
5033.21	1298.41	5084.19	1298.6	5090.68	1298.69	5131.1	1309.29	5157.51	1308.61
5194.43	1310.68	5206.95	1311.3	5212.01	1311.46				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4492.04	.04	4864.26	.025	5131.1	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4864.26	5131.1	250	250	250	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4492.04	4864.26	1313	5131.1	5212.01	1313

Left Levee Station= 4864.26 Elevation= 1308.72
Right Levee Station= 5131.1 Elevation= 1309.29

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1306.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.30	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1301.74	Flow Area (sq ft)		1663.96	
E.G. Slope (ft/ft)	0.000383	Area (sq ft)		1663.96	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	245.03	Top Width (ft)		245.03	
Vel Total (ft/s)	4.15	Avg. Vel. (ft/s)		4.15	
Max Chl Dpth (ft)	8.25	Hydr. Depth (ft)		6.79	

Conv. Total (cfs)	352729.0	Conv. (cfs)		352729.0
Length Wtd. (ft)	250.00	Wetted Per. (ft)		247.05
Min Ch El (ft)	1297.79	Shear (lb/sq ft)		0.16
Alpha	1.00	Stream Power (lb/ft s)		0.67
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.26	830.24
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	109.61

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.29	Element			
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.61	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1302.40	Flow Area (sq ft)		1975.72	
E.G. Slope (ft/ft)	0.000392	Area (sq ft)		1975.72	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	254.17	Top Width (ft)		254.17	
Vel Total (ft/s)	4.59	Avg. Vel. (ft/s)		4.59	
Max Chl Dpth (ft)	9.50	Hydr. Depth (ft)		7.77	
Conv. Total (cfs)	457984.7	Conv. (cfs)		457984.7	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		256.52	
Min Ch El (ft)	1297.79	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.87	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	15.89	1002.40	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	114.14	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1309.18	Element			
Vel Head (ft)	0.43	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.61	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1303.45	Flow Area (sq ft)		2471.25	
E.G. Slope (ft/ft)	0.000407	Area (sq ft)	25.07	2471.25	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	300.61	Top Width (ft)	34.17	266.44	
Vel Total (ft/s)	5.26	Avg. Vel. (ft/s)		5.26	
Max Chl Dpth (ft)	11.39	Hydr. Depth (ft)		9.28	
Conv. Total (cfs)	643920.1	Conv. (cfs)		643920.1	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		269.23	
Min Ch El (ft)	1297.79	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		1.23	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	167.18	1213.57	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	103.30	116.48	13.20

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.552

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4535.99	1315.34	4553.61	1315.32	4585.98	1315.2	4617.92	1315.27	4654.68	1315.24
4686.09	1315.11	4705.53	1314.95	4737.52	1314.9	4750.21	1314.73	4776.41	1314.65
4813.88	1309.23	4824.75	1310.39	4844.04	1307.2	4849.65	1308.65	4863.71	1308.48
4884.7	1302.65	4900.35	1298.23	4907.16	1298.2	4965.84	1298.24	4975	1298.29
4986.83	1297.54	4992.78	1297.65	5021.07	1297.8	5047.89	1298.22	5080.85	1298.32
5090	1298.39	5130.63	1309.31	5138.46	1309.1	5157.27	1308.46	5194.41	1310.99
5200.4	1311.36	5216.46	1312.04						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4535.99	.04	4863.71	.025	5130.63	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4863.71	5130.63	338.78	338.78	338.78	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4535.99	4863.71	1312	5130.63	5216.46	1312

Left Levee Station= 4863.71 Elevation= 1308.48
Right Levee Station= 5130.63 Elevation= 1309.31

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1305.95	Element			
Vel Head (ft)	0.26	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.21	Reach Len. (ft)	338.78	338.78	338.78
Crit W.S. (ft)	1301.49	Flow Area (sq ft)		1702.44	
E.G. Slope (ft/ft)	0.000355	Area (sq ft)		1702.44	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	245.33	Top Width (ft)		245.33	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	8.41	Hydr. Depth (ft)		6.94	
Conv. Total (cfs)	366064.1	Conv. (cfs)		366064.1	
Length Wtd. (ft)	338.78	Wetted Per. (ft)		247.42	
Min Ch El (ft)	1297.54	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.62	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.26	820.58	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	108.21	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.20	Element			
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.51	Reach Len. (ft)	338.78	338.78	338.78
Crit W.S. (ft)	1302.15	Flow Area (sq ft)		2013.89	
E.G. Slope (ft/ft)	0.000369	Area (sq ft)		2013.89	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	254.45	Top Width (ft)		254.45	
Vel Total (ft/s)	4.50	Avg. Vel. (ft/s)		4.50	
Max Chl Dpth (ft)	9.66	Hydr. Depth (ft)		7.91	
Conv. Total (cfs)	472388.0	Conv. (cfs)		472388.0	
Length Wtd. (ft)	338.78	Wetted Per. (ft)		256.88	
Min Ch El (ft)	1297.54	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.81	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	15.89	990.95	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	112.68	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1309.09	Element			
Vel Head (ft)	0.42	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.51	Reach Len. (ft)	338.78	338.78	338.78
Crit W.S. (ft)	1303.21	Flow Area (sq ft)		2508.61	
E.G. Slope (ft/ft)	0.000387	Area (sq ft)	24.84	2508.61	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	297.24	Top Width (ft)	31.12	266.12	
Vel Total (ft/s)	5.18	Avg. Vel. (ft/s)		5.18	
Max Chl Dpth (ft)	11.55	Hydr. Depth (ft)		9.43	
Conv. Total (cfs)	660663.1	Conv. (cfs)		660663.1	
Length Wtd. (ft)	338.78	Wetted Per. (ft)		268.97	
Min Ch El (ft)	1297.54	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		1.17	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	167.04	1199.28	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	103.11	114.95	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.488

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4488.34	1315.48	4533.72	1315.44	4583.72	1315.61	4604.54	1315.5	4633.73	1315.51

4654.2	1315.55	4683.72	1315.47	4733.73	1315.03	4781.42	1314.8	4814.65	1309.08
4823.26	1309.88	4841.43	1307.52	4844.12	1307.45	4848.19	1308.5	4863.21	1308.55
4883.74	1302.52	4898.26	1298.37	4951.09	1298.38	4979.08	1298.1	4990.72	1297.8
5033.16	1298.01	5067.52	1298.26	5094.04	1298.68	5129.87	1309.2	5151.08	1309.05
5158.76	1308.88	5193.31	1310.9	5202.91	1311.43	5216.2	1311.6		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4488.34	.04	4863.21	.025	5129.87	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4863.21	5129.87	294	250	210	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4488.34	4863.21	1312	5129.87	5216.2	1312

Left Levee Station= 4863.21 Elevation= 1308.55
Right Levee Station= 5129.87 Elevation= 1309.2

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1305.82	Element			
Vel Head (ft)	0.26	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.08	Reach Len. (ft)	294.00	250.00	210.00
Crit W.S. (ft)	1301.52	Flow Area (sq ft)		1675.27	
E.G. Slope (ft/ft)	0.000376	Area (sq ft)		1675.27	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	245.85	Top Width (ft)		245.85	
Vel Total (ft/s)	4.12	Avg. Vel. (ft/s)		4.12	
Max Chl Dpth (ft)	8.02	Hydr. Depth (ft)		6.81	
Conv. Total (cfs)	355874.7	Conv. (cfs)		355874.7	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		247.94	
Min Ch El (ft)	1297.80	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.65	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.26	807.45	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	106.30	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.06	Element			
Vel Head (ft)	0.32	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.39	Reach Len. (ft)	294.00	250.00	210.00
Crit W.S. (ft)	1302.17	Flow Area (sq ft)		1985.76	
E.G. Slope (ft/ft)	0.000386	Area (sq ft)		1985.76	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	254.31	Top Width (ft)		254.31	
Vel Total (ft/s)	4.57	Avg. Vel. (ft/s)		4.57	
Max Chl Dpth (ft)	9.26	Hydr. Depth (ft)		7.81	
Conv. Total (cfs)	461588.3	Conv. (cfs)		461588.3	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		256.76	
Min Ch El (ft)	1297.80	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.85	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	15.89	975.40	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	110.70	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1308.95	Element			
Vel Head (ft)	0.43	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.38	Reach Len. (ft)	294.00	250.00	210.00
Crit W.S. (ft)	1303.21	Flow Area (sq ft)		2477.75	
E.G. Slope (ft/ft)	0.000402	Area (sq ft)	22.13	2477.75	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	298.59	Top Width (ft)	32.78	265.81	
Vel Total (ft/s)	5.24	Avg. Vel. (ft/s)		5.24	
Max Chl Dpth (ft)	11.15	Hydr. Depth (ft)		9.32	
Conv. Total (cfs)	647531.7	Conv. (cfs)		647531.7	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		268.74	
Min Ch El (ft)	1297.80	Shear (lb/sq ft)		0.23	

Alpha	1.00	Stream Power (lb/ft s)		1.21	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	166.86	1179.89	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	102.86	112.89	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.441

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4528.21	1314.56	4580.33	1314.5	4607.47	1314.41	4647.72	1314.44	4687.94	1314.26
4699.24	1314.26	4761.39	1314.1	4770.86	1313.95	4794.3	1313.47	4828.04	1308.17
4836.29	1309.5	4851.81	1307.3	4855.97	1308.39	4871.54	1308.46	4894.29	1301.58
4906.24	1298.42	4935.6	1298.3	4956.06	1298.34	4994.88	1297.71	5013.37	1297.79
5067.19	1298.13	5097.61	1298.5	5138.53	1309.5	5163.91	1308.78	5195.46	1310.8
5206.83	1311.49	5221.76	1311.6						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4528.21	.04	4871.54	.025	5138.53	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4871.54	5138.53	567	483.07	402	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4528.21	4871.54	1312	5138.53	5221.76	1312

Left Levee Station= 4871.54 Elevation= 1308.46
Right Levee Station= 5138.53 Elevation= 1309.5

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1305.71	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.99	Reach Len. (ft)	567.00	483.07	402.00
Crit W.S. (ft)	1301.48	Flow Area (sq ft)		1648.78	
E.G. Slope (ft/ft)	0.000392	Area (sq ft)		1648.78	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	243.83	Top Width (ft)		243.83	
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)		4.18	
Max Chl Dpth (ft)	8.00	Hydr. Depth (ft)		6.76	
Conv. Total (cfs)	348544.3	Conv. (cfs)		348544.3	
Length Wtd. (ft)	483.07	Wetted Per. (ft)		245.81	
Min Ch El (ft)	1297.71	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.69	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.26	797.91	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	104.89	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1306.95	Element			
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.29	Reach Len. (ft)	567.00	483.07	402.00
Crit W.S. (ft)	1302.15	Flow Area (sq ft)		1955.95	
E.G. Slope (ft/ft)	0.000402	Area (sq ft)		1955.95	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	252.53	Top Width (ft)		252.53	
Vel Total (ft/s)	4.64	Avg. Vel. (ft/s)		4.64	
Max Chl Dpth (ft)	9.24	Hydr. Depth (ft)		7.75	
Conv. Total (cfs)	452327.3	Conv. (cfs)		452327.3	
Length Wtd. (ft)	483.07	Wetted Per. (ft)		254.86	
Min Ch El (ft)	1297.71	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.89	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	15.89	964.09	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	109.25	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1308.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.27	Reach Len. (ft)	567.00	483.07	402.00
Crit W.S. (ft)	1303.20	Flow Area (sq ft)		2443.34	
E.G. Slope (ft/ft)	0.000419	Area (sq ft)	21.55	2443.34	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	303.41	Top Width (ft)	38.89	264.51	
Vel Total (ft/s)	5.32	Avg. Vel. (ft/s)		5.32	
Max Chl Dpth (ft)	11.12	Hydr. Depth (ft)		9.24	
Conv. Total (cfs)	634862.6	Conv. (cfs)		634862.6	
Length Wtd. (ft)	483.07	Wetted Per. (ft)		267.31	
Min Ch El (ft)	1297.71	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		1.27	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	166.71	1165.77	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	102.62	111.36	13.20

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.349

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4222.59	1308.8	4277.15	1308.64	4305.02	1308.48	4340.4	1308.39	4375.77	1308.6
4413.76	1308.7	4517.29	1308.3	4552.66	1307.94	4618.68	1308.05	4686.99	1307.82
4701.89	1307.9	4729.55	1308.22	4755.29	1308.08	4775.29	1308.09	4819.84	1308.26
4831.54	1307.8	4844.59	1308.27	4854.07	1307.64	4860.56	1307.1	4865.65	1308.51
4881.59	1308.8	4893.02	1305.52	4920.01	1298.12	4951.26	1297.77	5011.38	1297.66
5028.46	1297.7	5070.95	1297.79	5083.83	1297.76	5106.72	1298.38	5111.7	1299.8
5147.48	1309.8	5164.46	1308.97	5171.55	1308.35	5212.67	1309.91	5222.59	1310.48

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4222.59	.04	4881.59	.025	5147.48	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4881.59	5147.48	250	250	250	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4222.59	4881.59	1312	5147.48	5222.59	1312

Left Levee Station= 4881.59 Elevation= 1308.8
Right Levee Station= 5147.48 Elevation= 1309.8

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1305.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.80	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1301.24	Flow Area (sq ft)		1630.29	
E.G. Slope (ft/ft)	0.000397	Area (sq ft)		1630.29	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	239.13	Top Width (ft)		239.13	
Vel Total (ft/s)	4.23	Avg. Vel. (ft/s)		4.23	
Max Chl Dpth (ft)	7.86	Hydr. Depth (ft)		6.82	
Conv. Total (cfs)	346479.9	Conv. (cfs)		346479.9	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		241.12	
Min Ch El (ft)	1297.66	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.71	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.26	779.73	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	102.21	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1306.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.025	

E.G. Elev (ft)	1307.09	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1301.91	Flow Area (sq ft)		1929.39	
E.G. Slope (ft/ft)	0.000410	Area (sq ft)		1929.39	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	247.80	Top Width (ft)		247.80	
Vel Total (ft/s)	4.70	Avg. Vel. (ft/s)		4.70	
Max Chl Dpth (ft)	9.09	Hydr. Depth (ft)		7.79	
Conv. Total (cfs)	447685.2	Conv. (cfs)		447685.2	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		250.13	
Min Ch El (ft)	1297.66	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.93	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	15.89	942.55	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	106.47	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1308.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.		0.025	
E.G. Elev (ft)	1309.07	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1302.98	Flow Area (sq ft)		2404.14	
E.G. Slope (ft/ft)	0.000434	Area (sq ft)		2404.14	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	260.98	Top Width (ft)		260.98	
Vel Total (ft/s)	5.40	Avg. Vel. (ft/s)		5.40	
Max Chl Dpth (ft)	10.95	Hydr. Depth (ft)		9.21	
Conv. Total (cfs)	623403.8	Conv. (cfs)		623403.8	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		263.83	
Min Ch El (ft)	1297.66	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		1.33	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	166.57	1138.89	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	102.37	108.45	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.302

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4222.59	1308.4	4236.63	1308.39	4286.52	1308.64	4304.93	1308.71	4331.43	1308.49
4359.91	1308.3	4373.23	1308.17	4433.3	1308.08	4441.53	1308.04	4476.07	1308.11
4503.35	1308.1	4508.98	1308.08	4552.46	1308.66	4558.22	1307.43	4564.3	1306.38
4576.27	1308.2	4586.29	1307.95	4591.57	1307.3	4595.21	1307.16	4601.33	1307.91
4604.17	1308.1	4611.45	1307.8	4650.16	1307.86	4653.45	1307.83	4714.77	1308.32
4755.97	1308.6	4791.33	1308.68	4812.68	1308.58	4840.32	1308.39	4859.5	1306.95
4865.28	1308.6	4882.75	1308.66	4918.44	1298.29	4932.05	1298.01	4951.13	1297.92
5063.66	1297.6	5075.6	1297.65	5088.77	1297.91	5107.15	1298.1	5146.23	1309.57
5162.38	1309	5167.56	1308.29	5217.67	1310.15	5222.59	1310.31		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4222.59	.04	4882.75	.025	5146.23	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4882.75	5146.23	300.07	300.07	300.07	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4222.59	4882.75	1312	5146.23	5222.59	1312

Left Levee Station= 4882.75 Elevation= 1308.66
Right Levee Station= 5146.23 Elevation= 1309.57

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1305.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.69	Reach Len. (ft)	300.07	300.07	300.07
Crit W.S. (ft)	1301.23	Flow Area (sq ft)		1609.10	
E.G. Slope (ft/ft)	0.000412	Area (sq ft)		1609.10	

Q Total (cfs)	6900.00	Flow (cfs)		6900.00
Top Width (ft)	238.11	Top Width (ft)		238.11
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)		4.29
Max Chl Dpth (ft)	7.81	Hydr. Depth (ft)		6.76
Conv. Total (cfs)	339887.6	Conv. (cfs)		339887.6
Length Wtd. (ft)	300.07	Wetted Per. (ft)		240.18
Min Ch El (ft)	1297.60	Shear (lb/sq ft)		0.17
Alpha	1.00	Stream Power (lb/ft s)		0.74
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.26	770.43
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	100.84

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1306.63	Element			
Vel Head (ft)	0.35	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.98	Reach Len. (ft)	300.07	300.07	300.07
Crit W.S. (ft)	1301.90	Flow Area (sq ft)		1905.61	
E.G. Slope (ft/ft)	0.000425	Area (sq ft)		1905.61	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	246.49	Top Width (ft)		246.49	
Vel Total (ft/s)	4.76	Avg. Vel. (ft/s)		4.76	
Max Chl Dpth (ft)	9.03	Hydr. Depth (ft)		7.73	
Conv. Total (cfs)	439963.3	Conv. (cfs)		439963.3	
Length Wtd. (ft)	300.07	Wetted Per. (ft)		248.91	
Min Ch El (ft)	1297.60	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.97	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	15.89	931.54	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	105.05	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1308.49	Element			
Vel Head (ft)	0.46	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.95	Reach Len. (ft)	300.07	300.07	300.07
Crit W.S. (ft)	1302.97	Flow Area (sq ft)		2375.33	
E.G. Slope (ft/ft)	0.000448	Area (sq ft)		2375.33	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	259.21	Top Width (ft)		259.21	
Vel Total (ft/s)	5.47	Avg. Vel. (ft/s)		5.47	
Max Chl Dpth (ft)	10.89	Hydr. Depth (ft)		9.16	
Conv. Total (cfs)	613588.4	Conv. (cfs)		613588.4	
Length Wtd. (ft)	300.07	Wetted Per. (ft)		262.17	
Min Ch El (ft)	1297.60	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		1.39	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	166.57	1125.17	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	102.37	106.96	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.245

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4331.07	1306.8	4379.29	1306.7	4447.61	1306.64	4477.84	1306.52	4551.23	1306.38
4584.23	1306.3	4624.61	1306.32	4652.56	1306.37	4698.01	1306.38	4780.57	1306.27
4823.11	1306.6	4832.18	1307.34	4843.11	1307.73	4852.31	1306.81	4862.31	1306.69
4865.91	1308.2	4881.76	1308.43	4921.82	1298.16	4928.63	1297.61	4933.08	1297.5
5063.62	1297.4	5104.08	1298.17	5147.14	1309.85	5173.55	1308.38	5202.38	1310.2
5206.44	1310	5215.36	1310.43	5219.12	1310.48				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4331.07	.04	4881.76	.025	5147.14	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4881.76	5147.14	285	359.72	429	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4331.07	4881.76	1312	5147.14	5219.12	1312

Left Levee Station= 4881.76 Elevation= 1308.43
Right Levee Station= 5147.14 Elevation= 1309.85

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1305.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.57	Reach Len. (ft)	285.00	359.72	429.00
Crit W.S. (ft)	1301.04	Flow Area (sq ft)		1602.60	
E.G. Slope (ft/ft)	0.000413	Area (sq ft)		1602.60	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	236.26	Top Width (ft)		236.26	
Vel Total (ft/s)	4.31	Avg. Vel. (ft/s)		4.31	
Max Chl Dpth (ft)	7.88	Hydr. Depth (ft)		6.78	
Conv. Total (cfs)	339533.2	Conv. (cfs)		339533.2	
Length Wtd. (ft)	359.72	Wetted Per. (ft)		238.14	
Min Ch El (ft)	1297.40	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.75	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.26	759.37	
C & E Loss (ft)	0.01	Cum SA (acres)	0.99	99.21	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1306.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.86	Reach Len. (ft)	285.00	359.72	429.00
Crit W.S. (ft)	1301.73	Flow Area (sq ft)		1896.00	
E.G. Slope (ft/ft)	0.000429	Area (sq ft)		1896.00	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	245.50	Top Width (ft)		245.50	
Vel Total (ft/s)	4.78	Avg. Vel. (ft/s)		4.78	
Max Chl Dpth (ft)	9.10	Hydr. Depth (ft)		7.72	
Conv. Total (cfs)	437699.9	Conv. (cfs)		437699.9	
Length Wtd. (ft)	359.72	Wetted Per. (ft)		247.69	
Min Ch El (ft)	1297.40	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.98	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	15.89	918.45	0.19
C & E Loss (ft)	0.01	Cum SA (acres)	16.54	103.36	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1308.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.		0.025	
E.G. Elev (ft)	1308.82	Reach Len. (ft)	285.00	359.72	429.00
Crit W.S. (ft)	1302.82	Flow Area (sq ft)		2362.81	
E.G. Slope (ft/ft)	0.000456	Area (sq ft)		2362.81	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	259.53	Top Width (ft)		259.53	
Vel Total (ft/s)	5.50	Avg. Vel. (ft/s)		5.50	
Max Chl Dpth (ft)	10.95	Hydr. Depth (ft)		9.10	
Conv. Total (cfs)	608156.3	Conv. (cfs)		608156.3	
Length Wtd. (ft)	359.72	Wetted Per. (ft)		262.20	
Min Ch El (ft)	1297.40	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)		1.41	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	166.57	1108.85	16.41
C & E Loss (ft)	0.01	Cum SA (acres)	102.37	105.17	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.177

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
 4315.79  1306.8 4368.22 1306.67 4404.81 1306.55  4444.3 1306.64 4473.79 1306.61
 4526.52  1306.5 4579.28 1306.36 4602.18 1306.33 4684.79 1306.02 4737.54    1306
  4790.3    1306 4806.54  1306.6 4817.54 1308.01 4829.19 1308.19 4837.65 1306.59
 4854.07  1306.3 4859.48 1307.91 4875.18 1308.15 4892.33 1302.72 4909.41 1297.66
 4933.75  1297.5 5072.68 1297.28 5096.59  1297.8 5101.31 1298.05 5141.77 1309.94
 5148.26  1308.9 5151.93 1308.71  5157.8 1309.12 5169.83 1308.18 5201.07 1309.45
 5214.37  1309.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4315.79     .04 4875.18    .025 5141.77     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       4875.18 5141.77               500     500     500              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 4315.79 4875.18    1312 5141.77 5214.37    1312
Left Levee       Station= 4875.18      Elevation= 1308.15
Right Levee      Station= 5141.77      Elevation= 1309.94

CROSS SECTION OUTPUT    Profile #Design

  W.S. Elev (ft)            1305.15   Element                   Left OB    Channel   Right OB
  Vel Head (ft)                0.27   Wt. n-Val.                            0.025
  E.G. Elev (ft)            1305.42   Reach Len. (ft)            500.00    500.00     500.00
  Crit W.S. (ft)            1300.82   Flow Area (sq ft)                   1659.07
  E.G. Slope (ft/ft)       0.000378   Area (sq ft)                        1659.07
  Q Total (cfs)             6900.00   Flow (cfs)                          6900.00
  Top Width (ft)             240.84   Top Width (ft)                       240.84
  Vel Total (ft/s)             4.16   Avg. Vel. (ft/s)                       4.16
  Max Chl Dpth (ft)            7.87   Hydr. Depth (ft)                       6.89
  Conv. Total (cfs)        354905.7   Conv. (cfs)                        354905.7
  Length Wtd. (ft)           500.00   Wetted Per. (ft)                     242.98
  Min Ch El (ft)            1297.28   Shear (lb/sq ft)                       0.16
  Alpha                        1.00   Stream Power (lb/ft s)                 0.67
  Frctn Loss (ft)              0.20   Cum Volume (acre-ft)         0.26    745.90
  C & E Loss (ft)              0.00   Cum SA (acres)               0.99     97.24

CROSS SECTION OUTPUT    Profile #Future

  W.S. Elev (ft)            1306.37   Element                   Left OB    Channel   Right OB
  Vel Head (ft)                0.33   Wt. n-Val.                            0.025
  E.G. Elev (ft)            1306.70   Reach Len. (ft)            500.00    500.00     500.00
  Crit W.S. (ft)            1301.48   Flow Area (sq ft)                   1956.16
  E.G. Slope (ft/ft)       0.000394   Area (sq ft)                        1956.16
  Q Total (cfs)             9070.00   Flow (cfs)                          9070.00
  Top Width (ft)             248.80   Top Width (ft)                       248.80
  Vel Total (ft/s)             4.64   Avg. Vel. (ft/s)                       4.64
  Max Chl Dpth (ft)            9.09   Hydr. Depth (ft)                       7.86
  Conv. Total (cfs)        456659.5   Conv. (cfs)                        456659.5
  Length Wtd. (ft)           500.00   Wetted Per. (ft)                     251.31
  Min Ch El (ft)            1297.28   Shear (lb/sq ft)                       0.19
  Alpha                        1.00   Stream Power (lb/ft s)                 0.89
  Frctn Loss (ft)              0.21   Cum Volume (acre-ft)        15.89    902.54       0.19
  C & E Loss (ft)              0.00   Cum SA (acres)              16.54    101.32       0.64

CROSS SECTION OUTPUT    Profile #Existing

  W.S. Elev (ft)            1308.21   Element                   Left OB    Channel   Right OB
  Vel Head (ft)                0.45   Wt. n-Val.                            0.025
  E.G. Elev (ft)            1308.65   Reach Len. (ft)            500.00    500.00     500.00
  Crit W.S. (ft)            1302.53   Flow Area (sq ft)                   2425.24
  E.G. Slope (ft/ft)       0.000422   Area (sq ft)                956.77  2425.24
  Q Total (cfs)            12990.00   Flow (cfs)                         12990.00
  Top Width (ft)             820.09   Top Width (ft)              559.39    260.70
  Vel Total (ft/s)             5.36   Avg. Vel. (ft/s)                       5.36
  Max Chl Dpth (ft)           10.93   Hydr. Depth (ft)                       9.30
  Conv. Total (cfs)        632691.3   Conv. (cfs)                        632691.3
```

Length Wtd. (ft)	500.00	Wetted Per. (ft)		263.74	
Min Ch El (ft)	1297.28	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		1.30	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	163.44	1089.08	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	100.54	103.02	13.20

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 12.082

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4215.79	1306.9	4258.3	1306.81	4305.51	1306.63	4337.25	1306.73	4455.67	1306.36
4495.19	1306.3	4516.54	1306.18	4574.11	1306.22	4622.05	1306.12	4639.07	1306.11
4674.81	1306	4745.08	1306.01	4780.3	1305.96	4789.83	1306.16	4811.59	1306.48
4819.88	1307.3	4836.26	1307.19	4853.76	1306.36	4858.6	1307.68	4875.24	1307.44
4910.51	1297.7	4951.79	1297.44	4962.91	1297.29	5023.5	1297.32	5035.94	1297.29
5047.1	1297.4	5064.02	1297.32	5095.67	1297.56	5099.98	1297.91	5141.3	1309.28
5158.42	1308.8	5168.66	1308.07	5204.1	1309.34	5215.79	1309.52		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4215.79	.04	4875.24	.025	5141.3	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.24	5141.3	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4215.79	4858.6	1311	5141.3	5215.79	1311

Left Levee Station= 4858.6 Elevation= 1307.68
Right Levee Station= 5141.3 Elevation= 1309.28

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1304.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.22	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1300.80	Flow Area (sq ft)		1611.63	
E.G. Slope (ft/ft)	0.000417	Area (sq ft)		1611.63	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	241.22	Top Width (ft)		241.22	
Vel Total (ft/s)	4.28	Avg. Vel. (ft/s)		4.28	
Max Chl Dpth (ft)	7.65	Hydr. Depth (ft)		6.68	
Conv. Total (cfs)	337984.0	Conv. (cfs)		337984.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		243.17	
Min Ch El (ft)	1297.29	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.74	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.26	727.13	
C & E Loss (ft)	0.01	Cum SA (acres)	0.99	94.47	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1306.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.49	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.46	Flow Area (sq ft)		1907.40	
E.G. Slope (ft/ft)	0.000431	Area (sq ft)		1907.40	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	249.96	Top Width (ft)		249.96	
Vel Total (ft/s)	4.76	Avg. Vel. (ft/s)		4.76	
Max Chl Dpth (ft)	8.85	Hydr. Depth (ft)		7.63	
Conv. Total (cfs)	436779.4	Conv. (cfs)		436779.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		252.23	
Min Ch El (ft)	1297.29	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.97	

Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	15.89	880.37	0.19
C & E Loss (ft)	0.01	Cum SA (acres)	16.54	98.45	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.97	Element			
Vel Head (ft)	0.46	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1308.43	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.53	Flow Area (sq ft)	6.81	2375.81	
E.G. Slope (ft/ft)	0.000452	Area (sq ft)	1020.97	2375.81	
Q Total (cfs)	12990.00	Flow (cfs)	2.97	12987.03	
Top Width (ft)	920.75	Top Width (ft)	659.45	261.30	
Vel Total (ft/s)	5.45	Avg. Vel. (ft/s)	0.44	5.47	
Max Chl Dpth (ft)	10.68	Hydr. Depth (ft)	0.41	9.09	
Conv. Total (cfs)	611097.5	Conv. (cfs)	139.6	610957.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	16.64	263.99	
Min Ch El (ft)	1297.29	Shear (lb/sq ft)	0.01	0.25	
Alpha	1.01	Stream Power (lb/ft s)	0.01	1.39	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	152.09	1061.53	16.41
C & E Loss (ft)	0.01	Cum SA (acres)	93.54	100.03	13.20

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.988

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4215.79	1307	4230.22	1306.9	4309.16	1306.7	4349.67	1306.5	4394.09	1306.33
4401.05	1306.2	4467.04	1306	4506.58	1305.97	4546.96	1305.88	4611.56	1305.66
4621.6	1305.7	4663.25	1305.43	4709.76	1305.34	4717.57	1305.23	4795.38	1305.33
4806.41	1305.5	4819.92	1307.03	4830.88	1305.98	4846	1305.4	4853.05	1305.22
4858.53	1307.8	4874.4	1307.42	4892.16	1302.53	4909.98	1297.56	4927.58	1296.93
4959.94	1296.9	5003.46	1297.2	5018.71	1296.93	5056.49	1296.98	5102.62	1297.39
5141.51	1309.1	5159.43	1308.46	5168.19	1307.13	5201.63	1309.14	5215.79	1309.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4215.79	.04	4874.4	.025	5141.51	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.4	5141.51	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4215.79	4858.53	1311	5141.51	5215.79	1311

Left Levee Station= 4858.53 Elevation= 1307.8
Right Levee Station= 5141.51 Elevation= 1309.1

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1304.75	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.02	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1300.42	Flow Area (sq ft)		1664.55	
E.G. Slope (ft/ft)	0.000378	Area (sq ft)		1664.55	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	242.98	Top Width (ft)		242.98	
Vel Total (ft/s)	4.15	Avg. Vel. (ft/s)		4.15	
Max Chl Dpth (ft)	7.85	Hydr. Depth (ft)		6.85	
Conv. Total (cfs)	354844.1	Conv. (cfs)		354844.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		245.06	
Min Ch El (ft)	1296.90	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.66	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.26	708.33	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	91.70	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1305.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.28	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.08	Flow Area (sq ft)		1960.29	
E.G. Slope (ft/ft)	0.000397	Area (sq ft)		1960.29	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	251.30	Top Width (ft)		251.30	
Vel Total (ft/s)	4.63	Avg. Vel. (ft/s)		4.63	
Max Chl Dpth (ft)	9.05	Hydr. Depth (ft)		7.80	
Conv. Total (cfs)	455361.5	Conv. (cfs)		455361.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		253.72	
Min Ch El (ft)	1296.90	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.89	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	15.89	858.17	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	95.58	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1307.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1308.21	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.14	Flow Area (sq ft)	2.47	2427.88	
E.G. Slope (ft/ft)	0.000424	Area (sq ft)	2.47	2427.88	
Q Total (cfs)	12990.00	Flow (cfs)	0.59	12989.42	
Top Width (ft)	277.05	Top Width (ft)	14.38	262.67	
Vel Total (ft/s)	5.34	Avg. Vel. (ft/s)	0.24	5.35	
Max Chl Dpth (ft)	10.86	Hydr. Depth (ft)	0.17	9.24	
Conv. Total (cfs)	630973.8	Conv. (cfs)	28.4	630945.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	14.38	265.56	
Min Ch El (ft)	1296.90	Shear (lb/sq ft)	0.00	0.24	
Alpha	1.00	Stream Power (lb/ft s)	0.00	1.29	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	146.22	1033.96	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	89.68	97.02	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.893

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4215.79	1306.1	4232.81	1305.91	4338.31	1305.83	4399.51	1305.72	4443.82	1305.78
4533.1	1305.7	4692.08	1305.78	4760.37	1305.78	4815.24	1306	4832.04	1306.15
4839.66	1305.4	4852	1304.93	4859.94	1307.55	4874.53	1307.77	4910.74	1297.14
4913.53	1297.1	4946.83	1296.86	4974.46	1296.85	5004.24	1296.71	5033.04	1296.76
5099.79	1297.6	5104.12	1297.8	5141.77	1308.42	5159.3	1307.59	5168.86	1306.5
5202.69	1308.4	5215.79	1308.49						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4215.79	.04	4874.53	.025	5141.77	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.53	5141.77	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4215.79	4874.53	1311	5141.77	5215.79	1311

Left Levee Station= 4874.53 Elevation= 1307.77
Right Levee Station= 5141.77 Elevation= 1308.42

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1304.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
E.G. Elev (ft)	1304.82	Reach Len. (ft)	500.00	500.00	500.00

Crit W.S. (ft)	1300.34	Flow Area (sq ft)		1637.29
E.G. Slope (ft/ft)	0.000398	Area (sq ft)		1637.29
Q Total (cfs)	6900.00	Flow (cfs)		6900.00
Top Width (ft)	242.54	Top Width (ft)		242.54
Vel Total (ft/s)	4.21	Avg. Vel. (ft/s)		4.21
Max Chl Dpth (ft)	7.84	Hydr. Depth (ft)		6.75
Conv. Total (cfs)	345691.4	Conv. (cfs)		345691.4
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.55
Min Ch El (ft)	1296.71	Shear (lb/sq ft)		0.17
Alpha	1.00	Stream Power (lb/ft s)		0.70
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.26	689.38
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	88.91

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1305.73	Element			
Vel Head (ft)	0.34	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.08	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1300.99	Flow Area (sq ft)		1929.80	
E.G. Slope (ft/ft)	0.000417	Area (sq ft)		1929.80	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	250.78	Top Width (ft)		250.78	
Vel Total (ft/s)	4.70	Avg. Vel. (ft/s)		4.70	
Max Chl Dpth (ft)	9.02	Hydr. Depth (ft)		7.70	
Conv. Total (cfs)	444310.3	Conv. (cfs)		444310.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		253.13	
Min Ch El (ft)	1296.71	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.93	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	15.89	835.84	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	92.70	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.53	Element			
Vel Head (ft)	0.46	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.99	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.05	Flow Area (sq ft)		2391.94	
E.G. Slope (ft/ft)	0.000447	Area (sq ft)		2391.94	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	263.28	Top Width (ft)		263.28	
Vel Total (ft/s)	5.43	Avg. Vel. (ft/s)		5.43	
Max Chl Dpth (ft)	10.82	Hydr. Depth (ft)		9.09	
Conv. Total (cfs)	614574.0	Conv. (cfs)		614574.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		266.13	
Min Ch El (ft)	1296.71	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		1.36	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	146.20	1006.30	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	89.59	94.00	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.798

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4266.07	1313.19	4283.82	1312.6	4296.87	1306.72	4313.87	1306.46	4316.15	1305.1
4318.92	1305.94	4321.36	1305.1	4347.48	1304.9	4381.08	1304.53	4486.59	1304.35
4499.44	1304.35	4568.78	1304.5	4592.1	1304.42	4639.08	1304.38	4697.61	1304.42
4798.05	1304.71	4811.92	1304.8	4832.28	1305.13	4839.62	1304.61	4853.27	1304.51
4859.65	1307.64	4875.05	1307.4	4909.97	1297.03	5006.87	1296.67	5091.55	1296.97
5103.82	1297.35	5140.12	1308.2	5156.87	1307.52	5166.96	1306.86	5198	1308.67
5215.24	1308.68								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4266.07	.04	4875.05	.025	5140.12	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.05	5140.12		500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4266.07	4859.65	1311	5140.12	5215.24	1311

Left Levee Station= 4859.65 Elevation= 1307.64
Right Levee Station= 5140.12 Elevation= 1308.2

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1304.34	Element			
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
E.G. Elev (ft)	1304.62	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1300.20	Flow Area (sq ft)		1622.51	
E.G. Slope (ft/ft)	0.000409	Area (sq ft)		1622.51	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	241.86	Top Width (ft)		241.86	
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)		4.25	
Max Chl Dpth (ft)	7.67	Hydr. Depth (ft)		6.71	
Conv. Total (cfs)	341064.9	Conv. (cfs)		341064.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		243.95	
Min Ch El (ft)	1296.67	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.72	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	0.26	670.67	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	86.13	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1305.52	Element			
Vel Head (ft)	0.35	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.87	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1300.86	Flow Area (sq ft)		1911.31	
E.G. Slope (ft/ft)	0.000428	Area (sq ft)		1911.31	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	249.74	Top Width (ft)		249.74	
Vel Total (ft/s)	4.75	Avg. Vel. (ft/s)		4.75	
Max Chl Dpth (ft)	8.85	Hydr. Depth (ft)		7.65	
Conv. Total (cfs)	438330.5	Conv. (cfs)		438330.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		252.18	
Min Ch El (ft)	1296.67	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.96	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	15.89	813.80	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	89.82	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.29	Element			
Vel Head (ft)	0.47	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.76	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.91	Flow Area (sq ft)		2366.17	
E.G. Slope (ft/ft)	0.000460	Area (sq ft)		2366.17	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	261.68	Top Width (ft)		261.68	
Vel Total (ft/s)	5.49	Avg. Vel. (ft/s)		5.49	
Max Chl Dpth (ft)	10.62	Hydr. Depth (ft)		9.04	
Conv. Total (cfs)	605850.1	Conv. (cfs)		605850.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		264.64	
Min Ch El (ft)	1296.67	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)		1.41	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	146.20	978.99	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	89.59	90.99	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.703

INPUT

Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4485.37	1311.9	4507.48	1311.57	4520.75	1310.41	4535	1309.08	4545.53	1308.21
4562.86	1308.2	4571.33	1308.12	4629.3	1307.91	4645.52	1307.97	4746.01	1307.47
4757.74	1307.1	4811.16	1305.74	4841.29	1305.61	4859.86	1307.26	4875.28	1307.29
4912.48	1297	4930.54	1296.89	4991.57	1296.71	5010.25	1296.68	5058.44	1296.98
5103.51	1297	5120.51	1301.97	5141.71	1308.13	5158.98	1307.48	5169.35	1306.64
5194.78	1308.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4485.37	.04	4875.28	.025	5141.71	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.28	5141.71	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4485.37	4875.28	1311	5141.71	5194.78	1311

Left Levee Station= 4875.28 Elevation= 1307.29
Right Levee Station= 5141.71 Elevation= 1308.13

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1304.10	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.025	
E.G. Elev (ft)	1304.40	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1300.22	Flow Area (sq ft)		1560.76	
E.G. Slope (ft/ft)	0.000463	Area (sq ft)		1560.76	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	241.01	Top Width (ft)		241.01	
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)		4.42	
Max Chl Dpth (ft)	7.42	Hydr. Depth (ft)		6.48	
Conv. Total (cfs)	320541.4	Conv. (cfs)		320541.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		242.99	
Min Ch El (ft)	1296.68	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.82	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.26	652.40	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	83.36	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1305.26	Element			
Vel Head (ft)	0.37	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.64	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1300.87	Flow Area (sq ft)		1845.94	
E.G. Slope (ft/ft)	0.000479	Area (sq ft)		1845.94	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	249.22	Top Width (ft)		249.22	
Vel Total (ft/s)	4.91	Avg. Vel. (ft/s)		4.91	
Max Chl Dpth (ft)	8.58	Hydr. Depth (ft)		7.41	
Conv. Total (cfs)	414344.4	Conv. (cfs)		414344.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		251.53	
Min Ch El (ft)	1296.68	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.08	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	15.89	792.24	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	86.96	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1307.02	Element			
Vel Head (ft)	0.50	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.52	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.93	Flow Area (sq ft)		2295.22	
E.G. Slope (ft/ft)	0.000508	Area (sq ft)		2295.22	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	261.64	Top Width (ft)		261.64	
Vel Total (ft/s)	5.66	Avg. Vel. (ft/s)		5.66	

Max Chl Dpth (ft)	10.34	Hydr. Depth (ft)		8.77	
Conv. Total (cfs)	576178.5	Conv. (cfs)		576178.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		264.43	
Min Ch El (ft)	1296.68	Shear (lb/sq ft)		0.28	
Alpha	1.00	Stream Power (lb/ft s)		1.56	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	146.20	952.24	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	89.59	87.98	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.609

INPUT
Description: Queen Creek Detention Basin located East of the EMF
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4482.74	1309.01	4529.38	1308.7	4538.26	1308.74	4567.38	1301.39	4580.19	1298.07
4672.62	1297.78	4679.77	1297.8	4756.05	1298.04	4806.95	1298.51	4820.62	1298.8
4826.43	1300.48	4852.29	1307.5	4870.34	1308.45	4892.33	1300.37	4903.98	1297.01
4905.6	1296.98	4962.79	1297	4995.04	1296.88	5013.55	1296.62	5082.4	1296.39
5083.88	1296.41	5091.04	1297.6	5108.8	1298.58	5113.28	1299.6	5121.35	1302.11
5136.55	1306.65	5141.47	1308.4	5160.77	1307.28	5169.56	1306.17	5194.16	1307.91
5213.86	1308.29								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4482.74	.04	4870.34	.025	5141.47	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4870.34	5141.47	194.37	194.37	194.37	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4482.74	4870.34	1311	5141.47	5213.86	1311

Left Levee Station= 4870.34 Elevation= 1308.45
Right Levee Station= 5141.47 Elevation= 1308.4

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1303.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1304.17	Reach Len. (ft)	194.37	194.37	194.37
Crit W.S. (ft)	1300.15	Flow Area (sq ft)		1555.48	
E.G. Slope (ft/ft)	0.000477	Area (sq ft)		1555.48	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	244.38	Top Width (ft)		244.38	
Vel Total (ft/s)	4.44	Avg. Vel. (ft/s)		4.44	
Max Chl Dpth (ft)	7.47	Hydr. Depth (ft)		6.36	
Conv. Total (cfs)	315829.7	Conv. (cfs)		315829.7	
Length Wtd. (ft)	194.37	Wetted Per. (ft)		246.36	
Min Ch El (ft)	1296.39	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.83	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.26	634.51	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	80.57	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1305.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.39	Reach Len. (ft)	194.37	194.37	194.37
Crit W.S. (ft)	1300.78	Flow Area (sq ft)		1842.41	
E.G. Slope (ft/ft)	0.000488	Area (sq ft)		1842.41	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	251.41	Top Width (ft)		251.41	
Vel Total (ft/s)	4.92	Avg. Vel. (ft/s)		4.92	
Max Chl Dpth (ft)	8.63	Hydr. Depth (ft)		7.33	
Conv. Total (cfs)	410601.4	Conv. (cfs)		410601.4	
Length Wtd. (ft)	194.37	Wetted Per. (ft)		253.76	
Min Ch El (ft)	1296.39	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.09	

Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	15.89	771.07	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	84.09	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1306.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.26	Reach Len. (ft)	194.37	194.37	194.37
Crit W.S. (ft)	1301.81	Flow Area (sq ft)		2290.25	
E.G. Slope (ft/ft)	0.000513	Area (sq ft)		2290.25	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	261.94	Top Width (ft)		261.94	
Vel Total (ft/s)	5.67	Avg. Vel. (ft/s)		5.67	
Max Chl Dpth (ft)	10.37	Hydr. Depth (ft)		8.74	
Conv. Total (cfs)	573486.7	Conv. (cfs)		573486.7	
Length Wtd. (ft)	194.37	Wetted Per. (ft)		264.85	
Min Ch El (ft)	1296.39	Shear (lb/sq ft)		0.28	
Alpha	1.00	Stream Power (lb/ft s)		1.57	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	146.20	925.92	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	89.59	84.98	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.572

INPUT
Description: Downstream of Side Inlet (150' Wide) from the Left Overbank
Invert elevation of spillway is 1301.3 ft
Q(D)=6,900 cfs, Q(F)=10,060 cfs & Q(E)=13,910 cfs
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4228.03	1304.6	4295.67	1304.34	4372.25	1304.47	4407.53	1304.4	4438.92	1304.5
4492.42	1304.6	4509.65	1304.68	4526.49	1306.83	4536.18	1307.81	4581.19	1308.25
4600.92	1308.5	4641.35	1308.73	4693.07	1308.76	4760.4	1308.89	4777.44	1309.06
4806.66	1309	4849.84	1309.12	4872.33	1309.11	4908.47	1297.32	4934.51	1297.19
4953.36	1297	5007.37	1296.51	5041.14	1296.67	5078.98	1296.78	5092.82	1296.64
5105.78	1296.6	5110.99	1298.4	5141.46	1308.4	5159.88	1308.08	5169.97	1306.5
5191.66	1308.2	5214.3	1308.66						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4228.03	.04	4872.33	.025	5141.46	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4872.33	5141.46	218.29	218.29	218.29	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4228.03	4872.33	1311	5141.46	5214.3	1311

Left Levee Station= 4872.33 Elevation= 1309.11
Right Levee Station= 5141.46 Elevation= 1308.4

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1303.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
E.G. Elev (ft)	1304.07	Reach Len. (ft)	218.29	218.29	218.29
Crit W.S. (ft)	1300.11	Flow Area (sq ft)		1507.65	
E.G. Slope (ft/ft)	0.000513	Area (sq ft)		1507.65	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	238.49	Top Width (ft)		238.49	
Vel Total (ft/s)	4.58	Avg. Vel. (ft/s)		4.58	
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)		6.32	
Conv. Total (cfs)	304515.4	Conv. (cfs)		304515.4	
Length Wtd. (ft)	218.29	Wetted Per. (ft)		240.67	
Min Ch El (ft)	1296.51	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.92	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.26	627.68	

C & E Loss (ft)	0.00	Cum SA (acres)	0.99	79.49

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1304.89	Element			
Vel Head (ft)	0.40	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.29	Reach Len. (ft)	218.29	218.29	218.29
Crit W.S. (ft)	1300.75	Flow Area (sq ft)		1786.02	
E.G. Slope (ft/ft)	0.000525	Area (sq ft)		1786.02	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	245.52	Top Width (ft)		245.52	
Vel Total (ft/s)	5.08	Avg. Vel. (ft/s)		5.08	
Max Chl Dpth (ft)	8.38	Hydr. Depth (ft)		7.27	
Conv. Total (cfs)	395809.3	Conv. (cfs)		395809.3	
Length Wtd. (ft)	218.29	Wetted Per. (ft)		248.07	
Min Ch El (ft)	1296.51	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		1.20	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	15.89	762.97	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	82.98	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1306.62	Element			
Vel Head (ft)	0.53	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.16	Reach Len. (ft)	218.29	218.29	218.29
Crit W.S. (ft)	1301.80	Flow Area (sq ft)		2220.13	
E.G. Slope (ft/ft)	0.000553	Area (sq ft)		2220.13	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	256.10	Top Width (ft)		256.10	
Vel Total (ft/s)	5.85	Avg. Vel. (ft/s)		5.85	
Max Chl Dpth (ft)	10.11	Hydr. Depth (ft)		8.67	
Conv. Total (cfs)	552411.9	Conv. (cfs)		552411.9	
Length Wtd. (ft)	218.29	Wetted Per. (ft)		259.20	
Min Ch El (ft)	1296.51	Shear (lb/sq ft)		0.30	
Alpha	1.00	Stream Power (lb/ft s)		1.73	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	146.20	915.86	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	89.59	83.82	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.531

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4217.5	1303.2	4222.25	1303.14	4308	1303.19	4418.16	1303.14	4496.08	1302.91
4511.08	1303.3	4538.05	1304.14	4565.7	1304.64	4582.06	1305.01	4597.83	1306.65
4631.23	1306.7	4644.31	1306.76	4717.44	1306.86	4755.6	1307	4838.62	1306.63
4841.32	1306.5	4854.2	1306.16	4858.48	1307.19	4864.3	1306.96	4874.08	1307.06
4908.36	1297.3	4955.57	1297.22	5010.42	1296.26	5017.73	1296.29	5107.63	1296.9
5139.89	1308	5158.23	1307.59	5166.2	1306.54	5168.43	1306.43	5181.52	1307.64
5191.07	1308.1	5213.65	1308.64						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4217.5	.04	4874.08	.025	5139.89	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.08	5139.89	237.2	237.2	237.2	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4217.5	4874.08	1311	5139.89	5213.65	1311

Left Levee Station= 4858.48 Elevation= 1307.19
Right Levee Station= 5139.89 Elevation= 1308

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1303.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
E.G. Elev (ft)	1303.95	Reach Len. (ft)	237.20	237.20	237.20
Crit W.S. (ft)	1300.07	Flow Area (sq ft)		1499.89	
E.G. Slope (ft/ft)	0.000529	Area (sq ft)		1499.89	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	241.03	Top Width (ft)		241.03	
Vel Total (ft/s)	4.60	Avg. Vel. (ft/s)		4.60	
Max Chl Dpth (ft)	7.37	Hydr. Depth (ft)		6.22	
Conv. Total (cfs)	299932.8	Conv. (cfs)		299932.8	
Length Wtd. (ft)	237.20	Wetted Per. (ft)		243.05	
Min Ch El (ft)	1296.26	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.94	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.26	620.14	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	78.29	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1304.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.18	Reach Len. (ft)	237.20	237.20	237.20
Crit W.S. (ft)	1300.72	Flow Area (sq ft)		1781.17	
E.G. Slope (ft/ft)	0.000538	Area (sq ft)		1781.17	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	248.41	Top Width (ft)		248.41	
Vel Total (ft/s)	5.09	Avg. Vel. (ft/s)		5.09	
Max Chl Dpth (ft)	8.51	Hydr. Depth (ft)		7.17	
Conv. Total (cfs)	391174.7	Conv. (cfs)		391174.7	
Length Wtd. (ft)	237.20	Wetted Per. (ft)		250.78	
Min Ch El (ft)	1296.26	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		1.21	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	15.89	754.03	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	81.74	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1306.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.		0.025	
E.G. Elev (ft)	1307.03	Reach Len. (ft)	237.20	237.20	237.20
Crit W.S. (ft)	1301.77	Flow Area (sq ft)		2219.86	
E.G. Slope (ft/ft)	0.000562	Area (sq ft)		2219.86	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	259.50	Top Width (ft)		259.50	
Vel Total (ft/s)	5.85	Avg. Vel. (ft/s)		5.85	
Max Chl Dpth (ft)	10.24	Hydr. Depth (ft)		8.55	
Conv. Total (cfs)	547802.0	Conv. (cfs)		547802.0	
Length Wtd. (ft)	237.20	Wetted Per. (ft)		262.40	
Min Ch El (ft)	1296.26	Shear (lb/sq ft)		0.30	
Alpha	1.00	Stream Power (lb/ft s)		1.74	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	146.20	904.73	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	89.59	82.53	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.486

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4216.49	1303.2	4289.24	1303.25	4343.09	1303.12	4367.05	1303.11	4449.72	1303.21
4556.33	1303.2	4630.96	1303.52	4648.77	1303.66	4672.63	1305.79	4678.81	1306.3
4739.01	1306.8	4760.28	1306.87	4812.38	1306.83	4835.67	1306.35	4850.72	1305.79
4855.54	1307.1	4866.67	1307	4871.96	1306.68	4892.33	1300.74	4905.72	1296.92
4916.36	1296.9	4963.19	1296.84	5001.44	1296.57	5013.11	1296.97	5045.85	1296.89
5078.16	1296.7	5106.39	1297.13	5129.52	1304.69	5137.42	1307.41	5149.46	1307.52
5154.37	1307.4	5165.09	1306.58	5188.38	1307.88	5209.96	1308.61		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4216.49	.04	4866.67	.025	5137.42	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4866.67	5137.42	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4216.49	4855.54	1311	5137.42	5209.96	1311

Left Levee Station= 4855.54 Elevation= 1307.1
Right Levee Station= 5137.42 Elevation= 1307.41

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1303.48	Element			
Vel Head (ft)	0.34	Wt. n-Val.		0.025	
E.G. Elev (ft)	1303.82	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1300.10	Flow Area (sq ft)		1469.49	
E.G. Slope (ft/ft)	0.000572	Area (sq ft)		1469.49	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	242.88	Top Width (ft)		242.88	
Vel Total (ft/s)	4.70	Avg. Vel. (ft/s)		4.70	
Max Chl Dpth (ft)	6.91	Hydr. Depth (ft)		6.05	
Conv. Total (cfs)	288460.4	Conv. (cfs)		288460.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.83	
Min Ch El (ft)	1296.57	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		1.01	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	0.26	612.06	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	76.98	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1304.63	Element			
Vel Head (ft)	0.42	Wt. n-Val.		0.025	
E.G. Elev (ft)	1305.04	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1300.75	Flow Area (sq ft)		1752.86	
E.G. Slope (ft/ft)	0.000573	Area (sq ft)		1752.86	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	250.34	Top Width (ft)		250.34	
Vel Total (ft/s)	5.17	Avg. Vel. (ft/s)		5.17	
Max Chl Dpth (ft)	8.06	Hydr. Depth (ft)		7.00	
Conv. Total (cfs)	378997.2	Conv. (cfs)		378997.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		252.64	
Min Ch El (ft)	1296.57	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		1.28	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	15.89	744.41	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	80.38	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1306.35	Element			
Vel Head (ft)	0.54	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.90	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.78	Flow Area (sq ft)		2193.55	
E.G. Slope (ft/ft)	0.000590	Area (sq ft)		2193.55	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	261.26	Top Width (ft)		261.26	
Vel Total (ft/s)	5.92	Avg. Vel. (ft/s)		5.92	
Max Chl Dpth (ft)	9.78	Hydr. Depth (ft)		8.40	
Conv. Total (cfs)	534728.4	Conv. (cfs)		534728.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		264.09	
Min Ch El (ft)	1296.57	Shear (lb/sq ft)		0.31	
Alpha	1.00	Stream Power (lb/ft s)		1.81	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	146.20	892.72	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	89.59	81.11	13.20

CROSS SECTION RIVER: EMF

REACH: Reach 3 RS: 11.391

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4198.58	1303.1	4264.78	1303.15	4371.39	1303.18	4478.02	1303.16	4584.71	1303.17
4630.64	1303.1	4706.78	1303.05	4763.97	1302.98	4783.95	1303.07	4792.56	1303.6
4806.6	1304.8	4822.1	1306.4	4839.06	1305.49	4848.71	1306.7	4866.2	1306.75
4885.37	1301	4900.25	1296.6	4940.34	1296.7	4943.29	1296.67	4996.86	1295.69
5026.87	1296.2	5069.74	1296.66	5100.91	1296.93	5133.03	1307.11	5150.72	1306.78
5160.67	1306.3	5175.44	1307.46	5195.42	1307.79				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4198.58	.04	4866.2	.025	5133.03	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4866.2	5133.03	335.09	335.09	335.09	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4198.58	4866.2	1311	5133.03	5195.42	1311

Left Levee Station= 4866.2 Elevation= 1306.75
Right Levee Station= 5133.03 Elevation= 1307.11

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1303.22	Element			
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
E.G. Elev (ft)	1303.54	Reach Len. (ft)	335.09	335.09	335.09
Crit W.S. (ft)	1299.67	Flow Area (sq ft)		1505.05	
E.G. Slope (ft/ft)	0.000528	Area (sq ft)		1505.05	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	242.76	Top Width (ft)		242.76	
Vel Total (ft/s)	4.58	Avg. Vel. (ft/s)		4.58	
Max Chl Dpth (ft)	7.53	Hydr. Depth (ft)		6.20	
Conv. Total (cfs)	300281.8	Conv. (cfs)		300281.8	
Length Wtd. (ft)	335.09	Wetted Per. (ft)		244.72	
Min Ch El (ft)	1295.69	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.93	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.26	594.99	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	74.19	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1304.36	Element			
Vel Head (ft)	0.40	Wt. n-Val.		0.025	
E.G. Elev (ft)	1304.76	Reach Len. (ft)	335.09	335.09	335.09
Crit W.S. (ft)	1300.32	Flow Area (sq ft)		1787.76	
E.G. Slope (ft/ft)	0.000536	Area (sq ft)		1787.76	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	250.21	Top Width (ft)		250.21	
Vel Total (ft/s)	5.07	Avg. Vel. (ft/s)		5.07	
Max Chl Dpth (ft)	8.67	Hydr. Depth (ft)		7.15	
Conv. Total (cfs)	391792.8	Conv. (cfs)		391792.8	
Length Wtd. (ft)	335.09	Wetted Per. (ft)		252.51	
Min Ch El (ft)	1295.69	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		1.20	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	15.89	724.09	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	77.51	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1306.07	Element			
Vel Head (ft)	0.53	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.60	Reach Len. (ft)	335.09	335.09	335.09
Crit W.S. (ft)	1301.36	Flow Area (sq ft)		2225.44	
E.G. Slope (ft/ft)	0.000563	Area (sq ft)		2225.44	

Q Total (cfs)	12990.00	Flow (cfs)		12990.00		
Top Width (ft)	261.31	Top Width (ft)		261.31		
Vel Total (ft/s)	5.84	Avg. Vel. (ft/s)		5.84		
Max Chl Dpth (ft)	10.38	Hydr. Depth (ft)		8.52		
Conv. Total (cfs)	547698.8	Conv. (cfs)		547698.8		
Length Wtd. (ft)	335.09	Wetted Per. (ft)		264.13		
Min Ch El (ft)	1295.69	Shear (lb/sq ft)		0.30		
Alpha	1.00	Stream Power (lb/ft s)		1.73		
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	146.20	867.36	16.41	
C & E Loss (ft)	0.00	Cum SA (acres)	89.59	78.12	13.20	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.328

INPUT
Description: Concrete Drop Structure - Begin Transition (Contraction)
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4197.63	1303.1	4260.57	1302.97	4364.57	1302.97	4460.72	1303.02	4506	1302.96
4567.33	1302.8	4596.24	1302.88	4673.99	1302.87	4761.41	1303.06	4782.64	1304.28
4785.09	1304.5	4804.67	1305.13	4822.81	1306.31	4836.14	1305.18	4846.65	1306.85
4861.56	1307	4867.11	1306.96	4892.91	1299.7	4905.09	1296.36	4923.76	1296.13
4968.01	1296	5001.77	1294.88	5011.18	1295.4	5025.68	1295.8	5077.01	1296.27
5092.72	1296.7	5130.34	1306.51	5133.81	1307.45	5161.04	1306.1	5172.84	1307.12
5192.22	1307.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4197.63	.04	4867.11	.025	5133.81	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4867.11	5133.81	36.18	36.18	36.18	.3	.5

Left Levee Station= 4867.11 Elevation= 1306.96
Right Levee Station= 5133.81 Elevation= 1307.45

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1303.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
E.G. Elev (ft)	1303.37	Reach Len. (ft)	36.18	36.18	36.18
Crit W.S. (ft)	1299.34	Flow Area (sq ft)		1493.62	
E.G. Slope (ft/ft)	0.000521	Area (sq ft)		1493.62	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	235.96	Top Width (ft)		235.96	
Vel Total (ft/s)	4.62	Avg. Vel. (ft/s)		4.62	
Max Chl Dpth (ft)	8.16	Hydr. Depth (ft)		6.33	
Conv. Total (cfs)	302275.3	Conv. (cfs)		302275.3	
Length Wtd. (ft)	36.18	Wetted Per. (ft)		237.73	
Min Ch El (ft)	1294.88	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.94	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.26	583.45	
C & E Loss (ft)	0.50	Cum SA (acres)	0.99	72.35	

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.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1304.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1304.58	Reach Len. (ft)	36.18	36.18	36.18
Crit W.S. (ft)	1300.03	Flow Area (sq ft)		1766.82	
E.G. Slope (ft/ft)	0.000540	Area (sq ft)		1766.82	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	244.36	Top Width (ft)		244.36	
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)		5.13	

Max Chl Dpth (ft)	9.29	Hydr. Depth (ft)		7.23	
Conv. Total (cfs)	390457.3	Conv. (cfs)		390457.3	
Length Wtd. (ft)	36.18	Wetted Per. (ft)		246.44	
Min Ch El (ft)	1294.88	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		1.24	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	15.89	710.42	0.19
C & E Loss (ft)	0.54	Cum SA (acres)	16.54	75.61	0.64

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.

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1305.86	Element			
Vel Head (ft)	0.55	Wt. n-Val.		0.025	
E.G. Elev (ft)	1306.41	Reach Len. (ft)	36.18	36.18	36.18
Crit W.S. (ft)	1301.10	Flow Area (sq ft)		2190.92	
E.G. Slope (ft/ft)	0.000578	Area (sq ft)		2190.92	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	256.87	Top Width (ft)		256.87	
Vel Total (ft/s)	5.93	Avg. Vel. (ft/s)		5.93	
Max Chl Dpth (ft)	10.98	Hydr. Depth (ft)		8.53	
Conv. Total (cfs)	540089.3	Conv. (cfs)		540089.3	
Length Wtd. (ft)	36.18	Wetted Per. (ft)		259.39	
Min Ch El (ft)	1294.88	Shear (lb/sq ft)		0.31	
Alpha	1.00	Stream Power (lb/ft s)		1.81	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	146.20	850.37	16.41
C & E Loss (ft)	0.62	Cum SA (acres)	89.59	76.12	13.20

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.321

INPUT
Description: Drop Structure - End Transition (Contraction)
Drop Structure
Crest, elevation 1296.22
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4207.74	1303.9	4255.66	1303.01	4390.86	1303	4449.99	1303.04	4481.51	1302.92
4554.1	1302.7	4613.76	1302.89	4660.34	1302.88	4737.25	1303.08	4767.97	1303.74
4770.73	1303.3	4781.01	1300.86	4789.87	1300.84	4797.59	1300.94	4807.11	1301.41
4814.85	1302	4820.17	1302.85	4826.54	1303.42	4830.39	1302.68	4835.34	1302.36
4842.58	1303.9	4852.17	1306.78	4875.55	1307.56	4877.25	1307.52	4894.06	1304.5
4897.47	1303.7	4908.89	1302.58	4913.36	1301.51	4919.88	1301.35	4926.32	1299.74
4930.15	1298.4	4932.94	1299.61	4934.53	1296.33	4992.31	1296.29	5028.24	1296.42
5064	1296.5	5065.71	1301.19	5068.71	1299.9	5071.64	1299.7	5077.28	1301.52
5086.49	1302.2	5098.97	1304.19	5110.44	1306.26	5114.12	1307.38	5126.9	1307.38
5150.52	1306.8	5163.9	1306.34	5166.76	1306.58	5191.5	1307.47	5195.15	1307.55

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4207.74	.04	4875.55	.013	5114.12	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.55	5114.12	65.83	65.83	65.83	.3	.5

Left Levee Station= 4875.55 Elevation= 1307.56
Right Levee Station= 5114.12 Elevation= 1307.38

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.86	Element			

Vel Head (ft)	1.98	Wt. n-Val.		0.013	
E.G. Elev (ft)	1302.84	Reach Len. (ft)	65.83	65.83	65.83
Crit W.S. (ft)	1300.86	Flow Area (sq ft)		610.61	
E.G. Slope (ft/ft)	0.001620	Area (sq ft)		610.61	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	152.48	Top Width (ft)		152.48	
Vel Total (ft/s)	11.30	Avg. Vel. (ft/s)		11.30	
Max Chl Dpth (ft)	4.57	Hydr. Depth (ft)		4.00	
Conv. Total (cfs)	171451.8	Conv. (cfs)		171451.8	
Length Wtd. (ft)	65.83	Wetted Per. (ft)		158.59	
Min Ch El (ft)	1296.29	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)		4.40	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.26	582.58	
C & E Loss (ft)	0.81	Cum SA (acres)	0.99	72.19	

Warning - The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning - 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.
Note - Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1301.78	Element			
Vel Head (ft)	2.23	Wt. n-Val.		0.013	
E.G. Elev (ft)	1304.01	Reach Len. (ft)	65.83	65.83	65.83
Crit W.S. (ft)	1301.78	Flow Area (sq ft)		757.66	
E.G. Slope (ft/ft)	0.001557	Area (sq ft)		757.66	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	168.60	Top Width (ft)		168.60	
Vel Total (ft/s)	11.97	Avg. Vel. (ft/s)		11.97	
Max Chl Dpth (ft)	5.49	Hydr. Depth (ft)		4.49	
Conv. Total (cfs)	229857.3	Conv. (cfs)		229857.3	
Length Wtd. (ft)	65.83	Wetted Per. (ft)		175.22	
Min Ch El (ft)	1296.29	Shear (lb/sq ft)		0.42	
Alpha	1.00	Stream Power (lb/ft s)		5.03	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	15.89	709.37	0.19
C & E Loss (ft)	0.90	Cum SA (acres)	16.54	75.44	0.64

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

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1303.13	Element			
Vel Head (ft)	2.62	Wt. n-Val.		0.013	
E.G. Elev (ft)	1305.76	Reach Len. (ft)	65.83	65.83	65.83
Crit W.S. (ft)	1303.13	Flow Area (sq ft)		999.34	

E.G. Slope (ft/ft)	0.001473	Area (sq ft)		999.34	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	189.08	Top Width (ft)		189.08	
Vel Total (ft/s)	13.00	Avg. Vel. (ft/s)		13.00	
Max Chl Dpth (ft)	6.84	Hydr. Depth (ft)		5.29	
Conv. Total (cfs)	338479.9	Conv. (cfs)		338479.9	
Length Wtd. (ft)	65.83	Wetted Per. (ft)		195.91	
Min Ch El (ft)	1296.29	Shear (lb/sq ft)		0.47	
Alpha	1.00	Stream Power (lb/ft s)		6.10	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	146.20	849.04	16.41
C & E Loss (ft)	1.02	Cum SA (acres)	89.59	75.94	13.20

Warning - The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning - During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note - Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.308

INPUT
Description: Drop Structure - Begin Transition (Expansion);
Drop Structure End
Sill, elevation 1290.72 ft
Detention Basin located East of the
East Maricopa Floodway
Begin Dense Grass
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4209.01	1304	4246.53	1303.71	4257.55	1303.52	4290.27	1303.28	4323.5	1303.91
4330.94	1304	4344.93	1303.76	4410.86	1303.05	4442.33	1303.06	4465.04	1302.97
4565.46	1302.8	4712.62	1303.06	4744.19	1303.99	4762.82	1299.42	4776.92	1299.51
4805.92	1299.6	4824.41	1299.6	4852.1	1306.71	4881.88	1307.14	4889.52	1305.08
4905.17	1301	4911.04	1299.24	4932.75	1294.08	4938.27	1293.45	4944.87	1291.74
4945.23	1291.1	5002.28	1290.71	5051.1	1290.89	5057.59	1290.97	5059.19	1292.46
5063.65	1293.2	5075.24	1295.63	5088.73	1299.29	5123.24	1307.27	5127.62	1307.32
5173.15	1306.8	5205.09	1307.69						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4209.01	.04	4881.88	.013	5123.24	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4881.88	5123.24	58.67	58.67	58.67	.3	.5

Left Levee Station= 4881.88 Elevation= 1307.14
Right Levee Station= 5123.24 Elevation= 1307.27

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1300.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.013	
E.G. Elev (ft)	1300.81	Reach Len. (ft)	58.67	58.67	58.67
Crit W.S. (ft)	1295.60	Flow Area (sq ft)		1412.46	
E.G. Slope (ft/ft)	0.000126	Area (sq ft)		1412.46	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	186.63	Top Width (ft)		186.63	
Vel Total (ft/s)	4.89	Avg. Vel. (ft/s)		4.89	
Max Chl Dpth (ft)	9.72	Hydr. Depth (ft)		7.57	
Conv. Total (cfs)	615917.6	Conv. (cfs)		615917.6	

Length Wtd. (ft)	58.67	Wetted Per. (ft)		189.55
Min Ch El (ft)	1290.71	Shear (lb/sq ft)		0.06
Alpha	1.00	Stream Power (lb/ft s)		0.29
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.26	581.05
C & E Loss (ft)	0.08	Cum SA (acres)	0.99	71.93

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

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1302.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.		0.013	
E.G. Elev (ft)	1302.48	Reach Len. (ft)	58.67	58.67	58.67
Crit W.S. (ft)	1296.48	Flow Area (sq ft)		1724.02	
E.G. Slope (ft/ft)	0.000122	Area (sq ft)		1724.02	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	199.52	Top Width (ft)		199.52	
Vel Total (ft/s)	5.26	Avg. Vel. (ft/s)		5.26	
Max Chl Dpth (ft)	11.34	Hydr. Depth (ft)		8.64	
Conv. Total (cfs)	820686.9	Conv. (cfs)		820686.9	
Length Wtd. (ft)	58.67	Wetted Per. (ft)		202.85	
Min Ch El (ft)	1290.71	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.34	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	15.89	707.50	0.19
C & E Loss (ft)	0.10	Cum SA (acres)	16.54	75.16	0.64

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

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1303.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.		0.013	
E.G. Elev (ft)	1304.54	Reach Len. (ft)	58.67	58.67	58.67
Crit W.S. (ft)	1297.85	Flow Area (sq ft)		2120.41	
E.G. Slope (ft/ft)	0.000139	Area (sq ft)		2120.41	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	215.12	Top Width (ft)		215.12	
Vel Total (ft/s)	6.13	Avg. Vel. (ft/s)		6.13	
Max Chl Dpth (ft)	13.25	Hydr. Depth (ft)		9.86	
Conv. Total (cfs)	1101297.4	Conv. (cfs)		1101297.4	
Length Wtd. (ft)	58.67	Wetted Per. (ft)		218.91	
Min Ch El (ft)	1290.71	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.52	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	146.20	846.69	16.41
C & E Loss (ft)	0.13	Cum SA (acres)	89.59	75.63	13.20

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.297

INPUT
Description: Drop Structure - End Transition (Expansion);
Detention Basin
Located just East of the East Maricopa Floodway
Begin Dense Grass
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4223.73	1301.5	4244.85	1299.36	4277.52	1302.62	4292.34	1303.84	4299.21	1303.83
4334.76	1304.1	4364.29	1304.3	4370.8	1304.43	4388.42	1304.58	4405.75	1304.78
4414	1304.8	4451.25	1303.43	4469.66	1303.43	4486.98	1303.57	4515.76	1303.73
4531.01	1303.9	4554.85	1303.48	4578.31	1302.96	4608.04	1302.94	4691.47	1302.99
4700.43	1303.2	4711.98	1303.28	4724.94	1303.54	4743.19	1299.43	4769.74	1299.67
4794.32	1299.6	4810.15	1299.48	4823.35	1303.08	4827.81	1304.4	4836.02	1304.72

4839.35	1305.5	4845.64	1306.03	4852.73	1306.1	4859.56	1305.4	4875.2	1301.7
4878.89	1301	4880.98	1300.17	4889.27	1297.6	4895.45	1295.18	4900.47	1293.52
4914.52	1291.9	4923.13	1291.85	4931.49	1291.65	4945.58	1291.59	5001.15	1290.78
5052.01	1291.4	5070.63	1291.39	5085.43	1291.23	5089.54	1292.28	5146.59	1307.68
5186.17	1307.3	5216.69	1307.79						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4223.73	.04	4852.73	.03	5146.59	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4852.73	5146.59	140	195.02	255	.3	.5

Left Levee Station= 4852.73 Elevation= 1306.1
Right Levee Station= 5146.59 Elevation= 1307.68

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.51	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
E.G. Elev (ft)	1300.71	Reach Len. (ft)	140.00	195.02	255.00
Crit W.S. (ft)	1294.86	Flow Area (sq ft)		1916.52	
E.G. Slope (ft/ft)	0.000335	Area (sq ft)		1916.52	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	239.89	Top Width (ft)		239.89	
Vel Total (ft/s)	3.60	Avg. Vel. (ft/s)		3.60	
Max Chl Dpth (ft)	9.73	Hydr. Depth (ft)		7.99	
Conv. Total (cfs)	376741.2	Conv. (cfs)		376741.2	
Length Wtd. (ft)	195.02	Wetted Per. (ft)		242.40	
Min Ch El (ft)	1290.78	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.60	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.26	578.81	
C & E Loss (ft)	0.02	Cum SA (acres)	0.99	71.64	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1302.13	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.030	
E.G. Elev (ft)	1302.37	Reach Len. (ft)	140.00	195.02	255.00
Crit W.S. (ft)	1295.55	Flow Area (sq ft)		2316.47	
E.G. Slope (ft/ft)	0.000331	Area (sq ft)		2316.47	
Q Total (cfs)	9070.00	Flow (cfs)		9070.00	
Top Width (ft)	252.68	Top Width (ft)		252.68	
Vel Total (ft/s)	3.92	Avg. Vel. (ft/s)		3.92	
Max Chl Dpth (ft)	11.35	Hydr. Depth (ft)		9.17	
Conv. Total (cfs)	498730.8	Conv. (cfs)		498730.8	
Length Wtd. (ft)	195.02	Wetted Per. (ft)		255.61	
Min Ch El (ft)	1290.78	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.73	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	15.89	704.78	0.19
C & E Loss (ft)	0.01	Cum SA (acres)	16.54	74.85	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1304.08	Element			
Vel Head (ft)	0.33	Wt. n-Val.		0.030	
E.G. Elev (ft)	1304.40	Reach Len. (ft)	140.00	195.02	255.00
Crit W.S. (ft)	1296.62	Flow Area (sq ft)		2822.03	
E.G. Slope (ft/ft)	0.000381	Area (sq ft)		2822.03	
Q Total (cfs)	12990.00	Flow (cfs)		12990.00	
Top Width (ft)	268.08	Top Width (ft)		268.08	
Vel Total (ft/s)	4.60	Avg. Vel. (ft/s)		4.60	
Max Chl Dpth (ft)	13.30	Hydr. Depth (ft)		10.53	
Conv. Total (cfs)	665737.9	Conv. (cfs)		665737.9	
Length Wtd. (ft)	195.02	Wetted Per. (ft)		271.49	
Min Ch El (ft)	1290.78	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		1.14	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	146.20	843.36	16.41
C & E Loss (ft)	0.02	Cum SA (acres)	89.59	75.31	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.26

INPUT
Description: Chandler Heights Road Bridge (Upstream Face)
Dense Grass in
Channel Bottom
4 Span Bridge with Riprap Protection
Manning n
Value of .030 used for Channel
Use Field Survey Data for This
Cross Section
Skew Angle18.86 Degrees, Cross Section Data
Adjusted
Downstream of Inlet from the Left Bank
Q(D)=8,100 cfs,
Q(F)=10,060 cfs & Q(E)=13,910 cfs
Q(D)=6,900 cfs, Q(F)=10,060 cfs
& Q(E)=13,910 cfs

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4788.76	1308.1	4794.79	1308.43	4807.2	1308.5	4827.58	1310.23	4843.98	1309.56
4853.53	1304.08	4861.19	1303.09	4899.71	1292.57	4926.74	1291.17	5000.57	1290.4
5074.51	1291.1	5109.16	1292.19	5137.41	1301.18	5146.82	1302.67	5165.74	1310.06
5226.91	1309.26								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4788.76	.04	4843.98	.03	5165.74	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4843.98	5165.74	57.31	57.31	57.31	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4788.76	4843.98	1313	5165.74	5226.91	1313

Left Levee Station= 4843.98 Elevation= 1309.56
Right Levee Station= 5165.74 Elevation= 1310.06

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1300.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.030	
E.G. Elev (ft)	1300.63	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1294.28	Flow Area (sq ft)		2195.70	
E.G. Slope (ft/ft)	0.000242	Area (sq ft)		2195.70	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	264.44	Top Width (ft)		264.44	
Vel Total (ft/s)	3.14	Avg. Vel. (ft/s)		3.14	
Max Chl Dpth (ft)	10.08	Hydr. Depth (ft)		8.30	
Conv. Total (cfs)	443254.2	Conv. (cfs)		443254.2	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		266.85	
Min Ch El (ft)	1290.40	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.39	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.26	569.60	
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	70.51	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1302.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.030	
E.G. Elev (ft)	1302.30	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1295.19	Flow Area (sq ft)		2629.09	
E.G. Slope (ft/ft)	0.000303	Area (sq ft)		2629.09	
Q Total (cfs)	10060.00	Flow (cfs)		10060.00	
Top Width (ft)	278.18	Top Width (ft)		278.18	
Vel Total (ft/s)	3.83	Avg. Vel. (ft/s)		3.83	
Max Chl Dpth (ft)	11.68	Hydr. Depth (ft)		9.45	

Conv. Total (cfs)	578221.9	Conv. (cfs)		578221.9	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		280.98	
Min Ch El (ft)	1290.40	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	15.89	693.70	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	73.66	0.64

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1304.02	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.030	
E.G. Elev (ft)	1304.32	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1296.16	Flow Area (sq ft)		3187.49	
E.G. Slope (ft/ft)	0.000332	Area (sq ft)		3187.49	
Q Total (cfs)	13910.00	Flow (cfs)		13910.00	
Top Width (ft)	296.31	Top Width (ft)		296.31	
Vel Total (ft/s)	4.36	Avg. Vel. (ft/s)		4.36	
Max Chl Dpth (ft)	13.62	Hydr. Depth (ft)		10.76	
Conv. Total (cfs)	763685.1	Conv. (cfs)		763685.1	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		299.61	
Min Ch El (ft)	1290.40	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.96	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	146.20	829.91	16.41
C & E Loss (ft)	0.01	Cum SA (acres)	89.59	74.04	13.20

BRIDGE RIVER: EMF
REACH: Reach 3 RS: 11.254

INPUT
Description: Chandler Heights Road 4-Span Bridge
Elongated Piers With
Semi-Circular Ends
Distance from Upstream XS = 0
Deck/Roadway Width = 57.31
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4763.34	1310.97	1307	4809.84	1311.12	1307	4839.01	1310.97	1306
4853.53	1310.96	1304	4853.54	1310.96	1306.04	4889.06	1310.92	1305.99
4926.14	1310.88	1305.97	4936.17	1310.87	1305.92	4982.92	1310.79	1305.83
5000.03	1310.74	1305.79	5029.65	1310.69	1305.74	5073.64	1310.65	1305.67
5076.71	1310.64	1305.67	5124.3	1310.57	1305.66	5146.16	1310.54	1305.65
5146.82	1310.54	1300	5162.06	1310.47	1302	5165.74	1310.46	1303
5211.21	1310.32	1304	5226.91	1310.21	1305			

Upstream Bridge Cross Section Data
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4788.76	1308.1	4794.79	1308.43	4807.2	1308.5	4827.58	1310.23	4843.98	1309.56
4853.53	1304.08	4861.19	1303.09	4899.71	1292.57	4926.74	1291.17	5000.57	1290.4
5074.51	1291.1	5109.16	1292.19	5137.41	1301.18	5146.82	1302.67	5165.74	1310.06
5226.91	1309.26								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4788.76	.04	4843.98	.03	5165.74	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
4843.98	5165.74	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4788.76	4843.98	1313	5165.74	5226.91	1313

Left Levee Station= 4843.98 Elevation= 1309.56
Right Levee Station= 5165.74 Elevation= 1310.06

Downstream Deck/Roadway Coordinates

```
    num=      20
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 4763.34 1310.97    1307 4809.84 1311.12    1307 4839.01 1310.97    1306
 4844.79 1310.96    1306 4852.34 1310.96    1302 4854.67 1310.95 1305.86
 4889.06 1310.92 1305.81 4927.62 1310.88 1305.75 4936.17 1310.87 1305.73
 4982.92 1310.79 1305.65 5001.46 1310.75 1305.62 5029.65 1310.69 1305.56
 5074.77 1310.67 1305.46 5076.71 1310.64 1305.46  5124.3 1310.57 1305.41
 5145.58 1310.51 1305.39 5145.59 1310.51    1302 5162.06 1310.47    1303
 5211.21 1310.32    1304 5217.93 1310.21    1305

Downstream Bridge Cross Section Data
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4773.32 1309.41 4804.54  1310.2 4810.78 1310.16 4838.25 1310.46 4844.79 1310.69
 4852.34 1303.35 4870.98 1301.22 4904.08 1291.97 4924.66 1291.66 4999.19 1290.69
  5072.6 1290.88 5110.53 1292.81 5136.59 1301.02 5145.58 1303.35 5160.69  1309.5
 5217.93 1309.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4773.32     .04 4844.79     .03 5160.69     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4844.79 5160.69              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 4773.32 4844.79    1313 5160.69 5217.93    1313
Left Levee      Station= 4844.79      Elevation= 1310.69
Right Levee     Station= 5160.69      Elevation=  1309.5

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

Number of Piers =  3

Pier Data
Pier Station     Upstream= 4926.74    Downstream= 4924.66
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1290.17    2.36 1302.97    3.79 1302.97    3.79    1307
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1290.66    2.36 1302.75    3.79 1302.75    3.79    1307

Pier Data
Pier Station     Upstream= 5000.57    Downstream= 4999.19
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36  1289.4    2.36 1302.79    3.79 1302.79    3.79    1307
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1289.69    2.36 1302.62    3.79 1302.62    3.79    1307

Pier Data
Pier Station     Upstream= 5074.51    Downstream=  5072.6
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36  1290.1    2.36 1302.67    3.79 1302.67    3.79    1307
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1289.88    2.36 1302.46    3.79 1302.46    3.79    1307

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
```

```
        Energy
        Momentum                Cd   =    1.33
        Yarnell                 KVal =      .9
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 downstream end
        Criteria to check for pressure flow = Upstream water surface
```

BRIDGE OUTPUT Profile #Design
Opening : Bridge #1

E.G. US. (ft)	1300.63	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1300.48	E.G. Elev (ft)	1300.63	1300.60
Q Total (cfs)	6900.00	W.S. Elev (ft)	1300.46	1300.43
Q Bridge (cfs)	6900.00	Crit W.S. (ft)	1294.35	1294.55
Q Weir (cfs)		Max Chl Dpth (ft)	10.05	9.74
Weir Sta Lft (ft)		Vel Total (ft/s)	3.25	3.36
Weir Sta Rgt (ft)		Flow Area (sq ft)	2124.51	2054.32
Weir Submerg		Froude # Chl	0.20	0.21
Weir Max Depth (ft)		Specif Force (cu ft)	10266.99	9778.33
Min Top Rd (ft)	1310.47	Hydr Depth (ft)	8.26	8.09
Min El Prs (ft)	1306.04	W.P. Total (ft)	317.01	312.24
Delta EG (ft)	0.03	Conv. Total (cfs)	374039.4	357271.4
Delta WS (ft)	0.04	Top Width (ft)	257.27	253.82
BR Open Area (sq ft)	3470.20	Frctn Loss (ft)	0.02	0.00
BR Open Vel (ft/s)	3.36	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.14	0.15
Br Sel Mthd	Energy only	Power Total (lb/ft s)	0.46	0.51

Warning - The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.

BRIDGE OUTPUT Profile #Future
Opening : Bridge #1

E.G. US. (ft)	1302.30	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1302.08	E.G. Elev (ft)	1302.30	1302.27
Q Total (cfs)	10060.00	W.S. Elev (ft)	1302.06	1302.01
Q Bridge (cfs)	10060.00	Crit W.S. (ft)	1295.30	1295.48
Q Weir (cfs)		Max Chl Dpth (ft)	11.65	11.32
Weir Sta Lft (ft)		Vel Total (ft/s)	3.95	4.08
Weir Sta Rgt (ft)		Flow Area (sq ft)	2544.72	2466.73
Weir Submerg		Froude # Chl	0.23	0.24
Weir Max Depth (ft)		Specif Force (cu ft)	14526.85	13909.57
Min Top Rd (ft)	1310.47	Hydr Depth (ft)	9.39	9.16
Min El Prs (ft)	1306.04	W.P. Total (ft)	340.62	337.58
Delta EG (ft)	0.04	Conv. Total (cfs)	481686.4	460071.3
Delta WS (ft)	0.06	Top Width (ft)	270.91	269.29
BR Open Area (sq ft)	3470.20	Frctn Loss (ft)	0.03	0.00
BR Open Vel (ft/s)	4.08	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.20	0.22
Br Sel Mthd	Energy only	Power Total (lb/ft s)	0.80	0.89

Warning - The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.

BRIDGE OUTPUT Profile #Existing

Opening : Bridge #1

E.G. US. (ft)	1304.32	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1304.02	E.G. Elev (ft)	1304.31	1304.28
Q Total (cfs)	13910.00	W.S. Elev (ft)	1304.00	1303.94
Q Bridge (cfs)	13910.00	Crit W.S. (ft)	1296.29	1296.48
Q Weir (cfs)		Max Chl Dpth (ft)	13.58	13.25
Weir Sta Lft (ft)		Vel Total (ft/s)	4.52	4.63
Weir Sta Rgt (ft)		Flow Area (sq ft)	3078.75	3002.13
Weir Submerg		Froude # Chl	0.24	0.25
Weir Max Depth (ft)		Specif Force (cu ft)	20688.04	19917.82
Min Top Rd (ft)	1310.47	Hydr Depth (ft)	10.96	10.70
Min El Prs (ft)	1306.04	W.P. Total (ft)	372.50	370.61
Delta EG (ft)	0.05	Conv. Total (cfs)	623375.9	599755.9
Delta WS (ft)	0.07	Top Width (ft)	280.80	280.70
BR Open Area (sq ft)	3470.20	Frctn Loss (ft)	0.03	0.00
BR Open Vel (ft/s)	4.63	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.26	0.27
Br Sel Mthd	Energy only	Power Total (lb/ft s)	1.16	1.26

Warning - The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.249

INPUT
Description: Chandler Height Road Bridge (Downstream Face)
Dense Grass in
Channel Bottom
4 Span Bridge with Riprap Protection
Manning n
Value of .030 used for Channel
Use Field Survey Data for This
Cross Section
Skew Angle 19.00 Degrees, Cross Section Data
Adjusted
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4773.32	1309.41	4804.54	1310.2	4810.78	1310.16	4838.25	1310.46	4844.79	1310.69
4852.34	1303.35	4870.98	1301.22	4904.08	1291.97	4924.66	1291.66	4999.19	1290.69
5072.6	1290.88	5110.53	1292.81	5136.59	1301.02	5145.58	1303.35	5160.69	1309.5
5217.93	1309.73								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4773.32	.04	4844.79	.03	5160.69	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4844.79	5160.69	150	95.09	40	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4773.32	4844.79	1313	5160.69	5217.93	1313

Left Levee Station= 4844.79 Elevation= 1310.69
Right Levee Station= 5160.69 Elevation= 1309.5

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1300.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.030	
E.G. Elev (ft)	1300.60	Reach Len. (ft)	150.00	95.09	40.00
Crit W.S. (ft)	1294.47	Flow Area (sq ft)		2121.89	
E.G. Slope (ft/ft)	0.000267	Area (sq ft)		2121.89	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	260.93	Top Width (ft)		260.93	
Vel Total (ft/s)	3.25	Avg. Vel. (ft/s)		3.25	
Max Chl Dpth (ft)	9.74	Hydr. Depth (ft)		8.13	

Conv. Total (cfs)	422424.4	Conv. (cfs)		422424.4
Length Wtd. (ft)	95.09	Wetted Per. (ft)		263.33
Min Ch El (ft)	1290.69	Shear (lb/sq ft)		0.13
Alpha	1.00	Stream Power (lb/ft s)		0.44
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.26	566.86
C & E Loss (ft)	0.02	Cum SA (acres)	0.99	70.18

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1302.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.030	
E.G. Elev (ft)	1302.26	Reach Len. (ft)	150.00	95.09	40.00
Crit W.S. (ft)	1295.39	Flow Area (sq ft)		2546.30	
E.G. Slope (ft/ft)	0.000334	Area (sq ft)		2546.30	
Q Total (cfs)	10060.00	Flow (cfs)		10060.00	
Top Width (ft)	276.47	Top Width (ft)		276.47	
Vel Total (ft/s)	3.95	Avg. Vel. (ft/s)		3.95	
Max Chl Dpth (ft)	11.33	Hydr. Depth (ft)		9.21	
Conv. Total (cfs)	550488.9	Conv. (cfs)		550488.9	
Length Wtd. (ft)	95.21	Wetted Per. (ft)		279.23	
Min Ch El (ft)	1290.69	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.75	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	15.89	690.41	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.54	73.31	0.64

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1303.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.030	
E.G. Elev (ft)	1304.27	Reach Len. (ft)	150.00	95.09	40.00
Crit W.S. (ft)	1296.38	Flow Area (sq ft)		3103.29	
E.G. Slope (ft/ft)	0.000361	Area (sq ft)		3103.29	
Q Total (cfs)	13910.00	Flow (cfs)		13910.00	
Top Width (ft)	295.35	Top Width (ft)		295.35	
Vel Total (ft/s)	4.48	Avg. Vel. (ft/s)		4.48	
Max Chl Dpth (ft)	13.27	Hydr. Depth (ft)		10.51	
Conv. Total (cfs)	731815.5	Conv. (cfs)		731815.5	
Length Wtd. (ft)	95.56	Wetted Per. (ft)		298.72	
Min Ch El (ft)	1290.69	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		1.05	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	146.20	825.91	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	89.59	73.67	13.20

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.231

INPUT
Description: Just Downstream of Chandler Heights Road Bridge
Downstream of
Side Inlet (60' Wide) from the Left Bank
Q(D)=8,100 cfs,
Q(F)=10,470 cfs & Q(E)=14,320 cfs;
Dense Grass in channel bed
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4223.41	1300.8	4286.31	1300.59	4365.26	1300.41	4397.8	1300.41	4444.21	1300.52
4503.31	1300.4	4541.6	1300.46	4582.12	1300.29	4607.6	1300.29	4628.99	1300.23
4647.23	1301	4653.57	1303.03	4671.71	1303.63	4685.57	1303.3	4699.59	1304.58
4751.36	1304.9	4800.8	1303.73	4816.15	1301.23	4825.08	1300.42	4829.5	1300.62
4848.82	1300.1	4858.6	1301.96	4871.41	1302.13	4899.91	1292.61	4904.44	1291.04
4933.04	1290.9	5004.04	1290.93	5100	1290.62	5143.88	1301.29	5160.69	1311.62
5197.16	1310.9	5201.03	1310.88	5216.94	1310.57				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4223.41	.04	4871.41	.03	5160.69	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4871.41	5160.69	221.88	221.88	221.88	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev
4223.41	4807	1311

Left Levee Station= 4751.36 Elevation= 1305.5
Right Levee Station= 5160.69 Elevation= 1311.62

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1300.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1300.55	Reach Len. (ft)	221.88	221.88	221.88
Crit W.S. (ft)	1294.52	Flow Area (sq ft)	1.21	2177.06	
E.G. Slope (ft/ft)	0.000342	Area (sq ft)	1.21	2177.06	
Q Total (cfs)	8100.00	Flow (cfs)	0.20	8099.80	
Top Width (ft)	273.34	Top Width (ft)	10.14	263.20	
Vel Total (ft/s)	3.72	Avg. Vel. (ft/s)	0.17	3.72	
Max Chl Dpth (ft)	9.72	Hydr. Depth (ft)	0.12	8.27	
Conv. Total (cfs)	438065.2	Conv. (cfs)	10.9	438054.3	
Length Wtd. (ft)	221.88	Wetted Per. (ft)	10.17	265.88	
Min Ch El (ft)	1290.62	Shear (lb/sq ft)	0.00	0.17	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.65	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.26	562.16	
C & E Loss (ft)	0.00	Cum SA (acres)	0.97	69.61	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1301.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1302.23	Reach Len. (ft)	221.88	221.88	221.88
Crit W.S. (ft)	1295.18	Flow Area (sq ft)	59.36	2619.37	
E.G. Slope (ft/ft)	0.000322	Area (sq ft)	59.36	2619.37	
Q Total (cfs)	10470.00	Flow (cfs)	44.79	10425.21	
Top Width (ft)	322.17	Top Width (ft)	49.00	273.17	
Vel Total (ft/s)	3.91	Avg. Vel. (ft/s)	0.75	3.98	
Max Chl Dpth (ft)	11.37	Hydr. Depth (ft)	1.21	9.59	
Conv. Total (cfs)	583451.1	Conv. (cfs)	2496.2	580954.9	
Length Wtd. (ft)	221.88	Wetted Per. (ft)	49.29	276.43	
Min Ch El (ft)	1290.62	Shear (lb/sq ft)	0.02	0.19	
Alpha	1.03	Stream Power (lb/ft s)	0.02	0.76	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	15.79	684.77	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.45	72.71	0.64

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1303.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1304.23	Reach Len. (ft)	221.88	221.88	221.88
Crit W.S. (ft)	1296.15	Flow Area (sq ft)	181.92	3153.41	
E.G. Slope (ft/ft)	0.000323	Area (sq ft)	187.08	3153.41	
Q Total (cfs)	14320.00	Flow (cfs)	241.72	14078.28	
Top Width (ft)	355.66	Top Width (ft)	78.90	276.76	
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)	1.33	4.46	
Max Chl Dpth (ft)	13.31	Hydr. Depth (ft)	2.82	11.39	
Conv. Total (cfs)	797100.6	Conv. (cfs)	13455.2	783645.4	
Length Wtd. (ft)	221.88	Wetted Per. (ft)	64.76	280.60	
Min Ch El (ft)	1290.62	Shear (lb/sq ft)	0.06	0.23	
Alpha	1.06	Stream Power (lb/ft s)	0.08	1.01	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	145.88	819.08	16.41
C & E Loss (ft)	0.00	Cum SA (acres)	89.46	73.05	13.20

CROSS SECTION RIVER: EMF

REACH: Reach 3 RS: 11.189

INPUT
Description: Dense Grass in channel bed
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4282.94	1300.5	4323.12	1300.52	4396.47	1300.41	4428.62	1300.35	4526.06	1300.42
4545.88	1300.4	4553.32	1300.52	4571.77	1301.58	4581.89	1303.07	4599.32	1303.39
4615.66	1303.4	4635.69	1306.7	4637.95	1306.81	4677.66	1306.92	4714.48	1306.29
4724.14	1306.1	4741.8	1305.41	4750.77	1305.19	4774.37	1304.39	4799.64	1301.19
4816.51	1300.3	4823.49	1299.4	4832.16	1300.33	4846.91	1300.14	4855.25	1302.24
4867	1302.1	4894.33	1293.96	4904.99	1290.7	4945.28	1291.39	4967.54	1291.4
5014.61	1291	5102.61	1290.86	5142.31	1302.84	5155.45	1302.26	5167.81	1301.55
5175.47	1305.7	5182.37	1309.58	5200.5	1309.23	5214.52	1306.81	5216.65	1306.63
5220.62	1307.8	5226.99	1306.01	5239.88	1304.62	5256.77	1304.83	5262.35	1306.37

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4282.94	.04	4867	.03	5142.31	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4867	5142.31	276	326.49	374	.1	.3

Left Levee Station= 4677.66 Elevation= 1306.92
Right Levee Station= 5182.37 Elevation= 1309.58

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.24	Element			
Vel Head (ft)	0.23	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1300.47	Reach Len. (ft)	276.00	326.49	374.00
Crit W.S. (ft)	1294.71	Flow Area (sq ft)	6.47	2108.87	
E.G. Slope (ft/ft)	0.000375	Area (sq ft)	6.47	2108.87	
Q Total (cfs)	8100.00	Flow (cfs)	2.47	8097.53	
Top Width (ft)	283.12	Top Width (ft)	22.66	260.46	
Vel Total (ft/s)	3.83	Avg. Vel. (ft/s)	0.38	3.84	
Max Chl Dpth (ft)	9.54	Hydr. Depth (ft)	0.29	8.10	
Conv. Total (cfs)	418317.2	Conv. (cfs)	127.7	418189.5	
Length Wtd. (ft)	326.48	Wetted Per. (ft)	22.78	263.25	
Min Ch El (ft)	1290.70	Shear (lb/sq ft)	0.01	0.19	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.72	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.24	551.25	
C & E Loss (ft)	0.00	Cum SA (acres)	0.89	68.27	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1301.90	Element			
Vel Head (ft)	0.26	Wt. n-Val.	0.040	0.030	0.040
E.G. Elev (ft)	1302.15	Reach Len. (ft)	276.00	326.49	374.00
Crit W.S. (ft)	1295.37	Flow Area (sq ft)	83.89	2548.88	1.15
E.G. Slope (ft/ft)	0.000348	Area (sq ft)	83.89	2548.88	1.15
Q Total (cfs)	10470.00	Flow (cfs)	72.52	10397.24	0.25
Top Width (ft)	337.97	Top Width (ft)	59.82	271.50	6.66
Vel Total (ft/s)	3.98	Avg. Vel. (ft/s)	0.86	4.08	0.21
Max Chl Dpth (ft)	11.20	Hydr. Depth (ft)	1.40	9.39	0.17
Conv. Total (cfs)	561260.9	Conv. (cfs)	3887.5	557360.3	13.1
Length Wtd. (ft)	326.14	Wetted Per. (ft)	60.21	274.78	6.76
Min Ch El (ft)	1290.70	Shear (lb/sq ft)	0.03	0.20	0.00
Alpha	1.05	Stream Power (lb/ft s)	0.03	0.82	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	15.42	671.61	0.19
C & E Loss (ft)	0.00	Cum SA (acres)	16.18	71.32	0.62

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1303.84	Element			

Vel Head (ft)	0.31	Wt. n-Val.	0.040	0.030	0.040
E.G. Elev (ft)	1304.16	Reach Len. (ft)	276.00	326.49	374.00
Crit W.S. (ft)	1296.33	Flow Area (sq ft)	237.54	3083.77	45.84
E.G. Slope (ft/ft)	0.000339	Area (sq ft)	237.54	3083.77	45.84
Q Total (cfs)	14320.00	Flow (cfs)	312.96	13965.76	41.28
Top Width (ft)	393.37	Top Width (ft)	88.32	275.31	29.73
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)	1.32	4.53	0.90
Max Chl Dpth (ft)	13.14	Hydr. Depth (ft)	2.69	11.20	1.54
Conv. Total (cfs)	777562.8	Conv. (cfs)	16993.4	758328.1	2241.4
Length Wtd. (ft)	325.44	Wetted Per. (ft)	88.88	278.76	30.35
Min Ch El (ft)	1290.70	Shear (lb/sq ft)	0.06	0.23	0.03
Alpha	1.11	Stream Power (lb/ft s)	0.07	1.06	0.03
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	144.80	803.19	16.30
C & E Loss (ft)	0.00	Cum SA (acres)	89.03	71.64	13.12

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.127

INPUT
Description: Dense Grass in channel bed
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4212.75	1300.6	4306.26	1300.56	4406.26	1300.27	4413.07	1300.28	4507.16	1300.19
4520.91	1300.4	4540.72	1301.01	4548.72	1302.81	4563.11	1303.05	4574.46	1302.82
4598.63	1307.3	4605.38	1307.61	4638.99	1308.46	4699.06	1307.53	4707.97	1306.57
4723.92	1305.8	4755.19	1305.54	4781.83	1301.43	4810.12	1300.45	4817.38	1299.45
4826.36	1300.5	4841.18	1299.58	4850.4	1302.09	4861.37	1301.95	4875.59	1297.48
4897.89	1290.7	4933.76	1290.8	5000.58	1291.07	5005.77	1290.86	5015.59	1290.87
5097.28	1291.2	5105.44	1293.18	5135.04	1302.53	5159.06	1302.77	5168.1	1308.71
5175.86	1309	5186.12	1309.27						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4212.75	.04	4861.37	.03	5135.04	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4861.37	5135.04	500	500	500	.1	.3

Left Levee Station= 4638.99 Elevation= 1308.46
Right Levee Station= 5135.04 Elevation= 1302.53

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1300.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1300.35	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.55	Flow Area (sq ft)	6.46	2117.25	
E.G. Slope (ft/ft)	0.000369	Area (sq ft)	6.46	2117.25	
Q Total (cfs)	8100.00	Flow (cfs)	2.08	8097.92	
Top Width (ft)	281.55	Top Width (ft)	21.33	260.23	
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)	0.32	3.82	
Max Chl Dpth (ft)	9.42	Hydr. Depth (ft)	0.30	8.14	
Conv. Total (cfs)	421391.7	Conv. (cfs)	108.4	421283.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	21.50	262.95	
Min Ch El (ft)	1290.70	Shear (lb/sq ft)	0.01	0.19	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.71	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.20	535.41	
C & E Loss (ft)	0.00	Cum SA (acres)	0.75	66.32	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1301.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1302.04	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.21	Flow Area (sq ft)	88.66	2558.87	
E.G. Slope (ft/ft)	0.000342	Area (sq ft)	88.66	2558.87	
Q Total (cfs)	10470.00	Flow (cfs)	71.17	10398.83	

Top Width (ft)	340.53	Top Width (ft)	69.75	270.78	
Vel Total (ft/s)	3.95	Avg. Vel. (ft/s)	0.80	4.06	
Max Chl Dpth (ft)	11.08	Hydr. Depth (ft)	1.27	9.45	
Conv. Total (cfs)	565883.3	Conv. (cfs)	3846.4	562036.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	70.24	274.02	
Min Ch El (ft)	1290.70	Shear (lb/sq ft)	0.03	0.20	
Alpha	1.05	Stream Power (lb/ft s)	0.02	0.81	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	14.88	652.46	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	15.77	69.29	0.59

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1303.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.040	0.030	0.040
E.G. Elev (ft)	1304.05	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1296.17	Flow Area (sq ft)	257.97	3092.06	26.80
E.G. Slope (ft/ft)	0.000333	Area (sq ft)	257.97	3092.06	26.80
Q Total (cfs)	14320.00	Flow (cfs)	340.05	13961.30	18.65
Top Width (ft)	393.65	Top Width (ft)	94.49	273.67	25.49
Vel Total (ft/s)	4.24	Avg. Vel. (ft/s)	1.32	4.52	0.70
Max Chl Dpth (ft)	13.04	Hydr. Depth (ft)	2.73	11.30	1.05
Conv. Total (cfs)	784514.4	Conv. (cfs)	18629.3	764863.2	1021.9
Length Wtd. (ft)	500.00	Wetted Per. (ft)	95.18	277.05	25.78
Min Ch El (ft)	1290.70	Shear (lb/sq ft)	0.06	0.23	0.02
Alpha	1.11	Stream Power (lb/ft s)	0.07	1.05	0.02
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	143.23	780.05	15.98
C & E Loss (ft)	0.00	Cum SA (acres)	88.45	69.59	12.89

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.033

INPUT
Description: Dense Grass in channel bed
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.28	1300.1	4307.21	1300.46	4407.2	1300.12	4508.72	1300.14	4517.84	1300.27
4553.14	1302.1	4570.83	1302.94	4593.87	1308.27	4609.43	1308.55	4690.24	1308.89
4699.47	1308.9	4709.93	1308.49	4735.3	1307.32	4772.96	1306.07	4790.8	1302.28
4816	1299.8	4826.6	1300.54	4841.12	1299.99	4850.51	1302.12	4861.62	1302.02
4874.8	1298	4898.39	1290.83	4906.79	1290.41	4940.36	1290.72	4960.96	1290.46
5000.57	1290.6	5011.89	1290.81	5095.3	1291.25	5105.49	1293.62	5108.79	1294.55
5134.81	1302.9	5157.24	1301.57	5177.78	1304.12	5192.28	1305.2	5205.15	1305.48
5209.71	1305.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.28	.04	4861.62	.03	5134.81	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4861.62	5134.81	500	500	500	.1	.3

Left Levee Station= 4699.47 Elevation= 1308.9
Right Levee Station= 5134.81 Elevation= 1302.9

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1299.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1300.16	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.44	Flow Area (sq ft)	0.19	2079.29	
E.G. Slope (ft/ft)	0.000386	Area (sq ft)	0.19	2079.29	
Q Total (cfs)	8100.00	Flow (cfs)	0.02	8099.98	
Top Width (ft)	260.05	Top Width (ft)	3.01	257.04	
Vel Total (ft/s)	3.90	Avg. Vel. (ft/s)	0.11	3.90	
Max Chl Dpth (ft)	9.51	Hydr. Depth (ft)	0.06	8.09	
Conv. Total (cfs)	412233.5	Conv. (cfs)	1.1	412232.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	3.02	259.65	

Min Ch El (ft)	1290.41	Shear (lb/sq ft)	0.00	0.19
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.75
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.16	511.32
C & E Loss (ft)	0.00	Cum SA (acres)	0.61	63.35

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1301.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1301.86	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.10	Flow Area (sq ft)	56.64	2518.91	
E.G. Slope (ft/ft)	0.000357	Area (sq ft)	56.64	2518.91	
Q Total (cfs)	10470.00	Flow (cfs)	42.76	10427.24	
Top Width (ft)	318.24	Top Width (ft)	50.49	267.75	
Vel Total (ft/s)	4.07	Avg. Vel. (ft/s)	0.76	4.14	
Max Chl Dpth (ft)	11.19	Hydr. Depth (ft)	1.12	9.41	
Conv. Total (cfs)	553979.6	Conv. (cfs)	2262.7	551716.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	50.79	270.88	
Min Ch El (ft)	1290.41	Shear (lb/sq ft)	0.02	0.21	
Alpha	1.03	Stream Power (lb/ft s)	0.02	0.86	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	14.04	623.32	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	15.08	66.20	0.59

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1303.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.040	0.030	0.040
E.G. Elev (ft)	1303.87	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1296.07	Flow Area (sq ft)	190.40	3048.96	45.26
E.G. Slope (ft/ft)	0.000352	Area (sq ft)	190.40	3048.96	45.26
Q Total (cfs)	14320.00	Flow (cfs)	242.12	14042.73	35.14
Top Width (ft)	388.36	Top Width (ft)	76.80	273.19	38.37
Vel Total (ft/s)	4.36	Avg. Vel. (ft/s)	1.27	4.61	0.78
Max Chl Dpth (ft)	13.14	Hydr. Depth (ft)	2.48	11.16	1.18
Conv. Total (cfs)	762788.3	Conv. (cfs)	12897.3	748019.1	1871.9
Length Wtd. (ft)	500.00	Wetted Per. (ft)	77.33	276.58	38.54
Min Ch El (ft)	1290.41	Shear (lb/sq ft)	0.05	0.24	0.03
Alpha	1.10	Stream Power (lb/ft s)	0.07	1.12	0.02
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	140.66	744.80	15.57
C & E Loss (ft)	0.00	Cum SA (acres)	87.47	66.45	12.52

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.938

INPUT
Description: Dense Grass in channel bed
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.27	1299.7	4311.64	1299.48	4408.14	1299.38	4500.64	1299.14	4504.71	1299.73
4512.74	1300.6	4516.72	1300.11	4520.69	1299.39	4534.5	1299.87	4547.79	1301.96
4573.99	1302.7	4594.88	1309	4608.97	1309.37	4621.23	1310.02	4668.08	1309.42
4697.19	1308.9	4711.85	1308.36	4735.18	1307.02	4772.44	1306.09	4779.58	1304.43
4788.54	1302.2	4819.39	1298.94	4827.11	1300.03	4842.24	1299.28	4850.94	1301.09
4861.77	1301.3	4898.49	1290.66	4909.68	1290.11	5000.64	1290.69	5019.9	1290.61
5096.02	1290.7	5106.69	1293.4	5109.46	1294.21	5135.91	1302.55	5161.16	1301.28
5176.44	1303.3	5191.3	1304.97	5209.42	1306.09				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.27	.04	4861.77	.03	5135.91	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4861.77	5135.91	500	500	500	.1	.3

Left Levee Station= 4621.23 Elevation= 1310.02
Right Levee Station= 5135.91 Elevation= 1302.55

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1299.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1299.97	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.18	Flow Area (sq ft)	7.90	2109.68	
E.G. Slope (ft/ft)	0.000373	Area (sq ft)	7.90	2109.68	
Q Total (cfs)	8100.00	Flow (cfs)	2.74	8097.26	
Top Width (ft)	284.49	Top Width (ft)	24.66	259.83	
Vel Total (ft/s)	3.83	Avg. Vel. (ft/s)	0.35	3.84	
Max Chl Dpth (ft)	9.63	Hydr. Depth (ft)	0.32	8.12	
Conv. Total (cfs)	419464.9	Conv. (cfs)	142.0	419322.8	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	24.81	262.44	
Min Ch El (ft)	1290.11	Shear (lb/sq ft)	0.01	0.19	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.72	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.11	487.28	
C & E Loss (ft)	0.00	Cum SA (acres)	0.45	60.38	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1301.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.040	0.030	
E.G. Elev (ft)	1301.69	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.85	Flow Area (sq ft)	84.64	2558.94	
E.G. Slope (ft/ft)	0.000342	Area (sq ft)	84.64	2558.94	
Q Total (cfs)	10470.00	Flow (cfs)	68.38	10401.62	
Top Width (ft)	336.54	Top Width (ft)	65.95	270.59	
Vel Total (ft/s)	3.96	Avg. Vel. (ft/s)	0.81	4.06	
Max Chl Dpth (ft)	11.32	Hydr. Depth (ft)	1.28	9.46	
Conv. Total (cfs)	566226.5	Conv. (cfs)	3698.0	562528.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	66.37	273.68	
Min Ch El (ft)	1290.11	Shear (lb/sq ft)	0.03	0.20	
Alpha	1.05	Stream Power (lb/ft s)	0.02	0.81	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	13.23	594.18	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	14.41	63.11	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1303.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.040	0.030	0.040
E.G. Elev (ft)	1303.70	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.82	Flow Area (sq ft)	228.01	3093.52	54.01
E.G. Slope (ft/ft)	0.000333	Area (sq ft)	228.01	3093.52	54.01
Q Total (cfs)	14320.00	Flow (cfs)	314.50	13961.83	43.67
Top Width (ft)	393.46	Top Width (ft)	78.00	274.14	41.31
Vel Total (ft/s)	4.24	Avg. Vel. (ft/s)	1.38	4.51	0.81
Max Chl Dpth (ft)	13.28	Hydr. Depth (ft)	2.92	11.28	1.31
Conv. Total (cfs)	784434.4	Conv. (cfs)	17228.1	764813.9	2392.3
Length Wtd. (ft)	500.00	Wetted Per. (ft)	78.60	277.40	41.48
Min Ch El (ft)	1290.11	Shear (lb/sq ft)	0.06	0.23	0.03
Alpha	1.11	Stream Power (lb/ft s)	0.08	1.05	0.02
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	138.25	709.55	15.00
C & E Loss (ft)	0.00	Cum SA (acres)	86.58	63.31	12.06

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.843

INPUT
Description: End Dense Grass in channel bed
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.26	1300	4312.55	1299.91	4409.09	1299.67	4508.87	1299.7	4513.44	1299.49

4517.57	1299.9	4533.79	1299.86	4543.03	1300.88	4562.21	1300.72	4565.44	1300.75
4592.82	1307.9	4605.9	1308.01	4619.84	1309.11	4694.67	1307.99	4701.55	1307.38
4713.26	1306.7	4727.36	1306.57	4748.07	1306.02	4767.69	1305.62	4783.67	1301.67
4809.52	1300.1	4813.08	1300.09	4817.56	1299.23	4826.92	1299.7	4841.79	1299.06
4848.54	1301.5	4862.81	1301.62	4895.89	1290.73	4908.24	1290.09	4911.45	1290.04
4973.02	1289.9	4993.46	1290.04	5009.09	1290.29	5059.09	1289.95	5098.86	1290.97
5108.1	1293.5	5115.7	1295.97	5134.92	1302.33	5144.4	1301.87	5156.11	1301.66
5161.83	1301.4	5176.85	1303.54	5190.84	1304.82	5208.72	1305.85		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.26	.04	4862.81	.025	5134.92	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4862.81	5134.92	500	500	500	.1	.3

Left Levee Station= 4619.84 Elevation= 1309.11
Right Levee Station= 5134.92 Elevation= 1302.33

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1299.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1299.82	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.77	Flow Area (sq ft)	5.50	2163.16	
E.G. Slope (ft/ft)	0.000236	Area (sq ft)	5.50	2163.16	
Q Total (cfs)	8100.00	Flow (cfs)	1.21	8098.79	
Top Width (ft)	281.04	Top Width (ft)	23.32	257.72	
Vel Total (ft/s)	3.74	Avg. Vel. (ft/s)	0.22	3.74	
Max Chl Dpth (ft)	9.70	Hydr. Depth (ft)	0.24	8.39	
Conv. Total (cfs)	527313.8	Conv. (cfs)	79.0	527234.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	23.47	260.49	
Min Ch El (ft)	1289.90	Shear (lb/sq ft)	0.00	0.12	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.46	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.03	462.76	
C & E Loss (ft)	0.00	Cum SA (acres)	0.18	57.41	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1301.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1301.55	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.44	Flow Area (sq ft)	76.24	2610.52	
E.G. Slope (ft/ft)	0.000220	Area (sq ft)	76.24	2610.52	
Q Total (cfs)	10470.00	Flow (cfs)	50.00	10420.00	
Top Width (ft)	326.28	Top Width (ft)	58.25	268.03	
Vel Total (ft/s)	3.90	Avg. Vel. (ft/s)	0.66	3.99	
Max Chl Dpth (ft)	11.40	Hydr. Depth (ft)	1.31	9.74	
Conv. Total (cfs)	705216.3	Conv. (cfs)	3368.0	701848.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	58.79	271.35	
Min Ch El (ft)	1289.90	Shear (lb/sq ft)	0.02	0.13	
Alpha	1.04	Stream Power (lb/ft s)	0.01	0.53	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	12.31	564.51	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	13.70	60.02	0.59

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1303.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1303.56	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.40	Flow Area (sq ft)	231.25	3140.96	50.43
E.G. Slope (ft/ft)	0.000221	Area (sq ft)	231.25	3140.96	50.43
Q Total (cfs)	14320.00	Flow (cfs)	246.10	14041.48	32.42
Top Width (ft)	397.62	Top Width (ft)	85.56	272.11	39.94
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)	1.06	4.47	0.64

Max Chl Dpth (ft)	13.36	Hydr. Depth (ft)	2.70	11.54	1.26
Conv. Total (cfs)	964098.7	Conv. (cfs)	16568.6	945347.4	2182.7
Length Wtd. (ft)	500.00	Wetted Per. (ft)	86.34	275.65	40.10
Min Ch El (ft)	1289.90	Shear (lb/sq ft)	0.04	0.16	0.02
Alpha	1.12	Stream Power (lb/ft s)	0.04	0.70	0.01
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	135.62	673.77	14.40
C & E Loss (ft)	0.00	Cum SA (acres)	85.64	60.17	11.59

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.749

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.25	1301	4241.38	1300.9	4282.61	1300.68	4306.9	1300.52	4380.3	1300.49
4421.26	1300.6	4490.41	1300.55	4538.41	1300.49	4556.35	1300.58	4580.3	1300.71
4593.28	1301.2	4596.42	1301.87	4602.9	1302.02	4612.02	1301.47	4621.13	1301.96
4625.16	1302	4636.13	1301.84	4651.34	1302.04	4660.04	1301.69	4710.03	1301.3
4725.78	1301.6	4740.07	1301.69	4760.04	1301.36	4767.96	1301.72	4795.74	1302.77
4806.95	1302.3	4814.31	1301.2	4828.19	1301.1	4843.24	1300.44	4860.68	1301.82
4862.86	1301.5	4896.96	1290.73	4910.04	1290.22	4960.65	1289.8	4995.11	1290.04
5012.19	1290.2	5060.04	1290.13	5099.65	1291.48	5111.09	1294.52	5134.52	1302.03
5157.67	1301.5	5174.55	1303.6	5192.99	1304.92	5207.5	1305.61		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.25	.04	4860.68	.025	5134.52	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4860.68	5134.52	500	500	500	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev
4214.25	4795.74	1306

Left Levee Station= 4795.74 Elevation= 1302.77
Right Levee Station= 5134.52 Elevation= 1302.03

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1299.46	Element			
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.69	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.88	Flow Area (sq ft)		2105.02	
E.G. Slope (ft/ft)	0.000257	Area (sq ft)		2105.02	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	257.20	Top Width (ft)		257.20	
Vel Total (ft/s)	3.85	Avg. Vel. (ft/s)		3.85	
Max Chl Dpth (ft)	9.66	Hydr. Depth (ft)		8.18	
Conv. Total (cfs)	504786.7	Conv. (cfs)		504786.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		259.75	
Min Ch El (ft)	1289.80	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.50	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.00	438.26	
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	54.46	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1301.17	Element			
Vel Head (ft)	0.26	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1301.43	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.54	Flow Area (sq ft)	9.76	2553.52	
E.G. Slope (ft/ft)	0.000239	Area (sq ft)	9.76	2553.52	
Q Total (cfs)	10470.00	Flow (cfs)	2.43	10467.57	
Top Width (ft)	302.09	Top Width (ft)	34.15	267.94	
Vel Total (ft/s)	4.08	Avg. Vel. (ft/s)	0.25	4.10	
Max Chl Dpth (ft)	11.37	Hydr. Depth (ft)	0.29	9.53	
Conv. Total (cfs)	677204.9	Conv. (cfs)	157.3	677047.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	34.20	271.02	

Min Ch El (ft)	1289.80	Shear (lb/sq ft)	0.00	0.14	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.58	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	11.82	534.87	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	13.16	56.94	0.59

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1303.12	Element			
Vel Head (ft)	0.33	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1303.44	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.51	Flow Area (sq ft)	113.92	3084.27	41.84
E.G. Slope (ft/ft)	0.000241	Area (sq ft)	1342.66	3084.27	41.84
Q Total (cfs)	14320.00	Flow (cfs)	95.49	14197.95	26.57
Top Width (ft)	956.42	Top Width (ft)	646.43	273.84	36.15
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)	0.84	4.60	0.63
Max Chl Dpth (ft)	13.32	Hydr. Depth (ft)	1.75	11.26	1.16
Conv. Total (cfs)	921659.9	Conv. (cfs)	6145.7	913804.4	1709.9
Length Wtd. (ft)	500.00	Wetted Per. (ft)	65.10	277.13	36.26
Min Ch El (ft)	1289.80	Shear (lb/sq ft)	0.03	0.17	0.02
Alpha	1.08	Stream Power (lb/ft s)	0.02	0.77	0.01
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	126.59	638.04	13.87
C & E Loss (ft)	0.00	Cum SA (acres)	81.44	57.04	11.16

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.654

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.24	1302.3	4260.97	1302.33	4307.48	1302.46	4310.97	1302.44	4360.98	1303.09
4364.36	1303.1	4410.97	1303.36	4457.77	1302.71	4514.08	1302.88	4560.97	1302.97
4563.99	1302.9	4610.98	1302.8	4663.79	1302.47	4710.98	1302.42	4764.35	1301.5
4797.76	1300.7	4809.24	1300.94	4815.88	1299.67	4820.99	1299.99	4827.33	1300.06
4841.44	1299.2	4862.58	1301.74	4883.68	1295.58	4900.77	1290.53	4913.33	1290.14
4961.47	1290	4997.55	1290.09	5013.12	1290.19	5060.97	1290.19	5101.18	1291.74
5110.07	1294.1	5116.33	1296.1	5135.28	1302.37	5158.96	1301.19	5170.22	1302.98
5193.51	1304.6	5209.42	1305.58						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.24	.04	4862.58	.025	5135.28	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4862.58	5135.28	465.44	465.44	465.44	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4214.24	4862.58	1305	5135.28	5209.42	1305

Left Levee Station= 4862.58 Elevation= 1301.74
Right Levee Station= 5135.28 Elevation= 1302.37

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1299.31	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.56	Reach Len. (ft)	465.44	465.44	465.44
Crit W.S. (ft)	1293.95	Flow Area (sq ft)		2036.08	
E.G. Slope (ft/ft)	0.000284	Area (sq ft)		2036.08	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	255.13	Top Width (ft)		255.13	
Vel Total (ft/s)	3.98	Avg. Vel. (ft/s)		3.98	
Max Chl Dpth (ft)	9.31	Hydr. Depth (ft)		7.98	
Conv. Total (cfs)	480234.8	Conv. (cfs)		480234.8	
Length Wtd. (ft)	465.44	Wetted Per. (ft)		257.57	

Min Ch El (ft)	1290.00	Shear (lb/sq ft)		0.14
Alpha	1.00	Stream Power (lb/ft s)		0.56
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.00	414.50
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	51.52

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1301.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
E.G. Elev (ft)	1301.31	Reach Len. (ft)	465.44	465.44	465.44
Crit W.S. (ft)	1294.62	Flow Area (sq ft)		2484.40	
E.G. Slope (ft/ft)	0.000260	Area (sq ft)		2484.40	
Q Total (cfs)	10470.00	Flow (cfs)		10470.00	
Top Width (ft)	266.22	Top Width (ft)		266.22	
Vel Total (ft/s)	4.21	Avg. Vel. (ft/s)		4.21	
Max Chl Dpth (ft)	11.03	Hydr. Depth (ft)		9.33	
Conv. Total (cfs)	649727.8	Conv. (cfs)		649727.8	
Length Wtd. (ft)	465.44	Wetted Per. (ft)		269.18	
Min Ch El (ft)	1290.00	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.63	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	11.76	505.96	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	12.97	53.88	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1302.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.		0.025	
E.G. Elev (ft)	1303.32	Reach Len. (ft)	465.44	465.44	465.44
Crit W.S. (ft)	1295.60	Flow Area (sq ft)		3007.99	
E.G. Slope (ft/ft)	0.000265	Area (sq ft)	422.27	3007.99	37.91
Q Total (cfs)	14320.00	Flow (cfs)		14320.00	
Top Width (ft)	863.78	Top Width (ft)	556.25	272.70	34.84
Vel Total (ft/s)	4.76	Avg. Vel. (ft/s)		4.76	
Max Chl Dpth (ft)	12.96	Hydr. Depth (ft)		11.03	
Conv. Total (cfs)	878885.4	Conv. (cfs)		878885.4	
Length Wtd. (ft)	465.44	Wetted Per. (ft)		275.98	
Min Ch El (ft)	1290.00	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.86	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	116.46	603.08	13.41
C & E Loss (ft)	0.00	Cum SA (acres)	74.54	53.90	10.75

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.566

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4217.79	1302.6	4261.85	1302.53	4299.91	1302.19	4323.81	1302.06	4361.85	1302.14
4411.85	1302.6	4461.84	1302.42	4499.55	1302.46	4524.2	1302.52	4561.84	1302.45
4599.35	1302.5	4624.39	1302.29	4661.85	1302.07	4761.85	1300.8	4793.49	1299.36
4801.87	1300.7	4814.64	1299.37	4827.88	1299.29	4841.4	1298.86	4863.63	1301.52
4900.88	1290.4	4911.85	1289.92	4961.84	1290.16	5011.84	1290.05	5061.85	1289.5
5096.04	1290.6	5101.85	1291.96	5129.28	1300.3	5135.55	1302.13	5161.76	1300.78
5171.01	1301.8	5191.76	1303.71	5209.25	1304.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4217.79	.04	4863.63	.025	5135.55	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4863.63	5135.55	280	250	222	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev

4217.79 4863.63 1305 5135.55 5209.25 1305
Left Levee Station= 4863.63 Elevation= 1301.52
Right Levee Station= 5135.55 Elevation= 1302.13

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1299.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.42	Reach Len. (ft)	280.00	250.00	222.00
Crit W.S. (ft)	1293.71	Flow Area (sq ft)		2053.60	
E.G. Slope (ft/ft)	0.000275	Area (sq ft)		2053.60	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	254.15	Top Width (ft)		254.15	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)		3.94	
Max Chl Dpth (ft)	9.68	Hydr. Depth (ft)		8.08	
Conv. Total (cfs)	488246.0	Conv. (cfs)		488246.0	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		256.69	
Min Ch El (ft)	1289.50	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.00	392.65	
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	48.80	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1300.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1301.19	Reach Len. (ft)	280.00	250.00	222.00
Crit W.S. (ft)	1294.39	Flow Area (sq ft)		2503.49	
E.G. Slope (ft/ft)	0.000253	Area (sq ft)		2503.49	
Q Total (cfs)	10470.00	Flow (cfs)		10470.00	
Top Width (ft)	265.72	Top Width (ft)		265.72	
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)		4.18	
Max Chl Dpth (ft)	11.41	Hydr. Depth (ft)		9.42	
Conv. Total (cfs)	658726.1	Conv. (cfs)		658726.1	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		268.78	
Min Ch El (ft)	1289.50	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.61	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	11.76	479.31	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	12.97	51.03	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1302.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.		0.025	
E.G. Elev (ft)	1303.19	Reach Len. (ft)	280.00	250.00	222.00
Crit W.S. (ft)	1295.37	Flow Area (sq ft)		3025.13	
E.G. Slope (ft/ft)	0.000260	Area (sq ft)	648.23	3025.13	56.69
Q Total (cfs)	14320.00	Flow (cfs)		14320.00	
Top Width (ft)	964.56	Top Width (ft)	645.84	271.92	46.80
Vel Total (ft/s)	4.73	Avg. Vel. (ft/s)		4.73	
Max Chl Dpth (ft)	13.34	Hydr. Depth (ft)		11.13	
Conv. Total (cfs)	888844.4	Conv. (cfs)		888844.4	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		275.23	
Min Ch El (ft)	1289.50	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.84	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	110.74	570.84	12.91
C & E Loss (ft)	0.00	Cum SA (acres)	68.12	50.99	10.31

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.518

INPUT
Description:
Station Elevation Data num= 37
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

4258.45	1305.07	4270.94	1304.59	4308.36	1304.01	4319.34	1303.63	4370.51	1303.4
4421.71	1303.24	4472.9	1302.92	4524.09	1302.45	4575.29	1302.53	4626.47	1302.2
4677.67	1302.06	4703.2	1301.6	4728.84	1301.38	4772.47	1300.27	4791.69	1299.6
4799.57	1300.82	4809.96	1299.2	4817.08	1299.74	4824.01	1299.66	4844.77	1298.3
4864.63	1301.48	4873.97	1298.8	4897	1292	4904.18	1290.22	4908.56	1290.2
4933.61	1290.09	4984.8	1290.1	4997.31	1290.15	5036	1289.62	5052.87	1289.8
5087.17	1290.12	5101.39	1290.46	5137.14	1301.55	5159.71	1300.98	5167.77	1302.2
5187.78	1303.81	5203.51	1304.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4258.45	.04	4864.63	.025	5137.14	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4864.63	5137.14	460	408.26	365	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4258.45	4864.63	1305	5137.14	5203.51	1305

Left Levee Station= 4864.63 Elevation= 1301.48
Right Levee Station= 5137.14 Elevation= 1301.55

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1299.11	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.36	Reach Len. (ft)	460.00	408.26	365.00
Crit W.S. (ft)	1293.69	Flow Area (sq ft)		2057.00	
E.G. Slope (ft/ft)	0.000277	Area (sq ft)		2057.00	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	256.42	Top Width (ft)		256.42	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)		3.94	
Max Chl Dpth (ft)	9.49	Hydr. Depth (ft)		8.02	
Conv. Total (cfs)	486705.2	Conv. (cfs)		486705.2	
Length Wtd. (ft)	408.26	Wetted Per. (ft)		258.98	
Min Ch El (ft)	1289.62	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.00	380.85	
C & E Loss (ft)	0.01	Cum SA (acres)	0.04	47.33	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.85	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1301.12	Reach Len. (ft)	460.00	408.26	365.00
Crit W.S. (ft)	1294.37	Flow Area (sq ft)		2512.69	
E.G. Slope (ft/ft)	0.000252	Area (sq ft)		2512.69	
Q Total (cfs)	10470.00	Flow (cfs)		10470.00	
Top Width (ft)	268.07	Top Width (ft)		268.07	
Vel Total (ft/s)	4.17	Avg. Vel. (ft/s)		4.17	
Max Chl Dpth (ft)	11.23	Hydr. Depth (ft)		9.37	
Conv. Total (cfs)	658896.9	Conv. (cfs)		658896.9	
Length Wtd. (ft)	408.26	Wetted Per. (ft)		271.15	
Min Ch El (ft)	1289.62	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.61	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	11.76	464.92	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	12.97	49.50	0.59

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1302.78	Element			
Vel Head (ft)	0.35	Wt. n-Val.		0.025	
E.G. Elev (ft)	1303.13	Reach Len. (ft)	460.00	408.26	365.00
Crit W.S. (ft)	1295.35	Flow Area (sq ft)		3036.91	
E.G. Slope (ft/ft)	0.000257	Area (sq ft)	503.30	3036.91	45.92
Q Total (cfs)	14320.00	Flow (cfs)		14320.00	
Top Width (ft)	686.98	Top Width (ft)	376.62	272.51	37.85
Vel Total (ft/s)	4.72	Avg. Vel. (ft/s)		4.72	
Max Chl Dpth (ft)	13.16	Hydr. Depth (ft)		11.14	

Conv. Total (cfs)	893446.7	Conv. (cfs)		893446.7	
Length Wtd. (ft)	408.31	Wetted Per. (ft)		275.78	
Min Ch El (ft)	1289.62	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.83	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	107.04	553.45	12.65
C & E Loss (ft)	0.00	Cum SA (acres)	64.83	49.43	10.10

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.441

INPUT
Description: Downstream of Side Inlet from the Left Bank
Q(D)=8,100 cfs,
Q(F)=10,790 cfs & Q(E)=14,650 cfs
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4203.3	1304.3	4235.34	1304.08	4261.67	1304.01	4287.54	1304.06	4327.76	1304.31
4380.59	1304.2	4440.03	1303.67	4499.48	1303.4	4558.96	1303.2	4618.41	1302.28
4649.32	1302.2	4685.49	1302.7	4697.36	1302.28	4721.67	1301.61	4737.32	1300.79
4770.29	1299.9	4783.88	1299.92	4794.06	1299.58	4802.65	1298.43	4809.22	1299.56
4852.28	1298.2	4860.25	1300.52	4872.95	1300.22	4883.31	1297.4	4910.83	1289.79
4915.66	1289.5	4975.62	1289.06	5001.12	1289.28	5034.6	1289.37	5067.01	1289.3
5095.33	1289.6	5105.93	1289.92	5144.26	1301.12	5157.98	1301.03	5164.91	1300.8
5168.87	1302.3	5173.15	1302.57	5181.65	1302.62	5198.26	1303.88		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4203.3	.04	4872.95	.025	5144.26	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4872.95	5144.26	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4203.3	4860.25	1305	5144.26	5198.26	1305

Left Levee Station= 4860.25 Elevation= 1300.52
Right Levee Station= 5144.26 Elevation= 1301.12

CROSS SECTION OUTPUT *Profile #Design*

W.S. Elev (ft)	1299.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.24	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.05	Flow Area (sq ft)		2186.83	
E.G. Slope (ft/ft)	0.000230	Area (sq ft)		2186.83	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	259.79	Top Width (ft)		259.79	
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)		3.70	
Max Chl Dpth (ft)	9.97	Hydr. Depth (ft)		8.42	
Conv. Total (cfs)	534327.3	Conv. (cfs)		534327.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		262.37	
Min Ch El (ft)	1289.06	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.44	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.00	360.97	
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	44.91	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1300.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1301.02	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.81	Flow Area (sq ft)	4.99	2646.77	
E.G. Slope (ft/ft)	0.000228	Area (sq ft)	159.63	2646.77	
Q Total (cfs)	10790.00	Flow (cfs)	1.50	10788.50	
Top Width (ft)	404.70	Top Width (ft)	134.62	270.09	
Vel Total (ft/s)	4.07	Avg. Vel. (ft/s)	0.30	4.08	
Max Chl Dpth (ft)	11.70	Hydr. Depth (ft)	0.39	9.80	
Conv. Total (cfs)	715261.3	Conv. (cfs)	99.3	715162.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	12.70	273.07	

Min Ch El (ft)	1289.06	Shear (lb/sq ft)	0.01	0.14	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.56	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	10.92	440.74	0.18
C & E Loss (ft)	0.01	Cum SA (acres)	12.26	46.98	0.59

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1302.69	Element			
Vel Head (ft)	0.33	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1303.02	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.80	Flow Area (sq ft)	29.50	3170.26	
E.G. Slope (ft/ft)	0.000230	Area (sq ft)	493.69	3170.26	41.02
Q Total (cfs)	14650.00	Flow (cfs)	29.18	14620.82	
Top Width (ft)	590.19	Top Width (ft)	280.53	271.31	38.35
Vel Total (ft/s)	4.58	Avg. Vel. (ft/s)	0.99	4.61	
Max Chl Dpth (ft)	13.63	Hydr. Depth (ft)	2.32	11.69	
Conv. Total (cfs)	965058.4	Conv. (cfs)	1922.0	963136.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	12.70	274.34	
Min Ch El (ft)	1289.06	Shear (lb/sq ft)	0.03	0.17	
Alpha	1.01	Stream Power (lb/ft s)	0.03	0.77	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	101.77	524.36	12.28
C & E Loss (ft)	0.01	Cum SA (acres)	61.36	46.88	9.78

Warning - Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.346

INPUT
Description:
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4204.52	1304.4	4236.47	1304.77	4273.71	1304.94	4295.96	1304.96	4336.33	1304.66
4365.99	1304.5	4414.92	1304.27	4431.91	1304.35	4458.29	1304.68	4474.42	1304.67
4503.66	1304.4	4533.9	1304.13	4550.58	1304.04	4593.38	1304.02	4612.78	1303.97
4652.86	1303.2	4685.14	1302.78	4712.36	1302.58	4727.78	1302.23	4735.75	1301.99
4749.1	1300.8	4771.13	1299.56	4785.51	1299.16	4803.47	1298.36	4810.82	1299.18
4828.94	1298.8	4851.17	1297.93	4860.03	1300.3	4869	1300.52	4872.63	1300.1
4891.24	1294.1	4903.87	1290.63	4911.3	1289.23	4924.19	1289.06	4950.31	1288.95
4984	1289.3	5002.09	1289.17	5012.03	1289.19	5069.26	1288.88	5092.68	1289.12
5105.64	1289.4	5111.11	1290.78	5129.38	1295.63	5148.95	1301.22	5165.41	1300.6
5178.97	1302.2	5191.87	1302.53	5197.09	1303.03				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4204.52	.04	4869	.025	5148.95	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4869	5148.95		500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4204.52	4869	1305	5148.95	5197.09	1305

Left Levee Station= 4869 Elevation= 1300.52
Right Levee Station= 5148.95 Elevation= 1301.22

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1298.93	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.13	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1292.76	Flow Area (sq ft)		2270.87	
E.G. Slope (ft/ft)	0.000208	Area (sq ft)		2270.87	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	264.69	Top Width (ft)		264.69	
Vel Total (ft/s)	3.57	Avg. Vel. (ft/s)		3.57	
Max Chl Dpth (ft)	10.05	Hydr. Depth (ft)		8.58	
Conv. Total (cfs)	561930.4	Conv. (cfs)		561930.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		267.33	

Min Ch El (ft)	1288.88	Shear (lb/sq ft)		0.11
Alpha	1.00	Stream Power (lb/ft s)		0.39
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.00	335.38
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	41.90

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1300.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.91	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.53	Flow Area (sq ft)		2740.17	
E.G. Slope (ft/ft)	0.000211	Area (sq ft)	175.28	2740.17	
Q Total (cfs)	10790.00	Flow (cfs)		10790.00	
Top Width (ft)	395.51	Top Width (ft)	117.51	278.01	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)		3.94	
Max Chl Dpth (ft)	11.79	Hydr. Depth (ft)		9.86	
Conv. Total (cfs)	743221.1	Conv. (cfs)		743221.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		281.09	
Min Ch El (ft)	1288.88	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.51	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	8.99	409.82	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	10.81	43.84	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1302.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1302.91	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.49	Flow Area (sq ft)		3280.02	
E.G. Slope (ft/ft)	0.000215	Area (sq ft)	429.42	3280.02	46.95
Q Total (cfs)	14650.00	Flow (cfs)		14650.00	
Top Width (ft)	482.32	Top Width (ft)	158.77	279.95	43.60
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)		4.47	
Max Chl Dpth (ft)	13.72	Hydr. Depth (ft)		11.72	
Conv. Total (cfs)	998182.2	Conv. (cfs)		998182.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		283.11	
Min Ch El (ft)	1288.88	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.70	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	96.47	487.34	11.78
C & E Loss (ft)	0.00	Cum SA (acres)	58.84	43.72	9.31

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.252

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4658.04	1304.8	4698.66	1303.46	4705.96	1303.14	4719.74	1302.3	4737.35	1300.94
4785.48	1300.03	4793.47	1299.76	4799.57	1299.71	4824.28	1299.7	4836.29	1299.49
4845.85	1301.15	4867.88	1301.31	4873.51	1301.4	4910.83	1289.8	4925.86	1289.26
4957.19	1288.97	4987.25	1289.25	5003.76	1289.54	5043.67	1288.8	5054.5	1288.91
5103.62	1289.7	5144.94	1301.08	5163.49	1300.16	5165.79	1300.1	5178.08	1301.37
5197.94	1302.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4658.04	.04	4873.51	.025	5144.94	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4873.51	5144.94	80	176.46	270	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev
4658.04	4773	1305

Left Levee Station= 4873.51 Elevation= 1301.4
Right Levee Station= 5144.94 Elevation= 1301.08

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1298.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.01	Reach Len. (ft)	80.00	176.46	270.00
Crit W.S. (ft)	1292.96	Flow Area (sq ft)		2125.60	
E.G. Slope (ft/ft)	0.000246	Area (sq ft)		2125.60	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	254.71	Top Width (ft)		254.71	
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)		3.81	
Max Chl Dpth (ft)	9.99	Hydr. Depth (ft)		8.35	
Conv. Total (cfs)	516249.7	Conv. (cfs)		516249.7	
Length Wtd. (ft)	176.46	Wetted Per. (ft)		257.33	
Min Ch El (ft)	1288.80	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.48	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.00	310.15	
C & E Loss (ft)	0.01	Cum SA (acres)	0.04	38.92	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1300.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.79	Reach Len. (ft)	80.00	176.46	270.00
Crit W.S. (ft)	1293.72	Flow Area (sq ft)		2575.91	
E.G. Slope (ft/ft)	0.000245	Area (sq ft)		2575.91	
Q Total (cfs)	10790.00	Flow (cfs)		10790.00	
Top Width (ft)	266.54	Top Width (ft)		266.54	
Vel Total (ft/s)	4.19	Avg. Vel. (ft/s)		4.19	
Max Chl Dpth (ft)	11.72	Hydr. Depth (ft)		9.66	
Conv. Total (cfs)	689274.8	Conv. (cfs)		689274.8	
Length Wtd. (ft)	176.46	Wetted Per. (ft)		269.66	
Min Ch El (ft)	1288.80	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.61	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	7.99	379.31	0.18
C & E Loss (ft)	0.01	Cum SA (acres)	10.14	40.71	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1302.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1302.79	Reach Len. (ft)	80.00	176.46	270.00
Crit W.S. (ft)	1294.72	Flow Area (sq ft)	222.42	3102.03	71.72
E.G. Slope (ft/ft)	0.000240	Area (sq ft)	303.74	3102.03	71.72
Q Total (cfs)	14650.00	Flow (cfs)	217.26	14382.30	50.44
Top Width (ft)	480.86	Top Width (ft)	156.43	271.43	53.00
Vel Total (ft/s)	4.31	Avg. Vel. (ft/s)	0.98	4.64	0.70
Max Chl Dpth (ft)	13.66	Hydr. Depth (ft)	2.21	11.43	1.35
Conv. Total (cfs)	945162.4	Conv. (cfs)	14017.1	927891.4	3253.9
Length Wtd. (ft)	175.91	Wetted Per. (ft)	100.66	274.76	53.13
Min Ch El (ft)	1288.80	Shear (lb/sq ft)	0.03	0.17	0.02
Alpha	1.13	Stream Power (lb/ft s)	0.03	0.79	0.01
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	92.27	450.71	11.10
C & E Loss (ft)	0.00	Cum SA (acres)	57.03	40.55	8.75

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.218

INPUT
Description: Riggs Road Bridge (Upstream Face)
4 Span Bridge with Riprap
Protection
Manning n Value of .030 used for Channel
Use Field
Survey Data for This Cross Section
Skew Angle 33.23 Degrees,

Cross Section Data Adjusted

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4826.45	1306.09	4852.45	1306.38	4853.16	1306.38	4872.77	1300.51	4909.75	1288.64
4941.69	1288.96	5012.54	1288.84	5081.55	1289.05	5109.34	1289.82	5146.46	1301.64
5165.71	1306.39	5170.41	1306.18	5190.74	1304.81				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4826.45	.04	4853.16	.03	5165.71	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4853.16	5165.71	123.82	123.82	123.82	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4826.45	4853.16	1309	5165.71	5190.74	1309

Left Levee Station= 4853.16 Elevation= 1306.38

Right Levee Station= 5165.71 Elevation= 1306.39

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1298.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
E.G. Elev (ft)	1298.96	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1292.61	Flow Area (sq ft)		2236.03	
E.G. Slope (ft/ft)	0.000307	Area (sq ft)		2236.03	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	259.14	Top Width (ft)		259.14	
Vel Total (ft/s)	3.62	Avg. Vel. (ft/s)		3.62	
Max Chl Dpth (ft)	10.11	Hydr. Depth (ft)		8.63	
Conv. Total (cfs)	462379.3	Conv. (cfs)		462379.3	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		262.12	
Min Ch El (ft)	1288.64	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.59	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.00	301.32	
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	37.88	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1300.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.030	
E.G. Elev (ft)	1300.73	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1293.36	Flow Area (sq ft)		2693.27	
E.G. Slope (ft/ft)	0.000310	Area (sq ft)		2693.27	
Q Total (cfs)	10790.00	Flow (cfs)		10790.00	
Top Width (ft)	269.95	Top Width (ft)		269.95	
Vel Total (ft/s)	4.01	Avg. Vel. (ft/s)		4.01	
Max Chl Dpth (ft)	11.84	Hydr. Depth (ft)		9.98	
Conv. Total (cfs)	612907.4	Conv. (cfs)		612907.4	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		273.48	
Min Ch El (ft)	1288.64	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.76	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	7.99	368.64	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	10.14	39.62	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1302.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.030	
E.G. Elev (ft)	1302.74	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	1294.33	Flow Area (sq ft)		3228.46	
E.G. Slope (ft/ft)	0.000333	Area (sq ft)		3228.46	
Q Total (cfs)	14650.00	Flow (cfs)		14650.00	
Top Width (ft)	283.21	Top Width (ft)		283.21	
Vel Total (ft/s)	4.54	Avg. Vel. (ft/s)		4.54	
Max Chl Dpth (ft)	13.78	Hydr. Depth (ft)		11.40	
Conv. Total (cfs)	802271.3	Conv. (cfs)		802271.3	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		287.29	

Min Ch El (ft)	1288.64	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		1.06	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	91.99	437.89	10.87
C & E Loss (ft)	0.02	Cum SA (acres)	56.89	39.43	8.59

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

```
BRIDGE                    RIVER: EMF
REACH: Reach 3               RS: 10.207

INPUT
Description: Riggs Road 4-Span Bridge with Circular Piers
Distance from Upstream XS =       0
Deck/Roadway Width        =  123.82
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=      19
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 4751.04 1306.49    1300 4794.77 1307.12    1300 4851.59  1307.8    1300
 4872.77 1307.91    1300 4874.13 1307.92 1301.32 4892.26 1308.01 1301.44
 4936.49 1308.27 1301.73 4943.73 1308.27 1301.78 4978.31 1308.25 1301.84
 5013.59 1308.25 1301.91 5019.73 1308.25  1301.9 5060.52 1308.13 1301.85
 5083.35 1307.97 1301.82 5102.43 1307.83 1301.78 5141.54 1307.65 1301.71
 5146.46 1307.63 1301.64 5164.07 1307.55    1304    5185 1307.14    1304
 5190.74 1307.03    1304

Upstream Bridge Cross Section Data
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4826.45 1306.09 4852.45 1306.38 4853.16 1306.38 4872.77 1300.51 4909.75 1288.64
 4941.69 1288.96 5012.54 1288.84 5081.55 1289.05 5109.34 1289.82 5146.46 1301.64
 5165.71 1306.39 5170.41 1306.18 5190.74 1304.81

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4826.45     .04 4853.16     .03 5165.71     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4853.16 5165.71             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 4826.45 4853.16    1309 5165.71 5190.74    1309
Left Levee      Station= 4853.16      Elevation= 1306.38
Right Levee     Station= 5165.71      Elevation= 1306.39

Downstream  Deck/Roadway Coordinates
    num=      19
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 4751.04 1306.49    1300 4794.77 1307.12    1300 4851.59  1307.8    1300
 4873.51 1307.91    1300 4873.52 1307.91 1301.79 4892.26 1308.01 1301.86
 4936.49 1308.27 1302.05 4941.54 1308.26 1302.07 4978.31 1308.25 1302.06
 5011.56 1308.25 1302.06 5019.73 1308.25 1302.03 5060.52 1308.13 1301.85
 5081.54 1307.98 1301.75 5102.43 1307.83 1301.71 5140.79 1307.66 1301.68
  5146.7 1307.63 1300.78 5164.07 1307.55    1300    5185 1307.14    1305
 5200.06 1306.85    1305

Downstream Bridge Cross Section Data
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 4822.46 1307.47 4854.43 1307.05 4855.34 1306.99 4873.51  1301.9 4910.99 1289.58
 4939.48 1289.32 5012.25 1288.91  5079.2 1289.47 5108.92 1290.28  5146.7 1300.78
  5167.6 1306.47 5168.45  1306.6 5200.06 1305.61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 4822.46     .04 4855.34     .03  5167.6     .04
```

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
       4855.34  5167.6              .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 4822.46 4855.34    1308  5167.6 5200.06    1308
Left Levee       Station= 4855.34      Elevation= 1306.99
Right Levee      Station=  5167.6      Elevation= 1306.47

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

Number of Piers =  3

Pier Data
Pier Station     Upstream= 4941.69    Downstream= 4939.48
Upstream     num=       2
    Width   Elev    Width   Elev
    2.09 1287.96    2.09    1303
Downstream     num=       2
    Width   Elev    Width   Elev
    2.09 1288.32    2.09    1303

Pier Data
Pier Station     Upstream= 5012.54    Downstream= 5012.25
Upstream     num=       2
    Width   Elev    Width   Elev
    2.09 1287.84    2.09    1303
Downstream     num=       2
    Width   Elev    Width   Elev
    2.09 1287.91    2.09    1303

Pier Data
Pier Station     Upstream= 5081.55    Downstream=  5079.2
Upstream     num=       2
    Width   Elev    Width   Elev
    2.09 1288.05    2.09    1303
Downstream     num=       2
    Width   Elev    Width   Elev
    2.09 1288.47    2.09    1303

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =     1.2
       Yarnell                 KVal =      .9
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 downstream end
       Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT    Profile #Design
Opening : Bridge #1

  E.G. US. (ft)                1298.96   Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                1298.75   E.G. Elev (ft)               1298.95       1298.88
  Q Total (cfs)                8100.00   W.S. Elev (ft)               1298.74       1298.64
  Q Bridge (cfs)               8100.00   Crit W.S. (ft)               1292.69       1293.06
```

Q Weir (cfs)		Max Chl Dpth (ft)	10.10	9.72
Weir Sta Lft (ft)		Vel Total (ft/s)	3.73	3.97
Weir Sta Rgt (ft)		Flow Area (sq ft)	2170.58	2039.78
Weir Submerg		Froude # Chl	0.22	0.24
Weir Max Depth (ft)		Specif Force (cu ft)	11058.03	10086.57
Min Top Rd (ft)	1307.52	Hydr Depth (ft)	8.59	8.18
Min El Prs (ft)	1301.91	W.P. Total (ft)	314.45	308.31
Delta EG (ft)	0.08	Conv. Total (cfs)	389763.9	356057.4
Delta WS (ft)	0.10	Top Width (ft)	252.77	249.30
BR Open Area (sq ft)	2883.74	Frctn Loss (ft)	0.06	0.00
BR Open Vel (ft/s)	3.97	C & E Loss (ft)	0.01	0.01
Coef of Q		Shear Total (lb/sq ft)	0.19	0.21
Br Sel Mthd	Energy only	Power Total (lb/ft s)	0.69	0.85

Warning - The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.

BRIDGE OUTPUT Profile #Future
Opening : Bridge #1

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	1300.73	E.G. Elev (ft)	1300.73	1300.66
W.S. US. (ft)	1300.48	W.S. Elev (ft)	1300.46	1300.36
Q Total (cfs)	10790.00	Crit W.S. (ft)	1293.45	1293.85
Q Bridge (cfs)	10790.00	Max Chl Dpth (ft)	11.82	11.45
Q Weir (cfs)		Vel Total (ft/s)	4.12	4.35
Weir Sta Lft (ft)		Flow Area (sq ft)	2615.96	2478.88
Weir Sta Rgt (ft)		Froude # Chl	0.23	0.25
Weir Submerg		Specif Force (cu ft)	15627.71	14433.53
Weir Max Depth (ft)		Hydr Depth (ft)	9.94	9.51
Min Top Rd (ft)	1307.52	W.P. Total (ft)	335.99	330.59
Min El Prs (ft)	1301.91	Conv. Total (cfs)	508994.0	470371.7
Delta EG (ft)	0.08	Top Width (ft)	263.24	260.74
Delta WS (ft)	0.11	Frctn Loss (ft)	0.06	0.00
BR Open Area (sq ft)	2883.74	C & E Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	4.35	Shear Total (lb/sq ft)	0.22	0.25
Coef of Q		Power Total (lb/ft s)	0.90	1.07
Br Sel Mthd	Energy only			

Warning - The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.

BRIDGE OUTPUT Profile #Existing
Opening : Bridge #1

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	1302.74	E.G. Elev (ft)	1302.72	1302.55
W.S. US. (ft)	1302.42	W.S. Elev (ft)	1302.34	1302.15
Q Total (cfs)	14650.00	Crit W.S. (ft)	1294.45	1294.85
Q Bridge (cfs)	14650.00	Max Chl Dpth (ft)	13.70	13.24
Q Weir (cfs)		Vel Total (ft/s)	4.95	5.08
Weir Sta Lft (ft)		Flow Area (sq ft)	2957.50	2883.74
Weir Sta Rgt (ft)		Froude # Chl	0.26	0.27
Weir Submerg		Specif Force (cu ft)	21823.44	20134.55
Weir Max Depth (ft)		Hydr Depth (ft)		
Min Top Rd (ft)	1307.52	W.P. Total (ft)	615.39	612.97
Min El Prs (ft)	1301.91	Conv. Total (cfs)	417170.8	401026.0
Delta EG (ft)	0.20	Top Width (ft)		
Delta WS (ft)	0.24	Frctn Loss (ft)	0.16	0.00
BR Open Area (sq ft)	2883.74	C & E Loss (ft)	0.01	0.02
BR Open Vel (ft/s)	5.08	Shear Total (lb/sq ft)	0.37	0.39
Coef of Q		Power Total (lb/ft s)	1.83	1.99
Br Sel Mthd	Energy only			

Warning - The Yarnell method gave an invalid answer. The upstream energy was less than the

downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.

Warning - There was not enough momentum to compute a supercritical answer through the bridge. The momentum answer has been disregarded.

Note - Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.195

INPUT
Description: Riggs Road Bridge (Downstream Face)
4 Span Bridge with Riprap
Protection
Manning n Value of .030 used for Channel
Use Field
Survey Data for This Cross Section
Skew Angle 33.06 Degrees,
Cross Section Data Adjusted

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4822.46	1307.47	4854.43	1307.05	4855.34	1306.99	4873.51	1301.9	4910.99	1289.58
4939.48	1289.32	5012.25	1288.91	5079.2	1289.47	5108.92	1290.28	5146.7	1300.78
5167.6	1306.47	5168.45	1306.6	5200.06	1305.61				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4822.46	.04	4855.34	.03	5167.6	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4855.34	5167.6		208	128	12	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4822.46	4855.34	1308	5167.6	5200.06	1308

Left Levee Station= 4855.34 Elevation= 1306.99
Right Levee Station= 5167.6 Elevation= 1306.47

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1298.65	Element			
Vel Head (ft)	0.23	Wt. n-Val.		0.030	
E.G. Elev (ft)	1298.88	Reach Len. (ft)	208.00	128.00	12.00
Crit W.S. (ft)	1293.00	Flow Area (sq ft)		2100.48	
E.G. Slope (ft/ft)	0.000371	Area (sq ft)		2100.48	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	255.62	Top Width (ft)		255.62	
Vel Total (ft/s)	3.86	Avg. Vel. (ft/s)		3.86	
Max Chl Dpth (ft)	9.74	Hydr. Depth (ft)		8.22	
Conv. Total (cfs)	420793.5	Conv. (cfs)		420793.5	
Length Wtd. (ft)	128.00	Wetted Per. (ft)		258.23	
Min Ch El (ft)	1288.91	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.73	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.00	295.33	
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	37.17	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.37	Element			
Vel Head (ft)	0.28	Wt. n-Val.		0.030	
E.G. Elev (ft)	1300.65	Reach Len. (ft)	208.00	128.00	12.00
Crit W.S. (ft)	1293.74	Flow Area (sq ft)		2550.77	
E.G. Slope (ft/ft)	0.000366	Area (sq ft)		2550.77	
Q Total (cfs)	10790.00	Flow (cfs)		10790.00	
Top Width (ft)	267.06	Top Width (ft)		267.06	
Vel Total (ft/s)	4.23	Avg. Vel. (ft/s)		4.23	
Max Chl Dpth (ft)	11.46	Hydr. Depth (ft)		9.55	

Conv. Total (cfs)	564362.6	Conv. (cfs)		564362.6	
Length Wtd. (ft)	128.13	Wetted Per. (ft)		270.18	
Min Ch El (ft)	1288.91	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.91	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	7.99	361.40	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	10.14	38.88	0.59

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1302.17	Element			
Vel Head (ft)	0.36	Wt. n-Val.		0.030	
E.G. Elev (ft)	1302.53	Reach Len. (ft)	208.00	128.00	12.00
Crit W.S. (ft)	1294.74	Flow Area (sq ft)		3043.16	
E.G. Slope (ft/ft)	0.000398	Area (sq ft)		3043.16	
Q Total (cfs)	14650.00	Flow (cfs)		14650.00	
Top Width (ft)	279.28	Top Width (ft)		279.28	
Vel Total (ft/s)	4.81	Avg. Vel. (ft/s)		4.81	
Max Chl Dpth (ft)	13.26	Hydr. Depth (ft)		10.90	
Conv. Total (cfs)	734457.6	Conv. (cfs)		734457.6	
Length Wtd. (ft)	128.63	Wetted Per. (ft)		282.93	
Min Ch El (ft)	1288.91	Shear (lb/sq ft)		0.27	
Alpha	1.00	Stream Power (lb/ft s)		1.29	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	91.99	429.59	10.87
C & E Loss (ft)	0.01	Cum SA (acres)	56.89	39.43	8.59

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.171

INPUT
Description: Just Downstream of Riggs Road Bridge
Downstream of Side Inlet
(130' Wide) from the Left Bank
Q(D)=8,100 cfs, Q(F)=10,800 cfs &
Q(E)=14,660 cfs
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4267.13	1301.7	4293.86	1301.41	4343.48	1301.38	4352.56	1301.2	4409.7	1300.42
4451.06	1300.3	4464.76	1300.07	4514.17	1299.63	4530.46	1299.57	4561.78	1299.29
4589.43	1299.2	4606.46	1299.02	4695.56	1298.56	4705.4	1298.72	4773.13	1299.45
4778.89	1299.8	4782.49	1298.64	4802.51	1298.45	4809.41	1298.5	4813.51	1299.82
4816.49	1299	4828.02	1298.83	4844.17	1299.92	4851.64	1300.13	4874.49	1300.11
4909.38	1289.7	4946.83	1289.21	5005.27	1289	5065.81	1288.86	5102.4	1289.97
5135.69	1298.9	5146.54	1301.76	5157.39	1305.33	5169.1	1305.14	5182.5	1305.21
5206.68	1305.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4267.13	.04	4874.49	.025	5157.39	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.49	5157.39	194.72	194.72	194.72	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev
4267.13	4800	1304

Left Levee Station= 4874.49 Elevation= 1300.11
Right Levee Station= 5157.39 Elevation= 1305.33

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1298.60	Element			
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.84	Reach Len. (ft)	194.72	194.72	194.72
Crit W.S. (ft)	1292.93	Flow Area (sq ft)		2091.55	
E.G. Slope (ft/ft)	0.000260	Area (sq ft)		2091.55	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	255.05	Top Width (ft)		255.05	
Vel Total (ft/s)	3.87	Avg. Vel. (ft/s)		3.87	
Max Chl Dpth (ft)	9.74	Hydr. Depth (ft)		8.20	

Conv. Total (cfs)	502310.4	Conv. (cfs)		502310.4
Length Wtd. (ft)	194.72	Wetted Per. (ft)		257.51
Min Ch El (ft)	1288.86	Shear (lb/sq ft)		0.13
Alpha	1.00	Stream Power (lb/ft s)		0.51
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.00	289.17
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	36.42

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1300.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1300.61	Reach Len. (ft)	194.72	194.72	194.72
Crit W.S. (ft)	1293.71	Flow Area (sq ft)	63.93	2542.51	
E.G. Slope (ft/ft)	0.000255	Area (sq ft)	458.34	2542.51	
Q Total (cfs)	10800.00	Flow (cfs)	34.12	10765.88	
Top Width (ft)	700.79	Top Width (ft)	434.16	266.63	
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)	0.53	4.23	
Max Chl Dpth (ft)	11.47	Hydr. Depth (ft)	0.86	9.54	
Conv. Total (cfs)	676800.1	Conv. (cfs)	2137.9	674662.3	
Length Wtd. (ft)	194.72	Wetted Per. (ft)	74.85	269.53	
Min Ch El (ft)	1288.86	Shear (lb/sq ft)	0.01	0.15	
Alpha	1.04	Stream Power (lb/ft s)	0.01	0.63	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	6.89	353.92	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	9.10	38.09	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1302.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1302.48	Reach Len. (ft)	194.72	194.72	194.72
Crit W.S. (ft)	1294.70	Flow Area (sq ft)	198.52	3030.39	
E.G. Slope (ft/ft)	0.000263	Area (sq ft)	1432.77	3030.39	
Q Total (cfs)	14660.00	Flow (cfs)	229.35	14430.65	
Top Width (ft)	880.56	Top Width (ft)	607.36	273.20	
Vel Total (ft/s)	4.54	Avg. Vel. (ft/s)	1.16	4.76	
Max Chl Dpth (ft)	13.28	Hydr. Depth (ft)	2.67	11.09	
Conv. Total (cfs)	903158.0	Conv. (cfs)	14129.8	889028.2	
Length Wtd. (ft)	194.72	Wetted Per. (ft)	74.85	276.35	
Min Ch El (ft)	1288.86	Shear (lb/sq ft)	0.04	0.18	
Alpha	1.08	Stream Power (lb/ft s)	0.05	0.86	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	88.57	420.67	10.87
C & E Loss (ft)	0.01	Cum SA (acres)	55.44	38.62	8.59

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.134

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4339.29	1301.8	4354.81	1301.67	4464.05	1300.79	4539.16	1300.3	4583.37	1299.96
4651.17	1299.4	4697.86	1299.03	4727.76	1299.06	4749.41	1299.31	4778.91	1299.59
4781.91	1298.6	4807.8	1298.28	4813.38	1299.46	4815.9	1298.61	4827.08	1298.38
4845.58	1297.8	4848.78	1298.87	4854.65	1300.29	4868.47	1300.9	4887.13	1295.24
4907.76	1289.7	4923.14	1289.72	4940.34	1289.83	4991.88	1289.55	5003.11	1289.67
5010.71	1289.6	5059.3	1289.82	5073.88	1289.69	5101.14	1289.57	5106.59	1289.47
5123.56	1294.3	5146.36	1300.92	5167.1	1300.43	5176.44	1300.76	5194.91	1301.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4339.29	.04	4868.47	.025	5146.36	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4868.47	5146.36	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4339.29	4751	1304	5194.91	5194.91	1304

Left Levee Station= 4868.47 Elevation= 1300.9
Right Levee Station= 5146.36 Elevation= 1300.92

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1298.54	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.78	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.30	Flow Area (sq ft)		2046.34	
E.G. Slope (ft/ft)	0.000290	Area (sq ft)		2046.34	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	261.90	Top Width (ft)		261.90	
Vel Total (ft/s)	3.96	Avg. Vel. (ft/s)		3.96	
Max Chl Dpth (ft)	9.07	Hydr. Depth (ft)		7.81	
Conv. Total (cfs)	475897.3	Conv. (cfs)		475897.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		264.40	
Min Ch El (ft)	1289.47	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.55	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.00	279.92	
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	35.26	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.27	Element			
Vel Head (ft)	0.29	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.55	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.05	Flow Area (sq ft)		2509.24	
E.G. Slope (ft/ft)	0.000277	Area (sq ft)		2509.24	
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	273.55	Top Width (ft)		273.55	
Vel Total (ft/s)	4.30	Avg. Vel. (ft/s)		4.30	
Max Chl Dpth (ft)	10.80	Hydr. Depth (ft)		9.17	
Conv. Total (cfs)	648789.5	Conv. (cfs)		648789.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		276.56	
Min Ch El (ft)	1289.47	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	5.87	342.62	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	8.13	36.89	0.59

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1302.09	Element			
Vel Head (ft)	0.33	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1302.43	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.00	Flow Area (sq ft)	364.78	3015.80	60.07
E.G. Slope (ft/ft)	0.000263	Area (sq ft)	1124.84	3015.80	60.07
Q Total (cfs)	14660.00	Flow (cfs)	466.02	14152.52	41.46
Top Width (ft)	855.62	Top Width (ft)	529.18	277.89	48.55
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	1.28	4.69	0.69
Max Chl Dpth (ft)	12.62	Hydr. Depth (ft)	3.11	10.85	1.24
Conv. Total (cfs)	903244.3	Conv. (cfs)	28713.1	871976.8	2554.4
Length Wtd. (ft)	500.00	Wetted Per. (ft)	118.26	281.08	49.05
Min Ch El (ft)	1289.47	Shear (lb/sq ft)	0.05	0.18	0.02
Alpha	1.17	Stream Power (lb/ft s)	0.06	0.83	0.01
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	82.85	407.15	10.74
C & E Loss (ft)	0.01	Cum SA (acres)	52.90	37.39	8.48

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.039

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4339.3	1301.6	4387.78	1301.17	4499.13	1300.86	4576.78	1300.37	4619.65	1300.05
4675.95	1299.6	4735.73	1299.3	4756.64	1299.43	4782.51	1299.82	4785.64	1298.91
4808.36	1298.1	4813.23	1299.45	4814.38	1298.51	4850.37	1297.84	4858.59	1300.37
4871.62	1300.3	4892.81	1294.49	4912.38	1289.01	4919.66	1289.04	4945.97	1288.99
4975.55	1289.3	4987.23	1289.95	5000.89	1289.38	5011.02	1290.03	5019.97	1289.56
5038.24	1289.1	5097.29	1288.96	5101.05	1288.97	5143.71	1300.23	5165.41	1300.21
5177.93	1301.8	5194.91	1302.47						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4339.3	.04	4871.62	.025	5143.71	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4871.62	5143.71	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4339.3	4626	1304	5194.91	5194.91	1304

Left Levee Station= 4871.62 Elevation= 1300.3
Right Levee Station= 5143.71 Elevation= 1300.23

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1298.40	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.64	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1292.95	Flow Area (sq ft)		2056.04	
E.G. Slope (ft/ft)	0.000280	Area (sq ft)		2056.04	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	258.21	Top Width (ft)		258.21	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)		3.94	
Max Chl Dpth (ft)	9.44	Hydr. Depth (ft)		7.96	
Conv. Total (cfs)	484092.2	Conv. (cfs)		484092.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		260.78	
Min Ch El (ft)	1288.96	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.00	256.38	
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	32.28	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.13	Element			
Vel Head (ft)	0.29	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.42	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.71	Flow Area (sq ft)		2514.79	
E.G. Slope (ft/ft)	0.000272	Area (sq ft)		2514.79	
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	271.09	Top Width (ft)		271.09	
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)		4.29	
Max Chl Dpth (ft)	11.17	Hydr. Depth (ft)		9.28	
Conv. Total (cfs)	655024.4	Conv. (cfs)		655024.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		274.13	
Min Ch El (ft)	1288.96	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.67	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	5.87	313.79	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	8.13	33.76	0.59

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1301.98	Element			
Vel Head (ft)	0.31	Wt. n-Val.	0.040	0.025	0.040
E.G. Elev (ft)	1302.29	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.69	Flow Area (sq ft)	664.25	3018.27	50.86
E.G. Slope (ft/ft)	0.000245	Area (sq ft)	995.18	3018.27	50.86
Q Total (cfs)	14660.00	Flow (cfs)	748.31	13876.31	35.38
Top Width (ft)	843.22	Top Width (ft)	532.32	272.09	38.81
Vel Total (ft/s)	3.93	Avg. Vel. (ft/s)	1.13	4.60	0.70
Max Chl Dpth (ft)	13.02	Hydr. Depth (ft)	2.70	11.09	1.31

Conv. Total (cfs)	935678.4	Conv. (cfs)	47761.2	885658.9	2258.2
Length Wtd. (ft)	500.00	Wetted Per. (ft)	246.68	275.16	38.92
Min Ch El (ft)	1288.96	Shear (lb/sq ft)	0.04	0.17	0.02
Alpha	1.30	Stream Power (lb/ft s)	0.05	0.77	0.01
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	70.68	372.52	10.10
C & E Loss (ft)	0.01	Cum SA (acres)	46.81	34.23	7.98

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.944

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4340.98	1301.7	4535.42	1300.67	4566.96	1300.54	4621.63	1300.11	4660.21	1299.87
4782.24	1299.7	4784.43	1298.99	4810.05	1298.35	4813.61	1299.26	4816.62	1298.76
4853.7	1297.7	4860.13	1300.03	4874.02	1299.83	4899.23	1292.87	4913.72	1289.02
4951.81	1288.9	4979.49	1289.14	4992.68	1289.63	4998.51	1288.55	5008.52	1288.72
5013.81	1289.5	5070.79	1288.72	5102.4	1288.74	5129.01	1296.4	5142.98	1300.56
5165.18	1300.3	5180.38	1301.62	5195.89	1302.19				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4340.98	.04	4874.02	.025	5142.98	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.02	5142.98	250	250	250	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4340.98	4860.13	1304	5142.98	5195.89	1304

Left Levee Station= 4860.13 Elevation= 1300.03
Right Levee Station= 5142.98 Elevation= 1300.56

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1298.26	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.50	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1292.74	Flow Area (sq ft)		2063.74	
E.G. Slope (ft/ft)	0.000273	Area (sq ft)		2063.74	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	255.55	Top Width (ft)		255.55	
Vel Total (ft/s)	3.92	Avg. Vel. (ft/s)		3.92	
Max Chl Dpth (ft)	9.71	Hydr. Depth (ft)		8.08	
Conv. Total (cfs)	490217.5	Conv. (cfs)		490217.5	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		258.31	
Min Ch El (ft)	1288.55	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.53	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.00	232.73	
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	29.33	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.00	Element			
Vel Head (ft)	0.29	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1300.28	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1293.51	Flow Area (sq ft)	0.96	2517.97	
E.G. Slope (ft/ft)	0.000266	Area (sq ft)	0.96	2517.97	
Q Total (cfs)	10800.00	Flow (cfs)	0.11	10799.89	
Top Width (ft)	278.64	Top Width (ft)	11.57	267.07	
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)	0.12	4.29	
Max Chl Dpth (ft)	11.45	Hydr. Depth (ft)	0.08	9.43	
Conv. Total (cfs)	662604.5	Conv. (cfs)	6.8	662597.7	
Length Wtd. (ft)	250.00	Wetted Per. (ft)	11.57	270.29	
Min Ch El (ft)	1288.55	Shear (lb/sq ft)	0.00	0.15	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.66	

Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	5.86	284.91	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	8.06	30.67	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1301.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1302.16	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1294.49	Flow Area (sq ft)	25.81	2999.31	
E.G. Slope (ft/ft)	0.000275	Area (sq ft)	829.20	2999.31	43.12
Q Total (cfs)	14660.00	Flow (cfs)	24.03	14635.97	
Top Width (ft)	843.98	Top Width (ft)	533.04	268.96	41.98
Vel Total (ft/s)	4.85	Avg. Vel. (ft/s)	0.93	4.88	
Max Chl Dpth (ft)	13.24	Hydr. Depth (ft)	1.86	11.15	
Conv. Total (cfs)	884044.4	Conv. (cfs)	1449.1	882595.3	
Length Wtd. (ft)	250.00	Wetted Per. (ft)	13.89	272.27	
Min Ch El (ft)	1288.55	Shear (lb/sq ft)	0.03	0.19	
Alpha	1.01	Stream Power (lb/ft s)	0.03	0.92	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	60.21	337.98	9.56
C & E Loss (ft)	0.00	Cum SA (acres)	40.69	31.12	7.52

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.897

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4339.4	1302.1	4405.24	1301.52	4446.41	1301.45	4477.11	1301.28	4496.62	1301.13
4549.54	1300.5	4610.35	1300.24	4638.94	1300.08	4738.9	1299.48	4783.99	1299.8
4788.04	1299	4811.01	1298.3	4814.7	1299.01	4819.59	1298.6	4848.73	1298.21
4855.17	1297.7	4861.91	1299.96	4875.26	1299.63	4892.38	1295.03	4914.92	1288.76
4931.5	1288.8	4970.75	1288.74	4988.2	1289.02	4994.78	1289.27	5003.64	1288.53
5008.2	1288.8	5015.13	1289.55	5018.12	1289.31	5030.53	1288.89	5073.45	1288.57
5089.26	1288.5	5104.41	1288.87	5125.41	1294.57	5146.4	1300.15	5172.54	1300.32
5182.55	1300.8	5197.7	1301.91						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4339.4	.04	4875.26	.025	5146.4	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.26	5146.4	226.79	226.79	226.79	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4339.4	4861.91	1304	5146.4	5197.7	1304

Left Levee Station= 4861.91 Elevation= 1299.96
Right Levee Station= 5146.4 Elevation= 1300.15

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1298.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.43	Reach Len. (ft)	226.79	226.79	226.79
Crit W.S. (ft)	1292.55	Flow Area (sq ft)		2101.05	
E.G. Slope (ft/ft)	0.000261	Area (sq ft)		2101.05	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	258.48	Top Width (ft)		258.48	
Vel Total (ft/s)	3.86	Avg. Vel. (ft/s)		3.86	
Max Chl Dpth (ft)	9.70	Hydr. Depth (ft)		8.13	
Conv. Total (cfs)	501474.4	Conv. (cfs)		501474.4	
Length Wtd. (ft)	226.79	Wetted Per. (ft)		261.10	
Min Ch El (ft)	1288.50	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.51	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.00	220.78	
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	27.85	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1299.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1300.21	Reach Len. (ft)	226.79	226.79	226.79
Crit W.S. (ft)	1293.31	Flow Area (sq ft)	1.93	2561.72	
E.G. Slope (ft/ft)	0.000255	Area (sq ft)	1.93	2561.72	
Q Total (cfs)	10800.00	Flow (cfs)	0.33	10799.67	
Top Width (ft)	282.83	Top Width (ft)	12.49	270.34	
Vel Total (ft/s)	4.21	Avg. Vel. (ft/s)	0.17	4.22	
Max Chl Dpth (ft)	11.44	Hydr. Depth (ft)	0.15	9.48	
Conv. Total (cfs)	676776.3	Conv. (cfs)	20.6	676755.7	
Length Wtd. (ft)	226.79	Wetted Per. (ft)	12.49	273.38	
Min Ch El (ft)	1288.50	Shear (lb/sq ft)	0.00	0.15	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.63	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	5.86	270.33	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	7.99	29.13	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1301.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1302.09	Reach Len. (ft)	226.79	226.79	226.79
Crit W.S. (ft)	1294.29	Flow Area (sq ft)	25.82	3047.15	
E.G. Slope (ft/ft)	0.000263	Area (sq ft)	771.25	3047.15	56.66
Q Total (cfs)	14660.00	Flow (cfs)	24.16	14635.84	
Top Width (ft)	813.75	Top Width (ft)	493.77	271.14	48.83
Vel Total (ft/s)	4.77	Avg. Vel. (ft/s)	0.94	4.80	
Max Chl Dpth (ft)	13.23	Hydr. Depth (ft)	1.93	11.24	
Conv. Total (cfs)	903404.6	Conv. (cfs)	1488.8	901915.8	
Length Wtd. (ft)	226.79	Wetted Per. (ft)	13.35	274.20	
Min Ch El (ft)	1288.50	Shear (lb/sq ft)	0.03	0.18	
Alpha	1.01	Stream Power (lb/ft s)	0.03	0.88	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	55.62	320.63	9.28
C & E Loss (ft)	0.00	Cum SA (acres)	37.74	29.57	7.26

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.854

INPUT
Description: Upstream Side of Retaining Wall on the Left Bank
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4290	1301.9	4310.23	1301.81	4352.32	1301.44	4469.52	1300.8	4591.23	1300.28
4667.13	1300	4703.41	1299.94	4766.27	1299.6	4772.88	1299.49	4782.71	1299.6
4786.2	1299	4809.01	1298.22	4813.39	1299.47	4818.33	1298.92	4831.96	1298.58
4836.71	1298.8	4848.78	1298.7	4855.41	1298.84	4859.39	1299.77	4861.98	1300.02
4874.68	1300.2	4885.7	1296.95	4912	1289.06	4919.38	1288.63	4930.98	1288.47
4939.19	1288.6	4943.33	1288.53	4978.32	1289.06	4995.96	1289.49	5002.96	1288.52
5011.69	1288.4	5017.36	1289.26	5034.84	1289.12	5063.52	1288.8	5106.39	1289.1
5147.53	1300.3	5171.31	1299.99	5182.74	1300.92	5199.65	1301.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4290	.04	4874.68	.025	5147.53	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.68	5147.53	25.98	25.98	25.98	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4290	4874.68	1306	5147.53	5199.65	1306

Left Levee Station= 4874.68 Elevation= 1300.5
Right Levee Station= 5147.53 Elevation= 1300.3

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1298.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.37	Reach Len. (ft)	25.98	25.98	25.98
Crit W.S. (ft)	1292.59	Flow Area (sq ft)		2082.92	
E.G. Slope (ft/ft)	0.000268	Area (sq ft)		2082.92	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	257.90	Top Width (ft)		257.90	
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)		3.89	
Max Chl Dpth (ft)	9.74	Hydr. Depth (ft)		8.08	
Conv. Total (cfs)	494919.8	Conv. (cfs)		494919.8	
Length Wtd. (ft)	25.98	Wetted Per. (ft)		260.59	
Min Ch El (ft)	1288.40	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.52	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.00	209.89	
C & E Loss (ft)	0.03	Cum SA (acres)	0.04	26.51	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1299.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.16	Reach Len. (ft)	25.98	25.98	25.98
Crit W.S. (ft)	1293.36	Flow Area (sq ft)		2542.42	
E.G. Slope (ft/ft)	0.000261	Area (sq ft)		2542.42	
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	270.19	Top Width (ft)		270.19	
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)		4.25	
Max Chl Dpth (ft)	11.48	Hydr. Depth (ft)		9.41	
Conv. Total (cfs)	668291.5	Conv. (cfs)		668291.5	
Length Wtd. (ft)	25.98	Wetted Per. (ft)		273.37	
Min Ch El (ft)	1288.40	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.64	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	5.85	257.04	0.18
C & E Loss (ft)	0.04	Cum SA (acres)	7.96	27.72	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1301.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.025	
E.G. Elev (ft)	1302.03	Reach Len. (ft)	25.98	25.98	25.98
Crit W.S. (ft)	1294.34	Flow Area (sq ft)		3029.39	
E.G. Slope (ft/ft)	0.000272	Area (sq ft)	777.70	3029.39	58.36
Q Total (cfs)	14660.00	Flow (cfs)		14660.00	
Top Width (ft)	872.58	Top Width (ft)	547.61	272.85	52.12
Vel Total (ft/s)	4.84	Avg. Vel. (ft/s)		4.84	
Max Chl Dpth (ft)	13.26	Hydr. Depth (ft)		11.10	
Conv. Total (cfs)	888351.8	Conv. (cfs)		888351.8	
Length Wtd. (ft)	25.98	Wetted Per. (ft)		276.43	
Min Ch El (ft)	1288.40	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.90	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	51.59	304.82	8.98
C & E Loss (ft)	0.05	Cum SA (acres)	35.03	28.16	6.99

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.849

INPUT
Description: Retaining Wall on the Left Bank
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4290	1301.9	4316	1301.68	4335.76	1301.51	4471.14	1300.77	4574.04	1300.33
4671.49	1300	4684.11	1299.94	4743.3	1299.62	4779.36	1299.53	4784.35	1299.12
4807.98	1298.2	4812.17	1299.32	4819.01	1298.87	4861.73	1299.87	4864.05	1300.03
4875.76	1300.2	4897.58	1302.83	4929.74	1302.97	4930.4	1288.45	4940.77	1288.46
4996.93	1289.3	5004.86	1288.55	5012.25	1288.61	5018.41	1289.32	5035.62	1288.88
5046.98	1288.8	5105.96	1289.14	5139.8	1298.25	5147.7	1300.34	5171.84	1300.04

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 5182.66    1301 5190.71 1301.26 5199.85 1301.36

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4290     .04 4929.74    .025  5147.7     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       4929.74  5147.7            25.86   25.86   25.86            .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    4290 4929.74    1305  5147.7 5199.85    1305
Left Levee       Station= 4929.74      Elevation= 1302.97
Right Levee      Station=  5147.7      Elevation= 1300.34
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CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1298.00	Element			
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.33	Reach Len. (ft)	25.86	25.86	25.86
Crit W.S. (ft)	1292.88	Flow Area (sq ft)		1745.54	
E.G. Slope (ft/ft)	0.000383	Area (sq ft)		1745.54	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	208.90	Top Width (ft)		208.90	
Vel Total (ft/s)	4.64	Avg. Vel. (ft/s)		4.64	
Max Chl Dpth (ft)	9.55	Hydr. Depth (ft)		8.36	
Conv. Total (cfs)	413629.3	Conv. (cfs)		413629.3	
Length Wtd. (ft)	25.86	Wetted Per. (ft)		219.28	
Min Ch El (ft)	1288.45	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.88	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.00	208.75	
C & E Loss (ft)	0.05	Cum SA (acres)	0.04	26.37	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1299.70	Element			
Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.11	Reach Len. (ft)	25.86	25.86	25.86
Crit W.S. (ft)	1293.71	Flow Area (sq ft)		2106.95	
E.G. Slope (ft/ft)	0.000383	Area (sq ft)		2106.95	
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	215.40	Top Width (ft)		215.40	
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)		5.13	
Max Chl Dpth (ft)	11.25	Hydr. Depth (ft)		9.78	
Conv. Total (cfs)	552064.3	Conv. (cfs)		552064.3	
Length Wtd. (ft)	25.86	Wetted Per. (ft)		227.63	
Min Ch El (ft)	1288.45	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.13	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	5.85	255.66	0.18
C & E Loss (ft)	0.06	Cum SA (acres)	7.96	27.58	0.59

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1301.42	Element			
Vel Head (ft)	0.54	Wt. n-Val.		0.025	
E.G. Elev (ft)	1301.96	Reach Len. (ft)	25.86	25.86	25.86
Crit W.S. (ft)	1294.77	Flow Area (sq ft)		2480.90	
E.G. Slope (ft/ft)	0.000419	Area (sq ft)		2480.90	42.83
Q Total (cfs)	14660.00	Flow (cfs)		14660.00	
Top Width (ft)	270.04	Top Width (ft)		217.89	52.15
Vel Total (ft/s)	5.91	Avg. Vel. (ft/s)		5.91	
Max Chl Dpth (ft)	12.97	Hydr. Depth (ft)		11.39	
Conv. Total (cfs)	716028.6	Conv. (cfs)		716028.6	
Length Wtd. (ft)	25.86	Wetted Per. (ft)		231.85	
Min Ch El (ft)	1288.45	Shear (lb/sq ft)		0.28	
Alpha	1.00	Stream Power (lb/ft s)		1.65	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	51.36	303.17	8.95
C & E Loss (ft)	0.09	Cum SA (acres)	34.87	28.01	6.96

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.844

INPUT
Description: Downstream Side of Retaining Wall on the Left Bank
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4290	1301.8	4325.49	1301.54	4443.19	1300.92	4511.78	1300.57	4556.93	1300.38
4625.28	1300.1	4667.4	1299.98	4691.97	1299.81	4778.63	1299.48	4784.21	1299.51
4787.28	1299.1	4807.98	1298.36	4813.11	1299.34	4818.38	1299.14	4857.47	1299.23
4862.66	1299.9	4875.47	1300.23	4884.98	1297.67	4905.76	1290.18	4907.99	1289.83
4919.13	1288.61	4931.48	1288.56	4971.24	1288.74	4978.98	1288.9	4998.58	1289.37
5005.12	1288.66	5012.85	1288.66	5019.68	1289.4	5031.96	1289.1	5070.64	1288.86
5090.48	1288.98	5105.28	1289.26	5149.44	1299.69	5150.31	1299.5	5163.23	1299.43
5182.57	1301.08	5200.04	1301.32						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4290	.04	4875.47	.025	5149.44	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.47	5149.44	221.37	221.37	221.37	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4290	4875.47	1305	5149.44	5200.04	1305

Left Levee Station= 4875.47 Elevation= 1300.5
Right Levee Station= 5149.44 Elevation= 1299.69

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1298.04	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.28	Reach Len. (ft)	221.37	221.37	221.37
Crit W.S. (ft)	1292.60	Flow Area (sq ft)		2064.71	
E.G. Slope (ft/ft)	0.000277	Area (sq ft)		2064.71	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	258.82	Top Width (ft)		258.82	
Vel Total (ft/s)	3.92	Avg. Vel. (ft/s)		3.92	
Max Chl Dpth (ft)	9.48	Hydr. Depth (ft)		7.98	
Conv. Total (cfs)	486737.7	Conv. (cfs)		486737.7	
Length Wtd. (ft)	221.37	Wetted Per. (ft)		261.39	
Min Ch El (ft)	1288.56	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.00	207.62	
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	26.23	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1299.75	Element			
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.04	Reach Len. (ft)	221.37	221.37	221.37
Crit W.S. (ft)	1293.36	Flow Area (sq ft)		2520.96	
E.G. Slope (ft/ft)	0.000271	Area (sq ft)		2520.96	4.49
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	289.79	Top Width (ft)		272.20	17.59
Vel Total (ft/s)	4.28	Avg. Vel. (ft/s)		4.28	
Max Chl Dpth (ft)	11.19	Hydr. Depth (ft)		9.26	
Conv. Total (cfs)	656010.9	Conv. (cfs)		656010.9	
Length Wtd. (ft)	221.37	Wetted Per. (ft)		275.19	
Min Ch El (ft)	1288.56	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.66	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	5.85	254.28	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	7.96	27.43	0.59

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1301.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.025	
E.G. Elev (ft)	1301.87	Reach Len. (ft)	221.37	221.37	221.37
Crit W.S. (ft)	1294.33	Flow Area (sq ft)		2998.22	
E.G. Slope (ft/ft)	0.000283	Area (sq ft)	696.30	2998.22	57.16
Q Total (cfs)	14660.00	Flow (cfs)		14660.00	
Top Width (ft)	866.53	Top Width (ft)	541.96	273.97	50.60
Vel Total (ft/s)	4.89	Avg. Vel. (ft/s)		4.89	
Max Chl Dpth (ft)	12.94	Hydr. Depth (ft)		10.94	
Conv. Total (cfs)	871373.6	Conv. (cfs)		871373.6	
Length Wtd. (ft)	221.37	Wetted Per. (ft)		277.29	
Min Ch El (ft)	1288.56	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.93	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	51.15	301.55	8.92
C & E Loss (ft)	0.00	Cum SA (acres)	34.71	27.87	6.93

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.802

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4339.41	1301.3	4415.57	1300.93	4487.12	1300.45	4531.04	1300.21	4616.25	1299.99
4652.63	1299.9	4673.13	1299.85	4782.48	1299.42	4788.09	1299.42	4790.59	1298.63
4809.88	1298.3	4817.57	1299.17	4819.33	1298.65	4843.49	1298.22	4858.7	1297.6
4864.24	1299.3	4876.99	1299.5	4900.49	1293.7	4908.22	1291.94	4921.27	1288.82
4948.4	1288.8	4958.69	1288.99	4991.99	1289.8	5002.9	1288.71	5012.02	1288.73
5024.74	1289.3	5082.75	1289.01	5106.22	1288.82	5149.45	1300.57	5170.96	1300
5183.69	1300.6	5201.46	1301.16						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4339.41	.04	4876.99	.025	5149.45	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4876.99	5149.45	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4339.41	4876.99	1304	5149.45	5201.46	1304

Left Levee Station= 4876.99 Elevation= 1299.5
Right Levee Station= 5149.45 Elevation= 1300.57

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1297.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.21	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1292.85	Flow Area (sq ft)		1967.89	
E.G. Slope (ft/ft)	0.000321	Area (sq ft)		1967.89	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	256.50	Top Width (ft)		256.50	
Vel Total (ft/s)	4.12	Avg. Vel. (ft/s)		4.12	
Max Chl Dpth (ft)	9.23	Hydr. Depth (ft)		7.67	
Conv. Total (cfs)	452198.6	Conv. (cfs)		452198.6	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		258.88	
Min Ch El (ft)	1288.71	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.63	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.00	197.37	
C & E Loss (ft)	0.01	Cum SA (acres)	0.04	24.92	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1299.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.025	

E.G. Elev (ft)	1299.97	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.62	Flow Area (sq ft)		2420.37	
E.G. Slope (ft/ft)	0.000306	Area (sq ft)	108.61	2420.37	
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	425.70	Top Width (ft)	156.57	269.13	
Vel Total (ft/s)	4.46	Avg. Vel. (ft/s)		4.46	
Max Chl Dpth (ft)	10.95	Hydr. Depth (ft)		8.99	
Conv. Total (cfs)	617864.1	Conv. (cfs)		617864.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		271.93	
Min Ch El (ft)	1288.71	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.76	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	5.58	241.73	0.17
C & E Loss (ft)	0.01	Cum SA (acres)	7.56	26.06	0.54

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1301.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.		0.025	
E.G. Elev (ft)	1301.80	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.60	Flow Area (sq ft)		2892.15	
E.G. Slope (ft/ft)	0.000316	Area (sq ft)	773.17	2892.15	47.29
Q Total (cfs)	14660.00	Flow (cfs)		14660.00	
Top Width (ft)	862.05	Top Width (ft)	537.58	272.46	52.01
Vel Total (ft/s)	5.07	Avg. Vel. (ft/s)		5.07	
Max Chl Dpth (ft)	12.69	Hydr. Depth (ft)		10.61	
Conv. Total (cfs)	824393.3	Conv. (cfs)		824393.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		275.38	
Min Ch El (ft)	1288.71	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		1.05	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	47.41	286.58	8.65
C & E Loss (ft)	0.01	Cum SA (acres)	31.97	26.48	6.67

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.708

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4339.41	1301.1	4448.01	1300.2	4520.44	1299.91	4573.68	1299.82	4629.63	1299.63
4690.53	1299.3	4711.57	1299.16	4778.54	1298.93	4791.06	1299.41	4804.32	1298.71
4814.62	1298.3	4819.75	1299.27	4847.46	1298.39	4859.31	1297.58	4864.52	1299.55
4877.64	1299.7	4899.94	1293.55	4918.96	1288.39	4966.43	1288.35	5005.78	1288.4
5013.95	1287.7	5020.1	1288.53	5073.01	1288.17	5101	1288.54	5105.93	1288.54
5148.89	1300.3	5158	1300.27	5162.76	1300.22	5172.38	1299.74	5186.01	1300.99
5203.63	1301.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4339.41	.04	4877.64	.025	5148.89	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4877.64	5148.89	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4339.41	4877.64	1304	5148.89	5203.63	1304

Left Levee Station= 4877.64 Elevation= 1299.7
Right Levee Station= 5148.89 Elevation= 1300.3

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1297.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.05	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1292.13	Flow Area (sq ft)		2092.55	
E.G. Slope (ft/ft)	0.000260	Area (sq ft)		2092.55	

Q Total (cfs)	8100.00	Flow (cfs)		8100.00
Top Width (ft)	255.39	Top Width (ft)		255.39
Vel Total (ft/s)	3.87	Avg. Vel. (ft/s)		3.87
Max Chl Dpth (ft)	10.12	Hydr. Depth (ft)		8.19
Conv. Total (cfs)	502091.3	Conv. (cfs)		502091.3
Length Wtd. (ft)	500.00	Wetted Per. (ft)		257.99
Min Ch El (ft)	1287.70	Shear (lb/sq ft)		0.13
Alpha	1.00	Stream Power (lb/ft s)		0.51
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.00	174.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	21.98

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1299.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.82	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1292.91	Flow Area (sq ft)		2543.36	
E.G. Slope (ft/ft)	0.000258	Area (sq ft)		2543.36	
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	267.93	Top Width (ft)		267.93	
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)		4.25	
Max Chl Dpth (ft)	11.84	Hydr. Depth (ft)		9.49	
Conv. Total (cfs)	672607.7	Conv. (cfs)		672607.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		270.99	
Min Ch El (ft)	1287.70	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.64	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	4.95	213.24	0.17
C & E Loss (ft)	0.00	Cum SA (acres)	6.67	22.98	0.54

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1301.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.025	
E.G. Elev (ft)	1301.64	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.90	Flow Area (sq ft)		3011.86	
E.G. Slope (ft/ft)	0.000275	Area (sq ft)	860.57	3011.86	40.57
Q Total (cfs)	14660.00	Flow (cfs)		14660.00	
Top Width (ft)	858.88	Top Width (ft)	538.23	271.25	49.40
Vel Total (ft/s)	4.87	Avg. Vel. (ft/s)		4.87	
Max Chl Dpth (ft)	13.58	Hydr. Depth (ft)		11.10	
Conv. Total (cfs)	884060.8	Conv. (cfs)		884060.8	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		274.44	
Min Ch El (ft)	1287.70	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.92	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	38.04	252.69	8.15
C & E Loss (ft)	0.01	Cum SA (acres)	25.79	23.36	6.09

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.613

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4339.42	1301.2	4382.31	1301	4448.47	1300.52	4490.53	1300.38	4568.56	1299.93
4609.05	1299.7	4665.75	1299.35	4727.55	1298.93	4782.93	1298.33	4791.7	1298.79
4804.77	1298.7	4811.67	1297.78	4819.43	1299.42	4822.83	1299.09	4825.01	1298.57
4830.55	1298.4	4845.16	1297.57	4852.83	1298.37	4865.8	1298.01	4889.27	1291.62
4901.17	1288.5	4947.18	1288.37	4965.09	1288.29	4994.38	1288.24	5004.03	1287.19
5011.95	1288.2	5059.69	1288.24	5093.82	1288.2	5109.46	1292.57	5138	1300.11
5144.83	1300	5151.57	1299.66	5172.61	1299.38	5187.58	1299.69	5207.46	1300.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4339.42	.04	4865.8	.025	5138	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4865.8	5138	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4339.42	4819.43	1304	5138	5207.46	1304

Left Levee Station= 4819.43 Elevation= 1299.42
Right Levee Station= 5138 Elevation= 1300.11

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1297.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1297.92	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1291.96	Flow Area (sq ft)	0.24	2145.92	
E.G. Slope (ft/ft)	0.000247	Area (sq ft)	0.24	2145.92	
Q Total (cfs)	8100.00	Flow (cfs)	0.02	8099.98	
Top Width (ft)	265.57	Top Width (ft)	3.61	261.96	
Vel Total (ft/s)	3.77	Avg. Vel. (ft/s)	0.10	3.77	
Max Chl Dpth (ft)	10.51	Hydr. Depth (ft)	0.07	8.19	
Conv. Total (cfs)	514903.0	Conv. (cfs)	1.5	514901.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	3.62	264.56	
Min Ch El (ft)	1287.19	Shear (lb/sq ft)	0.00	0.13	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.47	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.00	149.74	
C & E Loss (ft)	0.00	Cum SA (acres)	0.02	19.02	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1299.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1299.70	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1292.70	Flow Area (sq ft)	55.62	2606.35	
E.G. Slope (ft/ft)	0.000238	Area (sq ft)	149.94	2606.35	
Q Total (cfs)	10800.00	Flow (cfs)	35.90	10764.10	
Top Width (ft)	482.97	Top Width (ft)	213.34	269.63	
Vel Total (ft/s)	4.06	Avg. Vel. (ft/s)	0.65	4.13	
Max Chl Dpth (ft)	12.24	Hydr. Depth (ft)	1.20	9.67	
Conv. Total (cfs)	700338.9	Conv. (cfs)	2327.8	698011.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	46.52	272.50	
Min Ch El (ft)	1287.19	Shear (lb/sq ft)	0.02	0.14	
Alpha	1.03	Stream Power (lb/ft s)	0.01	0.59	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	4.09	183.68	0.17
C & E Loss (ft)	0.00	Cum SA (acres)	5.44	19.89	0.54

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1301.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1301.50	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.68	Flow Area (sq ft)	135.89	3076.68	
E.G. Slope (ft/ft)	0.000251	Area (sq ft)	781.33	3076.68	95.94
Q Total (cfs)	14660.00	Flow (cfs)	163.54	14496.46	
Top Width (ft)	860.13	Top Width (ft)	518.47	272.20	69.46
Vel Total (ft/s)	4.56	Avg. Vel. (ft/s)	1.20	4.71	
Max Chl Dpth (ft)	13.97	Hydr. Depth (ft)	2.93	11.30	
Conv. Total (cfs)	924721.3	Conv. (cfs)	10316.0	914405.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	46.52	275.16	
Min Ch El (ft)	1287.19	Shear (lb/sq ft)	0.05	0.18	
Alpha	1.05	Stream Power (lb/ft s)	0.06	0.83	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	28.62	217.75	7.37
C & E Loss (ft)	0.00	Cum SA (acres)	19.73	20.24	5.41

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.518

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4339.42	1301.3	4422.98	1300.69	4527.96	1300	4559.6	1299.85	4609.3	1299.55
4646.48	1299.3	4693.55	1298.88	4751.17	1298.41	4773.78	1298	4787.57	1297.76
4795.02	1298.6	4806.78	1298.57	4817.62	1297.37	4820.57	1298.35	4823.28	1298.83
4827.54	1297.8	4842.19	1297.41	4847.88	1299	4862	1299.27	4878.7	1294.63
4901.15	1288.2	4919.15	1288.15	4992.7	1288.32	5001.08	1287.94	5003.29	1288.09
5033.61	1288.3	5046.72	1288.28	5084.93	1287.96	5124.75	1297.58	5133.38	1299.71
5158.86	1298.7	5201.26	1300.49	5209.37	1300.58				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4339.42	.04	4862	.025	5133.38	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4862	5133.38	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4339.42	4862	1303	5133.38	5209.37	1303

Left Levee Station= 4862 Elevation= 1299.27
Right Levee Station= 5133.38 Elevation= 1299.71

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1297.55	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1297.79	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1291.99	Flow Area (sq ft)		2063.43	
E.G. Slope (ft/ft)	0.000274	Area (sq ft)		2063.43	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	256.46	Top Width (ft)		256.46	
Vel Total (ft/s)	3.93	Avg. Vel. (ft/s)		3.93	
Max Chl Dpth (ft)	9.61	Hydr. Depth (ft)		8.05	
Conv. Total (cfs)	489322.1	Conv. (cfs)		489322.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		258.92	
Min Ch El (ft)	1287.94	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		125.59	
C & E Loss (ft)	0.00	Cum SA (acres)		16.04	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1299.28	Element			
Vel Head (ft)	0.29	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.57	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1292.77	Flow Area (sq ft)		2518.38	
E.G. Slope (ft/ft)	0.000268	Area (sq ft)	163.11	2518.38	
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	483.18	Top Width (ft)	213.54	269.65	
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)		4.29	
Max Chl Dpth (ft)	11.34	Hydr. Depth (ft)		9.34	
Conv. Total (cfs)	659111.6	Conv. (cfs)		659111.6	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		272.55	
Min Ch El (ft)	1287.94	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.66	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	2.29	154.27	0.17
C & E Loss (ft)	0.00	Cum SA (acres)	2.99	16.80	0.54

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.99	Element			
Vel Head (ft)	0.38	Wt. n-Val.		0.025	
E.G. Elev (ft)	1301.37	Reach Len. (ft)	500.00	500.00	500.00

Crit W.S. (ft)	1293.76	Flow Area (sq ft)		2982.03	
E.G. Slope (ft/ft)	0.000284	Area (sq ft)	762.05	2982.03	108.49
Q Total (cfs)	14660.00	Flow (cfs)		14660.00	
Top Width (ft)	827.79	Top Width (ft)	480.42	271.38	75.99
Vel Total (ft/s)	4.92	Avg. Vel. (ft/s)		4.92	
Max Chl Dpth (ft)	13.05	Hydr. Depth (ft)		10.99	
Conv. Total (cfs)	869733.4	Conv. (cfs)		869733.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		274.34	
Min Ch El (ft)	1287.94	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.95	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	19.76	182.98	6.19
C & E Loss (ft)	0.00	Cum SA (acres)	13.99	17.12	4.57

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.424

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4358.23	1301.8	4482.56	1300.83	4617.12	1299.75	4689.58	1299.49	4702.76	1299.42
4762	1299	4795.25	1298.54	4809.17	1298.15	4816.84	1298.83	4826.13	1298.95
4837.67	1297.2	4843.35	1298.51	4845.46	1299.25	4849.09	1297.77	4863.1	1297.27
4869.76	1299.4	4884.11	1299.07	4897.9	1295.23	4923.82	1288.37	4953.01	1288.32
4976.11	1288.5	5003.08	1288.57	5023.48	1288.24	5056.09	1287.94	5059.2	1287.99
5095.19	1288.1	5110.65	1288.24	5154.76	1299.94	5161.39	1299.77	5180.49	1298.73
5216.26	1300								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4358.23	.04	4884.11	.025	5154.76	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4884.11	5154.76	470.1	470.1	470.1	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4358.23	4869.76	1303	5154.76	5216.26	1303

Left Levee Station= 4869.76 Elevation= 1299.4
Right Levee Station= 5154.76 Elevation= 1299.94

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1297.40	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1297.65	Reach Len. (ft)	470.10	470.10	470.10
Crit W.S. (ft)	1292.03	Flow Area (sq ft)		2018.59	
E.G. Slope (ft/ft)	0.000293	Area (sq ft)		2018.59	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	255.07	Top Width (ft)		255.07	
Vel Total (ft/s)	4.01	Avg. Vel. (ft/s)		4.01	
Max Chl Dpth (ft)	9.46	Hydr. Depth (ft)		7.91	
Conv. Total (cfs)	473504.4	Conv. (cfs)		473504.4	
Length Wtd. (ft)	470.10	Wetted Per. (ft)		257.46	
Min Ch El (ft)	1287.94	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.57	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		102.16	
C & E Loss (ft)	0.00	Cum SA (acres)		13.10	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1299.13	Element			
Vel Head (ft)	0.30	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1299.43	Reach Len. (ft)	470.10	470.10	470.10
Crit W.S. (ft)	1292.80	Flow Area (sq ft)	0.09	2471.65	
E.G. Slope (ft/ft)	0.000283	Area (sq ft)	0.09	2471.65	
Q Total (cfs)	10800.00	Flow (cfs)	0.01	10800.00	

Top Width (ft)	270.33	Top Width (ft)	2.72	267.61	
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)	0.06	4.37	
Max Chl Dpth (ft)	11.19	Hydr. Depth (ft)	0.03	9.24	
Conv. Total (cfs)	642161.8	Conv. (cfs)	0.3	642161.5	
Length Wtd. (ft)	470.10	Wetted Per. (ft)	2.72	270.45	
Min Ch El (ft)	1287.94	Shear (lb/sq ft)	0.00	0.16	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.71	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	1.36	125.63	0.17
C & E Loss (ft)	0.00	Cum SA (acres)	1.75	13.71	0.54

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.83	Element			
Vel Head (ft)	0.39	Wt. n-Val.	0.040	0.025	
E.G. Elev (ft)	1301.22	Reach Len. (ft)	470.10	470.10	470.10
Crit W.S. (ft)	1293.80	Flow Area (sq ft)	22.94	2930.85	
E.G. Slope (ft/ft)	0.000299	Area (sq ft)	562.10	2930.85	89.28
Q Total (cfs)	14660.00	Flow (cfs)	20.15	14639.85	
Top Width (ft)	734.18	Top Width (ft)	402.03	270.65	61.50
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)	0.88	5.00	
Max Chl Dpth (ft)	12.89	Hydr. Depth (ft)	1.60	10.83	
Conv. Total (cfs)	847680.6	Conv. (cfs)	1165.1	846515.6	
Length Wtd. (ft)	470.10	Wetted Per. (ft)	14.35	273.60	
Min Ch El (ft)	1287.94	Shear (lb/sq ft)	0.03	0.20	
Alpha	1.01	Stream Power (lb/ft s)	0.03	1.00	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	12.16	149.04	5.06
C & E Loss (ft)	0.00	Cum SA (acres)	8.93	14.01	3.78

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.334

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4358.23	1301.4	4384.59	1300.98	4457.15	1300.47	4501.92	1300.13	4545.12	1299.82
4589.98	1299.7	4621.74	1299.35	4645.83	1299.31	4671.41	1300.23	4690.32	1300.2
4713.99	1300.1	4731.16	1299.39	4741.52	1299.17	4756.83	1298.99	4762.94	1298.85
4777.45	1298.2	4791.46	1298.02	4800.99	1298.87	4809.26	1299.14	4820.58	1298.17
4829.72	1299.2	4833.64	1297.74	4844.83	1297.75	4852.99	1299.06	4865.69	1299.57
4870.17	1298.1	4897.96	1289.83	4904.66	1288.76	4950.22	1288.31	4977.21	1288.01
4994.85	1288	5008.3	1288.31	5017.63	1288.28	5059.69	1288.57	5086.92	1288.25
5099.38	1288.7	5136.54	1298.94	5139.3	1298.94	5145.29	1298.44	5155.01	1299
5163.32	1298.3	5178.69	1298.81	5199.14	1299.41	5213.91	1300.81		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4358.23	.04	4865.69	.025	5136.54	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4865.69	5136.54	500.09	500.09	500.09	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4358.23	4865.69	1303	5136.54	5213.91	1303

Left Levee Station= 4671.41 Elevation= 1300.23
Right Levee Station= 5136.54 Elevation= 1298.94

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1297.26	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1297.51	Reach Len. (ft)	500.09	500.09	500.09
Crit W.S. (ft)	1292.03	Flow Area (sq ft)		2013.41	
E.G. Slope (ft/ft)	0.000299	Area (sq ft)		2013.41	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	257.45	Top Width (ft)		257.45	

Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)	4.02
Max Chl Dpth (ft)	9.26	Hydr. Depth (ft)	7.82
Conv. Total (cfs)	468665.9	Conv. (cfs)	468665.9
Length Wtd. (ft)	500.09	Wetted Per. (ft)	259.79
Min Ch El (ft)	1288.00	Shear (lb/sq ft)	0.14
Alpha	1.00	Stream Power (lb/ft s)	0.58
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	80.40
C & E Loss (ft)	0.00	Cum SA (acres)	10.34

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1299.00	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.30	Reach Len. (ft)	500.09	500.09	500.09
Crit W.S. (ft)	1292.79	Flow Area (sq ft)		2471.78	
E.G. Slope (ft/ft)	0.000285	Area (sq ft)	53.44	2471.78	15.07
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	405.96	Top Width (ft)	88.28	269.11	48.57
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)		4.37	
Max Chl Dpth (ft)	11.00	Hydr. Depth (ft)		9.19	
Conv. Total (cfs)	639857.4	Conv. (cfs)		639857.4	
Length Wtd. (ft)	500.09	Wetted Per. (ft)		271.95	
Min Ch El (ft)	1288.00	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.71	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	1.07	98.96	0.09
C & E Loss (ft)	0.00	Cum SA (acres)	1.26	10.82	0.28

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.69	Element			
Vel Head (ft)	0.39	Wt. n-Val.		0.025	
E.G. Elev (ft)	1301.08	Reach Len. (ft)	500.09	500.09	500.09
Crit W.S. (ft)	1293.76	Flow Area (sq ft)		2929.40	
E.G. Slope (ft/ft)	0.000301	Area (sq ft)	497.13	2929.40	126.72
Q Total (cfs)	14660.00	Flow (cfs)		14660.00	
Top Width (ft)	786.88	Top Width (ft)	439.92	270.85	76.11
Vel Total (ft/s)	5.00	Avg. Vel. (ft/s)		5.00	
Max Chl Dpth (ft)	12.69	Hydr. Depth (ft)		10.82	
Conv. Total (cfs)	845450.9	Conv. (cfs)		845450.9	
Length Wtd. (ft)	500.09	Wetted Per. (ft)		273.78	
Min Ch El (ft)	1288.00	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		1.01	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	6.44	117.42	3.89
C & E Loss (ft)	0.00	Cum SA (acres)	4.39	11.08	3.04

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.24

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4345.71	1301.1	4405.2	1300.66	4504.04	1299.83	4525.26	1299.68	4588.94	1299.12
4645.31	1298.7	4666.47	1298.52	4668.02	1298.44	4683.02	1298.37	4760.27	1297.62
4765	1297.5	4771.84	1298.73	4779.41	1298.52	4789.88	1298.02	4799.58	1300.6
4816.52	1301.2	4821.44	1298.17	4825.82	1297.8	4840.43	1297.39	4846.26	1299
4860.42	1299	4876.67	1294.37	4898.96	1288.06	4949.61	1288.36	4979.77	1288.32
4995.4	1288.5	5021.73	1288.43	5041.83	1288.45	5091.52	1288.74	5095.39	1288.89
5130.07	1299.5	5147.14	1299.31	5157.77	1298.77	5194.85	1299.85	5207.29	1300.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4345.71	.04	4860.42	.025	5130.07	.04

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

```
      4860.42 5130.07              500      500      500              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 4345.71 4860.42    1303 5130.07 5207.29    1303
Left Levee       Station= 4816.52       Elevation=  1301.5
Right Levee      Station= 5130.07       Elevation=  1299.5
```

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1297.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1297.35	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1292.07	Flow Area (sq ft)		1957.70	
E.G. Slope (ft/ft)	0.000324	Area (sq ft)		1957.70	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	255.05	Top Width (ft)		255.05	
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)		4.14	
Max Chl Dpth (ft)	9.03	Hydr. Depth (ft)		7.68	
Conv. Total (cfs)	449850.5	Conv. (cfs)		449850.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		257.54	
Min Ch El (ft)	1288.06	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.64	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)		57.61	
C & E Loss (ft)	0.00	Cum SA (acres)		7.40	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1298.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.025	
E.G. Elev (ft)	1299.15	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1292.84	Flow Area (sq ft)		2413.94	
E.G. Slope (ft/ft)	0.000305	Area (sq ft)	26.00	2413.94	
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	292.21	Top Width (ft)	25.31	266.90	
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)		4.47	
Max Chl Dpth (ft)	10.78	Hydr. Depth (ft)		9.04	
Conv. Total (cfs)	618206.5	Conv. (cfs)		618206.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		269.90	
Min Ch El (ft)	1288.06	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.76	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.61	70.91	
C & E Loss (ft)	0.00	Cum SA (acres)	0.61	7.74	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1300.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.92	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.81	Flow Area (sq ft)		2866.20	
E.G. Slope (ft/ft)	0.000322	Area (sq ft)	93.23	2866.20	84.24
Q Total (cfs)	14660.00	Flow (cfs)		14660.00	
Top Width (ft)	389.66	Top Width (ft)	42.79	269.65	77.22
Vel Total (ft/s)	5.11	Avg. Vel. (ft/s)		5.11	
Max Chl Dpth (ft)	12.46	Hydr. Depth (ft)		10.63	
Conv. Total (cfs)	817282.7	Conv. (cfs)		817282.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		272.77	
Min Ch El (ft)	1288.06	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		1.08	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	3.05	84.15	2.68
C & E Loss (ft)	0.00	Cum SA (acres)	1.62	7.98	2.16

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.145

INPUT
Description: Detention Basin located East of East Maricopa Floodway Channel
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4345.72	1301.3	4433.16	1300.49	4473.32	1300.02	4533.85	1299.59	4568.64	1299.25
4599.61	1298.8	4606.84	1299.95	4617.59	1299.96	4622.93	1300.68	4628.07	1301.64
4636.21	1301.2	4654.86	1297.83	4776.05	1297.83	4796.45	1301.02	4809.24	1301.52
4815.22	1298.3	4820.98	1297.16	4834	1296.96	4840.21	1299.17	4854.31	1298.73
4890.59	1288.4	4913.39	1288.49	4983.56	1288.14	4999.12	1288.29	5043.65	1288.41
5063.66	1288.5	5089.63	1288.77	5112.5	1296.23	5122.74	1299.49	5141.07	1299.3
5150.74	1298.4	5172.51	1299.55	5200.12	1300.38				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4345.72	.04	4840.21	.025	5122.74	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4840.21	5122.74	485.37	485.37	485.37	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4345.72	4840.21	1302	5122.74	5200.12	1302

Left Levee Station= 4809.24 Elevation= 1301.52
Right Levee Station= 5122.74 Elevation= 1299.49

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1296.91	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
E.G. Elev (ft)	1297.19	Reach Len. (ft)	485.37	485.37	485.37
Crit W.S. (ft)	1292.03	Flow Area (sq ft)		1925.93	
E.G. Slope (ft/ft)	0.000340	Area (sq ft)		1925.93	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	253.95	Top Width (ft)		253.95	
Vel Total (ft/s)	4.21	Avg. Vel. (ft/s)		4.21	
Max Chl Dpth (ft)	8.77	Hydr. Depth (ft)		7.58	
Conv. Total (cfs)	439011.1	Conv. (cfs)		439011.1	
Length Wtd. (ft)	485.37	Wetted Per. (ft)		256.43	
Min Ch El (ft)	1288.14	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.67	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		35.32	
C & E Loss (ft)	0.01	Cum SA (acres)		4.48	

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1298.67	Element			
Vel Head (ft)	0.32	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.99	Reach Len. (ft)	485.37	485.37	485.37
Crit W.S. (ft)	1292.78	Flow Area (sq ft)		2383.12	
E.G. Slope (ft/ft)	0.000317	Area (sq ft)	30.65	2383.12	
Q Total (cfs)	10800.00	Flow (cfs)		10800.00	
Top Width (ft)	289.94	Top Width (ft)	24.28	265.66	
Vel Total (ft/s)	4.53	Avg. Vel. (ft/s)		4.53	
Max Chl Dpth (ft)	10.53	Hydr. Depth (ft)		8.97	
Conv. Total (cfs)	606966.1	Conv. (cfs)		606966.1	
Length Wtd. (ft)	485.37	Wetted Per. (ft)		268.66	
Min Ch El (ft)	1288.14	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.79	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.29	43.38	
C & E Loss (ft)	0.01	Cum SA (acres)	0.32	4.68	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

			Left OB	Channel	Right OB
W.S. Elev (ft)	1300.34	Element			
Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.75	Reach Len. (ft)	485.37	485.37	485.37

Crit W.S. (ft)	1293.74	Flow Area (sq ft)		2850.53	
E.G. Slope (ft/ft)	0.000349	Area (sq ft)	75.84	2850.53	72.11
Q Total (cfs)	14660.00	Flow (cfs)		14660.00	
Top Width (ft)	387.49	Top Width (ft)	28.79	282.53	76.17
Vel Total (ft/s)	5.14	Avg. Vel. (ft/s)		5.14	
Max Chl Dpth (ft)	12.20	Hydr. Depth (ft)		10.09	
Conv. Total (cfs)	785263.7	Conv. (cfs)		785263.7	
Length Wtd. (ft)	485.37	Wetted Per. (ft)		285.67	
Min Ch El (ft)	1288.14	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.12	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	2.08	51.34	1.78
C & E Loss (ft)	0.01	Cum SA (acres)	1.21	4.81	1.28

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.053

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4212.19	1303.1	4239.9	1302.63	4286.47	1302.13	4305.03	1301.71	4314.51	1301.73
4323.79	1300.9	4330.42	1300.79	4335.45	1300.49	4337.59	1300.64	4348.86	1299.95
4355.25	1299.7	4362.61	1300.28	4372.49	1301.57	4374.31	1301.62	4383	1300.99
4394.48	1299.8	4406.32	1298.4	4410.79	1297.72	4426.34	1297.07	4445.56	1297.34
4454.82	1299.1	4473.1	1302.45	4488.27	1301.01	4501.89	1299.92	4508.76	1299.52
4531.57	1300.3	4535.16	1300.27	4546.74	1298.04	4556.85	1296.88	4568.18	1296.82
4574.87	1296.6	4585.14	1296.66	4599.81	1296.89	4641.92	1302.28	4663.19	1301.88
4679.87	1301.7	4703.61	1300.17	4723.59	1298.79	4739.22	1297.83	4767.44	1297.83
4784.37	1299.9	4790.84	1300.74	4811.52	1300.75	4828.1	1298.72	4837.76	1297.76
4846.34	1298.7	4862.99	1298.67	4900.53	1288.12	4916.43	1287.81	4945.61	1287.57
5002.11	1288	5019.74	1287.86	5033.22	1287.65	5071.26	1287.67	5096.91	1287.94
5131.37	1298.7	5154.33	1298.67	5163.25	1298.14	5181.15	1298.37	5205.1	1299.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4212.19	.04	4862.99	.025	5131.37	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4862.99	5131.37	89.53	89.53	89.53	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4212.19	4862.99	1302	5131.37	5205.1	1302

Left Levee Station= 4811.52 Elevation= 1301.5
Right Levee Station= 5131.37 Elevation= 1298.7

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1296.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1297.03	Reach Len. (ft)	89.53	89.53	89.53
Crit W.S. (ft)	1291.45	Flow Area (sq ft)		2026.60	
E.G. Slope (ft/ft)	0.000290	Area (sq ft)		2026.60	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	255.50	Top Width (ft)		255.50	
Vel Total (ft/s)	4.00	Avg. Vel. (ft/s)		4.00	
Max Chl Dpth (ft)	9.21	Hydr. Depth (ft)		7.93	
Conv. Total (cfs)	475925.6	Conv. (cfs)		475925.6	
Length Wtd. (ft)	89.53	Wetted Per. (ft)		258.05	
Min Ch El (ft)	1287.57	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.57	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		13.30	
C & E Loss (ft)	0.00	Cum SA (acres)		1.64	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1298.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.84	Reach Len. (ft)	89.53	89.53	89.53

Crit W.S. (ft)	1292.21	Flow Area (sq ft)		2489.00
E.G. Slope (ft/ft)	0.000276	Area (sq ft)	5.94	2489.00
Q Total (cfs)	10800.00	Flow (cfs)		10800.00
Top Width (ft)	282.55	Top Width (ft)	15.10	267.45
Vel Total (ft/s)	4.34	Avg. Vel. (ft/s)		4.34
Max Chl Dpth (ft)	10.98	Hydr. Depth (ft)		9.31
Conv. Total (cfs)	649585.3	Conv. (cfs)		649585.3
Length Wtd. (ft)	89.53	Wetted Per. (ft)		270.52
Min Ch El (ft)	1287.57	Shear (lb/sq ft)		0.16
Alpha	1.00	Stream Power (lb/ft s)		0.69
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.08	16.24
C & E Loss (ft)	0.00	Cum SA (acres)	0.10	1.71

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1300.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.59	Reach Len. (ft)	89.53	89.53	89.53
Crit W.S. (ft)	1293.18	Flow Area (sq ft)		2933.74	
E.G. Slope (ft/ft)	0.000296	Area (sq ft)	70.21	2933.74	118.38
Q Total (cfs)	14660.00	Flow (cfs)		14660.00	
Top Width (ft)	389.12	Top Width (ft)	47.01	268.38	73.73
Vel Total (ft/s)	5.00	Avg. Vel. (ft/s)		5.00	
Max Chl Dpth (ft)	12.63	Hydr. Depth (ft)		10.93	
Conv. Total (cfs)	852303.4	Conv. (cfs)		852303.4	
Length Wtd. (ft)	89.53	Wetted Per. (ft)		271.48	
Min Ch El (ft)	1287.57	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		1.00	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	1.27	19.12	0.72
C & E Loss (ft)	0.00	Cum SA (acres)	0.78	1.74	0.44

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.036

INPUT
Description: Just Upstream of Side Inlet (95' Wide) from the Left Bank
Q(D)=8,100 cfs, Q(F)=10,790 cfs & Q(E)=14,630 cfs
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4209.15	1305.2	4227.56	1303.74	4249.39	1302.1	4257.14	1300.53	4270.43	1302.34
4317.44	1301.6	4357.82	1301.39	4374.57	1301.13	4401.84	1300.88	4418.93	1300.82
4436.07	1300.7	4461.25	1300.39	4483.54	1300.26	4518.35	1300.25	4531.72	1298.03
4535.89	1297.8	4545.46	1296.5	4566.25	1296.13	4576.37	1296.17	4588.39	1297.27
4595.18	1298.2	4601.78	1298.89	4607.27	1300.14	4614.04	1299.93	4615.86	1300.37
4625.88	1299	4627.28	1298.35	4630.47	1297.99	4639.25	1298.57	4651.42	1298.79
4670.33	1298.8	4683.42	1295.56	4692.38	1295.65	4703.21	1295.33	4728.75	1301.2
4737.92	1301.2	4762.8	1300.42	4768.2	1300.31	4783.96	1299.11	4794.58	1298.55
4807.39	1297.5	4817.03	1297.36	4826.35	1297.03	4836.36	1298.61	4848.49	1299.23
4861.42	1299.4	4875.63	1295.24	4904.67	1287.7	4922.89	1287.69	4980.82	1287.51
5002.65	1287.7	5017.51	1287.58	5056.12	1287.69	5071.71	1287.71	5099.32	1287.81
5123.07	1295.2	5135.85	1299.01	5153.49	1298.57	5164.22	1297.7	5182.27	1298.18
5207.33	1299.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4209.15	.04	4861.42	.025	5135.85	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4861.42	5135.85	95.92	95.92	95.92	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4209.15	4861.42	1302	5135.85	5207.33	1302

Left Levee Station= 4737.92 Elevation= 1301.5

Right Levee Station= 5135.85 Elevation= 1299.01

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1296.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
E.G. Elev (ft)	1297.00	Reach Len. (ft)	95.92	95.92	95.92
Crit W.S. (ft)	1291.33	Flow Area (sq ft)		2059.32	
E.G. Slope (ft/ft)	0.000278	Area (sq ft)		2059.32	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	257.85	Top Width (ft)		257.85	
Vel Total (ft/s)	3.93	Avg. Vel. (ft/s)		3.93	
Max Chl Dpth (ft)	9.25	Hydr. Depth (ft)		7.99	
Conv. Total (cfs)	485862.5	Conv. (cfs)		485862.5	
Length Wtd. (ft)	95.92	Wetted Per. (ft)		260.39	
Min Ch El (ft)	1287.51	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		9.10	
C & E Loss (ft)	0.00	Cum SA (acres)		1.11	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1298.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.81	Reach Len. (ft)	95.92	95.92	95.92
Crit W.S. (ft)	1292.10	Flow Area (sq ft)		2526.46	
E.G. Slope (ft/ft)	0.000266	Area (sq ft)	36.61	2526.46	
Q Total (cfs)	10790.00	Flow (cfs)		10790.00	
Top Width (ft)	310.85	Top Width (ft)	41.01	269.84	
Vel Total (ft/s)	4.27	Avg. Vel. (ft/s)		4.27	
Max Chl Dpth (ft)	11.02	Hydr. Depth (ft)		9.36	
Conv. Total (cfs)	662097.3	Conv. (cfs)		662097.3	
Length Wtd. (ft)	95.92	Wetted Per. (ft)		272.89	
Min Ch El (ft)	1287.51	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.66	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.04	11.08	
C & E Loss (ft)	0.00	Cum SA (acres)	0.05	1.16	

Warning - Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1300.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.56	Reach Len. (ft)	95.92	95.92	95.92
Crit W.S. (ft)	1293.07	Flow Area (sq ft)		2979.91	
E.G. Slope (ft/ft)	0.000288	Area (sq ft)	154.57	2979.91	123.52
Q Total (cfs)	14630.00	Flow (cfs)		14630.00	
Top Width (ft)	437.52	Top Width (ft)	91.61	274.43	71.48
Vel Total (ft/s)	4.91	Avg. Vel. (ft/s)		4.91	
Max Chl Dpth (ft)	12.68	Hydr. Depth (ft)		10.86	
Conv. Total (cfs)	861734.8	Conv. (cfs)		861734.8	
Length Wtd. (ft)	95.92	Wetted Per. (ft)		277.67	
Min Ch El (ft)	1287.51	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.95	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	1.04	13.04	0.47
C & E Loss (ft)	0.00	Cum SA (acres)	0.64	1.19	0.30

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.018

INPUT
Description: Just Upstream of Hunt Highway
Downstream of Side Inlet (95' Wide)
from the Left Bank

Q(D)=8,700 cfs, Q(F)=11,920 cfs & Q(E)=15,770 cfs

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4220.78	1302.4	4233.23	1302.5	4246.91	1302.16	4310.35	1306.97	4322.78	1307.19
4356.36	1303.5	4376.11	1301.57	4393.26	1299.27	4394.09	1299.08	4411.38	1300.95
4429.38	1301.1	4443.5	1300.97	4480.78	1300.41	4519.64	1300.3	4565.59	1299.71
4568.61	1298.9	4570.99	1297.93	4578.34	1299.93	4609.45	1298.8	4634.63	1298.65
4640.02	1298.7	4644.5	1298.32	4659.13	1295.33	4675.73	1294.93	4701.35	1294.59
4705.67	1294.4	4717.66	1294.51	4721.91	1294.71	4741.46	1300.18	4783.8	1300.23
4824.91	1300	4842.69	1298.46	4859.07	1299.31	4866.33	1297.11	4874.79	1294.04
4897.19	1287.5	4902.24	1287.43	4917.02	1287.6	4929.46	1287.58	4938.65	1287.43
4978.55	1287.1	5001.99	1287.12	5072.91	1287.63	5097.63	1287.76	5129.29	1296.98
5137.16	1299.3	5150.31	1299.13	5157.58	1298.94	5168.63	1297.9	5173.67	1297.98
5184.52	1297.9	5207.44	1299.14						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4220.78	.04	4859.07	.025	5137.16	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4859.07	5137.16	90.5	90.5	90.5	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4220.78	4859.07	1302	5137.16	5207.44	1302

Left Levee Station= 4783.8 Elevation= 1300.23
Right Levee Station= 5137.16 Elevation= 1299.3

CROSS SECTION OUTPUT Profile #Design

W.S. Elev (ft)	1296.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1296.97	Reach Len. (ft)	90.50	90.50	90.50
Crit W.S. (ft)	1291.19	Flow Area (sq ft)		2149.39	
E.G. Slope (ft/ft)	0.000283	Area (sq ft)		2149.39	
Q Total (cfs)	8700.00	Flow (cfs)		8700.00	
Top Width (ft)	260.97	Top Width (ft)		260.97	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	9.62	Hydr. Depth (ft)		8.24	
Conv. Total (cfs)	517473.6	Conv. (cfs)		517473.6	
Length Wtd. (ft)	90.50	Wetted Per. (ft)		263.66	
Min Ch El (ft)	1287.10	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.58	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		4.46	
C & E Loss (ft)	0.00	Cum SA (acres)		0.54	

CROSS SECTION OUTPUT Profile #Future

W.S. Elev (ft)	1298.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.025	
E.G. Elev (ft)	1298.78	Reach Len. (ft)	90.50	90.50	90.50
Crit W.S. (ft)	1292.06	Flow Area (sq ft)		2613.99	
E.G. Slope (ft/ft)	0.000293	Area (sq ft)		2613.99	
Q Total (cfs)	11920.00	Flow (cfs)		11920.00	
Top Width (ft)	272.43	Top Width (ft)		272.43	
Vel Total (ft/s)	4.56	Avg. Vel. (ft/s)		4.56	
Max Chl Dpth (ft)	11.36	Hydr. Depth (ft)		9.60	
Conv. Total (cfs)	696100.1	Conv. (cfs)		696100.1	
Length Wtd. (ft)	90.50	Wetted Per. (ft)		275.64	
Min Ch El (ft)	1287.10	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.79	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		5.42	
C & E Loss (ft)	0.00	Cum SA (acres)		0.56	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1300.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.025	

E.G. Elev (ft)	1300.53	Reach Len. (ft)	90.50	90.50	90.50
Crit W.S. (ft)	1292.98	Flow Area (sq ft)		3073.91	
E.G. Slope (ft/ft)	0.000308	Area (sq ft)	37.40	3073.91	109.96
Q Total (cfs)	15770.00	Flow (cfs)		15770.00	
Top Width (ft)	404.18	Top Width (ft)	55.81	278.09	70.28
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)		5.13	
Max Chl Dpth (ft)	13.02	Hydr. Depth (ft)		11.05	
Conv. Total (cfs)	899165.9	Conv. (cfs)		899165.9	
Length Wtd. (ft)	90.50	Wetted Per. (ft)		281.55	
Min Ch El (ft)	1287.10	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		1.08	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.83	6.38	0.22
C & E Loss (ft)	0.00	Cum SA (acres)	0.48	0.58	0.14

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 9.001

INPUT
Description: Upstream End of Reach 2 at Hunt Highway
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4250.88	1302.5	4269.99	1302.35	4301.98	1301.83	4331.19	1301.7	4392.35	1300.58
4409.62	1300.6	4466.06	1300.03	4481.61	1299.78	4503.49	1299.79	4526.68	1299.54
4532.6	1298.8	4543.55	1297.77	4560.68	1299.35	4571.1	1299.36	4586	1299.49
4591.47	1299.8	4613.26	1299.76	4623.66	1299.91	4629.7	1298.97	4645.26	1298.71
4655.08	1298.8	4664.04	1298.63	4668.71	1297.33	4676.2	1294.88	4685.71	1294.51
4691.43	1294.4	4712.14	1293.85	4723.4	1294.01	4727.63	1294.74	4731.09	1295.71
4737.5	1297	4739.28	1296.99	4751.93	1298.37	4761.33	1298.3	4779.2	1297.74
4805.82	1297.7	4808.75	1297.82	4820.03	1297.81	4835.66	1299.1	4842.05	1299.15
4864.67	1300	4908.36	1288.04	4911.53	1287.21	4991.02	1286.69	5000.44	1286.84
5095.8	1287.2	5098.53	1287.15	5121.51	1293.55	5136	1297.09	5142.86	1298.97
5154.88	1298.7	5169.25	1298.64	5187.9	1297.97	5206.98	1299.12		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4250.88	.04	4864.67	.025	5142.86	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4864.67	5142.86		0	0	0 .1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
4250.88	4864.67	1302	5142.86	5206.98	1302

Left Levee Station= 4864.67 Elevation= 1300
Right Levee Station= 5142.86 Elevation= 1298.97

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
W.S. Elev (ft)	1296.69	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	1296.94	Reach Len. (ft)			
Crit W.S. (ft)	1290.96	Flow Area (sq ft)		2147.09	
E.G. Slope (ft/ft)	0.000279	Area (sq ft)		2147.09	
Q Total (cfs)	8700.00	Flow (cfs)		8700.00	
Top Width (ft)	257.60	Top Width (ft)		257.60	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	10.00	Hydr. Depth (ft)		8.33	
Conv. Total (cfs)	521215.4	Conv. (cfs)		521215.4	
Length Wtd. (ft)		Wetted Per. (ft)		260.13	
Min Ch El (ft)	1286.69	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.58	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #Future

			Left OB	Channel	Right OB
W.S. Elev (ft)	1298.43	Element			

Vel Head (ft)	0.32	Wt. n-Val.	0.025
E.G. Elev (ft)	1298.75	Reach Len. (ft)	
Crit W.S. (ft)	1291.84	Flow Area (sq ft)	2606.68
E.G. Slope (ft/ft)	0.000293	Area (sq ft)	2606.68
Q Total (cfs)	11920.00	Flow (cfs)	11920.00
Top Width (ft)	270.48	Top Width (ft)	270.48
Vel Total (ft/s)	4.57	Avg. Vel. (ft/s)	4.57
Max Chl Dpth (ft)	11.74	Hydr. Depth (ft)	9.64
Conv. Total (cfs)	696505.9	Conv. (cfs)	696505.9
Length Wtd. (ft)		Wetted Per. (ft)	273.47
Min Ch El (ft)	1286.69	Shear (lb/sq ft)	0.17
Alpha	1.00	Stream Power (lb/ft s)	0.80
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

CROSS SECTION OUTPUT Profile #Existing

W.S. Elev (ft)	1300.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	1300.50	Reach Len. (ft)			
Crit W.S. (ft)	1292.80	Flow Area (sq ft)		3063.42	
E.G. Slope (ft/ft)	0.000311	Area (sq ft)	758.72	3063.42	98.26
Q Total (cfs)	15770.00	Flow (cfs)		15770.00	
Top Width (ft)	746.86	Top Width (ft)	404.55	278.19	64.12
Vel Total (ft/s)	5.15	Avg. Vel. (ft/s)		5.15	
Max Chl Dpth (ft)	13.40	Hydr. Depth (ft)		11.01	
Conv. Total (cfs)	894235.9	Conv. (cfs)		894235.9	
Length Wtd. (ft)		Wetted Per. (ft)		281.46	
Min Ch El (ft)	1286.69	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		1.09	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:EMF

Reach	River Sta.	n1	n2	n3
Reach 3	13.471	.04	.025	.04
Reach 3	13.439	.04	.03	.04
Reach 3	13.431	Bridge		
Reach 3	13.426	.04	.03	.04
Reach 3	13.374	.04	.025	.04
Reach 3	13.28	.04	.025	.04
Reach 3	13.232	.04	.025	.04
Reach 3	13.179	.04	.025	.04
Reach 3	13.084	.04	.025	.04
Reach 3	13.037	.04	.025	.04
Reach 3	12.981	.04	.025	.04
Reach 3	12.905	.04	.025	.04
Reach 3	12.884	.04	.025	.04
Reach 3	12.789	.04	.025	.04
Reach 3	12.694	.04	.025	.04
Reach 3	12.6	.04	.025	.04
Reach 3	12.552	.04	.025	.04
Reach 3	12.488	.04	.025	.04
Reach 3	12.441	.04	.025	.04
Reach 3	12.349	.04	.025	.04
Reach 3	12.302	.04	.025	.04
Reach 3	12.245	.04	.025	.04
Reach 3	12.177	.04	.025	.04
Reach 3	12.082	.04	.025	.04
Reach 3	11.988	.04	.025	.04
Reach 3	11.893	.04	.025	.04
Reach 3	11.798	.04	.025	.04

Reach 3	11.703	.04	.025	.04
Reach 3	11.609	.04	.025	.04
Reach 3	11.572	.04	.025	.04
Reach 3	11.531	.04	.025	.04
Reach 3	11.486	.04	.025	.04
Reach 3	11.391	.04	.025	.04
Reach 3	11.328	.04	.025	.04
Reach 3	11.321	.04	.013	.04
Reach 3	11.308	.04	.013	.04
Reach 3	11.297	.04	.03	.04
Reach 3	11.26	.04	.03	.04
Reach 3	11.254	Bridge		
Reach 3	11.249	.04	.03	.04
Reach 3	11.231	.04	.03	.04
Reach 3	11.189	.04	.03	.04
Reach 3	11.127	.04	.03	.04
Reach 3	11.033	.04	.03	.04
Reach 3	10.938	.04	.03	.04
Reach 3	10.843	.04	.025	.04
Reach 3	10.749	.04	.025	.04
Reach 3	10.654	.04	.025	.04
Reach 3	10.566	.04	.025	.04
Reach 3	10.518	.04	.025	.04
Reach 3	10.441	.04	.025	.04
Reach 3	10.346	.04	.025	.04
Reach 3	10.252	.04	.025	.04
Reach 3	10.218	.04	.03	.04
Reach 3	10.207	Bridge		
Reach 3	10.195	.04	.03	.04
Reach 3	10.171	.04	.025	.04
Reach 3	10.134	.04	.025	.04
Reach 3	10.039	.04	.025	.04
Reach 3	9.944	.04	.025	.04
Reach 3	9.897	.04	.025	.04
Reach 3	9.854	.04	.025	.04
Reach 3	9.849	.04	.025	.04
Reach 3	9.844	.04	.025	.04
Reach 3	9.802	.04	.025	.04
Reach 3	9.708	.04	.025	.04
Reach 3	9.613	.04	.025	.04
Reach 3	9.518	.04	.025	.04
Reach 3	9.424	.04	.025	.04
Reach 3	9.334	.04	.025	.04
Reach 3	9.24	.04	.025	.04
Reach 3	9.145	.04	.025	.04
Reach 3	9.053	.04	.025	.04
Reach 3	9.036	.04	.025	.04
Reach 3	9.018	.04	.025	.04
Reach 3	9.001	.04	.025	.04

SUMMARY OF REACH LENGTHS

River: EMF

Reach	River Sta.	Left	Channel	Right
Reach 3	13.471	84	171.57	254
Reach 3	13.439	64.85	64.85	64.85
Reach 3	13.431	Bridge		
Reach 3	13.426	366	274.54	188
Reach 3	13.374	500	500	500
Reach 3	13.28	250	250	250
Reach 3	13.232	283.83	283.83	283.83
Reach 3	13.179	462	500	535
Reach 3	13.084	234	250	267
Reach 3	13.037	272	293.35	315
Reach 3	12.981	402.01	402.01	402.01

Reach 3	12.905	112.17	112.17	112.17
Reach 3	12.884	500	500	500
Reach 3	12.789	500	500	500
Reach 3	12.694	500	500	500
Reach 3	12.6	250	250	250
Reach 3	12.552	338.78	338.78	338.78
Reach 3	12.488	294	250	210
Reach 3	12.441	567	483.07	402
Reach 3	12.349	250	250	250
Reach 3	12.302	300.07	300.07	300.07
Reach 3	12.245	285	359.72	429
Reach 3	12.177	500	500	500
Reach 3	12.082	500	500	500
Reach 3	11.988	500	500	500
Reach 3	11.893	500	500	500
Reach 3	11.798	500	500	500
Reach 3	11.703	500	500	500
Reach 3	11.609	194.37	194.37	194.37
Reach 3	11.572	218.29	218.29	218.29
Reach 3	11.531	237.2	237.2	237.2
Reach 3	11.486	500	500	500
Reach 3	11.391	335.09	335.09	335.09
Reach 3	11.328	36.18	36.18	36.18
Reach 3	11.321	65.83	65.83	65.83
Reach 3	11.308	58.67	58.67	58.67
Reach 3	11.297	140	195.02	255
Reach 3	11.26	57.31	57.31	57.31
Reach 3	11.254	Bridge		
Reach 3	11.249	150	95.09	40
Reach 3	11.231	221.88	221.88	221.88
Reach 3	11.189	276	326.49	374
Reach 3	11.127	500	500	500
Reach 3	11.033	500	500	500
Reach 3	10.938	500	500	500
Reach 3	10.843	500	500	500
Reach 3	10.749	500	500	500
Reach 3	10.654	465.44	465.44	465.44
Reach 3	10.566	280	250	222
Reach 3	10.518	460	408.26	365
Reach 3	10.441	500	500	500
Reach 3	10.346	500	500	500
Reach 3	10.252	80	176.46	270
Reach 3	10.218	123.82	123.82	123.82
Reach 3	10.207	Bridge		
Reach 3	10.195	208	128	12
Reach 3	10.171	194.72	194.72	194.72
Reach 3	10.134	500	500	500
Reach 3	10.039	500	500	500
Reach 3	9.944	250	250	250
Reach 3	9.897	226.79	226.79	226.79
Reach 3	9.854	25.98	25.98	25.98
Reach 3	9.849	25.86	25.86	25.86
Reach 3	9.844	221.37	221.37	221.37
Reach 3	9.802	500	500	500
Reach 3	9.708	500	500	500
Reach 3	9.613	500	500	500
Reach 3	9.518	500	500	500
Reach 3	9.424	470.1	470.1	470.1
Reach 3	9.334	500.09	500.09	500.09
Reach 3	9.24	500	500	500
Reach 3	9.145	485.37	485.37	485.37
Reach 3	9.053	89.53	89.53	89.53
Reach 3	9.036	95.92	95.92	95.92
Reach 3	9.018	90.5	90.5	90.5
Reach 3	9.001	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: EMF

Reach	River Sta.		Contr.	Expan.
Reach 3	13.471		.3	.5
Reach 3	13.439		.3	.5
Reach 3	13.431	Bridge		
Reach 3	13.426		.3	.5
Reach 3	13.374		.1	.3
Reach 3	13.28		.1	.3
Reach 3	13.232		.1	.3
Reach 3	13.179		.1	.3
Reach 3	13.084		.1	.3
Reach 3	13.037		.1	.3
Reach 3	12.981		.1	.3
Reach 3	12.905		.1	.3
Reach 3	12.884		.1	.3
Reach 3	12.789		.1	.3
Reach 3	12.694		.1	.3
Reach 3	12.6		.1	.3
Reach 3	12.552		.1	.3
Reach 3	12.488		.1	.3
Reach 3	12.441		.1	.3
Reach 3	12.349		.1	.3
Reach 3	12.302		.1	.3
Reach 3	12.245		.1	.3
Reach 3	12.177		.1	.3
Reach 3	12.082		.1	.3
Reach 3	11.988		.1	.3
Reach 3	11.893		.1	.3
Reach 3	11.798		.1	.3
Reach 3	11.703		.1	.3
Reach 3	11.609		.1	.3
Reach 3	11.572		.1	.3
Reach 3	11.531		.1	.3
Reach 3	11.486		.1	.3
Reach 3	11.391		.1	.3
Reach 3	11.328		.3	.5
Reach 3	11.321		.3	.5
Reach 3	11.308		.3	.5
Reach 3	11.297		.3	.5
Reach 3	11.26		.3	.5
Reach 3	11.254	Bridge		
Reach 3	11.249		.3	.5
Reach 3	11.231		.3	.5
Reach 3	11.189		.1	.3
Reach 3	11.127		.1	.3
Reach 3	11.033		.1	.3
Reach 3	10.938		.1	.3
Reach 3	10.843		.1	.3
Reach 3	10.749		.1	.3
Reach 3	10.654		.1	.3
Reach 3	10.566		.1	.3
Reach 3	10.518		.1	.3
Reach 3	10.441		.1	.3
Reach 3	10.346		.1	.3
Reach 3	10.252		.3	.5
Reach 3	10.218		.3	.5
Reach 3	10.207	Bridge		
Reach 3	10.195		.3	.5
Reach 3	10.171		.3	.5
Reach 3	10.134		.1	.3
Reach 3	10.039		.1	.3
Reach 3	9.944		.1	.3
Reach 3	9.897		.1	.3
Reach 3	9.854		.3	.5
Reach 3	9.849		.3	.5
Reach 3	9.844		.1	.3
Reach 3	9.802		.1	.3

Reach 3	9.708	.1	.3
Reach 3	9.613	.1	.3
Reach 3	9.518	.1	.3
Reach 3	9.424	.1	.3
Reach 3	9.334	.1	.3
Reach 3	9.24	.1	.3
Reach 3	9.145	.1	.3
Reach 3	9.053	.1	.3
Reach 3	9.036	.1	.3
Reach 3	9.018	.1	.3
Reach 3	9.001	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 3	13.471	6900.00	1299.43	1307.77	1303.31	1308.06	0.000397	4.33	1593.11	225.60	0.29
Reach 3	13.471	8970.00	1299.43	1309.08	1303.99	1309.42	0.000398	4.74	1894.48	242.77	0.29
Reach 3	13.471	12910.00	1299.43	1311.06	1305.13	1311.51	0.000406	5.42	2439.82	286.15	0.31
Reach 3	13.439	6900.00	1299.34	1307.73	1302.90	1307.96	0.000416	3.77	1828.54	251.26	0.25
Reach 3	13.439	8970.00	1299.34	1309.05	1303.53	1309.31	0.000420	4.15	2163.46	259.32	0.25
Reach 3	13.439	12910.00	1299.34	1311.03	1304.55	1311.39	0.000452	4.80	2691.25	273.37	0.27
Reach 3	13.431	Bridge									
Reach 3	13.426	6900.00	1299.62	1307.63	1303.21	1307.88	0.000495	4.00	1723.70	246.56	0.27
Reach 3	13.426	8970.00	1299.62	1308.93	1303.81	1309.23	0.000493	4.37	2050.40	255.56	0.27
Reach 3	13.426	12910.00	1299.62	1310.90	1304.84	1311.29	0.000520	5.03	2565.73	269.44	0.29
Reach 3	13.374	6900.00	1299.45	1307.52	1303.15	1307.77	0.000350	4.00	1723.34	250.03	0.27
Reach 3	13.374	9070.00	1299.45	1308.81	1303.78	1309.12	0.000353	4.42	2051.72	257.80	0.28
Reach 3	13.374	12990.00	1299.45	1310.78	1304.80	1311.17	0.000359	5.05	2608.05	330.85	0.29
Reach 3	13.28	6900.00	1299.23	1307.34	1302.88	1307.59	0.000355	4.05	1703.47	245.45	0.27
Reach 3	13.28	9070.00	1299.23	1308.63	1303.53	1308.94	0.000362	4.48	2025.54	254.47	0.28
Reach 3	13.28	12990.00	1299.23	1310.58	1304.58	1310.99	0.000374	5.12	2536.47	327.38	0.29
Reach 3	13.232	6900.00	1299.09	1307.23	1303.00	1307.50	0.000392	4.18	1649.06	244.09	0.28
Reach 3	13.232	9070.00	1299.09	1308.51	1303.65	1308.84	0.000395	4.61	1968.84	253.28	0.29
Reach 3	13.232	12990.00	1299.09	1310.46	1304.71	1310.89	0.000402	5.25	2476.52	328.95	0.30
Reach 3	13.179	6900.00	1299.00	1307.12	1302.79	1307.39	0.000378	4.14	1665.67	243.36	0.28
Reach 3	13.179	9070.00	1299.00	1308.40	1303.44	1308.73	0.000383	4.57	1984.12	252.47	0.29
Reach 3	13.179	12990.00	1299.00	1310.35	1304.50	1310.78	0.000394	5.22	2489.34	304.86	0.30
Reach 3	13.084	6900.00	1298.67	1306.95	1302.44	1307.20	0.000348	4.02	1714.71	245.79	0.27
Reach 3	13.084	9070.00	1298.67	1308.23	1303.10	1308.54	0.000356	4.46	2035.52	254.80	0.28
Reach 3	13.084	12990.00	1298.67	1310.17	1304.15	1310.58	0.000370	5.11	2543.71	308.60	0.29
Reach 3	13.037	6900.00	1298.52	1306.87	1302.22	1307.11	0.000325	3.93	1755.78	247.77	0.26
Reach 3	13.037	9070.00	1298.52	1308.15	1302.87	1308.45	0.000336	4.36	2078.77	256.89	0.27
Reach 3	13.037	12990.00	1298.52	1310.09	1303.92	1310.49	0.000351	5.02	2590.06	312.81	0.28
Reach 3	12.981	6900.00	1298.62	1306.76	1302.26	1307.01	0.000345	4.02	1716.74	244.90	0.27
Reach 3	12.981	9070.00	1298.62	1308.04	1302.92	1308.35	0.000355	4.46	2034.27	253.31	0.28
Reach 3	12.981	12990.00	1298.62	1309.97	1303.98	1310.38	0.000369	5.12	2535.47	302.18	0.29
Reach 3	12.905	6900.00	1298.40	1306.62	1302.05	1306.88	0.000343	4.02	1717.14	243.92	0.27
Reach 3	12.905	9070.00	1298.40	1307.89	1302.71	1308.20	0.000355	4.46	2032.69	253.20	0.28
Reach 3	12.905	12990.00	1298.40	1309.82	1303.77	1310.23	0.000366	5.13	2531.93	311.12	0.29
Reach 3	12.884	6900.00	1298.30	1306.59	1302.05	1306.84	0.000342	4.00	1725.05	246.57	0.27
Reach 3	12.884	9070.00	1298.30	1307.86	1302.70	1308.16	0.000353	4.44	2043.73	255.71	0.28
Reach 3	12.884	12990.00	1298.30	1309.78	1303.78	1310.19	0.000371	5.09	2553.77	317.71	0.29
Reach 3	12.789	6900.00	1298.10	1306.41	1301.88	1306.66	0.000347	4.02	1715.36	245.40	0.27
Reach 3	12.789	9070.00	1298.10	1307.67	1302.54	1307.98	0.000359	4.47	2030.88	254.59	0.28
Reach 3	12.789	12990.00	1298.10	1309.59	1303.59	1310.00	0.000373	5.13	2530.04	302.50	0.29
Reach 3	12.694	6900.00	1298.04	1306.23	1301.78	1306.49	0.000354	4.04	1706.25	245.88	0.27
Reach 3	12.694	9070.00	1298.04	1307.49	1302.43	1307.80	0.000365	4.49	2020.51	254.64	0.28
Reach 3	12.694	12990.00	1298.04	1309.40	1303.48	1309.81	0.000379	5.16	2517.21	303.40	0.29
Reach 3	12.6	6900.00	1297.79	1306.04	1301.74	1306.30	0.000383	4.15	1663.96	245.03	0.28
Reach 3	12.6	9070.00	1297.79	1307.29	1302.40	1307.61	0.000392	4.59	1975.72	254.17	0.29
Reach 3	12.6	12990.00	1297.79	1309.18	1303.45	1309.61	0.000407	5.26	2471.25	300.61	0.30
Reach 3	12.552	6900.00	1297.54	1305.95	1301.49	1306.21	0.000355	4.05	1702.44	245.33	0.27
Reach 3	12.552	9070.00	1297.54	1307.20	1302.15	1307.51	0.000369	4.50	2013.89	254.45	0.28
Reach 3	12.552	12990.00	1297.54	1309.09	1303.21	1309.51	0.000387	5.18	2508.61	297.24	0.30
Reach 3	12.488	6900.00	1297.80	1305.82	1301.52	1306.08	0.000376	4.12	1675.27	245.85	0.28
Reach 3	12.488	9070.00	1297.80	1307.06	1302.17	1307.39	0.000386	4.57	1985.76	254.31	0.29
Reach 3	12.488	12990.00	1297.80	1308.95	1303.21	1309.38	0.000402	5.24	2477.75	298.59	0.30
Reach 3	12.441	6900.00	1297.71	1305.71	1301.48	1305.99	0.000392	4.18	1648.78	243.83	0.28
Reach 3	12.441	9070.00	1297.71	1306.95	1302.15	1307.29	0.000402	4.64	1955.95	252.53	0.29
Reach 3	12.441	12990.00	1297.71	1308.83	1303.20	1309.27	0.000419	5.32	2443.34	303.41	0.31

Reach 3	12.349	6900.00	1297.66	1305.52	1301.24	1305.80	0.000397	4.23	1630.29	239.13	0.29
Reach 3	12.349	9070.00	1297.66	1306.75	1301.91	1307.09	0.000410	4.70	1929.39	247.80	0.3
Reach 3	12.349	12990.00	1297.66	1308.61	1302.98	1309.07	0.000434	5.40	2404.14	260.98	0.3
Reach 3	12.302	6900.00	1297.60	1305.41	1301.23	1305.69	0.000412	4.29	1609.10	238.11	0.29
Reach 3	12.302	9070.00	1297.60	1306.63	1301.90	1306.98	0.000425	4.76	1905.61	246.49	0.30
Reach 3	12.302	12990.00	1297.60	1308.49	1302.97	1308.95	0.000448	5.47	2375.33	259.21	0.32
Reach 3	12.245	6900.00	1297.40	1305.28	1301.04	1305.57	0.000413	4.31	1602.60	236.26	0.29
Reach 3	12.245	9070.00	1297.40	1306.50	1301.73	1306.86	0.000429	4.78	1896.00	245.50	0.30
Reach 3	12.245	12990.00	1297.40	1308.35	1302.82	1308.82	0.000456	5.50	2362.81	259.53	0.32
Reach 3	12.177	6900.00	1297.28	1305.15	1300.82	1305.42	0.000378	4.16	1659.07	240.84	0.28
Reach 3	12.177	9070.00	1297.28	1306.37	1301.48	1306.70	0.000394	4.64	1956.16	248.80	0.29
Reach 3	12.177	12990.00	1297.28	1308.21	1302.53	1308.65	0.000422	5.36	2425.24	820.09	0.31
Reach 3	12.082	6900.00	1297.29	1304.94	1300.80	1305.22	0.000417	4.28	1611.63	241.22	0.29
Reach 3	12.082	9070.00	1297.29	1306.14	1301.46	1306.49	0.000431	4.76	1907.40	249.96	0.30
Reach 3	12.082	12990.00	1297.29	1307.97	1302.53	1308.43	0.000452	5.47	2382.62	920.75	0.32
Reach 3	11.988	6900.00	1296.90	1304.75	1300.42	1305.02	0.000378	4.15	1664.55	242.98	0.28
Reach 3	11.988	9070.00	1296.90	1305.95	1301.08	1306.28	0.000397	4.63	1960.29	251.30	0.29
Reach 3	11.988	12990.00	1296.90	1307.76	1302.14	1308.21	0.000424	5.35	2430.35	277.05	0.31
Reach 3	11.893	6900.00	1296.71	1304.55	1300.34	1304.82	0.000398	4.21	1637.29	242.54	0.29
Reach 3	11.893	9070.00	1296.71	1305.73	1300.99	1306.08	0.000417	4.70	1929.80	250.78	0.30
Reach 3	11.893	12990.00	1296.71	1307.53	1302.05	1307.99	0.000447	5.43	2391.94	263.28	0.32
Reach 3	11.798	6900.00	1296.67	1304.34	1300.20	1304.62	0.000409	4.25	1622.51	241.86	0.29
Reach 3	11.798	9070.00	1296.67	1305.52	1300.86	1305.87	0.000428	4.75	1911.31	249.74	0.30
Reach 3	11.798	12990.00	1296.67	1307.29	1301.91	1307.76	0.000460	5.49	2366.17	261.68	0.32
Reach 3	11.703	6900.00	1296.68	1304.10	1300.22	1304.40	0.000463	4.42	1560.76	241.01	0.31
Reach 3	11.703	9070.00	1296.68	1305.26	1300.87	1305.64	0.000479	4.91	1845.94	249.22	0.32
Reach 3	11.703	12990.00	1296.68	1307.02	1301.93	1307.52	0.000508	5.66	2295.22	261.64	0.34
Reach 3	11.609	6900.00	1296.39	1303.86	1300.15	1304.17	0.000477	4.44	1555.48	244.38	0.31
Reach 3	11.609	9070.00	1296.39	1305.02	1300.78	1305.39	0.000488	4.92	1842.41	251.41	0.32
Reach 3	11.609	12990.00	1296.39	1306.76	1301.81	1307.26	0.000513	5.67	2290.25	261.94	0.34
Reach 3	11.572	6900.00	1296.51	1303.74	1300.11	1304.07	0.000513	4.58	1507.65	238.49	0.32
Reach 3	11.572	9070.00	1296.51	1304.89	1300.75	1305.29	0.000525	5.08	1786.02	245.52	0.33
Reach 3	11.572	12990.00	1296.51	1306.62	1301.80	1307.16	0.000553	5.85	2220.13	256.10	0.35
Reach 3	11.531	6900.00	1296.26	1303.63	1300.07	1303.95	0.000529	4.60	1499.89	241.03	0.32
Reach 3	11.531	9070.00	1296.26	1304.77	1300.72	1305.18	0.000538	5.09	1781.17	248.41	0.34
Reach 3	11.531	12990.00	1296.26	1306.50	1301.77	1307.03	0.000562	5.85	2219.86	259.50	0.35
Reach 3	11.486	6900.00	1296.57	1303.48	1300.10	1303.82	0.000572	4.70	1469.49	242.88	0.34
Reach 3	11.486	9070.00	1296.57	1304.63	1300.75	1305.04	0.000573	5.17	1752.86	250.34	0.34
Reach 3	11.486	12990.00	1296.57	1306.35	1301.78	1306.90	0.000590	5.92	2193.55	261.26	0.36
Reach 3	11.391	6900.00	1295.69	1303.22	1299.67	1303.54	0.000528	4.58	1505.05	242.76	0.32
Reach 3	11.391	9070.00	1295.69	1304.36	1300.32	1304.76	0.000536	5.07	1787.76	250.21	0.33
Reach 3	11.391	12990.00	1295.69	1306.07	1301.36	1306.60	0.000563	5.84	2225.44	261.31	0.35
Reach 3	11.328	6900.00	1294.88	1303.04	1299.34	1303.37	0.000521	4.62	1493.62	235.96	0.32
Reach 3	11.328	9070.00	1294.88	1304.17	1300.03	1304.58	0.000540	5.13	1766.82	244.36	0.34
Reach 3	11.328	12990.00	1294.88	1305.86	1301.10	1306.41	0.000578	5.93	2190.92	256.87	0.36
Reach 3	11.321	6900.00	1296.29	1300.86	1300.86	1302.84	0.001620	11.30	610.61	152.48	1.00
Reach 3	11.321	9070.00	1296.29	1301.78	1301.78	1304.01	0.001557	11.97	757.66	168.60	1.00
Reach 3	11.321	12990.00	1296.29	1303.13	1303.13	1305.76	0.001473	13.00	999.34	189.08	1.00
Reach 3	11.308	6900.00	1290.71	1300.43	1295.60	1300.81	0.000126	4.89	1412.46	186.63	0.31
Reach 3	11.308	9070.00	1290.71	1302.05	1296.48	1302.48	0.000122	5.26	1724.02	199.52	0.32
Reach 3	11.308	12990.00	1290.71	1303.96	1297.85	1304.54	0.000139	6.13	2120.41	215.12	0.34
Reach 3	11.297	6900.00	1290.78	1300.51	1294.86	1300.71	0.000335	3.60	1916.52	239.89	0.22
Reach 3	11.297	9070.00	1290.78	1302.13	1295.55	1302.37	0.000331	3.92	2316.47	252.68	0.23
Reach 3	11.297	12990.00	1290.78	1304.08	1296.62	1304.40	0.000381	4.60	2822.03	268.08	0.25
Reach 3	11.26	6900.00	1290.40	1300.48	1294.28	1300.63	0.000242	3.14	2195.70	264.44	0.19
Reach 3	11.26	10060.00	1290.40	1302.08	1295.19	1302.30	0.000303	3.83	2629.09	278.18	0.22
Reach 3	11.26	13910.00	1290.40	1304.02	1296.16	1304.32	0.000332	4.36	3187.49	296.31	0.23
Reach 3	11.254	Bridge									
Reach 3	11.249	6900.00	1290.69	1300.43	1294.47	1300.60	0.000267	3.25	2121.89	260.93	0.20
Reach 3	11.249	10060.00	1290.69	1302.02	1295.39	1302.26	0.000334	3.95	2546.30	276.47	0.23
Reach 3	11.249	13910.00	1290.69	1303.96	1296.38	1304.27	0.000361	4.48	3103.29	295.35	0.24
Reach 3	11.231	8100.00	1290.62	1300.34	1294.52	1300.55	0.000342	3.72	2178.27	273.34	0.23
Reach 3	11.231	10470.00	1290.62	1301.99	1295.18	1302.23	0.000322	3.98	2678.73	322.17	0.23
Reach 3	11.231	14320.00	1290.62	1303.93	1296.15	1304.23	0.000323	4.46	3335.33	355.66	0.23
Reach 3	11.189	8100.00	1290.70	1300.24	1294.71	1300.47	0.000375	3.84	2115.34	283.12	0.24
Reach 3	11.189	10470.00	1290.70	1301.90	1295.37	1302.15	0.000348	4.08	2633.92	337.97	0.23
Reach 3	11.189	14320.00	1290.70	1303.84	1296.33	1304.16	0.000339	4.53	3367.14	393.37	0.24
Reach 3	11.127	8100.00	1290.70	1300.12	1294.55	1300.35	0.000369	3.82	2123.71	281.55	0.24
Reach 3	11.127	10470.00	1290.70	1301.78	1295.21	1302.04	0.000342	4.06	2647.53	340.53	0.23
Reach 3	11.127	14320.00	1290.70	1303.74	1296.17	1304.05	0.000333	4.52	3376.83	393.65	0.2
Reach 3	11.033	8100.00	1290.41	1299.92	1294.44	1300.16	0.000386	3.90	2079.48	260.05	0.2

Reach 3	11.033	10470.00	1290.41	1301.60	1295.10	1301.86	0.000357	4.14	2575.55	318.24	0.24
Reach 3	11.033	14320.00	1290.41	1303.55	1296.07	1303.87	0.000352	4.61	3284.62	388.36	0.24
Reach 3	10.938	8100.00	1290.11	1299.74	1294.18	1299.97	0.000373	3.84	2117.58	284.49	0.24
Reach 3	10.938	10470.00	1290.11	1301.43	1294.85	1301.69	0.000342	4.06	2643.58	336.54	0.23
Reach 3	10.938	14320.00	1290.11	1303.39	1295.82	1303.70	0.000333	4.51	3375.55	393.46	0.24
Reach 3	10.843	8100.00	1289.90	1299.60	1293.77	1299.82	0.000236	3.74	2168.66	281.04	0.23
Reach 3	10.843	10470.00	1289.90	1301.30	1294.44	1301.55	0.000220	3.99	2686.76	326.28	0.23
Reach 3	10.843	14320.00	1289.90	1303.26	1295.40	1303.56	0.000221	4.47	3422.64	397.62	0.23
Reach 3	10.749	8100.00	1289.80	1299.46	1293.88	1299.69	0.000257	3.85	2105.02	257.20	0.24
Reach 3	10.749	10470.00	1289.80	1301.17	1294.54	1301.43	0.000239	4.10	2563.29	302.09	0.23
Reach 3	10.749	14320.00	1289.80	1303.12	1295.51	1303.44	0.000241	4.60	3240.04	956.42	0.24
Reach 3	10.654	8100.00	1290.00	1299.31	1293.95	1299.56	0.000284	3.98	2036.08	255.13	0.25
Reach 3	10.654	10470.00	1290.00	1301.03	1294.62	1301.31	0.000260	4.21	2484.40	266.22	0.24
Reach 3	10.654	14320.00	1290.00	1302.96	1295.60	1303.32	0.000265	4.76	3007.99	863.78	0.25
Reach 3	10.566	8100.00	1289.50	1299.18	1293.71	1299.42	0.000275	3.94	2053.60	254.15	0.24
Reach 3	10.566	10470.00	1289.50	1300.91	1294.39	1301.19	0.000253	4.18	2503.49	265.72	0.24
Reach 3	10.566	14320.00	1289.50	1302.84	1295.37	1303.19	0.000260	4.73	3025.13	964.56	0.25
Reach 3	10.518	8100.00	1289.62	1299.11	1293.69	1299.36	0.000277	3.94	2057.00	256.42	0.25
Reach 3	10.518	10470.00	1289.62	1300.85	1294.37	1301.12	0.000252	4.17	2512.69	268.07	0.24
Reach 3	10.518	14320.00	1289.62	1302.78	1295.35	1303.13	0.000257	4.72	3036.91	686.98	0.25
Reach 3	10.441	8100.00	1289.06	1299.03	1293.05	1299.24	0.000230	3.70	2186.83	259.79	0.22
Reach 3	10.441	10790.00	1289.06	1300.76	1293.81	1301.02	0.000228	4.08	2651.76	404.70	0.23
Reach 3	10.441	14650.00	1289.06	1302.69	1294.80	1303.02	0.000230	4.61	3199.77	590.19	0.24
Reach 3	10.346	8100.00	1288.88	1298.93	1292.76	1299.13	0.000208	3.57	2270.87	264.69	0.21
Reach 3	10.346	10790.00	1288.88	1300.67	1293.53	1300.91	0.000211	3.94	2740.17	395.51	0.22
Reach 3	10.346	14650.00	1288.88	1302.60	1294.49	1302.91	0.000215	4.47	3280.02	482.32	0.23
Reach 3	10.252	8100.00	1288.80	1298.79	1292.96	1299.01	0.000246	3.81	2125.60	254.71	0.23
Reach 3	10.252	10790.00	1288.80	1300.52	1293.72	1300.79	0.000245	4.19	2575.91	266.54	0.24
Reach 3	10.252	14650.00	1288.80	1302.46	1294.72	1302.79	0.000240	4.64	3396.17	480.86	0.24
Reach 3	10.218	8100.00	1288.64	1298.75	1292.61	1298.96	0.000307	3.62	2236.03	259.14	0.22
Reach 3	10.218	10790.00	1288.64	1300.48	1293.36	1300.73	0.000310	4.01	2693.27	269.95	0.22
Reach 3	10.218	14650.00	1288.64	1302.42	1294.33	1302.74	0.000333	4.54	3228.46	283.21	0.24
Reach 3	10.207	Bridge									
Reach 3	10.195	8100.00	1288.91	1298.65	1293.00	1298.88	0.000371	3.86	2100.48	255.62	0.24
Reach 3	10.195	10790.00	1288.91	1300.37	1293.74	1300.65	0.000366	4.23	2550.77	267.06	0.24
Reach 3	10.195	14650.00	1288.91	1302.17	1294.74	1302.53	0.000398	4.81	3043.16	279.28	0.26
Reach 3	10.171	8100.00	1288.86	1298.60	1292.93	1298.84	0.000260	3.87	2091.55	255.05	0.24
Reach 3	10.171	10800.00	1288.86	1300.33	1293.71	1300.61	0.000255	4.23	2606.44	700.79	0.24
Reach 3	10.171	14660.00	1288.86	1302.14	1294.70	1302.48	0.000263	4.76	3228.90	880.56	0.25
Reach 3	10.134	8100.00	1289.47	1298.54	1293.30	1298.78	0.000290	3.96	2046.34	261.90	0.25
Reach 3	10.134	10800.00	1289.47	1300.27	1294.05	1300.55	0.000277	4.30	2509.24	273.55	0.25
Reach 3	10.134	14660.00	1289.47	1302.09	1295.00	1302.43	0.000263	4.69	3440.64	855.62	0.25
Reach 3	10.039	8100.00	1288.96	1298.40	1292.95	1298.64	0.000280	3.94	2056.04	258.21	0.25
Reach 3	10.039	10800.00	1288.96	1300.13	1293.71	1300.42	0.000272	4.29	2514.79	271.09	0.25
Reach 3	10.039	14660.00	1288.96	1301.98	1294.69	1302.29	0.000245	4.60	3733.39	843.22	0.24
Reach 3	9.944	8100.00	1288.55	1298.26	1292.74	1298.50	0.000273	3.92	2063.74	255.55	0.24
Reach 3	9.944	10800.00	1288.55	1300.00	1293.51	1300.28	0.000266	4.29	2518.93	278.64	0.25
Reach 3	9.944	14660.00	1288.55	1301.79	1294.49	1302.16	0.000275	4.88	3025.12	843.98	0.26
Reach 3	9.897	8100.00	1288.50	1298.20	1292.55	1298.43	0.000261	3.86	2101.05	258.48	0.24
Reach 3	9.897	10800.00	1288.50	1299.94	1293.31	1300.21	0.000255	4.22	2563.65	282.83	0.24
Reach 3	9.897	14660.00	1288.50	1301.73	1294.29	1302.09	0.000263	4.80	3072.97	813.75	0.25
Reach 3	9.854	8100.00	1288.40	1298.14	1292.59	1298.37	0.000268	3.89	2082.92	257.90	0.24
Reach 3	9.854	10800.00	1288.40	1299.88	1293.36	1300.16	0.000261	4.25	2542.42	270.19	0.24
Reach 3	9.854	14660.00	1288.40	1301.66	1294.34	1302.03	0.000272	4.84	3029.39	872.58	0.26
Reach 3	9.849	8100.00	1288.45	1298.00	1292.88	1298.33	0.000383	4.64	1745.54	208.90	0.28
Reach 3	9.849	10800.00	1288.45	1299.70	1293.71	1300.11	0.000383	5.13	2106.95	215.40	0.29
Reach 3	9.849	14660.00	1288.45	1301.42	1294.77	1301.96	0.000419	5.91	2480.90	270.04	0.31
Reach 3	9.844	8100.00	1288.56	1298.04	1292.60	1298.28	0.000277	3.92	2064.71	258.82	0.24
Reach 3	9.844	10800.00	1288.56	1299.75	1293.36	1300.04	0.000271	4.28	2520.96	289.79	0.25
Reach 3	9.844	14660.00	1288.56	1301.50	1294.33	1301.87	0.000283	4.89	2998.22	866.53	0.26
Reach 3	9.802	8100.00	1288.71	1297.94	1292.85	1298.21	0.000321	4.12	1967.89	256.50	0.26
Reach 3	9.802	10800.00	1288.71	1299.66	1293.62	1299.97	0.000306	4.46	2420.37	425.70	0.26
Reach 3	9.802	14660.00	1288.71	1301.40	1294.60	1301.80	0.000316	5.07	2892.15	862.05	0.27
Reach 3	9.708	8100.00	1287.70	1297.82	1292.13	1298.05	0.000260	3.87	2092.55	255.39	0.24
Reach 3	9.708	10800.00	1287.70	1299.54	1292.91	1299.82	0.000258	4.25	2543.36	267.93	0.24
Reach 3	9.708	14660.00	1287.70	1301.28	1293.90	1301.64	0.000275	4.87	3011.86	858.88	0.26
Reach 3	9.613	8100.00	1287.19	1297.70	1291.96	1297.92	0.000247	3.77	2146.16	265.57	0.23
Reach 3	9.613	10800.00	1287.19	1299.43	1292.70	1299.70	0.000238	4.13	2661.97	482.97	0.23
Reach 3	9.613	14660.00	1287.19	1301.16	1293.68	1301.50	0.000251	4.71	3212.57	860.13	0.25
Reach 3	9.518	8100.00	1287.94	1297.55	1291.99	1297.79	0.000274	3.93	2063.43	256.46	0.24
Reach 3	9.518	10800.00	1287.94	1299.28	1292.77	1299.57	0.000268	4.29	2518.38	483.18	0.25
Reach 3	9.518	14660.00	1287.94	1300.99	1293.76	1301.37	0.000284	4.92	2982.03	827.79	0.26

Reach 3	9.424	8100.00	1287.94	1297.40	1292.03	1297.65	0.000293	4.01	2018.59	255.07	0.25
Reach 3	9.424	10800.00	1287.94	1299.13	1292.80	1299.43	0.000283	4.37	2471.74	270.33	0.25
Reach 3	9.424	14660.00	1287.94	1300.83	1293.80	1301.22	0.000299	5.00	2953.79	734.18	0.2
Reach 3	9.334	8100.00	1288.00	1297.26	1292.03	1297.51	0.000299	4.02	2013.41	257.45	0.25
Reach 3	9.334	10800.00	1288.00	1299.00	1292.79	1299.30	0.000285	4.37	2471.78	405.96	0.25
Reach 3	9.334	14660.00	1288.00	1300.69	1293.76	1301.08	0.000301	5.00	2929.40	786.88	0.27
Reach 3	9.24	8100.00	1288.06	1297.09	1292.07	1297.35	0.000324	4.14	1957.70	255.05	0.26
Reach 3	9.24	10800.00	1288.06	1298.84	1292.84	1299.15	0.000305	4.47	2413.94	292.21	0.26
Reach 3	9.24	14660.00	1288.06	1300.52	1293.81	1300.92	0.000322	5.11	2866.20	389.66	0.28
Reach 3	9.145	8100.00	1288.14	1296.91	1292.03	1297.19	0.000340	4.21	1925.93	253.95	0.27
Reach 3	9.145	10800.00	1288.14	1298.67	1292.78	1298.99	0.000317	4.53	2383.12	289.94	0.27
Reach 3	9.145	14660.00	1288.14	1300.34	1293.74	1300.75	0.000349	5.14	2850.53	387.49	0.29
Reach 3	9.053	8100.00	1287.57	1296.78	1291.45	1297.03	0.000290	4.00	2026.60	255.50	0.25
Reach 3	9.053	10800.00	1287.57	1298.55	1292.21	1298.84	0.000276	4.34	2489.00	282.55	0.25
Reach 3	9.053	14660.00	1287.57	1300.20	1293.18	1300.59	0.000296	5.00	2933.74	389.12	0.27
Reach 3	9.036	8100.00	1287.51	1296.76	1291.33	1297.00	0.000278	3.93	2059.32	257.85	0.25
Reach 3	9.036	10790.00	1287.51	1298.53	1292.10	1298.81	0.000266	4.27	2526.46	310.85	0.25
Reach 3	9.036	14630.00	1287.51	1300.19	1293.07	1300.56	0.000288	4.91	2979.91	437.52	0.26
Reach 3	9.018	8700.00	1287.10	1296.72	1291.19	1296.97	0.000283	4.05	2149.39	260.97	0.25
Reach 3	9.018	11920.00	1287.10	1298.46	1292.06	1298.78	0.000293	4.56	2613.99	272.43	0.26
Reach 3	9.018	15770.00	1287.10	1300.12	1292.98	1300.53	0.000308	5.13	3073.91	404.18	0.27
Reach 3	9.001	8700.00	1286.69	1296.69	1290.96	1296.94	0.000279	4.05	2147.09	257.60	0.25
Reach 3	9.001	11920.00	1286.69	1298.43	1291.84	1298.75	0.000293	4.57	2606.68	270.48	0.26
Reach 3	9.001	15770.00	1286.69	1300.09	1292.80	1300.50	0.000311	5.15	3063.42	746.86	0.27

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach 3	13.471	1308.06	1307.77	0.29	0.07	0.04		6900.00		225.60
Reach 3	13.471	1309.42	1309.08	0.35	0.07	0.04		8969.92	0.07	242.77
Reach 3	13.471	1311.51	1311.06	0.45	0.07	0.05		12836.09	73.91	286.15
Reach 3	13.439	1307.96	1307.73	0.22	0.00	0.01		6900.00		251.26
Reach 3	13.439	1309.31	1309.05	0.27	0.00	0.01		8970.00		259.32
Reach 3	13.439	1311.39	1311.03	0.36	0.00	0.01		12910.00		273.37
Reach 3	13.431	Bridge								
Reach 3	13.426	1307.88	1307.63	0.25	0.11	0.00		6900.00		246.56
Reach 3	13.426	1309.23	1308.93	0.30	0.11	0.00		8970.00		255.56
Reach 3	13.426	1311.29	1310.90	0.39	0.12	0.00		12910.00		269.44
Reach 3	13.374	1307.77	1307.52	0.25	0.18	0.00		6900.00		250.03
Reach 3	13.374	1309.12	1308.81	0.30	0.18	0.00		9070.00		257.80
Reach 3	13.374	1311.17	1310.78	0.39	0.18	0.00	19.81	12968.56	1.62	330.85
Reach 3	13.28	1307.59	1307.34	0.25	0.09	0.00		6900.00		245.45
Reach 3	13.28	1308.94	1308.63	0.31	0.09	0.00		9070.00		254.47
Reach 3	13.28	1310.99	1310.58	0.41	0.10	0.00		12990.00		327.38
Reach 3	13.232	1307.50	1307.23	0.27	0.11	0.00		6900.00		244.09
Reach 3	13.232	1308.84	1308.51	0.33	0.11	0.00		9070.00		253.28
Reach 3	13.232	1310.89	1310.46	0.43	0.11	0.00		12990.00		328.95
Reach 3	13.179	1307.39	1307.12	0.27	0.18	0.00		6900.00		243.36
Reach 3	13.179	1308.73	1308.40	0.32	0.18	0.00		9070.00		252.47
Reach 3	13.179	1310.78	1310.35	0.42	0.19	0.01		12990.00		304.86
Reach 3	13.084	1307.20	1306.95	0.25	0.08	0.00		6900.00		245.79
Reach 3	13.084	1308.54	1308.23	0.31	0.09	0.00		9070.00		254.80
Reach 3	13.084	1310.58	1310.17	0.40	0.09	0.00		12990.00		308.60
Reach 3	13.037	1307.11	1306.87	0.24	0.10	0.00		6900.00		247.77
Reach 3	13.037	1308.45	1308.15	0.30	0.10	0.00		9070.00		256.89
Reach 3	13.037	1310.49	1310.09	0.39	0.11	0.00		12990.00		312.81
Reach 3	12.981	1307.01	1306.76	0.25	0.14	0.00		6900.00		244.90
Reach 3	12.981	1308.35	1308.04	0.31	0.14	0.00		9070.00		253.31
Reach 3	12.981	1310.38	1309.97	0.41	0.15	0.00		12990.00		302.18
Reach 3	12.905	1306.88	1306.62	0.25	0.04	0.00		6900.00		243.92
Reach 3	12.905	1308.20	1307.89	0.31	0.04	0.00		9070.00		253.20
Reach 3	12.905	1310.23	1309.82	0.41	0.04	0.00		12990.00		311.12
Reach 3	12.884	1306.84	1306.59	0.25	0.17	0.00		6900.00		246.57
Reach 3	12.884	1308.16	1307.86	0.31	0.18	0.00		9070.00		255.71
Reach 3	12.884	1310.19	1309.78	0.40	0.19	0.00		12990.00		317.71
Reach 3	12.789	1306.66	1306.41	0.25	0.18	0.00		6900.00		245.40
Reach 3	12.789	1307.98	1307.67	0.31	0.18	0.00		9070.00		254.59
Reach 3	12.789	1310.00	1309.59	0.41	0.19	0.00		12990.00		302.50
Reach 3	12.694	1306.49	1306.23	0.25	0.18	0.00		6900.00		245.88
Reach 3	12.694	1307.80	1307.49	0.31	0.19	0.00		9070.00		254.64
Reach 3	12.694	1309.81	1309.40	0.41	0.20	0.00		12990.00		303.40

Reach 3	12.6	1306.30	1306.04	0.27	0.09	0.00		6900.00	245.03
Reach 3	12.6	1307.61	1307.29	0.33	0.10	0.00		9070.00	254.17
Reach 3	12.6	1309.61	1309.18	0.43	0.10	0.00		12990.00	300.61
Reach 3	12.552	1306.21	1305.95	0.26	0.12	0.00		6900.00	245.33
Reach 3	12.552	1307.51	1307.20	0.31	0.13	0.00		9070.00	254.45
Reach 3	12.552	1309.51	1309.09	0.42	0.13	0.00		12990.00	297.24
Reach 3	12.488	1306.08	1305.82	0.26	0.10	0.00		6900.00	245.85
Reach 3	12.488	1307.39	1307.06	0.32	0.10	0.00		9070.00	254.31
Reach 3	12.488	1309.38	1308.95	0.43	0.10	0.00		12990.00	298.59
Reach 3	12.441	1305.99	1305.71	0.27	0.19	0.00		6900.00	243.83
Reach 3	12.441	1307.29	1306.95	0.33	0.20	0.00		9070.00	252.53
Reach 3	12.441	1309.27	1308.83	0.44	0.21	0.00		12990.00	303.41
Reach 3	12.349	1305.80	1305.52	0.28	0.10	0.00		6900.00	239.13
Reach 3	12.349	1307.09	1306.75	0.34	0.10	0.00		9070.00	247.80
Reach 3	12.349	1309.07	1308.61	0.45	0.11	0.00		12990.00	260.98
Reach 3	12.302	1305.69	1305.41	0.29	0.12	0.00		6900.00	238.11
Reach 3	12.302	1306.98	1306.63	0.35	0.13	0.00		9070.00	246.49
Reach 3	12.302	1308.95	1308.49	0.46	0.14	0.00		12990.00	259.21
Reach 3	12.245	1305.57	1305.28	0.29	0.14	0.01		6900.00	236.26
Reach 3	12.245	1306.86	1306.50	0.36	0.15	0.01		9070.00	245.50
Reach 3	12.245	1308.82	1308.35	0.47	0.16	0.01		12990.00	259.53
Reach 3	12.177	1305.42	1305.15	0.27	0.20	0.00		6900.00	240.84
Reach 3	12.177	1306.70	1306.37	0.33	0.21	0.00		9070.00	248.80
Reach 3	12.177	1308.65	1308.21	0.45	0.22	0.00		12990.00	820.09
Reach 3	12.082	1305.22	1304.94	0.28	0.20	0.01		6900.00	241.22
Reach 3	12.082	1306.49	1306.14	0.35	0.21	0.01		9070.00	249.96
Reach 3	12.082	1308.43	1307.97	0.46	0.22	0.01	2.97	12987.03	920.75
Reach 3	11.988	1305.02	1304.75	0.27	0.19	0.00		6900.00	242.98
Reach 3	11.988	1306.28	1305.95	0.33	0.20	0.00		9070.00	251.30
Reach 3	11.988	1308.21	1307.76	0.44	0.22	0.00	0.59	12989.42	277.05
Reach 3	11.893	1304.82	1304.55	0.28	0.20	0.00		6900.00	242.54
Reach 3	11.893	1306.08	1305.73	0.34	0.21	0.00		9070.00	250.78
Reach 3	11.893	1307.99	1307.53	0.46	0.23	0.00		12990.00	263.28
Reach 3	11.798	1304.62	1304.34	0.28	0.22	0.00		6900.00	241.86
Reach 3	11.798	1305.87	1305.52	0.35	0.23	0.00		9070.00	249.74
Reach 3	11.798	1307.76	1307.29	0.47	0.24	0.00		12990.00	261.68
Reach 3	11.703	1304.40	1304.10	0.30	0.24	0.00		6900.00	241.01
Reach 3	11.703	1305.64	1305.26	0.37	0.24	0.00		9070.00	249.22
Reach 3	11.703	1307.52	1307.02	0.50	0.26	0.00		12990.00	261.64
Reach 3	11.609	1304.17	1303.86	0.31	0.10	0.00		6900.00	244.38
Reach 3	11.609	1305.39	1305.02	0.38	0.10	0.00		9070.00	251.41
Reach 3	11.609	1307.26	1306.76	0.50	0.10	0.00		12990.00	261.94
Reach 3	11.572	1304.07	1303.74	0.33	0.11	0.00		6900.00	238.49
Reach 3	11.572	1305.29	1304.89	0.40	0.12	0.00		9070.00	245.52
Reach 3	11.572	1307.16	1306.62	0.53	0.12	0.00		12990.00	256.10
Reach 3	11.531	1303.95	1303.63	0.33	0.13	0.00		6900.00	241.03
Reach 3	11.531	1305.18	1304.77	0.40	0.13	0.00		9070.00	248.41
Reach 3	11.531	1307.03	1306.50	0.53	0.14	0.00		12990.00	259.50
Reach 3	11.486	1303.82	1303.48	0.34	0.28	0.00		6900.00	242.88
Reach 3	11.486	1305.04	1304.63	0.42	0.28	0.00		9070.00	250.34
Reach 3	11.486	1306.90	1306.35	0.54	0.29	0.00		12990.00	261.26
Reach 3	11.391	1303.54	1303.22	0.33	0.18	0.00		6900.00	242.76
Reach 3	11.391	1304.76	1304.36	0.40	0.18	0.00		9070.00	250.21
Reach 3	11.391	1306.60	1306.07	0.53	0.19	0.00		12990.00	261.31
Reach 3	11.328	1303.37	1303.04	0.33	0.03	0.50		6900.00	235.96
Reach 3	11.328	1304.58	1304.17	0.41	0.03	0.54		9070.00	244.36
Reach 3	11.328	1306.41	1305.86	0.55	0.03	0.62		12990.00	256.87
Reach 3	11.321	1302.84	1300.86	1.98	0.02	0.81		6900.00	152.48
Reach 3	11.321	1304.01	1301.78	2.23	0.02	0.90		9070.00	168.60
Reach 3	11.321	1305.76	1303.13	2.62	0.02	1.02		12990.00	189.08
Reach 3	11.308	1300.81	1300.43	0.37	0.01	0.08		6900.00	186.63
Reach 3	11.308	1302.48	1302.05	0.43	0.01	0.10		9070.00	199.52
Reach 3	11.308	1304.54	1303.96	0.58	0.01	0.13		12990.00	215.12
Reach 3	11.297	1300.71	1300.51	0.20	0.06	0.02		6900.00	239.89
Reach 3	11.297	1302.37	1302.13	0.24	0.06	0.01		9070.00	252.68
Reach 3	11.297	1304.40	1304.08	0.33	0.07	0.02		12990.00	268.08
Reach 3	11.26	1300.63	1300.48	0.15	0.00	0.00		6900.00	264.44
Reach 3	11.26	1302.30	1302.08	0.23	0.00	0.00		10060.00	278.18
Reach 3	11.26	1304.32	1304.02	0.30	0.00	0.01		13910.00	296.31
Reach 3	11.254	Bridge							
Reach 3	11.249	1300.60	1300.43	0.16	0.03	0.02		6900.00	260.93

Reach 3	11.249	1302.26	1302.02	0.24	0.03	0.00		10060.00		276.47
Reach 3	11.249	1304.27	1303.96	0.31	0.03	0.00		13910.00		295.35
Reach 3	11.231	1300.55	1300.34	0.21	0.08	0.00	0.20	8099.80		273.34
Reach 3	11.231	1302.23	1301.99	0.24	0.07	0.00	44.79	10425.21		322.17
Reach 3	11.231	1304.23	1303.93	0.30	0.07	0.00	241.72	14078.28		355.66
Reach 3	11.189	1300.47	1300.24	0.23	0.12	0.00	2.47	8097.53		283.12
Reach 3	11.189	1302.15	1301.90	0.26	0.11	0.00	72.52	10397.24	0.25	337.97
Reach 3	11.189	1304.16	1303.84	0.31	0.11	0.00	312.96	13965.76	41.28	393.37
Reach 3	11.127	1300.35	1300.12	0.23	0.19	0.00	2.08	8097.92		281.55
Reach 3	11.127	1302.04	1301.78	0.25	0.17	0.00	71.17	10398.83		340.53
Reach 3	11.127	1304.05	1303.74	0.31	0.17	0.00	340.05	13961.30	18.65	393.65
Reach 3	11.033	1300.16	1299.92	0.24	0.19	0.00	0.02	8099.98		260.05
Reach 3	11.033	1301.86	1301.60	0.27	0.17	0.00	42.76	10427.24		318.24
Reach 3	11.033	1303.87	1303.55	0.32	0.17	0.00	242.12	14042.73	35.14	388.36
Reach 3	10.938	1299.97	1299.74	0.23	0.15	0.00	2.74	8097.26		284.49
Reach 3	10.938	1301.69	1301.43	0.25	0.14	0.00	68.38	10401.62		336.54
Reach 3	10.938	1303.70	1303.39	0.31	0.13	0.00	314.50	13961.83	43.67	393.46
Reach 3	10.843	1299.82	1299.60	0.22	0.12	0.00	1.21	8098.79		281.04
Reach 3	10.843	1301.55	1301.30	0.25	0.11	0.00	50.00	10420.00		326.28
Reach 3	10.843	1303.56	1303.26	0.30	0.12	0.00	246.10	14041.48	32.42	397.62
Reach 3	10.749	1299.69	1299.46	0.23	0.14	0.00		8100.00		257.20
Reach 3	10.749	1301.43	1301.17	0.26	0.12	0.00	2.43	10467.57		302.09
Reach 3	10.749	1303.44	1303.12	0.33	0.13	0.00	95.49	14197.95	26.57	956.42
Reach 3	10.654	1299.56	1299.31	0.25	0.13	0.00		8100.00		255.13
Reach 3	10.654	1301.31	1301.03	0.28	0.12	0.00		10470.00		266.22
Reach 3	10.654	1303.32	1302.96	0.35	0.12	0.00		14320.00		863.78
Reach 3	10.566	1299.42	1299.18	0.24	0.07	0.00		8100.00		254.15
Reach 3	10.566	1301.19	1300.91	0.27	0.06	0.00		10470.00		265.72
Reach 3	10.566	1303.19	1302.84	0.35	0.06	0.00		14320.00		964.56
Reach 3	10.518	1299.36	1299.11	0.24	0.10	0.01		8100.00		256.42
Reach 3	10.518	1301.12	1300.85	0.27	0.10	0.00		10470.00		268.07
Reach 3	10.518	1303.13	1302.78	0.35	0.10	0.00		14320.00		686.98
Reach 3	10.441	1299.24	1299.03	0.21	0.11	0.00		8100.00		259.79
Reach 3	10.441	1301.02	1300.76	0.26	0.11	0.01	1.50	10788.50		404.70
Reach 3	10.441	1303.02	1302.69	0.33	0.11	0.01	29.18	14620.82		590.19
Reach 3	10.346	1299.13	1298.93	0.20	0.11	0.00		8100.00		264.69
Reach 3	10.346	1300.91	1300.67	0.24	0.11	0.00		10790.00		395.51
Reach 3	10.346	1302.91	1302.60	0.31	0.11	0.00		14650.00		482.32
Reach 3	10.252	1299.01	1298.79	0.23	0.05	0.01		8100.00		254.71
Reach 3	10.252	1300.79	1300.52	0.27	0.05	0.01		10790.00		266.54
Reach 3	10.252	1302.79	1302.46	0.33	0.05	0.00	217.26	14382.30	50.44	480.86
Reach 3	10.218	1298.96	1298.75	0.20	0.00	0.00		8100.00		259.14
Reach 3	10.218	1300.73	1300.48	0.25	0.00	0.00		10790.00		269.95
Reach 3	10.218	1302.74	1302.42	0.32	0.00	0.02		14650.00		283.21
Reach 3	10.207	Bridge								
Reach 3	10.195	1298.88	1298.65	0.23	0.04	0.00		8100.00		255.62
Reach 3	10.195	1300.65	1300.37	0.28	0.04	0.00		10790.00		267.06
Reach 3	10.195	1302.53	1302.17	0.36	0.04	0.01		14650.00		279.28
Reach 3	10.171	1298.84	1298.60	0.23	0.05	0.00		8100.00		255.05
Reach 3	10.171	1300.61	1300.33	0.28	0.05	0.00	34.12	10765.88		700.79
Reach 3	10.171	1302.48	1302.14	0.35	0.05	0.01	229.35	14430.65		880.56
Reach 3	10.134	1298.78	1298.54	0.24	0.14	0.00		8100.00		261.90
Reach 3	10.134	1300.55	1300.27	0.29	0.14	0.00		10800.00		273.55
Reach 3	10.134	1302.43	1302.09	0.33	0.13	0.01	466.02	14152.52	41.46	855.62
Reach 3	10.039	1298.64	1298.40	0.24	0.14	0.00		8100.00		258.21
Reach 3	10.039	1300.42	1300.13	0.29	0.13	0.00		10800.00		271.09
Reach 3	10.039	1302.29	1301.98	0.31	0.13	0.01	748.31	13876.31	35.38	843.22
Reach 3	9.944	1298.50	1298.26	0.24	0.07	0.00		8100.00		255.55
Reach 3	9.944	1300.28	1300.00	0.29	0.07	0.00	0.11	10799.89		278.64
Reach 3	9.944	1302.16	1301.79	0.37	0.07	0.00	24.03	14635.97		843.98
Reach 3	9.897	1298.43	1298.20	0.23	0.06	0.00		8100.00		258.48
Reach 3	9.897	1300.21	1299.94	0.28	0.06	0.00	0.33	10799.67		282.83
Reach 3	9.897	1302.09	1301.73	0.36	0.06	0.00	24.16	14635.84		813.75
Reach 3	9.854	1298.37	1298.14	0.23	0.01	0.03		8100.00		257.90
Reach 3	9.854	1300.16	1299.88	0.28	0.01	0.04		10800.00		270.19
Reach 3	9.854	1302.03	1301.66	0.36	0.01	0.05		14660.00		872.58
Reach 3	9.849	1298.33	1298.00	0.33	0.01	0.05		8100.00		208.90
Reach 3	9.849	1300.11	1299.70	0.41	0.01	0.06		10800.00		215.40
Reach 3	9.849	1301.96	1301.42	0.54	0.01	0.09		14660.00		270.04
Reach 3	9.844	1298.28	1298.04	0.24	0.07	0.00		8100.00		258.82
Reach 3	9.844	1300.04	1299.75	0.28	0.06	0.00		10800.00		289.79
Reach 3	9.844	1301.87	1301.50	0.37	0.07	0.00		14660.00		866.53

Reach 3	9.802	1298.21	1297.94	0.26	0.14	0.01		8100.00	256.50
Reach 3	9.802	1299.97	1299.66	0.31	0.14	0.01		10800.00	425.70
Reach 3	9.802	1301.80	1301.40	0.40	0.15	0.01		14660.00	862.05
Reach 3	9.708	1298.05	1297.82	0.23	0.13	0.00		8100.00	255.39
Reach 3	9.708	1299.82	1299.54	0.28	0.12	0.00		10800.00	267.93
Reach 3	9.708	1301.64	1301.28	0.37	0.13	0.01		14660.00	858.88
Reach 3	9.613	1297.92	1297.70	0.22	0.13	0.00	0.02	8099.98	265.57
Reach 3	9.613	1299.70	1299.43	0.26	0.13	0.00	35.90	10764.10	482.97
Reach 3	9.613	1301.50	1301.16	0.34	0.13	0.00	163.54	14496.46	860.13
Reach 3	9.518	1297.79	1297.55	0.24	0.14	0.00		8100.00	256.46
Reach 3	9.518	1299.57	1299.28	0.29	0.14	0.00		10800.00	483.18
Reach 3	9.518	1301.37	1300.99	0.38	0.15	0.00		14660.00	827.79
Reach 3	9.424	1297.65	1297.40	0.25	0.14	0.00		8100.00	255.07
Reach 3	9.424	1299.43	1299.13	0.30	0.13	0.00	0.01	10800.00	270.33
Reach 3	9.424	1301.22	1300.83	0.39	0.14	0.00	20.15	14639.85	734.18
Reach 3	9.334	1297.51	1297.26	0.25	0.16	0.00		8100.00	257.45
Reach 3	9.334	1299.30	1299.00	0.30	0.15	0.00		10800.00	405.96
Reach 3	9.334	1301.08	1300.69	0.39	0.16	0.00		14660.00	786.88
Reach 3	9.24	1297.35	1297.09	0.27	0.17	0.00		8100.00	255.05
Reach 3	9.24	1299.15	1298.84	0.31	0.16	0.00		10800.00	292.21
Reach 3	9.24	1300.92	1300.52	0.41	0.17	0.00		14660.00	389.66
Reach 3	9.145	1297.19	1296.91	0.27	0.15	0.01		8100.00	253.95
Reach 3	9.145	1298.99	1298.67	0.32	0.14	0.01		10800.00	289.94
Reach 3	9.145	1300.75	1300.34	0.41	0.16	0.01		14660.00	387.49
Reach 3	9.053	1297.03	1296.78	0.25	0.03	0.00		8100.00	255.50
Reach 3	9.053	1298.84	1298.55	0.29	0.02	0.00		10800.00	282.55
Reach 3	9.053	1300.59	1300.20	0.39	0.03	0.00		14660.00	389.12
Reach 3	9.036	1297.00	1296.76	0.24	0.03	0.00		8100.00	257.85
Reach 3	9.036	1298.81	1298.53	0.28	0.03	0.00		10790.00	310.85
Reach 3	9.036	1300.56	1300.19	0.37	0.03	0.00		14630.00	437.52
Reach 3	9.018	1296.97	1296.72	0.25	0.03	0.00		8700.00	260.97
Reach 3	9.018	1298.78	1298.46	0.32	0.03	0.00		11920.00	272.43
Reach 3	9.018	1300.53	1300.12	0.41	0.03	0.00		15770.00	404.18
Reach 3	9.001	1296.94	1296.69	0.25				8700.00	257.60
Reach 3	9.001	1298.75	1298.43	0.32				11920.00	270.48
Reach 3	9.001	1300.50	1300.09	0.41				15770.00	746.86

Reach 3	9.802	1298.21	1297.94	0.26	0.14	0.01		8100.00	256.50
Reach 3	9.802	1299.97	1299.66	0.31	0.14	0.01		10800.00	425.70
Reach 3	9.802	1301.80	1301.40	0.40	0.15	0.01		14660.00	862.05
Reach 3	9.708	1298.05	1297.82	0.23	0.13	0.00		8100.00	255.39
Reach 3	9.708	1299.82	1299.54	0.28	0.12	0.00		10800.00	267.93
Reach 3	9.708	1301.64	1301.28	0.37	0.13	0.01		14660.00	858.88
Reach 3	9.613	1297.92	1297.70	0.22	0.13	0.00	0.02	8099.98	265.57
Reach 3	9.613	1299.70	1299.43	0.26	0.13	0.00	35.90	10764.10	482.97
Reach 3	9.613	1301.50	1301.16	0.34	0.13	0.00	163.54	14496.46	860.13
Reach 3	9.518	1297.79	1297.55	0.24	0.14	0.00		8100.00	256.46
Reach 3	9.518	1299.57	1299.28	0.29	0.14	0.00		10800.00	483.18
Reach 3	9.518	1301.37	1300.99	0.38	0.15	0.00		14660.00	827.79
Reach 3	9.424	1297.65	1297.40	0.25	0.14	0.00		8100.00	255.07
Reach 3	9.424	1299.43	1299.13	0.30	0.13	0.00	0.01	10800.00	270.33
Reach 3	9.424	1301.22	1300.83	0.39	0.14	0.00	20.15	14639.85	734.18
Reach 3	9.334	1297.51	1297.26	0.25	0.16	0.00		8100.00	257.45
Reach 3	9.334	1299.30	1299.00	0.30	0.15	0.00		10800.00	405.96
Reach 3	9.334	1301.08	1300.69	0.39	0.16	0.00		14660.00	786.88
Reach 3	9.24	1297.35	1297.09	0.27	0.17	0.00		8100.00	255.05
Reach 3	9.24	1299.15	1298.84	0.31	0.16	0.00		10800.00	292.21
Reach 3	9.24	1300.92	1300.52	0.41	0.17	0.00		14660.00	389.66
Reach 3	9.145	1297.19	1296.91	0.27	0.15	0.01		8100.00	253.95
Reach 3	9.145	1298.99	1298.67	0.32	0.14	0.01		10800.00	289.94
Reach 3	9.145	1300.75	1300.34	0.41	0.16	0.01		14660.00	387.49
Reach 3	9.053	1297.03	1296.78	0.25	0.03	0.00		8100.00	255.50
Reach 3	9.053	1298.84	1298.55	0.29	0.02	0.00		10800.00	282.55
Reach 3	9.053	1300.59	1300.20	0.39	0.03	0.00		14660.00	389.12
Reach 3	9.036	1297.00	1296.76	0.24	0.03	0.00		8100.00	257.85
Reach 3	9.036	1298.81	1298.53	0.28	0.03	0.00		10790.00	310.85
Reach 3	9.036	1300.56	1300.19	0.37	0.03	0.00		14630.00	437.52
Reach 3	9.018	1296.97	1296.72	0.25	0.03	0.00		8700.00	260.97
Reach 3	9.018	1298.78	1298.46	0.32	0.03	0.00		11920.00	272.43
Reach 3	9.018	1300.53	1300.12	0.41	0.03	0.00		15770.00	404.18
Reach 3	9.001	1296.94	1296.69	0.25				8700.00	257.60
Reach 3	9.001	1298.75	1298.43	0.32				11920.00	270.48
Reach 3	9.001	1300.50	1300.09	0.41				15770.00	746.86