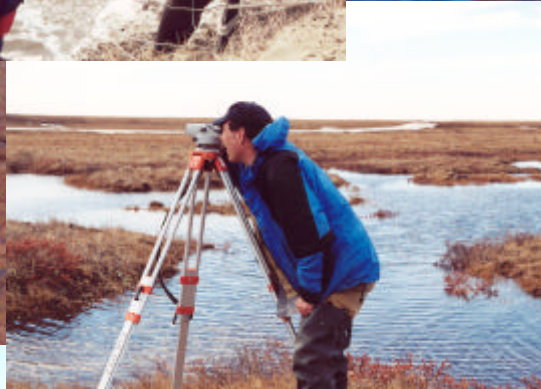


2002 Hydrologic and Hydraulic Assessment Fish Creek, Judy Creek and the Ublutuoch River North Slope, Alaska

January, 2003



Prepared For:

ConocoPhillips Alaska

Prepared By:


URS

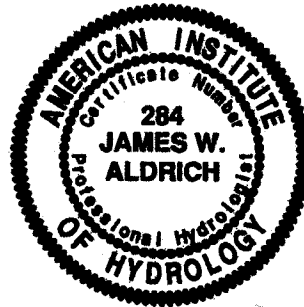
URS Corporation
3504 Industrial Ave., Suite 125
Fairbanks, AK 99701
(907) 374-0303

**2002 HYDROLOGIC AND HYDRAULIC ASSESSMENT
FISH CREEK, JUDY CREEK AND THE UBLUTUOCH RIVER
NORTH SLOPE, ALASKA**

JANUARY 2003


James C. Dietzmann


Derek J. Helmericks



James W. Aldrich, P.E., P.H.

Prepared by
URS CORPORATION
3504 Industrial Avenue, Suite 125
Fairbanks, AK 99701

Prepared for
ConocoPhillips ALASKA
700 G Street
Anchorage, AK 99501

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1.0 INTRODUCTION

This report summarizes the 2002 monitoring effort on Fish Creek, Judy Creek and the Ublutuoch River. The three streams are located within the National Petroleum Reserve, on the north slope of Alaska (Figure 1). These rivers were monitored to provide hydrologic and hydraulic information for engineering and environmental assessments of the rivers. The site investigations began on 22 May and concluded on 01 June.

Each of the three rivers is discussed in a separate section of the report, Sections 2.0 through 4.0. Within each section is a discussion of: the water surface elevations and discharge observed throughout the spring of 2002, the impact of ice and snow on water surface elevations, the magnitude and timing of flood peaks, the magnitude of the observed riverbed movement, main channel hydraulic roughness, and the 100-year water surface profile. A brief comparison of the conditions in 2002 and 2001 is also provided. The methods used to collect the field data, revise the flood frequency analysis, and revise the 100-year water surface profile are summarized in Appendix A. Summaries of the spring breakup water surface elevations and observations are presented in Appendix B, summaries of the discharge measurements are presented in Appendix C, and a photographic record is presented in Appendix D. The 100-year water surface profile computations are presented in Appendix E, summaries of the bed material gradations are presented in Appendix F and the cross section survey data are presented in Appendix G. All of the elevations presented in this report are based on the British Petroleum mean sea level datum (BPMSL).

2.0 FISH CREEK

2.1 MONITORING PROGRAM

During spring breakup, monitoring was conducted at 7 locations along Fish Creek (Figure 2). The monitoring sites were located at River Miles 0.7, 11.7, 12.6, 18.4, 25.1, 32.4, and 43.3. The monitoring consisted of recording snow and ice conditions, and water surface elevations (Appendix B). Discharge measurements were made periodically at River Miles 25.1 and 32.4 (Appendix C).

2.2 STREAM DESCRIPTION

Fish Creek lies to the west of the Colville River delta, and flows northeast into Harrison Bay. It has a drainage area of approximately 1,827 square miles, of which 22 percent is covered with lakes.

Fish Creek has a relatively low gradient and highly sinuous channel. The 2002 and 2001 average water surface slope is approximately 0.00012 feet/foot, based on water surface elevation measurements taken between River Mile 43.3 and the mouth. The channel banks and bed consist of sand and silt sized material. Undercut stream banks and bank sloughing are common along the outside of meander bends.

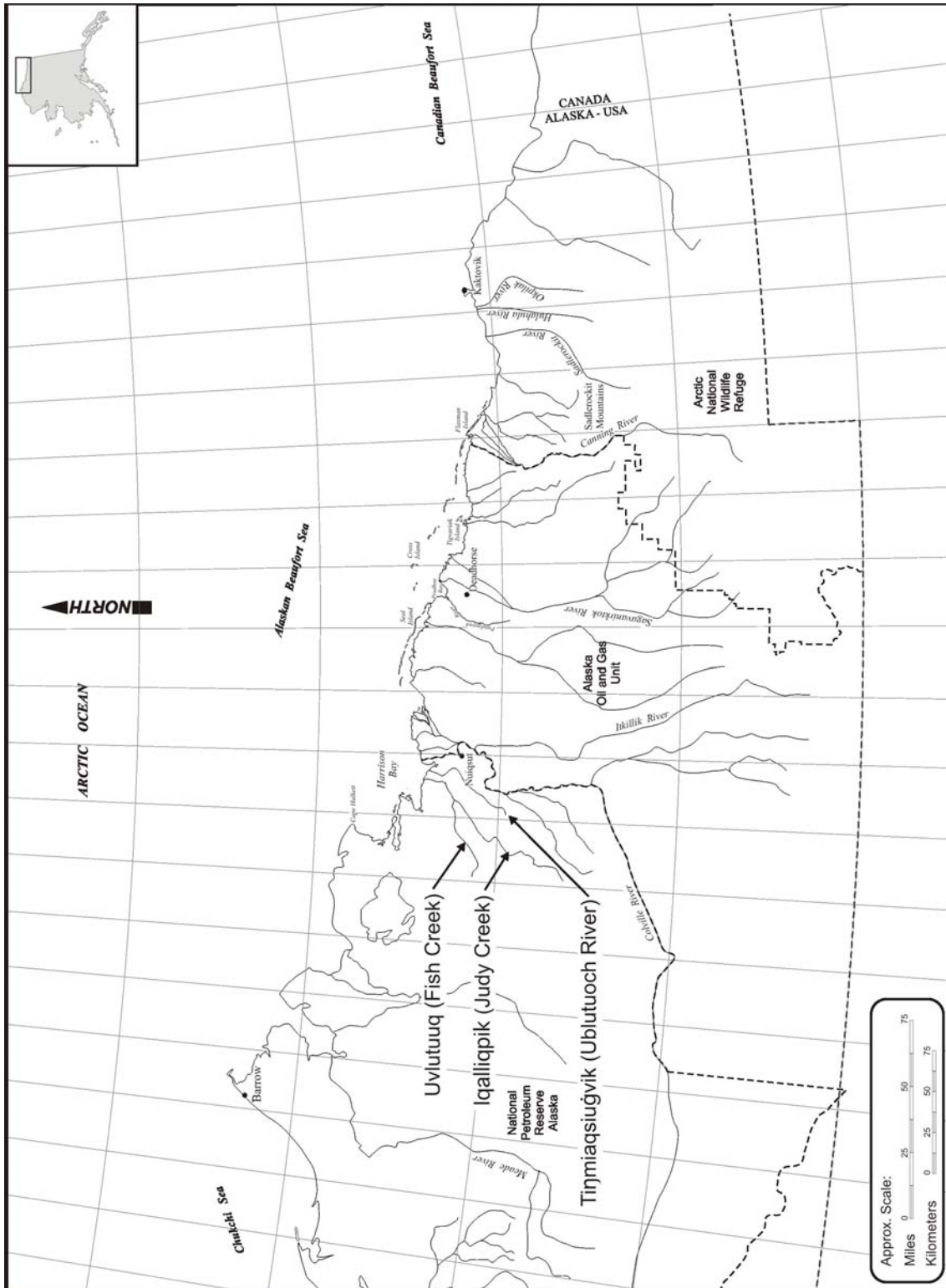
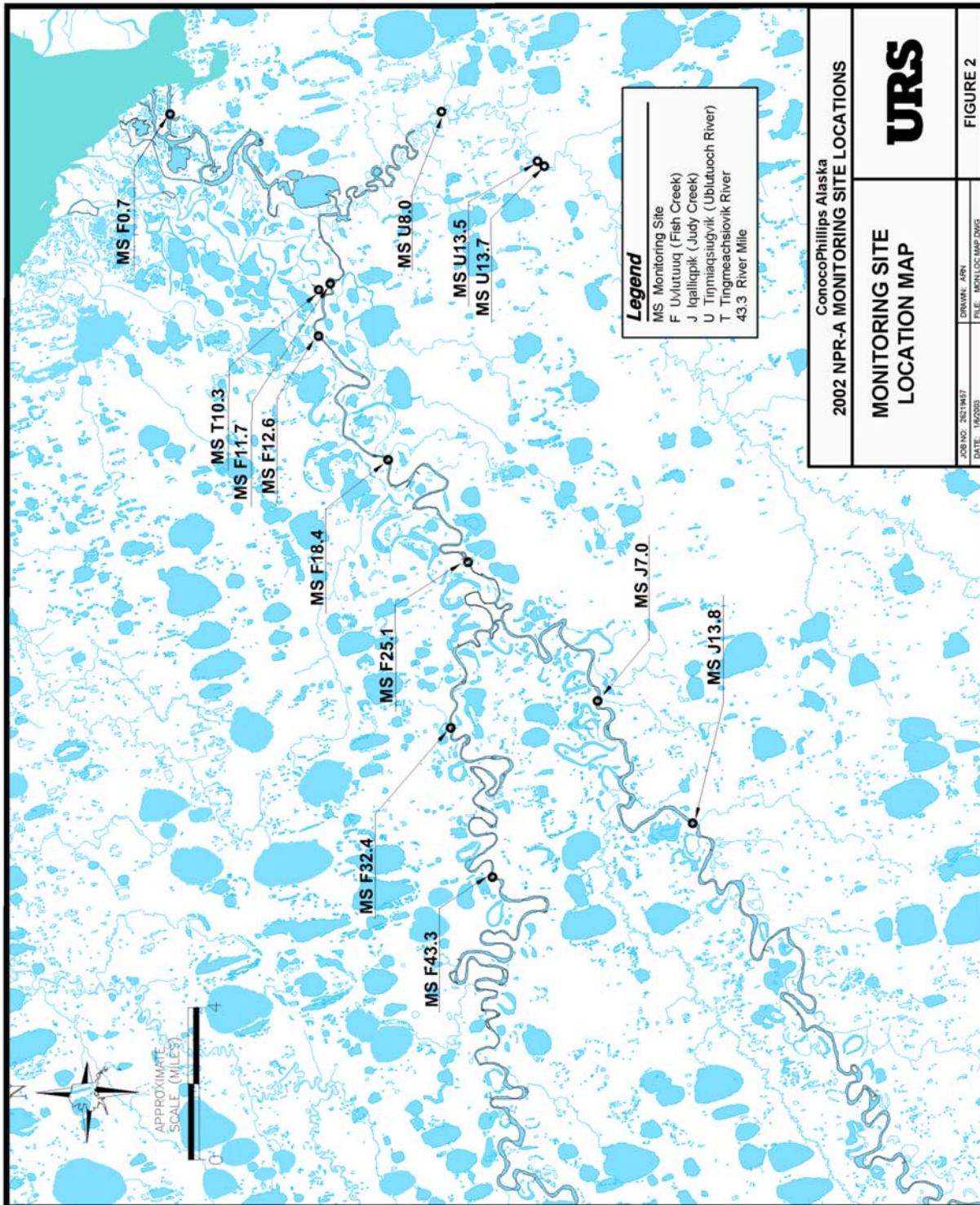


Figure 1: Location Map



2.3 SPRING BREAKUP OBSERVATIONS

2.3.1 Summary

2.3.1.1 River Mile 25.1

At River Mile 25.1, the spring-peak water surface elevation was 18.23 feet (BPMSL) and occurred at 12:13 on 25 May. The spring-peak discharge occurred at the same time as the spring-peak water surface elevation, and was approximately 8,900 cubic feet per second. The channel was clear of ice and snow when the spring-peak water surface elevation and discharge occurred.

The spring-peak discharge and the water surface elevation at the spring-peak discharge were greater in 2002 than in 2001 (Table 1, Figure 3). The spring-peak water surface elevation was affected by ice and snow in 2001, but not in 2002. Although the spring-peak discharge was greater in 2002 than in 2001, the spring-peak water surface elevation was greater in 2001.

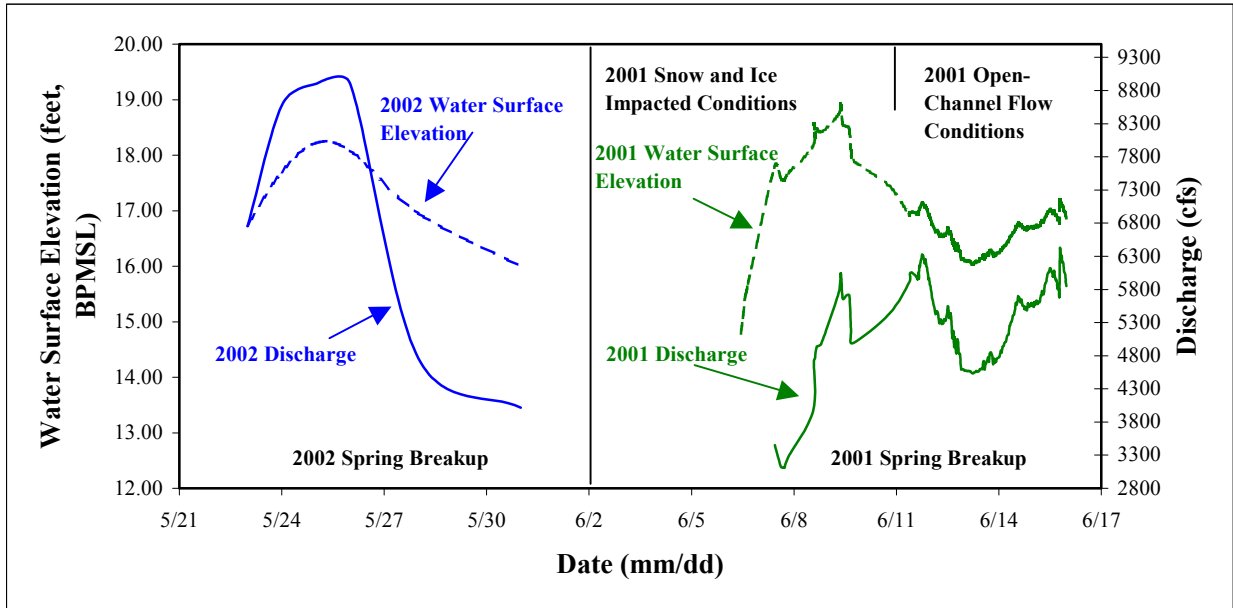
Table 1: Comparison of 2002 and 2001 Spring-Peak Water Surface Elevation and Discharge at River Mile 25.1

Year	Date	Spring-Peak Discharge (cfs) ¹	Water Surface Elevation During Spring-Peak Discharge (BPMSL) ²	Spring-Peak Water Surface Elevation (BPMSL)
2001	15-Jun	6,400	17.20	18.90 ³
2002	25-May	8,900	18.23	18.23

Notes:

1. Cubic feet per second is abbreviated cfs.
2. British Petroleum Mean Sea Level is abbreviated BPMSL.
3. This water surface elevation occurred between 9 and 10 June, and was influenced by a downstream ice-jam.

Figure 3: Comparison of 2002 and 2001 Water Surface Elevation and Discharge at River Mile 25.1



2.3.1.2 River Mile 32.4

At River Mile 32.4, the spring-peak water surface elevation was 22.42 feet (BPMSL) and occurred at approximately 16:14 on 27 May. The spring-peak discharge occurred at the same time as the spring-peak water surface elevation, and was approximately 3,700 cubic feet per second. The channel was clear of ice and snow when the spring-peak water surface elevation and discharge occurred.

The spring-peak discharge was the same in 2002 as it was in 2001 (Table 2, Figure 4). In both years, the spring-peak water surface elevation occurred at the same time as the spring-peak discharge. However, in 2002 the water surface elevation at the spring-peak discharge was 0.17 feet higher than in 2001. The difference in the water surface elevation may have to do with naturally occurring changes in the riverbed, such as the passage of dunes.

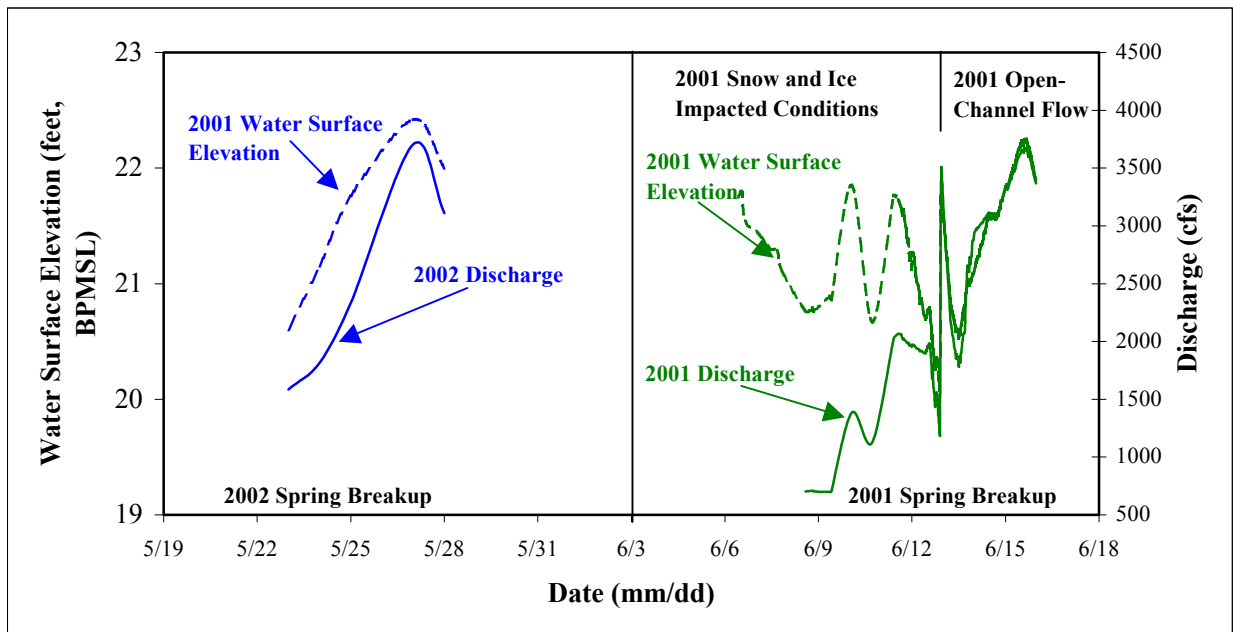
Table 2: Comparison of 2002 and 2001 Spring-Peak Water Surface Elevation and Discharge at River Mile 32.4

Year	Date	Spring-Peak Discharge (cfs) ¹	Water Surface Elevation During Spring-Peak Discharge (BPMSL) ²	Spring-Peak Water Surface Elevation (BPMSL)
2001	15-Jun	3700	22.25	22.25
2002	27-May	3700	22.42	22.42

Notes:

1. Cubic feet per second is abbreviated cfs.
2. British Petroleum Mean Sea Level is abbreviated BPMSL.

Figure 4: Comparison of 2002 and 2001 Water Surface Elevation and Discharge at River Mile 32.4



2.3.2 Daily Observations

21 May - 22 May

Water was flowing to the mouth of Fish Creek on 21 May. Little to no snow remained within the channel banks above or below the water surface (Photo 1). A surface ice jam was located at approximately River Mile 10.0, upstream from the confluence with the Ublutuoch River. The ice jam was continuous across the channel. Two smaller surface ice jams were located further upstream between River Miles 12.0 and 12.5. No ice jams were observed upstream of River

Mile 12.5, and the ice jams observed on 21 May were not present on 22 May. There was no evidence that the water surface had been higher than what it was on 21 and 22 May.



PHOTO 1. *Fish Creek at River Mile 25.1 on 21 May 2002.*

23 May - 24 May

The water surface elevation continued to rise at all Fish Creek monitoring sites on 23 and 24 May. There were a few ice floes observed in the channel, but no ice jams.

On 23 May, the discharge was measured at River Miles 25.1 and 32.4. At approximately 10:55, the discharge and average main channel velocity at River Mile 25.1 were 6,752 cubic feet per second and 3.28 feet per second, respectively (Table C-1.2, Appendix C). At approximately 16:14, the discharge and average main channel velocity at River Mile 32.4 were 1,584 cubic feet per second and 1.48 feet per second, respectively (Table C-2.2, Appendix C).

On 24 May, at approximately 14:26, the discharge at River Mile 25.1 was 8,575 cubic feet per second. The average main channel velocity was 3.67 feet per second, respectively (Table C-1.3, Appendix C).

25 May - 26 May

At approximately 12:13 on 25 May, the spring-peak water surface elevation and discharge occurred at River Mile 25.1. The spring-peak water surface elevation was 18.23 feet (BPMSL) and the spring-peak discharge was approximately 8,900 cubic feet per second (Table B-1.6 in Appendix B, and Table C-1.4 in Appendix C). The average velocity in the main channel was

3.83 feet per second. At approximately 15:51, the discharge and average main channel velocity at River Mile 32.4 were 2,334 cubic feet per second and 1.68 feet per second, respectively (Table C-2.3, Appendix C). Between 25 and 26 May, the air temperature began to decrease.

On 26 May, at River Mile 25.1, the water surface elevation was approximately 0.14 feet lower than it was on 25 May; however, the discharge was the same (Table C-1.5, Appendix C). The average main channel velocity was approximately 0.08 feet per second slower than on 25 May. Air temperatures remained well below freezing throughout the afternoon.

27 May – 28 May

On 27 May, the air temperature remained below freezing. Newly formed ice was observed on the water surface at the mouth of Fish Creek near River Mile 0.7. Due to the cold temperatures, slush was forming in the main channel between River Mile 0.7 and River Mile 43.3. At approximately 16:14 on 27 May, the spring-peak water surface elevation and discharge occurred at River Mile 32.4. The spring-peak water surface elevation was 22.42 feet (BPMSL) and the spring-peak discharge was approximately 3,700 cubic feet per second (Table B-1.7 in Appendix B, and Table C-2.4 in Appendix C). The average velocity in the main channel was 2.27 feet per second. The air temperature remained well below freezing throughout 28 May, and ice floes were nearly continuous across the flowing portion of the main channel (Photo 2).

On 28 May, discharge was measured at River Miles 25.1 and 32.4. At approximately 10:36, the discharge and average main channel velocity at River Mile 25.1 were 4,760 cubic feet per second and 2.54 feet per second, respectively (Table C-1.6, Appendix C). At approximately 11:35, the discharge and average main channel velocity at River Mile 32.4 were 3,110 cubic feet per second and 2.14 feet per second, respectively (Table C-2.5, Appendix C).



PHOTO 2. *Fish Creek at River Mile 25.1 on 28 May 2002. Note that the ice floes in the channel had formed between 27 and 28 May.*

30 May – 31 May

Due to poor weather conditions, no observations could be made on 29 May. The air temperatures remained below freezing, and by 30 May, a large ice jam had formed between approximately River Mile 9.0 and 15.0 (Photo 3).



PHOTO 3. *Upper edge of the surface ice jam on Fish Creek near River Mile 15.0 on 30 May 2002. Note that the ice floes in the channel had formed between 27 and 30 May.*

For much of its length, the ice jam was continuous across the channel (Photo 4), and caused the water surface elevation to be higher at River Mile 18.4 (Table B-1.5, Appendix B). Prior to the ice jam, the peak water surface elevation at River Mile 18.4 had been 12.90 feet (BPMSL). By 28 May, just prior to the ice jam forming, the water surface elevation had dropped to 12.03 feet (BPMSL). Between 28 May and 30 May, the water surface elevation rose to 13.41 feet (BPMSL) as the result of the downstream ice jam. By 31 May, the water surface elevation had dropped to 13.01 feet (BPMSL).

At River Mile 12.6, the water surface elevation was also increased as a result of the ice jam. Prior to the ice jam, the peak water surface elevation had been 9.59 feet (BPMSL). Between 27 and 30 May, the water surface elevation rose to 10.85 feet (BPMSL). By 31 May, the elevation had dropped to 9.51 feet (BPMSL).

Localized flooding resulting from the ice jam was observed between River Miles 12.0 and 14.0 on 30 May. The flooded area was along the south bank of the channel, and extended south as much as 1,500 feet at the widest point. Photo 5 is an aerial photograph depicting the extent of the ice jam and the flooded area.



PHOTO 4. *The surface ice jam on Fish Creek at River Mile 12.6 on 30 May 2002. Note that the ice jam was continuous across the channel.*

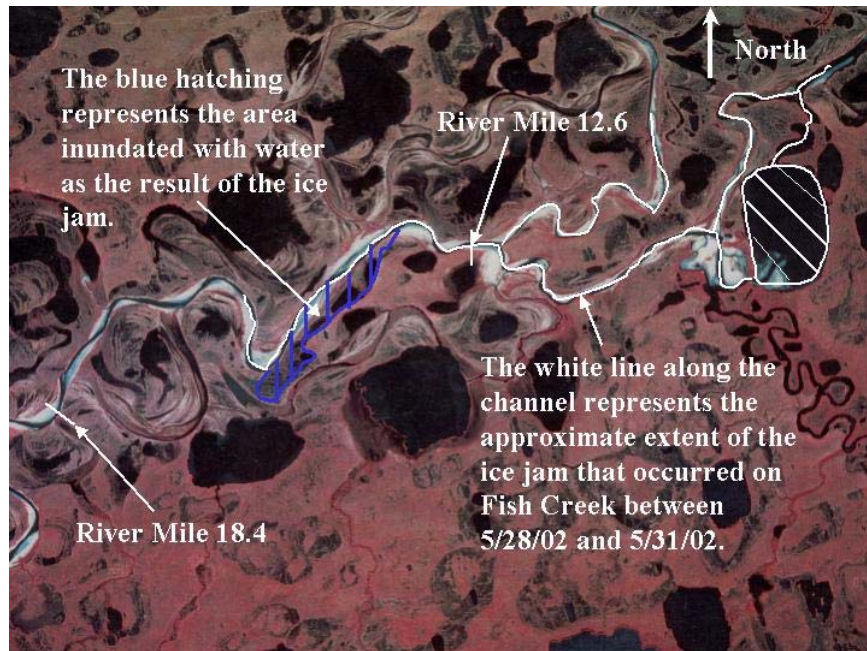


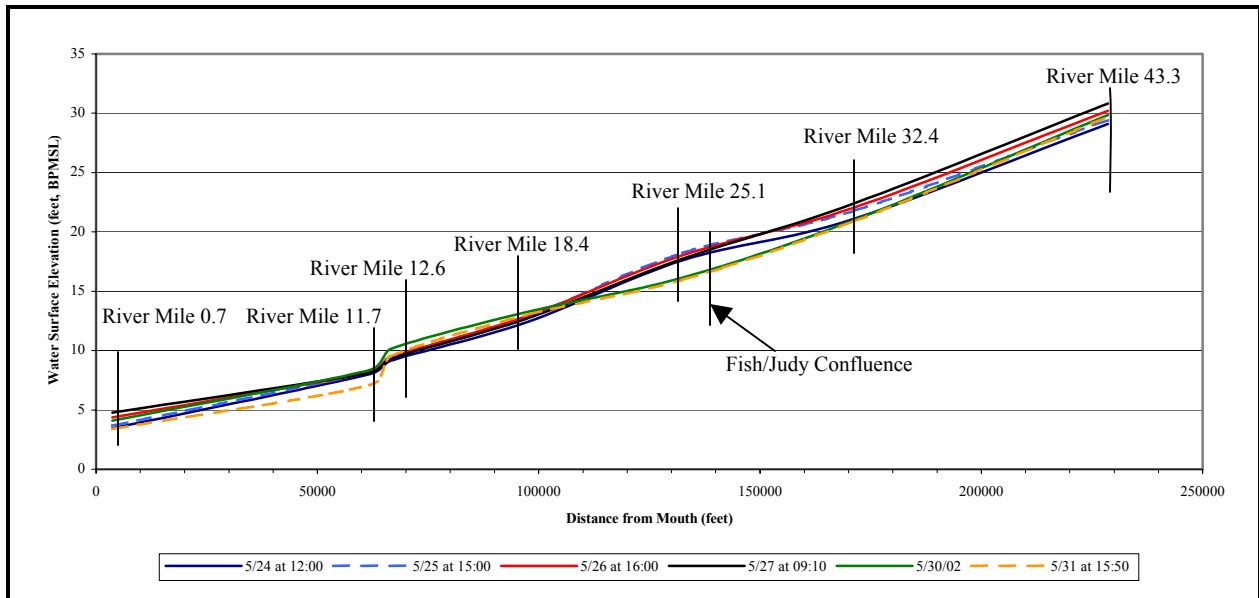
PHOTO 5. *An aerial photograph depicting the extent of the ice jam and the area flooded on Fish Creek.*

Between 15:50 and 17:00 on 31 May, the ice jam began breaking up. By 19:00, the majority of the ice jam had broken up and was no longer continuous across the channel.

The water surface profiles between River Mile 0.7 and 43.3 on 24, 25, 26, 27, 30, and 31 May are presented in Figure 5. On 30 and 31 May, there was a distinct increase in the water surface elevation between River Mile 11.7 and 12.6. Although the ice jam was still present at the time the water surface elevations were recorded at River Mile 11.7 and 12.6 on 31 May, the elevation was beginning to drop.

On 31 May, discharge was measured at River Mile 25.1. At approximately 13:51, the discharge and average channel velocity were 4,000 cubic feet per second and 2.29 feet per second, respectively (Table C-1.7, Appendix C)

Figure 5: Fish Creek Water Surface Profiles



01 June

The water surface elevation on Fish Creek continued to decrease at all monitoring sites. At River Mile 18.4, the water surface elevation dropped by more than 2 feet between 31 May and 01 June. No ice jams were observed along the channel, and the majority of the water in the flooded section between River Miles 12.0 and 14.0 had receded. Remnant ice pans remained on sand bars near River Mile 11.7 (Photo 6).



PHOTO 6. *Remnants of the ice jam near River Mile 11.7 on Fish Creek on 01 June.*

2.4 REVISED FLOOD FREQUENCY AND TIMING ANALYSIS

Other than the data collected in 2001 (URS, 2001), no other flood-peak discharge data have been collected on Fish Creek. Therefore, flood frequency and magnitude were estimated from historical data collected on other rivers in the region (URS, 2001), and calibrated with 2001 and 2002 data collected on Fish Creek, Judy Creek and the Ublutuoch River (Appendix A). The calibration was made by assuming that: (1) the average of the flood-peak discharges observed in 2001 and 2002 is equal to the mean annual discharge (i.e. the 2-year flood), and (2) adjusting the regional flood-frequency relationship to reflect this assumption (Appendix A). The flood-peak discharge estimates for Fish Creek at River Miles 0.7, 11.7, 12.6, 18.4, 25.1, 32.4, and 43.3 are presented in Table 3.

Table 3: Flood-Peak Discharge On Fish Creek

Location	Drainage Area (mile ²)	Peak Discharge (cfs)							
		2-Year Return Period	5-Year Return Period	10-Year Return Period	25-Year Return Period	50-Year Return Period	100-Year Return Period	200-Year Return Period	500-Year Return Period
Fish Creek at River Mile 0.7	1,827	17,500	26,200	32,100	40,300	46,700	53,000	59,600	72,000
Fish Creek at River Mile 11.7	1,537	14,800	22,300	27,400	34,500	40,100	45,600	51,500	62,400
Fish Creek at River Mile 12.6	1,537	14,800	22,300	27,400	34,500	40,100	45,600	51,500	62,400
Fish Creek at River Mile 18.4	1,507	14,500	21,900	26,900	33,800	39,400	44,800	50,600	61,400
Fish Creek at River Mile 25.1	1,461	14,100	21,200	26,100	32,900	38,300	43,600	49,300	59,800
Fish Creek at River Mile 32.4	783	7,700	11,800	14,700	18,800	22,100	25,400	29,000	35,800
Fish Creek at River Mile 43.3	769	7,500	11,600	14,400	18,400	21,700	25,000	28,600	35,200

These numbers represent the best estimates available at this time. However, it must be stressed that collection of 1 to 3 more years of flood-peak discharge data are desirable in order to more reliably estimate the magnitude of the 2-year flood. As a significant amount of additional regional data becomes available, the regional equations should be re-evaluated.

Whether discharges on the order of the 50- to 200-year flood are likely to occur as snowmelt floods or rainfall floods was assessed using data from three North Slope rivers (URS, 2001). Based on the available data, it appears that discharges on the order of the 50- to 200-year flood are more likely to result from snowmelt than from rainfall. This is significant because it suggests that ice loading on structures may occur in conjunction with a high stage and discharge.

2.5 BED MOVEMENT

2.5.1 2002 Sediment Transport Measurements

Bed material, bed load, and suspended sediment samples have been collected at River Mile 25.1. Bed material samples were collected on 16 July 2001 and 01 June 2002. The bedload was measured on 25 and 26 May 2002, and the suspended load was measured on 26 May 2002.

The bed material is composed of sand with some silt (Appendix F). The median diameter of the bed material (D_{50}) is on the order of 0.00038 feet. The median diameter of the 2001 sample was 0.00041 feet, while the median diameter of the 2002 sample was 0.00036 feet.

Bedload is defined as the material that is moving along the riverbed. On 25 May 2002, the bedload was approximately 351 tons per day¹. At the time of the measurement, the water surface elevation was 18.22 feet (BPMSL) and the discharge was approximately 8,900 cubic feet per second (Table C-1.1, Appendix C). The median diameter (D_{50}) of the bedload was 0.00041 feet and the specific gravity of the bedload was 2.634. Approximately 3.3 percent of the bedload was composed of organic material. The median diameter of the mineral portion of the bedload was 0.00041 feet and the specific gravity of the mineral portion of the bedload was 2.642 (Appendix F).

On 26 May, the bedload was approximately 423 tons per day¹. At the time of the measurement, the water surface elevation was 18.08 feet (BPMSL), and the discharge was approximately 8,900 cubic feet per second. (Table C-1.1, Appendix C). The median diameter (D_{50}) of the bed load was 0.00039 feet and the specific gravity of the bedload was 2.623. Approximately 6.1 percent of the bedload was composed of organic material. The median diameter of the mineral portion of the bedload was 0.00039 feet and the specific gravity of the mineral portion of the bedload was 2.640 (Appendix F).

On 26 May, the suspended sediment load was approximately 8,400 tons per day. The concentration of the suspended sediment was 349 milligrams per liter (Appendix F). Thus, on 26 May the total sediment load was approximately 8,800 tons per day.

¹ This number assumes that the sampling efficiency of the apparatus was 100%.

2.5.2 Comparison of 2002 and 2001 Riverbed Elevations

During both the 2002 and 2001 spring breakups, the Fish Creek riverbed was relatively mobile. A comparison of the riverbed elevation on various dates during the 2002 breakup, at River Miles 25.1 and 32.4, is shown in Figures 6 and 8. The 2002 and 2001 average riverbed elevation at River Miles 25.1 and 32.4, with selected maximum and minimum riverbed elevations, are presented in Figures 7 and 9. Note that in 2001 the riverbed elevation changed by as much as 5 and 7 feet at River Miles 25.1 and 32.4, respectively. In 2002, the maximum observed riverbed elevation change was less, about 3 and 1 feet at River Miles 25.1 and 32.4, respectively.

Figure 6: 2002 Riverbed Elevation Over Time At River Mile 25.1

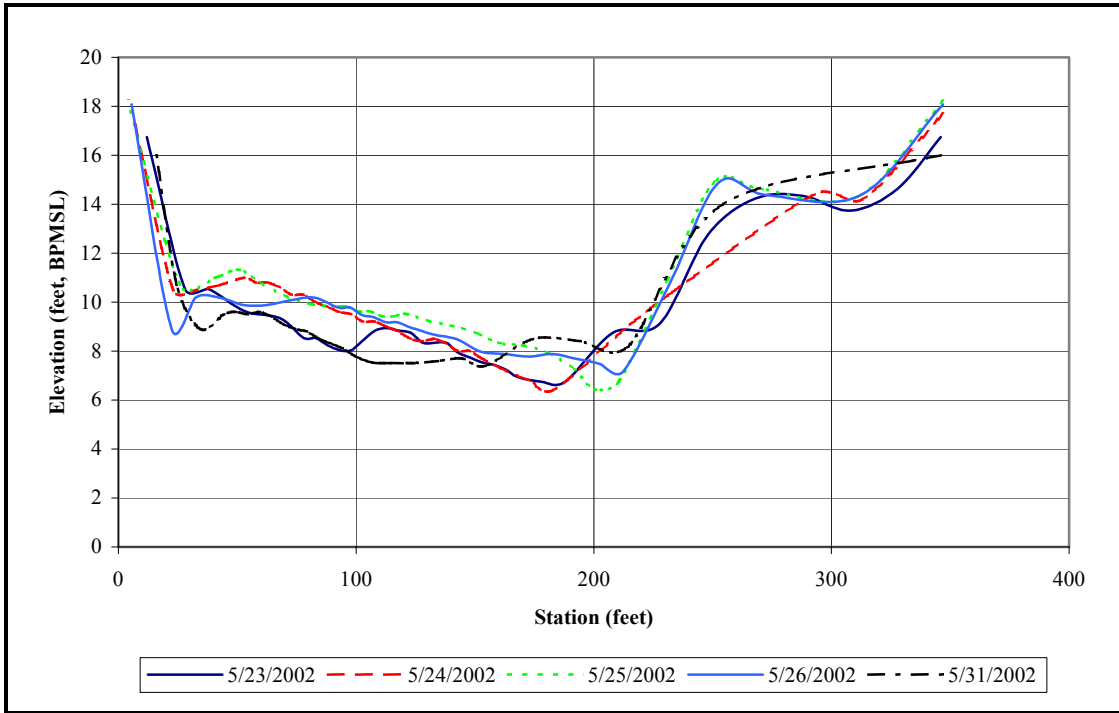


Figure 7: 2002 and 2001 Average Riverbed Elevation at River Mile 25.1

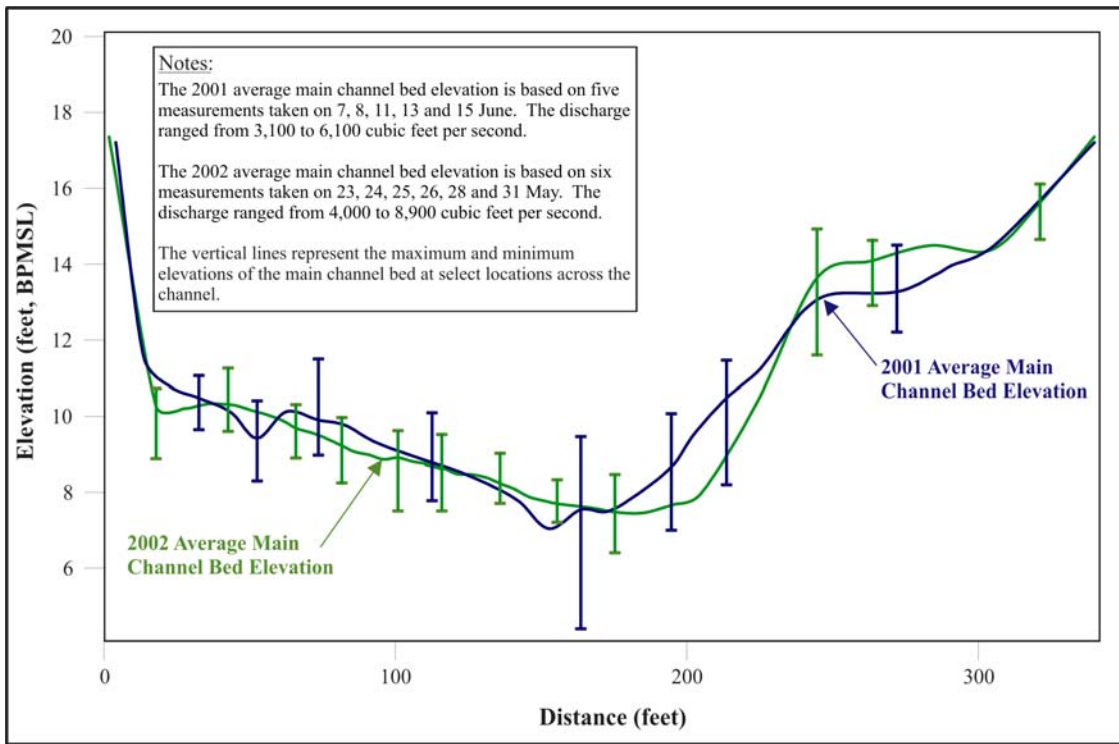


Figure 8: 2002 Riverbed Elevation Over Time at River Mile 32.4

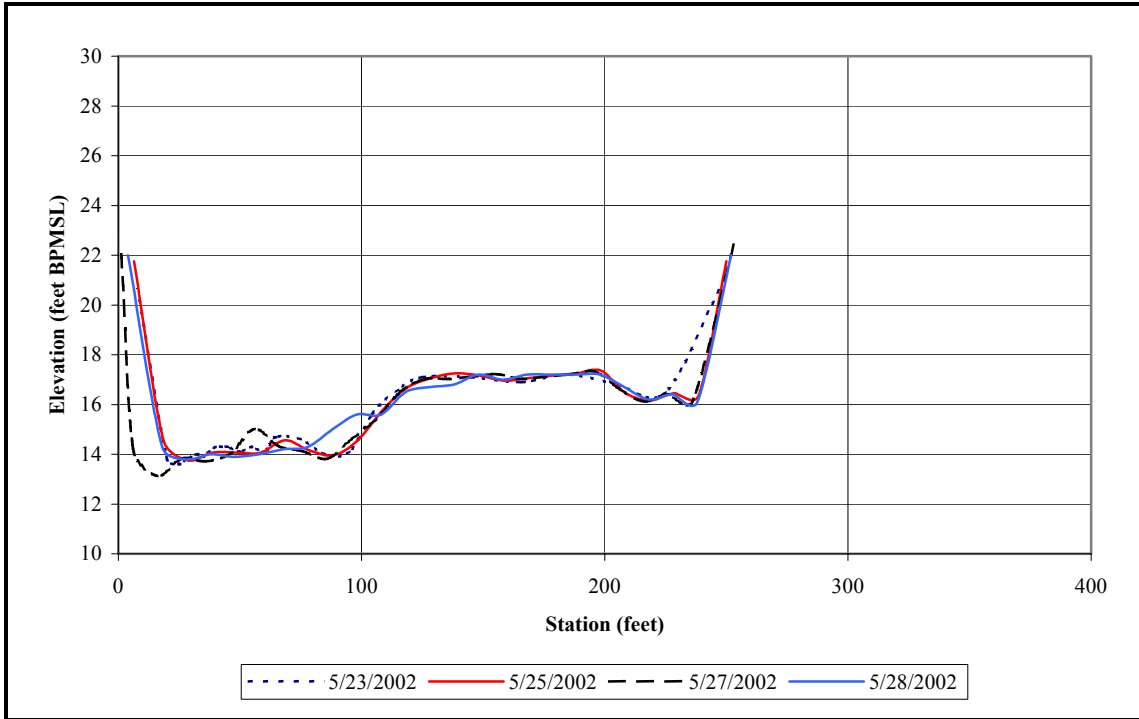
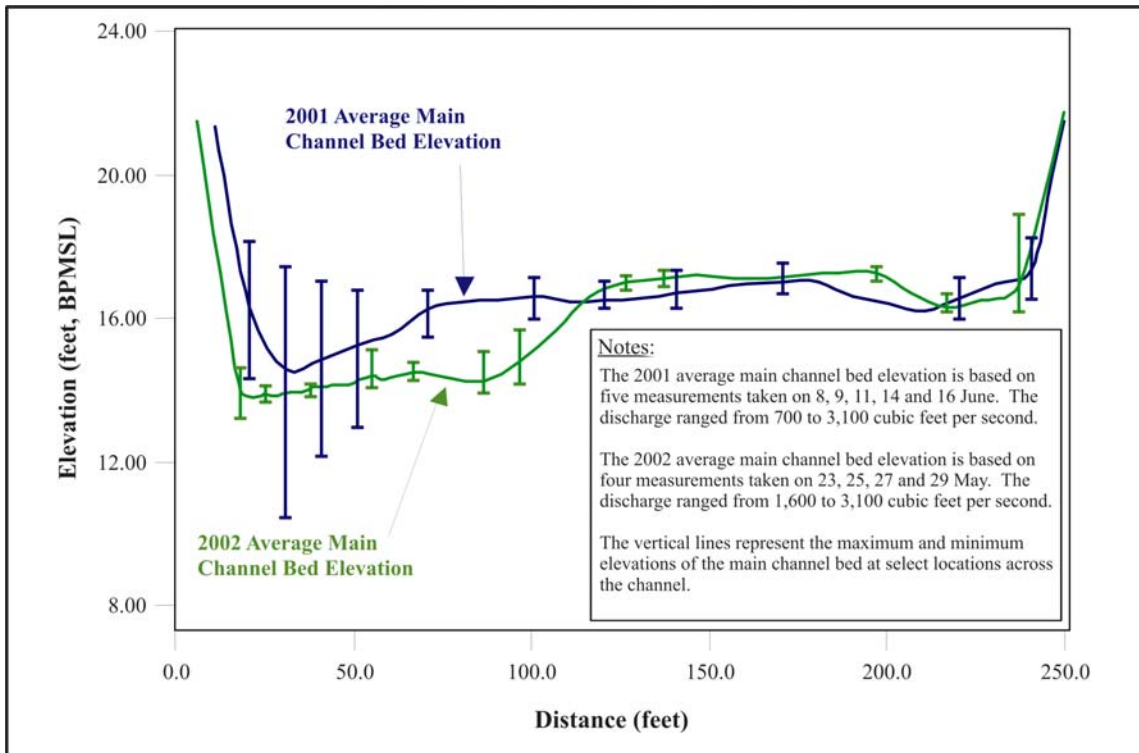


Figure 9: 2002 and 2001 Average Riverbed Elevation at River Mile 32.4



2.5.3 Bed Forms

The daily changes in the channel bed that were recorded during the 2002 and 2001 breakups suggest that the bed is easily eroded, moved and shaped by the flow. The interaction of the water-sediment mixture and the sand bed can create different bed configurations, such as: ripples, dunes, transition and antidunes. For a particular size of bed material, the bed forms change from ripples to dunes to transition and then to antidunes as the stream power increases. The type of bed form present in the channel affects both the hydraulic roughness and the rate of sediment transport, which affect the water velocity, depth of scour and water surface elevation. Using the information obtained during the discharge measurements on Fish Creek and Figure 4.15 in *Engineering Analysis of Fluvial Systems* (Simons, Li & Associates, 1982), an estimate was made of the type of bed form present during the discharge measurements at River Miles 25.1 and 32.4.

At River Mile 25.1, dunes are probably present at discharges of 3100 to 4800 cubic feet per second. At discharges between 6100 and 8900 cubic feet per second both dunes and antidunes are probably present. The antidunes are probably confined to the deepest and/or the fastest portions of the channel. As the discharge increases, the portion of the bed covered by antidunes is likely to increase.

At River Mile 32.4, both ripples and dunes are probably present at discharges of 1500 to 2300 cubic feet per second. At discharges between 3100 and 3700 cubic feet per second dunes are probably the predominant bed form.

The height of a dune or antidune is measured from the trough to the crest. Generally, it is assumed that one-half the dune or antidunes height is above the average riverbed elevation. Thus, if dunes or antidunes are present, their height must be considered when estimating riverbed scour depth.

The average dune height is approximately one-third to one-half the average depth of flow (Richardson, et al., 1990). The maximum height is approximately equal to the average depth of flow (Simons, Li & Associates, 1982). The presence of dunes can cause undulations in the water surface to be out of phase with the surface of the riverbed. Hydraulic roughness typically ranges between 0.020 and 0.035.

The maximum antidune height is approximately equal to the depth of flow (Simons, Li & Associates, 1982). If antidunes are present, there will be either standing waves or breaking waves on the surface of the water. The water surface will be in phase with the riverbed surface except when an antidune breaks. Hydraulic roughness typical ranges from 0.014 to 0.025 when standing waves are present, and 0.015 to 0.031 when breaking waves are present. The presence

and height of the waves will be an important consideration in setting freeboard requirements, if structures are located adjacent to the channel.

2.6 HYDRAULIC ROUGHNESS

The hydraulic roughness of the channel was predicted based on the discharge and water surface elevation measurements made during the breakup monitoring. An estimate of hydraulic roughness is required in order to estimate the extent of the 100-year floodplain and to design structures in or adjacent to Fish Creek.

The hydraulic roughness was estimated based on each of two methods of analysis. The first assessment of hydraulic roughness was based on normal depth computations. Normal depth computations are useful when a limited amount of information is available or a quick estimate of water surface elevation and velocity are required. The normal depth computations assume that the water surface slope is equal to the energy slope, which in natural rivers is often not precisely the situation. The second assessment was based on backwater computations. Backwater computations do not assume that the water surface slope is equal to the energy slope and thus, are more precise. However, backwater computations require considerably more data and more computational effort to estimate water surface elevation and velocity.

2.6.1 Normal Depth Computations

2.6.1.1 2002 Estimates

The hydraulic roughness (Manning's "n") at River Mile 25.1 was estimated based on: water surface elevations at River Miles 18.4 and 25.1, and discharge measurements at River Mile 25.1. As shown in Table 4, the main-channel hydraulic roughness varied over the monitoring period. The values ranged from 0.017 to 0.021, with a median value of 0.018.

Table 4: 2002 Hydraulic Roughness on Fish Creek at River Mile 25.1

Date	Time	Water Surface Elevation RM 18.4 (feet)	Water Surface Elevation RM 25.1 (feet)	Discharge RM 25.1 (cubic feet per second)	Cross-Sectional Area RM 25.1 (sq feet)	Wetted Perimeter RM 25.1 (feet)	Water Surface Slope ¹ (feet/foot)	Main Channel Hydraulic Roughness
23-May	9:08	11.76						
23-May	10:55	11.79 ²	16.74	6751.7	2057.0	336.0	0.00014	0.018
23-May	13:08	11.82						
24-May	12:40	12.40						
24-May	14:26	12.44 ²	17.70	8574.9	2336.5	343.1	0.00015	0.018
24-May	15:32	12.47						
25-May	14:14	12.87 ³	18.22	8910.3	2325.2	345.4	0.00015	0.017
25-May	14:30	12.87						
25-May	18:35	12.90						
26-May	9:44	12.90						
26-May	10:26	12.90 ²	18.08	8929.8	2381.0	344.9	0.00015	0.017
26-May	16:05	12.88						
28-May	8:14	12.14						
28-May	10:36	12.09 ²	16.95	4759.8	1875.8	338.5	0.00014	0.021
28-May	14:00	12.03						
31-May	12:14	13.17						
31-May	13:51	13.09 ²	16.00	4018.0	1757.5	332.2	0.00008 ⁴	0.018
31-May	15:25	13.01						

Notes:

1. The distance along the channel between RM 18.4 and RM 25.1 is 35,393 feet.
2. Interpolated water surface elevation.
3. Extrapolated water surface elevation
4. The slope is impacted by an ice jam located downstream of RM 18.4.

The hydraulic roughness (Manning’s “n”) at River Mile 32.4 was estimated based on: water surface elevations at River Miles 25.1 and 32.4, discharge measurements at River Mile 32.4, and normal depth computations. As shown in Table 5, the main-channel hydraulic roughness was fairly constant during the 2002 monitoring period. The values ranged from 0.025 to 0.027, with a median value of 0.026.

Table 5: 2002 Hydraulic Roughness on Fish Creek at River Mile 32.4

Date	Time	Water Surface Elevation RM 25.1 (feet)	Water Surface Elevation RM 32.4 (feet)	Discharge RM 32.4 (cubic feet per second)	Cross-Sectional Area RM 32.4 (sq ft)	Wetted Perimeter RM 32.4 (feet)	Water Surface Slope ¹ (feet/foot)	Main Channel Hydraulic Roughness
23-May	11:56	16.76						
23-May	16:14	16.91 ²	20.60	1616.3	1069.8	241.5	0.00010	0.026
24-May	8:44	17.51						
24-May	13:35	17.66						
24-May	14:26	17.70 ²	21.15	1956	1220	244	0.00009	0.026
24-May	15:16	17.73						
25-May	14:46	18.22						
25-May	15:51	18.20 ²	21.76	2333.8	1387.3	247.0	0.00009	0.027
25-May	16:40	18.19						
27-May	15:22	17.65						
27-May	15:58	17.64 ²	22.42	3702.8	1631.6	258.1	0.00012	0.025
27-May	17:03	17.63						
28-May	11:30	16.90						
28-May	11:35	16.90 ³	22.00	3109.9	1456.2	251.3	0.00013	0.026

Notes:

1. The distance along the channel between RM 32.4 and RM 25.1 is 38,534 feet.
2. Interpolated water surface elevation.
3. Assumed the water surface elevation was the same at 11:35 as it had been at 11:30.

2.6.1.2 Comparison of 2002 and 2001 Estimates

Hydraulic roughness was estimated at River Mile 25.1 in both 2001 and 2002. In 2001, three simultaneous measurements of discharge and water surface slope were made during the period unaffected by snow and ice, and the median hydraulic roughness was 0.019 (URS, 2001). In 2002 six measurements were made, and the median value was 0.018. The values varied from 0.019 to 0.020 in 2001 and from 0.017 to 0.021 in 2002. Thus, the hydraulic roughness during the period unaffected by snow and ice was similar during the two years. Although measurements of discharge and water surface slope were made during the ice and snow impacted portion of breakup in 2001, no such measurements were made in 2002. In 2001 the median hydraulic roughness associated with three measurements during the ice and snow impacted period was 0.034. The values varied from 0.030 to 0.041 (URS, 2001).

The variations in hydraulic roughness from 2001 to 2002 at River Mile 32.4 were similar to those at River Mile 25.1. In 2001, two simultaneous measurements of discharge and water surface slope were made during the period unaffected by snow and ice, and the median hydraulic roughness was 0.024 (URS, 2001). In 2002, five measurements were made and the median value was 0.026. The values varied from 0.023 to 0.024 in 2001, and from 0.025 to 0.027 in 2002. As at River Mile 25.1, no simultaneous measurements of discharge and water surface slope were made during the ice and snow impacted portion of breakup in 2002. However in 2001, three measurements were made and the hydraulic roughness varied from 0.025 to 0.038. The median value was 0.038 (URS, 2001).

2.6.2 Backwater Computations

2.6.2.1 2002 Estimates

A water surface profile model of Fish and Judy Creeks was developed using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS) computer program and surveyed cross sections at River Miles 0.7, 11.7, 12.6, 18.4, 25.1, 32.4 and 43.3 on Fish Creek and River Miles 7.0 and 13.8 on Judy Creek. The hydraulic roughness of the sand bed portion of the main channel was estimated based on discharge and water surface elevation measurements made on 25 May 2002. The discharge, water surface elevations and estimated values of the hydraulic roughness at each of the surveyed cross sections are presented in Table 6, and a more detailed description of the model is provided in Appendices A and E.

Table 6: 2002 Fish Creek Calibrated Hydraulic Roughness Values

River Mile	Discharge (cubic feet per second)	Observed Water Surface Elevation (feet)	Computed Water Surface Elevation (feet)	Calibrated Main Channel Hydraulic Roughness Values
0.7	11,080	3.68	3.68	0.070
11.7	9,361	8.19	8.19	0.030
12.6	9,361	9.46	9.46	0.038
18.4	9,183	12.87	12.87	0.014
25.1	8,910	18.22	18.22	0.021
32.4	2,334	21.77	21.77	0.030
43.3	2,293	29.43	29.43	0.027

2.6.2.2 Comparison of 2002 and 2001 Estimates

Estimated hydraulic roughness values based on the 2001 water surface profile model are presented in Table 7. Although the hydraulic roughness varied from one year to the next, the values are generally within the range of values one would expect when dunes and antidunes are present on the riverbed (0.014 – 0.035). The one notable exception is the estimated hydraulic

roughness between River Miles 0.7 and 11.7. The calibrated values between River Mile 0.7 and 11.7 reflect the influence of the offshore ice on the water surface profile within this reach. Thus, these values are higher than one would expect, based solely on the bed form. The only other exception is the hydraulic roughness at River Mile 12.6 in the 2002 model². The estimated hydraulic roughness at this location is slightly higher than the upper value generally associated with dunes. The reason is probably related to the split channel condition that occurs just below River Mile 12.6. Thus, the hydraulic roughness is related to both the bed form and the split channel condition. Upstream of River Mile 12.6 the calibrated roughness values were within the range of roughness values associated with dunes and antidunes. The average main channel roughness at the surveyed cross sections between River Mile 18.4 and 43.3 was 0.024 in the 2001 model, and 0.023 in the 2002 model.

Table 7: 2001 Fish Creek Calibrated Hydraulic Roughness Values

River Mile	Discharge (cubic feet per second)	Observed Water Surface Elevation (feet)	Computed Water Surface Elevation (feet)	Calibrated Main Channel Hydraulic Roughness Values
0.7	5,805	2.87	2.87	0.055
11.7	4,905	7.03	7.03	0.047
18.4	4,811	11.37	11.39	0.020
25.1	4,668	16.18	16.16	0.021
32.4	1,983	20.71	20.70	0.028
43.3	1,948	29.01	28.98	0.027

2.7 IMPACT OF SNOW AND ICE

The impact of snow and ice on the water surface elevation is an important consideration during the design of structures adjacent to the river. This consideration is often addressed in the freeboard requirements associated with the design water surface elevation. For this reason, observations were made of the impact of snow and ice on water surface elevations along the Fish Creek Channel.

2.7.1 2002 Observations

On 21 May 2002, when the first observations of breakup were made, there was little to no snow or ice remaining in the Fish Creek channel. At River Miles 25.1 and 32.4, the primary Fish Creek monitoring sites, the spring peak water surface elevation occurred at the same time as the spring peak discharge, and snow and ice had no impact on the water surface elevation.

² A surveyed cross section was not available at River Mile 12.6 until 2002.

However, after the spring peak discharge and water surface elevation had occurred at River Miles 25.1 and 32.4, an ice jam formed at about River Mile 9.0 that did impact water surface elevations at the River Mile 18.4 and 12.6 monitoring sites. Although the previous winter's ice had already cleared the channel, a sharp decrease in air temperature caused ice to begin forming on the water surface. The ice formed during this short cold snap produced the ice jam.

At River Mile 18.4, the effect of the ice jam was to raise the water surface about 1.4 feet. The peak water surface elevation during the ice jam was about 0.5 feet higher than the water surface elevation at the peak discharge. At River Mile 12.6, the peak water surface elevation during the ice jam was about 1.3 feet higher than the water surface elevation at the peak discharge.

2.7.2 Comparison of 2001 and 2002 Observations

During the 2001 breakup, monitoring began before water had begun to flow in the channel. As the snow began to melt, the water began to flow over the top of the snow. As breakup continued, the water cut down into the snow, and eventually cleared the channel of snow and ice. At River Mile 25.1 the peak water surface elevation occurred prior to the peak discharge, and was affected by snow. The difference between the peak water surface elevation and the water surface elevation at the peak discharge was about 1.7 feet. At River Mile 32.4 the peak water surface elevation and discharge occurred at the same time and were not affected by ice and snow.

Thus, during both 2002 and 2001 the peak water surface elevation was affected by snow and ice at one or more of the monitoring sites. In 2002 the maximum observed impact was about 1.3 feet and in 2001 the maximum observed impact was about 1.7 feet.

2.8 REVISED 100-YEAR WATER SURFACE PROFILE

The 100-year water surface profile that was developed in 2001 was re-evaluated using the data collected during the 2002 breakup. The water surface profile is based on the assumption that the channel is unaffected by snow and ice blockage, and was developed using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS) computer program. A more detailed description of the methods used to develop the water surface profile is presented in Appendix A, and a copy of the HEC-RAS output is presented in Appendix E.

Because the sand bed portion of the riverbed is likely to be covered by dunes and antidunes during the peak discharge of the 100-year flood, and because the hydraulic roughness associated with these bed forms has a wide range, three different HEC-RAS models were used to describe the conditions likely to occur during the 100-year flood. The first model is based on the calibrated roughness values developed from the data collected in 2002. However, because the hydraulic roughness can vary over a large range during a single flood event, it is suggested that for planning and design purposes two other models be used to estimate the conditions that could

occur during the 100-year flood. Where an estimate of water surface elevations is required, it is suggested that the hydraulically rough model be considered. Where an estimate of water velocities is required, it is suggested that the hydraulically smooth model be considered. The only difference between the models is the hydraulic roughness associated with the sand bed portion of the channel.

These models were developed to predict water surface elevations upstream from River Mile 12.6. The reach below River Mile 12.6 is likely to be more severely impacted by our limited understanding of the conditions at the coast.

2.8.1 Calibration Model

This model is based on the sand bed hydraulic roughness observed on 25 May 2002. A summary of the results is presented in Table 8.

Table 8: Fish Creek 100-Year Calibration Model Summary

100-Year Return Period					
River Mile	Discharge (cubic feet per second)	Water Surface Elevation (feet)	Average Velocity		
			Left Overbank	Channel	Right Overbank
0.7	53,000	6.42	0.48	0.49	0.27
11.7	45,600	12.27	0.76	2.55	0.30
12.6	45,600	12.78	0.92	2.60	0.40
18.4	44,800	17.02	0.74	5.56	0.71
25.1	43,600	23.50	0.69	4.64	0.85
32.4	25,400	28.51	0.70	1.74	0.70
43.3	25,000	39.29	0.93	3.30	1.06

2.8.2 Hydraulically Smooth Model

The hydraulically smooth model is based on a sand bed hydraulic roughness value that is the average of the lower end of the roughness values associated with the dune, transition and antidune bed forms. Thus, the sand bed portion of each cross section above River Mile 11.7 was assigned a hydraulic roughness of 0.016. Below River Mile 11.7, the hydraulic roughness was not altered from that of the calibration model because the roughness values used in the calibration model were a function of both the bed form and the boundary conditions. A summary of the 100-year hydraulically smooth model results is presented in Table 9.

Table 9: Fish Creek Hydraulically Smooth Model Summary

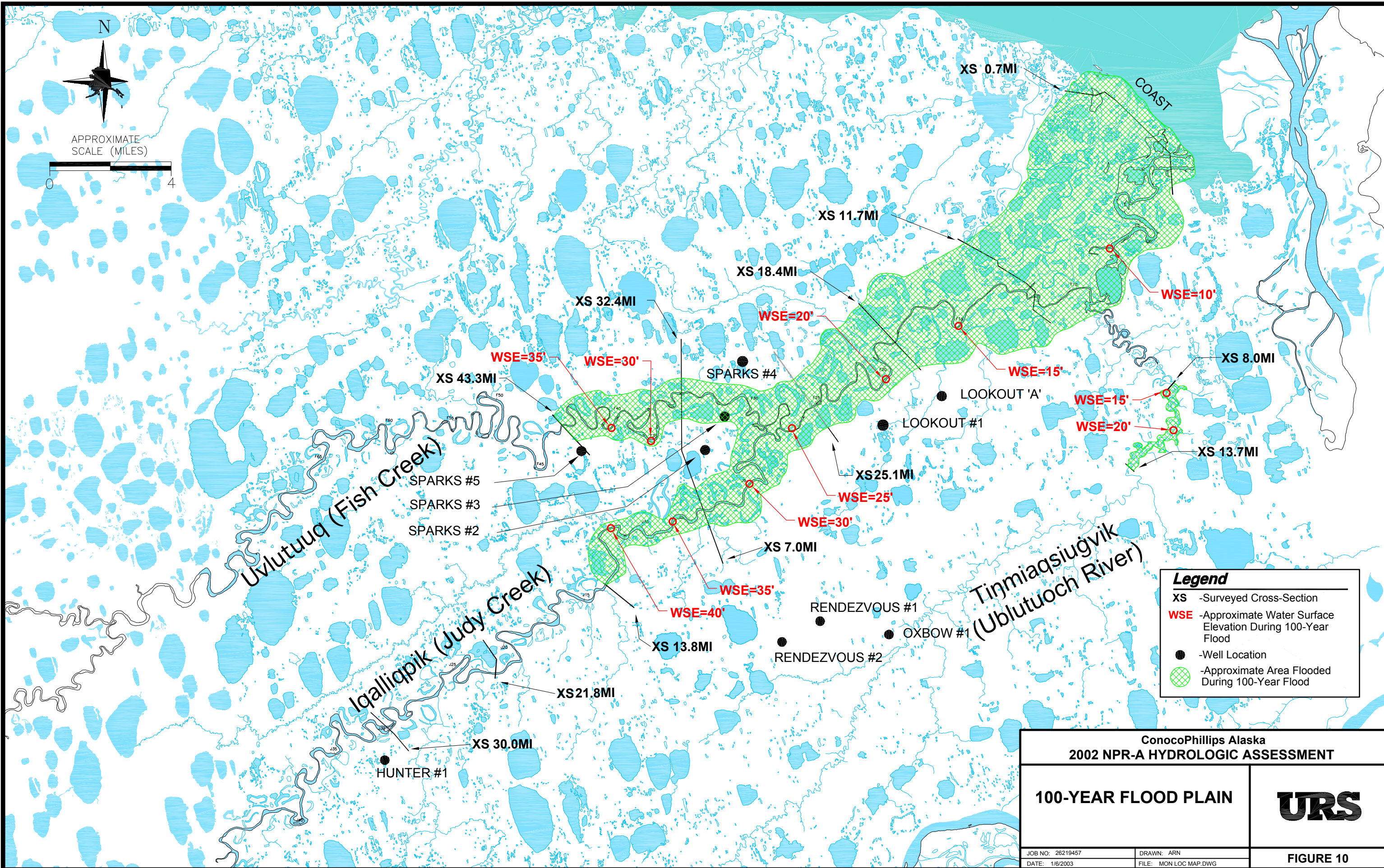
100-Year Return Period					
River Mile	Discharge (cubic feet per second)	Water Surface Elevation (feet)	Average Velocity		
			Left Overbank	Channel	Right Overbank
0.7	53,000	6.42	0.48	0.49	0.27
11.7	45,600	12.27	0.76	2.55	0.30
12.6	45,600	12.61	0.67	4.54	0.29
18.4	44,800	17.06	0.73	5.49	0.70
25.1	43,600	23.12	0.64	5.65	0.80
32.4	25,400	27.95	0.66	2.92	0.64
43.3	25,000	37.74	0.73	4.65	0.86

2.8.3 Hydraulically Rough Model

The hydraulically rough model is based on a sand bed hydraulic roughness value that is the average of the upper end of the roughness values associated with dune, transition and antidune bed forms. Thus, the sand bed portion of each cross section above River Mile 11.7 was assigned a hydraulic roughness of 0.031. Below River Mile 11.7, the hydraulic roughness was not altered from that of the calibration model because the roughness values used in the calibration model were a function of both the bed form and the boundary conditions. A summary of the 100-year hydraulically rough model results is presented in Table 10, and an estimate of the area inundated by the 100-year flood is presented in Figure 10.

Table 10: Fish Creek Hydraulically Rough Model Summary

100-Year Return Period					
River Mile	Discharge (cubic feet per second)	Water Surface Elevation (feet)	Average Velocity		
			Left Overbank	Channel	Right Overbank
0.7	53,000	6.42	0.48	0.49	0.27
11.7	45,600	12.27	0.76	2.55	0.30
12.6	45,600	12.75	0.87	3.00	0.38
18.4	44,800	17.64	0.69	4.69	0.62
25.1	43,600	24.00	0.75	3.35	0.90
32.4	25,400	28.71	0.69	1.62	0.68
43.3	25,000	39.54	0.99	3.03	1.11



ConocoPhillips Alaska 2002 NPR-A HYDROLOGIC ASSESSMENT	
100-YEAR FLOOD PLAIN	
JOB NO: 26219457 DATE: 1/6/2003	DRAWN: ARN FILE: MON LOC MAP.DWG
FIGURE 10	

3.0 JUDY CREEK

3.1 MONITORING PROGRAM

During spring breakup, monitoring was conducted at two locations along Judy Creek (Figure 2). The monitoring sites were located at River Miles 7.0 and 13.8. The monitoring consisted of recording snow and ice conditions, and water surface elevations (Appendix B). Discharge measurements were made periodically at River Mile 7.0 (Appendix C).

3.2 STREAM DESCRIPTIONS

Judy Creek is a tributary to Fish Creek. It enters Fish Creek approximately 26 miles upstream from the mouth of Fish Creek. It has a drainage area of approximately 666 square miles, of which 18 percent is covered by lakes. A portion of the Judy Creek headwaters is located in the foothills of the Brooks Range, while the remainder of the watershed is located on the Arctic Coastal Plain.

Judy Creek has a relatively low gradient and highly sinuous channel. The 2002 and 2001 average water surface slope is approximately 0.00020 feet/foot, based on water surface elevation measurements taken between River Mile 13.8 on Judy Creek and River Mile 25.1 on Fish Creek. The channel banks and bed consist of sand and silt sized material. Undercut stream banks and bank sloughing are common along the outside of meander bends.

3.3 SPRING BREAKUP OBSERVATIONS

3.3.1 Summary

At River Mile 7.0, the spring-peak water surface elevation was 26.81 feet (BPMSL) and occurred at 14:16 on 25 May. The spring-peak discharge occurred at the same time as the spring-peak water surface elevation, and was approximately 7,200 cubic feet per second. The channel was clear of ice and snow when the spring-peak water surface elevation and discharge occurred. The Judy Creek peaks occurred on the same day as the peaks on Fish Creek at River Mile 25.1.

The spring-peak discharge was greater in 2002 than in 2001 (Table 11); however, the spring-peak water surface elevation at the spring-peak discharge was greater in 2001 than in 2002. The spring-peak water surface elevation was affected by snow and ice in 2001, but not in 2002. Although the spring-peak discharge was greater in 2002 than in 2001, the spring-peak water surface elevation was greater in 2001.

Table 11: Comparison of 2002 and 2001 Spring-Peak Water Surface Elevation and Discharge at River Mile 7.0

Year	Date	Spring-Peak Discharge (cubic feet per second)¹	Water Surface Elevation During Spring-Peak Discharge (BPMSL)²	Spring-Peak Water Surface Elevation (BPMSL)
2001	10-Jun	5,600	27.11 ³	27.11 ³
2002	25-May	7,100	26.81	26.81

Notes:

1. Cubic feet per second is abbreviated cfs.
2. British Petroleum Mean Sea Level is abbreviated BPMSL.
3. This water surface elevation occurred between 9 and 10 June, and was influenced by a downstream ice-jam.

3.3.2 Daily Observations

21 May – 22 May

Water was flowing in Judy Creek to the confluence with Fish Creek on 21 May. No ice jams were observed between River Mile 13.8 and the confluence with Fish Creek. Localized patches of snow were present above the water surface along the channel banks in the vicinity of River Mile 13.8 (Photo 7). Between River Mile 13.8 and the confluence, little to no snow remained on the channel banks above or below the water surface. There was no evidence that the water surface had been higher than it was on 21 or 22 May.



PHOTO 7. *Looking upstream from River Mile 13.8 on Judy Creek on 21 May 2002.*

23 May – 24 May

The water surface elevation continued to rise at both River Mile 7.0 and 13.8 on 23 and 24 May (Table B-2.1, Appendix B). By 24 May, less than 5% of the channel banks were covered with snow above or below the water surface in the vicinity of River Mile 13.8, and the snow appeared to have no effect on flow within the channel.

On 24 May, discharge was measured at River Mile 7.0. At approximately 10:00, the discharge and average main channel velocity were 6,823 cubic feet per second and 4.92 feet per second, respectively (Table C-3.2, Appendix C).

25 May – 26 May

At approximately 19:13 on 25 May, the spring-peak water surface elevation and discharge occurred at River Mile 7.0. The spring-peak water surface elevation was 26.81 feet (BPMSL) and the spring-peak discharge was approximately 7,100 cubic feet per second (Table B-2.1 in Appendix B, and Table C-3.3 in Appendix C). The average velocity in the main channel was 4.81 feet per second.

Between 25 and 26 May, the water surface elevation at River Mile 7.0 and 13.8 dropped by approximately 0.4 feet and 0.6 feet, respectively. By 26 May, no snow remained on the banks within the channel between River Mile 13.8 and the confluence (Photo 8).



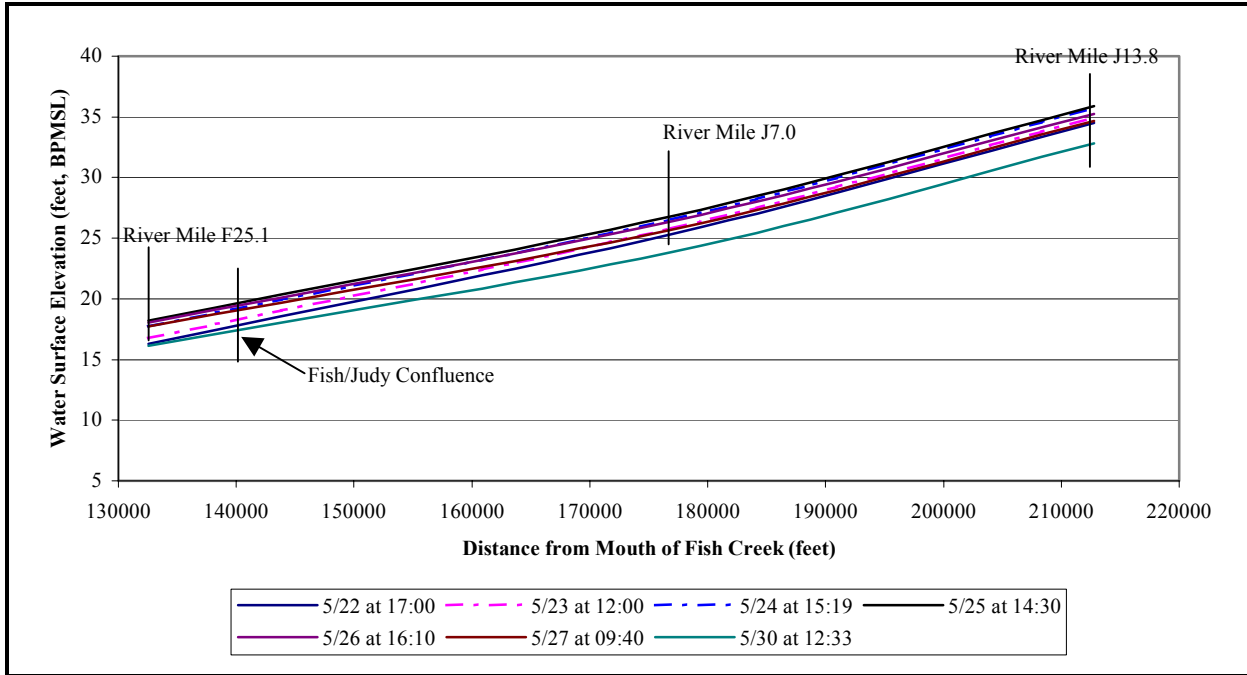
PHOTO 8. River Mile 13.8 on Judy Creek on 26 May 2002.

26 May – 1 June

For the remainder of the monitoring period, water surface elevations continued to drop at both monitoring sites on Judy Creek (Tables B-2.1 and B-2-2, Appendix B). Ice formed in the channel due to the cold air temperatures between 27 and 30 May; however, no ice jams were observed along the channel between River Mile 13.8 and the confluence with Fish Creek.

The water surface profile between River Mile 13.8 on Judy Creek and River Mile 25.1 on Fish Creek on 22, 23, 24, 25, 26, 27, and 30 May is presented in Figure 11.

Figure 11: Judy Creek Water Surface Profiles



3.4 REVISED FLOOD FREQUENCY AND TIMING ANALYSIS

Other than the data collected in 2001 (URS, 2001), no other historical flood-peak discharge data have been collected on Judy Creek. Therefore, flood frequency and magnitude were estimated from historical data collected on other rivers in the region (URS, 2001), and calibrated with 2001 and 2002 data collected on Fish Creek, Judy Creek and the Ublutuoch River (Appendix A). The calibration was made by assuming that: (1) the average of the flood-peak discharges observed in 2001 and 2002 is equal to the mean annual discharge (i.e. the 2-year flood), and (2) adjusting the regional flood-frequency relationship to reflect this assumption (Appendix A). The flood-peak discharge estimates for Judy Creek at River Mile 7.0 and 13.8 are presented in Table 12.

Table 12: Flood Peak Discharge On Judy Creek

Location	Drainage Area (mile ²)	Peak Discharge (cubic feet per second)							
		2-Year Return Period	5-Year Return Period	10-Year Return Period	25-Year Return Period	50-Year Return Period	100-Year Return Period	200-Year Return Period	500-Year Return Period
Judy Creek at River Mile 7.0	647	6,400	9,900	12,300	15,800	18,600	21,500	24,700	30,500
Judy Creek at River Mile 13.8	593	5,800	9,100	11,400	14,600	17,300	19,900	22,900	28,400

These numbers represent the best estimates available at this time. However, it must be stressed that collection of 1 to 3 more years of flood-peak discharge data are desirable in order to more reliably estimate the magnitude of the 2-year flood. As a significant amount of additional regional data becomes available, the regional equations should be re-evaluated.

Whether discharges on the order of the 50- to 200-year flood are likely to occur as snowmelt floods or rainfall floods was assessed using data from three North Slope rivers (URS, 2001). Based on the available data, it appears that discharges on the order of the 50- to 200-year flood are more likely to result from snowmelt than from rainfall. This is significant because it suggests that ice loading on structures will occur in conjunction with a high stage and discharge.

3.5 BED MOVEMENT

Bed material was not sampled as part of the 2002 assessment; however, a bed material sample was collected on 17 July 2001 from River Mile 7.0. The median diameter (D_{50}) of the 2001 bed material sample was 0.00057 feet (URS, 2001).

3.5.1 Comparison of 2002 and 2001 Riverbed Elevations

During both the 2002 and 2001 spring breakups, the Judy Creek riverbed was relatively mobile. A comparison of the riverbed elevation at River Mile 7.0 on two dates during the 2002 breakup is shown in Figure 12. The 2002 and 2001 average riverbed elevations at River Mile 7.0, with selected maximum and minimum riverbed elevations, are presented in Figure 13. Note that in 2001 the riverbed elevation changed by as much as 5 feet. In 2002, the maximum observed riverbed elevation change was approximately 2 feet.

Figure 12: 2002 Riverbed Elevation Over Time at River Mile 7.0

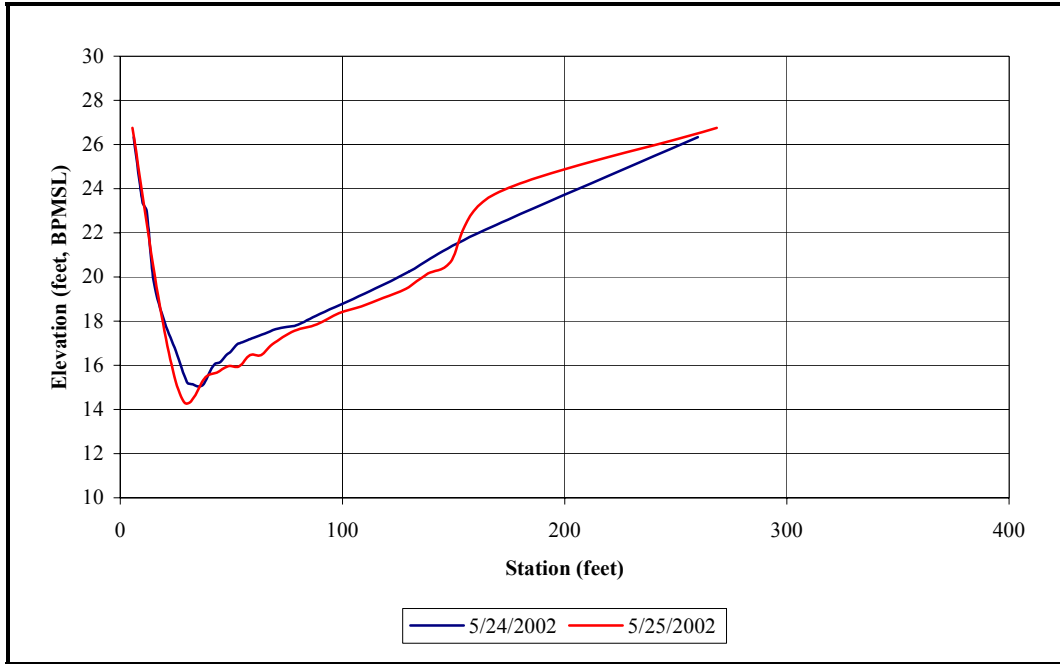
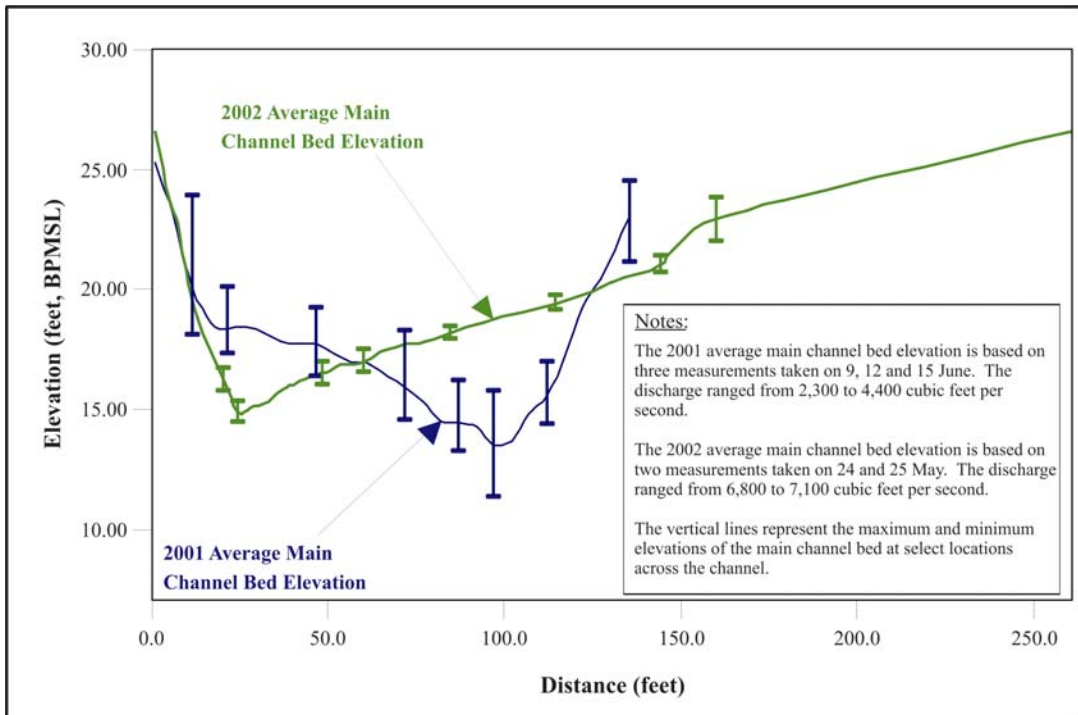


Figure 13: 2002 and 2001 Average Riverbed Elevation at River Mile 7.0



3.5.2 Bed Forms

The daily changes in the channel bed that were recorded during the 2002 and 2001 breakups suggest that the bed is easily eroded, moved and shaped by the flow. The interaction of the water-sediment mixture and the sand bed can create different bed configurations, such as: ripples, dunes, transition and antidunes. For a particular size of bed material, the bed forms change from ripples to dunes to transition and then to antidunes as the stream power increases. The type of bed form present in the channel affects both the hydraulic roughness and the rate of sediment transport, which affect the water velocity, depth of scour and water surface elevation. Using the information obtained during the discharge measurements on Judy Creek and Figure 4.15 in *Engineering Analysis of Fluvial Systems* (Simons, Li & Associates, 1982), an estimate was made of the type of bed form present during the discharge measurements at River Mile 7.0.

At River Mile 7.0, dunes are probably present at discharges on the order of 2300 cubic feet per second. At discharges between 3200 and 7000 cubic feet per second dunes and antidunes are probably present. The antidunes are probably confined to the deepest and/or the fastest portions of the channel. At discharges above 7000 cubic feet per second it is likely that antidunes cover the bed.

The height of a dune or antidune is measured from the trough to the crest. Generally, it is assumed that one-half the dune or antidunes height is above the average riverbed elevation. Thus, if dunes or antidunes are present, their height must be considered when estimating riverbed scour depth.

The average dune height is approximately one-third to one-half the average depth of flow (Richardson, et al., 1990). The maximum height is approximately equal to the average depth of flow (Simons, Li & Associates, 1982). The presence of dunes can cause undulations in the water surface to be out of phase with the surface of the riverbed. Hydraulic roughness typically ranges between 0.020 and 0.035.

The maximum antidune height is approximately equal to the depth of flow (Simons, Li & Associates, 1982). If antidunes are present, there will be either standing waves or breaking waves on the surface of the water. The water surface will be in phase with the riverbed surface except when an antidune breaks. Hydraulic roughness typical ranges from 0.014 to 0.025 when standing waves are present, and 0.015 to 0.031 when breaking waves are present. The presence and height of the waves will be an important consideration in setting freeboard requirements, if structures are located adjacent to the channel.

3.6 HYDRAULIC ROUGHNESS

The hydraulic roughness of the channel can be predicted based on the discharge and water surface elevation measurements made during the breakup monitoring. An estimate of hydraulic roughness is required in order to estimate the extent of the 100-year floodplain and to design structures in or adjacent to Judy Creek.

The hydraulic roughness was estimated based on each of two methods of analysis. The first assessment of hydraulic roughness was based on normal depth computations. Normal depth computations are useful when a limited amount of information is available or a quick estimate of water surface elevation and velocity are required. The normal depth computations assume that the water surface slope is equal to the energy slope, which in natural rivers is often not precisely the situation. The second assessment was based on backwater computations. Backwater computations do not assume that the water surface slope is equal to the energy slope and thus, are more precise. However, backwater computations require considerably more data and more computational effort to estimate water surface elevation and velocity.

3.6.1 Normal Depth Computations

3.6.1.1 2002 Estimates

The hydraulic roughness (Manning’s “n”) at River Mile 7.0 was estimated based on: water surface elevations on Fish Creek at River Mile 25.1 and Judy Creek at River Mile 7.0, and discharge measurements on Judy Creek at River Mile 7.0. As shown in Table 13, the main channel hydraulic roughness was the same for both measurements.

Table 13: 2002 Hydraulic Roughness of Judy Creek at River Mile 7.0

Date	Time	Water Surface Elevation RM F25.1 (feet)	Water Surface Elevation RM J7.0 (feet)	Discharge RM J7.0 (cubic feet per second)	Cross-Sectional Area RM J7.0 (sq feet)	Wetted Perimeter RM J7.0 (feet)	Water Surface Slope ¹ (feet/foot)	Main Channel Hydraulic Roughness
24-May	8:44	17.51						
24-May	10:00	17.55 ²	26.34	6822.7	1385.7	257.4	0.00020	0.013
24-May	12:10	17.62						
25-May	19:05	18.20						
25-May	19:13	18.20 ²	26.76	7124.8	1480.0	266.8	0.00019	0.013
25-May	19:30	18.20						

Notes:

1. The distance along the channel between RM F25.1 and RM J7.0 is 45,995 feet.
2. Interpolated water surface elevation.

3.6.1.2 Comparison of 2002 and 2001 Estimates

Hydraulic roughness was estimated at River Mile 7.0 in both 2001 and 2002. In 2001, three simultaneous measurements of discharge and water surface slope were made during the period unaffected by snow and ice, and the median hydraulic roughness was 0.022 (URS, 2001). In 2002, two measurements were made and the median value was 0.013. The values varied from 0.020 to 0.022 in 2001, and in 2002 both values were 0.013. Although measurements of discharge and water surface slope were made during the ice and snow impacted portion of breakup in 2001, no such measurements were made in 2002. In 2001 the average hydraulic roughness associated with two measurements during the ice and snow impacted period was 0.025. The values varied from 0.022 to 0.028 (URS, 2001).

3.6.2 Backwater Computations

3.6.2.1 2002 Estimates

A water surface profile model of Fish and Judy Creeks was developed using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS) computer program and surveyed cross sections at River Miles 0.7, 11.7, 12.6, 18.4, 25.1, 32.4 and 43.3 on Fish Creek and River Miles 7.0 and 13.8 on Judy Creek. The hydraulic roughness of the sand bed portion of the main channel was then estimated based on discharge and water surface elevation measurements made on 25 May 2002. The discharge, water surface elevations and estimated values of the hydraulic roughness at each of the surveyed cross sections are presented in Table 14, and a more detailed description of the model is provided in Appendix A.

Table 14: 2002 Judy Creek Calibrated Hydraulic Roughness Values

River Mile	Discharge (cubic feet per second)	Observed Water Surface Elevation (feet)	Computed Water Surface Elevation (feet)	Calibrated Main Channel Hydraulic Roughness Values
7.0	7,169	26.80	26.80	0.014
13.8	6,585	35.85	35.85	0.020

3.6.2.2 Comparison of 2002 and 2001 Estimates

Estimated hydraulic roughness values based on the 2001 water surface profile model are presented in Table 15³. Although the hydraulic roughness varied from one year to the next, the values are generally within the range of values one would expect when dunes and antidunes are present on the riverbed (0.014 – 0.035). The average main channel roughness at River Mile 7.0 and 13.8 on Judy Creek was 0.024 in the 2001 model, and 0.017 in the 2002 model.

³ The 2001 hydrologic assessment included cross sections at River Miles 21.8 and 31.0. These were not included in the 2002 assessment.

Table 15: 2001 Judy Creek Calibrated Hydraulic Roughness Values

River Mile	Discharge (cubic feet per second)	Observed Water Surface Elevation (feet)	Computed Water Surface Elevation (feet)	Calibrated Main Channel Hydraulic Roughness Values
7.0	2,608	24.62	24.61	0.024
13.8	2,396	33.57	33.58	0.024

3.7 IMPACT OF SNOW AND ICE

The impact of snow and ice on the water surface elevation is an important consideration during the design of structures adjacent to the river. This consideration is often addressed in the freeboard requirements associated with the design water surface elevation. For this reason, observations were made of the impact of snow and ice on water surface elevations along the Judy Creek channel.

3.7.1 2002 Observations

During the 2002 spring breakup monitoring, neither ice nor snow had an impact on the Judy Creek water surface elevations at River Mile 7.0.

3.7.2 Comparison of 2002 and 2001 Observations

During the 2001 breakup monitoring the peak water surface elevation was about 0.5 feet higher than it would have been if snow and ice were not impacting the water surface elevation (URS, 2001). Therefore, in 2001 the impact was about 0.5 feet and in 2002 the impact was 0.0 feet.

3.8 REVISED 100-YEAR WATER SURFACE ELEVATION

The 100-year water surface profile that was developed in 2001 was re-evaluated using the data collected during the 2002 breakup. The water surface profile is based on the assumption that the channel is unaffected by snow and ice blockage, and was developed using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS) computer program. A more detailed description of the methods used to develop the water surface profile is presented in Appendix A, and a copy of the HEC-RAS output is presented in Appendix E.

Because the sand bed portion of the riverbed is likely to be covered by dunes and antidunes during the peak discharge of the 100-year flood, and because the hydraulic roughness associated with these bed forms has a wide range, three different HEC-RAS models were used to describe the conditions likely to occur during the 100-year flood. The first model is based on the calibrated roughness values developed from the data collected in 2002. However, because the hydraulic roughness can vary over a large range during a single flood event, it is suggested that

for planning and design purposes two other models be used to estimate the conditions that could occur during the 100-year flood. Where an estimate of water surface elevations is required, it is suggested that the hydraulically rough model be considered. Where an estimate of water velocities is required, it is suggested that the hydraulically smooth model be considered. The only difference between the models is the hydraulic roughness associated with the sand bed portion of the channel.

3.8.1 Calibration Model

This model is based on the sand bed hydraulic roughness observed on 25 May 2002. A summary of the results is presented in Table 16.

Table 16: Judy Creek 100-Year Calibration Model Summary

100-Year Return Period					
River Mile	Discharge (cubic feet per second)	Water Surface Elevation (feet)	Average Velocity		
			Left Overbank	Channel	Right Overbank
7.0	21,500	31.29	0.84	4.51	1.36
13.8	19,900	41.31	1.02	6.61	0.73

3.8.2 Hydraulically Smooth Model

The hydraulically smooth model is based on a sand bed hydraulic roughness value that is the average of the lower end of the roughness values associated with the dune, transition and antidune bed forms. Thus, the sand bed portion of each cross section on Judy Creek was assigned a hydraulic roughness of 0.016. A summary of the 100-year hydraulically smooth model results is presented in Table 17.

Table 17: Judy Creek Hydraulically Smooth Model Summary

100-Year Return Period					
River Mile	Discharge (cubic feet per second)	Water Surface Elevation (feet)	Average Velocity		
			Left Overbank	Channel	Right Overbank
7.0	21,500	31.39	0.85	4.27	1.37
13.8	19,900	40.45	0.90	7.23	0.70

3.8.3 Hydraulically Rough Model

The hydraulically rough model is based on a sand bed hydraulic roughness value that is the average of the upper end of the roughness values associated with dune, transition and antidune bed forms. Thus, the sand bed portion of each cross section on Judy Creek was assigned a hydraulic roughness of 0.031. A summary of the 100-year hydraulically rough model results is presented in Table 18, and an estimate of the area inundated by the 100-year flood is presented in Figure 10.

Table 18: Judy Creek Hydraulically Rough Model Summary

100-Year Return Period					
River Mile	Discharge (cubic feet per second)	Water Surface Elevation (feet)	Average Velocity		
			Left Overbank	Channel	Right Overbank
7.0	21,500	32.03	0.86	2.90	1.39
13.8	19,900	43.85	1.03	4.99	0.66

4.0 UBLUTUOCH RIVER

4.1 MONITORING PROGRAM

During spring breakup, monitoring was conducted at three locations along the Ublutuoch River (Figure 2). The monitoring sites were located at River Miles 8.0, 13.5 and 13.7. The monitoring consisted of recording snow and ice conditions, and water surface elevations (Appendix B). Discharge measurements were made periodically at River Miles 8.0 and 13.7 (Appendix C).

4.2 STREAM DESCRIPTION

The Ublutuoch River is a tributary of Fish Creek, and enters Fish Creek approximately 10 miles upstream from the mouth of Fish Creek. It has a drainage area of approximately 248 square miles, of which lakes cover 15 percent. Both the headwaters and the mouth are located on the Arctic Coastal Plain.

The Ublutuoch River has a relatively low gradient, sinuous channel. The channel is incised within relatively steep upper banks that are vegetated with dense brush. The lower portion of the channel at River Miles 13.5 and 13.7 consists of a relatively flat bench located approximately 10 to 15 feet below the top of the upper banks. A 2- to 3-foot deep by 15- to 20-foot wide low-water channel is located in the bottom of the otherwise vegetated channel. The low-water channel has a riverbed composed of sand and gravel.

At River Mile 8.0, the upper channel banks are vegetated with dense brush. Observations during low-water conditions were not made as part of the 2002 monitoring.

4.3 SPRING BREAKUP OBSERVATIONS

4.3.1 Summary

At River Mile 13.7 the spring-peak water surface elevation was 18.22 feet (BPMSL) and occurred at 09:00 on 22 May. The spring-peak discharge occurred at the same time as the spring-peak water surface elevation, and was approximately 2,000 cubic feet per second. The spring-peak water surface elevation and discharge were affected by snow and ice in the channel. The spring-peak discharge on the Ublutuoch River occurred earlier than the spring-peak discharge on Fish and Judy Creeks.

The spring-peak discharge was greater in 2001 than in 2002 (Table 19); however, the spring-peak water surface elevation was higher in 2002 than in 2001. In both years, the spring-peak water surface elevation occurred at the same time as the spring-peak discharge.

Table 19: Comparison of 2002 and 2001 Spring-Peak Water Surface Elevation and Discharge at River Mile 13.7

Year	Date	Spring-Peak Discharge (cubic feet per second)¹	Water Surface Elevation During Spring-Peak Discharge (BPMSL)²	Spring-Peak Water Surface Elevation (BPMSL)
2001	10-Jun	2,200	18.09 ³	18.09 ³
2002	22-May	2,000	18.22	18.22

Notes:

1. Cubic feet per second is abbreviated cfs.
2. British Petroleum Mean Sea Level is abbreviated BPMSL.
3. This water surface elevation occurred between 9 and 10 June.

4.3.2 Daily Observations

21 May

Water was flowing in the Ublutuoch River at River Mile 13.7 on 21 May (Photo 9). The flow was contained within the channel banks near River Mile 13.7, and was flowing over snow and ice present on the bottom of the channel. The ground surface beyond the channel banks was roughly 95 percent free of snow at this time. The ice-road bridge crossing located upstream of River Mile 13.7 was blocking a substantial portion of the channel on 21 May, causing the water surface elevation upstream of the ice-road to be approximately two to three feet higher than the water surface elevation on the downstream side (Photo 9).



Photo 9: *The Ublutuoch River at River Mile 13.7 on 21 May 2002.*

22 May

The spring-peak water surface elevation and discharge occurred at approximately 09:06 at River Mile 13.7. The spring-peak water surface elevation was 18.22 feet (BPMSL) and the spring-peak discharge was approximately 2,000 cubic feet per second (Table B-3.3 in Appendix B)⁴ Snow affected the water surface elevation in the channel at the time of the spring-peak. Approximately one percent of the flow at the peak discharge was in the overbank area along the east (right bank) side of the channel near River Mile 13.7. There was flow in the overbank because the remnants of the ice-road bridge above River Mile 13.7 constricted flow. This caused the water upstream of the ice-road to back up onto the right overbank. The water in the right overbank overtopped the ice-road and re-entered the channel several hundred feet downstream of River Mile 13.7.

The discharge was measured at River Mile 13.7 at approximately 11:55. The discharge and average main channel velocity were 1,900 cubic feet per second and 3.21 feet per second, respectively (Table C-5.2, Appendix C). At the time of the discharge measurement, approximately 40 percent of the channel area below the water surface was filled with snow.

23 May

By 23 May, the water surface elevation at River Miles 13.5 and 13.7 had dropped by as much as 1.5 and 2 feet, respectively (Tables B-3.2 and B-3.3 in Appendix B). Grounded and moving ice floes were observed between River Miles 13.5 and 13.7. Near River Mile 8.0, ice jams were temporarily forming and breaking, affecting the water surface elevation by as much as 0.6 feet.

The discharge was measured at River Mile 13.7 at approximately 14:26. The discharge and average main channel velocity were 1,700 cubic feet per second and 3.47 feet per second, respectively (Table C-5.4, Appendix C). At the time of the discharge measurement, approximately 36 percent of the channel area below the water surface was blocked by snow and ice.

24 May

By 24 May, the water surface elevation at River Mile 13.7 had dropped by more than 3 feet (Table B-3.3, Appendix B). Very few ice floes were observed at River Miles 13.5 and 13.7; however, grounded and flowing ice floes were observed near River Mile 8.0. Between 23 and 24 May, an ice jam formed between River Miles 9.0 and 9.5 that was continuous across the channel. By late afternoon on 24 May, the ice jam began breaking up and was no longer continuous across the channel.

⁴ The spring-peak discharge was estimated based on the water surface elevation at 09:06 on 22 May and the discharge measurement and corresponding water surface elevation taken at 11:55 on 22 May.

The discharge was measured at River Miles 8.0 and 13.7. The purpose of measuring the discharge at River Mile 8.0 was to obtain cross section data and downstream boundary conditions for developing a model for predicting water surface elevations. At approximately 15:40, the discharge and average main channel velocity at River Mile 8.0 were 1,500 cubic feet per second and 2.26 feet per second, respectively (Table C-4.2, Appendix C). At the time of the discharge measurement at River Mile 8.0, approximately 22 percent of the cross sectional channel area below the water surface was blocked by snow and ice.

At approximately 12:08, the discharge and average main channel velocity at River Mile 13.7 were 1,400 cubic feet per second and 3.44 feet per second, respectively (Table C-5.5, Appendix C). At the time of the discharge measurement at River Mile 13.7, approximately 33 percent of the channel area below the water surface was blocked by snow and ice.

4.4 REVISED FLOOD FREQUENCY AND TIMING ANALYSIS

Other than the data collected in 2001 (URS, 2001), no other flood-peak discharge data have been collected on the Ublutuoch River. Therefore, flood frequency and magnitude were estimated from historical data collected on other rivers in the region (URS, 2001), and calibrated with 2001 and 2002 data collected on Fish Creek, Judy Creek and the Ublutuoch River (Appendix A). The calibration was made by assuming that: (1) the average of the flood-peak discharges observed in 2001 and 2002 is equal to the mean annual discharge (i.e. the 2-year flood), and (2) adjusting the regional flood-frequency relationship to reflect this assumption (Appendix A). The flood-peak discharge estimates for the Ublutuoch River at River Miles 8.0 and 13.7 are presented in Table 20.

Table 20: 2002 Flood-Peak Discharge On the Ublutuoch River at River Mile 13.7

		Peak Discharge (cubic feet per second)							
Location	Drainage Area (mile ²)	2-Year Return Period	5-Year Return Period	10-Year Return Period	25-Year Return Period	50-Year Return Period	100-Year Return Period	200-Year Return Period	500-Year Return Period
Ublutuoch River at River Mile 8.0	233	2,400	3,800	4,800	6,300	7,600	8,900	10,400	13,100
Ublutuoch River at River Mile 13.7	222	2,200	3,600	4,600	6,000	7,200	8,500	9,900	12,600

These numbers represent the best estimates available at this time. However, it must be stressed that collection of 1 to 3 more years of flood-peak discharge data are desirable in order to more reliably estimate the magnitude of the 2-year flood. As a significant amount of additional regional data becomes available, the regional equations should be re-evaluated.

Whether discharges on the order of the 50- to 200-year flood are likely to occur as snowmelt floods or rainfall floods was assessed using data from three North Slope rivers (URS Corp, 2001). Based on the available data, it appears that discharges on the order of the 50- to 200-year flood are more likely to result from snowmelt than from rainfall. This is significant because it suggests that ice loading on structures will occur in conjunction with a high stage and discharge.

4.5 BED MOVEMENT

4.5.1 2002 Sediment Transport Measurements

Bed material was not sampled as part of the 2002 assessment; however, a bed material sample was collected on 17 July 2001 from River Mile 13.7. The median diameter (D_{50}) of the 2001 bed material sample was 0.023 feet (URS, 2001).

4.5.2 Comparison of 2002 and 2001 Bed Movement

At the time of the 2002 and 2001 spring-peak water surface elevation and discharge, the water was flowing on snow within the channel, and the bed of the low-water channel was not mobile. A comparison of riverbed elevation on various dates during the 2002 breakup at River Mile 13.7 is shown in Figure 14, and the 2002 and 2001 riverbed elevations at the time of the peak discharge are presented in Figure 15.

Figure 14: Effect of Snow and Ice in 2002 on the Channel Cross Section at River Mile 13.7

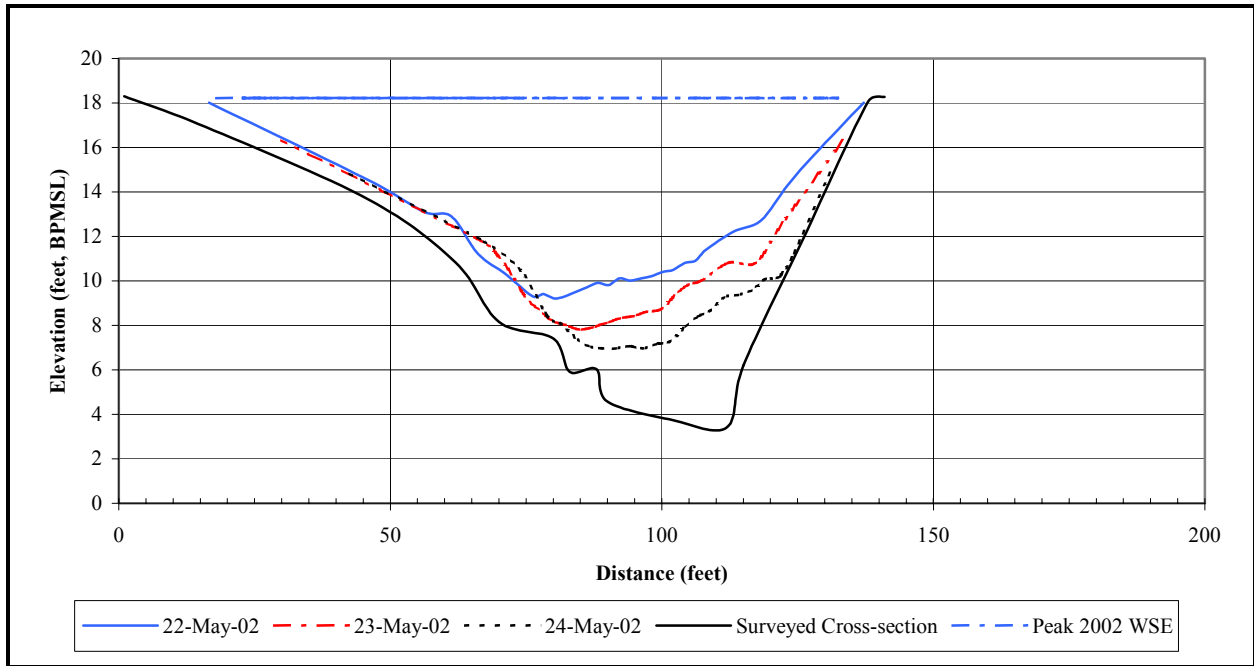
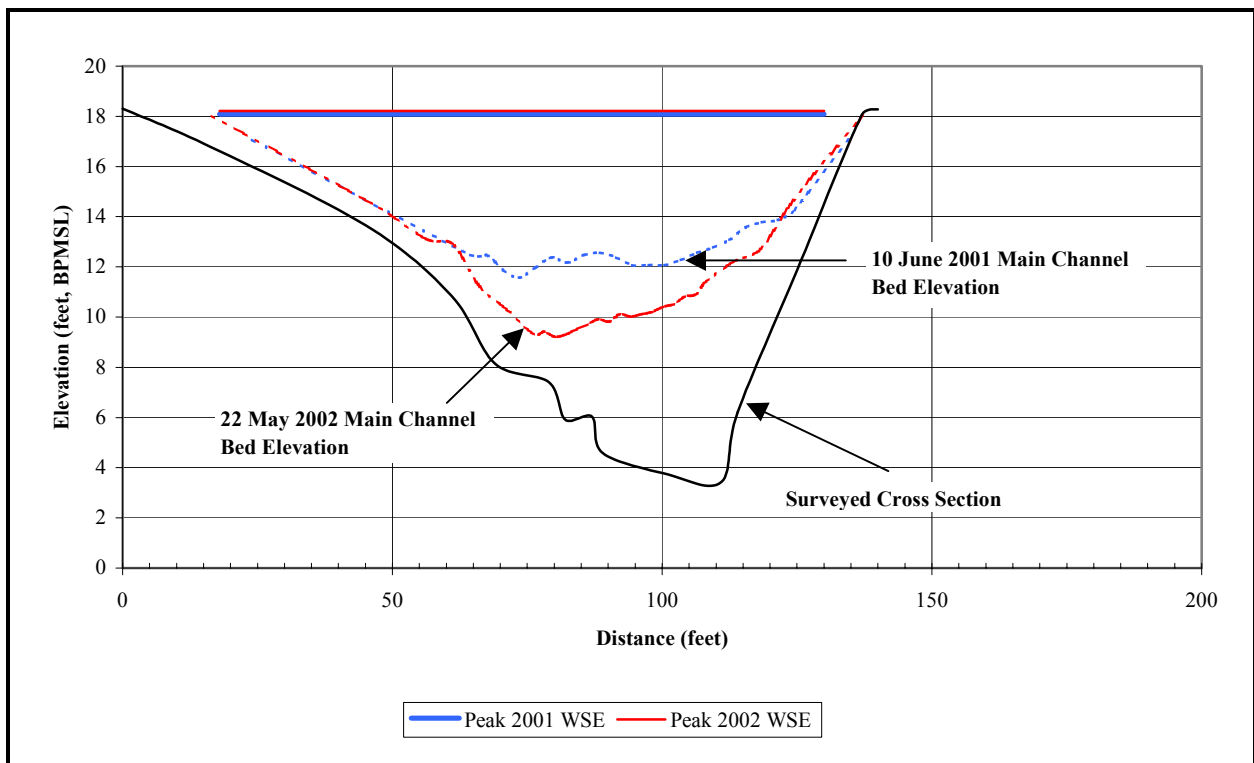


Figure 15: Comparison of the 2002 and 2001 River Mile 13.7 Channel Bed Elevations at Peak Discharge



4.6 HYDRAULIC ROUGHNESS

The hydraulic roughness of the channel was predicted based on the discharge and water surface elevation measurements made during the breakup monitoring. An estimate of hydraulic roughness is required in order to estimate the extent of the 100-year floodplain and to design structures in or adjacent to the Ublutuoch River.

The hydraulic roughness was estimated based on each of two methods of analysis. The first assessment of hydraulic roughness was based on normal depth computations. Normal depth computations are useful when a limited amount of information is available or a quick estimate of water surface elevation and velocity are required. The normal depth computations assume that the water surface slope is equal to the energy slope, which in natural rivers is often not precisely the situation. The second assessment was based on backwater computations. Backwater computations do not assume that the water surface slope is equal to the energy slope and thus, are more precise. However, backwater computations require considerably more data and more computational effort to estimate water surface elevation and velocity.

4.6.1 Normal Depth Computations

4.6.1.1 2002 Estimates

The hydraulic roughness (Manning's "n") at River Mile 13.7 was estimated based on: water surface elevations at River Miles 13.5 and 13.7, and discharge measurements at River Mile 13.7. As shown in Table 21, the main-channel hydraulic roughness was relatively constant over the monitoring period. The values ranged from 0.023 to 0.025 during the time when the water was flowing on top of the snow. The median value of the measurements was 0.025.

Table 21: 2002 Hydraulic Roughness at River Mile 13.7

Date	Time	Water Surface Elevation RM 13.5 (feet)	Water Surface Elevation RM 13.7 (feet)	Discharge RM 13.7 (cubic feet per second)	Cross-Sectional Area RM13.7 (sq feet)	Wetted Perimeter RM13.7 (feet)	Water Surface Slope ¹ (feet/foot)	Main Channel Hydraulic Roughness
22-May	11:20	17.66						
22-May	11:55	17.66 ²	18.06	1903.0	592.7	122.4	0.00036	0.025
22-May	13:11	17.67						
23-May	12:54	16.02						
23-May	14:26	15.90 ²	16.32	1710.6	492.7	105.2	0.00038	0.023
23-May	15:00	15.86						
24-May	11:04	14.44						
24-May	12:08	14.38 ²	14.87	1415.9	411.8	91.3	0.00044	0.025
24-May	12:41	14.35						

Notes:

1. The distance along the channel between RM 13.5 and RM 13.7 is 1,112 feet.
2. Interpolated water surface elevation.

4.6.1.2 Comparison of 2002 and 2001 Estimates

Hydraulic roughness was estimated at River Mile 13.7 in both 2001 and 2002. In 2001, three measurements were taken during the period water was flowing on top of the snow in the channel, and the median hydraulic roughness was 0.019 (URS, 2001). In 2002, three measurements were taken during the period water was flowing on top of the snow in the channel, and the median hydraulic roughness was 0.023. The values varied from 0.019 to 0.023 in 2001 and from 0.023 to 0.025 in 2002. Thus, the hydraulic roughness during the period affected by snow and ice was somewhat similar during the two years. Although discharge measurements were made during the period unaffected by snow and ice in 2001, the hydraulic roughness was not estimated. No discharge measurements were made during the period unaffected by snow and ice in 2002.

4.6.2 Backwater Computations

4.6.2.1 2002 Estimates

A water surface profile of the Ublutuoch River was developed using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS) computer program and surveyed cross sections at River Miles 8.0 and 13.7. The hydraulic roughness of the snow and ice covered portion of the main channel was estimated based on discharge and water surface elevation measurements made on 24 May 2002. The discharge, water surface elevations and estimated values of hydraulic

roughness at each of the surveyed cross sections are presented in Table 22, and a more detailed description of the model is provided in Appendix A.

Table 22: 2002 Ublutuoch River Calibrated Hydraulic Roughness Values

River Mile	Discharge (cubic feet per second)	Observed Water Surface Elevation (feet)	Computed Water Surface Elevation (feet)	Calibrated Main Channel Hydraulic Roughness Values
8.0	1,510	8.36	8.36	0.012
13.7	1,363	14.68	14.68	0.021

4.6.2.2 Comparison of 2002 and 2001 Estimates

In 2001 insufficient cross sectional data were available to perform water surface profile computations.

4.7 IMPACT OF SNOW AND ICE

The impact of snow and ice on the water surface elevation is an important consideration during the design of structures adjacent to the river. This consideration is often addressed in the freeboard requirements associated with the design water surface elevation. For this reason, observations were made of the impact of snow and ice on water surface elevations along the Ublutuoch River channel.

4.7.1 2002 Observations

At the beginning of the 2002 breakup monitoring, approximately 33 percent of the channel was blocked by snow and ice at River Mile 13.7. During the breakup period, the water gradually cut through the snow and ice. The snow and ice had a dramatic impact on the channel hydraulics. The shape, size and elevation of the channel cross-section, the hydraulic roughness, and the energy slope were all affected by the snow and ice. The most significant effect was the change in the elevation of the riverbed (Figure 14). The spring-peak water surface elevation and discharge occurred on 22 May. At that time, flow was being conveyed on snow approximately 6 feet above the permanent riverbed.

4.7.2 Comparison of 2002 and 2001 Observations

The effect of snow and ice on the channel hydraulics was similar in 2002 and 2001. However, the elevation of the snow on the bottom of the channel was approximately two feet lower in 2002 than what is was in 2001 (Figure 15).

4.8 100-YEAR WATER SURFACE PROFILE

In 2001, normal depth computations were used to estimate the water surface elevation during the peak discharge associated with selected flood events at River Mile 13.7. This method was used because insufficient cross sectional data were available to compute water surface profiles. With additional cross section data available in 2002, the 100-year water surface profile was developed using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS) computer program. Because it is not possible to know how much snow and ice blockage will be present in the channel during a spring-breakup event, two conditions were evaluated for computing the 100-year water surface profile: one with the channel partially obstructed by snow and ice, and the other with the channel free of snow and ice. A more detailed description of the methods used to develop the water surface profile is presented in Appendix A, and a copy of the HEC-RAS output is presented in Appendix E.

4.8.1 Snow and Ice Affected Model

This model is based on the average bed conditions measured during the 2001 and 2002 peak discharges, and the hydraulic roughness parameters measured on 24 May 2002. A summary of the results is presented in Table 23, and an estimate of the area inundated by the 100-year flood is presented in Figure 10. It should be noted that the extent of the inundation is based solely on two surveyed cross sections, U.S. Geological Survey topographic maps with 50-foot (25-foot interpolated) contours, and the hydraulic computations.

Table 23: 2002 Ublutuoch River Water Surface Elevations

100-Year Return Period Snow & Ice Affected Channel					
River Mile	Discharge (cubic feet per second)	Water Surface Elevation (feet)	Average Velocity		
			Left Overbank	Channel	Right Overbank
13.7	8500	22.06	1.19	3.11	1.14
8.00	8865	14.48	0.88	4.32	0.63

4.8.2 Snow and Ice Free Condition Model

This model uses the surveyed cross sections obtained by Lounsbury & Associates at River Mile 8.0 and 13.7, and the estimates of hydraulic roughness representative of snow free conditions. A summary of the results is presented in Table 24.

Table 24: 2002 Ublutuoch River Water Surface Elevations

100-Year Return Period Open Water Channel					
			Average Velocity		
River Mile	Discharge (cubic feet per second)	Water Surface Elevation (feet)	Left Overbank	Channel	Right Overbank
13.7	8500	21.85	1.19	2.58	1.10
8.00	8865	14.65	0.93	3.46	0.67

The results of the analysis indicate that the estimated peak water surface elevations are not significantly different between the snow and ice affected and the snow and ice free conditions. Snow and ice blockage in the channel reduces the cross sectional area and raises the elevation of the riverbed. However, when the channel is free of snow and ice, the hydraulic roughness is higher due to the dense willows exposed along the channel banks. Thus, both the snow and ice affected and snow and ice free conditions should be considered when selecting design water surface elevations and the height of freeboard to be used in the design of structures subject to flooding.

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APPENDIX A

METHODS

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A.1 FIELD MEASUREMENTS

Monitoring sites are located along Fish Creek, Judy Creek, and the Ublutuoch River. On Fish Creek, 2 sites are located above the Fish Creek/Judy Creek confluence, and 6 sites are located below the confluence. Two monitoring sites are located on Judy Creek and three monitoring sites are located on the Ublutuoch River, below the location of the 2001-2002 ice-road crossing. All but two of the monitoring sites used during the 2002 spring breakup were established and used during the 2001 monitoring. The monitoring sites at River Mile 12.6 on Fish Creek and at River Mile 8.0 on the Ublutuoch River were added this year.

Staff gages were used to monitor water surface elevations at the monitoring sites and were tied by level loop survey to the closest benchmark. Lounsbury & Associates provided horizontal and vertical coordinates for the benchmarks established at each monitoring site. The horizontal coordinates were based on the Alaska State Plane, Zone 4, NAD 27 datum. The vertical coordinates were based on the British Petroleum mean sea level (BPMSL) datum.

Daily observations of the water surface elevation at each monitoring site were recorded either from staff gage readings or by level loop survey. High water surface elevations that occurred between site visits were recorded using chalk on the staff gages at each of the monitoring sites. As the water surface elevation increased, the chalk was washed off the staff gage. When the water surface elevation decreased, a chalk line remained where the highest water surface elevation had occurred. These measurements are referred to as High Water Marks in the water surface elevation records.

Discharge measurement stations were established at two sites on Fish Creek (RM 25.1 and RM 32.4), one site on Judy Creek (RM 7.0), and two sites on the Ublutuoch River (RM 8.0 and RM 13.7). Anchors were established on the right and left banks, such that a tag line stretched between the anchors was perpendicular to the current. The tag line provided stationing during the discharge measurements.

Discharge was measured according to U.S. Geological Survey (USGS) standard procedures (Buchanan and Somers 1984). A Price AA current meter was used to measure velocity at selected locations within the channel. A boat or wading rod was used to suspend the current meter, depending upon the water depth. The water surface elevation was measured at the beginning and end of each discharge measurement. The discharge was calculated from the velocity, depth, and width measurements.

Suspended sediment was measured on Fish Creek at River Mile 25.1, using USGS standard procedures (Edwards and Glysson, 1999). A DH-59 Suspended Sediment Sampler, with a 3/16-inch nozzle, was used to collect suspended sediment samples at select locations within the channel. The sampler was suspended from a boat at each sampling location, then lowered to the bottom and raised back to the surface at a constant rate. The suspended sediment sample was

submitted to a laboratory for analysis, and the concentration of suspended sediment was reported in milligrams per liter.

Bedload was measured on Fish Creek at River Mile 25.1, using USGS standard procedures (Edwards and Glysson, 1999). A Healy-Smith Bedload Sampler with a 3-inch by 3-inch square entrance nozzle, 3.22-area-ratio, and a 0.125-millimeter mesh sample bag was used. The Healy-Smith Bedload Sampler was suspended from a boat at each sampling location for a fixed period of time. The bedload sample was submitted to a laboratory for the analysis of total weight, gradation, percent organics, bulk specific gravity, and specific gravity of the mineral portion of the sample. In calculating the total bedload, it was assumed that the sampling efficiency of the apparatus was 100%.

A.2 FLOOD MAGNITUDE AND FREQUENCY

Flood-peak discharge data collected in 2001 and 2002 were used to adjust a series of regional regression equations previously developed by URS (2001) to predict flood-peak magnitude and frequency on Fish Creek, Judy Creek and the Ublutuoch River. The purpose of the adjustment was to modify the regional regression equations to more accurately predict the likely flood-peak-frequency relationship on these streams.

Other than the data collected in 2001 and 2002, no other flood-peak discharge data have been collected on these streams. Therefore, it was necessary to use flood-peak discharge data collected at other long-term monitoring sites to estimate the relationship between flood magnitude and frequency on these streams. A regression analysis was conducted (URS, 2001) to estimate the regional relationship between selected drainage basin variables and flood peak discharge. However, when the “best-fit” equation was applied to Fish Creek, Judy Creek and Ublutuoch River, it appeared to over estimate the magnitude of the 2-year flood-peak discharge (URS, 2001). Thus, the flood-peak data collected in NPR-A in 2001 and 2002 were used to adjust the regional regression equations.

The data used to compute the adjustment factor is presented in Table A.1. An adjustment factor was computed for each site at which flood-peak discharge data were available. To calculate the adjustment factor it was assumed that the average of the flood-peak discharges observed in 2001 and 2002 is equal to the 2-year flood-peak discharge. Based on this assumption, the adjustment factor was computed by dividing the average of the observed flood-peak discharges by the 2-year flood-peak discharge predicted with the regional regression equation. The result was a separate adjustment factor for each site. Because it is reasonable to assume that the same relationship applies to all of the sites, a single adjustment factor was selected. In order to be conservative, the largest ratio (i.e. 0.654) was used to produce the modified 2-year flood-peak regression equation. The same adjustment factor was then applied to all of the other regression equations.

Table A.1 Flood-Peak Adjustment Factors

		Measured Peak Discharge (cubic feet per second)			2-Year Flood-Peak Discharge From Regional Regression Equation (cubic feet per second)	Adjustment Factor
River	Mile	2001	2002	Average		
Fish Creek	25.1	6420	8930	7700	21650	0.356
Fish Creek	32.4	3670	3700	3700	11785	0.314
Judy Creek	7.0	5620	7190	6400	9785	0.654
Ublutuoch River	13.7	2160	1990	2100	3450	0.609

The modified regression equations are presented below, and were used to estimate flood-peak magnitude and frequency on Fish Creek, Judy Creek and the Ublutuoch River.

$$Q_2 = 11.56(\text{Drainage Area})^{0.975}$$

$$Q_5 = 22.02(\text{Drainage Area})^{0.943}$$

$$Q_{10} = 31.11(\text{Drainage Area})^{0.924}$$

$$Q_{25} = 46.01(\text{Drainage Area})^{0.902}$$

$$Q_{50} = 60.66(\text{Drainage Area})^{0.885}$$

$$Q_{100} = 78.13(\text{Drainage Area})^{0.868}$$

$$Q_{200} = 100.7(\text{Drainage Area})^{0.850}$$

$$Q_{500} = 145.5 (\text{Drainage Area})^{0.826}$$

where Q_T denotes flood peak discharge in cubic feet per second for the T-year event, and *Drainage Area* denotes drainage basin area in square miles.

The above equations provide the most reliable estimate of flood magnitude and frequency on Fish Creek, Judy Creek and the Ublutuoch River. However, it must be stressed that collection of 1 to 3 more years of flood-peak discharge data are desirable in order to more reliably estimate the magnitude of the 2-year flood. As a significant amount of additional regional data become available, the regional regression equations should be re-evaluated.

A.3 FISH AND JUDY CREEK 100-YEAR WATER SURFACE PROFILE

Discharge and water surface elevation data collected in 2002 were used to revise a water surface profile model of Fish and Judy Creeks previously developed by URS (2002). The model was modified to include additional cross section data collected in 2002 and recalibrated using a more complete data set than was available in 2001. Three models were considered. The first used a sand bed roughness equal to that of 25 May 2002. The second used a sand bed roughness that represented hydraulically smooth conditions for the bed forms likely to be present during a flood, and the third represented hydraulically rough conditions. The purpose of the revision was to provide a more accurate estimate of the water surface profile at the peak discharge of the 100-year flood.

A.3.1 BASE MODEL

The model was developed using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS) computer program. The model is essentially the same as the model developed by URS in March of 2002, except that:

- an additional surveyed cross section has been added,
- the magnitude of the 100-year flood-peak discharge has been revised,
- the roughness of the sand bed portion of the channel has been calibrated with 2002 data, and
- the downstream boundary conditions have been based on the conditions observed in 2002.

A.3.1.1 Cross Sections

A surveyed cross section was obtained on Fish Creek at River Mile 12.6 and added to the model (URS, 2002). This cross section replaced the interpolated cross section at River Mile 12.6 in the March 2002 model. This cross section is located immediately upstream of the entrance to the Tingmeachsiovik River, a tributary of Fish Creek, and is one of several critical locations within the model. The interpolated cross sections between River Mile 12.6 and 18.4 were revised based on the new 12.6 cross section. All of the other cross sections within the model are the same as in the March 2002 model.

No flowing water was observed outside of the main channel during either the 2001 or the 2002 spring breakups. Therefore, anywhere the floodplain was below the highest of the 2002 and 2001 spring-peak water surface elevations, it was assumed to be ineffective in passing flow, and was treated as such in the water surface profile model.

A.3.1.2 100-Year Flood Peak Discharge

The magnitude of the 100-year flood-peak discharge was specified at selected locations along the Fish Creek and Judy Creek channels. Those locations, and the magnitude of the 100-year flood-peak discharge at each location, are presented in Table A.2.

Table A.2 100-Year Flood-Peak Discharge On Fish and Judy Creeks

Location	Drainage Area (mile²)	Discharge (cubic feet per second)
Fish Creek		
Fish Creek at River Mile 0.7	1,827	53,000
Fish Creek at River Mile 11.7	1,537	45,600
Fish Creek at River Mile 12.6	1,537	45,600
Fish Creek at River Mile 18.4	1,507	44,800
Fish Creek at River Mile 25.1	1,461	43,600
Fish Creek at River Mile 26.09	1,459	43,600
Fish Creek at River Mile 26.85	794	25,700
Fish Creek at River Mile 32.4	783	25,400
Fish Creek at River Mile 43.3	769	25,000
Judy Creek		
Judy Creek at River Mile 0.38	666	22,100
Judy Creek at River Mile 7.0	647	21,500
Judy Creek at River Mile 13.8	593	19,900

A.3.1.3 Hydraulic Roughness

In general the Fish Creek and Judy Creek channels have a sandy, mobile riverbed and vegetated banks. The hydraulic roughness associated with the vegetated banks was estimated based on the type and density of the vegetation noted in the Lounsbury survey data (URS, 2001; Appendix G), and the depth of water at the vegetation (Table A.4). The hydraulic roughness of the sand bed portion of the channel was estimated based on data collected in the field and typical values associated with the expected bed forms. Although the sand bed and vegetated side slopes were assigned separate values of hydraulic roughness, the model computed and used a single weighted value of hydraulic roughness to represent the channel. Similarly, where more than one roughness value was used in the floodplain, the model computed a single weighted value based on wetted perimeter. A list of all of the channel and floodplain roughness values is provided in each of the HEC-RAS reports included in Appendix E.

A.3.1.3.1 Hydraulic Roughness of the Sand Bed

A.3.1.3.1.1 Calibration of the Sand Bed

The sand bed portion of the water surface profile model was calibrated to the observed conditions at 15:00 on 25 May 2002 to obtain an estimate of the hydraulic roughness of the sand bed at that time. Both Fish and Judy Creek were free of snow and ice blockage, and the flowing water was confined to the main channel.

On 25 May, the discharge was measured at River Mile 25.1 and 32.4 on Fish Creek, and at River Mile 7.0 on Judy Creek. The water surface elevation was measured at River Miles 0.7, 11.7, 12.6, 18.4, 25.1, 32.4 and 43.3 on Fish Creek, and at River Miles 7.0 and 13.8 on Judy Creek. Since all of the water surface elevation and discharge measurements were not performed at exactly 15:00, the values used in the model were interpolated from the available information. Thus, the discharge at 15:00 on Fish Creek at River Miles 25.1 and 32.4, and on Judy Creek at River Mile 7.0, was estimated to be 8910, 2334 and 7169 cfs, respectively. To estimate the discharge at each of the other significant cross section locations within the model (RM 0.7, 11.7, 12.6, 18.4, 25.1, 26.09, 26.85, 32.4, and 43.3 on Fish Creek and at River Mile 0.38, 7.0 and 13.8 on Judy Creek) the following regression equations were used.

$$\text{Fish Creek above the confluence: } Q = 3.521(\text{Drainage Area})^{0.975}$$

$$\text{Fish Creek below the confluence: } Q = 7.317(\text{Drainage Area})^{0.975}$$

$$\text{Judy Creek: } Q = 13.026(\text{Drainage Area})^{0.975}$$

These equations were developed from the measured discharges, assuming that the form and exponent of the relationship would be the same as that of the 2-year flood-peak regression equation.

Once the discharge values had been entered into the water surface profile model, the model was calibrated by adjusting the sand bed hydraulic roughness values as follows. At cross sections between 0.7 and 11.7 the initial estimates of floodplain and channel roughness were increased uniformly until the predicted water surface elevation matched the observed water surface elevation at River Miles 0.7 and 11.7. The hydraulic conditions at these cross-sections are affected by offshore ice. Thus, the hydraulic roughness values account for both roughness and the conditions at the coast. At cross sections above River Mile 11.7, the sand bed hydraulic roughness values were adjusted until the calculated water surface elevations approximated the observed elevations. A summary of the sand bed hydraulic roughness values, the observed water surface elevations and the calculated water surface elevations is presented in Table A.3, and a copy of the HEC-RAS report is presented in Appendix E.

Table A.3 25 May 2002 Calibration

River Mile	Sand Bed Hydraulic Roughness	Observed Water Surface Elevation (feet)	Calculated Water Surface Elevation (feet)	Observed Average Channel Velocity (feet per second)¹	Calculated Average Channel Velocity (feet per second)
Fish Creek					
0.7	0.070	3.68	3.68	-	-
11.7	0.030	8.19	8.19	-	-
12.6	0.038	9.46	9.46		
18.4	0.014	12.87	12.87	-	-
25.1	0.021	18.22	18.22	3.83	3.66
32.4	0.030	21.77	21.77	1.68	1.53
43.3	0.027	29.43	29.43	-	-
Judy Creek					
7.0	0.014	26.80	26.80	4.81	4.71
13.8	0.020	35.85	35.85	-	-
Notes:					
1. The measured average channel velocity is only provided for those cross sections where discharge was measured.					

A.3.1.3.1.2 Typical Sand Bed Values

Fish Creek and Judy Creek both have sandy, mobile riverbeds, and the hydraulic roughness can change significantly with changes in discharge and bed form. Thus, the sand bed hydraulic roughness estimated from the 25 May 2002 data represents the conditions at only one point in time.

To account for the variability in the hydraulic roughness, two other estimates of hydraulic roughness were made based on the types of bed forms likely to be present in the channels during flooding. The bed forms likely to be present include dunes, transition and antidunes. The hydraulic roughness associated with these bed forms can vary between approximately 0.014 and 0.035. Thus, the average minimum hydraulic roughness associated with dunes, transition and antidunes (i.e. 0.016) was chosen to represent hydraulically smooth conditions. The average maximum hydraulic roughness associated with dunes, transition and antidunes (i.e. 0.031) was chosen to represent hydraulically rough conditions. When hydraulically smooth or rough conditions were modeled, the hydraulic roughness at cross sections between 0.7 and 11.7 were kept the same as in the calibration model.

A.3.1.3.1 Hydraulic Roughness of the Vegetated Banks and Floodplain

The hydraulic roughness of the floodplains and the vegetated banks was based on the type and density of vegetation noted in the Lounsbury survey data (URS, 2001; Appendix G), and the depth of water at the vegetation. A summary of the values of hydraulic roughness used to describe the vegetation is presented in Table A.4.

Table A.4 Floodplain Hydraulic Roughness

Description	Value
Dense Willows, Spring	
Water Depth 0 to 1 Times Willow Height	0.150
Water Depth 1 to 2 Times Willow Height	0.110
Water Depth 2 to 3 Times Willow Height	0.080
Water Depth >3 Times Willow Height	0.055
Sparse Willows, Spring	
Water Depth 0 to 1 Times Willow Height	0.110
Water Depth 1 to 2 Times Willow Height	0.090
Water Depth 2 to 3 Times Willow Height	0.070
Water Depth >3 Times Willow Height	0.050
Grass 6-10 Inches high – Fair Condition	
Velocity x Hydraulic Radius = 1	0.058
Velocity x Hydraulic Radius = 2	0.045
Velocity x Hydraulic Radius = 3	0.040
Velocity x Hydraulic Radius = 4	0.038
Velocity x Hydraulic Radius = 5	0.037
Velocity x Hydraulic Radius = 6	0.036
Velocity x Hydraulic Radius = 7	0.035
Velocity x Hydraulic Radius = 8	0.034
Velocity x Hydraulic Radius = 9	0.033
Velocity x Hydraulic Radius = 10	0.032
Velocity x Hydraulic Radius = 13	0.031
Velocity x Hydraulic Radius = 18	0.030
Velocity x Hydraulic Radius > 20	0.029

A.3.1.4 Downstream Boundary Conditions

A normal depth computation, and the 25 May 2002 water surface slope between River Miles 0.7 and 11.7 were used to estimate the starting water surface elevation. Based on the data collected on 25 May 2002, the water surface slope used in the model is 0.00008 feet/foot.

Additionally, below River Mile 11.7, the hydraulic roughness was not altered from that of the calibration model. Between cross sections 0.7 and 11.7 the roughness values obtained during calibration were a function of both the roughness and the offshore conditions.

A.3.2 Results

The water surface profile during the peak discharge of the 100-year flood was estimated for three conditions: the sand bed roughness on 25 May 2002, a hydraulically smooth sand bed, and a hydraulically rough sand bed. All three profiles represent open water conditions with no snow or ice blockage. A summary of the results is presented in Table A.5, and a copy of each of the HEC-RAS reports is presented in Appendix E.

Table A.5 Summary of 100-Year Flood Conditions

River Mile	Water Surface Elevation (feet)			Velocity (feet per second)		
	Calibrated Sand Bed Hydraulic Roughness	Sand Bed Roughness of 0.016	Sand Bed Roughness of 0.031	Calibrated Sand Bed Hydraulic Roughness	Sand Bed Roughness of 0.016	Sand Bed Roughness of 0.031
Fish Creek						
12.6	12.78	12.61	12.75	2.60	4.54	3.00
18.4	17.02	17.06	17.64	5.56	5.49	4.69
25.1	23.52	23.15	24.02	4.64	5.66	3.36
32.4	28.52	27.96	28.72	1.74	2.93	1.62
43.3	39.29	37.74	39.54	3.30	4.65	3.03
Judy Creek						
7.0	31.32	31.42	32.05	4.51	4.27	2.91
13.8	41.12	40.26	43.68	6.50	7.12	4.91

A.4 UBLUTUOCH RIVER 100-YEAR WATER SURFACE PROFILE

A water surface profile model of the Ublutuoch River was developed using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS) computer program. The purpose of the model is to estimate the water surface profile during the peak discharge of the 100-year flood. Two scenarios were considered. The first scenario includes a channel partially blocked by ice and snow, and the second scenario includes an ice- and snow-free channel. The floodplain is assumed to be free of ice and snow in both scenarios.

A.4.1 BASE MODEL

A.4.1.1 Cross-Sections

The model is based on two cross sections surveyed during the summers of 2001 and 2002 by Lounsbury & Associates. One is located at River Mile 8.0 (Appendix G); the other is located at River Mile 13.7 (URS, 2001). Computer interpolated cross-sections were used between the two surveyed cross-sections, and were located at approximately 3000-foot intervals along the main channel. The interpolated cross sections were close enough together that the drop in velocity head between any two of the cross sections was less than one foot.

A.4.1.1.1 Development of the Ice- and Snow-Free Cross-Sections

The surveyed cross-section data obtained by Lounsbury & Associates during the summers of 2001 and 2002 were used to develop hydraulically representative cross-sections at River Miles 8.0 and 13.7. Specifically, the elevations associated with ponds on the floodplain were adjusted to depict only the cross sectional area above the water surface.

A.4.1.1.2 Development of the Ice and Snow Affected Cross-Sections

To represent the ice- and snow-affected cross sections, the floodplain survey data collected by Lounsbury & Associates was combined with the channel cross sections obtained by URS during spring breakup to produce hydraulically representative cross sections at River Miles 8.0 and 13.7. As with the ice- and snow-free condition, the elevations associated with ponds on the floodplain were adjusted to depict only the cross sectional area above the water surface.

To represent the partially blocked channel at River Mile 13.7, an average of the channel bed elevations observed during the spring-peak discharges of 2001 and 2002 was used. To represent the partially blocked channel at River Mile 8.0, the channel bed elevations observed on 24 May 2002 were used. No cross section data are available at River Mile 8.0 at the time of the spring peak discharge. However, a measurement on 24 May 2002, two days after the spring-peak discharge, indicated that the water surface elevation was about 2 feet below the bank full elevation, and the bottom of the channel was ice. There was no evidence of over bank flow. It is estimated that the channel bottom on 24 May was the top of the water surface at freeze up, and that the channel bottom was probably at the same elevation during the peak discharge two days before.

A.4.1.2 100-Year Flood-Peak discharge

The magnitude of the 100-year flood-peak discharge was specified at selected locations along the Ublutuoch River. Those locations, and the magnitude of the 100-year flood-peak discharge at each location, are presented in Table A.6.

Table A.6 Flood-Peak Discharge Estimates On The Ublutuoch River

River Mile	Drainage Area (mile ²)	Flood-Peak Discharge (cfs)
		100-Year Return Period
8.0	233	8,865
9.14		8792
10.28		8719
11.42		8646
12.56		8573
13.7	222	8,500

At River Miles 8.0 and 13.7 the magnitude of the 100-year flood-peak discharge was estimated using the modified regression equations presented in Section A.2. Between River Miles 8.0 and

13.7 the magnitude of the 100-year flood-peak discharge was estimated by linear interpolation along the channel.

A.4.1.3 Hydraulic Roughness

A.4.1.3.1 Main Channel Hydraulic Roughness, Snow And Ice-Free Condition

In general, the Ublutuoch River channel has a gravel riverbed and heavily vegetated banks. The hydraulic roughness associated with the vegetated banks was estimated based on the type and density of the vegetation noted in the Lounsbury survey data (URS, 2001; Appendix G), and the depth of water at the vegetation (Table A.4). The hydraulic roughness of the gravel bed portion of the channel was estimated based on data collected in the field, published methods of calculating channel roughness (Arcement, G. J., and V. R. Schneider, 1984), and our experience with similar streams on the North Slope. Although the gravel bed and vegetated side slopes were assigned separate values of hydraulic roughness, a single weighted value of hydraulic roughness was computed and used to represent the channel. A list of all of the channel hydraulic roughness values is provided in each of the HEC-RAS reports included in Appendix E.

A.4.1.3.2 Main Channel Hydraulic Roughness, Ice and Snow Affected Conditions

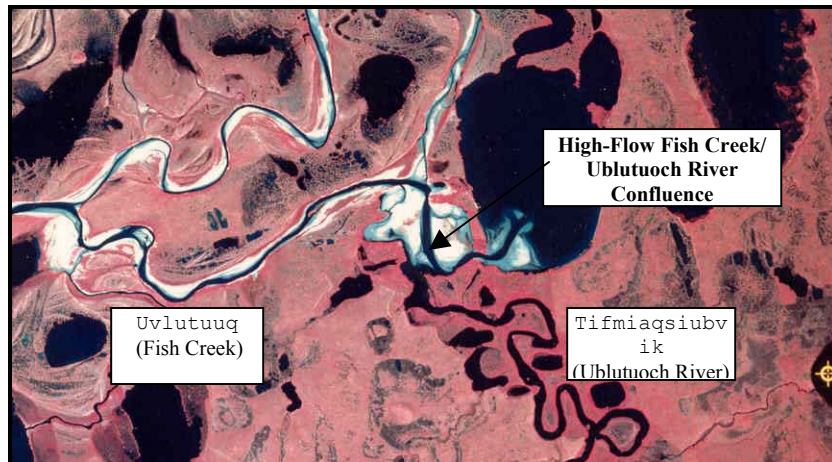
For the ice- and snow-affected condition, the channel hydraulic roughness was estimated based on a water surface profile model of conditions on Fish Creek and the Ublutuoch River on 24 May 2002. The data used to develop the calibration model included discharge and water surface elevation measurements made at River Miles 8.0 and 13.7 on the Ublutuoch River, and water surface elevation measurements made at River Miles 0.7 and 11.7 on Fish Creek. The data used to develop the calibration model is summarized in Table A.7.

Table A.7 Ublutuoch River Calibration Data

Cross-Section River Mile	Date	Time	WSE (feet, BPMSL)	Discharge (cfs)	Velocity (fps)	Slope (ft/ft)
Fish Creek/Ublutuoch River Confluence	24 May 02	15:40	6.83 ²			0.000041 ^{4,5}
Ublutuoch 8.0	24 May 02	15:40	8.36	1510	2.26	
Ublutuoch 13.7	24 May 02	15:40	14.68 ¹	1363 ³	3.44	
Notes:						
1. Interpolated water surface elevation.						
2. Water surface elevation interpolated between River Miles 0.7 and 11.7 on Fish Creek.						
3. This discharge was estimated based on the discharge measured at 12:08 and the change in water surface elevation.						
4. Computed water surface slope between Fish Creek/Ublutuoch River Confluence and River Mile 8.0 on the Ublutuoch River at 15:40 on May 24 th 2002.						
5. The main channel length between Fish Creek/Ublutuoch River Confluence and River Mile 8.0 on the Ublutuoch River is 38,540 FT.						

In contrast to the 100-year flood models, the cross-sections used in the calibration model were based solely on the discharge measurements made at River Miles 8.0 and 13.7 on 24 May. Computer interpolated cross-sections were used between the two measured cross-sections, and were located at approximately 3000-foot intervals along the main channel. The discharge was specified at River Miles 8.0 and 13.7, and at every other interpolated cross section. The discharge at River Miles 8.0 and 13.7 was 1510 and 1363 cubic feet per second, respectively. The magnitude of the discharge at the interpolated cross sections was linearly interpolated based on the discharge at River Miles 8.0 and 13.7, and the distance along the channel. The starting water surface slope was calculated from the measured water surface elevation at River Mile 8.0 on the Ublutuoch River and the estimated water surface elevation at the confluence of Fish Creek and the Ublutuoch River (Table A.7, Figure A.1).

Figure A.1 Ublutuoch River/Fish Creek Confluence



Once the discharge values and the downstream boundary condition were entered into the water surface profile model, the model was calibrated by varying the hydraulic roughness until the water surface elevations at River Miles 8.0 and 13.7 approximated the observed elevations. A summary of the results of the calibration model is presented in Table A.8, and a copy of the HEC-RAS report is presented in Appendix E.

Table A.8 24 May 2002 Calibration

River Mile	Main Channel Hydraulic Roughness	Measured Water Surface Elevation (feet)	Calculated Water Surface Elevation (feet)	Measured Average Channel Velocity (feet per second)	Calculated Average Channel Velocity (feet per second)
8.0	0.012	8.36	8.36	2.26	2.39
13.7	0.021	14.68	14.68	3.44	3.44

A.4.1.3.3 Floodplain Hydraulic Roughness

The hydraulic roughness values were based on the type and density of vegetation noted in the Lounsbury survey data (URS, 2001; Appendix G), and the depth of water at the vegetation. A summary of the values of hydraulic roughness used to describe the vegetation is presented in Table A.2. Where more than one hydraulic roughness value was used in the floodplain, the model computed a single weighted value based on wetted perimeter.

A.4.1.4 Downstream Boundary Conditions

A normal depth computation and a starting water surface slope associated with the 100-year flood were used to describe the downstream boundary condition. The starting water surface slope was estimated based on water surface elevations at River Mile 8.0 on the Ublutuoch River and the Fish Creek/Ublutuoch River Confluence, using an iterative procedure.

First, the expected 100-year water surface elevation at the Fish Creek/Ublutuoch River Confluence was estimated from a 100-year flood-peak discharge model of Fish Creek (URS, 2002). Second, an initial water surface elevation was calculated for River Mile 8.0 on the Ublutuoch River using the water surface slope on 24 May 2002 and a normal depth computation. Third, the water surface slope between River Mile 8.0 on the Ublutuoch River and the Fish Creek/Ublutuoch River Confluence was calculated based on these two water surface elevations and the main channel distance between them.¹ Fourth, this new slope was used as the starting water surface slope in the 100-year water surface profile model, and a new water surface elevation was calculated for the Ublutuoch River at River Mile 8.0. Finally, the new elevation at River Mile 8.0 was used to compute a new starting water surface slope and the model was re-run with the new slope. This iterative process was repeated until the water surface slope was stable. For the ice- and snow-free condition, the water surface slope was 0.0000951 feet/foot. For the ice- and snow-affected condition, the water surface slope was 0.0000905 feet/foot.

¹ The main channel distance between the Ublutuoch River at River Mile 8.0 and Fish Creek at River Mile 9.0 is 38,540 feet.

A.4.2 RESULTS

The water surface profiles developed for the Ublutuoch River during the peak-discharge of the 100-year flood were based on two scenarios. The first scenario includes a channel partially blocked by ice and snow, and the second scenario includes an ice- and snow-free channel. The floodplain is assumed to be free of snow and ice in both scenarios. A summary of the results is presented in Table A.9, and a copy of each of the HEC-RAS reports is presented in Appendix E.

Table A.9 HEC-RAS Model Comparison for the Ublutuoch River

River Mile	Water Surface Elevation (feet)		Main Channel Velocity (feet per second)	
	Ice- and Snow-Affected Condition	Ice- and Snow-Free Condition	Ice- and Snow-Affected Condition	Ice- and Snow-Free Condition
8.0	14.58	14.65	4.32	3.46
13.7	22.06	21.85	3.11	2.58

A.5 REFERENCES

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- URS Corporation. 2002. *2001 Water Surface Profiles for Selected Flood Peak Discharges on Fish Creek, Judy Creek and the Ublutuoch River, North Slope, Alaska*. Prepared for Phillips Alaska, Inc., Anchorage, Alaska.

APPENDIX B

SPRING BREAKUP WATER SURFACE ELEVATIONS AND OBSERVATIONS

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SPRING BREAKUP WATER SURFACE ELEVATIONS AND OBSERVATIONS

FISH CREEK

Table B-1.1: Water Surface Elevations and Observations on Fish Creek at River Mile 0.7

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/23/02	14:44	3.19		There is no evidence that the water surface has been higher than it is at present.
05/24/02	10:17	3.33	0.01	
05/25/02	15:02	3.68	0.05	
05/26/02	9:06	4.15	0.10	
05/26/02	15:40	4.35	0.05	
05/27/02	8:40	4.67	0.02	Ice starting to form on the water surface due to cold air temperatures.
05/30/02	15:57	4.10	0.01	Recently formed ice starting to melt and breakup.
05/31/02	16:00	3.41	0.00	
06/01/02	8:38	2.93	0.01	Little ice remaining in the channel at present time.
<p>Notes:</p> <ol style="list-style-type: none"> 1. Water surface elevations are based on an elevation of 3.90 feet (BPMSL) for TBM D1A South, established by Lounsbury & Associates in 2001. 2. GPS coordinates for TBM D1A South are N 70° 22.296' W 151° 15.279' (NAD 27, decimal minutes). 				

Table B-1.2: Water Surface Elevations and Observations on Tingmeachsiovik River at River Mile 10.3

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/23/02	15:24	7.90	-	There is no evidence that the water surface has been higher than it is at present. No snow remains on either bank above or below the water surface.
05/24/02	10:37	8.25	-	
05/25/02	14:43	8.62	0.03	
05/26/02	9:29	8.62	0.10	
05/26/02	15:15	8.64	0.10	
05/27/02	9:00	8.49	0.10	
05/30/02	14:53	8.38	0.02	An ice jam has formed across the channel. It is continuous upstream and downstream from the cross section.
05/31/02	15:40	7.85	0.00	The ice jam began breaking up in the afternoon of 31 June.
06/01/02	8:53	7.11	0.01	Grounded ice pans remained on exposed sand bars in the vicinity of the cross section, however, no ice floes were observed in the channel.
<p>Notes:</p> <ol style="list-style-type: none"> Elevations are based on an elevation of 15.09 feet (BPMSL) for TBM C3A North, established by Lounsbury & Associates in 2001. GPS coordinates for TBM C3A North are N 70° 19.199' W 151° 25.942' (NAD 27, decimal minutes). 				

Table B-1.3: Water Surface Elevations and Observations on Fish Creek at River Mile 11.7

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/23/02	15:35	7.57	-	There is no evidence that the water surface has been higher than it is at present. No snow remains on either bank above or below the water surface.
05/24/02	10:29	7.89	0.05	
05/25/02	14:49	8.19	0.03	
-	-	8.48	-	High water mark observed on 5/26/02 at 09:21. Possibly due to wind wave action.
05/26/02	9:21	8.17	0.10	
05/26/02	15:45	8.16	0.05	
05/27/02	8:51	8.13	0.05	
HWM	-	8.68	-	High water mark observed on 5/30/02 at 13:47.
05/30/02	13:47	8.37	0.01	An ice jam has formed across the channel that is continuous upstream and downstream from the cross section.
05/31/02	15:50	7.09	0.01	The ice jam began breaking up in the afternoon of 5/31/02.
Notes:				
1. Elevations are based on an elevation of 8.37 feet (BPMSL) for TBM C2A North, established by Lounsbury & Associates in 2001.				
2. GPS coordinates for TBM C2A North are N 70° 19.011' W 151° 25.487' (NAD 27, decimal minutes).				

Table B-1.4: Water Surface Elevations and Observations on Fish Creek at River Mile 12.6

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/24/02	11:58	9.15	0.01	There is no evidence that the water surface has been higher than it has at present time.
05/24/02	15:38	9.19	0.01	
05/25/02	14:35	9.46	-	
05/25/02	18:40	9.44	0.03	
-	-	9.59	-	High water mark observed 5/26/02 at 9:35. Possibly due to wind wave action.
05/26/02	9:35	9.47	0.10	
05/26/02	16:00	9.43	0.05	
05/27/02	9:03	9.34	-	
HWM	-	10.85	-	High water mark observed 5/30/02 at 15:14. An ice jam formed across the entire channel, and is continuous upstream to approximately River Mile 15 on Fish Creek.
05/30/02	15:14	10.14	0.01	The water surface elevation at this time was near the top of the left bank. The water surface was above the top of the left bank at the time the high water mark occurred. An area along the right channel bank between approximately River Miles 13 and 14 was flooded during the time that the ice jam was present
05/31/02	15:35	9.51	0.01	The ice jam began breaking up in the afternoon of 5/31/02.
06/01/02	9:00	8.08	0.02	Little to no ice remained in the channel in the vicinity of the cross section.
Notes:				
1. Elevations are based on an elevation of 15.06 feet (BPMSL) for TBM F12.6-N, established by Lounsbury & Associates in 2002.				
2. GPS coordinates for TBM F12.6-N are N 70° 19.1525' W 151° 26.4202' (NAD 27, decimal minutes).				

Table B-1.5: Water Surface Elevations and Observations on Fish Creek at River Mile 18.4

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/21/02	17:08	9.81	0.02	There is little to no snow in the channel within the channel banks. There is no evidence that the water surface has been higher than it is at present time.
05/22/02	13:50	11.21	-	
05/23/02	9:08	11.76	-	
05/23/02	13:08	11.82	0.05	
05/24/02	12:40	12.40	0.01	
05/24/02	15:32	12.47	0.01	
05/25/02	14:30	12.87	0.02	There is no evidence that the water surface has been higher than it is at present time.
05/25/02	18:35	12.90	0.03	
05/26/02	9:44	12.90	0.10	
05/26/02	16:05	12.88	0.05	
05/27/02	9:09	12.66	0.05	
05/28/02	8:14	12.14	0.02	
05/28/02	14:00	12.03	0.02	
HWM	-	13.41	-	High water mark observed 5/30/02 at 14:24. The water surface elevation appeared to rise at this cross section due to the effects of the ice jam located at approximately River Mile 15.
05/30/02	14:24	13.24	0.04	
05/31/02	12:14	13.17	0.02	
05/31/02	15:25	13.01	0.02	
06/01/02	15:50	10.66	0.01	
Notes:				
1. Elevations are based on an elevation of 27.82 feet (BPMSL) for TBM Line 1 North, established by Lounsbury & Associates in 2001.				
2. GPS coordinates for TBM C2A North are N 70° 17.731' W 151° 36.226' (NAD 27, decimal minutes).				

Table B-1.6: Water Surface Elevations and Observations on Fish Creek at River Mile 25.1

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/21/02	16:13	15.16	0.02	No snow present on the banks above or below the water surface. There is no evidence that the water surface has been higher than it is at present time.
05/22/02	12:45	16.03	0.02	
05/22/02	18:17	16.36	0.05	
05/23/02	8:36	16.71	-	
05/23/02	9:52	16.72	0.01	
05/23/02	11:56	16.76	0.03	
05/24/02	8:44	17.51	-	
05/24/02	12:10	17.62	0.03	
05/24/02	13:35	17.66	0.02	
05/24/02	15:16	17.73	0.02	
05/24/02	16:14	17.77	0.02	
05/25/02	11:55	18.22	-	
05/25/02	12:13	18.23	0.03	
05/25/02	13:08	18.22	0.02	
05/25/02	14:46	18.22	0.02	
05/25/02	16:40	18.19	0.05	
05/25/02	17:22	18.20	0.05	
05/25/02	19:05	18.20	0.05	
05/25/02	19:30	18.20	0.05	
05/26/02	8:35	18.10	0.05	
05/26/02	9:38	18.09	0.04	
05/26/02	11:12	18.07	0.04	
05/26/02	11:58	18.08	0.05	
05/26/02	12:35	18.08	0.05	
05/26/02	13:00	18.07	0.01	
05/26/02	15:00	18.06	0.05	
05/26/02	16:10	18.05	0.05	
05/27/02	9:16	17.74	0.05	
05/27/02	14:00	17.67	0.05	
05/27/02	15:22	17.65	0.05	

Table B-1.6: Continued

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/27/02	17:03	17.63	0.04	
05/28/02	9:46	17.00	0.02	Ice floes are present in the channel. They have developed as the result of cold air temperatures.
05/28/02	11:30	16.90	0.02	
05/30/02	9:28	16.16	0.02	
05/31/02	12:30	16.07	0.02	Few ice floes remain in the channel.
05/31/02	13:14	16.01	0.02	
05/31/02	14:32	15.99	0.02	

Notes:

1. Elevations are based on an elevation of 21.44 feet (BPMSL) for TBM Line 2 South, established by Lounsbury & Associates in 2001.
2. GPS coordinates for TBM Line 2 South are N 70° 15.919' W 151° 42.126' (NAD 27, decimal minutes).

Table B-1.7: Water Surface Elevations and Observations on Fish Creek at River Mile 32.4

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/21/02	17:56	18.94	0.03	There is no evidence that the water surface has been higher than it is at present time.
05/22/02	15:11	19.49	0.04	There is no evidence that the water surface has been higher than it is at present. Between Fish Creek River Miles 18.4 and 32.4, the channel is clear of snow and ice. There are no ice jams and almost no snow remaining along the banks.
05/23/02	11:35	20.49	0.05	
05/23/02	14:29	20.58	0.04	Several ice pans were observed flowing in the channel.
05/23/02	15:35	20.62	0.04	High concentration of ice floes during discharge measurement
05/23/02	16:42	20.59	0.04	
05/24/02	14:50	21.15	0.01	
05/25/02	12:41	21.76	0.02	
05/25/02	15:02	21.77	0.02	
05/25/02	16:40	21.74	0.02	
05/26/02	10:03	21.85	0.10	
05/26/02	16:20	22.04	0.05	
05/27/02	9:26	22.39	0.05	
05/27/02	13:26	22.41	0.04	
05/27/02	15:16	22.42	0.04	
05/27/02	16:14	22.42	0.05	
05/27/02	16:36	22.42	0.04	
05/28/02	9:55	22.07	0.00	
05/28/02	10:36	22.04	0.00	
05/28/02	12:30	21.96	0.00	
05/28/02	13:35	21.93	0.00	
05/30/02	10:40	20.99	0.01	
05/31/02	11:53	20.93	0.01	
05/31/02	15:10	20.89	0.01	
06/01/02	9:12	20.51	0.01	

Table B-1.7: Continued

Notes:

1. Elevations are based on an elevation of 23.37 feet (BPMSL) for TBM Line 3 South2, established by Lounsbury & Associates in 2001.
2. GPS coordinates for TBM Line 3 South2 are N 70° 16.161' W 151° 52.343' (NAD 27, decimal minutes).

Table B-1.8: Water Surface Elevations and Observations on Fish Creek at River Mile 43.3

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/22/02	15:51	29.40	0.04	
05/23/02	11:52	29.10	0.05	Between Fish Creek River Miles 32.4 and 43.3 there was a loose surface ice jam that probably had an insignificant affect on the water surface elevation. There is no evidence that the water surface has been higher than it is at present time.
05/23/02	16:53	29.07	0.05	
05/24/02	15:07	29.10	0.01	
05/25/02	14:00	29.43		There is no evidence that the water surface has been higher than it is at present.
05/25/02	18:15	29.44	0.03	
05/26/02	10:11	29.88	0.10	
05/26/02	16:25	30.22	0.02	
05/27/02	9:33	30.81	0.10	
05/27/02	15:36	30.88	0.05	
05/27/02	17:54	30.87	0.05	
05/28/02	8:36	30.66	0.01	
05/28/02	13:47	30.55	0.03	
05/30/02	12:06	29.84	0.02	
05/31/02	12:02	29.74	0.02	
05/31/02	15:15	29.71	0.01	
06/01/02	9:32	29.39	0.01	

Notes:

1. Elevations are based on an elevation of 35.29 feet (BPMSL) for TBM Line 4A South, established by Lounsbury & Associates in 2000.
2. GPS coordinates for TBM Line 4A South are N 70° 15.242' W 152° 01.294' (NAD 27, decimal minutes).

SPRING BREAKUP WATER SURFACE ELEVATIONS AND OBSERVATIONS

JUDY CREEK

Table B-2.1: Water Surface Elevations and Observations on Judy Creek at River Mile 7.0

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/21/02	18:38	24.26	0.01	No snow observed on channel banks above or below the present water surface. There is no evidence that the water surface has been higher than it is at present.
-	-	25.62	-	High water mark observed 5/22/02 at 17:00.
05/22/02	17:00	25.30	0.08	
05/23/02	12:05	25.80	0.01	
05/23/02	17:12	26.06	-	There is no evidence that the water surface has been higher than it is at present.
05/23/02	18:31	26.13	0.02	
05/24/02	8:18	26.30	0.02	
05/24/02	9:13	26.32	0.02	
05/24/02	10:42	26.36	0.02	
05/24/02	15:23	26.52	0.02	
05/25/02	14:16	26.81	0.02	There is no evidence that the water surface has been higher than it is at present.
05/25/02	18:11	26.78	0.03	
05/25/02	18:39	26.77	0.05	
05/25/02	19:46	26.76	0.05	
05/26/02	10:27	26.58	0.10	
05/26/02	16:40	26.38	0.05	
05/27/02	9:51	25.70	0.01	
05/27/02	14:34	25.52	-	
05/30/02	12:56	23.87	0.04	
Notes:				
1. Water surface elevations are based on an elevation of 36.62 feet (BPMSL) for TBM Line 3 South 1, established by Lounsbury & Associates in 2000.				
2. GPS coordinates for TBM Line 3 South 1 are N 70° 13.162' W 151° 50.333' (NAD 27, decimal minutes).				

Table B-2.2: Water Surface Elevations and Observations on Judy Creek at River Mile 13.8

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/21/02	19:11	33.71	0.02	There is no evidence that the water surface has been higher than it is at present time.
05/22/02	17:36	34.52	0.03	
05/23/02	12:20	34.94	0.03	
05/23/02	17:02	35.24	0.05	
05/24/02	8:28	35.49	0.01	
05/24/02	15:15	35.75	0.02	There is no evidence that the water surface has been higher than it is at present time.
05/25/02	14:08	35.86	0.02	
05/25/02	18:25	35.79	0.03	
05/26/02	10:20	35.49	0.10	
05/26/02	16:30	35.24	0.05	
05/27/02	9:40	34.65	0.03	
05/30/02	12:10	32.84	0.02	

Notes:

1. Water surface elevations are based on an elevation of 40.87 feet (BPMSL) for TBM Line 3 South 1, established by Lounsbury & Associates in 2000.
2. GPS coordinates for TBM Line 4B North are N 70° 11.198' W 151° 57.718' (NAD 27, decimal minutes).

SPRING BREAKUP WATER SURFACE ELEVATIONS AND OBSERVATIONS

UBLUTUOCH RIVER

Table B-3.1: Water Surface Elevations and Observations on Ublutuoch River at River Mile 8.0

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/23/02	17:55	9.39	0.00	Ice jams are forming and breaking, affecting the WSE by up to 0.60 foot in 20 minutes
05/23/02	18:05	8.77	0.00	
HWM	-	9.49	0.00	High water mark confirmed by the presence of ice which formed while the water was high. The high water mark was recorded at 08:00 on 05/24/02.
05/24/02	8:03	8.79	0.00	
05/24/02	8:50	8.73	0.00	
05/24/02	13:44	8.46	0.01	
05/24/02	14:50	8.39	0.02	
05/24/02	16:31	8.32	0.01	
05/25/02	12:43	7.75	0.00	
Notes:				
1. Water surface elevations are based on an elevation of 14.64 feet (BPMSL) for TBM U6.0N, established by Lounsbury & Associates in 2002.				
2. GPS coordinates for TBM U6.0N are N 70° 16.781' W 151° 14.446' (NAD 83, decimal minutes).				

Table B-3.2: Water Surface Elevations and Observations on Ublutuoch River at River Mile 13.5

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/21/02	15:00	16.41	0.02	Water is flowing on top of the snow. Dense brush protrudes through the snow along the sides of the channel, below the water surface.
05/21/02	19:43	17.24	0.02	
05/22/02	9:48	17.75	0.03	This was the highest water surface elevation recorded during the 2002 breakup. Water is flowing on top of the snow. Dense brush protrudes through the snow along the sides of the channel, below the water surface.
05/22/02	11:20	17.66	0.01	
05/22/02	13:11	17.67	0.03	
05/22/02	14:49	17.69	-	
05/22/02	14:54	17.69	0.03	
05/22/02	15:45	17.62	0.03	
05/23/02	11:06	16.19	-	Water is flowing on top of the snow. Dense brush protrudes through the snow along the sides of the channel, below the water surface. The amount of snow below the water surface in the channel appears to be decreasing.
05/23/02	12:54	16.02	0.02	
05/23/02	15:00	15.86	0.02	
05/23/02	15:55	15.99	0.00	
05/23/02	16:58	15.72	0.01	
05/24/02	11:04	14.44	0.02	Water is flowing on top of the snow. Dense brush protrudes through the snow along the sides of the channel, below the water surface. The amount of snow below the water surface in the channel continues to decrease.
05/24/02	12:41	14.35	0.03	
05/24/02	16:45	14.13	0.05	
Notes:				
1. Water surface elevations are based on an elevation of 18.55 feet (BPMSL) for monument UB-US West, established by Lounsbury & Associates in 2001.				
2. GPS coordinates for monument UB-DS West are N 70° 14' 45.0" W 151° 17' 16.4" (NAD 27).				

Table B-3.3: Water Surface Elevations and Observations on Ublutuoch River at River Mile 13.7

Date	Time	Water Surface Elevation (feet)	Fluctuation in gage reading (+/-)	Observations
05/21/02	14:55	16.69	0.02	Water is flowing on top of the snow. Dense brush protrudes through the snow along the sides of the channel, below the water surface.
05/21/02	19:40	17.57	0.03	
05/22/02	8:18	18.18	0.00	
05/22/02	9:06	18.22	0.01	This was the highest water surface elevation recorded during the 2002 breakup. Water is flowing on top of the snow. Dense brush protrudes through the snow along the sides of the channel, below the water surface.
05/22/02	10:50	18.07	0.01	
05/22/02	11:56	18.06	0.01	
05/22/02	13:00	18.06	0.00	
05/22/02	14:44	18.06	0.01	
05/22/02	15:51	17.96	0.01	
05/23/02	10:58	16.53	-	Pans of bottom-fast ice are beginning to come down the river. Water is flowing on top of the snow. Dense brush protrudes through the snow along the sides of the channel, below the water surface. The amount of snow below the water surface in the channel appears to be decreasing.
05/23/02	13:01	16.39	0.00	
05/23/02	15:06	16.25	-	
05/23/02	15:39	16.22	0.02	
05/24/02	9:50	14.94	0.03	Pans of bottom-fast ice are beginning to come down the river. Water is flowing on top of the snow. Dense brush protrudes through the snow along the sides of the channel, below the water surface. The amount of snow below the water surface in the channel continues to decrease.
05/24/02	10:50	14.94	0.03	
05/24/02	13:05	14.82	0.02	
Notes:				
1. Water surface elevations are based on an elevation of 18.55 feet (BPMSL) for TBM UB-DS West, established by Lounsbury & Associates in 2001.				
2. GPS coordinates for TBM UB-DS West are N 70° 14' 45.0"W 151° 17' 16.4" (NAD 27).				

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DISCHARGE MEASUREMENTS

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C-2.1	Summary of Discharge Measurements on Fish Creek at River Mile 32.4
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Judy Creek

C-3.1	Summary of Discharge Measurements on Judy Creek at River Mile 7.0
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DISCHARGE MEASUREMENTS

ON FISH CREEK AT RIVER MILE 25.1

Table C-1.1: Summary of 2002 and 2001 Discharge Measurements on Fish Creek at River Mile 25.1

Date	Average Time	Water Surface Elevation (feet)	Discharge (cfs) ¹	Discharge Measurement Rating	Cross Sectional Area (square feet)	Wetted Perimeter (feet)	Water Surface Slope (Feet/foot)	Average Velocity (feet per second)
2002								
5/23/2002	10:55	16.74	6,752	Good	2057.0	366.0	0.00014	3.28
5/24/2002	14:26	17.70	8,575	Good	2336.5	343.1	0.00015	3.67
5/25/2002	14:14	18.22	8,910	Good	2325.2	345.4	0.00015	3.83
5/26/2002	10:26	18.08	8,930	Good	2381.0	344.9	0.00015	3.75
5/28/2002	10:36	16.95	4,760	Poor	1875.8	338.5	0.00014	2.54
5/31/2002	13:51	16.00	4,018	Good	1757.5	332.2	0.00008	2.29
2001								
6/7/2001	16:43	17.56	3110	Good	2104.9	338.5	0.00015	1.48
6/8/2001	14:45	18.33	4760	Good	2528.8	340.7	0.00013	1.88
6/9/2001	16:05	18.08	5185 ²	-	2417.8	339.9	0.00014	-
6/11/2001	10:32	16.97	6050	Good	2064.8	338	0.00013	2.93
6/13/2001	13:35	16.14	4600	Good	1693.9	332.8	0.00013	2.71
6/15/2001	12:27	16.99	6100	Good	2066.5	341.1	0.00014	2.95
7/17/2001	10:16	10.91	755 ²	-	-	-	-	-
8/14/2001	19:20	10.18	511 ²	-	-	-	-	-
9/5/2001	13:25	10.25	511 ²	-	-	-	-	-
Notes:								
1. Cubic feet per second is abbreviated cfs.								
2. Discharge was calculated based on discharge measurements made on Judy Creek and Fish Creek upstream of the confluence.								
3. Water surface elevations are based on an elevation of 21.44 feet (BPMSL) for TBM Line 2 South, established by Lounsbury & Associates in 2001.								

Table C-1.2: Discharge Measurement on Fish Creek at River Mile 25.1 on 5/23/2002

DISCHARGE MEASUREMENT NOTES					
LOCATION: Fish Creek, approximately 25.1 river miles upstream from mouth.					
Date: 5/23 2002 Party: Mark Vania, James Dietzmann					
Width: 334		Area: 2057		Vel: 3.28	
W.S.E.: 16.74 ft. BPMSL			Disch.: 6752		cfs
No Secs. 32		WSE Change: 0.04 ft.		in: 1.8 hrs.	
Method coef.:		Hor. Angle coef.		Sus. Coef.:	
				Meter No. URS 2	
Water Surface Elevation Readings			Type of meter: Price AA		
Time	Description	WSE	Date rated:		
9:52	SG25.1-B	16.72	Meter: 1.5 ft. above bottom of weight.		
10:00	Start discharge measurement (WSE est.).	16.72	Spin before meas. 2 min 46 sec after 1 min 56 sec		
11:50	End discharge measurement (WSE est.).	16.76	Method: Boat, sounding reel		
11:56	SG25.1-B	16.76			
			Weather:		
			Air Temp. 40 (°F)		
			Water Temp. (°F)		
			Precip. None		
			Cloud Cover Clear		
Datum		BPMSL		Wind Breezy	
Weighted Mean WSE		16.74 ft. BPMSL			
Measurement rated:		Good			
Cross section:		Fairly Uniform			
Flow:		Fairly Uniform			
Other:					
Control:					
Remarks: No snow was present above or below water surface on either bank.					
Few ice floes were present in the channel.					

Table C-1.2: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	12.0	0.0	0.0								REW - Sandy bank with brush
	30.0	19.0	2.1	0.2	15	47	0.721	0.635	39.9	25.3	sandy/silty channel bottom
	50.0	20.0	3.0	0.2	25	46	1.216	1.070	60.0	64.2	sandy/silty channel bottom
	70.0	20.0	2.4	0.2	28	52	1.205	1.060	48.0	50.9	sandy/silty channel bottom
	90.0	20.0	2.5	0.2	24	51	1.055	0.929	50.0	46.4	sandy/silty channel bottom
	110.0	20.0	4.0	0.2	17	43	0.889	0.783	80.0	62.6	sandy/silty channel bottom
	130.0	20.0	7.6	0.2	17	43	0.889	0.911	152.0	138.5	sandy/silty channel bottom
				0.8	22	53	0.933				
	150.0	20.0	8.0	0.2	40	40	2.223	1.922	160.0	307.5	sandy/silty channel bottom
				0.8	32	44	1.621				
	170.0	15.0	10.0	0.2	60	44	3.024	2.702	150.0	405.3	sandy/silty channel bottom
				0.8	45	42	2.380				
	180.0	10.0	10.0	0.2	70	45	3.447	3.486	100.0	348.6	sandy/silty channel bottom
				0.8	70	44	3.525				
	190.0	7.5	9.8	0.2	90	46	4.332	4.143	73.5	304.5	sandy/silty channel bottom
				0.8	75	42	3.955				
	195.0	5.0	9.5	0.2	90	42	4.742	4.349	47.5	206.6	sandy/silty channel bottom
				0.8	75	42	3.955				
	200.0	5.0	9.3	0.2	90	43	4.632	4.530	46.5	210.6	sandy/silty channel bottom
				0.8	90	45	4.427				
	205.0	5.0	9.2	0.2	95	45	4.672	4.781	46.0	219.9	sandy/silty channel bottom
				0.8	95	43	4.889				
	210.0	5.0	9.0	0.2	95	47	4.474	4.474	45.0	201.3	sandy/silty channel bottom
				0.8	95	47	4.474				
	215.0	5.0	8.8	0.2	90	42	4.742	4.431	44.0	195.0	sandy/silty channel bottom
				0.8	80	43	4.120				
	220.0	5.0	8.4	0.2	85	41	4.589	4.423	42.0	185.8	sandy/silty channel bottom
				0.8	100	52	4.258				
	225.0	5.0	8.4	0.2	95	42	5.005	4.562	42.0	191.6	sandy/silty channel bottom
				0.8	80	43	4.120				

Table C-1.2: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	230.0	5.0	8.4	0.2	107	45	5.260	4.818	42.0	202.4	sandy/silty channel bottom
				0.8	85	43	4.376				
	235.0	5.0	8.0	0.2	100	43	5.145	4.878	40.0	195.1	sandy/silty channel bottom
				0.8	100	48	4.611				
	240.0	5.0	7.9	0.2	101	42	5.320	4.900	39.5	193.5	sandy/silty channel bottom
				0.8	85	42	4.480				
	245.0	5.0	7.8	0.2	100	43	5.145	4.863	39.0	189.7	sandy/silty channel bottom
				0.8	89	43	4.581				
	250.0	5.0	7.9	0.2	100	41	5.395	5.103	39.5	201.6	sandy/silty channel bottom
				0.8	100	46	4.811				
	255.0	5.0	8.3	0.2	100	44	5.029	4.643	41.5	192.7	sandy/silty channel bottom
				0.8	100	52	4.258				
	260.0	5.0	8.7	0.2	100	45	4.917	4.452	43.5	193.7	sandy/silty channel bottom
				0.8	90	50	3.986				
	265.0	5.0	8.7	0.2	100	43	5.145	4.504	43.5	195.9	sandy/silty channel bottom
				0.8	75	43	3.863				
	270.0	5.0	8.5	0.2	95	42	5.005	4.434	42.5	188.4	sandy/silty channel bottom
				0.8	75	43	3.863				
	275.0	5.0	8.2	0.2	100	46	4.811	4.252	41.0	174.3	sandy/silty channel bottom
				0.8	70	42	3.692				
	280.0	7.5	8.2	0.2	90	42	4.742	4.244	61.5	261.0	sandy/silty channel bottom
				0.8	71	42	3.745				
	290.0	12.5	7.4	0.2	95	43	4.889	4.291	92.5	396.9	sandy/silty channel bottom
				0.8	70	42	3.692				
	305.0	15.0	7.1	0.2	90	42	4.742	4.480	106.5	477.1	sandy/silty channel bottom
				0.8	80	42	4.217				
	320.0	12.5	6.2	0.6	70	42	3.692	3.69	77.5	286.2	sandy/silty channel bottom
	330.0	13.0	6.2	0.6	60	45	2.958	2.96	80.6	238.4	sandy/silty channel bottom
	346.0	0.0	0.0								LEW - Sand dune slope
Totals:		334.0							2057.0	6751.7	Page 3 of 3

Table C-1.3: Discharge Measurement on Fish Creek at River Mile 25.1 on 5/24/2002

DISCHARGE MEASUREMENT NOTES				
LOCATION: Fish Creek, approximately 25.1 river miles upstream from mouth.				
Date: 5/24 2002 Party: Mark Vania, James Dietzmann				
Width: 341	Area: 2336	Vel.: 3.67	W.S.E.: 17.70 ft. BPMSL	Disch.: 8575 cfs
No Secs. 31	W.S.E. change: 0.07 ft.	in: 1.5	hrs.:	Susp.:
Method Coef.:	Hor. Angle Coef.	Sus. Coef.:	Meter No. URS 2	
Water Surface Elevation Readings			Type of meter: Price AA	
Time	Description	WSE	Date rated:	
13:35	SG25.1-B	17.66	Meter: 1.5	ft. above bottom of weight.
13:40	Start discharge measurement (WSE est.).	17.66	Spin before meas.	2 min 16 sec after 2 min 9 sec
15:11	End discharge measurement (WSE est.).	17.73	Method:	Boat, sounding reel
15:16	SG25.1-B	17.73		
			Weather:	
			Air Temp. 60	(°F)
			Water Temp.	(°F)
			Precip.	None
			Cloud Cover	Clear
Datum		BPMSL	Wind	Breezy
Weighted Mean WSE		17.70 ft. BPMSL		
Measurement rated:	Good			
Cross section:	Fairly Uniform			
Flow:	Fairly Uniform			
Other:				
Control:				
Remarks:	No snow was present above or below water surface on either bank.			

Table C-1.3: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	6.0	0.0	0.0								REW - Sandy bank with brush
	40.0	27.0	3.5	0.2	45	44	2.273	2.000	94.5	189.0	sandy/silty channel bottom
	60.0	40.0	3.3	0.2	44	42	2.328	2.048	132.0	270.4	sandy/silty channel bottom
	120.0	40.0	7.3	0.6	26	42	1.383	1.383	292.0	403.7	sandy/silty channel bottom
	140.0	25.0	8.8	0.2	50	45	2.468	2.214	220.0	487.0	sandy/silty channel bottom
				0.8	37	42	1.960				sandy/silty channel bottom
	170.0	20.0	11.3	0.2	67	42	3.535	3.659	226.0	826.8	sandy/silty channel bottom
				0.8	70	41	3.782				
	180.0	10.0	10.9	0.2	80	42	4.217	4.269	109.0	465.3	sandy/silty channel bottom
				0.8	80	41	4.320				
	190.0	10.0	10.5	0.2	90	41	4.858	4.538	105.0	476.4	sandy/silty channel bottom
				0.8	80	42	4.217				
	200.0	7.5	10.0	0.2	90	42	4.742	4.816	75.0	361.2	sandy/silty channel bottom
				0.8	95	43	4.889				
	205.0	5.0	9.7	0.2	110	51	4.773	4.959	48.5	240.5	sandy/silty channel bottom
				0.8	100	43	5.145				
	210.0	5.0	9.7	0.2	95	43	4.889	4.816	48.5	233.6	sandy/silty channel bottom
				0.8	90	42	4.742				
	215.0	5.0	9.4	0.2	95	42	5.005	5.005	47.0	235.2	sandy/silty channel bottom
				0.8	95	42	5.005				
	220.0	5.0	9.2	0.2	95	42	5.005	5.031	46.0	231.4	sandy/silty channel bottom
				0.8	96	42	5.057				
	225.0	5.0	9.3	0.2	100	43	5.145	5.075	46.5	236.0	sandy/silty channel bottom
				0.8	95	42	5.005				
	230.0	5.0	9.2	0.2	95	41	5.126	4.992	46.0	229.6	sandy/silty channel bottom
				0.8	90	41	4.858				
	235.0	5.0	8.9	0.2	100	42	5.267	5.005	44.5	222.7	sandy/silty channel bottom
				0.8	90	42	4.742				
	240.0	5.0	8.7	0.2	100	42	5.267	4.897	43.5	213.0	sandy/silty channel bottom
				0.8	90	44	4.528				

Table C-1.3: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	245.0	5.0	8.5	0.2	95	42	5.005	4.874	42.5	207.1	sandy/silty channel bottom
				0.8	90	42	4.742				
	250.0	5.0	8.5	0.2	95	43	4.889	4.684	42.5	199.1	sandy/silty channel bottom
				0.8	85	42	4.480				
	255.0	5.0	8.2	0.2	95	43	4.889	4.632	41.0	189.9	sandy/silty channel bottom
				0.8	85	43	4.376				
	260.0	5.0	8.1	0.2	95	43	4.889	4.684	40.5	189.7	sandy/silty channel bottom
				0.8	85	42	4.480				
	265.0	5.0	7.9	0.2	100	43	5.145	4.813	39.5	190.1	sandy/silty channel bottom
				0.8	85	42	4.480				
	270.0	5.0	7.7	0.2	100	42	5.267	4.950	38.5	190.6	sandy/silty channel bottom
				0.8	90	43	4.632				
	275.0	5.0	7.4	0.2	100	41	5.395	5.014	37.0	185.5	sandy/silty channel bottom
				0.8	90	43	4.632				
	280.0	5.0	7.4	0.2	100	41	5.395	5.069	37.0	187.5	sandy/silty channel bottom
				0.8	90	42	4.742				
	285.0	5.0	7.1	0.6	100	42	5.267	5.267	35.5	187.0	sandy/silty channel bottom
	290.0	5.0	6.9	0.6	95	41	5.126	5.126	34.5	176.9	
	295.0	5.0	6.9	0.6	95	41	5.126	5.126	34.5	176.9	sandy/silty channel bottom
	300.0	7.5	6.7	0.6	90	40	4.979	4.979	50.3	250.2	
	310.0	10.0	7.0	0.6	80	40	4.427	4.427	70.0	309.9	sandy/silty channel bottom
	320.0	10.0	7.2	0.6	70	40	3.876	3.876	72.0	279.1	
	330.0	13.5	7.2	0.6	65	42	3.430	3.430	97.2	333.4	sandy/silty channel bottom
	347.0	0.0	0.0								LEW - Sand dune slope
Totals		341.0							2336.5	8574.9	

Table C-1.4: Discharge Measurement on Fish Creek at River Mile 25.1 on 5/25/2002

DISCHARGE MEASUREMENT NOTES				
LOCATION: Fish Creek, approximately 25.1 river miles upstream from mouth.				
Date: 5/25 2002 Party: Mark Vania, James Dietzmann				
Width: 343	Area: 2325	Vel.: 3.83	W.S.E.: 18.22 ft. BPMSL	Disch.: 8910 cfs
No Secs. 26	W.S.E. Change: 0.0 ft. in: 0.92 hrs.		Susp.:	
Method Coef.:		Hor. Angle Coef.	Sus. Coef.:	Meter No. URS 2
Water Surface Elevation Readings			Type of meter: Price AA	
Time	Description	WSE	Date rated:	
13:08	SG25.1-B	18.22	Meter: 1.5 ft. above bottom of weight.	
13:47	Start discharge measurement (WSE est.).	18.22	Spin before meas. 1 min. 50 sec. after 2 min. 14 sec.	
14:42	End discharge measurement (WSE est.).	18.22	Method: Boat, sounding reel	
14:46	SG25.1-B	18.22		
			Weather:	
			Air Temp. 38 (°F)	
			Water Temp. (°F)	
			Precip. None	
			Cloud Cover Clear	
Datum		BPMSL	Wind	Breezy
Weighted Mean WSE		18.22 ft. BPMSL		
Measurement rated:	Good			
Cross section:	Fairly Uniform			
Flow:	Fairly Uniform			
Other:				
Control:				
Remarks:				

Table C-1.4: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	4.0	0.0	0.0								REW - Sandy bank with brush
	40.0	38.0	3.9	0.6	44	43	2.274	2.274	148.2	337.0	sandy/silty channel bottom
	80.0	30.0	3.6	0.6	40	41	2.169	2.169	108.0	234.2	sandy/silty channel bottom
	100.0	20.0	3.3	0.2	41	41	2.223	1.956	66.0	129.1	sandy/silty channel bottom
	120.0	20.0	7.3	0.2	46	42	2.433	2.013	146.0	293.8	sandy/silty channel bottom
				0.8	35	49	1.593				
	140.0	15.0	11.4	0.2	60	41	3.244	2.975	171.0	508.8	sandy/silty channel bottom
				0.8	50	41	2.707				
	150.0	10.0	11.8	0.2	62	41	3.352	3.146	118.0	371.2	sandy/silty channel bottom
				0.8	57	43	2.940				
	160.0	10.0	10.9	0.2	65	43	3.351	3.277	109.0	357.1	sandy/silty channel bottom
				0.8	65	45	3.203				
	170.0	10.0	10.3	0.2	67	42	3.535	3.745	103.0	385.7	sandy/silty channel bottom
				0.8	75	42	3.955				
	180.0	10.0	10.0	0.2	73	41	3.943	4.159	100.0	415.9	sandy/silty channel bottom
				0.8	83	42	4.375				
	190.0	10.0	9.9	0.2	100	50	4.427	4.454	99.0	440.9	sandy/silty channel bottom
				0.8	85	42	4.480				
	200.0	10.0	9.5	0.2	90	41	4.858	4.858	95.0	461.5	sandy/silty channel bottom
				0.8	90	41	4.858				
	210.0	10.0	9.2	0.2	113	50	5.001	4.889	92.0	449.8	sandy/silty channel bottom
				0.8	95	44	4.778				
	220.0	10.0	9.0	0.2	98	43	5.043	4.893	90.0	440.3	sandy/silty channel bottom
				0.8	90	42	4.742				
	230.0	7.5	8.7	0.2	105	43	5.402	5.072	65.3	330.9	sandy/silty channel bottom
				0.8	90	42	4.742				

Table C-1.4: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revolutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in-vertical (fps)			
	235.0	5.0	8.8	0.2	100	42	5.267	5.136	44.0	226.0	sandy/silty channel bottom
				0.8	95	42	5.005				
	240.0	5.0	8.8	0.2	100	42	5.267	4.950	44.0	217.8	sandy/silty channel bottom
				0.8	90	43	4.632				
	245.0	5.0	8.6	0.2	105	42	5.530	5.194	43.0	223.3	sandy/silty channel bottom
				0.8	90	41	4.858				
	250.0	5.0	8.6	0.2	105	42	5.530	5.136	43.0	220.9	sandy/silty channel bottom
				0.8	90	42	4.742				
	255.0	5.0	8.4	0.2	115	46	5.530	5.154	42.0	216.5	sandy/silty channel bottom
				0.8	95	44	4.778				
	260.0	7.5	8.4	0.2	105	42	5.530	5.081	63.0	320.1	sandy/silty channel bottom
				0.8	90	43	4.632				
	270.0	10.0	8.3	0.2	100	43	5.145	4.810	83.0	399.2	sandy/silty channel bottom
				0.8	95	47	4.474				
	280.0	10.0	8.0	0.2	95	43	4.889	4.632	80.0	370.6	sandy/silty channel bottom
				0.8	85	43	4.376				
	290.0	10.0	7.5	0.2	90	41	4.858	4.489	75.0	336.7	sandy/silty channel bottom
				0.8	80	43	4.120				
	300.0	10.0	6.9	0.6	90	41	4.858	4.858	69.0	335.2	sandy/silty channel bottom
	310.0	12.5	7.2	0.6	80	43	4.120	4.120	90.0	370.8	sandy/silty channel bottom
	325.0	18.5	7.5	0.2	80	45	3.937	3.725	138.8	516.9	sandy/silty channel bottom
				0.8	65	41	3.513				
	347.0	0.0	0.0								LEW - Sand dune slope
Totals:		343.0							2325.2	8910.3	

Table C-1.5: Discharge Measurement on Fish Creek at River Mile 25.1 on 5/26/2002

DISCHARGE MEASUREMENT NOTES				
LOCATION: Fish Creek, approximately 25.1 river miles upstream from mouth.				
Date: 5/26 2002 Party: Mark Vania, James Dietzmann				
Width:	341.5	Area:	2381	Vel.: 3.75
			W.S.E.: 18.08 ft. BPMSL	Disch.: 8930 cfs
No Secs.	27	W.S.E. Change: 0.02 ft.		in: 1.4 hrs.
Method Coef.:		Hor. Angle Coef.		Sus. Coef.:
				Meter No. URS 2
Water Surface Elevation Readings			Type of meter: Price AA	
Time	Description	WSE	Date rated:	
9:38	SG25.1-B	18.09	Meter: 1.5	ft. above bottom of weight.
9:45	Start discharge measurement (WSE est.).	18.09	Spin before meas. 3 min. 14 sec. after 1 min. 27 sec.	
11:07	End discharge measurement (WSE est.).	18.07	Method: Boat, sounding reel	
11:12	SG25.1-B	18.07		
			Weather:	
			Air Temp. 27	(°F)
			Water Temp.	(°F)
			Precip.	Light blowing snow
			Cloud Cover	Cloudy
			Wind	Windy
Datum		BPMSL		
Weighted Mean WSE		18.08 ft. BPMSL		
Measurement rated:	Good			
Cross section:	Fairly Uniform			
Flow:	Fairly Uniform			
Other:				
Control:				
Remarks:				

Table C-1.5: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	5.5	0.0	0.0								REW - Sandy bank with brush
	40.0	37.3	3.7	0.6	43	44	2.172	2.172	137.8	299.4	sandy/silty channel bottom
	80.0	30.0	3.7	0.6	37	45	1.831	1.831	111.0	203.2	sandy/silty channel bottom
	100.0	20.0	3.2	0.2	39	42	2.065	1.817	64.0	116.3	sandy/silty channel bottom
	120.0	20.0	7.2	0.6	36	43	1.864	1.864	144.0	268.4	sandy/silty channel bottom
	140.0	15.0	10.9	0.6	55	43	2.838	2.838	163.5	464.0	sandy/silty channel bottom
	150.0	10.0	10.6	0.6	65	44	3.275	3.275	106.0	347.1	sandy/silty channel bottom
	160.0	10.0	10.4	0.6	60	43	3.094	3.094	104.0	321.8	sandy/silty channel bottom
	170.0	10.0	10.2	0.6	73	44	3.676	3.676	102.0	374.9	sandy/silty channel bottom
	180.0	10.0	10.3	0.6	80	45	3.937	3.937	103.0	405.6	sandy/silty channel bottom
	190.0	10.0	10.2	0.6	80	42	4.217	4.217	102.0	430.2	sandy/silty channel bottom
	200.0	10.0	10.1	0.6	90	44	4.528	4.528	101.0	457.3	sandy/silty channel bottom
	210.0	10.0	9.6	0.6	90	42	4.742	4.742	96.0	455.3	sandy/silty channel bottom
	220.0	10.0	9.4	0.6	100	45	4.917	4.917	94.0	462.2	sandy/silty channel bottom
	230.0	7.5	9.1	0.6	95	43	4.889	4.889	68.3	333.7	sandy/silty channel bottom

Table C-1.5: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	235.0	5.0	8.9	0.2	85	43	4.376	4.632	44.5	206.1	sandy/silty channel bottom
				0.8	95	43	4.889				
	240.0	5.0	8.9	0.2	100	44	5.029	4.728	44.5	210.4	sandy/silty channel bottom
				0.8	90	45	4.427				
	245.0	5.0	8.7	0.2	108	48	4.979	4.703	43.5	204.6	sandy/silty channel bottom
				0.8	86	43	4.427				
	250.0	5.0	8.6	0.2	100	44	5.029	4.779	43.0	205.5	sandy/silty channel bottom
				0.8	88	43	4.530				
	255.0	5.0	8.3	0.2	95	44	4.778	4.695	41.5	194.8	sandy/silty channel bottom
				0.8	100	48	4.611				
	260.0	7.5	8.3	0.2	95	42	5.005	4.819	62.3	300.0	sandy/silty channel bottom
				0.8	90	43	4.632				
	270.0	10.0	7.9	0.6	90	44	4.528	4.528	79.0	357.7	sandy/silty channel bottom
	280.0	10.0	8.0	0.6	95	45	4.672	4.672	80.0	373.8	sandy/silty channel bottom
	290.0	10.0	8.2	0.6	95	45	4.672	4.672	82.0	383.1	sandy/silty channel bottom
	300.0	10.0	8.2	0.6	90	44	4.528	4.528	82.0	371.3	sandy/silty channel bottom
	310.0	10.0	7.9	0.6	95	44	4.778	4.778	79.0	377.5	sandy/silty channel bottom
	320.0	10.0	7.9	0.6	90	44	4.528	4.528	79.0	357.7	sandy/silty channel bottom
	330.0	13.5	9.2	0.6	70	43	3.607	3.607	124.2	448.0	sandy/silty channel bottom
	347.0	0.0	0.0								LEW - Sand dune slope
Totals:		341.5							2381.0	8929.8	Page 3 of 3

Table C-1.6: Discharge Measurement on Fish Creek at River Mile 25.1 on 5/28/2002

DISCHARGE MEASUREMENT NOTES				
LOCATION: Fish Creek, approximately 25.1 river miles upstream from mouth.				
Date: 5/28 2002 Party: Mark Vania, James Dietzmann				
Width: 336	Area: 1876	Vel.: 2.54	W.S.E.: 16.95 ft. BPMSL	Disch.: 4760 cfs
No Secs. 6	W.S.E. change: 0.08 ft. in: 1.5		hrs.	Susp.:
Method Coef.:		Hor. Angle Coef.	Sus. Coef.:	Meter No. URS 2
Water Surface Elevation Readings			Type of meter: Price AA	
Time	Description	WSE	Date rated:	
9:46	SG F25.1-B	17.00	Meter: 1.5 ft. above bottom of weight.	
9:52	Start discharge measurement (WSE est.)	16.99	Spin before meas. 3 min. 00 sec. after 3 min. 31 sec.	
11:20	End discharge measurement (WSE est.)	16.91	Method: Boat, sounding reel	
11:30	SG F25.1-B	16.90		
			Weather:	
			Air Temp. 25 (°F)	
			Water Temp. (°F)	
			Precip. Light blowing snow	
			Cloud Cover Cloudy	
Datum	BPMSL		Wind Windy	
Weighted Mean WSE	16.95 ft. BPMSL			
Measurement rated:	Poor			
Cross section:	Fairly Uniform			
Flow:	Fairly Uniform			
Other:				
Control:				
Remarks:	Ice floes were present in majority of the channel due to a sharp drop in the air temperature. Velocities were measured from the boat between REW to station 210. Between station 210 to LEW, the surface velocity was measured by timing several ice pans over a 300 foot distance. The depth of the channel between stations 210 and 330 was obtained from the 5/26/02 measurement, and was adjusted based on the difference in water surface elevation between 5/26/02 and 5/28/02.			
Page 1 of 3				

Table C-1.6: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	10.0	0.0	0.0								REW - Sandy bank with brush
	100.0	70.0	2.6	0.2	23	57	0.907	0.799	182.0	145.3	sandy/silty channel bottom
	150.0	35.0	8.9	0.2	43	43	2.223	1.997	311.5	622.1	sandy/silty channel bottom
	170.0	20.0	8.6	0.8	35	44	1.772				
	170.0	20.0	8.6	0.2	45	42	2.380	2.170	172.0	373.3	sandy/silty channel bottom
	190.0	15.0	8.7	0.8	37	42	1.960				
	190.0	15.0	8.7	0.2	60	43	3.094	3.026	130.5	394.9	sandy/silty channel bottom
	200.0	10.0	9.0	0.8	56	42	2.958				
	200.0	10.0	9.0	0.6	63	43	3.248	3.248	90.0	292.3	sandy/silty channel bottom
	210.0	10.0	8.3	0.2	67	41	3.621	3.641	83.0	302.2	sandy/silty channel bottom
	210.0	10.0	8.3	0.8	76	46	3.661				
	220.0	10.0	8.3	Surface	-	-	-	2.9	83.0	240.7	Average surface velocity
	230.0	7.5	8.0	Surface	-	-	-	2.9	60.0	174.0	Average surface velocity
	235.0	5.0	7.8	Surface	-	-	-	2.9	39.0	113.1	Average surface velocity
	240.0	5.0	7.8	Surface	-	-	-	2.9	39.0	113.1	Average surface velocity
	245.0	5.0	7.6	Surface	-	-	-	2.9	38.0	110.2	Average surface velocity
	250.0	5.0	7.5	Surface	-	-	-	2.9	37.5	108.8	Average surface velocity
	255.0	5.0	7.2	Surface	-	-	-	2.9	36.0	104.4	Average surface velocity
	260.0	7.5	7.2	Surface	-	-	-	2.9	54.0	156.6	Average surface velocity

Table C-1.6: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	270.0	10.0	6.8	Surface	-	-	-	2.9	68.0	197.2	Average surface velocity
	280.0	10.0	6.9	Surface	-	-	-	2.9	69.0	200.1	Average surface velocity
	290.0	10.0	7.1	Surface	-	-	-	2.9	71.0	205.9	Average surface velocity
	300.0	10.0	7.1	Surface	-	-	-	2.9	71.0	205.9	Average surface velocity
	310.0	10.0	6.8	Surface	-	-	-	2.9	68.0	197.2	Average surface velocity
	320.0	10.0	6.8	Surface	-	-	-	2.9	68.0	197.2	Average surface velocity
	330.0	13.0	8.1	Surface	-	-	-	2.9	105.3	305.4	Average surface velocity
	346.0	0.0	0.0								LEW
Totals:		336.0							1875.8	4759.8	

Table C-1.7: Discharge Measurement on Fish Creek at River Mile 25.1 on 5/31/2002

DISCHARGE MEASUREMENT NOTES			
LOCATION: Fish Creek, approximately 25.1 river miles upstream from mouth.			
Date: 5/31 2002		Party: Paul Myerchin, James Dietzmann	
Width: 330	Area: 1758	Vel.: 2.29	W.S.E.: 16.00 ft. BPSML
Disch.: 4018 cfs			
No Secs. 26	W.S.E. change: 0.02 ft.	in: 1.1	hrs.
Method Coef.:		Hor. Angle Coef.:	Sus. Coef.:
			Meter No. URS 2
Water Surface Elevation Readings			Type of meter:
Time	Description	WSE	Price AA
13:14	SG25.1-B	16.01	Date rated: factory
13:17	Start Discharge Measurement (W.S.E. est.)	16.01	Meter: 1.5 ft. above bottom of weight.
14:25	End Discharge Measurement (W.S.E. est.)	15.99	Spin before meas. 2 min. 24 sec. after 2 min. 52 sec.
14:32	SG25.1-B	15.99	Method: Boat, sounding reel
			Weather:
			Air Temp. 35 (°F)
			Water Temp. (°F)
			Precip. none
			Cloud Cover Cloudy
Datum	BPSML		Wind Windy
Weighted Mean WSE	16.00 ft. BPSML		
Measurement rated:	Good		
Cross section:	Fairly Uniform		
Flow:	Fairly Uniform		
Other:			
Control:			
Remarks: Few ice floes were present in the channel.			

Table C-1.7: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	16.5	0.0	0.0								REW - Sandy bank with brush
	108.0	65.8	2.0	0.2	16	41	0.878	0.773	131.5	101.6	sandbar
	148.0	30.0	7.8	0.2	38	41	2.061	1.774	234.0	415.2	sandy/silty channel bottom
				0.8	30	45	1.488				
	168.0	20.0	7.6	0.2	44	42	2.328	1.934	152.0	293.9	sandy/silty channel bottom
				0.8	29	42	1.540				
	188.0	20.0	7.5	0.2	48	41	2.599	2.196	150.0	329.4	sandy/silty channel bottom
				0.8	33	41	1.792				
	208.0	15.0	8.6	0.2	60	43	3.094	2.712	129.0	349.9	sandy/silty channel bottom
				0.8	43	41	2.330				
	218.0	10.0	8.3	0.2	60	43	3.094	2.658	83.0	220.6	sandy/silty channel bottom
				0.8	44	44	2.223				
	228.0	10.0	8.4	0.2	60	42	3.168	2.856	84.0	239.9	sandy/silty channel bottom
				0.8	47	41	2.545				
	238.0	7.5	8.5	0.2	62	44	3.125	2.779	63.8	177.1	sandy/silty channel bottom
				0.8	46	42	2.433				
	243.0	5.0	8.5	0.2	60	42	3.168	2.749	42.5	116.8	sandy/silty channel bottom
				0.8	43	41	2.330				
	248.0	5.0	8.5	0.2	60	41	3.244	2.838	42.5	120.6	sandy/silty channel bottom
				0.8	46	42	2.433				
	253.0	5.0	8.5	0.2	60	43	3.094	2.658	42.5	113.0	sandy/silty channel bottom
				0.8	42	42	2.223				
	258.0	5.0	8.4	0.2	60	43	3.094	2.712	42.0	113.9	sandy/silty channel bottom
				0.8	43	41	2.330				
	263.0	5.0	8.2	0.2	60	41	3.244	2.786	41.0	114.2	sandy/silty channel bottom
				0.8	44	42	2.328				
	268.0	5.0	7.9	0.2	56	41	3.029	2.677	39.5	105.7	sandy/silty channel bottom
				0.8	45	43	2.325				

Table C-1.7: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	273.0	5.0	7.7	0.2	60	41	3.244	2.812	38.5	108.3	sandy/silty channel bottom
				0.8	45	42	2.380				
	278.0	5.0	7.5	0.2	60	42	3.168	2.826	37.5	106.0	sandy/silty channel bottom
				0.8	47	42	2.485				
	283.0	5.0	7.2	0.6	48	42	2.538	2.538	36.0	91.4	sandy/silty channel bottom
	288.0	5.0	7.1	0.6	53	41	2.868	2.868	35.5	101.8	sandy/silty channel bottom
	293.0	5.0	6.9	0.6	53	42	2.800	2.800	34.5	96.6	sandy/silty channel bottom
	298.0	5.0	6.6	0.6	53	42	2.800	2.800	33.0	92.4	sandy/silty channel bottom
	303.0	5.0	6.4	0.6	57	42	3.010	3.010	32.0	96.3	sandy/silty channel bottom
	308.0	5.0	6.5	0.6	50	42	2.643	2.643	32.5	85.9	sandy/silty channel bottom
	313.0	5.0	6.4	0.6	51	41	2.760	2.760	32.0	88.3	sandy/silty channel bottom
	318.0	7.5	6.5	0.6	43	41	2.330	2.330	48.8	113.6	sandy/silty channel bottom
	328.0	10.0	7.1	0.6	35	41	1.900	1.900	71.0	134.9	sandy/silty channel bottom
	338.0	9.3	5.3	0.6	34	41	1.846	1.846	49.0	90.5	sandy/silty channel bottom
	346.5	0.0	0.0								LEW - Sand dune slope
Totals :		330.0							1757.5	4018.0	Page 3 of 3

DISCHARGE MEASUREMENTS

ON FISH CREEK AT RIVER MILE 32.4

Table C-2.1: Summary of 2002 and 2001 Discharge Measurements on Fish Creek at River Mile 32.4

Date	Average Time	Water Surface Elevation (feet)	Discharge (cfs) ¹	Discharge Measurement Rating	Cross Sectional Area (square feet)	Wetted Perimeter (feet)	Water Surface Slope (Feet/foot)	Average Velocity (feet per second)
2002								
5/23/2002	16:14	20.60	1,584	Good	1069.8	241.5	0.00010	1.48
5/24/2002	14:26	21.15	1,800 ²	-	1220	244	0.00009	-
5/25/2002	15:51	21.76	2,334	Good	1387.3	247.0	0.00009	1.68
5/27/2002	15:58	22.42	3,703	Good	1631.6	258.1	0.00012	2.27
5/28/2002	11:35	22.00	3,110	Poor	1456.2	251.3	0.00013	2.14
2001								
6/8/2001	19:46	20.78	709	Good	928.8	234.8	0.000062	0.76
6/9/2001	9:28	20.87	698	Good	926.4	237.8	0.000059	0.75
6/11/2001	15:15	21.67	2070	Good	1142.4	244.3	0.00012	1.81
6/14/2001	12:55	21.56	3100	Good	1351.0	244.8	0.00013	2.29
6/15/2001	12:27	22.23	3657 ³	-	-	-	-	-
6/16/2001	13:13	21.6	3120	Good	1382.6	245.6	0.00013	2.25
7/17/2001	10:16	17.43	578	Good	324.3	230.2	0.00017	1.78
8/14/2001	19:20	16.92	345	Good	224.0	117.4	0.00018	1.54
9/5/2001	13:25	16.95	349	Good	269.8	133.7	0.00017	1.29

Notes:

1. Cubic feet per second is abbreviated cfs.
2. Discharge was estimated based on the difference in the water surface elevation on 23 and 24 May. A cross section area was calculated based on the difference in the water surface elevation, and was added to the cross section area measured on 23 May. The resulting cross section area was then multiplied by the velocity from 23 May.
3. Discharge was calculated based on discharge measurements made on Judy Creek and Fish Creek downstream of the confluence.
4. Water surface elevations are based on an elevation of 23.67 feet (BPMSL) for TBM Line 3 South 2, established by Lounsbury & Associates in 2000.

Table C-2.2: Discharge Measurement on Fish Creek at River Mile 32.4 on 5/23/2002

DISCHARGE MEASUREMENT NOTES					
LOCATION: Fish Creek, approximately 32.4 river miles upstream from mouth.					
Date: 5/23 2002 Party: Mark Vania, James Dietzmann					
Width: 239		Area: 1070		Vel: 1.48	
			W.S.E.: 20.60 ft. BPMSL		Disch.: 1584 cfs
No Secs. 25		W.S.E. change: 0.02 ft.		in: 0.9	hrs.
Method Coef.:		Hor. Angle Coef.		Sus. Coef.:	
				Meter No. URS 2	Susp.:
Water Surface Elevation Readings			Type of meter: Price AA		
Time	Description		WSE	Date rated:	
15:35	Cut to water		20.62	Meter: 1.5 ft. above bottom of weight.	
15:47	Start discharge measurement (WSE est.)		20.61	Spin before meas. 3 min 12 sec after 2 min 37 sec	
16:40	End discharge measurement (WSE est.)		20.59	Method: Boat, sounding reel	
16:42	Cut to water		20.59		
			Weather:		
			Air Temp. 45 (°F)		
			Water Temp. (°F)		
			Precip.		
			Cloud Cover Clear		
Datum			BPMSL		Wind Windy
Weighted Mean WSE			20.60 ft. BPMSL		
Measurement rated:		Good			
Cross section:		Fairly Uniform			
Flow:		Fairly Uniform			
Other:					
Control:					
Remarks: No snow was present above or below the water surface on either bank.					
Snow and ice floes were common during discharge measurement.					

Table C-2.2: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	8.0	0.0	0.0								REW - Sandy bank with brush
	30.0	21.0	4.1	0.6	21	43	1.095	1.095	86.1	94.2	sandy/silty channel bottom
	50.0	20.0	3.8	0.6	16	41	0.878	0.878	76.0	66.7	sandy/silty channel bottom
	70.0	20.0	3.4	0.2	24	42	1.278	1.124	68.0	76.5	sandy/silty channel bottom
	90.0	20.0	3.7	0.6	21	42	1.120	1.120	74.0	82.9	sandy/silty channel bottom
	110.0	20.0	3.5	0.2	27	41	1.470	1.293	70.0	90.5	sandy/silty channel bottom
	130.0	15.0	3.5	0.2	27	41	1.470	1.293	52.5	67.9	sandy/silty channel bottom
	140.0	10.0	4.0	0.6	25	42	1.330	1.330	40.0	53.2	sandy/silty channel bottom
	150.0	10.0	4.9	0.6	30	42	1.593	1.593	49.0	78.0	sandy/silty channel bottom
	160.0	10.0	6.5	0.6	30	41	1.631	1.631	65.0	106.0	sandy/silty channel bottom
	170.0	10.0	6.6	0.6	33	47	1.566	1.566	66.0	103.3	sandy/silty channel bottom
	180.0	10.0	6.0	0.6	33	45	1.635	1.635	60.0	98.1	sandy/silty channel bottom
	190.0	7.5	5.9	0.6	33	41	1.792	1.792	44.3	79.3	sandy/silty channel bottom
	195.0	5.0	6.5	0.6	30	42	1.593	1.593	32.5	51.8	sandy/silty channel bottom
	200.0	5.0	6.3	0.6	32	42	1.698	1.698	31.5	53.5	sandy/silty channel bottom

Table C-2.2: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revolutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in-vertical (fps)			
	205.0	5.0	6.5	0.6	36	42	1.908	1.908	32.5	62.0	sandy/silty channel bottom
	210.0	3.8	6.3	0.6	37	42	1.960	1.960	23.6	46.3	sandy/silty channel bottom
	212.5	2.5	6.3	0.6	37	45	1.831	1.831	15.8	28.8	sandy/silty channel bottom
	215.0	2.5	6.3	0.6	36	42	1.908	1.908	15.8	30.0	sandy/silty channel bottom
	217.5	2.5	6.5	0.6	37	42	1.960	1.960	16.3	31.9	sandy/silty channel bottom
	220.0	2.5	6.7	0.6	35	41	1.900	1.900	16.8	31.8	sandy/silty channel bottom
	222.5	2.5	6.6	0.6	40	43	2.069	2.069	16.5	34.1	sandy/silty channel bottom
	225.0	2.5	6.7	0.6	33	41	1.792	1.792	16.8	30.0	sandy/silty channel bottom
	227.5	2.5	6.8	0.6	36	42	1.908	1.908	17.0	32.4	sandy/silty channel bottom
	230.0	3.8	7.0	0.6	39	45	1.929	1.929	26.3	50.6	sandy/silty channel bottom
	235.0	8.5	6.8	0.6	34	42	1.803	1.803	57.8	104.2	sandy/silty channel bottom
	247.0	0.0	0.0								LEW - Sand dune slope
Totals:		239.0							1069.8	1584.3	

Table C-2.3: Discharge Measurement on Fish Creek at River Mile 32.4 on 5/25/2002

DISCHARGE MEASUREMENT NOTES				
LOCATION: Fish Creek, approximately 32.4 river miles upstream from mouth.				
Date: 5/25 2002 Party: Derek Helmericks, Paul Myerchin				
Width: 243.5		Area: 1387		Vel: 1.68
		W.S.E.: 21.76 ft. BPMSL		Disch.: 2334 cfs
No Secs. 23		W.S.E. change: 0.03		in: 1.4 hrs.
Method coef.:		Hor. Angle coef.		Sus. Coef.:
				Meter No. URS 1
Water Surface Elevation Readings			Type of meter: Price AA	
Time	Description	WSE	Date rated:	
15:02	From top of SG F32.4A	21.77	Meter: 1 ft. above bottom of weight.	
15:09	Start discharge measurement (W.S.E. est.)	21.77	Spin before meas. 3 min 46 sec after 3 min 41 sec	
16:33	End discharge measurement (W.S.E. est.)	21.74	Method: Boat, sounding reel	
16:40	From top of SG F32.4A	21.74		
			Weather:	
			Air Temp. 55 (°F)	
			Water Temp. (°F)	
			Precip. None	
			Cloud Cover Scattered clouds	
Datum		BPMSL		Wind Windy
Weighted Mean WSE		21.76 ft. BPMSL		
Measurement rated:		Good		
Cross section:		Fairly Uniform		
Flow:		Fairly Uniform		
Other:				
Control:				
Remarks: No snow remaining within the channel banks. Infrequent ice floes were observed during discharge measurement.				

Table C-2.3: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	6.5	0.0	0.0								REW - Sandy bank with brush
	18.0	10.8	5.4	0.2	30	50	1.341	1.217	58.1	70.6	sandy/silty channel bottom
				0.8	20	41	1.093				
	28.0	10.0	5.3	0.2	30	44	1.521	1.418	53.0	75.1	sandy/silty channel bottom
				0.8	30	51	1.315				
	38.0	10.0	5.6	0.2	30	44	1.521	1.340	56.0	75.0	sandy/silty channel bottom
				0.8	30	58	1.158				
	48.0	10.0	5.3	0.2	30	44	1.521	1.278	53.0	67.7	sandy/silty channel bottom
				0.8	30	65	1.035				
	58.0	10.0	4.4	0.6	25	41	1.362	1.362	44.0	59.9	sandy/silty channel bottom
	68.0	10.0	4.5	0.6	30	45	1.488	1.488	45.0	66.9	sandy/silty channel bottom
	78.0	10.0	4.6	0.6	30	41	1.631	1.631	46.0	75.0	sandy/silty channel bottom
	88.0	10.0	4.7	0.6	30	42	1.593	1.593	47.0	74.9	sandy/silty channel bottom
	98.0	10.0	4.8	0.6	30	43	1.556	1.556	48.0	74.7	sandy/silty channel bottom
	108.0	10.0	4.6	0.6	30	40	1.671	1.671	46.0	76.9	sandy/silty channel bottom
	118.0	10.0	4.5	0.6	30	40	1.671	1.671	45.0	75.2	sandy/silty channel bottom
	128.0	10.0	4.7	0.6	38	48	1.763	1.763	47.0	82.9	sandy/silty channel bottom
	138.0	10.0	5.1	0.2	40	44	2.022	1.724	51.0	87.9	sandy/silty channel bottom
				0.8	30	47	1.425				
	148.0	10.0	6.0	0.2	40	43	2.069	1.870	60.0	112.2	sandy/silty channel bottom
				0.8	30	40	1.671				

Table C-2.4: Discharge Measurement on Fish Creek at River Mile 32.4 on 5/27/2002

DISCHARGE MEASUREMENT NOTES				
LOCATION: Fish Creek, approximately 32.4 river miles upstream from mouth.				
Date: 5/27 2002 Party: Derek Helmericks, Paul Myerchin				
Width: 252	Area: 1632	Vel: 2.27	W.S.E.: 22.42 ft. BPMSL	Disch.: 3703 cfs
No Secs. 24	W.S.E. change: 0.0 ft.	in: 1.3	hrs.	Susp.:
Method Coef.:		Hor. Angle Coef.		Sus. Coef.: Meter No. URS 1
Water Surface Elevation Readings			Type of meter: Price AA	
Time	Description	WSE	Date rated:	
15:16	From top of SG F32.4A	22.42	Meter: 1 ft. above bottom of weight.	
15:20	Start discharge measurement (W.S.E. est.)	22.42	Spin before meas. 2 min, 50 sec after 2 min, 33 sec	
16:36	End discharge measurement (W.S.E. est.)	22.42	Method: Boat, sounding reel	
16:40	From top of SG F32.4A	22.42		
			Weather:	
			Air Temp. 55	(°F)
			Water Temp.	(°F)
			Precip.	None
			Cloud Cover	Scattered clouds
Datum		BPMSL	Wind	Windy
Weighted Mean WSE		22.42 ft. BPMSL		
Measurement rated:	Good			
Cross section:	Fairly Uniform			
Flow:	Fairly Uniform			
Other:				
Control:				
Remarks:				

Table C-2.4: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	1.0	0.0	0.0								REW - Sandy bank with brush
	18.0	13.5	6.3	0.2	38	42	2.013	1.803	85.1	153.3	sandy/silty channel bottom
				0.8	30	42	1.593				
	28.0	10.0	6.0	0.2	40	46	1.935	1.764	60.0	105.8	sandy/silty channel bottom
				0.8	30	42	1.593				
	38.0	10.0	6.3	0.2	40	43	2.069	1.831	63.0	115.3	sandy/silty channel bottom
				0.8	30	42	1.593				
	48.0	10.0	5.8	0.2	40	41	2.169	1.845	58.0	107.0	sandy/silty channel bottom
				0.8	30	44	1.521				
	58.0	10.0	5.1	0.2	42	41	2.276	1.954	51.0	99.6	sandy/silty channel bottom
				0.8	30	41	1.631				
	68.0	10.0	5.2	0.2	50	45	2.468	2.030	52.0	105.6	sandy/silty channel bottom
				0.8	30	42	1.593				
	78.0	10.0	5.3	0.2	45	41	2.438	1.997	53.0	105.8	sandy/silty channel bottom
				0.8	30	43	1.556				
	88.0	10.0	5.4	0.2	50	42	2.643	2.164	54.0	116.8	sandy/silty channel bottom
				0.8	31	41	1.685				
	98.0	10.0	5.2	0.2	46	41	2.491	2.169	52.0	112.8	sandy/silty channel bottom
				0.8	34	41	1.846				
	108.0	10.0	5.3	0.2	50	42	2.643	2.217	53.0	117.5	sandy/silty channel bottom
				0.8	37	46	1.791				
	118.0	10.0	5.4	0.2	50	42	2.643	2.244	54.0	121.2	sandy/silty channel bottom
				0.8	34	41	1.846				
	128.0	10.0	5.4	0.2	50	42	2.643	2.310	54.0	124.7	sandy/silty channel bottom
				0.8	40	45	1.978				
	138.0	10.0	5.9	0.2	50	41	2.707	2.439	59.0	143.9	sandy/silty channel bottom
				0.8	42	43	2.171				
	148.0	10.0	7.0	0.2	50	40	2.774	2.498	70.0	174.9	sandy/silty channel bottom
				0.8	40	40	2.223				

Table C-2.4: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	158.0	10.0	7.8	0.2	53	41	2.868	2.518	78.0	196.4	sandy/silty channel bottom
				0.8	40	41	2.169				
	168.0	10.0	8.6	0.2	52	41	2.814	2.456	86.0	211.2	sandy/silty channel bottom
				0.8	50	53	2.098				
	178.0	10.0	8.3	0.2	50	40	2.774	2.708	83.0	224.8	sandy/silty channel bottom
				0.8	50	42	2.643				
	188.0	10.0	8.1	0.2	50	40	2.774	2.398	81.0	194.2	sandy/silty channel bottom
				0.8	40	44	2.022				
	198.0	10.0	7.4	0.2	53	41	2.868	2.519	74.0	186.4	sandy/silty channel bottom
				0.8	41	42	2.170				
	208.0	10.0	8.4	0.2	50	40	2.774	2.446	84.0	205.4	sandy/silty channel bottom
				0.8	40	42	2.118				
	218.0	10.0	8.7	0.2	51	40	2.829	2.499	87.0	217.4	sandy/silty channel bottom
				0.8	40	41	2.169				
	228.0	10.0	8.6	0.2	60	47	2.832	2.366	86.0	203.5	sandy/silty channel bottom
				0.8	35	41	1.900				
	238.0	10.0	9.3	0.2	51	40	2.829	2.418	93.0	224.9	sandy/silty channel bottom
				0.8	37	41	2.007				
	248.0	7.5	8.2	0.2	44	41	2.384	2.181	61.5	134.1	sandy/silty channel bottom
				0.8	40	45	1.978				
	253.0	0.0	0.0								LEW - Sand dune slope
Totals		252.0							1631.6	3702.8	Page 3 of 3

Table C-2.5: Discharge Measurement on Fish Creek at River Mile 32.4 on 5/28/2002

DISCHARGE MEASUREMENT NOTES				
LOCATION: Fish Creek, approximately 32.4 river miles upstream from mouth.				
Date: 5/ 5/28 2002 Party: Paul Myerchin, Derek Helmericks				
Width: 248	Area: 1456	Vel: 2.14	W.S.E.: 22.00 ft. BPMSL	Disch.: 3110 cfs
No Secs. 18	W.S.E. change: 0.08 ft.	in:	hrs.	Susp.:
Method Coef.:		Hor. Angle Coef.		Sus. Coef.: Meter No. URS 1
Water Surface Elevation Readings			Type of meter: Price AA	
Time	Description	WSE	Date rated:	
10:36	Tape down from iron anchor	22.04	Meter: 1 ft. above bottom of weight.	
10:40	Start discharge measurement (W.S.E. est.)	22.04	Spin before meas. 2 min 22 sec after see below	
12:30	End discharge measurement	21.96	Method: Boat, sounding reel	
12:30	Tape down from iron anchor	21.96		
			Weather:	
			Air Temp. 20 (°F)	
			Water Temp. (°F)	
			Precip. light snow	
			Cloud Cover 100%	
Datum		BPMSL	Wind Windy	
Weighted Mean WSE		22.00 ft. BPMSL		
Measurement rated:	Poor			
Cross section:	Fairly Uniform			
Flow:	Fairly Uniform			
Other:				
Control:				
Remarks:	Slush and ice pans are forming in the river and flowing down the main part of the channel., and frazzel ice was forming on willows below the water line.			
	Velocity was not measured between stations 158 - 198 using the Price AA due to the ice buildup in channel.			
	The surface velocity of individual ice pans was measured and averaged, and used at these stations to compute discharge.			
	A spin test was not conducted due to freezing temperatures causing ice to form on the meter when exposed to the air.			
Page 1 of 3				

Table C-2.5: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	4.0	0.0	0.0								REW
	18.0	12.0	5.9	0.2	22	41	1.201	1.071	70.8	75.8	sandy/silty channel bottom
				0.8	18	43	0.941				
	28.0	10.0	5.6	0.2	37	44	1.872	1.563	56.0	87.5	sandy/silty channel bottom
				0.8	23	41	1.255				
	38.0	10.0	5.8	0.2	36	41	1.954	1.685	58.0	97.7	sandy/silty channel bottom
				0.8	26	41	1.416				
	48.0	10.0	5.3	0.2	38	41	2.061	1.757	53.0	93.1	sandy/silty channel bottom
				0.8	28	43	1.453				
	58.0	10.0	4.8	0.6	34	40	1.892	1.892	48.0	90.8	sandy/silty channel bottom
	68.0	10.0	4.8	0.6	38	41	2.061	2.061	48.0	98.9	sandy/silty channel bottom
	78.0	10.0	4.8	0.6	37	40	2.057	2.057	48.0	98.7	sandy/silty channel bottom
	88.0	10.0	4.8	0.6	36	40	2.002	2.002	48.0	96.1	sandy/silty channel bottom
	98.0	10.0	5.0	0.6	40	41	2.169	2.169	50.0	108.4	sandy/silty channel bottom
	108.0	10.0	4.8	0.6	44	41	2.384	2.384	48.0	114.4	sandy/silty channel bottom
	118.0	10.0	5.2	0.6	40	40	2.223	2.223	52.0	115.6	sandy/silty channel bottom
	128.0	10.0	5.3	0.6	40	40	2.223	2.223	53.0	117.8	sandy/silty channel bottom
	138.0	10.0	5.5	0.6	44	40	2.443	2.443	55.0	134.4	sandy/silty channel bottom
	148.0	10.0	6.4	0.6	54	50	2.399	2.399	64.0	153.5	sandy/silty channel bottom

Table C-2.5: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revolutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in-vertical (fps)			
	158.0	10.0	6.4	0			2.680	2.280	64.0	145.9	Average surface velocity
	168.0	10.0	7.0	0			2.680	2.280	70.0	159.6	Average surface velocity
	178.0	10.0	7.7	0			2.680	2.280	77.0	175.6	Average surface velocity
	188.0	10.0	7.8	0			2.680	2.280	78.0	177.8	Average surface velocity
	198.0	10.0	8.0	0			2.680	2.280	80.0	182.4	Average surface velocity
	208.0	10.0	8.1	0.6	49	41	2.653	2.653	81.0	214.9	sandy/silty channel bottom
	218.0	10.0	8.0	0.6	48	40	2.664	2.664	80.0	213.1	sandy/silty channel bottom
	228.0	10.0	8.2	0.6	47	40	2.608	2.608	82.0	213.9	sandy/silty channel bottom
	238.0	12.0	7.7	0.6	30	43	1.556	1.556	92.4	143.8	sandy/silty channel bottom
	252.0	0.0	0.0								LEW
Totals:		248.0							1456.2	3109.9	

DISCHARGE MEASUREMENTS

ON JUDY CREEK AT RIVER MILE 7.0

Table C-3.1: Summary of Discharge Measurements on Judy Creek at River Mile 7.0

Date	Average Time	Water Surface Elevation (feet)	Discharge (cfs)¹	Discharge Measurement Rating	Cross Sectional Area (square feet)	Wetted Perimeter (feet)	Water Surface Slope (Feet/foot)	Average Velocity (feet per second)
2002								
5/23/2002	10:55	25.60	5,053 ²	-	-	-	-	-
5/24/2002	10:00	26.34	6,823	Fair	1385.7	257.4	0.00020	4.92
5/25/2002	19:13	26.76	7,125	Poor	1480.0	266.8	0.00019	4.81
5/28/2002	10:36	25.05	1,531 ²	-	-	-	-	-
2001								
6/8/2001	14:45	26.72	3957 ²	-	1628.5	263.5	0.00019	-
6/9/2001	16:05	26.31	4410	Good	1522.6	261	0.00018	2.9
6/11/2001	10:32	25.36	3826 ²	-	1237.6	228.8	0.00019	-
6/12/2001	15:58	25.01	3280	Good	1132.6	216.9	0.000194	2.89
6/15/2001	17:25	24.44	2300	Fair	801.7	140.3	0.000173	2.87
7/17/2001	18:22	20.3	154	Good	327	108.1	0.000215	0.47
8/14/2001	22:30	20.25	157	Good	341	116.4	0.00023	0.46
9/5/2001	16:25	20.15	158	Good	303.4	113.2	0.000222	0.52
Notes:								
1. Cubic feet per second is abbreviated cfs.								
2. Discharge was calculated based on discharge measurements made on Fish Creek at monitoring sites upstream and downstream of the Judy Creek/Fish Creek confluence.								
3. Water surface elevations are based on an elevation of 36.62 feet (BPMSL) for TBM Line 3 South 1, established by Lounsbury & Associates in 2000.								

Table C-3.2: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	6.0	0.0	0.0								LEW - Sand dune slope
	10.0	3.0	2.9	0.2	63	43	3.248	2.858	8.7	24.9	
	12.0	2.5	3.4	0.2	113	70	3.577	3.148	8.5	26.8	sandy/silty channel bottom
	15.0	4.0	6.5	0.6	70	43	3.607	3.607	26.0	93.8	
	20.0	5.0	8.4	0.2	90	42	4.742	4.217	42.0	177.1	sandy/silty channel bottom
				0.8	70	42	3.692				
	25.0	5.0	9.7	0.2	107	42	5.635	5.189	48.5	251.6	sandy/silty channel bottom
				0.8	90	42	4.742				
	30.0	3.8	11.1	0.2	110	41	5.933	5.207	41.6	216.7	sandy/silty channel bottom
				0.8	83	41	4.481				
	32.5	2.5	11.2	0.2	121	41	6.525	5.579	28.0	156.2	sandy/silty channel bottom
				0.8	90	43	4.632				
	35.0	2.5	11.3	0.2	119	42	6.265	5.669	28.3	160.1	sandy/silty channel bottom
				0.8	94	41	5.073				
	37.5	2.5	11.2	0.2	118	42	6.212	5.535	28.0	155.0	sandy/silty channel bottom
				0.8	90	41	4.858				
	40.0	2.5	10.7	0.2	112	41	6.041	5.584	26.8	149.4	sandy/silty channel bottom
				0.8	95	41	5.126				
	42.5	2.5	10.3	0.2	115	41	6.202	5.826	25.8	150.0	sandy/silty channel bottom
				0.8	101	41	5.449				
	45.0	2.5	10.2	0.2	116	41	6.256	5.799	25.5	147.9	sandy/silty channel bottom
				0.8	99	41	5.342				
	47.5	2.5	9.9	0.2	115	41	6.202	5.918	24.8	146.5	sandy/silty channel bottom
				0.8	107	42	5.635				
	50.0	2.5	9.7	0.2	130	44	6.532	5.881	24.3	142.6	sandy/silty channel bottom
				0.8	104	44	5.229				
	52.5	2.5	9.4	0.2	120	42	6.317	5.819	23.5	136.7	sandy/silty channel bottom
				0.8	101	42	5.320				
	55.0	2.5	9.3	0.2	119	42	6.265	5.833	23.3	135.6	sandy/silty channel bottom
				0.8	105	43	5.402				

Table C-3.3: Discharge Measurement on Judy Creek at River Mile 7.0 on 5/25/2002

DISCHARGE MEASUREMENT NOTES				
LOCATION: Judy Creek, approximately 7.0 river miles upstream from the confluence with Fish Creek.				
Date: 5/25 2002		Party: Derek Helmericks, Paul Myerchin		
Width: 263	Area: 1480	Vel.: 4.81	W.S.E.: 26.76 ft. BPMSL	Disch.: 7125 cfs
No Secs. 18	W.S.E. change: 0.01	in: 0.75	hrs.	Susp.:
Method Coef.:		Hor. Angle Coef.		Sus. Coef.: Meter No. URS 1
Water Surface Elevation Readings			Type of meter: Price AA	
Time	Description	WSE	Date rated:	
18:39	SG 7.0-B	26.77	Meter: 1 ft. above bottom of weight.	
18:50	Start discharge measurements (W.S.E. est.)	26.77	Spin before meas. 3 min, 20 sec after see below	
19:35	End discharge measurements (W.S.E. est.)	26.76	Method: Boat, sounding reel	
19:46	SG 7.0-B	26.76		
			Weather:	
			Air Temp. 32 (°F)	
			Water Temp. (°F)	
			Precip.	
			Cloud Cover Cloudy, ground fog	
Datum		BPMSL	Wind Windy	
Weighted Mean WSE		26.76 ft. BPMSL		
Measurement rated:		Poor		
Cross section:		Fairly Uniform		
Flow:		Fairly Uniform		
Other:				
Control:				
Remarks: No snow in channel above or below water surface.				
Due to time constraints, a spin test was not conducted immediately following the discharge measurement. Additionally, a relatively high concentration of weeds was present in the channel during the discharge measurement. The Price AA was checked at each vertical and weeds were removed as necessary during the measurement. The highest concentration of weeds encountered appeared to be within the last few verticals. Based on independent analysis, it is possible this discharge measurement could be as much as 500 cubic feet per second higher than the actual discharge at the time if the measurement.				

Table C-3.3: Continued

Angle coef.	Dist. From Initial point (ft)	Width (ft)	Depth (ft)	Observ. depth	Revo- lutions	Time In seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean in- vertical (fps)			
	0.0	0.0	0.0								REW - Sandy bank with brush
	100.0	60.0	3.0	0.6	20	46	0.976	0.976	180.0	175.8	sandy/silty channel bottom
	120.0	15.0	6.1	0.6	60	40	3.325	3.325	91.5	304.2	sandy/silty channel bottom
	130.0	10.0	6.6	0.6	80	40	4.427	4.427	66.0	292.2	sandy/silty channel bottom
	140.0	10.0	7.3	0.6	100	42	5.267	5.267	73.0	384.5	sandy/silty channel bottom
	150.0	10.0	7.7	0.6	110	42	5.792	5.792	77.0	446.0	sandy/silty channel bottom
	160.0	10.0	8.1	0.6	120	44	6.031	6.031	81.0	488.5	sandy/silty channel bottom
	170.0	10.0	8.4	0.6	115	42	6.055	6.055	84.0	508.6	sandy/silty channel bottom
	180.0	10.0	8.9	0.6	115	42	6.055	6.055	89.0	538.9	sandy/silty channel bottom
	190.0	10.0	9.2	0.6	110	41	5.933	5.933	92.0	545.8	sandy/silty channel bottom
	200.0	7.5	9.8	0.6	110	42	5.792	5.792	73.5	425.7	sandy/silty channel bottom
	205.0	5.0	10.3	0.6	110	41	5.933	5.933	51.5	305.6	sandy/silty channel bottom
	210.0	5.0	10.3	0.6	112	43	5.761	5.761	51.5	296.7	sandy/silty channel bottom
	215.0	5.0	10.8	0.6	110	42	5.792	5.792	54.0	312.8	sandy/silty channel bottom
	220.0	5.0	10.8	0.6	110	41	5.933	5.933	54.0	320.4	sandy/silty channel bottom

DISCHARGE MEASUREMENTS

ON THE UBLUTUOCH RIVER AT RIVER MILE 8.0

Table C-4.1: Summary of Discharge Measurements on the Ublutuoch River at River Mile 8.0

Date	Average Time	Water Surface Elevation (feet)	Discharge (cfs)	Average Velocity (feet per second)
5/24/2002	15:40	8.36	1,500	2.26

Notes:

1. Cubic feet per second is abbreviated cfs.
2. Water surface elevations are based on an elevation of 14.64 feet (BPMSL) for TBM U6.0N, established by Lounsbury & Associates in 2002.

Table C-4.2: Discharge Measurement on Ublutuoeh River at River Mile 8.0 on 5/24/2002

DISCHARGE MEASUREMENT NOTES						
LOCATION: Ublutuoeh River, approximately 8.0 river miles upstream from the confluence with Fish Creek.						
Date: 5/24 2002 Party: Paul Myerchin, Derek Helmericks						
Width: 103 Area: 667 Vel: 2.26 W.S.E. 8.36 ft. BPMSL Disch.: 1510 cfs						
No Secs. 25 W.S.E. change: 0.05 ft in: 1.33 hrs. Susp.:						
Method Coef.: Hor. Angle Coef. Sus. Coef.: Meter No. URS #1						
Water Surface Elevation Readings			Type of meter:		Price AA	
Time	Description	WSE	Date rated:			
14:50	SGU6.0A	8.39	Meter: 1 ft. above bottom of weight.			
15:00	Start Discharge Measurement (W.S.E. est.)	8.38	Spin before meas. 3 min 20 sec after 3 min 28 sec			
16:20	End Discharge Measurement (W.S.E. est.)	8.33	Method: Boat, sounding reel			
16:31	SGU6.0A	8.32				
			Weather:			
			Air Temp. 60 (°F)			
			Water Temp. (°F)			
			Precip.			
			Cloud Cover None			
Datum			BPMSL		Wind Windy	
Weighted Mean WSE			8.36 ft. BPMSL			
Measurement rated: Fair						
Cross section: Uniform						
Flow: Fairly Uniform						
Other:						
Control:						
Remarks: No snow was present on the sides of channel banks, and none was observed immediately below the water surface.						
Large pans of ice were present on the banks.						
A large river-wide ice jam was present approximately one river mile upstream.						

Table C-4.2: Continued

Angle coef.	Dist. From Initial Point (ft)	Width (ft)	Depth (ft)	Observ. Depth	Revo- lutions	Time in Seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean In- Vertical (fps)			
	13.0	0.0	0.0								LEW
	23.0	14.0	3.5	0.6	20	49	0.918	0.918	49.0	45.0	Bottom mud w/ 2 foot willow
	28.0	5.0	4.6	0.6	30	47	1.425	1.425	23.0	32.8	Bottom mud w/ 2 foot willow
	33.0	5.0	5.1	0.2	40	51	1.747	1.601	25.5	40.8	Bottom mud
				0.8	30	46	1.456				
	38.0	5.0	5.8	0.2	40	45	1.978	1.898	29.0	55.0	Bottom mud
				0.8	40	49	1.818				
	43.0	5.0	6.9	0.2	40	40	2.223	2.100	34.5	72.5	Bottom mud
				0.8	40	45	1.978				
	48.0	5.0	7.6	0.2	50	45	2.468	2.345	38.0	89.1	Bottom hard, probably ice
				0.8	40	40	2.223				
	53.0	5.0	7.9	0.2	50	42	2.643	2.503	39.5	98.9	Bottom hard, probably ice
				0.8	50	47	2.363				
	58.0	3.8	8.1	0.2	50	40	2.774	2.594	30.4	78.8	Bottom hard, probably ice
				0.8	50	46	2.414				
	60.5	2.5	8.0	0.2	60	47	2.832	2.650	20.0	53.0	Bottom hard, probably ice
				0.8	50	45	2.468				
	63.0	2.5	8.1	0.2	60	46	2.894	2.581	20.3	52.3	Bottom hard, probably ice
				0.8	50	49	2.268				
	65.5	2.5	8.2	0.2	60	46	2.894	2.806	20.5	57.5	Bottom hard, probably ice
				0.8	60	49	2.718				
	68.0	2.5	8.4	0.2	60	45	2.958	2.770	21.0	58.2	Bottom hard, probably ice
				0.8	50	43	2.582				
	70.5	2.5	8.2	0.2	60	45	2.958	2.800	20.5	57.4	Bottom hard, probably ice
				0.8	50	42	2.643				
	73.0	2.5	8.2	0.2	60	43	3.094	2.838	20.5	58.2	Bottom hard, probably ice
				0.8	50	43	2.582				

Table C-4.2: Continued

Angle coef.	Dist. From Initial Point (ft)	Width (ft)	Depth (ft)	Observ. Depth	Revolu- tions	Time in Seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean In- Vertical (fps)			
	75.5	2.5	8.0	0.2	60	42	3.168	2.971	20.0	59.4	Bottom hard, probably ice
				0.8	50	40	2.774				
	78.0	2.5	8.0	0.2	60	42	3.168	2.971	20.0	59.4	Bottom hard, probably ice
				0.8	50	40	2.774				
	80.5	2.5	8.1	0.2	60	43	3.094	2.838	20.3	57.5	Bottom hard, probably ice
				0.8	50	43	2.582				
	83.0	2.5	8.2	0.2	70	48	3.233	3.063	20.5	62.8	Bottom hard, probably ice
				0.8	60	46	2.894				
	85.5	2.5	8.1	0.2	60	40	3.325	3.049	20.3	61.8	Bottom hard, probably ice
				0.8	50	40	2.774				
	88.0	2.5	8.1	0.2	70	47	3.302	2.972	20.3	60.2	Bottom hard, probably ice
				0.8	50	42	2.643				
	90.5	2.5	8.1	0.2	60	40	3.325	2.953	20.3	59.8	Bottom hard, probably ice
				0.8	50	43	2.582				
	93.0	2.5	8.1	0.2	60	44	3.024	2.833	20.3	57.4	Bottom hard, probably ice
				0.8	50	42	2.643				
	95.5	3.8	8.3	0.2	60	47	2.832	2.738	31.1	85.2	Bottom hard, probably ice
				0.8	50	42	2.643				
	100.5	5.0	8.2	0.2	40	43	2.069	1.875	41.0	76.9	Bottom hard, probably ice
				0.8	40	53	1.682				
	105.5	7.8	5.4	0.2	10	41	0.556	0.489	41.9	20.5	Willows, .2 depth only
	116.0	0.0	0.0								REW
Totals:		103.0							667.4	1510.1	

DISCHARGE MEASUREMENTS

ON THE UBLUTUOCH RIVER AT RIVER MILE 13.7

Table C-5.1: Summary of Discharge Measurements on the Ublutuoch River at River Mile 13.7

Date	Average Time	Water Surface Elevation (feet)	Discharge (cfs)¹	Discharge Measurement Rating	Cross Sectional Area (square feet)	Wetted Perimeter (feet)	Water Surface Slope (Feet/foot)	Average Velocity (feet per second)
2002								
5/22/2002	11:55	18.06	1,903	Fair	592.7	122.4	0.00036	3.21
5/23/2002	14:26	16.32	1,711	Fair	492.7	105.2	0.00038	3.47
5/24/2002	12:08	14.87	1,416	Fair	411.8	91.3	0.00044	3.44
2001								
6/10/2001	18:25	17.07	1440	Fair	376.7	111.5	0.00048	3.82
6/12/2001	12:16	15.1	1170	Fair	305.6	85.4	0.00044	3.84
6/13/2001	17:45	13.07	988	Fair	261.8	69	0.00057	3.77
7/18/2001	13:26	5.72	35.6	Good	31.2	-	-	1.14
8/13/2001	21:59	5.74	33.9	Good	30.3	-	-	1.12
9/6/2001	11:34	5.85	41.7	Good	31.8	-	-	1.31
Notes:								
1. Cubic feet per second is abbreviated cfs.								
2. Water surface elevations are based on an elevation of 17.48 feet (BPMSL) for UB-US West, established by Lounsbury & Associates in 2001.								

Table C-5.2: Discharge Measurement on the Ublutuoch River at River Mile 13.7 on 5/22/2002

DISCHARGE MEASUREMENT NOTES						
LOCATION: Ublutuoch River, approximately 13.7 river miles upstream from the confluence with Fish Creek.						
Date: 5/22 2002		Party: Mark Vania, James Dietzmann				
Width: 120.6	Area: 593	Vel: 3.21	W.S.E.: 18.06 ft BPMSL	Disch.: 1903	cfs	
No Secs. 26	W.S.E.: Change: 0.01 ft		in: 2.16	hrs.	Susp.:	
Method coef.:		Hor. Angle coef.		Sus. Coef.:	Meter No.	URS #2
Water Surface Elevation Readings			Type of meter:		Price AA	
Time	Description	WSE	Date rated:			
10:50	Start Discharge Measurement (SGU13.7C)	18.07	Meter: 1		ft. above bottom of weight.	
11:56	SGU13.7C	18.06	Spin before meas.		2Min.48Sec	after 2Min55Sec
13:00	End Discharge Measurement (SGU13.7C)	18.06	Method: Boat, sounding reel			
			Weather:			
			Air Temp. 32		(^o F)	
			Water Temp.		(^o F)	
			Precip.			
			Cloud Cover		None	
Datum			BPMSL		Wind Windy	
Weighted Mean WSE			18.06 ft. BPMSL			
Measurement rated:		Fair				
Cross section:		Fairly Uniform				
Flow:		Uniform				
Other:						
Control:						
Remarks: There is some discharge overflowing the banks, measured at 18 cfs at approximately 15:00 hours. The overflow appeared to be significantly greater around 12:00 hours, showing increased velocity as well as higher WSE than seen at 15:00 hours. Snow is present on bottom of channel beneath water surface from right bank to approx. 70 feet from the right bank, where snow appears to end and willow begins.						
Page 1 of 3						

Table C-5.2: Continued

Angle coef.	Dist. From Initial Point (ft)	Width (ft)	Depth (ft)	Observ. Depth	Revo- lutions	Time in Seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean In- Vertical (fps)			
	4.0	0.0	0.0								REW
	13.0	9.0	2.3	0.6	25	46	1.216	1.216	20.7	25.2	Bottom soft likely snow
	18.0	5.0	3.7	0.6	140	89	3.486	3.486	18.5	64.5	Bottom mod. likely willow
	23.0	5.0	5.3	0.2	80	44	4.027	4.027	26.5	106.7	Bottom hard, probably ice
				0.8	80	44	4.027				
	28.0	5.0	5.8	0.2	90	44	4.528	4.202	29.0	121.9	Bottom hard, probably ice
				0.8	105	60	3.876				
	33.0	3.5	6.6	0.2	87	44	4.377	4.157	23.1	96.0	Bottom hard, probably ice
				0.8	80	45	3.937				
	35.0	2.0	7.1	0.2	109	53	4.552	4.164	14.2	59.1	Bottom hard, probably ice
				0.8	75	44	3.776				
	37.0	2.0	7.2	0.2	95	47	4.474	4.279	14.4	61.6	Bottom hard, probably ice
				0.8	83	45	4.084				
	39.0	2.0	7.5	0.2	90	45	4.427	4.191	15.0	62.9	Bottom hard, probably ice
				0.8	75	42	3.955				
	41.0	2.0	7.6	0.2	95	46	4.571	4.345	15.2	66.1	Bottom hard, probably ice
				0.8	80	43	4.120				
	43.0	2.0	7.8	0.2	90	43	4.632	4.342	15.6	67.7	Bottom hard, probably ice
				0.8	75	41	4.051				
	45.0	2.0	7.9	0.2	90	44	4.528	4.452	15.8	70.3	Bottom hard, probably ice
				0.8	85	43	4.376				
	47.0	2.0	8.0	0.2	90	42	4.742	4.480	16.0	71.7	Bottom hard, probably ice
				0.8	80	42	4.217				
	49.0	2.0	7.9	0.2	95	44	4.778	4.673	15.8	73.8	Bottom hard, probably ice
				0.8	130	63	4.567				
	51.0	2.0	8.2	0.2	95	44	4.778	4.449	16.4	73.0	Bottom hard, probably ice
				0.8	80	43	4.120				

Table C-5.2: Continued

Angle coef.	Dist. From Initial Point (ft)	Width (ft)	Depth (ft)	Observ. Depth	Revolutions	Time in Seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean In-Vertical (fps)			
	53.0	2.0	8.1	0.2	90	44	4.528	4.452	16.2	72.1	snow on bottom
				0.8	85	43	4.376				
	55.0	2.0	8.3	0.2	110	47	5.178	4.711	16.6	78.2	snow on bottom
				0.8	115	60	4.244				
	57.0	2.0	8.5	0.2	105	48	4.841	4.480	17.0	76.2	snow on bottom
				0.8	80	43	4.120				
	59.0	2.0	8.7	0.2	95	43	4.889	4.495	17.4	78.2	snow on bottom
				0.8	100	54	4.101				
	61.0	2.0	8.8	0.2	85	43	4.376	3.992	17.6	70.3	snow on bottom
				0.8	70	43	3.607				
	63.0	2.0	8.6	0.2	85	45	4.182	3.895	17.2	67.0	snow on bottom
				0.8	70	43	3.607				
	65.0	3.5	8.7	0.2	80	43	4.120	3.322	30.5	101.1	bottom soft with willow
				0.8	50	44	2.523				
	70.0	5.0	7.7	0.6	43	50	1.914	1.914	38.5	73.7	Weeds/Brush
	75.0	5.0	6.8	0.6	40	51	1.747	1.747	34.0	59.4	Weeds/Brush
	80.0	5.0	5.1	0.6	35	45	1.733	1.733	25.5	44.2	Weeds/Brush
	85	7.5	4.9	0.2	45	44	2.273	2.000	36.8	73.5	Weeds/Brush
	95	19.8	3.5	0.2	28	43	1.453	1.279	69.3	88.6	Weeds/Brush
	124.6	0.0	0.0								LEW
Totals:		120.6							592.7	1903.0	Page 3 of 3

Table: C-5.3 Discharge Measurement on Ublutuoch R. Overflow Channel near River Mile 13.7, 5/22/2002

DISCHARGE MEASUREMENT NOTES						
LOCATION: Ublutuoch River at approximately River Mile 13.7						
Date: 5/22 2002		Party: Mark Vania, James Dietzmann				
Width: 184	Area: 219	Vel: 0.08	W.S.E.: 18.01 ft. BPMSL	Disch.: 18 cfs		
No Secs. 9	W.S.E. Change: 0.04 ft		in. 0.45	hrs.	Susp.:	
Method coef.:		Hor. Angle coef.		Sus. Coef.:	Meter No.	URS #1
Water Surface Elevation Readings			Type of meter:		Price AA	
Time	Description	WSE	Date rated:		Factory	
14:44	SG13.7C	18.06	Meter: 1		ft. above bottom of weight.	
15:02	Start discharge measurements (W.S.E. est.)	18.03	Spin before meas.		2Min.50Sec	after 3Min01Sec
15:29	End discharge measurements (W.S.E. est.)	17.99	Method: Backpack, wading rod			
15:51	SG13.7C	17.96				
			Weather:			
			Air Temp. 34 (°F)			
			Water Temp. (°F)			
			Precip.			
			Cloud Cover None			
Datum			BPMSL		Wind Breezy	
Weighted Mean WSE			18.01 ft. BPMSL			
Measurement rated:		Poor				
Cross section:		Non-uniform				
Flow:		Non-uniform				
Other:						
Control:						
Remarks: Small channels formed from overflow above the ice road flowing into ponded water. A temporary cross-section was established downstream of these channels (North of the ice road) to measure the discharge. Shallow depth, low velocities and tall grass affected the velocity measurement. By the time the measurement was taken, the stage had dropped, significantly reducing the amount of overflow.						
Page 1 of 2						

Table C-5.3: Continued

Angle coef.	Dist. From Initial Point (ft)	Width (ft)	Depth (ft)	Observ. Depth	Revo- lutions	Time in Seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean In- Vertical (fps)			
	0.0	0.0	0.0								REW
	25.0	20.0	1.1	0.6	2	60	0.091	0.091	22.0	2.0	Short willow and thick grass
	40.0	15.0	1.3	0.6	0	52	n/a	n/a	19.5	0.0	Short willow and thick grass
	55.0	15.0	1.5	0.6	2	49	0.108	0.108	22.5	2.4	Short willow and thick grass
	70.0	15.0	1.5	0.6	2	70	0.081	0.081	22.5	1.8	Short willow and thick grass
	85.0	15.0	1.6	0.6	3	65	0.120	0.120	24.0	2.9	Short willow and thick grass
	100.0	15.0	1.4	0.6	3	55	0.138	0.138	21.0	2.9	Short willow and thick grass
	115.0	15.0	1.9	0.6	2	49	0.108	0.108	28.5	3.1	Short willow and thick grass
	130.0	15.0	1.4	0.6	2	40	0.128	0.128	21.0	2.7	Short willow and thick grass
	145.0	27.0	1.4	0.6	0	40	n/a	n/a	37.8	0.0	Short willow and thick grass
	184.0	0.0	0.0								LEW
Totals:		184.0							218.8	17.8	

Table C-5.4: Discharge Measurement on the Ublutuoch River at River Mile 13.7 on 5/23/2002

DISCHARGE MEASUREMENT NOTES							
LOCATION: Ublutuoch River, approximately 13.7 river miles upstream from the confluence with Fish Creek.							
Date: 5/23 2002 Party: Paul Myerchin, Derek Helmericks							
Width:	103.3	Area:	493	Vel:	3.47	W.S.E.:	16.32 ft BPSML
Disch.:	1711		cfs				
No Secs.	20		W.S.E. Change:	0.14 ft		in:	2.18
Method coef.:			Hor. Angle coef.			Sus. Coef.:	
Meter No.				URS #1			
Water Surface Elevation Readings				Type of meter: Price AA			
Time	Description			WSE	Date rated: Factory		
13:01	TRU13.7D			16.39	Meter: 1 ft. above bottom of weight.		
13:20	Start discharge measurements (W.S.E. est.)			16.37	Spin before meas. 3Min.12Sec after 3Min10Sec		
15:31	End discharge measurements (W.S.E. est.)			16.23	Method: Boat, sounding reel		
15:39	TRU13.7D			16.22			
					Weather:		
					Air Temp.	40	(°F)
					Water Temp.		(°F)
					Precip.		
					Cloud Cover	None	
Datum				BPSML	Wind	Windy	
Weighted Mean W.S.E.				16.32 ft. BPSML			
Measurement rated:	Fair						
Cross section:	Fairly Uniform						
Flow:	Fairly Uniform						
Other:							
Control:							
Remarks:	Starting to see large pans of river-bottom fast ice floating down the river, up to 15x20 ft in size. Possible ice jam forming upstream at the ice road crossing. One-half way through the discharge measurement, significant amounts of slush started flowing down the channel, presumably this slush is snow lifting up from the bottom of the creek.						
Page 1 of 3							

Table C-5.4: Continued

Angle coef.	Dist. From Initial Point (ft)	Width (ft)	Depth (ft)	Observ. Depth	Revo- lutions	Time in Seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean In- Vertical (fps)			
	7.0	0.0	0.0								REW
	18.0	11.5	3.7	0.6	50	49	2.268	2.268	42.6	96.5	Bottom soft likely snow
	23.0	5.0	5.5	0.2	90	47	4.240	4.089	27.5	112.4	Bottom mod. likely willow
				0.8	80	45	3.937				
	28.0	5.0	5.5	0.2	120	50	5.309	4.820	27.5	132.6	
				0.8	90	46	4.332				
	33.0	3.8	6.3	0.2	100	43	5.145	4.927	23.6	116.4	Fairly hard bottom, could be ice
				0.8	100	47	4.709				
	35.5	2.5	6.5	0.2	100	43	5.145	5.062	16.3	82.3	
				0.8	90	40	4.979				
	38.0	2.5	7.0	0.2	100	44	5.029	4.831	17.5	84.5	
				0.8	90	43	4.632				
	40.5	2.5	7.6	0.2	120	48	5.530	4.979	19.0	94.6	
				0.8	90	45	4.427				
	43.0	2.5	7.7	0.2	110	46	5.290	4.909	19.3	94.5	
				0.8	90	44	4.528				
	45.5	2.5	7.9	0.2	100	42	5.267	4.950	19.8	97.8	
				0.8	90	43	4.632				
	48.0	2.5	8.0	0.2	120	48	5.530	5.081	20.0	101.6	
				0.8	90	43	4.632				
	50.5	2.5	8.2	0.2	110	46	5.290	4.811	20.5	98.6	
				0.8	90	46	4.332				
	53.0	2.5	8.4	0.2	100	45	4.917	4.579	21.0	96.1	
				0.8	90	47	4.240				
	55.5	2.5	8.5	0.2	100	43	5.145	4.419	21.3	93.9	
				0.8	70	42	3.692				
	58.0	2.5	8.3	0.2	80	43	4.120	3.676	20.8	76.3	
				0.8	70	48	3.233				

Table C-5.5: Discharge Measurement on the Ublutuoch River at River Mile 13.7 on 5/24/2002

DISCHARGE MEASUREMENT NOTES						
LOCATION: Ublutuoch River, approximately 13.7 river miles upstream from the confluence with Fish Creek.						
Date:	5/24	2002	Party: Paul Myerchin, Derek Helmericks			
Width:	80.3	Area:	412	Vel:	3.44	W.S.E.: 14.87 ft. BPMSL
Disch.:	1416	cfs				
No Secs.	21	WSE Change:	0.08 ft	in:	1.58	hrs.
Method coef.:	Hor. Angle coef.		Sus. Coef.:		Meter No.	Susp.: URS #1
Water Surface Elevation Readings				Type of meter: Price AA		
Time	Description		WSE	Date rated: Factory		
10:50	SGU13.7B		14.94	Meter: 1 ft. above bottom of weight.		
11:20	Start discharge measurements (W.S.E. est.)		14.91	Spin before meas. 3Min.26Sec after 3Min21Sec		
12:55	End discharge measurements (W.S.E. est.)		14.83	Method: Boat, sounding reel		
13:05	SGU13.7B		14.82			
				Weather:		
				Air Temp.	50	(°F)
				Water Temp.		(°F)
				Precip.		
				Cloud Cover	None	
Datum			BPMSL	Wind Breezy		
Weighted Mean WSE			14.87 ft. BPMSL			
Measurement rated:	Fair					
Cross section:	Fairly Uniform					
Flow:	Uniform					
Other:						
Control:						
Remarks:	Wind waves 0.1-0.3 ft in height. 3-5 ice pans per hour moving down the river, up to 10x15 ft in size. Smaller ice (2x2 ft) approximately every 5 min.					
	Less than 1% of snow present on sides of banks and very little observed underwater, visibility limited to less than one foot underwater.					
Page 1 of 3						

Table C-5.5: Continued

Angle coef.	Dist. From Initial Point (ft)	Width (ft)	Depth (ft)	Observ. Depth	Revo- lutions	Time in Seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean In- Vertical (fps)			
	11.0	0.0	0.0								REW
	18.0	10.3	3.8	0.6	60	52	2.562	2.562	39.0	99.8	Bottom soft likely snow
	20.5	2.5	4.7	0.2	70	42	3.692	3.650	11.8	42.9	Bottom mod. likely willow
	23.0	2.5	4.8	0.8	70	43	3.607				
				0.2	90	44	4.528	4.202	12.0	50.4	Bottom hard, probably ice
	25.5	2.5	5.3	0.8	70	40	3.876				
				0.2	90	43	4.632	4.482	13.3	59.4	Bottom hard, probably ice
	28.0	2.5	5.5	0.8	90	46	4.332				
				0.2	100	43	5.145	4.586	13.8	63.1	Bottom hard, probably ice
	30.5	2.5	5.6	0.8	80	44	4.027				
				0.2	100	41	5.395	4.961	14.0	69.5	Bottom hard, probably ice
	33.0	2.5	6.2	0.8	90	44	4.528				
				0.2	100	44	5.029	4.574	15.5	70.9	Bottom hard, probably ice
	35.5	2.5	6.5	0.8	80	43	4.120				
				0.2	100	41	5.395	4.806	16.3	78.1	Bottom hard, probably ice
	38.0	2.5	7.0	0.8	80	42	4.217				
				0.2	100	42	5.267	4.847	17.5	84.8	Bottom hard, probably ice
	40.5	2.5	7.6	0.8	80	40	4.427				
				0.2	100	42	5.267	4.847	19.0	92.1	Bottom hard, probably ice
	43.0	2.5	7.7	0.8	90	45	4.427				
				0.2	100	44	5.029	4.728	19.3	91.0	Bottom hard, probably ice
	45.5	2.5	7.9	0.8	90	45	4.427				
				0.2	100	43	5.145	4.632	19.8	91.5	Bottom hard, probably ice
	48.0	2.5	7.8	0.8	80	43	4.120				
				0.2	90	41	4.858	4.595	19.5	89.6	Bottom hard, probably ice
	50.5	2.5	7.9	0.8	90	46	4.332				
				0.2	90	43	4.632	4.376	19.8	86.4	Bottom hard, probably ice
				0.8	80	43	4.120				

Table C-5.5: Continued

Angle coef.	Dist. From Initial Point (ft)	Width (ft)	Depth (ft)	Observ. Depth	Revolu- tions	Time in Seconds	VELOCITY		Area (s.f.)	Discharge (cfs)	Description
							At Point (fps)	Mean In- Vertical (fps)			
	53.0	2.5	7.9	0.2	80	43	4.120	3.951	19.8	78.0	Bottom hard, probably ice
				0.8	70	41	3.782				
	55.5	2.5	7.8	0.2	80	48	3.692	3.358	19.5	65.5	Bottom hard, probably ice
				0.8	60	44	3.024				
	58.0	2.5	7.4	0.2	60	42	3.168	2.791	18.5	51.6	Bottom hard, probably ice
				0.8	50	46	2.414				
	60.5	2.5	6.8	0.2	50	43	2.582	2.350	17.0	39.9	Bottom hard, probably ice
				0.8	40	42	2.118				
	63.0	3.8	6.5	0.2	40	40	2.223	1.744	24.4	42.5	bottom soft with willow
				0.8	30	53	1.266				
	68.0	6.3	4.4	0.2	40	48	1.855	1.633	27.5	44.9	bottom soft with willow
	75.5	11.7	3.0	0.2	20	58	0.778	0.685	35.0	23.9	bottom soft with willow
	91.3	0.0	0.0								LEW
Totals:		80.3							411.8	1415.9	Page 3 of 3

APPENDIX D

PHOTOGRAPHIC RECORD

LIST OF PHOTOGRAPHS

Photo

Title

Fish Creek

- D-1.1 Looking downstream on Fish Creek near River Mile 0.7 on 30 May 2002. The ice formed on the river at the time of this photo began forming 27 May.
- D-1.2 Looking upstream on Fish Creek near River Mile 11.7 on 31 May 2002. An ice jam that formed between 28 May and 30 May was breaking up at the time of this photo.
- D-1.3 Ice pans remaining at River Mile 10.6 on the Tingmeachsiovik River distributary of Fish Creek on 1 June 2002.
- D-1.4 Looking upstream on Fish Creek from River Mile 12.6 on 26 May 2002.
- D-1.5 Looking downstream on Fish Creek near River Mile 12.6 on 30 May 2002. Note that ice started forming on the river on 27 May, creating this ice jam sometime between 28 May and 30 May.
- D-1.6 Looking upstream on Fish Creek from River Mile 12.6 on 30 May 2002.
- D-1.7 Looking downstream on Fish Creek from River Mile 12.6 on 30 May 2002.
- D-1.8 Looking downstream on Fish Creek from River Mile 18.4 on 21 May 2002.
- D-1.9 Looking south from River Mile 18.4 on 26 May 2002.
- D-1.10 Looking upstream on Fish Creek from River Mile 25.1 on 21 May 2002.
- D-1.11 Looking North from River Mile 25.1 on 25 May 2002.
- D-1.12 Collecting bedload samples at River Mile 25.1 on 22 May 2002.
- D-1.13 Preparing to collect suspended sediment samples at River Mile 25.1 on 26 May 2002.
- D-1.14 Looking upstream on Fish Creek from River Mile 25.1 on 28 May 2002.
- D-1.15 Looking south from River Mile 32.4 on 21 May 2002.
- D-1.16 Looking upstream from River Mile 32.4 on 26 May 2002.
- D-1.17 Looking upstream on Fish Creek from River Mile 43.3 on 26 May 2002.

LIST OF PHOTOGRAPHS (Continued)

Photo

Title

Judy Creek

- D-2.1 Looking southeast across the confluence of Fish Creek and Judy Creek on 26 May 2002.
- D-2.2 Looking downstream from River Mile 13.8 on 21 May 2002.
- D-2.3 Looking east from River Mile 13.8 on 26 May 2002.

Ublutuoch River

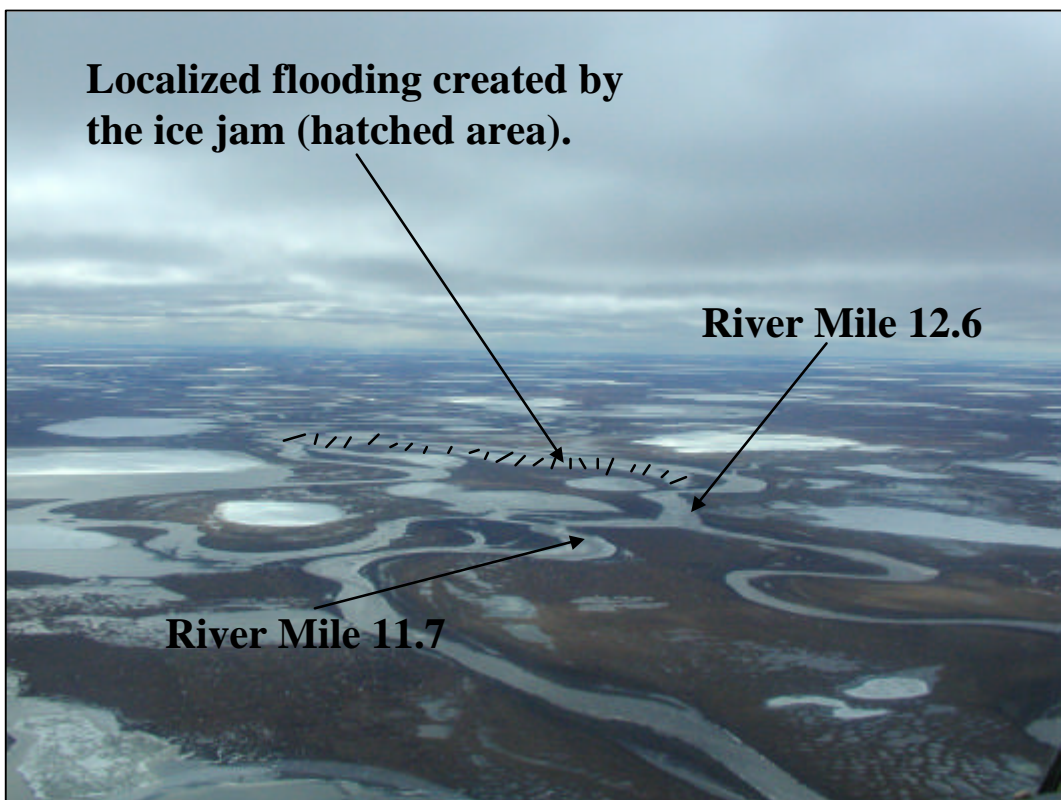
- D-3.1 Looking downstream on the Ublutuoch River from helicopter near River Mile 13.5 on 21 May 2002.
- D-3.2 Looking at ice road crossing near River Mile 13.7 on 21 May 2002.
- D-3.3 Looking upstream at ice road crossing from River Mile 13.7 on 21 May 2002.
- D-3.4 Looking downstream at River Mile 13.7 on 21 May 2002.
- D-3.5 Looking downstream from River Mile 13.7 on 22 May 2002.
- D-3.6 Looking upstream at ice road crossing from River Mile 13.7 on 22 May 2002.
Water is flowing over the ice road left of the ice road crossing.
- D-3.7 Looking east from River Mile 13.7 on 22 May 2002.
- D-3.8 Looking upstream from River 13.7 on 22 May 2002.

PHOTOGRAPHIC RECORD

FISH CREEK



D-1.1 Looking downstream on Fish Creek near River Mile 0.7 on 30 May 2002. The ice formed on the river at the time of this photo began forming 27 May.



D-1.2 Looking upstream on Fish Creek near River Mile 11.7 on 31 May 2002. An ice jam that formed between 28 May and 30 May was breaking up at the time of this photo.



D-1.3 Ice pans remaining at River Mile 10.6 on the Tingmeachsiovik River distributary of Fish Creek on 1 June 2002.



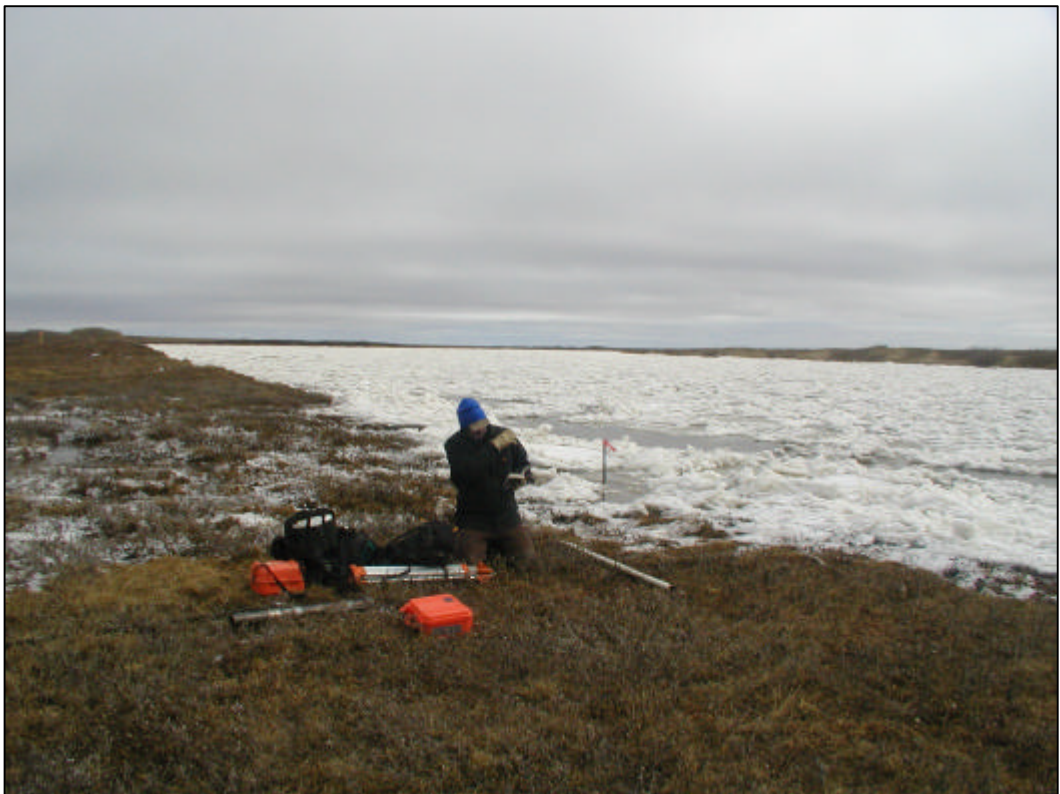
D-1.4 Looking upstream on Fish Creek from River Mile 12.6 on 26 May 2002.



D-1.5 Looking downstream on Fish Creek near River Mile 12.6 on 30 May 2002. Note that ice started forming on the river on 27 May, creating this ice jam sometime between 28 May and 30 May.



D-1.6 Looking upstream on Fish Creek from River Mile 12.6 on 30 May 2002.



D-1.7 Looking downstream on Fish Creek from River Mile 12.6 on 30 May 2002.



D-1.8 Looking downstream on Fish Creek from River Mile 18.4 on 21 May 2002.



D-1.9 Looking south from River Mile 18.4 on 26 May 2002.



D-1.10 Looking upstream on Fish Creek from River Mile 25.1 on 21 May 2002.



D-1.11 Looking North from River Mile 25.1 on 25 May 2002.



D-1.12 Collecting bedload samples at River Mile 25.1 on 22 May 2002.



D-1.13 Preparing to collect suspended sediment samples at River Mile 25.1 on 26 May 2002.



D-1.14 Looking upstream on Fish Creek from River Mile 25.1 on 28 May 2002.



D-1.15 Looking south from River Mile 32.4 on 21 May 2002.



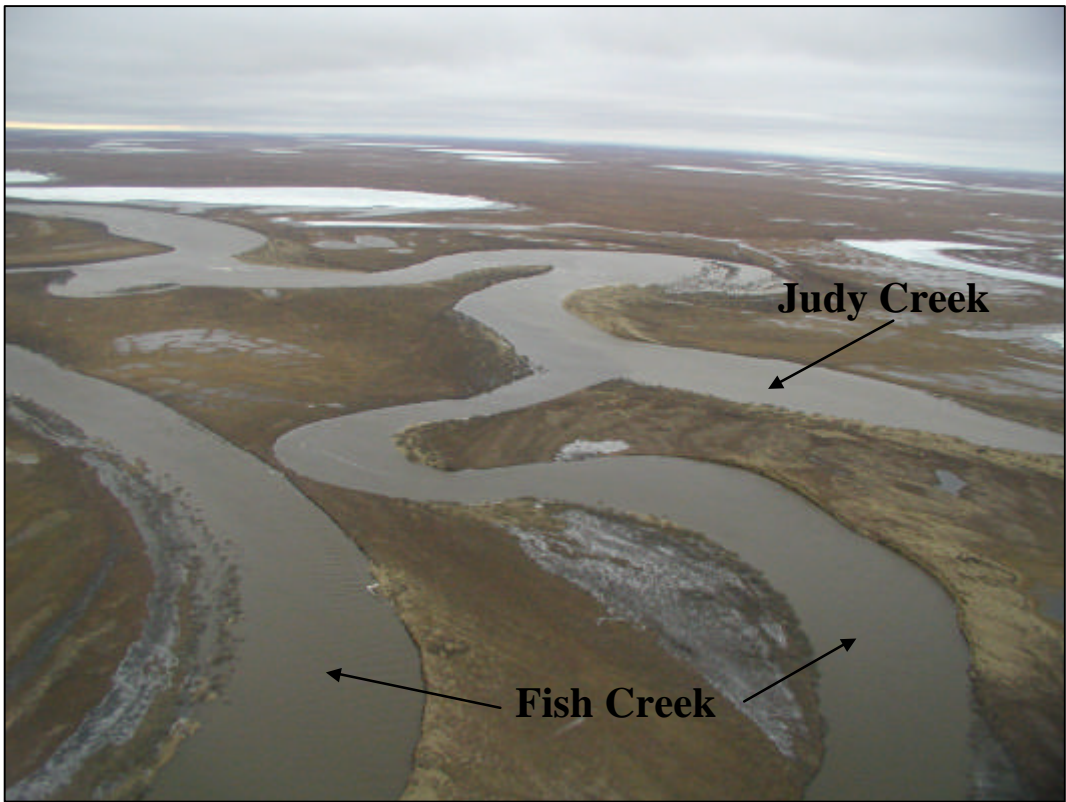
D-1.16 Looking upstream from River Mile 32.4 on 26 May 2002.



D-1.17 Looking upstream on Fish Creek from River Mile 43.3 on 26 May 2002.

PHOTOGRAPHIC RECORD

JUDY CREEK



D-2.1 Looking southeast across the confluence of Fish Creek and Judy Creek on 26 May 2002.



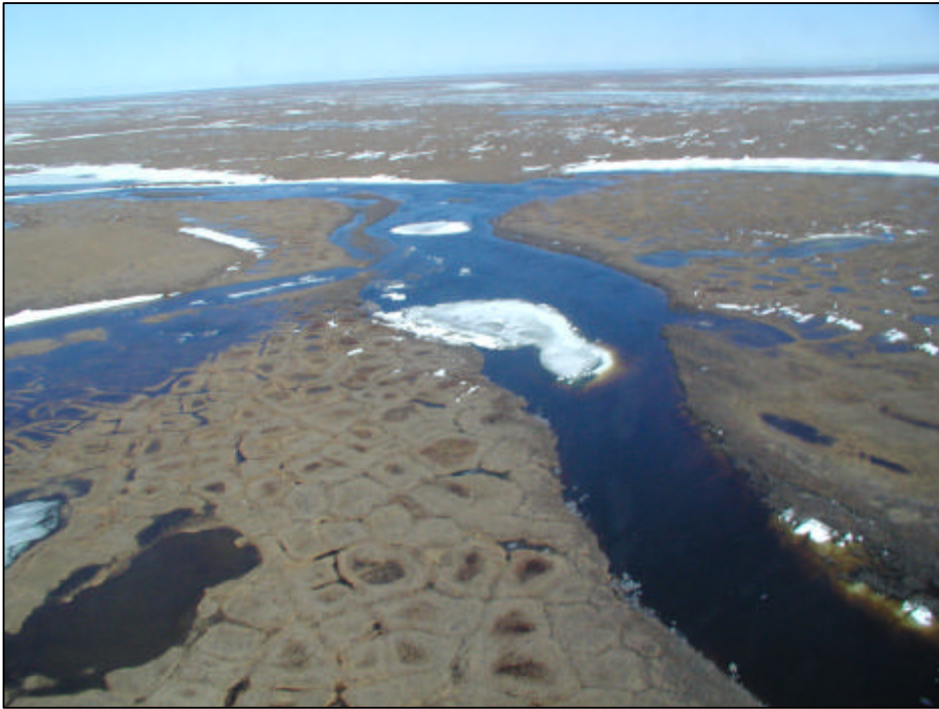
D-2.2 Looking downstream from River Mile 13.8 on 21 May 2002.



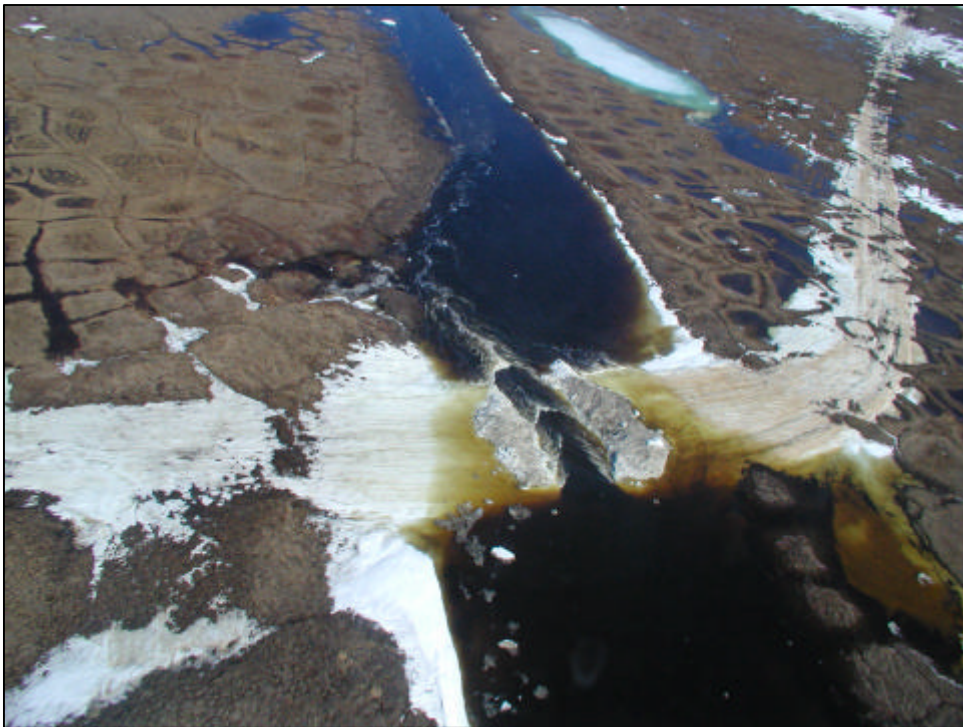
D-2.3 Looking east from River Mile 13.8 on 26 May 2002.

PHOTOGRAPHIC RECORD

UBLUTUOCH RIVER



D-3.1 Looking downstream on the Ublutuoch River from helicopter near River Mile 13.5 on 21 May 2002.



D-3.2 Looking at ice road crossing near River Mile 13.7 on 21 May 2002.



D-3.3 Looking upstream at ice road crossing from River Mile 13.7 on 21 May 2002.



D-3.4 Looking downstream at River Mile 13.7 on 21 May 2002.



D-3.5 Looking downstream from River Mile 13.7 on 22 May 2002.



D-3.6 Looking upstream at ice road crossing from River Mile 13.7 on 22 May 2002. Water is flowing over the ice road left of the ice road crossing.



D-3.7 Looking east from River Mile 13.7 on 22 May 2002.



D-3.8 Looking upstream from River Mile 13.7 on 22 May 2002.

APPENDIX E
HEC-RAS REPORTS

LIST OF TABLES

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Table E.3	HEC-RAS Run, Fish and Judy Creeks, 100-Year Flood Hydraulically Smooth Report.....E-219
Table E.4	HEC-RAS Run, Fish and Judy Creeks, 100-Year Flood Hydraulically Rough Report.....E-329
Table E.5	HEC-RAS Run, Ublutuoch River, Calibration ReportE-439
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Table E.1

HEC-RAS Run, Fish and Judy Creeks, Calibration Report

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

```

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   X
XXXXXXXX XXXX   X       XXX XXXX   XXXXXX   XXXX
X   X  X       X       X   X   X   X       X
X   X  X       X   X   X   X   X   X       X
X   X  XXXXXX   XXXX   X   X   X   X   XXXXX
  
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PROJECT DATA

Project Title: 2002 Calibration
 Project File : derek.prj
 Run Date and Time: 11/15/2002 11:47:48 AM

Project in English units

PLAN DATA

Plan Title: 2002 Calibration 26 Sept Run 1
 Plan File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\derek.p05

Geometry Title: 25 May 2002 Calibration
 Geometry File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\derek.g08

Flow Title : 25 May 2002 Calibration
 Flow File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\derek.f07

Plan Summary Information:

Number of:	Cross Sections =	79	Multitple Openings =	0
	Culverts =	0	Inline Weirs =	0
	Bridges =	0		

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculaton tolerance =	0.01
Maximum number of interations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Friction Slope
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 25 May 2002 Calibration
 Flow File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\derek.f07

Flow Data (cfs)

River	Reach	RS	Calibration
Fish Creek	Upper Fish Creek	43.3	2293
Fish Creek	Upper Fish Creek	32.4	2334
Fish Creek	Upper Fish Creek	26.85	2366
Fish Creek	Lower Fish Creek	26.09	8898
Fish Creek	Lower Fish Creek	25.1	8910
Fish Creek	Lower Fish Creek	18.4	9183
Fish Creek	Lower Fish Creek	12.6	9361
Fish Creek	Lower Fish Creek	11.7	9361
Fish Creek	Lower Fish Creek	0.7	11080
Judy Creek	Lower Judy Creek	13.8	6585
Judy Creek	Lower Judy Creek	7.0	7169
Judy Creek	Lower Judy Creek	0.38	7374

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Fish Creek	Lower Fish Creek	Calibration		Normal S = .00008

GEOMETRY DATA

Geometry Title: 25 May 2002 Calibration
 Geometry File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\derek.g08

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Fish Creek	Upper Fish Creek		Fish Junct.
Fish Creek	Lower Fish Creek	Fish Junct.	
Judy Creek	Lower Judy Creek		Fish Junct.

JUNCTION INFORMATION

Name: Fish Junct.
 Description: Confluence of Fish and Judy Creek
 Energy computation Method

Length across Junction		Tributary	Reach	Length	Angle
River	Reach	River			
Fish Creek	Upper Fish Creek	Fish Creek	Lower Fish Creek	3915	
Judy Creek	Lower Judy Creek	Fish Creek	Lower Fish Creek	3694	

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 43.3

INPUT

Description: Cross Section at River Mile 43.3

Station Elevation Data num= 62									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3	95.5	63.1	87.2	195.6	35	1377.1	35.7	1387.5	37.1
1507	37.6	1802.5	39	1914.9	40.9	2104.3	38.2	2170.4	38.4
2182.2	37.3	2197.8	27.1	2203.6	25.7	2212.1	21.6	2222.7	18.7
2231.9	19.3	2242.5	18.7	2252.4	19.1	2261.6	21.5	2272.2	22.2
2282.1	23.4	2292.8	23.5	2302	24	2311.9	24.2	2322.5	25
2332.4	24.9	2342.3	25.3	2351.9	25.7	2405.5	27.5	2452.6	27.9
2505.3	28.1	2551.4	28.1	2562.1	29.4	2577.3	34.4	2587.3	35.1
2721.7	40.7	2906.1	42.2	3074.5	34.9	3160.8	34.5	3185	35.9
3475.7	32.8	3562.3	42.5	3907.5	44.9	4205.9	44.9	4504.3	43.2
4806.6	41.6	5103.9	39.6	5129.4	39.7	5282.4	39.8	5407.4	40.5
5701.3	42.8	5925.6	43.2	6115.3	51.7	6309.9	55.6	6604.2	56.5
6910.5	54.9	7207.6	52.8	7509.9	53.1	7808.3	51.6	8106.9	54.4
8409.5	53.4	8705.2	56.6						

Manning's n Values num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3	.04	2182.2	.027	2562.1	.07	2721.7	.04

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	2182.2	2577.3		1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
3	2170.4	31.63	2562.1	8705.2	31.63

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	29.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.027	
W.S. Elev (ft)	29.43	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1431.25	
E.G. Slope (ft/ft)	0.000140	Area (sq ft)		1431.25	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	367.86	Top Width (ft)		367.86	
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)		1.60	
Max Chl Dpth (ft)	10.73	Hydr. Depth (ft)		3.89	
Conv. Total (cfs)	193855.9	Conv. (cfs)		193855.9	
Length Wtd. (ft)	4751.08	Wetted Per. (ft)		370.70	
Min Ch El (ft)	18.70	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.66	Cum Volume (acre-ft)		3320.48	
C & E Loss (ft)	0.00	Cum SA (acres)		617.67	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 42.3916*

INPUT

Description: Interpolated Cross Section at River Mile 42.39

Station Elevation Data num= 154									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.75	93.31	77.59	85.42	102.3	78.16	198.07	50.39	242.58	37.5
266.58	37.52	305.9	37.1	386.03	37.04	479.14	37.12	574.75	37.11
676.79	37.21	760.81	37.27	862.64	37.72	956.16	37.67	1010.33	37.57
1044.37	37.28	1120.15	37.56	1228.92	37.63	1270.14	37.66	1334.67	37.61
1427.27	37.29	1461.38	37.05	1525.6	37.14	1613.87	37.11	1695.17	37.65

1713.79	37.71	1723.85	38.74	1726.74	38.96	1743.34	38.64	1782.6	37.5
1812.83	37.4	1875.54	37.76	1921.76	38.05	1953	37.38	1977.44	37.13
2016.89	37.08	2092.76	37.22	2186.47	37.53	2243.5	37.66	2281	38.08
2306.08	38.42	2383.46	39.33	2481.03	38.24	2559.2	37.46	2580.2	37.33
2593.78	36.94	2619.3	36.75	2701.61	37.17	2713.39	36.4	2716.3	36.17
2719.46	34.24	2721.85	32.55	2724.96	30.71	2730.06	27.89	2733.4	26.06
2735.2	25.69	2739.75	24.76	2740.3	24.54	2745.4	22.48	2749.07	21
2750.49	20.67	2755.59	19.49	2760.68	18.28	2769.12	18.82	2778.83	18.28
2788.36	18.66	2796.28	20.63	2797.22	20.87	2807.42	21.53	2813.73	22.28
2816.95	22.66	2827.25	22.78	2831.18	22.99	2836.11	23.29	2845.64	23.55
2849.15	23.84	2855.84	24.32	2865.37	24.23	2874.9	24.6	2884.15	24.98
2931.34	26.51	2935.74	26.65	2981.08	27.05	3013.18	27.18	3031.81	27.19
3045.98	27.15	3063.96	26.97	3072.86	26.94	3076.19	26.98	3080.36	27.52
3085.77	28.28	3086.49	28.39	3101.12	33.37	3111.49	34.08	3112.41	34.13
3250.85	39.22	3255.48	39.25	3442.04	40.58	3563.17	35.93	3616.65	33.89
3706.13	33.55	3731.22	34.84	3799.83	34.2	3898.18	33.35	3948.94	33.46
4032.64	32.43	4083.73	37.34	4122.43	41.14	4283.73	42.01	4480.35	43.11
4502.5	43.1	4691.43	43.03	4789.75	43	4896.61	42.44	5086.54	41.67
5099.14	41.61	5412.58	40.3	5720.84	38.62	5735.79	38.68	5747.28	38.78
5905.92	39.69	5976.7	40.41	6035.53	40.86	6121.7	41.68	6215.24	42.39
6340.26	43.27	6430.19	43.43	6572.83	43.62	6637.38	46.16	6769.52	51.33
6855.5	52.82	6971.29	54.91	7083.03	55.26	7276.44	55.79	7281.74	55.77
7509.13	54.51	7594.02	54.11	7743.71	53.17	7902.07	53.18	7999.93	52.27
8161.19	52.41	8215.51	52.46	8372.04	51.78	8524.91	50.96	8595.19	51.47
8756.8	52.82	8834.52	53.64	8907.06	53.6	9071.62	53.02	9148.27	52.61
9186.86	52.88	9318.42	54.17	9360.04	54.93	9454.87	56.27		

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val
 2.75 .04 2716.3 .027 3086.49 .07 3101.12 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 2716.3 3101.12 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 2.75 2716.3 30.85 3101.12 9454.87 30.85

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.027	
W.S. Elev (ft)	28.76	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1433.76	
E.G. Slope (ft/ft)	0.000136	Area (sq ft)		1433.76	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	359.10	Top Width (ft)		359.10	
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)		1.60	
Max Chl Dpth (ft)	10.48	Hydr. Depth (ft)		3.99	
Conv. Total (cfs)	196341.4	Conv. (cfs)		196341.4	
Length Wtd. (ft)	4751.08	Wetted Per. (ft)		361.62	
Min Ch El (ft)	18.28	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Froctn Loss (ft)	0.66	Cum Volume (acre-ft)		3164.24	
C & E Loss (ft)	0.00	Cum SA (acres)		578.03	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 41.4833*

INPUT

Description: Interpolated Cross Section at River Mile 41.48

Station Elevation Data		num= 154							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.5	91.12	92.07	83.64	121.66	76.93	236.28	51.7	289.55	40
318.28	40.03	365.34	39.18	461.25	39.01	572.7	39.13	687.13	39.07
809.28	39.21	909.84	39.29	1031.72	40.15	1143.65	40	1208.49	39.77
1249.24	39.18	1339.93	39.7	1470.13	39.79	1519.46	39.82	1596.7	39.7
1707.54	39.02	1748.37	38.52	1825.22	38.68	1930.89	38.56	2028.19	39.61
2050.47	39.72	2062.52	40.69	2065.97	40.82	2085.85	40.13	2132.84	37.71
2169.01	37.41	2244.08	37.93	2299.4	38.33	2336.79	36.86	2366.05	36.27
2413.27	36.03	2504.07	36.02	2616.24	36.27	2684.49	36.32	2729.38	36.66
2759.4	36.99	2852.01	37.76	2968.8	36.7	3062.36	36.02	3087.5	36.01
3103.76	35.39	3134.3	35.3	3232.81	35.95	3246.92	35.28	3250.4	35.03
3253.84	33.06	3256.44	31.12	3259.82	29.29	3265.36	26.69	3268.99	25.02
3270.96	24.68	3275.9	23.82	3276.5	23.62	3282.04	21.75	3286.03	20.4
3287.58	20.1	3293.12	19.01	3298.67	17.85	3306.33	18.35	3315.17	17.85
3324.33	18.21	3331.94	20.02	3332.84	20.24	3342.65	20.87	3348.71	21.56
3351.81	21.92	3361.71	22.06	3365.48	22.27	3370.22	22.58	3379.38	22.91
3382.76	23.2	3389.19	23.64	3398.35	23.57	3407.51	23.91	3416.39	24.25
3461.76	25.67	3465.99	25.81	3509.57	26.19	3540.42	26.34	3558.33	26.29
3571.95	26.2	3589.23	25.83	3597.78	25.78	3600.99	25.86	3604.99	26.4
3610.19	27.26	3610.89	27.37	3624.95	32.33	3635.69	33.07	3636.64	33.11
3779.99	37.73	3784.79	37.76	3977.99	38.96	4103.42	34.73	4158.8	32.89
4251.46	32.59	4277.44	33.77	4348.5	33.21	4450.34	32.52	4502.9	33.25
4589.57	32.06	4642.49	36.37	4682.55	39.79	4849.6	40.43	5053.2	41.32
5076.14	41.3	5271.78	41.15	5373.59	41.1	5484.25	40.56	5680.94	40.07
5693.99	40.03	6018.57	39	6337.78	37.64	6353.27	37.7	6365.16	37.85
6529.44	39.58	6602.74	40.64	6663.65	41.21	6752.9	42.21	6849.75	42.93
6979.22	43.75	7072.35	43.9	7220.05	44.03	7286.9	46.32	7423.73	50.96
7512.77	52.27	7632.68	54.23	7748.39	54.59	7948.67	55.08	7954.16	55.06
8189.64	53.69	8277.55	53.33	8432.56	52.47	8596.55	51.57	8697.89	51.64
8864.87	51.77	8921.13	51.83	9083.22	51.22	9241.52	50.31	9314.3	50.71
9481.66	51.95	9562.13	52.89	9637.25	53.02	9807.66	52.4	9887.04	51.81
9927	51.9510063.23		53.1610106.34		54.2610204.53		55.93		

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2.5	.04	3250.4	.028	3610.89	.07	3624.95	.05		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	3250.4	3624.95		1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions		num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev		
2.5	3250.4	30.06	3624.95	10204.53	30.06		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.028	
W.S. Elev (ft)	28.10	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1435.41	
E.G. Slope (ft/ft)	0.000143	Area (sq ft)		1435.41	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	350.58	Top Width (ft)		350.58	
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)		1.60	
Max Chl Dpth (ft)	10.25	Hydr. Depth (ft)		4.09	
Conv. Total (cfs)	191788.3	Conv. (cfs)		191788.3	
Length Wtd. (ft)	4751.08	Wetted Per. (ft)		352.87	

Min Ch El (ft)	17.85	Shear (lb/sq ft)	0.04
Alpha	1.00	Stream Power (lb/ft s)	0.06
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	3007.77
C & E Loss (ft)	0.00	Cum SA (acres)	539.33

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 40.575*

INPUT

Description: Interpolated Cross Section at River Mile 40.58

Station Elevation Data		num= 154							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.25	88.93	106.56	81.85	141.01	75.71	274.49	53.01	336.53	42.5
369.98	42.53	424.79	41.25	536.48	40.98	666.26	41.13	799.52	41.02
941.76	41.2	1058.86	41.31	1200.79	42.57	1331.15	42.33	1406.65	41.97
1454.11	41.09	1559.72	41.84	1711.34	41.95	1768.79	41.99	1858.73	41.79
1987.81	40.75	2035.35	39.98	2124.85	40.21	2247.9	40.01	2361.21	41.57
2387.16	41.74	2401.19	42.64	2405.21	42.68	2428.35	41.62	2483.07	37.92
2525.2	37.42	2612.61	38.09	2677.04	38.61	2720.58	36.35	2754.65	35.42
2809.64	34.98	2915.38	34.82	3046	35.01	3125.49	34.98	3177.77	35.23
3212.72	35.56	3320.57	36.2	3456.57	35.16	3565.53	34.59	3594.8	34.69
3613.73	33.84	3649.3	33.85	3764.02	34.72	3780.45	34.16	3784.5	33.9
3788.21	31.89	3791.03	29.69	3794.68	27.87	3800.67	25.49	3804.59	23.98
3806.71	23.68	3812.06	22.88	3812.7	22.69	3818.69	21.01	3823	19.8
3824.68	19.53	3830.66	18.53	3836.65	17.43	3843.55	17.88	3851.5	17.43
3860.29	17.77	3867.59	19.41	3868.46	19.61	3877.87	20.2	3883.69	20.85
3886.66	21.18	3896.16	21.34	3899.79	21.54	3904.33	21.87	3913.12	22.26
3916.36	22.56	3922.53	22.96	3931.32	22.9	3940.11	23.21	3948.64	23.53
3992.17	24.83	3996.23	24.96	4038.05	25.34	4067.66	25.49	4084.84	25.38
4097.91	25.25	4114.49	24.7	4122.7	24.62	4125.78	24.75	4129.62	25.29
4134.61	26.23	4135.28	26.36	4148.77	31.3	4159.88	32.05	4160.86	32.1
4309.14	36.25	4314.1	36.28	4513.93	37.34	4643.67	33.53	4700.95	31.88
4796.79	31.64	4823.67	32.71	4897.16	32.22	5002.5	31.69	5056.86	33.05
5146.51	31.69	5201.24	35.39	5242.68	38.43	5415.46	38.86	5626.05	39.54
5649.77	39.5	5852.13	39.28	5957.44	39.2	6071.9	38.68	6275.34	38.48
6288.83	38.44	6624.56	37.7	6954.73	36.65	6970.74	36.72	6983.04	36.93
7152.96	39.47	7228.77	40.86	7291.78	41.57	7384.09	42.74	7484.27	43.47
7618.18	44.22	7714.5	44.37	7867.28	44.45	7936.42	46.49	8077.95	50.59
8170.04	51.72	8294.07	53.54	8413.75	53.92	8620.91	54.37	8626.59	54.35
8870.14	52.87	8961.07	52.54	9121.4	51.76	9291.02	50.95	9395.84	51.02
9568.55	51.14	9626.74	51.19	9794.4	50.66	9958.13	49.67	10033.41	49.95
10206.51	51.07	10289.75	52.13	10367.45	52.45	10543.7	51.78	10625.81	51.02
10667.14	51.03	10808.05	52.16	10852.64	53.58	10954.2	55.6		

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2.25	.04	3784.5	.028	4135.28	.07	4148.77	.05		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	3784.5	4148.77		1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions		num= 2							
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L
2.25	3784.5	29.29	4148.77	10954.2	29.29				

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.46	Element	Left OB	Channel	Right OB
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Vel Head (ft)	0.04	Wt. n-Val.		0.028	
W.S. Elev (ft)	27.42	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1431.72	
E.G. Slope (ft/ft)	0.000141	Area (sq ft)		1431.72	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	342.34	Top Width (ft)		342.34	
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)		1.60	
Max Chl Dpth (ft)	9.99	Hydr. Depth (ft)		4.18	
Conv. Total (cfs)	193047.8	Conv. (cfs)		193047.8	
Length Wtd. (ft)	4751.08	Wetted Per. (ft)		344.44	
Min Ch El (ft)	17.43	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)		2851.41	
C & E Loss (ft)	0.00	Cum SA (acres)		501.54	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 39.6666*

INPUT
 Description: Interpolated Cross Section at River Mile 39.67
 Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2	86.73	121.05	80.07	160.37	74.49	312.7	54.32	383.51	45
421.68	45.04	484.23	43.32	611.7	42.95	759.82	43.14	911.91	42.97
1074.24	43.2	1207.89	43.33	1369.87	45	1518.64	44.66	1604.81	44.18
1658.97	42.99	1779.51	43.98	1952.54	44.11	2018.11	44.16	2120.76	43.88
2268.07	42.48	2322.33	41.45	2424.48	41.74	2564.91	41.47	2694.24	43.53
2723.84	43.75	2739.86	44.59	2744.44	44.54	2770.86	43.1	2833.31	38.13
2881.39	37.43	2981.15	38.26	3054.68	38.88	3104.37	35.83	3143.26	34.56
3206.01	33.93	3326.7	33.62	3475.77	33.76	3566.48	33.64	3626.15	33.81
3666.04	34.13	3789.13	34.63	3944.34	33.62	4068.69	33.16	4102.1	33.37
4123.71	32.29	4164.29	32.4	4295.23	33.5	4313.98	33.05	4318.6	32.77
4322.59	30.71	4325.61	28.26	4329.54	26.45	4335.97	24.29	4340.18	22.95
4342.47	22.67	4348.21	21.94	4348.9	21.77	4355.33	20.28	4359.97	19.2
4361.77	18.96	4368.2	18.05	4374.63	17	4380.77	17.4	4387.83	17
4396.25	17.32	4403.25	18.8	4404.08	18.98	4413.09	19.54	4418.67	20.13
4421.52	20.44	4430.62	20.62	4434.09	20.81	4438.44	21.16	4446.86	21.62
4449.97	21.92	4455.88	22.28	4464.3	22.23	4472.72	22.52	4480.88	22.8
4522.59	24	4526.47	24.11	4566.54	24.49	4594.89	24.65	4611.36	24.47
4623.88	24.3	4639.76	23.57	4647.62	23.47	4650.57	23.63	4654.25	24.18
4659.03	25.21	4659.67	25.35	4672.6	30.27	4684.07	31.04	4685.09	31.09
4838.29	34.77	4843.41	34.79	5049.87	35.73	5183.91	32.32	5243.1	30.88
5342.12	30.69	5369.89	31.64	5445.82	31.23	5554.65	30.86	5610.82	32.84
5703.44	31.31	5759.99	34.41	5802.81	37.08	5981.32	37.29	6198.9	37.75
6223.41	37.7	6432.48	37.4	6541.29	37.3	6659.54	36.81	6869.73	36.88
6883.68	36.86	7230.54	36.4	7571.67	35.67	7588.21	35.74	7600.93	36.01
7776.48	39.36	7854.81	41.09	7919.91	41.92	8015.28	43.27	8118.78	44
8257.14	44.69	8356.66	44.84	8514.5	44.86	8585.94	46.66	8732.17	50.22
8827.32	51.17	8955.45	52.85	9079.12	53.25	9293.14	53.67	9299.01	53.65
9550.65	52.05	9644.59	51.75	9810.25	51.05	9985.49	50.3310093	79	50.4
10272.24	50.510332	36	50.5510505	58	50.0910674	75	49.0310752	52	49.19
10931.37	50.211017	37	51.3711097	64	51.8811279	75	51.1611364	58	50.22
11407.28	50.111552	87	51.1511598	93	52.9111703	87	55.27		

Manning's n Values	num=	4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2	.04	4318.6	.029	4659.67	.07	4672.6	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4318.6	4672.6	1903.5	4751.08	1745.42	.1	.3
Blocked Obstructions		num=	2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
2	4318.6	28.51	4672.6	1703.87	28.51	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	26.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
W.S. Elev (ft)	26.72	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1420.75	
E.G. Slope (ft/ft)	0.000151	Area (sq ft)		1420.75	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	334.30	Top Width (ft)		334.30	
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)		1.61	
Max Chl Dpth (ft)	9.72	Hydr. Depth (ft)		4.25	
Conv. Total (cfs)	186374.6	Conv. (cfs)		186374.6	
Length Wtd. (ft)	4751.08	Wetted Per. (ft)		336.26	
Min Ch El (ft)	17.00	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)		2695.85	
C & E Loss (ft)	0.00	Cum SA (acres)		464.64	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 38.7583*

INPUT

Description: Interpolated Cross Section at River Mile 38.76

Station Elevation Data		num=	154						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.75	84.54	135.53	78.29	179.72	73.26	350.92	55.63	430.48	47.5
473.38	47.55	543.68	45.39	686.93	44.91	853.38	45.15	1024.29	44.93
1206.72	45.2	1356.92	45.35	1538.95	47.42	1706.14	46.99	1802.97	46.38
1863.84	44.89	1999.29	46.12	2193.75	46.27	2267.44	46.33	2382.79	45.97
2548.34	44.2	2609.32	42.92	2724.11	43.27	2881.92	42.92	3027.26	45.49
3060.53	45.76	3078.52	46.54	3083.68	46.4	3113.36	44.59	3183.55	38.33
3237.58	37.44	3349.69	38.42	3432.32	39.16	3488.16	35.31	3531.86	33.7
3602.39	32.87	3738.01	32.42	3905.54	32.5	4007.48	32.3	4074.53	32.38
4119.36	32.7	4257.68	33.06	4432.11	32.08	4571.85	31.73	4609.4	32.04
4633.68	30.75	4679.29	30.95	4826.43	32.27	4847.51	31.93	4852.7	31.63
4856.96	29.53	4860.2	26.83	4864.39	25.04	4871.27	23.09	4875.78	21.91
4878.22	21.66	4884.36	21	4885.1	20.85	4891.98	19.54	4896.94	18.6
4898.86	18.39	4905.74	17.57	4912.62	16.58	4917.98	16.92	4924.17	16.58
4932.22	16.88	4938.91	18.19	4939.7	18.34	4948.32	18.87	4953.65	19.41
4956.37	19.7	4965.07	19.9	4968.39	20.09	4972.55	20.46	4980.6	20.97
4983.57	21.28	4989.22	21.6	4997.27	21.57	5005.32	21.82	5013.13	22.08
5053	23.16	5056.72	23.26	5095.02	23.64	5122.13	23.81	5137.88	23.57
5149.84	23.35	5165.03	22.43	5172.55	22.31	5175.36	22.51	5178.88	23.07
5183.45	24.18	5184.06	24.33	5196.43	29.23	5208.27	30.02	5209.32	30.08
5367.43	33.28	5372.72	33.3	5585.81	34.11	5724.16	31.12	5785.25	29.87
5887.45	29.73	5916.11	30.58	5994.48	30.24	6106.81	30.02	6164.78	32.64
6260.38	30.94	6318.74	33.44	6362.93	35.72	6547.18	35.71	6771.75	35.96
6797.05	35.9	7012.84	35.53	7125.13	35.41	7247.19	34.93	7464.13	35.28
7478.52	35.27	7836.53	35.1	8188.61	34.69	8205.69	34.76	8218.81	35.08
8400	39.26	8480.85	41.31	8548.04	42.28	8646.47	43.8	8753.3	44.54

8896.09	45.16	8998.81	45.31	9161.73	45.28	9235.46	46.83	9386.38	49.86
9484.59	50.63	9616.84	52.17	9744.48	52.58	9965.38	52.96	9971.44	52.94
10231.16	51.23	10328.12	50.97	10499.09	50.35	10679.97	49.72	10791.74	49.77
10975.92	49.86	11037.97	49.91	11216.75	49.53	11391.36	48.39	11471.63	48.43
11656.22	49.32	11744.98	50.62	11827.84	51.31	12015.79	50.54	12103.34	49.43
12147.42	49.18	12297.68	50.14	12345.23	52.23	12453.53	54.93		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1.75	.04	4852.7	.029	5184.06	.07	5196.43	.055

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

4852.7	5196.43	1903.5	4751.08	1745.42	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1.75	4852.7	27.72	5196.43	12453.53	27.72

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	26.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
W.S. Elev (ft)	25.99	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1402.48	
E.G. Slope (ft/ft)	0.000154	Area (sq ft)		1402.48	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	326.09	Top Width (ft)		326.09	
Vel Total (ft/s)	1.63	Avg. Vel. (ft/s)		1.63	
Max Chl Dpth (ft)	9.41	Hydr. Depth (ft)		4.30	
Conv. Total (cfs)	184686.2	Conv. (cfs)		184686.2	
Length Wtd. (ft)	4751.08	Wetted Per. (ft)		327.99	
Min Ch El (ft)	16.58	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)		2541.88	
C & E Loss (ft)	0.00	Cum SA (acres)		428.62	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 37.85*

INPUT

Description: Interpolated Cross Section at River Mile 37.85

Station	Elevation	Data	num=	154					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.5	82.35	150.02	76.51	199.08	72.04	389.13	56.94	477.46	50
525.09	50.06	603.13	47.47	762.15	46.88	946.94	47.16	1136.68	46.88
1339.21	47.2	1505.94	47.37	1708.03	49.85	1893.63	49.32	2001.13	48.58
2068.7	46.79	2219.08	48.26	2434.96	48.43	2516.76	48.49	2644.82	48.06
2828.6	45.93	2896.3	44.39	3023.73	44.81	3198.93	44.38	3360.28	47.45
3397.21	47.77	3417.19	48.49	3422.92	48.27	3455.87	46.08	3533.78	38.54
3593.77	37.44	3718.23	38.59	3809.96	39.44	3871.95	34.8	3920.47	32.84
3998.76	31.82	4149.32	31.21	4335.3	31.24	4448.48	30.96	4522.91	30.95
4572.68	31.27	4726.24	31.49	4919.88	30.54	5075.02	30.29	5116.7	30.72
5143.65	29.2	5194.29	29.5	5357.64	31.04	5381.03	30.81	5386.8	30.5
5391.34	28.36	5394.78	28.39	5399.25	23.62	5406.58	21.9	5411.38	20.87
5413.98	20.65	5420.51	20.06	5421.3	19.93	5428.63	18.81	5433.9	18
5435.95	17.82	5443.28	17.09	5450.6	16.15	5455.2	16.45	5460.5	16.15
5468.18	16.43	5474.56	17.57	5475.32	17.71	5483.54	18.21	5488.63	18.7
5491.22	18.96	5499.52	19.18	5502.69	19.36	5506.66	19.75	5514.34	20.32

5517.18	20.64	5522.57	20.92	5530.25	20.9	5537.93	21.13	5545.38	21.36
5583.41	22.32	5586.96	22.42	5623.5	22.78	5649.37	22.96	5664.39	22.66
5675.81	22.4	5690.3	21.3	5697.47	21.15	5700.16	21.39	5703.51	21.96
5707.88	23.15	5708.46	23.32	5720.25	28.2	5732.46	29.01	5733.54	29.07
5896.58	31.8	5902.03	31.82	6121.76	32.49	6264.41	29.92	6327.4	28.87
6432.78	28.78	6462.33	29.51	6543.14	29.25	6658.96	29.19	6718.74	32.43
6817.31	30.57	6877.49	32.46	6923.06	34.37	7113.04	34.14	7344.59	34.17
7370.68	34.1	7593.19	33.65	7708.98	33.51	7834.83	33.06	8058.52	33.68
8073.36	33.69	8442.51	33.8	8805.55	33.71	8823.16	33.78	8836.69	34.16
9023.52	39.15	9106.88	41.54	9176.16	42.63	9277.66	44.33	9387.81	45.08
9535.05	45.64	9640.97	45.78	9808.95	45.69	9884.98	46.99	10040.6	49.49
10141.86	50.08	10278.23	51.48	10409.84	51.91	10637.61	52.25	10643.86	52.24
10911.66	50.41	11011.64	50.18	11187.93	49.64	11374.44	49.11	11489.69	49.15
11679.6	49.22	11743.59	49.28	11927.93	48.97	12107.97	47.74	12190.74	47.67
12381.07	48.45	12472.6	49.86	12558.03	50.73	12751.84	49.92	12842.11	48.64
12887.56	48.25	13042.5	49.14	13091.52	51.56	13203.2	54.6		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 1.5 .04 5386.8 .029 5720.25 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5386.8 5720.25 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 1.5 5386.8 26.94 5720.25 13203.2 26.94

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.029	
W.S. Elev (ft)	25.28	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1390.60	
E.G. Slope (ft/ft)	0.000146	Area (sq ft)		1390.60	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	318.15	Top Width (ft)		318.15	
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)		1.65	
Max Chl Dpth (ft)	9.13	Hydr. Depth (ft)		4.37	
Conv. Total (cfs)	189726.2	Conv. (cfs)		189726.2	
Length Wtd. (ft)	4751.08	Wetted Per. (ft)		320.05	
Min Ch El (ft)	16.15	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)		2389.56	
C & E Loss (ft)	0.00	Cum SA (acres)		393.49	

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 36.9416*

INPUT

Description: Interpolated Cross Section at River Mile 36.94

Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.25	80.16	164.51	74.73	218.43	70.82	427.34	58.25	524.43	52.5
576.79	52.56	662.57	49.54	837.38	48.85	1040.5	49.16	1249.07	48.83
1471.69	49.2	1654.97	49.39	1877.11	52.27	2081.13	51.65	2199.29	50.79
2273.57	48.69	2438.87	50.4	2676.17	50.6	2766.08	50.66	2906.85	50.15
3108.87	47.66	3183.28	45.86	3323.36	46.34	3515.94	45.83	3693.3	49.4
3733.9	49.79	3755.86	50.45	3762.15	50.13	3798.37	47.56	3884.02	38.75
3949.96	37.45	4086.77	38.75	4187.6	39.71	4255.74	34.28	4309.07	31.99

4395.13	30.77	4560.64	30.01	4765.07	29.98	4889.47	29.62	4971.29	29.53
5026	29.85	5194.8	29.92	5407.65	29	5578.18	28.86	5624	29.4
5653.63	27.65	5709.29	28.05	5888.85	29.82	5914.56	29.69	5920.9	29.37
5925.72	27.18	5929.37	23.96	5934.11	22.2	5941.88	20.7	5946.97	19.83
5949.73	19.64	5956.66	19.12	5957.5	19.01	5965.27	18.07	5970.87	17.4
5973.04	17.25	5980.81	16.61	5988.58	15.73	5992.42	15.97	5996.83	15.73
6004.14	15.99	6010.22	16.96	6010.94	17.08	6018.77	17.54	6023.61	17.98
6026.08	18.21	6033.98	18.46	6036.99	18.63	6040.77	19.04	6048.08	19.68
6050.78	20	6055.91	20.24	6063.22	20.23	6070.53	20.43	6077.62	20.63
6113.83	21.49	6117.21	21.57	6151.99	21.93	6176.61	22.12	6190.9	21.75
6201.77	21.45	6215.56	20.17	6222.39	19.99	6224.95	20.28	6228.15	20.85
6232.3	22.13	6232.85	22.3	6244.08	27.17	6256.66	27.99	6257.77	28.06
6425.73	30.32	6431.34	30.33	6657.7	30.87	6804.66	28.71	6869.54	27.86
6978.11	27.83	7008.55	28.45	7091.8	28.26	7211.12	28.36	7272.7	32.23
7374.25	30.2	7436.24	31.48	7483.19	33.01	7678.9	32.57	7917.44	32.38
7944.32	32.3	8173.54	31.77	8292.83	31.61	8422.48	31.18	8652.92	32.09
8668.21	32.1	9048.5	32.5	9422.49	32.72	9440.63	32.8	9454.57	33.23
9647.04	39.04	9732.92	41.77	9804.29	42.99	9908.85	44.8510022.33	45.62	
10174.01	46.1110283.12		46.2510456.18		46.11	10534.5	47.1610694.82	49.12	
10799.14	49.5310939.62		50.79	11075.2	51.2511309.84		51.5411316.28	51.53	
11592.17	49.5911695.17		49.411876.78		48.9312068.91		48.4812187.64	48.52	
12383.29	48.59	12449.2	48.6412639.11		48.4112824.58		47.112909.85	46.91	
13105.93	47.5713200.21		49.113288.23		50.1613487.88		49.313580.88	47.84	
13627.7	47.3313787.32		48.1313837.82		50.8813952.87		54.27		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1.25	.04	5920.9	.029	6244.08	.055

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

5920.9	6244.08	1903.5	4751.08	1745.42	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	5920.9	26.16	6244.08	13952.87	26.16

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	24.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.029	
W.S. Elev (ft)	24.61	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1388.82	
E.G. Slope (ft/ft)	0.000142	Area (sq ft)		1388.82	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	309.53	Top Width (ft)		309.53	
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)		1.65	
Max Chl Dpth (ft)	8.88	Hydr. Depth (ft)		4.49	
Conv. Total (cfs)	192724.7	Conv. (cfs)		192724.7	
Length Wtd. (ft)	4751.08	Wetted Per. (ft)		311.60	
Min Ch El (ft)	15.73	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)		2237.99	
C & E Loss (ft)	0.00	Cum SA (acres)		359.26	

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 36.0333*

INPUT
 Description: Interpolated Cross Section at River Mile 36.03
 Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1	77.97	178.99	72.94	237.78	69.59	465.55	59.56	571.41	55
628.49	55.07	722.02	51.61	912.6	50.82	1134.06	51.17	1361.45	50.79
1604.17	51.2	1803.99	51.42	2046.19	54.7	2268.62	53.98	2397.46	52.99
2478.44	50.59	2658.65	52.54	2917.37	52.76	3015.41	52.83	3168.88	52.24
3389.14	49.39	3470.27	47.33	3622.99	47.87	3832.95	47.28	4026.32	51.36
4070.59	51.8	4094.53	52.4	4101.39	51.99	4140.88	49.05	4234.25	38.96
4306.15	37.46	4455.3	38.91	4565.24	39.99	4639.54	33.76	4697.68	31.13
4791.51	29.71	4971.95	28.81	5194.83	28.73	5330.47	28.28	5419.67	28.1
5479.32	28.42	5663.35	28.35	5895.42	27.46	6081.35	27.43	6131.3	28.08
6163.6	26.1	6224.29	26.6	6420.05	28.59	6448.09	28.57	6455	28.23
6460.09	26.01	6463.96	22.53	6468.97	20.78	6477.19	19.5	6482.57	18.79
6485.48	18.63	6492.82	18.18	6493.7	18.09	6501.92	17.34	6507.84	16.8
6510.13	16.68	6518.35	16.12	6526.57	15.3	6529.63	15.5	6533.17	15.3
6540.11	15.54	6545.88	16.35	6546.56	16.45	6553.99	16.88	6558.58	17.26
6560.93	17.47	6568.43	17.74	6571.29	17.91	6574.88	18.33	6581.82	19.03
6584.38	19.36	6589.26	19.56	6596.2	19.57	6603.14	19.74	6609.87	19.91
6644.24	20.65	6647.45	20.72	6680.47	21.08	6703.85	21.28	6717.42	20.85
6727.74	20.5	6740.83	19.03	6747.31	18.83	6749.74	19.16	6752.78	19.74
6756.72	21.1	6757.24	21.29	6767.9	26.13	6780.85	26.98	6782	27.05
6954.87	28.84	6960.66	28.85	7193.64	29.25	7344.91	27.51	7411.69	26.86
7523.44	26.87	7554.77	27.38	7640.46	27.26	7763.28	27.53	7826.66	32.02
7931.18	29.83	7994.99	30.51	8043.31	31.65	8244.76	30.99	8490.29	30.59
8517.95	30.5	8753.89	29.9	8876.67	29.71	9010.12	29.3	9247.32	30.49
9263.05	30.52	9654.48	31.21110039.44	31.74110058.11	31.82110072.45	31.82110072.45	31.82110072.45	32.31	32.31
10270.56	38.9310358.95	41.9910432.42	43.3410540.04	45.3810656.84	46.15	46.15	46.15	46.15	46.15
10812.97	46.5810925.28	46.72	11103.4	46.5211184.02	47.3311349.03	48.75	48.75	48.75	48.75
11456.41	48.9911601.01	50.1111740.56	50.5811982.08	50.8311988.71	50.82	50.82	50.82	50.82	50.82
12272.68	48.7812378.69	48.6112565.62	48.2312763.38	47.8712885.59	47.9	47.9	47.9	47.9	47.9
13086.97	47.9513154.81	48.13350.29	47.8513541.19	46.4613628.96	46.15	46.15	46.15	46.15	46.15
13830.78	46.713927.83	48.3514018.42	49.5914223.92	48.6814319.65	47.05	47.05	47.05	47.05	47.05
14367.84	46.414532.13	47.1314584.12	50.214702.53	53.93					

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1	.04	6455	.029	6767.9	.055

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

6455	6767.9	1903.5	4751.08	1745.42	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1	6455	25.37	6767.9	14702.53	25.37

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	24.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.029	
W.S. Elev (ft)	23.96	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1396.05	
E.G. Slope (ft/ft)	0.000134	Area (sq ft)		1396.05	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	300.75	Top Width (ft)		300.75	
Vel Total (ft/s)	1.64	Avg. Vel. (ft/s)		1.64	
Max Chl Dpth (ft)	8.66	Hydr. Depth (ft)		4.64	
Conv. Total (cfs)	198008.0	Conv. (cfs)		198008.0	
Length Wtd. (ft)	4751.08	Wetted Per. (ft)		303.13	
Min Ch El (ft)	15.30	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frcn Loss (ft)	0.61	Cum Volume (acre-ft)		2086.11	
C & E Loss (ft)	0.00	Cum SA (acres)		325.98	

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 35.125*

INPUT

Description: Interpolated Cross Section at River Mile 35.13

Station Elevation Data num= 154									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.75	75.77	193.48	71.16	257.14	68.37	503.76	60.87	618.39	57.5
680.19	57.58	781.46	53.68	987.83	52.79	1227.62	53.18	1473.84	52.74
1736.65	53.2	1953.02	53.44	2215.26	57.12	2456.12	56.31	2595.62	55.19
2683.3	52.5	2878.44	54.68	3158.58	54.92	3264.73	55	3430.91	54.33
3669.4	51.12	3757.25	48.79	3922.62	49.4	4149.97	48.74	4359.34	53.32
4407.27	53.81	4433.2	54.35	4440.62	53.85	4483.38	50.54	4584.49	39.17
4662.33	37.47	4823.84	39.08	4942.88	40.27	5023.33	33.25	5086.28	30.27
5187.88	28.66	5383.26	27.61	5624.6	27.47	5771.46	26.94	5868.06	26.68
5932.64	26.99	6131.91	26.79	6383.19	25.92	6584.51	26	6638.6	26.76
6673.58	24.55	6739.29	25.15	6951.26	27.36	6981.62	27.45	6989.1	27.1
6994.47	24.83	6998.54	21.1	7003.83	19.36	7012.49	18.3	7018.16	17.75
7021.24	17.63	7028.97	17.24	7029.9	17.16	7038.56	16.6	7044.8	16.2
7047.23	16.11	7055.89	15.64	7064.55	14.88	7066.85	15.02	7069.5	14.88
7076.07	15.1	7081.53	15.74	7082.18	15.82	7089.21	16.21	7093.56	16.55
7095.79	16.73	7102.89	17.02	7105.6	17.18	7108.99	17.62	7115.56	18.39
7117.99	18.72	7122.6	18.88	7129.17	18.9	7135.74	19.04	7142.11	19.18
7174.66	19.81	7177.69	19.87	7208.95	20.22	7231.08	20.43	7243.93	19.94
7253.7	19.55	7266.1	17.9	7272.23	17.67	7274.53	18.04	7277.41	18.63
7281.14	20.08	7281.64	20.28	7291.73	25.1	7305.04	25.96	7306.22	26.03
7484.02	27.35	7489.97	27.36	7729.59	27.63	7885.16	26.31	7953.84	25.85
8068.77	25.92	8100.99	26.32	8189.12	26.27	8315.43	26.7	8380.62	31.82
8488.12	29.46	8553.75	29.53	8603.44	30.3	8810.62	29.42	9063.14	28.81
9091.59	28.7	9334.24	28.02	9460.52	27.81	9597.77	27.43	9841.71	28.89
9857.89	28.93	10260.47	29.91	10656.38	30.76	10675.58	30.84	10690.33	31.39
10894.08	38.82	10984.99	42.22	11060.55	43.71	11171.23	45.91	11291.36	46.69
11451.93	47.06	11567.43	47.19	11750.63	46.94	11833.54	47.51	12003.25	48.38
12113.68	48.44	12262.4	49.42	12405.92	49.91	12654.31	50.12	12661.13	50.12
12953.18	47.96	13062.21	47.82	13254.47	47.52	13457.86	47.25	13583.55	47.27
13790.65	47.31	13860.43	47.36	14061.47	47.29	14257.8	45.82	14348.07	45.38
14555.64	45.82	14655.45	47.59	14748.62	49.02	14959.97	48.06	15058.42	46.25
15107.98	45.48	15276.95	46.12	15330.41	49.53	15452.2	53.6		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
.75	.04	6989.1	.029	7291.73	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	6989.1	7291.73	1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
.75	6989.1	24.6	7291.73	15452.2	24.6

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	23.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.029	
W.S. Elev (ft)	23.36	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1415.72	
E.G. Slope (ft/ft)	0.000123	Area (sq ft)		1415.72	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	292.00	Top Width (ft)		292.00	

Vel Total (ft/s)	1.62	Avg. Vel. (ft/s)	1.62
Max Chl Dpth (ft)	8.48	Hydr. Depth (ft)	4.85
Conv. Total (cfs)	206487.3	Conv. (cfs)	206487.3
Length Wtd. (ft)	4751.08	Wetted Per. (ft)	294.78
Min Ch El (ft)	14.88	Shear (lb/sq ft)	0.04
Alpha	1.00	Stream Power (lb/ft s)	0.06
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	1932.78
C & E Loss (ft)	0.00	Cum SA (acres)	293.65

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 34.2166*

INPUT
 Description: Interpolated Cross Section at River Mile 34.22

Station Elevation Data		num= 154	
Sta	Elev	Sta	Elev
.5	73.58	207.97	69.38
731.9	60.09	840.91	55.76
1869.14	55.2	2102.05	55.46
2888.17	54.4	3098.23	56.82
3949.67	52.84	4044.23	50.26
4743.96	55.82	4771.86	56.3
5018.52	37.48	5192.38	39.24
5584.25	27.61	5794.57	26.4
6385.96	25.56	6600.47	25.22
7183.55	23	7254.29	23.7
7528.85	23.65	7533.13	19.66
7556.99	16.62	7565.12	16.3
7584.32	15.54	7593.42	15.16
7612.03	14.65	7617.19	15.12
7630.64	15.99	7637.34	16.3
7651.59	18.08	7655.94	18.2
7705.07	18.97	7707.94	19.03
7779.67	18.6	7791.37	16.77
7805.56	19.05	7806.03	19.26
8013.17	25.87	8019.28	25.87
8614.1	24.97	8647.22	25.26
9045.05	29.09	9112.5	28.55
9665.23	26.9	9914.6	26.15
10452.74	27.34	10866.45	28.61
11517.6	38.71	11611.03	42.45
12090.89	47.53	12209.59	47.66
12770.95	47.89	12923.79	48.73
13633.69	47.14	13745.74	47.04
14494.33	46.67	14566.04	46.73
15280.49	44.95	15383.06	46.83
15848.12	44.55	16021.77	45.11
			276.49
			1063.05
			2384.34
			3399.79
			4222.24
			4779.86
			5320.52
			6054.37
			6870.96
			7482.47
			7538.68
			7566.1
			7602.53
			7617.8
			7639.9
			7662.15
			7737.44
			7797.16
			7815.55
			8265.53
			8737.78
			9163.57
			10044.36
			11273.32
			11688.67
			12397.85
			13071.28
			13943.31
			14152.33
			14772.64
			15478.81
			16076.71
			541.98
			1321.18
			2643.61
			3514.05
			4466.98
			4825.89
			5407.12
			6212.46
			7087.67
			7515.14
			7547.79
			7575.21
			7604.07
			7624.44
			7643.1
			7668.35
			7758.32
			7799.33
			7829.24
			8425.4
			8867.59
			9376.48
			10185.41
			11293.05
			11802.42
			12483.06
			13326.55
			14152.33
			14974.42
			15696.01
			16201.87
			62.18
			1586.23
			2793.78
			3692.94
			4692.36
			4934.73
			5474.89
			6316.44
			7145.9
			7523.2
			7553.76
			7581.77
			7605.83
			7628.54
			7649.31
			7674.36
			7770.45
			7802.04
			7830.45
			8495.99
			8934.58
			9635.99
			10436.11
			11308.22
			11925.87
			12657.47
			13333.55
			14281.5
			15067.18
			15797.19
			60
			54.69
			57.39
			56.42
			55.28
			39.38
			29.41
			25.25
			25.44
			25.97
			16.71
			15.6
			14.45
			15.83
			17.74
			18.46
			19.03
			17.52
			25.02
			24.85
			31.61
			27.02
			27.29
			30.46
			47.23
			48.01
			49.41
			46.65
			44.62
			45.46

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
.5	.04	7523.2	.03
			7815.55
			.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
7523.2	7815.55	1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Sta L
.5	7523.2	23.82	7815.55
			16201.87
			23.82

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	22.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
W.S. Elev (ft)	22.79	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1443.08	
E.G. Slope (ft/ft)	0.000119	Area (sq ft)		1443.08	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	283.24	Top Width (ft)		283.24	
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)		1.59	
Max Chl Dpth (ft)	8.34	Hydr. Depth (ft)		5.09	
Conv. Total (cfs)	210016.4	Conv. (cfs)	210016.4		
Length Wtd. (ft)	4751.08	Wetted Per. (ft)		286.52	
Min Ch El (ft)	14.45	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.06	
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)		1776.87	
C & E Loss (ft)	0.00	Cum SA (acres)		262.28	

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 33.3083*

INPUT
 Description: Interpolated Cross Section at River Mile 33.31
 Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.25	71.39	222.45	67.6	295.85	65.92	580.19	63.49	712.34	62.5
783.6	62.59	900.35	57.83	1138.28	56.73	1414.74	57.19	1698.61	56.65
2001.62	57.2	2251.07	57.48	2553.42	61.97	2831.11	60.97	2991.94	59.6
3093.03	56.3	3318.01	58.96	3640.99	59.24	3763.38	59.33	3954.97	58.51
4229.93	54.57	4331.22	51.73	4521.87	52.47	4783.99	51.65	5025.38	57.24
5080.64	57.84	5110.53	58.25	5119.09	57.57	5168.39	53.51	5284.96	39.59
5374.71	37.49	5560.92	39.41	5698.16	40.82	5790.91	32.22	5863.49	28.56
5980.63	26.55	6205.89	25.2	6484.13	24.96	6653.45	24.26	6764.82	23.83
6839.28	24.13	7069.02	23.65	7358.73	22.84	7590.84	23.13	7653.2	24.12
7693.53	21.45	7769.28	22.25	8013.67	24.91	8048.67	25.22	8057.3	24.83
8063.22	22.48	8067.71	18.23	8073.54	16.52	8083.1	15.9	8089.35	15.67
8092.75	15.61	8101.27	15.36	8102.3	15.32	8111.85	15.13	8118.74	15
8121.41	14.97	8130.96	14.68	8140.52	14.03	8141.28	14.08	8142.17	14.03
8148	14.21	8152.84	14.51	8153.42	14.56	8159.66	14.88	8163.52	15.12
8165.49	15.25	8171.79	15.58	8174.2	15.73	8177.21	16.2	8183.05	17.09
8185.2	17.44	8189.29	17.52	8195.12	17.57	8200.95	17.65	8206.61	17.74
8235.49	18.14	8238.18	18.18	8265.92	18.52	8285.56	18.74	8296.96	18.13
8305.63	17.65	8316.63	15.63	8322.08	15.36	8324.12	15.81	8326.67	16.41
8329.98	18.03	8330.42	18.25	8339.38	23.03	8353.43	23.93	8354.67	24.01
8542.31	24.39	8548.59	24.39	8801.47	24.4	8965.65	23.9	9038.14	23.84
9159.43	24.02	9193.44	24.19	9286.44	24.29	9419.74	25.03	9488.54	31.41
9601.99	28.72	9671.25	27.58	9723.7	27.59	9942.34	26.27	10208.84	25.23
10238.86	25.11	10494.95	24.28	10628.21	24.01	10773.05	23.68	11030.5	25.7
11047.58	25.76	11472.44	27.31	11890.26	28.79	11910.53	28.88	11926.1	29.54
12141.12	38.61	12237.06	42.67	12316.8	44.41	12433.61	46.97	12560.38	47.76
12729.85	48.12	12851.74	48.13	13045.08	47.77	13132.58	47.83	13311.68	47.64
13428.23	47.35	13585.17	48.05	13736.64	48.57	13998.78	48.71	14005.98	48.71
14314.19	46.32	14429.26	46.25	14632.16	46.11	14846.8	46.02	14979.45	46.02
15198.02	46.04	15271.66	46.09	15483.82	46.16	15691.03	44.53	15786.29	43.86
16005.34	44.07	16110.68	46.08	16209	47.87	16432.05	46.82	16535.96	44.67
16588.26	43.63	16766.58	44.11	16823	48.18	16951.53	52.93		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
.25	.04	8057.3	.03	8339.38	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8057.3	8339.38	1903.5	4751.09	1745.42	.1	.3
Blocked Obstructions		num=	2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
.25	8057.3	23.03	8339.38	16951.53	23.03	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	22.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
W.S. Elev (ft)	22.26	Reach Len. (ft)	1903.50	4751.09	1745.42
Crit W.S. (ft)		Flow Area (sq ft)		1477.07	
E.G. Slope (ft/ft)	0.000106	Area (sq ft)		1477.07	
Q Total (cfs)	2293.00	Flow (cfs)		2293.00	
Top Width (ft)	274.47	Top Width (ft)		274.47	
Vel Total (ft/s)	1.55	Avg. Vel. (ft/s)		1.55	
Max Chl Dpth (ft)	8.23	Hydr. Depth (ft)		5.38	
Conv. Total (cfs)	222585.0	Conv. (cfs)		222585.0	
Length Wtd. (ft)	4751.09	Wetted Per. (ft)		278.34	
Min Ch El (ft)	14.03	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.48	Cum Volume (acre-ft)		1617.62	
C & E Loss (ft)	0.00	Cum SA (acres)		231.87	

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 32.4

INPUT

Description: Cross Section at River Mile 32.4

Station Elevation Data	num=	97							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.2	315.2	64.7	618.4	64.8	835.3	65.1	959.8	59.9
1213.5	58.7	1508.3	59.2	1811	58.6	2134.1	59.2	2400.1	59.5
2722.5	64.4	3018.6	63.3	3190.1	61.8	3297.9	58.2	3537.8	61.1
3882.2	61.4	4012.7	61.5	4217	60.6	4510.2	56.3	4618.2	53.2
4821.5	54	5101	53.1	5358.4	59.2	5449.2	60.2	5510.9	55
5635.2	39.8	5730.9	37.5	6075.8	41.1	6174.7	31.7	6252.1	27.7
6377	25.5	6617.2	24	6913.9	23.7	7213.2	22.4	7292.6	22.7
7846.5	21.3	8094	21.7	8160.5	22.8	8203.5	19.9	8582.2	24.1
8591.4	23.7	8597.6	21.3	8602.3	16.8	8608.4	15.1	8618.4	14.7
8628.5	14.6	8638.5	14.4	8648.5	14.4	8658.5	14.4	8668.5	14.2
8678.5	13.6	8688.5	13.9	8698.5	14.4	8708.5	15	8718.8	16.8
8765.9	17.3	8812.8	17.9	8831.6	16.7	8841.9	14.5	8847	14.2
8851.3	15.3	8854.4	17	8863.2	22	8878.9	23	9077.9	22.9
9505.9	22.7	9835.1	23.3	9971.9	24.2	10042.5	31.2	10230	26.6
10508.2	24.7	10812.5	23.3	11075.3	22.4	11360.7	21.8	11624.9	24.1
12528	27.9	12863.1	42.9	13064.8	47.5	13194.9	48.3	13493.9	48.6
13782.1	48	14085.5	46.8	14402	47.9	14678.4	48	14994.7	45.5
15321	45.4	15677.4	45.4	15901.7	45.4	16195	45.6	16505.4	43.1
16730.2	43.2	16939.2	47.3	17168.1	46.2	17328.4	42.7	17511.4	43.1
17569.3	47.5	17701.2	52.6						

Manning's n Values	num=	9							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	7846.5	.1	8582.2	.07	8597.6	.03	8863.2	.06
8878.9	.05	15321	.04	15901.7	.05	16730.2	.04		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
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8591.4 8863.2 2464.43 4273.14 2171 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 0 8582.2 22.25 8878.9 17701.2 22.25

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	21.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.030	
W.S. Elev (ft)	21.77	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)		1521.80	
E.G. Slope (ft/ft)	0.000098	Area (sq ft)		1521.80	
Q Total (cfs)	2334.00	Flow (cfs)		2334.00	
Top Width (ft)	266.42	Top Width (ft)		266.42	
Vel Total (ft/s)	1.53	Avg. Vel. (ft/s)		1.53	
Max Chl Dpth (ft)	8.17	Hydr. Depth (ft)		5.71	
Conv. Total (cfs)	236254.4	Conv. (cfs)		236254.4	
Length Wtd. (ft)	4273.14	Wetted Per. (ft)		270.89	
Min Ch El (ft)	13.60	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.05	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)		1454.08	
C & E Loss (ft)	0.00	Cum SA (acres)		202.37	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 31.6071*

INPUT

Description: Interpolated Cross Section at River Mile 31.61

Station	Elevation	Data	num=	195					
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev					
0	67.73	168.71	65.39	259.62	63.85	294.66	63.27	320.24	62.89
472	62.5	509.35	62.53	599.81	62.6	628.29	62.59	688	62.63
695.9	62.63	698.78	62.58	790.55	62.6	818.52	62.63	821.57	62.64
848.66	62.66	850.88	62.58	863.5	62.12	975.15	58.19	999.5	58.09
1072.18	57.8	1074.97	57.8	1107.61	57.71	1232.91	57.23	1242.32	57.24
1491.65	57.61	1525.54	57.67	1532.42	57.69	1720.5	57.63	1757.76	57.61
1839.96	57.56	1976.86	57.92	1996.06	57.98	2168.23	58.04	2180.44	58.04
2242.4	57.68	2344.7	57.05	2438.48	57.06	2486.29	57.63	2527.79	58.12
2590.49	58.89	2627.55	59.36	2669.32	59.87	2716.33	60.47	2766.04	61.15
2805.2	61.06	2874.21	60.72	2913.93	60.6	3066.87	60.13	3197.6	59.17
3219.15	59.01	3241.12	58.84	3305.09	57.04	3350.64	55.76	3473.36	57
3474.39	57.01	3594.38	58.23	3714.85	58.32	3773.69	58.34	3803.81	58.34
3944.28	58.45	3971.26	58.47	4006.03	58.49	4076.87	58.52	4201.47	58.03
4284.44	57.76	4320.73	57.32	4413.48	56.3	4488.27	55.45	4516.34	55.08
4539.09	54.82	4582.33	54.29	4641.47	52.87	4692.05	51.76	4720.3	51.91
4898.61	52.37	4918.41	52.3	5107.25	51.26	5182.58	49.26	5191.8	49.22
5329.6	51.8	5437.46	53.9	5444.09	54.03	5536.34	54.89	5599.03	50.43
5725.32	37.41	5822.55	35.44	6172.96	38.54	6273.45	30.49	6352.08	27.06
6478.98	25.18	6723.02	23.9	7024.47	23.65	7328.55	22.55	7409.22	22.81
7833.21	21.92	7971.98	21.66	8075.9	21.82	8223.44	21.98	8271.21	22.63
8291	22.91	8334.69	20.42	8498.11	21.95	8541.91	22.37	8559.08	22.82
8617.12	23.18	8634.16	22.98	8642.72	23.05	8719.45	23.8	8727.74	23.5
8728.79	25.04	8732.5	23.51	8735.28	22.52	8735.95	22.23	8741.37	17.44
8742.38	17.1	8743.88	16.89	8744.5	16.6	8748.41	15.47	8755.96	14.74
8758.7	14.61	8759.94	14.58	8763.42	14.56	8771.6	14.41	8772.57	14.39
8781.72	14.26	8783.14	14.22	8790.87	14.15	8794.67	14.01	8800.01	13.82
8806.21	13.69	8809.16	13.58	8817.75	13.44	8818.31	13.41	8821.97	13.09

8829.29	12.64	8839.2	13.07	8840.65	13.16	8849.1	13.56	8852	13.72
8859.01	14.18	8863.37	14.92	8869.22	15.91	8874.73	15.99	8886.09	16.31
8897.45	16.57	8908.81	16.94	8912.67	17.17	8915.88	17.21	8937.89	17.49
8962.36	17.81	8980.99	16.72	8988.9	15.15	8991.2	14.71	8996.25	14.49
8999.12	15.21	9000.51	15.57	9003.58	17.22	9012.3	22.07	9026.37	22.95
9057.32	22.99	9095.9	23.04	9204.66	22.98	9588.11	22.81	9883.05	23.32
10005.61	24.09	10068.87	30.09	10236.85	26.15	10486.1	24.52	10758.73	23.31
10994.18	22.54	11249.87	22.02	11486.58	23.99	12295.69	27.24	12595.91	40.1
12776.62	44.04	12893.18	44.72	13161.06	44.98	13419.26	44.46	13691.09	43.43
13974.65	44.37	14222.28	44.45	14505.66	42.31	14798	42.22	15117.31	42.22
15318.27	42.21	15581.04	42.38	15859.14	40.24	16060.54	40.32	16247.79	43.83
16452.86	42.89	16596.48	39.89	16760.44	40.23	16812.31	44	16930.48	48.37

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	8728.79	.07	8735.95	.029	9012.3	.055

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

8728.79	9012.3	2464.43	4273.14	2171	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	8728.79	21.99	9012.3	16930.48	21.99

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	21.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.029	
W.S. Elev (ft)	21.39	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)		1577.35	
E.G. Slope (ft/ft)	0.000082	Area (sq ft)		1577.35	
Q Total (cfs)	2334.00	Flow (cfs)		2334.00	
Top Width (ft)	274.17	Top Width (ft)		274.17	
Vel Total (ft/s)	1.48	Avg. Vel. (ft/s)		1.48	
Max Chl Dpth (ft)	8.75	Hydr. Depth (ft)		5.75	
Conv. Total (cfs)	257031.5	Conv. (cfs)		257031.5	
Length Wtd. (ft)	4273.14	Wetted Per. (ft)		278.12	
Min Ch El (ft)	12.64	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)		1302.07	
C & E Loss (ft)	0.00	Cum SA (acres)		175.85	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 30.8142*

INPUT

Description: Interpolated Cross Section at River Mile 30.81

Station Elevation Data num= 195

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	66.27	171.36	63.95	263.71	62.15	299.3	61.47	325.28	61.07
479.43	60.25	517.36	60.3	609.25	60.41	638.18	60.39	698.83	60.39
706.85	60.37	709.78	60.27	802.99	60.18	831.4	60.2	834.5	60.23
862.02	60.22	864.27	60.15	877.09	59.76	990.5	56.47	1015.24	56.39
1089.06	56.16	1091.89	56.17	1125.05	56.14	1252.31	55.76	1261.88	55.77
1515.12	56.09	1549.56	56.14	1556.54	56.17	1747.58	56.43	1785.43	56.46
1868.92	56.52	2007.98	57	2027.48	57.07	2202.36	56.89	2214.77	56.87
2277.7	56.09	2381.61	54.71	2476.87	54.62	2525.42	55.04	2567.58	55.4
2631.26	56	2668.91	56.39	2711.34	56.79	2759.09	57.28	2809.58	57.89

2849.36	57.85	2919.45	57.43	2959.8	57.35	3115.15	56.95	3247.93	56.16
3269.82	56.02	3292.13	55.89	3357.11	54.39	3403.38	53.31	3528.03	54.33
3529.08	54.34	3650.95	55.36	3773.32	55.43	3833.09	55.43	3863.68	55.41
4006.37	55.5	4033.77	55.52	4069.09	55.53	4141.04	55.54	4267.61	55.11
4351.88	54.91	4388.74	54.57	4482.95	53.86	4558.92	53.24	4587.43	52.9
4610.54	52.71	4654.46	52.28	4714.53	51.11	4765.91	50.31	4794.59	50.52
4975.71	50.74	4995.82	50.66	5187.64	49.18	5264.15	45.42	5273.52	45.13
5413.49	47.06	5523.04	48.75	5529.78	48.86	5623.49	49.58	5687.16	45.87
5815.44	35.02	5914.2	33.38	6270.13	35.98	6372.19	29.27	6452.07	26.42
6580.96	24.86	6828.85	23.8	7135.04	23.61	7443.91	22.7	7525.85	22.92
7956.5	22.2	8097.46	22.01	8203.01	22.18	8352.88	22.25	8401.4	22.78
8421.51	23.01	8465.88	20.94	8631.87	22.21	8676.37	22.57	8693.81	23.3
8752.76	23.38	8770.07	22.79	8778.76	22.84	8856.69	23.5	8865.11	23.26
8866.19	26.37	8870.39	24.56	8873.54	23.51	8874.29	23.17	8880.44	18.09
8881.59	17.65	8883.29	17.58	8883.99	17.15	8888.42	15.84	8896.97	14.64
8900.08	14.48	8901.49	14.45	8905.43	14.45	8914.7	14.23	8915.8	14.19
8926.17	14.1	8927.77	14.05	8936.53	13.89	8940.85	13.62	8946.9	13.24
8953.93	12.97	8957.27	12.81	8967	12.68	8967.63	12.65	8971.78	12.21
8980.08	11.68	8989.89	12.25	8991.33	12.36	8999.71	12.72	9002.58	12.87
9009.53	13.35	9013.85	14.08	9019.64	15.02	9025.1	15.11	9036.35	15.65
9047.61	16.04	9058.87	16.66	9062.69	17.08	9065.88	17.11	9087.68	17.4
9111.93	17.73	9130.38	16.74	9138.22	15.3	9140.5	14.93	9145.5	14.77
9148.35	15.47	9149.72	15.85	9152.76	17.44	9161.41	22.13	9173.84	22.9
9201.19	22.99	9235.29	23.11	9331.42	23.07	9670.33	22.92	9931	23.34
10039.33	23.98	10095.23	28.98	10243.7	25.69	10464	24.33	10704.96	23.33
10913.05	22.68	11139.05	22.25	11348.25	23.88	12063.37	26.58	12328.72	37.29
12488.44	40.58	12591.46	41.15	12828.22	41.35	13056.43	40.92	13296.68	40.06
13547.3	40.84	13766.16	40.91	14016.62	39.12	14275	39.04	14557.22	39.03
14734.83	39.03	14967.08	39.17	15212.87	37.38	15390.88	37.44	15556.37	40.37
15737.63	39.58	15864.56	37.08	16009.47	37.36	16055.32	40.51	16159.76	44.14

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
0	.04	8866.19	.07
		8874.29	.029
		9161.41	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	8866.19	9161.41	2464.43	4273.14	2171	.1	.3	
Blocked Obstructions		num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev			
0	8866.19	21.73	9161.41	16159.76	21.73			

CROSS SECTION OUTPUT		Profile #Calibration	
E.G. Elev (ft)	21.09	Element	Left OB
Vel Head (ft)	0.03	Wt. n-Val.	0.029
W.S. Elev (ft)	21.06	Reach Len. (ft)	2464.43
Crit W.S. (ft)		Flow Area (sq ft)	4273.14
E.G. Slope (ft/ft)	0.000074	Area (sq ft)	1646.33
Q Total (cfs)	2334.00	Flow (cfs)	2334.00
Top Width (ft)	282.58	Top Width (ft)	282.58
Vel Total (ft/s)	1.42	Avg. Vel. (ft/s)	1.42
Max Chl Dpth (ft)	9.38	Hydr. Depth (ft)	5.83
Conv. Total (cfs)	270884.7	Conv. (cfs)	270884.7
Length Wtd. (ft)	4273.14	Wetted Per. (ft)	286.09
Min Ch El (ft)	11.68	Shear (lb/sq ft)	0.03
Alpha	1.00	Stream Power (lb/ft s)	0.04
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	1143.95
C & E Loss (ft)	0.00	Cum SA (acres)	148.55

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 30.0214*

INPUT

Description: Interpolated Cross Section at River Mile 30.02

Station Elevation Data		num= 195							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	64.8	174.02	62.51	267.79	60.44	303.94	59.68	330.32	59.26
486.86	58	525.38	58.06	618.7	58.22	648.07	58.18	709.66	58.14
717.81	58.11	720.77	57.95	815.44	57.76	844.29	57.77	847.43	57.81
875.37	57.78	877.67	57.73	890.68	57.39	1005.85	54.76	1030.97	54.69
1105.93	54.51	1108.81	54.54	1142.48	54.57	1271.72	54.29	1281.43	54.3
1538.6	54.58	1573.57	54.62	1580.66	54.66	1774.66	55.23	1813.1	55.31
1897.88	55.48	2039.09	56.07	2058.9	56.17	2236.49	55.73	2249.09	55.7
2313	54.49	2418.51	52.37	2515.25	52.17	2564.56	52.45	2607.37	52.68
2672.04	53.11	2710.27	53.42	2753.36	53.71	2801.85	54.1	2853.12	54.64
2893.51	54.65	2964.7	54.15	3005.66	54.09	3163.42	53.78	3298.26	53.15
3320.49	53.04	3343.15	52.93	3409.14	51.74	3456.12	50.87	3582.7	51.67
3583.77	51.67	3707.53	52.49	3831.8	52.54	3892.49	52.52	3923.56	52.47
4068.45	52.55	4096.27	52.57	4132.15	52.57	4205.21	52.56	4333.74	52.18
4419.32	52.07	4456.75	51.81	4552.42	51.41	4629.56	51.04	4658.52	50.73
4681.98	50.61	4726.58	50.27	4787.59	49.35	4839.76	48.87	4868.89	49.12
5052.82	49.11	5073.24	49.03	5268.03	47.1	5345.73	41.58	5355.24	41.04
5497.38	42.33	5608.63	43.6	5615.48	43.69	5710.63	44.27	5775.29	41.3
5905.56	32.63	6005.85	31.32	6367.29	33.42	6470.94	28.06	6552.05	25.78
6682.94	24.53	6934.67	23.7	7245.6	23.56	7559.26	22.85	7642.47	23.03
8079.8	22.47	8222.95	22.37	8330.13	22.53	8482.32	22.53	8531.59	22.93
8552.01	23.12	8597.07	21.46	8765.64	22.47	8810.82	22.78	8828.53	23.77
8888.39	23.57	8905.97	22.6	8914.8	22.63	8993.94	23.21	9002.49	23.01
9003.58	27.71	9008.28	25.62	9011.8	24.5	9012.64	24.1	9019.51	18.73
9020.79	18.19	9022.69	18.27	9023.48	17.71	9028.43	16.21	9037.98	14.54
9041.46	14.35	9043.04	14.33	9047.44	14.34	9057.79	14.04	9059.03	14
9070.62	13.94	9072.41	13.87	9082.2	13.64	9087.02	13.23	9093.78	12.66
9101.64	12.26	9105.38	12.04	9116.25	11.92	9116.96	11.89	9121.6	11.32
9130.87	10.72	9140.59	11.42	9142.01	11.55	9150.32	11.88	9153.16	12.02
9160.04	12.53	9164.32	13.24	9170.06	14.13	9175.47	14.24	9186.62	14.98
9197.77	15.51	9208.93	16.38	9212.71	16.98	9215.87	17.02	9237.47	17.31
9261.49	17.64	9279.77	16.76	9287.54	15.45	9289.79	15.14	9294.75	15.06
9297.57	15.74	9298.93	16.12	9301.95	17.67	9310.51	22.2	9321.31	22.84
9345.07	22.99	9374.68	23.19	9458.17	23.15	9752.54	23.03	9978.96	23.36
10073.04	23.88	10121.6	27.87	10250.56	25.24	10441.89	24.15	10651.18	23.34
10831.93	22.82	11028.22	22.47	11209.93	23.78	11831.06	25.93	12061.53	34.49
12200.25	37.11	12289.73	37.57	12495.38	37.73	12693.59	37.38	12902.26	36.69
13119.94	37.31	13310.04	37.36	13527.59	35.92	13752.01	35.86	13997.13	35.85
14151.4	35.84	14353.12	35.95	14566.61	34.52	14721.22	34.57	14864.96	36.9
15022.39	36.27	15132.64	34.27	15258.5	34.49	15298.33	37.15	15389.04	39.91

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	9003.58	.07	9012.64	.028	9310.51	.06		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
9003.58	9310.51		2464.43	4273.14	2171	.1	.3

Blocked Obstructions		num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev		
0	9003.58	21.47	9310.51	15389.04	21.47		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	20.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.028	
W.S. Elev (ft)	20.77	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)		1729.49	
E.G. Slope (ft/ft)	0.000061	Area (sq ft)		1729.49	
Q Total (cfs)	2334.00	Flow (cfs)		2334.00	
Top Width (ft)	290.91	Top Width (ft)		290.91	
Vel Total (ft/s)	1.35	Avg. Vel. (ft/s)		1.35	
Max Chl Dpth (ft)	10.05	Hydr. Depth (ft)		5.95	
Conv. Total (cfs)	298999.2	Conv. (cfs)	298999.2		
Length Wtd. (ft)	4273.14	Wetted Per. (ft)		294.14	
Min Ch El (ft)	10.72	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)		978.37	
C & E Loss (ft)	0.00	Cum SA (acres)		120.42	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 29.2285*

INPUT

Description: Interpolated Cross Section at River Mile 29.23

Station Elevation Data		num= 194							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	63.34	176.67	61.07	271.88	58.74	308.58	57.89	335.36	57.44
494.29	55.75	533.4	55.83	628.14	56.03	657.96	55.98	720.49	55.89
728.76	55.85	731.77	55.64	827.88	55.34	857.17	55.33	860.36	55.39
888.73	55.34	891.06	55.3	904.27	55.02	1021.2	53.04	1046.7	52.99
1122.81	52.87	1125.73	52.91	1159.92	53	1291.13	52.82	1300.99	52.83
1562.08	53.06	1597.58	53.1	1604.78	53.14	1801.75	54.03	1840.77	54.16
1926.85	54.45	2070.21	55.14	2090.31	55.26	2270.61	54.58	2283.41	54.53
2348.29	52.89	2455.42	50.03	2553.63	49.73	2603.7	49.86	2647.16	49.96
2712.81	50.22	2751.62	50.45	2795.37	50.63	2844.6	50.91	2896.65	51.39
2937.67	51.45	3009.94	50.86	3051.53	50.84	3211.69	50.61	3348.6	50.14
3371.16	50.06	3394.17	49.98	3461.16	49.08	3508.86	48.42	3637.37	49
3638.46	49.01	3764.11	49.61	3890.27	49.65	3951.89	49.61	3983.43	49.54
4130.54	49.6	4158.78	49.61	4195.2	49.61	4269.39	49.58	4399.87	49.26
4486.75	49.23	4524.76	49.06	4621.89	48.97	4700.21	48.83	4729.6	48.55
4753.43	48.5	4798.71	48.26	4860.65	47.59	4913.62	47.42	4943.19	47.72
5129.92	47.48	5150.66	47.39	5348.42	45.02	5427.3	37.74	5436.96	36.95
5581.27	37.59	5694.22	38.45	5701.17	38.52	5797.78	38.96	5863.42	36.74
5995.67	30.24	6097.5	29.27	6464.46	30.86	6569.69	26.84	6652.04	25.14
6784.93	24.21	7040.49	23.6	7356.17	23.52	7674.62	23	7759.1	23.14
8203.1	22.75	8348.43	22.72	8457.25	22.89	8611.76	22.81	8661.79	23.08
8682.51	23.22	8728.26	21.98	8899.4	22.73	8945.27	22.98	8963.25	24.24
9024.03	23.77	9041.88	22.4	9050.84	22.42	9131.19	22.91	9139.87	22.77
9140.98	29.04	9146.17	26.67	9150.05	25.49	9150.99	25.03	9158.58	19.37
9160	18.74	9162.97	18.26	9168.43	16.58	9179	14.44	9182.84	14.22
9184.58	14.21	9189.45	14.24	9200.89	13.85	9202.25	13.8	9215.07	13.78
9217.05	13.7	9227.87	13.39	9233.2	12.84	9240.67	12.07	9249.35	11.55
9253.48	11.26	9265.5	11.16	9266.28	11.14	9271.41	10.43	9281.65	9.76
9291.29	10.6	9292.7	10.74	9300.92	11.05	9303.74	11.17	9310.56	11.7
9314.8	12.39	9320.48	13.23	9325.84	13.37	9336.88	14.32	9347.93	14.98
9358.98	16.1	9362.73	16.89	9365.86	16.93	9387.26	17.22	9411.05	17.56
9429.16	16.79	9436.85	15.6	9439.09	15.35	9444	15.35	9446.8	16
9448.15	16.39	9451.13	17.89	9459.61	22.27	9468.78	22.79	9488.94	22.99
9514.08	23.27	9584.93	23.24	9834.75	23.14	10026.91	23.39	10106.76	23.77

10147.97	26.7610257.41	24.7910419.79	23.9610597.41	23.3510750.81	22.96
10917.39	22.6911071.61	23.6711598.74	25.2711794.34	31.6911912.07	33.65
11988.01	33.9912162.54	34.1112330.76	33.8412507.85	33.3212692.59	33.78
12853.93	33.8113038.55	32.7313229.01	32.6813437.04	32.6713567.96	32.66
13739.16	32.7313920.34	31.6514051.55	31.6914173.55	33.4414307.16	32.96
14400.72	31.4614507.54	31.6214541.34	33.514618.33	35.69	

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	9140.98	.07	9158.58	.027	9459.61	.05

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

9140.98	9459.61	2464.43	4273.14	2171	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	9140.98	21.21	10147.97	14618.33	21.21

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	20.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.027	
W.S. Elev (ft)	20.54	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)		1830.45	
E.G. Slope (ft/ft)	0.000050	Area (sq ft)		1830.45	
Q Total (cfs)	2334.00	Flow (cfs)		2334.00	
Top Width (ft)	299.23	Top Width (ft)		299.23	
Vel Total (ft/s)	1.28	Avg. Vel. (ft/s)		1.28	
Max Chl Dpth (ft)	10.78	Hydr. Depth (ft)		6.12	
Conv. Total (cfs)	330318.3	Conv. (cfs)		330318.3	
Length Wtd. (ft)	4273.14	Wetted Per. (ft)		302.09	
Min Ch El (ft)	9.76	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.02	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)		803.76	
C & E Loss (ft)	0.00	Cum SA (acres)		91.47	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 28.4357*

INPUT

Description: Interpolated Cross Section at River Mile 28.44

Station Elevation Data num= 195

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	61.87	179.33	59.63	275.97	57.04	313.21	56.1	340.4	55.63
501.72	53.5	541.42	53.6	637.58	53.84	667.85	53.77	731.32	53.64
739.71	53.59	742.77	53.33	840.32	52.92	870.05	52.9	873.3	52.97
902.09	52.91	904.45	52.87	917.87	52.65	1036.55	51.33	1062.43	51.29
1139.69	51.22	1142.65	51.28	1177.35	51.43	1310.53	51.34	1320.54	51.35
1585.56	51.54	1621.59	51.58	1628.9	51.63	1828.83	52.83	1868.43	53.01
1955.81	53.41	2101.33	54.21	2121.73	54.35	2304.74	53.42	2317.73	53.35
2383.59	51.29	2492.33	47.68	2592.01	47.29	2642.83	47.28	2686.94	47.25
2753.59	47.34	2792.98	47.49	2837.39	47.55	2887.36	47.72	2940.19	48.14
2981.82	48.25	3055.18	47.57	3097.4	47.58	3259.97	47.44	3398.93	47.13
3421.83	47.08	3445.18	47.02	3513.18	46.43	3561.6	45.98	3692.05	46.34
3693.14	46.34	3820.68	46.74	3948.74	46.77	4011.29	46.69	4043.3	46.6
4192.62	46.65	4221.29	46.66	4258.26	46.65	4333.56	46.6	4466	46.33
4554.19	46.38	4592.77	46.3	4691.36	46.53	4770.86	46.62	4800.69	46.38
4824.88	46.39	4870.84	46.25	4933.7	45.83	4987.47	45.98	5017.49	46.32

5207.03	45.85	5228.08	45.75	5428.81	42.94	5508.88	33.9	5518.68	32.86
5665.16	32.86	5779.81	33.3	5786.86	33.34	5884.92	33.65	5951.55	32.17
6085.79	27.85	6189.14	27.21	6561.62	28.3	6668.43	25.63	6752.02	24.5
6886.91	23.89	7146.31	23.5	7466.74	23.47	7789.97	23.15	7875.72	23.25
8326.4	23.02	8473.91	23.08	8584.37	23.24	8741.2	23.09	8791.98	23.24
8813.02	23.33	8859.46	22.5	9033.16	23	9079.72	23.19	9097.97	24.71
9159.67	23.97	9177.78	22.21	9186.88	22.21	9268.44	22.61	9277.25	22.53
9278.37	30.38	9284.05	27.72	9288.31	26.49	9289.34	25.96	9297.65	20.01
9299.2	19.29	9301.5	19.66	9302.45	18.82	9308.44	16.95	9320.01	14.34
9324.22	14.09	9326.13	14.09	9331.46	14.13	9343.99	13.66	9345.48	13.61
9359.51	13.61	9361.69	13.52	9373.54	13.14	9379.37	12.45	9387.56	11.49
9397.06	10.84	9401.59	10.49	9414.75	10.4	9415.61	10.38	9421.22	9.54
9432.44	8.8	9441.99	9.77	9443.38	9.93	9451.53	10.21	9454.32	10.31
9461.07	10.88	9465.27	11.55	9470.9	12.34	9476.21	12.5	9487.15	13.65
9498.09	14.44	9509.04	15.81	9512.75	16.8	9515.85	16.84	9537.04	17.13
9560.61	17.47	9578.56	16.81	9586.17	15.76	9588.39	15.56	9593.25	15.64
9596.02	16.27	9597.36	16.66	9600.31	18.11	9608.71	22.34	9616.24	22.74
9632.81	23	9653.47	23.35	9711.69	23.32	9916.97	23.25	10074.86	23.41
10140.47	23.66	10174.33	25.66	10264.26	24.33	10397.69	23.78	10543.64	23.37
10669.68	23.11	10806.57	22.92	10933.28	23.56	11366.43	24.61	11527.15	28.88
11623.89	30.19	11686.29	30.41	11829.7	30.49	11967.92	30.31	12113.44	29.95
12265.24	30.25	12397.81	30.27	12549.51	29.54	12706.01	29.51	12876.95	29.48
12984.53	29.47	13125.2	29.52	13274.08	28.79	13381.89	28.81	13482.13	29.97
13591.92	29.65	13668.8	28.64	13756.58	28.75	13784.35	30.01	13847.61	31.46

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 0 .04 9278.37 .07 9297.65 .026 9608.71 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9278.37 9608.71 2464.43 4273.14 2171 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 0 9278.37 20.94 10174.33 13847.61 20.94

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	20.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.026	
W.S. Elev (ft)	20.35	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)		1947.85	
E.G. Slope (ft/ft)	0.000038	Area (sq ft)		1947.85	
Q Total (cfs)	2334.00	Flow (cfs)		2334.00	
Top Width (ft)	307.58	Top Width (ft)		307.58	
Vel Total (ft/s)	1.20	Avg. Vel. (ft/s)		1.20	
Max Chl Dpth (ft)	11.55	Hydr. Depth (ft)		6.33	
Conv. Total (cfs)	376954.5	Conv. (cfs)		376954.5	
Length Wtd. (ft)	4273.14	Wetted Per. (ft)		310.61	
Min Ch El (ft)	8.80	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.02	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		618.44	
C & E Loss (ft)	0.00	Cum SA (acres)		61.71	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 27.6428*

INPUT

Description: Interpolated Cross Section at River Mile 27.64

Station Elevation Data									
num= 195									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	60.41	181.98	58.19	280.05	55.33	317.85	54.3	345.44	53.82
509.15	51.25	549.43	51.36	647.02	51.65	677.74	51.57	742.15	51.4
750.67	51.33	753.77	51.01	852.77	50.5	882.94	50.47	886.23	50.55
915.45	50.47	917.85	50.45	931.46	50.29	1051.9	49.61	1078.17	49.59
1156.56	49.58	1159.57	49.65	1194.79	49.86	1329.94	49.87	1340.1	49.88
1609.04	50.02	1645.61	50.05	1653.03	50.11	1855.91	51.63	1896.1	51.86
1984.77	52.37	2132.44	53.29	2153.15	53.45	2338.87	52.27	2352.05	52.18
2418.88	49.7	2529.23	45.34	2630.4	44.85	2681.97	44.69	2726.73	44.53
2794.36	44.45	2834.34	44.52	2879.4	44.47	2930.11	44.54	2983.73	44.88
3025.98	45.05	3100.42	44.29	3143.26	44.33	3308.24	44.26	3449.26	44.12
3472.5	44.09	3496.2	44.07	3565.21	43.77	3614.34	43.53	3746.72	43.67
3747.83	43.68	3877.26	43.87	4007.22	43.88	4070.69	43.78	4103.18	43.67
4254.71	43.7	4283.8	43.71	4321.31	43.69	4397.73	43.62	4532.14	43.41
4621.63	43.54	4660.78	43.55	4760.83	44.09	4841.5	44.42	4871.78	44.2
4896.32	44.29	4942.96	44.24	5006.76	44.07	5061.33	44.54	5091.79	44.93
5284.13	44.22	5305.49	44.12	5509.2	40.86	5590.45	30.06	5600.4	28.77
5749.05	28.12	5865.39	28.15	5872.55	28.17	5972.06	28.33	6039.68	27.6
6175.91	25.46	6280.79	25.15	6658.79	25.74	6767.18	24.41	6852	23.86
6988.89	23.57	7252.14	23.41	7577.31	23.42	7905.32	23.3	7992.34	23.36
8449.69	23.3	8599.39	23.43	8711.48	23.6	8870.64	23.36	8922.17	23.39
8943.52	23.43	8990.65	23.02	9166.93	23.26	9214.18	23.39	9232.7	25.19
9295.3	24.16	9313.69	22.02	9322.92	22	9405.68	22.31	9414.62	22.28
9415.77	31.71	9421.94	28.78	9426.57	27.48	9427.68	26.9	9436.72	20.66
9438.41	19.83	9440.9	20.35	9441.94	19.37	9448.45	17.32	9461.03	14.24
9465.6	13.96	9467.67	13.96	9473.47	14.02	9487.09	13.48	9488.71	13.41
9503.96	13.45	9506.32	13.35	9519.2	12.88	9525.54	12.06	9534.44	10.91
9544.78	10.12	9549.69	9.72	9564	9.64	9564.93	9.62	9571.04	8.66
9583.23	7.84	9592.68	8.95	9594.07	9.12	9602.13	9.37	9604.9	9.46
9611.58	10.05	9615.75	10.7	9621.32	11.45	9626.58	11.62	9637.41	12.99
9648.25	13.91	9659.09	15.53	9662.77	16.7	9665.84	16.74	9686.83	17.04
9710.18	17.39	9727.95	16.83	9735.49	15.91	9737.68	15.78	9742.5	15.92
9745.25	16.53	9746.57	16.94	9749.5	18.34	9757.82	22.4	9763.71	22.69
9776.69	23	9792.86	23.42	9838.45	23.41	9999.18	23.3610122.81	23.43	
10174.18	23.55	10200.7	24.5510271.11	23.8810375.59	23.610489.87	23.38			
10588.56	23.2410695.74	23.1410794.96	23.4511134.12	23.9511259.96	26.08				
11335.71	26.7311384.57	26.8411496.86	26.8611605.09	26.7611719.03	26.58				
11837.89	26.7211941.69	26.7212060.47	26.3512183.01	26.3212316.86	26.3				
12401.09	26.2912511.24	26.312627.81	25.9312712.23	25.9312790.72	26.51				
12876.68	26.3412936.88	25.8313005.61	25.8813027.35	26.5113076.89	27.23				

Manning's n Values									
num= 4									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	9415.77	.07	9436.72	.024	9757.82	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9415.77	9757.82	2464.43	4273.14	2171	.1	.3

Blocked Obstructions						
num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
0	9415.77	20.68	9759.82	13076.89	20.68	

CROSS SECTION OUTPUT						
Profile #Calibration						
E.G. Elev (ft)	20.23	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.02	Wt. n-Val.		0.024		
W.S. Elev (ft)	20.21	Reach Len. (ft)	2464.43	4273.14	2171.00	
Crit W.S. (ft)		Flow Area (sq ft)		2085.39		
E.G. Slope (ft/ft)	0.000027	Area (sq ft)		2085.39		

Q Total (cfs)	2334.00	Flow (cfs)	2334.00
Top Width (ft)	314.89	Top Width (ft)	314.89
Vel Total (ft/s)	1.12	Avg. Vel. (ft/s)	1.12
Max Chl Dpth (ft)	12.37	Hydr. Depth (ft)	6.62
Conv. Total (cfs)	452408.3	Conv. (cfs)	452408.3
Length Wtd. (ft)	4273.14	Wetted Per. (ft)	317.94
Min Ch El (ft)	7.84	Shear (lb/sq ft)	0.01
Alpha	1.00	Stream Power (lb/ft s)	0.01
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	420.61
C & E Loss (ft)	0.00	Cum SA (acres)	31.18

Warning: Divided flow computed for this cross-section.
Warning: The composite Mannings n value for the channel was larger than the largest entered n value or smaller than the smallest entered n value.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 26.85

INPUT

Description: Interpolated Cross Section at River Mile 26.85

Station Elevation Data		num= 123							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.94	184.64	56.75	284.14	53.63	322.49	52.51	516.58	49
557.45	49.13	656.46	49.46	752.98	49.15	761.62	49.07	764.77	48.7
865.21	48.08	895.82	48.04	899.16	48.13	931.24	48.02	945.05	47.92
1093.9	47.89	1173.44	47.93	1176.49	48.02	1212.22	48.29	1359.65	48.41
1632.52	48.5	1669.62	48.53	1882.99	50.43	1923.77	50.71	2163.56	52.36
2184.57	52.54	2386.37	51.01	2454.18	48.1	2566.14	43	2721.1	42.1
2766.52	41.81	2835.14	41.56	2875.7	41.55	2921.42	41.39	2972.87	41.35
3070.13	41.85	3145.66	41	3189.13	41.07	3499.59	41.11	3523.17	41.11
3617.23	41.12	3801.39	41.01	3802.52	41.01	4065.69	40.99	4130.09	40.87
4163.05	40.73	4346.31	40.76	4384.37	40.73	4598.27	40.48	4728.79	40.79
4830.3	41.65	4912.15	42.21	4942.87	42.03	4967.77	42.18	5079.82	42.31
5166.09	43.53	5382.91	42.48	5589.59	38.78	5682.12	24.68	5832.94	23.39
5950.98	23	8572.99	23.57	8838.6	23.95	9052.36	23.54	9300.69	23.52
9348.63	23.6	9367.42	25.66	9430.94	24.36	9449.59	21.83	9458.96	21.79
9552	22.04	9553.16	33.05	9559.83	29.83	9564.83	28.47	9566.03	27.83
9575.79	21.3	9577.61	20.38	9580.31	21.04	9581.43	19.93	9588.46	17.69
9602.04	14.14	9606.98	13.83	9609.22	13.84	9615.48	13.91	9630.19	13.29
9631.94	13.22	9648.41	13.29	9650.96	13.17	9664.87	12.63	9671.72	11.67
9681.33	10.33	9692.49	9.41	9697.8	8.95	9713.25	8.88	9714.26	8.86
9720.85	7.77	9734.02	6.88	9743.38	8.12	9744.75	8.31	9752.74	8.53
9755.48	8.61	9762.1	9.23	9766.22	9.86	9771.74	10.56	9776.95	10.75
9787.68	12.32	9798.41	13.38	9809.15	15.25	9812.79	16.61	9815.83	16.65
9836.62	16.95	9859.74	17.3	9877.34	16.85	9884.81	16.06	9886.98	15.99
9891.75	16.21	9894.47	16.8	9895.78	17.21	9898.68	18.56	9906.92	22.47
9920.56	23	9932.25	23.51	2306.17	23				

Manning's n Values		num= 7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	516.58	.04	1173.44	.05	5832.94	.06	9552	.04
9553.16	.023	9906.92	.06						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
9553.16	9906.92	0	0	0	.1	.3	

Blocked Obstructions			num= 1
Sta L	Sta R	Elev	
0	9553.16	20.42	

CROSS SECTION OUTPUT		Profile #Calibration			
E.G. Elev (ft)	20.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.023	
W.S. Elev (ft)	20.11	Reach Len. (ft)	3915.00	3915.00	3915.00
Crit W.S. (ft)		Flow Area (sq ft)		2242.32	
E.G. Slope (ft/ft)	0.000020	Area (sq ft)		2242.32	
Q Total (cfs)	2366.00	Flow (cfs)		2366.00	
Top Width (ft)	320.71	Top Width (ft)		320.71	
Vel Total (ft/s)	1.06	Avg. Vel. (ft/s)		1.06	
Max Chl Dpth (ft)	13.23	Hydr. Depth (ft)		6.99	
Conv. Total (cfs)	526531.8	Conv. (cfs)		526531.8	
Length Wtd. (ft)	3915.00	Wetted Per. (ft)		323.60	
Min Ch El (ft)	6.88	Shear (lb/sq ft)		0.01	
Alpha	1.00	Stream Power (lb/ft s)		0.01	
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)		208.34	
C & E Loss (ft)	0.02	Cum SA (acres)			

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 26.09

INPUT

Description: Cross Section at River Mile 26.09

Station Elevation Data num= 117									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	57.55	181.9	55.45	317.7	50.85	508.9	46.85	646.7	47.35
750.3	46.95	753.4	46.55	882.5	46.45	885.8	46.55	917.4	46.45
931	46.35	1156	46.45	1159	46.55	1194.2	46.85	1644.8	47.15
1855	49.25	2152.1	51.55	2350.9	49.35	2528	40.15	2725.4	38.95
2793	38.75	2878	38.85	3024.5	39.45	3098.9	38.35	3470.8	38.35
3746	38.35	4068.7	39.05	4319.2	38.95	4658.5	38.65	4869.4	39.95
5089.3	44.35	5315.9	42.95	5531.9	38.55	5628.6	22.45	7444.3	20.25
7698.8	20.85	7959.3	21.15	8063.9	21.35	8138.8	21.15	8284.4	21.55
8468.9	22.35	8721.6	23.75	8995.7	24.25	9216.3	23.85	9512.7	23.75
9531.5	26.05	9599.6	24.85	9619.6	22.05	10204.9	21.95	10380.1	26.45
10424.5	42.95	10430.4	40.05	10446	43.15	10452	44.95	10464.6	44.91
10468.9	44.63	10490.2	42.16	10499.6	40.49	10514.97	42.4	10525.1	37.2
10532.7	35.41	10552.1	24.2	10556.2	25.89	10557.9	23.81	10577.3	17.39
10583.8	12.99	10593.8	11.39	10603.8	10.89	10613.8	9.99	10623.8	10.39
10633.8	11.49	10643.8	11.49	10653.8	11.49	10663.8	11.19	10673.8	10.89
10683.8	10.69	10693.8	10.29	10703.8	10.09	10713.8	9.49	10723.8	8.69
10733.8	8.39	10743.8	7.89	10753.8	7.89	10763.8	8.79	10773.8	11.69
10783.8	12.39	10793.8	12.59	10803.8	13.29	10813.8	14.59	10907.8	17.39
10939.1	18.66	10950.7	22.95	10972.2	20.99	10981.2	21.85	10990.4	22.36
11022.5	20.75	11242.6	20.25	11335	20.55	11432.9	20.45	11720.9	19.65
14591.4	19.15	14624.4	21.35	14662.2	34.55	14691.4	36.75	15049.4	43.15
15301	43.35	15595.8	44.95	15925.7	45.05	16126.2	45.05	16172.7	45.35
16268.1	45.45	16363.2	45.25	16653.9	46.15	16889.9	46.55	17127.1	46.95
17215.7	49.35	17468.8	51.55						

Manning's n Values num= 15									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	508.9	.04	1194.2	.05	2725.4	.04	3470.8	.05
5089.3	.04	5628.6	.06	8721.6	.04	9216.3	.05	10464.6	.07
10556.2	.022	10950.7	.06	15301	.04	16363.2	.06	17215.7	.04

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	10514.97	10950.7		2826	4769	4679	.1
							.3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 010514.97 20.17 10950.7 17468.8 20.17

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	19.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.022	
W.S. Elev (ft)	19.36	Reach Len. (ft)	2826.00	4769.00	4679.00
Crit W.S. (ft)		Flow Area (sq ft)		2393.90	
E.G. Slope (ft/ft)	0.000253	Area (sq ft)		2393.90	
Q Total (cfs)	8898.00	Flow (cfs)		8898.00	
Top Width (ft)	369.66	Top Width (ft)		369.66	
Vel Total (ft/s)	3.72	Avg. Vel. (ft/s)		3.72	
Max Chl Dpth (ft)	11.47	Hydr. Depth (ft)		6.48	
Conv. Total (cfs)	558957.6	Conv. (cfs)		558957.6	
Length Wtd. (ft)	4769.00	Wetted Per. (ft)		372.44	
Min Ch El (ft)	7.89	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.38	
Frctn Loss (ft)	1.15	Cum Volume (acre-ft)	1394.72	26737.86	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9994.23	169.35

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

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 25.1

INPUT

Description: Cross Section at River Mile 25.1

Station Elevation Data		num= 115									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	56.3	181.9	54.2	317.7	49.6	508.9	45.6	646.7	46.1		
750.3	45.7	753.4	45.3	882.5	45.2	885.8	45.3	917.4	45.2		
931	45.1	1156	45.2	1159	45.3	1194.2	45.6	1644.8	45.9		
1855	48	2152.1	50.3	2350.9	48.1	2528	38.9	2725.4	37.7		
2793	37.5	2878	37.6	3024.5	38.2	3098.9	37.1	3470.8	37.1		
3746	37.1	4068.7	37.8	4319.2	37.7	4658.5	37.4	4869.4	38.7		
5089.3	43.1	5315.9	41.7	5531.9	37.3	5628.6	21.2	7444.3	19		
7698.8	19.6	7959.3	19.9	8063.9	20.1	8138.8	19.9	8284.4	20.3		
8468.9	21.1	8721.6	22.5	8995.7	23	9216.3	22.6	9512.7	22.5		
9531.5	24.8	9599.6	23.6	9619.6	20.8	10204.9	20.7	10380.1	25.2		
10424.5	41.7	10430.4	38.8	10446	41.9	10452	43.7	10464.6	43.66		
10468.9	43.38	10490.2	40.91	10499.6	39.24	10514.97	41.15	10525.1	35.95		
10532.7	34.16	10552.1	22.95	10577.3	16.14	10583.8	11.74	10593.8	10.14		
10603.8	9.64	10613.8	8.74	10623.8	9.14	10633.8	10.24	10643.8	10.24		
10653.8	10.24	10663.8	9.94	10673.8	9.64	10683.8	9.44	10693.8	9.04		
10703.8	8.84	10713.8	8.24	10723.8	7.44	10733.8	7.14	10743.8	6.64		
10753.8	6.64	10763.8	7.54	10773.8	10.44	10783.8	11.14	10793.8	11.34		
10803.8	12.04	10813.8	13.34	10907.8	16.14	10939.1	17.41	10950.7	21.7		
10972.2	19.74	10981.2	20.6	10990.4	21.11	11022.5	19.5	11242.6	19		
11335	19.3	11432.9	19.2	11720.9	18.4	14591.4	17.9	14624.4	20.1		
14662.2	33.3	14691.4	35.5	15049.4	41.9	15301	42.1	15595.8	43.7		
15925.7	43.8	16126.2	43.8	16172.7	44.1	16268.1	44.2	16363.2	44		
16653.9	44.9	16889.9	45.3	17127.1	45.7	17215.7	48.1	17468.8	50.3		

Manning's n Values		num= 15									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val

0	.05	508.9	.04	1194.2	.05	2725.4	.04	3470.8	.05
5089.3	.04	5628.6	.06	8721.6	.04	9216.3	.05	10464.6	.07
10552.1	.021	10939.1	.06	15301	.04	16363.2	.06	17215.7	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 10514.97 10950.7 2028.75 4406.38 2370.38 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 010514.97 18.92 10950.7 17468.8 18.92

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	18.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.021	
W.S. Elev (ft)	18.22	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)		2435.81	
E.G. Slope (ft/ft)	0.000227	Area (sq ft)		2435.81	
Q Total (cfs)	8910.00	Flow (cfs)		8910.00	
Top Width (ft)	371.69	Top Width (ft)		371.69	
Vel Total (ft/s)	3.66	Avg. Vel. (ft/s)		3.66	
Max Chl Dpth (ft)	11.58	Hydr. Depth (ft)		6.55	
Conv. Total (cfs)	591207.1	Conv. (cfs)		591207.1	
Length Wtd. (ft)	4406.38	Wetted Per. (ft)		374.46	
Min Ch El (ft)	6.64	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.34	
Frctn Loss (ft)	0.94	Cum Volume (acre-ft)	1394.72	26473.48	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9953.65	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 24.2625*

INPUT

Description:

Station Elevation Data num= 223

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.12	53.51	63.26	52.98	175.39	50.24	176.62	50.22	308.39	45.91
493.91	42	575.19	42.09	627.61	42.17	687.45	41.85	689.99	41.76
696.23	41.74	697.25	41.83	718	41.94	728.13	41.89	731.14	41.53
818.68	41.36	856.41	41.35	859.61	41.44	890.27	41.36	903.46	41.27
1087.12	41.4	1101.63	40.87	1121.78	40.88	1124.69	40.96	1158.84	41.22
1596.06	41.49	1800.01	43.33	2088.28	45.34	2281.18	43.41	2453.02	35.36
2644.55	34.31	2710.14	34.14	2792.62	34.22	2934.76	34.75	3006.95	33.79
3367.8	33.79	3634.83	33.79	3947.94	34.4	4191	34.31	4520.22	34.05
4724.85	35.19	4938.22	39.04	5158.08	37.81	5367.67	33.96	5461.49	19.88
5821.25	19.48	6110.31	19.3	6420.5	19.39	6721.64	18.91	6760.85	18.68
6946.81	18.46	7223.25	18.14	7300.91	18.3	7470.19	18.67	7668.88	18.88
7722.95	18.97	7764.6	19.07	7803.03	19.8	7824.44	19.94	7897.11	20.13
7964.3	20.63	8028.07	21.11	8038.39	21.11	8066.38	21.13	8147.97	20.8
8217.41	20.96	8328.46	21.34	8462.6	22.2	8492.27	22.29	8517.34	22.5
8580.73	22.57	8594.09	22.38	8728.56	22.59	8844.84	22.4	8942.6	22.29
8955.07	22.3	8985.49	21.97	9152.86	21.94	9230.19	21.99	9248.44	24.02
9299.62	23.26	9314.51	23.17	9333.92	20.91	9345.57	21.02	9413.41	21.04
9438.36	20.75	9505.18	21.09	9573.91	21.11	9587.79	21.81	9601.4	21.77
9631.06	21.15	9665.3	21.31	9694.07	21.83	9729.32	21.15	9756.05	21.45
9775.78	20.84	9828.22	20.67	9890.72	21.28	9901.83	21.12	9927.37	21.37
9996.23	23.25	10020.55	24.71	110071.82	26.07	10072.22	26.21	10110.02	37.59
10114.9	39.22	10120.63	36.67	10135.77	39.36	10141.59	40.93	10153.81	40.87

10157.99	40.6210166.79	39.6910178.65	38.710187.77	37.4310202.69	39.42
10213.38	34.0710214.53	33.6110223.41	31.8810225.66	30.8610234.12	26.96
10246.08	21.4910248.24	2110269.62	16.5810275.54	15.3810283.13	11.52
10294.82	10.1210296.78	10.0410306.51	9.65 10318.2	8.8410322.54	8.95
10329.88	9.1510341.57	10.06 10348.4	10.0310353.26	10.0210364.95	9.99
10376.63	9.6910377.39	9.6710388.32	9.3710400.01	9.15 10403.8	9.02
10411.7	8.7410415.43	8.6710420.41	8.510423.39	8.3810425.38	8.23
10430.35	7.9110435.07	7.6110435.33	7.59 10440.3	7.2310445.27	6.87
10446.76	6.810450.25	6.7410455.22	6.4510458.45	6.3210460.19	6.23
10465.16	5.610470.14	5.0610478.89	5.0610487.84	6.0110496.79	8.7
10505.74	9.4810514.69	9.8110523.64	10.5810532.59	11.8810534.83	11.99
10590.78	14.2410616.72	15.3610636.67	15.4110644.73	16.8610655.11	20.76
10676.32	19.02 10685.2	19.7610694.27	20.1910725.94	18.73 10867.8	18.24
10943.05	18.2 11034.2	18.6111130.77	18.6711180.85	18.6311414.86	18.11
11506.62	18.1211805.73	18.2812083.59	17.9812734.48	1813027.05	18.31
13043.32	18.713059.81	18.6813075.52	18.4213250.25	18.1813282.01	18.32
13368.54	18.2413406.06	17.4513427.86	17.3613471.34	17.3313632.24	17.34
13818.48	17.2813847.03	17.7113998.74	17.8814108.84	17.86 14246.4	17.81
14278.95	19.7314316.24	31.2714345.04	33.1914428.64	34.514577.47	36.56
14698.19	38.4814946.37	38.6615237.17	40.0715562.59	40.1615760.37	40.17
15806.24	40.4315900.35	40.5215994.16	40.3516131.44	40.7316218.75	41.69
16280.91	4216290.23	42.0416473.48	42.4116513.71	42.4816747.69	42.84
16766.94	43.316835.08	44.9217084.75	46.79		

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
.12	.0510202.69	.0810225.66	.02110655.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	10202.69	10655.11	2028.75	4406.38	2370.38	.1		.3

Blocked Obstructions		num=	2		
Sta L	Sta R	Elev	Sta L	Sta R	Elev
.12510202.69	18.3012510655.11	17084.75	18.30125		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	17.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.		0.021	
W.S. Elev (ft)	17.29	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)		2527.86	
E.G. Slope (ft/ft)	0.000200	Area (sq ft)		2527.86	
Q Total (cfs)	8910.00	Flow (cfs)		8910.00	
Top Width (ft)	379.70	Top Width (ft)		379.70	
Vel Total (ft/s)	3.52	Avg. Vel. (ft/s)		3.52	
Max Chl Dpth (ft)	12.23	Hydr. Depth (ft)		6.66	
Conv. Total (cfs)	630426.1	Conv. (cfs)		630426.1	
Length Wtd. (ft)	4406.38	Wetted Per. (ft)		382.03	
Min Ch El (ft)	5.06	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.29	
Frotn Loss (ft)	0.86	Cum Volume (acre-ft)	1394.72	26222.42	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9915.64	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 23.425*

INPUT
 Description:

Station Elevation Data		num= 223	
Sta	Elev	Sta	Elev
.25	50.72	61.45	50.41
478.91	38.41	557.7	38.28
675.04	37.65	676.03	37.84
793.74	37.5	830.31	37.5
1053.96	37.61	1068.02	36.54
1547.31	37.08	1745.02	38.65
2563.7	30.93	2627.29	30.77
3264.81	30.47	3523.66	30.47
4580.3	31.68	4787.13	34.97
5643.13	18.21	5923.33	18.22
6734.22	17.58	7002.2	17.29
7486.59	18.05	7526.97	18.16
7720.56	21.17	7782.37	21.95
7965.91	20.83	8073.56	20.95
8318.11	22.42	8331.07	22.01
8680.98	22	8710.47	21.36
9014.99	22.65	9029.42	22.74
9149.48	20.71	9214.25	21.4
9336.28	21.56	9369.47	21.88
9476.57	20.97	9527.4	20.63
9690.27	23.3	9713.84	25.58
9805.31	36.73	9810.86	34.54
9847.07	37.86	9855.61	37.05
9902.64	31.69	9903.95	31.27
9940.07	20.04	9942.53	19.56
9995.84	10.09	9998.08	10.0310009.22
10035.97	9.1510049.34	9.1510049.34	9.8810057.15
10089.47	9.4310090.33	9.4310090.33	9.4210102.85
10129.6	8.4410133.87	8.4410133.87	8.3610139.56
10150.95	7.3410156.35	7.3410156.35	6.9910156.64
10169.72	6.1510173.71	6.1510173.71	6.14 10179.4
10190.78	4.3410196.47	4.3410196.47	3.4810203.97
10227.67	7.8110235.57	7.8110235.57	8.2810243.47
10302.74	13.2110325.63	13.2110325.63	14.5810343.25
10380.44	18.29 10389.2	18.29 10389.2	18.9110398.15
10643.5	17.4110733.39	17.4110733.39	17.9210828.64
11199.32	17.8611494.31	17.8611494.31	18.2211768.35
12714.88	19.2812731.13	19.2812731.13	19.2612746.63
13035.62	18.4213072.62	18.4213072.62	16.8613094.12
13479.37	16.5813507.52	16.5813507.52	17.4513657.15
13933.51	19.3613970.28	19.3613970.28	29.2413998.69
14346.97	35.0614591.74	35.0614591.74	35.2214878.54
15439.78	36.7615532.59	36.7615532.59	36.8415625.11
15907.92	39.1115917.11	39.1115917.11	39.1616097.84
16387.26	40.3716454.47	40.3716454.47	41.74 16700.7

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
.25	.05	9890.4	.08
		9940.07	.02110359.53
			.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9890.4	10359.53	2028.75	4406.38	2370.38	.1	.3	

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Elev
.25	9890.402	17.6825	10359.53
		16700.7	17.6825

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	16.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.021	
W.S. Elev (ft)	16.44	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)		2585.16	
E.G. Slope (ft/ft)	0.000191	Area (sq ft)		2585.16	
Q Total (cfs)	8910.00	Flow (cfs)		8910.00	
Top Width (ft)	388.57	Top Width (ft)		388.57	
Vel Total (ft/s)	3.45	Avg. Vel. (ft/s)		3.45	
Max Chl Dpth (ft)	12.96	Hydr. Depth (ft)		6.65	
Conv. Total (cfs)	644773.1	Conv. (cfs)		644773.1	
Length Wtd. (ft)	4406.38	Wetted Per. (ft)		390.64	
Min Ch El (ft)	3.48	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.27	
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	1394.72	25963.81	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9876.79	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 22.5875*

INPUT

Description:

Station Elevation Data		num=	223							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
.38	47.94	59.64	47.84	164.91	42.28	166.06	42.27	289.76	38.53	
463.92	34.81	540.22	34.46	589.43	34.31	645.61	33.84	648	33.57	
653.85	33.55	654.81	33.85	674.28	34.33	683.8	34.26	686.62	34	
768.8	33.63	804.22	33.64	807.22	33.71	836	33.67	848.39	33.62	
1020.8	33.83	1034.42	32.22	1053.34	32.23	1056.07	32.29	1088.13	32.47	
1498.57	32.66	1690.03	33.97	1960.65	35.41	2141.73	34.04	2303.05	28.29	
2482.85	27.54	2544.43	27.41	2621.85	27.47	2755.29	27.85	2823.06	27.16	
3161.81	27.16	3412.48	27.16	3706.42	27.6	3934.59	27.54	4243.65	27.35	
4435.75	28.16	4636.05	30.91	4842.46	30.04	5039.2	27.29	5127.28	17.23	
5465.01	16.94	5736.36	17.13	6027.55	18.16	6310.26	17.48	6347.06	16.89	
6521.63	16.7	6781.15	16.43	6854.05	16.53	7012.96	16.8	7199.48	16.97	
7250.24	17.12	7289.34	17.25	7325.42	19.29	7345.52	19.63	7413.74	20.59	
7476.81	21.71	7536.68	22.79	7546.37	22.72	7572.64	22.55	7649.23	20.83	
7714.42	20.69	7818.67	20.56	7944.6	21.59	7972.45	21.75	7995.99	22.3	
8055.49	22.26	8068.04	21.64	8194.27	21.78	8303.43	21.63	8395.2	21.68	
8406.9	21.7	8435.46	20.75	8592.59	20.75	8665.18	20.97	8682.31	22.47	
8730.36	22.04	8744.34	22.31	8762.56	21.13	8773.49	21.47	8837.18	21.54	
8860.6	20.68	8923.33	21.72	8987.85	21.82	9000.88	23.92	9013.66	23.81	
9041.5	21.97	9073.64	22.45	9100.65	24.02	9133.75	21.99	9158.84	22.89	
9177.36	21.09	9226.59	20.6	9285.25	22.43	9295.69	21.97	9319.67	21.35	
9384.31	23.35	9407.13	26.45	9455.27	27.82	9455.64	27.92	9491.13	33.11	
9495.71	34.25	9501.09	32.41	9515.3	34.28	9520.76	35.38	9532.24	35.3	
9536.16	35.1	9544.42	34.4	9555.56	34.27	9564.12	33.81	9578.12	35.96	
9591.9	29.31	9593.38	28.93	9604.83	27.31	9607.73	26.49	9618.62	23.13	
9634.05	18.58	9636.83	18.11	9664.39	14.72	9672.01	13.86	9681.8	11.09	
9696.86	10.07	9699.38	10.01	9711.93	9.68	9726.99	9.03	9732.58	9.09	
9742.05	9.16	9757.12	9.71	9765.91	9.62	9772.18	9.58	9787.24	9.48	
9802.31	9.18	9803.28	9.16	9817.37	8.84	9832.43	8.56	9837.31	8.43	
9847.5	8.14	9852.31	8.05	9858.72	7.73	9862.56	7.45	9865.13	7.22	
9871.54	6.76	9877.62	6.36	9877.95	6.34	9884.36	5.94	9890.77	5.54	
9892.69	5.51	9897.17	5.53	9903.58	4.89	9907.75	4.69	9909.99	4.57	
9916.4	3.08	9922.81	1.9	9929.06	1.9	9935.91	2.94	9942.76	5.23	
9949.61	6.15	9956.46	6.76	9963.31	7.67	9970.16	8.97	9971.88	9.13	
10014.7	12.17	10034.55	13.81	10049.83	14.48	10055.99	15.77	10063.94	18.89	

10084.56	17.57	10093.2	18.0710102.02	18.3510132.81	17.210270.77	16.37
10343.95	16.6110432.59	17.23	10526.5	17.62	10575.2	17.54
10892.02	17.611182.89	18.1711453.11	17.3912086.08	17.6512370.61	18.71	
12386.43	19.8712402.46	19.8312417.74	19.0412587.66	18.3812618.55	18.83	
12702.7	18.612739.18	16.2712760.38	1612802.67	15.9212959.14	16.02	
13140.25	15.8813168.02	17.1913315.55	17.7413422.63	17.7313556.41	17.63	
13588.06	18.9913624.32	27.2213652.33	28.5713733.63	29.4713878.37	30.26	
13995.76	31.6314237.11	31.7814519.91	32.814836.38	32.8815028.71	32.9	
15073.32	33.0915164.84	33.1615256.07	33.0415389.57	33.3215474.48	35.67	
15534.93	36.2115543.99	36.29	15722.2	36.7815761.32	36.8315988.86	37.11
16007.59	37.4416073.85	38.5616316.65	39.76			

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.38	.05	9578.12	.08	9634.05	.0210063.94	.06	

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

9578.12	10063.94	2028.75	4406.38	2370.38	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.3759578.11	917.0637510063.94	16316.65	17.06375		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	15.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.020	
W.S. Elev (ft)	15.64	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)		2623.70	
E.G. Slope (ft/ft)	0.000170	Area (sq ft)		2623.70	
Q Total (cfs)	8910.00	Flow (cfs)		8910.00	
Top Width (ft)	398.51	Top Width (ft)		398.51	
Vel Total (ft/s)	3.40	Avg. Vel. (ft/s)		3.40	
Max Chl Dpth (ft)	13.74	Hydr. Depth (ft)		6.58	
Conv. Total (cfs)	682454.1	Conv. (cfs)		682454.1	
Length Wtd. (ft)	4406.38	Wetted Per. (ft)		400.52	
Min Ch El (ft)	1.90	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.24	
Frctn Loss (ft)	0.72	Cum Volume (acre-ft)	1394.72	25700.36	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9836.98	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 21.75*

INPUT

Description:

Station Elevation Data num= 223

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.5	45.15	57.83	45.27	159.67	38.31	160.78	38.29	280.44	34.84
448.92	31.21	522.73	30.65	570.34	30.38	624.69	29.83	627	29.48
632.66	29.46	633.59	29.86	652.43	30.52	661.63	30.45	664.36	30.23
743.86	29.77	778.12	29.79	781.03	29.85	808.87	29.83	820.86	29.79
987.64	30.04	1000.81	27.9	1019.12	27.9	1021.76	27.95	1052.78	28.1
1449.83	28.25	1635.05	29.3	1896.84	30.45	2072.01	29.35	2228.06	24.75
2402	24.15	2461.57	24.05	2536.47	24.1	2665.56	24.4	2731.12	23.85
3058.82	23.85	3301.31	23.85	3585.66	24.2	3806.39	24.15	4105.37	24
4291.2	24.65	4484.97	26.85	4684.64	26.15	4874.97	23.95	4960.18	15.9
5286.89	15.68	5549.39	16.04	5831.08	17.55	6104.57	16.76	6140.17	15.99

6309.05	15.82	6560.09	15.57	6630.62	15.64	6784.35	15.87	6964.79	16.02
7013.89	16.19	7051.71	16.34	7086.62	19.03	7106.06	19.47	7172.06	20.82
7233.07	22.25	7290.98	23.64	7300.35	23.53	7325.77	23.26	7399.87	20.84
7462.93	20.56	7563.77	20.17	7685.59	21.29	7712.54	21.48	7735.31	22.2
7792.87	22.11	7805.01	21.27	7927.12	21.37	8032.72	21.24	8121.5	21.37
8132.82	21.4	8160.45	20.14	8312.45	20.16	8382.68	20.47	8399.24	21.69
8445.72	21.44	8459.25	21.88	8476.87	21.24	8487.45	21.7	8549.06	21.79
8571.72	20.64	8632.4	22.03	8694.82	22.18	8707.42	24.98	8719.79	24.83
8746.72	22.37	8777.81	23.02	8803.94	25.12	8835.96	22.42	8860.23	23.61
8878.15	21.21	8925.77	20.56	8982.52	23	8992.62	22.39	9015.81	21.34
9078.35	23.4	9100.43	27.32	9146.99	28.69	9147.36	28.78	9181.69	30.87
9186.12	31.77	9191.32	30.28	9205.06	31.74	9210.35	32.61	9221.45	32.51
9225.24	32.34	9233.24	31.76	9244.01	32.06	9252.29	32	9265.83	34.22
9281.16	26.93	9282.8	26.59	9295.54	25.03	9298.76	24.3	9310.88	21.22
9328.03	17.12	9331.12	16.67	9361.77	13.79	9370.24	13.09	9381.13	10.88
9397.88	10.05	9400.69	10	9414.63	9.69	9431.39	9.12	9437.61	9.15
9448.14	9.16	9464.89	9.53	9474.67	9.42	9481.64	9.36	9498.39	9.22
9515.14	8.93	9516.22	8.91	9531.89	8.58	9548.64	8.27	9554.07	8.14
9565.39	7.84	9570.75	7.74	9577.88	7.35	9582.15	6.99	9585	6.72
9592.13	6.19	9598.9	5.74	9599.26	5.71	9606.38	5.29	9613.51	4.87
9615.65	4.86	9620.64	4.93	9627.77	4.11	9632.4	3.88	9634.89	3.73
9642.02	1.83	9649.15	.32	9654.15	.32	9659.95	1.41	9665.75	3.5
9671.55	4.49	9677.35	5.23	9683.15	6.22	9688.95	7.51	9690.4	7.71
9726.66	11.14	9743.47	13.02	9756.4	14.01	9761.62	15.22	9768.35	17.95
9788.68	16.85	9797.19	17.22	9805.89	17.42	9836.25	16.43	9972.26	15.44
10044.4	15.8210131.79		16.5410224.37		17.0910272.38		17.3310496.74		17.25
10584.71	17.3410871.47		18.1211137.87		17.0911761.89		17.4812042.39		18.91
12057.98	20.4612073.79		20.412088.86		19.3512256.37		18.4912286.82		19.09
12369.78	18.7812405.75		15.6712426.65		15.3212468.34		15.2212622.59		15.35
12801.14	15.1912828.51		16.9412973.96		17.6713079.52		17.6613211.41		17.54
13242.62	18.6213278.36		25.1913305.98		26.2713386.12		26.9613528.81		27.11
13644.54	28.2113882.48		28.3414161.28		29.1614473.27		29.2514662.89		29.26
14706.86	29.4214797.08		29.4814887.02		29.3915018.64		29.6215102.34		32.65
15161.94	33.3215170.88		33.4115346.56		33.9715385.13		34.0115609.45		34.25
15627.91	34.5115693.24		35.39	15932.6	36.25				

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val
 .5 .05 9265.83 .09 9310.88 .019 9768.35 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9265.83 9768.35 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .59265.835 16.445 9768.35 15932.6 16.445

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	15.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.019	
W.S. Elev (ft)	14.93	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)		2651.77	
E.G. Slope (ft/ft)	0.000155	Area (sq ft)		2651.77	
Q Total (cfs)	8910.00	Flow (cfs)		8910.00	
Top Width (ft)	410.73	Top Width (ft)		410.73	
Vel Total (ft/s)	3.36	Avg. Vel. (ft/s)		3.36	
Max Chl Dpth (ft)	14.61	Hydr. Depth (ft)		6.46	
Conv. Total (cfs)	716530.7	Conv. (cfs)		716530.7	
Length Wtd. (ft)	4406.38	Wetted Per. (ft)		412.90	
Min Ch El (ft)	0.32	Shear (lb/sq ft)		0.06	

Alpha	1.00	Stream Power (lb/ft s)	0.21		
Frctn Loss (ft)	0.62	Cum Volume (acre-ft)	1394.72	25433.54	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9796.05	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 20.9125*

INPUT

Description:

Station	Elevation	Data	num=	223						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
.62	42.36	56.02	42.71	154.43	34.33	155.5	34.31	271.13	31.14	
433.93	27.61	505.25	26.84	551.26	26.45	603.76	25.82	606	25.38	
611.47	25.37	612.36	25.87	630.57	26.72	639.46	26.64	642.1	26.47	
718.92	25.9	752.03	25.94	754.84	25.98	781.74	25.99	793.32	25.97	
954.48	26.26	967.21	23.57	984.9	23.58	987.45	23.61	1017.42	23.73	
1401.08	23.84	1580.06	24.63	1833.02	25.49	2002.29	24.66	2153.08	21.21	
2321.16	20.76	2378.71	20.69	2451.09	20.73	2575.82	20.95	2639.17	20.54	
2955.82	20.54	3190.14	20.54	3464.9	20.8	3678.19	20.76	3967.09	20.65	
4146.65	21.14	4333.89	22.79	4526.83	22.26	4710.74	20.61	4793.07	14.58	
5108.76	14.41	5362.42	14.96	5634.61	16.94	5898.88	16.05	5933.28	15.09	
6096.46	14.94	6339.04	14.71	6407.19	14.76	6555.74	14.94	6730.09	15.06	
6777.54	15.26	6814.08	15.43	6847.81	18.77	6866.6	19.32	6930.37	21.05	
6989.33	22.78	7045.29	24.48	7054.34	24.34	7078.91	23.97	7150.5	20.86	
7211.43	20.42	7308.88	19.78	7426.59	20.98	7452.63	21.21	7474.63	22.1	
7530.25	21.96	7541.98	20.91	7659.98	20.97	7762.02	20.86	7847.8	21.06	
7858.74	21.1	7885.44	19.53	8032.31	19.57	8100.17	19.96	8116.18	20.91	
8161.09	20.83	8174.16	21.45	8191.19	21.35	8201.41	21.92	8260.95	22.04	
8282.84	20.61	8341.48	22.35	8401.79	22.53	8413.96	26.03	8425.92	25.84	
8451.94	22.78	8481.99	23.59	8507.23	26.21	8538.17	22.84	8561.62	24.33	
8578.93	21.33	8624.95	20.52	8679.79	23.58	8689.54	22.82	8711.96	21.33	
8772.39	23.45	8793.72	28.19	8838.72	29.57	8839.07	29.63	8872.24	28.62	
8876.52	29.29	8881.54	28.16	8894.83	29.2	8899.94	29.83	8910.66	29.72	
8914.33	29.59	8922.05	29.12	8932.46	29.85	8940.46	30.19	8953.55	32.49	
8970.42	24.55	8972.23	24.25	8986.24	22.75	8989.8	22.12	9003.13	19.31	
9022.01	15.66	9025.42	15.22	9059.15	12.87	9068.48	12.33	9080.47	10.66	
9098.91	10.02	9101.99	9.98	9117.34	9.7	9135.78	9.22	9142.63	9.22	
9154.22	9.17	9172.66	9.35	9183.43	9.22	9191.1	9.14	9209.54	8.97	
9227.98	8.68	9229.17	8.66	9246.42	8.31	9264.85	7.97	9270.83	7.84	
9283.29	7.54	9289.19	7.43	9297.03	6.96	9301.73	6.53	9304.88	6.21	
9312.72	5.62	9320.17	5.11	9320.57	5.08	9328.41	4.64	9336.26	4.2	
9338.61	4.22	9344.11	4.32	9351.95	3.33	9357.05	3.06	9359.8	2.9	
9367.64	.57	9375.49	-1.26	9379.24	-1.26	9383.99	-.12	9388.74	1.76	
9393.49	2.83	9398.24	3.7	9402.99	4.76	9407.74	6.05	9408.93	6.28	
9438.62	10.1	9452.39	12.24	9462.98	13.54	9467.25	14.68	9472.76	17.01	
9492.8	16.12	9501.19	16.38	9509.77	16.5	9539.69	15.67	9673.74	14.5	
9744.85	15.02	9830.98	15.85	9922.24	16.56	9969.56	16.9	10190.7	16.96	
10277.41	17.08	10560.05	18.06	10822.62	16.79	11437.69	17.31	11714.17	19.11	
11729.54	21.04	11745.12	20.98	11759.97	19.67	11925.08	18.59	11955.09	19.34	
12036.86	18.96	12072.31	15.08	12092.91	14.64	12134	14.51	12286.05	14.69	
12462.03	14.49	12489.01	16.68	12632.37	17.61	12736.42	17.61	12866.41	17.45	
12897.17	18.25	12932.4	23.16	12959.62	23.96	13038.62	24.44	13179.26	23.95	
13293.33	24.79	13527.85	24.89	13802.65	25.53	14110.16	25.61	14297.06	25.63	
14340.4	25.75	14429.33	25.81	14517.97	25.73	14647.7	25.91	14730.21	29.64	
14788.95	30.42	14797.76	30.53	14970.92	31.15	15008.93	31.18	15230.04	31.38	
15248.23	31.59	15312.62	32.21	15548.55	32.74					

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .62 .05 8953.55 .1 9003.13 .017 9472.76 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 8953.55 9472.76 2028.75 4406.38 2370.38 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .6258953.55215.826259472.76315548.5515.82625

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	14.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.017	
W.S. Elev (ft)	14.32	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)		2683.31	
E.G. Slope (ft/ft)	0.000126	Area (sq ft)		2683.31	
Q Total (cfs)	8910.00	Flow (cfs)		8910.00	
Top Width (ft)	427.48	Top Width (ft)		427.48	
Vel Total (ft/s)	3.32	Avg. Vel. (ft/s)		3.32	
Max Chl Dpth (ft)	15.58	Hydr. Depth (ft)		6.28	
Conv. Total (cfs)	794927.7	Conv. (cfs)		794927.7	
Length Wtd. (ft)	4406.38	Wetted Per. (ft)		430.04	
Min Ch El (ft)	-1.26	Shear (lb/sq ft)		0.05	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	1394.72	25163.70	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9753.65	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 20.075*

INPUT

Description:

Station Elevation Data num= 223									
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
.75 39.58 54.22 40.14 149.18 30.35 150.22 30.33 261.82 27.45									
418.93 24.02 487.77 23.03 532.17 22.51 582.84 21.82 585 21.29									
590.28 21.28 591.14 21.88 608.71 22.91 617.3 22.82 619.85 22.7									
693.98 22.03 725.93 22.09 728.64 22.12 754.61 22.15 765.79 22.14									
921.32 22.47 933.61 19.25 950.68 19.25 953.14 19.28 982.07 19.35									
1352.34 19.43 1525.07 19.95 1769.21 20.53 1932.57 19.98 2078.1 17.68									
2240.31 17.38 2295.86 17.33 2365.7 17.35 2486.09 17.5 2547.22 17.23									
2852.83 17.23 3078.97 17.23 3344.14 17.4 3549.99 17.38 3828.8 17.3									
4002.11 17.63 4182.81 18.73 4369.01 18.38 4546.51 17.28 4625.97 13.25									
4930.64 13.14 5175.45 13.87 5438.14 16.33 5693.18 15.33 5726.39 14.19									
5883.87 14.06 6117.99 13.86 6183.76 13.87 6327.12 14.01 6495.39 14.11									
6541.18 14.34 6576.46 14.52 6609.01 18.51 6627.14 19.16 6688.69 21.28									
6745.59 23.32 6799.59 25.32 6808.33 25.14 6832.04 24.68 6901.13 20.87									
6959.94 20.29 7053.99 19.38 7167.59 20.68 7192.72 20.94 7213.96 22									
7267.64 21.81 7278.96 20.54 7392.83 20.56 7491.31 20.47 7574.11 20.76									
7584.66 20.8 7610.42 18.92 7752.17 18.98 7817.67 19.45 7833.12 20.14									
7876.46 20.22 7889.08 21.03 7905.51 21.47 7915.38 22.15 7972.83 22.3									
7993.96 20.57 8050.55 22.67 8108.76 22.89 8120.51 27.09 8132.04 26.86									
8157.16 23.19 8186.16 24.16 8210.52 27.31 8240.38 23.26 8263.01 25.06									
8279.72 21.46 8324.13 20.48 8377.06 24.15 8386.47 23.24 8408.11 21.32									
8466.42 23.5 8487.01 29.06 8530.44 30.44 8530.78 30.49 8562.79 26.38									
8566.93 26.8 8571.77 26.03 8584.59 26.66 8589.52 27.06 8599.88 26.94									

8603.41	26.83	8610.87	26.48	8620.91	27.64	8628.64	28.38	8641.27	30.76
8659.68	22.16	8661.66	21.91	8676.95	20.46	8680.83	19.93	8695.39	17.4
8716	14.21	8719.71	13.77	8756.54	11.94	8766.72	11.57	8779.8	10.44
8799.93	10	8803.29	9.97	8820.05	9.72	8840.18	9.32	8847.65	9.29
8860.31	9.18	8880.43	9.17	8892.19	9.01	8900.56	8.92	8920.69	8.71
8940.81	8.42	8942.11	8.41	8960.94	8.04	8981.07	7.68	8987.58	7.55
9001.19	7.25	9007.62	7.12	9016.19	6.57	9021.32	6.07	9024.75	5.71
9033.32	5.05	9041.45	4.49	9041.88	4.46	9050.44	4	9059.01	3.54
9061.57	3.58	9067.57	3.71	9076.13	2.56	9081.7	2.24	9084.7	2.07
9093.26	-.69	9101.83	-2.84	9104.33	-2.84	9108.02	-1.66	9111.72	.03
9115.42	1.16	9119.12	2.17	9122.82	3.31	9126.52	4.59	9127.45	4.85
9150.58	9.07	9161.3	11.46	9169.55	13.07	9172.88	14.13	9177.17	16.08
9196.92	15.4	9205.19	15.53	9213.64	15.58	9243.13	14.9	9375.23	13.57
9445.31	14.23	9530.18	15.15	9620.11	16.03	9666.74	16.46	9884.66	16.68
9970.11	16.82	10248.64	18.01	10507.38	16.51	11113.49	17.14	11385.94	19.3
11401.09	21.63	11416.45	21.55	11431.08	19.98	11593.79	18.69	11623.36	19.59
11703.94	19.14	11738.87	14.49	11759.17	13.96	11799.67	13.81	11949.5	14.03
12122.92	13.79	12149.51	16.42	12290.78	17.54	12393.31	17.53	12521.41	17.36
12551.72	17.88	12586.44	21.13	12613.27	21.65	12691.11	21.93	12829.71	20.8
12942.11	21.37	13173.23	21.45	13444.02	21.91	13747.06	21.97	13931.23	22
13973.94	22.08	14061.57	22.12	14148.93	22.08	14276.77	22.21	14358.07	26.63
14415.96	27.52	14424.64	27.65	14595.28	28.33	14632.74	28.36	14850.62	28.52
14868.55	28.66	14932.01	29.03	15164.5	29.23				

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
.75	.05	8641.27	.1
		8695.39	.016
		9177.17	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	8641.27	9177.17	2028.75	4406.38	2370.38	.1		.3

Blocked Obstructions		num=	2		
Sta L	Sta R	Elev	Sta L	Sta R	Elev
.74999998	8641.268	15.207591	77.175	15164.5	15.2075

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	13.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.016	
W.S. Elev (ft)	13.79	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)		2721.32	
E.G. Slope (ft/ft)	0.000115	Area (sq ft)		2721.32	
Q Total (cfs)	8910.00	Flow (cfs)		8910.00	
Top Width (ft)	452.27	Top Width (ft)		452.27	
Vel Total (ft/s)	3.27	Avg. Vel. (ft/s)		3.27	
Max Chl Dpth (ft)	16.63	Hydr. Depth (ft)		6.02	
Conv. Total (cfs)	832097.7	Conv. (cfs)		832097.7	
Length Wtd. (ft)	4406.38	Wetted Per. (ft)		455.51	
Min Ch El (ft)	-2.84	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frothn Loss (ft)	0.48	Cum Volume (acre-ft)	1394.72	24890.34	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9709.16	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 19.2375*

INPUT
 Description:

Station Elevation Data		num= 223	
Sta	Elev	Sta	Elev
.87	36.79	52.41	37.57
403.94	20.42	470.28	19.21
569.09	17.19	569.92	17.89
669.04	18.17	699.84	18.24
888.16	18.69	900	14.92
1303.6	15.01	1470.08	15.28
2159.46	13.99	2213	13.96
2749.83	13.91	2967.8	13.91
3857.56	14.11	4031.72	14.66
4752.52	11.87	4988.47	12.79
5671.29	13.18	5896.94	13
6304.83	13.41	6338.83	13.61
6501.84	23.86	6553.9	26.16
6708.45	20.15	6799.09	18.99
7005.02	21.65	7015.93	20.17
7310.58	20.5	7335.41	18.31
7591.83	19.61	7603.99	20.6
7705.08	20.54	7759.63	22.98
7862.38	23.59	7890.33	24.73
7980.51	21.58	8023.32	20.44
8160.46	23.55	8180.31	29.93
8257.33	24.32	8262	23.9
8292.5	24.07	8299.68	23.84
8348.94	19.78	8351.08	19.57
8409.98	12.75	8414.01	12.33
8500.95	9.97	8504.6	9.95
8566.39	9.18	8588.21	8.99
8653.65	8.17	8655.06	8.15
8719.09	6.95	8726.06	6.81
8753.91	4.47	8762.72	3.86
8784.53	2.93	8791.04	3.11
8818.88	-1.94	8828.16	-4.42
8837.36	-.5	8840.01	.65
8862.54	8.03	8870.22	10.68
8901.05	14.67	8909.19	14.69
9145.76	13.43	9229.38	14.46
9662.8	16.56	9937.22	17.95
11072.65	22.21	11087.77	22.13
11371.02	19.32	11405.44	13.89
11783.81	13.1	11810	16.16
12206.28	17.51	12240.49	19.11
12590.9	17.95	12818.6	18.01
13607.48	18.41	13693.82	18.44
14042.97	24.63	14051.52	24.78
14488.88	25.73	14551.39	25.85

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
.87	.05	8328.98	.1
		8367.66	.015
		8881.59	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	8328.98	8881.59		2028.75	4406.38	2370.38	.1	.3

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Elev
.87499998	8328.98414	588758881	58814780.4514
		58814780.4514	58875

CROSS SECTION OUTPUT Profile #Calibration

Parameter	Value	Element	Left OB	Channel	Right OB
E.G. Elev (ft)	13.48	Element			
Vel Head (ft)	0.16	Wt. n-Val.		0.015	
W.S. Elev (ft)	13.32	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)		2762.44	
E.G. Slope (ft/ft)	0.000102	Area (sq ft)		2762.44	
Q Total (cfs)	8910.00	Flow (cfs)		8910.00	
Top Width (ft)	472.57	Top Width (ft)		472.57	
Vel Total (ft/s)	3.23	Avg. Vel. (ft/s)		3.23	
Max Chl Dpth (ft)	17.74	Hydr. Depth (ft)		5.85	
Conv. Total (cfs)	882378.3	Conv. (cfs)		882378.3	
Length Wtd. (ft)	4406.38	Wetted Per. (ft)		477.09	
Min Ch El (ft)	-4.42	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.12	
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	1394.72	24612.98	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9662.38	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 18.4

INPUT

Description: Cross Section at River Mile 18.4

Station Elevation Data		num= 112	
Sta	Elev	Sta	Elev
1	34	50.6	35
543	13.1	547.9	13.1
855	14.9	866.4	10.6
5281.8	13.9	5312.6	12.4
6101.2	12.7	6131.4	18
6402.4	20.9	6544.2	18.6
6752.9	19.8	6949.9	19.7
7307.2	19	7343.3	22.6
7522.7	23.6	7533.6	29.2
7617.1	29.5	7644.8	24.1
7771.6	25.3	7800.4	21.3
7943.9	21.9	7988.5	21.2
8079.9	13.58	8108.3	10.88
8309.7	8.6	8368	7.9
8464.5	4.7	8474.5	3.9
8514.5	2.5	8524.5	1
8564.5	2	8574.5	7
9355.5	16.3	9625.8	17.9
10744.2	22.8	10759.1	22.7
11038.1	19.5	11072	13.3
11444.7	12.4	11470.5	15.9
12130.6	14.5	13534.9	14.8
14109.2	22.8	14396.4	22.2

Manning's n Values		num= 10	
Sta	n Val	Sta	n Val
1	.05	6026	.06
8038.2	.014	8778.2	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	8016.7	8586		3217.29	4349 2885.43	.1	.3

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Sta R
1	8016.7	13.97	8586 14396.4

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	13.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.014	
W.S. Elev (ft)	12.87	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)		2790.96	
E.G. Slope (ft/ft)	0.000098	Area (sq ft)		2790.96	
Q Total (cfs)	9183.00	Flow (cfs)		9183.00	
Top Width (ft)	496.56	Top Width (ft)		496.56	
Vel Total (ft/s)	3.29	Avg. Vel. (ft/s)		3.29	
Max Chl Dpth (ft)	18.87	Hydr. Depth (ft)		5.62	
Conv. Total (cfs)	927587.1	Conv. (cfs)		927587.1	
Length Wtd. (ft)	4349.00	Wetted Per. (ft)		503.68	
Min Ch El (ft)	-6.00	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.11	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	1394.72	24332.10	65.63
C & E Loss (ft)	0.01	Cum SA (acres)	991.74	9613.36	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 17.5714*

INPUT

Description: Interpolated Cross Section at River Mile 17.57

Station Elevation Data		num= 188	
Sta	Elev	Sta	Elev
.86	32.49	55.66	33.03
334.61	18.4	460.08	16.12
605.17	13.53	605.94	14.13
735.88	13.94	854.35	14.17
999.57	10.74	1080.46	10.9
1663.25	10.39	1779.17	10.37
3010.36	10.4	3961.94	10.37
4938.99	10.43	4961.92	10.56
5155.54	10.84	5170.19	11.34
5435.79	12.74	5545.35	13.95
5870.06	12.01	6031.5	11.91
6774.81	16.77	6914.81	22.25
7230.95	17.26	7373.16	18.8
7679.24	18.18	7774.93	18.61
8113.94	20.65	8172.83	20.82
8312.17	21.52	8324.21	26.33
8416.48	26.66	8434.47	23.95
8532.94	18.92	8587.2	23.14
8699.91	28.51	8708.35	28.78
8777.59	20.5	8824.27	20.06
8849.75	23.78	8858.03	25.24
8894.57	14.88	8903.49	14.29
9044.22	9.16	9095.2	8.61
9279.03	5.71	9288.87	5.08
9328.24	2.34	9338.08	1.89
9367.6	.1	9377.44	-3.28
9409.6	5.04	9412.5	6.64
9442.82	13.58	9617.55	11.3
9895.28	14.55	9898.03	14.59
10371.99	16.87	10398.35	16.54
11162.99	15.22	11208.34	15.51
			11271.62
			16.38
			11290
			16.22
			11296.94
			16.22

11325.41	16.4811552.14	18.6211566.71	21.2711581.49	21.1911595.56	19.39
11600.68	19.3411752.11	17.9311780.57	18.9611858.09	18.4511891.71	13.14
11911.24	12.54 11950.2	12.37 11954	12.3812094.35	12.6412149.11	12.56
12261.21	12.6112286.79	15.6612307.31	15.8912422.72	17.3912491.88	17.63
12521.36	17.6112662.74	17.312688.05	16.9612807.89	16.47 12812.5	16.39
12884.22	14.9412941.24	14.0614333.51	14.3114411.73	19.2914475.78	20.4
14639.96	21.0914902.89	21.1715187.63	20.66		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.86	.05	8858.03	.11	8879.19	.014	9427	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
8858.03 9427 3217.29 4349 2885.43 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.86	8858.03	13.42	9427	15187.63	13.42

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	12.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.014	
W.S. Elev (ft)	12.50	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)		2972.71	
E.G. Slope (ft/ft)	0.000081	Area (sq ft)		2972.71	
Q Total (cfs)	9183.00	Flow (cfs)		9183.00	
Top Width (ft)	503.30	Top Width (ft)		503.30	
Vel Total (ft/s)	3.09	Avg. Vel. (ft/s)		3.09	
Max Chl Dpth (ft)	18.47	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	1023149.0	Conv. (cfs)		1023149.0	
Length Wtd. (ft)	4349.00	Wetted Per. (ft)		509.06	
Min Ch El (ft)	-5.97	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	1394.72	24044.38	65.63
C & E Loss (ft)	0.01	Cum SA (acres)	991.74	9563.45	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 16.7428*

INPUT
Description: Interpolated Cross Section at River Mile 16.74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.71	30.97	60.73	31.07	108.82	26.51	167.33	21.44	224.59	20.56
366.17	18.07	503.57	16.03	547.37	15.5	654.09	14.45	656.51	13.95
662.44	13.96	663.29	14.46	663.41	14.53	683.13	15.34	778.84	13.72
805.56	13.52	935.29	13.68	1034.02	15.11	1046.18	12.56	1047.81	12.16
1094.3	10.89	1182.88	11.2	1367.7	11.17	1569.26	10.17	1685.04	10.23
1821.04	10.17	1947.98	10.14	2093.04	10.29	2252.76	10.17	2253.46	10.23
3296.13	10.2	4338.11	10.14	4571.76	10.57	4802.61	10.86	4877.93	10.14
5407.99	10.26	5433.1	10.51	5451.93	10.26	5534.33	10.28	5539.81	10.3
5645.12	10.63	5661.16	11.56	5683.48	10.94	5809.11	11.22	5826.46	11.36
5952	12.13	6071.96	13.18	6103.97	13.46	6249.11	13.12	6390.25	12.69
6427.52	11.61	6604.29	11.53	6940.9	11.36	7290.7	11.4	7381.69	11.75
7418.23	15.53	7571.53	20.09	7632.15	21.95	7668.57	21.3	7746.12	17.58
7917.7	15.92	8073.42	17.2	8097.25	18.19	8157.51	17.97	8170.21	16.76
8408.58	16.67	8513.36	17.02	8542.28	15.23	8701.38	15.29	8840.89	16.13

8884.57	18.7	8949.06	18.84	8972.78	17.19	9036.3	19.19	9070.96	19.3
9101.64	19.44	9114.83	23.46	9127.77	23.26	9155.97	19.8	9188.51	20.78
9215.86	23.82	9235.56	21.58	9249.37	20	9274.78	21.73	9293.54	18.32
9343.39	17.43	9402.8	20.98	9403.64	20.92	9437.64	18.49	9503.1	20.83
9526.21	26.22	9535.46	26.5	9567.54	26.13	9575.34	26.31	9596.14	22.11
9611.27	19.09	9662.39	18.88	9665.24	19.01	9680.53	21.78	9685.41	22.03
9690.29	21.89	9699.36	23.19	9713.52	17.69	9720.17	15.08	9727.68	14.27
9735.31	13.53	9744.09	13.01	9760.55	11.53	9788.05	9.48	9829.68	8.72
9882.55	8.39	9932.7	7.8	9983.05	6.99	10039.5	6.2410090.91	5.34	
10113.57	4.9110123.25		4.3710132.93		3.5410142.61		2.9310152.29	2.38	
10161.98	1.9810171.66		1.5810181.34		1.7610191.02		.6410193.93	.5	
10200.71	-.2110210.39		-3.3610220.07		-5.9410235.29		-.0310241.61	1.54	
10247	4.23	10250.5	6.2710252.92	7.83	10261	10.51	10268	13.94	
10283.68	13.1710456.91		10.910512.66		11.2610624.54		11.95	10669.5	14.09
10732.23	13.5410734.96		13.5710897.43		13.8511024.32		13.5311032.31	13.53	
11204.82	16.3611230.96		15.5311289.99		15.6811536.79		13.8	11670.1	13.71
11988.99	13.8312033.95		14.3412096.69		15.9812114.91		15.6512121.78	15.57	
12150.01	15.7712374.78		17.5312389.23		19.7512403.87		19.6712417.83	18.17	
12422.9	18.1312573.02		16.9712601.23		17.8312678.09		17.4112711.41	12.98	
12730.77	12.48	12769.4	12.3412773.17	12.3512912.31	12.5812966.59	12.52			
13077.73	12.8213103.08		15.4213123.43		15.6613237.83		17.38	13306.4	17.86
13335.63	17.8213475.78		17.4513500.88		16.8213619.68		16.0413624.25	15.95	
13695.35	14.3513751.87		13.6115132.12		13.8315209.66		17.9715273.16	18.9	
15435.92	19.4715696.58		19.5415978.86		19.11				

Manning's n Values		num=	4				
Sta	n Val	Sta	n Val				
.71	.05	9699.36	.11	9720.17	.014	10268	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9699.36	10268	3217.29	4349	2885.43	.1	.3	

Blocked Obstructions		num=	2		
Sta L	Sta R	Elev	Sta L	Sta R	Elev
.71	9699.36	12.87	10268	15978.86	12.87

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	12.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.014	
W.S. Elev (ft)	12.20	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)		3193.39	
E.G. Slope (ft/ft)	0.000065	Area (sq ft)		3193.39	
Q Total (cfs)	9183.00	Flow (cfs)		9183.00	
Top Width (ft)	511.33	Top Width (ft)		511.33	
Vel Total (ft/s)	2.88	Avg. Vel. (ft/s)		2.88	
Max Chl Dpth (ft)	18.14	Hydr. Depth (ft)		6.25	
Conv. Total (cfs)	1142077.0	Conv. (cfs)		1142077.0	
Length Wtd. (ft)	4349.00	Wetted Per. (ft)		516.28	
Min Ch El (ft)	-5.94	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	1394.72	23736.57	65.63
C & E Loss (ft)	0.01	Cum SA (acres)	991.74	9512.80	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 15.9142*

INPUT

Description: Interpolated Cross Section at River Mile 15.91

Station Elevation Data									
num= 188									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.57	29.46	65.79	29.1	118.05	25.11	181.64	20.96	243.87	20.17
397.74	17.74	547.06	15.95	594.66	15.54	710.64	14.77	713.27	14.38
719.71	14.38	720.63	14.79	720.76	14.84	742.19	15.36	846.21	13.44
875.25	13.09	1016.23	13.18	1123.52	15.22	1136.75	13.29	1138.52	12.93
1189.04	11.03	1285.3	11.5	1486.16	11.46	1705.21	9.96	1831.03	10.04
1978.83	9.96	2116.78	9.91	2274.43	10.13	2448.01	9.96	2448.76	10.04
3581.91	10	4714.29	9.91	4968.2	10.56	5219.09	10.99	5300.95	9.91
5876.99	10.09	5904.28	10.47	5924.74	10.09	6014.29	10.13	6020.25	10.14
6134.7	10.42	6152.13	11.79	6176.38	10.81	6312.91	10.99	6331.76	11.09
6468.2	11.53	6598.56	12.4	6633.36	12.65	6791.08	12.44	6944.47	12.08
6984.97	11.22	7177.09	11.14	7542.9	10.99	7923.05	11	8021.93	11.28
8061.64	14.3	8228.24	17.94	8294.12	19.42	8333.7	18.9	8417.99	15.92
8604.45	14.58	8773.68	15.59	8799.58	16.39	8865.07	16.21	8878.87	15.24
9137.91	15.15	9251.79	15.42	9283.21	13.99	9456.13	14.03	9607.74	14.7
9655.21	16.75	9725.3	16.86	9751.07	15.54	9820.1	17.13	9857.77	17.22
9891.11	17.36	9905.44	20.59	9919.51	20.45	9950.15	17.71	9985.52	18.52
10015.24	20.97	10036.65	19.21	10051.66	17.95	10079.28	19.35	10099.66	16.63
10153.83	15.95	10218.4	18.83	10219.31	18.77	10256.27	17.08	10327.4	19.44
10352.52	23.92	10362.57	24.22	10397.43	23.21	10405.91	23.36	10428.51	20.05
10444.96	17.69	10500.51	17.71	10503.6	17.91	10520.22	20.71	10525.53	20.65
10530.83	19.99	10540.69	21.13	10554.62	16.25	10561.16	13.92	10568.54	13
10576.04	12.18	10584.68	11.74	10600.87	10.51	10627.92	8.77	10668.87	8.04
10720.87	7.61	10770.2	6.98	10819.72	6.18	10875.24	5.41	10925.81	4.53
10948.1	4.12	10957.62	3.65	10967.15	2.96	10976.67	2.44	10986.19	1.98
10995.72	1.63	11005.24	1.28	11014.76	1.38	11024.29	.46	11027.14	.34
11033.81	-.51	11043.33	-3.44	11052.86	-5.91	11070.68	-1.04	11078.09	.27
11084.4	3.43	11088.5	5.91	11091.34	7.74	11100.8	10.11	11109	13.81
11124.55	12.75	11296.26	10.51	11351.53	10.65	11462.43	10.9	11507	13.79
11569.18	12.54	11571.89	12.56	11732.94	12.78	11858.73	12.15	11866.64	12.13
12037.66	15.85	12063.57	14.53	12122.08	14.57	12366.73	12.75	12498.88	12.5
12815	12.45	12859.56	13.17	12921.75	15.58	12939.81	15.07	12946.62	14.92
12974.61	15.05	13197.42	16.45	13211.74	18.22	13226.26	18.16	13240.09	16.96
13245.12	16.93	13393.93	16	13421.9	16.69	13498.09	16.36	13531.12	12.82
13550.31	12.42	13588.6	12.31	13592.33	12.32	13730.26	12.52	13784.08	12.47
13894.24	13.03	13919.38	15.18	13939.54	15.43	14052.95	17.36	14120.92	18.09
14149.89	18.03	14288.83	17.6	14313.7	16.68	14431.47	15.61	14436	15.52
14506.48	13.76	14562.51	13.17	15930.72	13.34	16007.6	16.66	16070.54	17.4
16231.88	17.86	16490.27	17.91	16770.09	17.57				

Manning's n Values									
num= 4									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.57	.05	10540.69	.11	110561.16	.014	11109	.06		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	10540.69	11109		3217.29	4349 2885.43	.1	.3	

Blocked Obstructions					
num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
.57	10540.69	12.33	11109	16770.09	12.33

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	12.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.014	
W.S. Elev (ft)	11.96	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)		3454.90	
E.G. Slope (ft/ft)	0.000051	Area (sq ft)		3454.90	
Q Total (cfs)	9183.00	Flow (cfs)		9183.00	

Top Width (ft)	524.52	Top Width (ft)	524.52
Vel Total (ft/s)	2.66	Avg. Vel. (ft/s)	2.66
Max Chl Dpth (ft)	17.87	Hydr. Depth (ft)	6.59
Conv. Total (cfs)	1281166.0	Conv. (cfs)	1281166.0
Length Wtd. (ft)	4349.00	Wetted Per. (ft)	529.03
Min Ch El (ft)	-5.91	Shear (lb/sq ft)	0.02
Alpha	1.00	Stream Power (lb/ft s)	0.06
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)	1394.72
C & E Loss (ft)	0.00	Cum SA (acres)	991.74
			23404.69
			65.63
			9461.09
			169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 15.0857*

INPUT
 Description: Interpolated Cross Section at River Mile 15.09
 Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.43	27.94	70.86	27.13	127.29	23.71	195.95	20.48	263.16	19.78
429.3	17.4	590.54	15.86	641.94	15.59	767.18	15.1	770.02	14.8
776.98	14.81	777.97	15.11	778.11	15.15	801.26	15.38	913.57	13.15
944.94	12.67	1097.17	12.69	1213.03	15.33	1227.31	14.02	1229.22	13.71
1283.78	11.17	1387.73	11.8	1604.62	11.74	1841.16	9.74	1977.02	9.86
2136.62	9.74	2285.59	9.69	2455.83	9.97	2643.25	9.74	2644.07	9.86
3867.68	9.8	5090.47	9.69	5364.65	10.54	5635.57	11.11	5723.96	9.69
6345.99	9.91	6375.46	10.43	6397.56	9.91	6494.25	9.97	6500.68	9.98
6624.27	10.22	6643.1	12.02	6669.29	10.68	6816.71	10.75	6837.07	10.81
6984.4	10.92	7125.17	11.63	7162.75	11.83	7333.06	11.75	7498.7	11.48
7542.43	10.83	7749.88	10.76	8144.9	10.62	8555.4	10.6	8662.17	10.8
8705.05	13.07	8884.96	15.79	8956.1	16.89	8998.83	16.5	9089.85	14.26
9291.19	13.24	9473.94	13.99	9501.91	14.59	9572.62	14.45	9587.53	13.72
9867.25	13.64	9990.22	13.8310024.15	12.7610210.87	12.7710374.59	12.7710374.59	12.7710374.59	12.7710374.59	13.27
10425.85	14.810501.53	14.8810529.36	14.8810529.36	13.89	10603.9	13.89	10603.9	15.0810644.58	15.14
10680.58	15.2910696.05	17.7210711.25	17.7210711.25	17.6310744.33	15.6110782.53	15.6110782.53	15.6110782.53	16.26	16.26
10814.62	18.1310837.73	16.8310853.95	16.8310853.95	15.8910883.77	16.9710905.78	16.9710905.78	16.9710905.78	14.94	14.94
10964.28	14.4711033.99	16.6711034.98	16.6711034.98	16.6311074.89	15.68	11151.7	15.68	11151.7	18.06
11178.82	21.6311189.67	21.9411227.32	21.9411227.32	20.2811236.47	20.4211260.88	20.4211260.88	20.4211260.88	17.99	17.99
11278.64	16.2911338.64	16.5311341.97	16.5311341.97	16.8211359.92	19.6311365.65	19.6311365.65	19.6311365.65	19.26	19.26
11371.37	18.0911382.01	19.0711395.71	19.0711395.71	14.8111402.15	12.7611409.41	12.7611409.41	12.7611409.41	11.72	11.72
11416.78	10.8311425.28	10.47	11441.2	9.4711467.79	8.0711508.06	8.0711508.06	8.0711508.06	7.36	7.36
11559.19	6.84	11607.7	6.17	11656.4	5.3711710.99	4.5811760.72	4.5811760.72	3.72	3.72
11782.63	3.32	11792	2.9411801.36	2.3811810.73	1.9511820.09	1.9511820.09	1.9511820.09	1.57	1.57
11829.46	1.2711838.82	.9711848.18	.9711848.18	1.0111857.55	.2811860.36	.2811860.36	.2811860.36	.18	.18
11866.91	-.8211876.28	-3.5211885.64	-3.5211885.64	-5.8911906.07	-2.0511914.57	-2.0511914.57	-2.0511914.57	-.99	-.99
11921.8	2.62	11926.5	5.5511929.75	7.66	11940.6	7.66	11940.6	9.71	11950
11965.41	12.3412135.62	10.1	12190.4	10.0412300.32	9.85	12344.5	9.85	12344.5	13.49
12406.14	11.5312408.82	11.5412568.46	11.5412568.46	11.7112693.13	10.7712700.98	10.7712700.98	10.7712700.98	10.72	10.72
12870.49	15.3412896.18	13.5212954.17	13.5212954.17	13.4613196.67	11.713327.66	11.713327.66	11.713327.66	11.3	11.3
13641	11.0613685.17	1213746.81	1213746.81	15.1913764.71	14.4913771.47	14.4913771.47	14.4913771.47	14.26	14.26
13799.21	14.3414020.06	15.3714034.25	15.3714034.25	16.6914048.64	16.6514062.36	16.6514062.36	16.6514062.36	15.74	15.74
14067.34	15.7214214.84	15.0414242.56	15.0414242.56	15.5614318.08	15.3114350.82	15.3114350.82	15.3114350.82	12.66	12.66
14369.85	12.36	14407.8	12.29	14411.5	12.2914548.22	12.4614601.56	12.4614601.56	12.43	12.43
14710.75	13.2314735.67	14.9414755.66	14.9414755.66	15.214868.07	17.3514935.44	17.3514935.44	17.3514935.44	18.31	18.31
14964.16	18.2415101.87	17.7515126.53	17.7515126.53	16.5315243.26	15.1815247.75	15.1815247.75	15.1815247.75	15.09	15.09
15317.61	13.1715373.15	12.7316729.33	12.7316729.33	12.8616805.53	15.3416867.92	15.3416867.92	15.3416867.92	15.9	15.9
17027.84	16.2417283.96	16.2917561.31	16.2917561.31	16.03					

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.43	.0511382.01	.1111402.15	.02	11950	.06		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 11382.01 11950 3217.29 4349 2885.43 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.4311382.01	11.78	1195017561.31	11.78		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	11.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.020	
W.S. Elev (ft)	11.67	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)		3702.41	
E.G. Slope (ft/ft)	0.000086	Area (sq ft)		3702.41	
Q Total (cfs)	9183.00	Flow (cfs)		9183.00	
Top Width (ft)	535.42	Top Width (ft)		535.42	
Vel Total (ft/s)	2.48	Avg. Vel. (ft/s)		2.48	
Max Chl Dpth (ft)	17.56	Hydr. Depth (ft)		6.91	
Conv. Total (cfs)	993067.4	Conv. (cfs)		993067.4	
Length Wtd. (ft)	4349.00	Wetted Per. (ft)		539.75	
Min Ch El (ft)	-5.89	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Froctn Loss (ft)	0.46	Cum Volume (acre-ft)	1394.72	23047.40	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9408.18	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 14.2571*

INPUT
 Description: Interpolated Cross Section at River Mile 14.26
 Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.29	26.43	75.92	25.17	136.53	22.3	210.26	20	282.44	19.38
460.87	17.07	634.03	15.77	689.23	15.64	823.73	15.42	826.78	15.23
834.25	15.24	835.31	15.44	835.47	15.47	860.32	15.4	980.94	12.86
1014.63	12.25	1178.12	12.19	1302.54	15.44	1317.87	14.75	1319.93	14.49
1378.52	11.31	1490.15	12.1	1723.08	12.03	1977.11	9.53	2123.02	9.67
2294.42	9.53	2454.39	9.46	2637.22	9.81	2838.5	9.53	2839.38	9.67
4153.45	9.6	5466.65	9.46	5761.1	10.53	6052.04	11.24	6146.97	9.46
6815	9.74	6846.64	10.39	6870.37	9.74	6974.22	9.81	6981.12	9.82
7113.85	10.01	7134.06	12.25	7162.19	10.56	7320.52	10.51	7342.38	10.54
7500.6	10.31	7651.78	10.85	7692.13	11.01	7875.04	11.07	8052.92	10.87
8099.89	10.44	8322.68	10.37	8746.9	10.25	9187.75	10.2	9302.42	10.33
9348.47	11.83	9541.67	13.63	9618.07	14.36	9663.97	14.1	9761.71	12.6
9977.94	11.9	10174.2	12.3910204.24	12.7810280.18	12.6810296.19	12.2			
10596.59	12.1210728.65	12.2410765.09	11.5210965.61	11.5211141.43	11.83				
11196.48	12.8511277.76	12.9111307.65	12.23	11387.7	13.0211431.38	13.06			
11470.05	13.2111486.67	14.8511502.98	14.8111538.51	13.5111579.53	13.99				
11614	15.2911638.82	14.4511656.24	13.8411688.26	14.5811711.89	13.25				
11774.72	12.9911849.59	14.5111850.66	14.4911893.51	14.27	11976	16.67			
12005.13	19.3412016.78	19.6612057.22	17.3512067.04	17.4712093.25	15.93				
12112.33	14.8812176.76	15.3512180.34	15.7212199.61	18.5512205.76	17.87				
12211.92	16.1912223.34	17.0112236.81	13.3812243.14	11.612250.27	10.45				
12257.52	9.4812265.87	9.1912281.52	8.4412307.67	7.3712347.25	6.68				
12397.52	6.06	12445.2	5.3612493.07	4.5712546.74	3.7512595.62	2.91			

12617.17	2.5312626.37	2.2212635.58	1.812644.78	1.4712653.99	1.16
12663.19	.91 12672.4	.6612681.61	.6412690.81	.112693.57	.02
12700.02	-1.1212709.22	-3.612718.43	-5.8612741.47	-3.0712751.04	-2.26
12759.2	1.8112764.51	5.1912768.17	7.57 12780.4	9.31 12791	13.56
12806.27	11.9312974.97	9.713029.26	9.4213138.21	8.8 13182	13.19
13243.09	10.5213245.75	10.5313403.97	10.6413527.54	9.3813535.32	9.31
13703.33	14.8213728.79	12.5113786.27	12.3514026.61	10.6514156.44	10.1
14467	9.6714510.78	10.8414571.88	14.7914589.62	13.9214596.31	13.61
14623.8	13.6314842.69	14.2814856.76	15.1714871.03	15.1314884.62	14.53
14889.56	14.5115035.76	14.0715063.23	14.4215138.08	14.2715170.53	12.5
15189.38	12.31 15227	12.2615230.67	12.2615366.17	12.3915419.04	12.39
15527.26	13.4415551.96	14.715571.77	14.9615683.19	17.3415749.96	18.54
15778.42	18.4415914.91	17.915939.35	16.3916055.05	14.75 16059.5	14.66
16128.74	12.5816183.79	12.2917527.94	12.3717603.46	14.0317665.29	14.4
17823.8	14.6318077.64	14.6618352.54	14.49		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.29	.0512223.34	.1112243.14	.026	12791	.06		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	12223.34	12791		3217.29	4349 2885.43	.1	.3	
Blocked Obstructions	num= 2							
Sta L	Sta R	Elev	Sta L	Sta R	Elev			
.2912223.34	11.24	1279118352.54	11.24					

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	11.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.026	
W.S. Elev (ft)	11.22	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)		3864.39	
E.G. Slope (ft/ft)	0.000127	Area (sq ft)		3864.39	
Q Total (cfs)	9183.00	Flow (cfs)		9183.00	
Top Width (ft)	539.63	Top Width (ft)		539.63	
Vel Total (ft/s)	2.38	Avg. Vel. (ft/s)		2.38	
Max Chl Dpth (ft)	17.08	Hydr. Depth (ft)		7.16	
Conv. Total (cfs)	816194.9	Conv. (cfs)		816194.9	
Length Wtd. (ft)	4349.00	Wetted Per. (ft)		543.93	
Min Ch El (ft)	-5.86	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.13	
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	1394.72	22669.66	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9354.51	169.35

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 13.4285*

INPUT
 Description: Interpolated Cross Section at River Mile 13.43

Station Elevation Data	num= 188										
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.14	24.91	80.98	23.2	145.76	20.9	224.58	19.52	301.72	18.99		
492.43	16.73	677.51	15.69	736.52	15.69	880.27	15.75	883.53	15.65		
891.52	15.67	892.66	15.77	892.82	15.78	919.39	15.42	1048.31	12.57		
1084.31	11.82	1259.06	11.7	1392.05	15.54	1408.44	15.47	1410.63	15.27		
1473.26	11.46	1592.58	12.4	1841.54	12.31	2113.05	9.31	2269.01	9.49		
2452.21	9.31	2623.2	9.23	2818.61	9.66	3033.75	9.31	3034.69	9.49		

4439.23	9.4	5842.82	9.23	6157.55	10.51	6468.52	11.37	6569.99	9.23
7284	9.57	7317.82	10.34	7343.19	9.57	7454.18	9.65	7461.56	9.66
7603.42	9.81	7625.03	12.47	7655.1	10.43	7824.32	10.27	7847.69	10.27
8016.8	9.71	8178.39	10.08	8221.52	10.19	8417.02	10.38	8607.15	10.27
8657.35	10.04	8895.47	9.99	9348.9	9.87	9820.09	9.8	9942.66	9.85
9991.88	10.610198	.39	11.4810280	.04	11.84	10329.1	11.710433	.58	10.94
10664.69	10.5710874	.46	10.7910906	.56	10.9810987	.73	10.9211004	.84	10.68
11325.93	10.611467	.08	10.6511506	.03	10.2911720	.36	10.2611908	.28	10.4
11967.12	10.912053	.99	10.9212085	.94	10.58	12171.5	10.9712218	.19	10.98
12259.52	11.1312277	.28	11.9812294	.72	11.99	12332.7	11.4112376	.54	11.73
12413.38	12.4512439	.91	12.0812458	.52	11.7912492	.75	12.212518	.01	11.56
12585.16	11.512665	.19	12.3512666	.33	12.3412712	.13	12.8712800	.31	15.28
12831.44	17.0512843	.89	17.3812887	.11	14.4312897	.61	14.5312925	.63	13.86
12946.02	13.4813014	.88	14.1813018	.71	14.6313039	.31	17.4813045	.88	16.49
13052.46	14.313064	.67	14.96	13077.9	11.9413084	.12	10.4413091	.14	9.17
13098.26	8.1313106	.47	7.9213121	.85	7.4213147	.54	6.6713186	.44	6
13235.84	5.28	13282.7	4.5513329	.75	3.7613382	.49	2.9113430	.53	2.1
13451.7	1.7313460	.75	1.5113469	.79	1.2213478	.84	.9813487	.89	.75
13496.93	.5513505	.98	.3513515	.03	.2713524	.07	-.0813526	.79	-1.14
13533.12	-1.4213542	.17	-3.6813551	.21	-5.8313576	.86	-4.0813587	.52	-3.53
13596.6	1.0113602	.51	4.8213606	.58	7.49	13620.2	8.9	13632	13.43
13647.14	11.5113814	.32	9.3113868	.13	8.8113976	.11	7.75	14019.5	12.9
14080.05	9.5114082	.68	9.5114239	.49	9.5714361	.95	814369	.66	7.91
14536.17	14.3114561	.39	11.5114618	.36	11.2314856	.55	9.614985	.22	8.9
15293	8.2915336	.39	9.6715396	.94	14.415414	.52	13.3415421	.16	12.95
15448.4	12.9115665	.33	13.215679	.28	13.6415693	.41	13.6215706	.88	13.32
15711.78	13.3115856	.67	13.1115883	.89	13.2915958	.07	13.2215990	.23	12.34
16008.92	12.25	16046.2	12.2316049	.83	12.2316184	.13	12.3316236	.52	12.34
16343.78	13.6516368	.25	14.4616387	.88	14.73	16498.3	17.3316564	.48	18.77
16592.69	18.6516727	.96	18.0516752	.18	16.2416866	.84	14.3216871	.25	14.23
16939.87	11.9916994	.42	11.8418326	.55	11.8918401	.39	12.7118462	.67	12.9
18619.76	13.0118871	.33	13.0319143	.77	12.94				

Manning's n Values		num=	4				
Sta	n Val	Sta	n Val				
.14	.0513064	.67	.1113084	.12	.032	13632	.06

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	13064.67	13632		3217.29		4349 2885.43	.1		.3

Blocked Obstructions		num=	2		
Sta L	Sta R	Elev	Sta L	Sta R	Elev
.14	13064.67	10.69	13632	19143.77	10.69

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	10.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.032	
W.S. Elev (ft)	10.54	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)		3909.61	
E.G. Slope (ft/ft)	0.000186	Area (sq ft)		3909.61	
Q Total (cfs)	9183.00	Flow (cfs)		9183.00	
Top Width (ft)	540.77	Top Width (ft)		540.77	
Vel Total (ft/s)	2.35	Avg. Vel. (ft/s)		2.35	
Max Chl Dpth (ft)	16.37	Hydr. Depth (ft)		7.23	
Conv. Total (cfs)	673219.3	Conv. (cfs)		673219.3	
Length Wtd. (ft)	4349.00	Wetted Per. (ft)		545.16	
Min Ch El (ft)	-5.83	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.20	
Frcn Loss (ft)	1.07	Cum Volume (acre-ft)	1394.72	22281.59	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9300.58	169.35

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 12.6

INPUT
 Description: Interpolated Cross Section at River Mile 12.6

Station Elevation Data num= 81									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	23.4	155	19.5	321	18.6	524	16.4	721	15.6
950	16.1	1154	11.4	1340	11.2	1499	16.2	1568	11.6
1695	12.7	1960	12.6	2249	9.1	2415	9.3	2610	9.1
2792	9	3000	9.5	3229	9.1	3230	9.3	4725	9.2
6219	9	6554	10.5	6885	11.5	6993	9	7753	9.4
7789	10.3	7816	9.4	7942	9.5	8093	9.6	8116	12.7
8148	10.3	8353	10	8533	9.1	8705	9.3	8959	9.7
13005	8.9	13241	9.7	13482	10.2	13671	15.1	13717	11.5
13758	11.8	13853	13	13879	16.4	13886	15.1	13893	12.4
13906	12.9	13919	10.5	13932	7.9	13939	6.78	14360	- .3
14384	-5.8	14424	-4.8	14434	.2	14445	7.4	14460	8.5
14473	13.3	14488	11.1	14707	8.2	14814	6.7	14857	12.6
14917	8.5	15075	8.5	15204	6.5	15369	13.8	15394	10.5
15814	7.7	16119	6.9	16162	8.5	16222	14	16246	12.3
16273	12.2	16534	12.1	16869	12.2	17054	12.3	17204	14.5
17379	19	17541	18.2	17565	16.1	17683	13.8	17751	11.4
19935	11.4								

Manning's n Values num= 12									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1154	.04	4725	.06	6885	.04	13482	.05
13758	.11	13932	.038	14473	.11	14707	.07	16222	.06
16869	.04	17751	.11						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	13906	14473		1090	5078	2467	.1	.3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	13932	10.14	14445	19935	10.14

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	9.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.038	
W.S. Elev (ft)	9.46	Reach Len. (ft)	1090.00	5078.00	2467.00
Crit W.S. (ft)		Flow Area (sq ft)		3702.25	
E.G. Slope (ft/ft)	0.000306	Area (sq ft)		3702.25	
Q Total (cfs)	9361.00	Flow (cfs)		9361.00	
Top Width (ft)	513.00	Top Width (ft)		513.00	
Vel Total (ft/s)	2.53	Avg. Vel. (ft/s)		2.53	
Max Chl Dpth (ft)	15.26	Hydr. Depth (ft)		7.22	
Conv. Total (cfs)	535283.0	Conv. (cfs)		535283.0	
Length Wtd. (ft)	5078.00	Wetted Per. (ft)		520.72	
Min Ch El (ft)	-5.80	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.34	
Frcn Loss (ft)	1.29	Cum Volume (acre-ft)	1394.72	21901.61	65.63
C & E Loss (ft)	0.01	Cum SA (acres)	991.74	9247.98	169.35

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

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 11.7

INPUT

Description: Cross Section at River Mile 11.7

Station Elevation Data num= 109									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	23.1	154.5	19.2	321.4	18.3	523.9	16.1	721.3	15.3
950.1	15.8	1153.5	11.1	1340.4	10.9	1499.4	15.9	1567.7	11.3
1694.6	12.4	1960.3	12.3	2248.9	8.8	2415.4	9	2610.4	8.8
2792.3	8.7	2999.5	9.2	3228.5	8.8	3230	9	4725	8.9
6219.3	8.7	6554	10.2	6884.5	11.2	6993.1	8.7	7752.9	9.1
7789	10	7816.4	9.1	7941.7	9.2	8092.5	9.3	8116.1	12.4
8147.5	10	8353.4	9.7	8533	8.8	8705	9	8958.5	9.4
13005.1	8.6	13240.6	9.4	13481.8	9.9	13670.5	14.8	13716.7	11.2
13758.2	11.5	13853.4	12.7	13878.5	16.1	13885.5	14.8	13892.6	12.1
13905.9	12.6	13919.1	10.2	13932.2	7.6	13951.4	5.8	14045.3	7.2
14136.4	2.8	14142.7	2.7	14152.6	2.4	14162.7	1.4	14172.6	-1
14182.7	-.6	14192.6	-1.3	14202.7	-1.9	14207.6	-3.1	14212.7	3
14220	10	14345.6	8.9	14384.6	16.7	14490.7	23.9	14771.9	20.9
15535.7	8.4	15555.8	7.7	15564.2	7.9	15576.9	4.9	15631.2	6.5
15691.2	6.1	15728.1	2.7	15759	1.3	15783.9	-3.9	15809	-5
15833.9	-5	15859	-4.3	15883.9	-4.7	15909	-4.1	15933.9	-3.5
15959	2.9	15978.2	7.7	15992.5	8.2	16005.8	13	16020.8	10.8
16240.1	7.9	16347.2	6.4	16390.3	12.3	16449.7	8.2	16608.1	8.2
16736.9	6.2	16902	13.5	16927.3	10.2	17347.2	7.4	17652.3	6.6
17695.4	8.2	17755.3	13.7	17779.3	12	17805.9	11.9	18066.6	11.8
18401.6	11.9	18587.3	12	18736.5	14.2	18912.2	18.7	19073.5	17.9
19097.8	15.8	19216	13.5	19284.3	11.1	21468.3	11.1		

Manning's n Values num= 15									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1153.5	.04	4725	.06	6884.5	.04	13481.8	.05
13758.2	.11	13932.2	.03	14220	.07	14490.7	.05	15535.7	.03
16005.8	.11	16240.1	.07	17755.3	.06	18401.6	.04	19284.3	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	13905.9	16005.8	2559	4481.46	2515.69	.1	.3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	13905.9	9.62	16005.8	21468.3	9.62

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	8.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.030	
W.S. Elev (ft)	8.19	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)		4107.71	
E.G. Slope (ft/ft)	0.000202	Area (sq ft)		4107.71	
Q Total (cfs)	9361.00	Flow (cfs)		9361.00	
Top Width (ft)	739.42	Top Width (ft)		739.42	
Vel Total (ft/s)	2.28	Avg. Vel. (ft/s)		2.28	
Max Chl Dpth (ft)	13.19	Hydr. Depth (ft)		5.56	
Conv. Total (cfs)	658902.5	Conv. (cfs)		658902.5	
Length Wtd. (ft)	4481.46	Wetted Per. (ft)		747.54	

Min Ch El (ft)	-5.00	Shear (lb/sq ft)			0.07
Alpha	1.00	Stream Power (lb/ft s)			0.16
Frctn Loss (ft)	0.66	Cum Volume (acre-ft)	1394.72	21446.38	65.63
C & E Loss (ft)	0.01	Cum SA (acres)	991.74	9174.98	169.35

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 RIVER: Fish Creek
REACH: Lower Fish Creek RS: 10.8538*

INPUT
Description: Interpolated Cross Section at River Mile 10.85
Station Elevation Data num= 271

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	21.53	145.83	17.92	303.37	17.09	494.51	15.05	680.84	14.3
789.5	14.52	896.81	14.76	1088.8	10.43	1265.21	10.25	1415.3	14.87
1479.76	10.63	1599.55	11.65	1839.03	11.57	1850.34	11.56	2122.75	8.33
2279.91	8.51	2463.98	8.33	2635.67	8.23	2817.1	8.66	2831.25	8.69
3047.41	8.31	3048.82	8.49	3871.16	8.38	4459.96	8.36	4850.97	8.32
5851.35	8.13	5870.44	8.13	6186.37	9.54	6498.33	10.49	6600.84	8.19
6840.92	8.33	7318.02	8.54	7352.1	9.37	7377.96	8.54	7496.23	8.62
7638.57	8.7	7660.85	11.56	7690.49	9.34	7773.33	9.22	7884.84	9.07
8054.36	8.24	8216.72	8.43	8456	8.81	8632.19	8.78	9555.54	8.54
10472.96	8.39	11325.9	8.2512275.61	8.1412323.49	8.3	12497.9	8.88		
12725.57	9.3312903.69	13.86	12947.3	10.5312986.47	10.8113076.33	11.92			
13100.02	15.0513106.63	13.8513113.33		11.3613125.88	11.8213147.48	9.58			
13160.7	8.0813168.91	7.1613180.17		6.5513197.96	5.613200.32	5.46			
13217.04	5.4913230.29	5.6913236.11		5.6413240.68	5.4113244.97	5.56			
13249.99	5.7813255.14	5.8213272.97		6.113289.67	6.2413308.47	6.41			
13326.23	6.5613339.82	6.6813353.93		6.7913355.07	6.7513380.51	6.07			
13416.17	5.0913431.07	4.6713441.06		4.3913452.66	4.0213465.87	3.64			
13485.18	3.1513499.33	2.8113502.97		2.7113513.27	2.6313526.93	2.4			
13529.47	2.3513545.02	1.4913545.99		1.4313562.11	.0713562.19	.06			
13578.71	-.3913582.71	-.5513594.91		-1.0413607.88	-1.4813611.43	-1.6			
13619.45	-2.7213627.79	2.9113639.73		9.3613641.55	9.3513677.07	9.18			
13718.64	8.9913756.01	8.7913789.27		8.64	13816.3	8.5	13845.2	8.35	
13860.8	10.1113893.53	13.8113909.01		15.5613926.77	16.2413950.71	17.16			
13982.96	18.3914014.06	19.5714048.86		20.9414074.19	21.8614082.58	22.19			
14104.36	22.0814137.55	21.8114166.11		21.714192.55	21.51	14227.7	21.3		
14272.64	21.0714307.63	20.8514334.41		20.6214387.41	20.3	14456.7	19.94		
14498.07	19.68	14541.8	19.47	14542.6	19.4614575.18	19.1214605.09	18.83		
14626.06	18.6914673.26	18.2814706.26		17.9414741.79	17.6114779.06	17.27			
14788.47	17.1814793.15	17.0614799.38		16.8114804.69	16.9514809.03	16.97			
14813.76	16.9314826.56	16.8114848.68		16.6114865.26	16.4714888.75	16.26			
14930.29	15.87	14958.5	15.6114982.83	15.3815020.04	15.0315051.27	14.74			
15086.1	14.4215111.11	14.215138.02		13.96	15157.2	13.7815180.79	13.55		
15211.19	13.315231.05	13.115251.75		12.9115271.23	12.7315286.72	12.59			
15295.3	12.5115305.65	12.4215331.09		12.215365.69	11.8615407.24	11.52			
15449.29	11.1315489.98	10.7415514.34		10.5115532.95	10.32	15541.3	10.21		
15548.25	10.15558.28	9.8415561.39		10.0415562.11	10.0915564.99	10.04			
15594.74	9.7715623.76	9.5415660.16		9.115694.76	8.8815792.13	7.97			
15825.01	7.3215838.75	7.5115859.53		4.7415948.36	6.2116046.52	5.83			
16106.88	2.6916157.43	1.3916169.64		-.0516178.24	-1.0416198.17	-3.43			
16204.4	-3.5916213.93	-3.9316239.23		-5.8516262.22	-5.8516284.98	-4.45			
16308.15	-4.0716312.09	-3.9916326.46		-3.9616343.87	-4.0516344.68	-4.04			
16350.43	-4.0816360.86	-4.1316361.58		-4.1416381.43	-3.9316409.43	-3.61			
16411.45	-3.5816438.19	-3.2416458.21		-316460.94	-2.9816466.18	-2.38			

16485.16	-.1716506.31	2.3316510.81	2.8516519.55	3.8416529.53	4.91
16548.97	7.1 16549	7.116569.05	7.416576.94	7.5316577.39	7.51
16584.82	8.3416591.59	9.2916594.97	10.0916598.36	11.0516603.81	12.2
16618.34	10.1716830.66	7.5516834.73	7.516934.35	6.1716976.08	11.62
17033.58	7.8417155.16	7.8517186.94	7.917311.64	6.2617329.58	7.04
17471.49	13.117495.98	10.0617670.98	9.0417902.51	7.618008.26	7.35
18197.9	6.5918239.63	8.0118261.47	9.8918297.62	13.0318320.86	11.44
18346.61	11.3318598.58	11.0618599.01	11.0618914.56	11.118923.35	11.11
19103.14	11.3519189.73	12.6419247.59	13.4519417.69	17.5819573.86	16.82
19589.12	15.5719597.39	14.8819711.82	12.7619777.95	10.5419850.25	10.54
20242.03	10.6720567.26	10.8420890.33	10.9521233.23	11.0921553.49	11.21
21892.42	11.24				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06213125.88	.10713168.91	.03113639.73	.06115948.36	.031				
16603.81	.079								

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

13125.88	16603.81	2559	4481.46	2515.69	.1	.3
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Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
013125.88	9.19		016603.81	-4.6116618.34	21892.42	9.19		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	7.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.031	
W.S. Elev (ft)	7.57	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)		6324.44	
E.G. Slope (ft/ft)	0.000091	Area (sq ft)		6324.44	
Q Total (cfs)	9361.00	Flow (cfs)		9361.00	
Top Width (ft)	1236.59	Top Width (ft)		1236.59	
Vel Total (ft/s)	1.48	Avg. Vel. (ft/s)		1.48	
Max Chl Dpth (ft)	12.18	Hydr. Depth (ft)		5.11	
Conv. Total (cfs)	981842.6	Conv. (cfs)		981842.6	
Length Wtd. (ft)	4480.60	Wetted Per. (ft)		1241.04	
Min Ch El (ft)	-4.61	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	1394.72	20909.75	65.63
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	9073.33	169.35

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 10.0076*

INPUT
 Description: Interpolated Cross Section at River Mile 10.01

Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	19.96	137.17	16.65	285.34	15.87	465.13	13.99	640.38	13.3
742.58	13.5	843.51	13.72	1024.09	9.75	1190.03	9.6	1331.19	13.84
1391.83	9.95	1504.49	10.89	1729.74	10.83	1740.38	10.82	1996.61	7.86
2144.43	8.02	2317.55	7.85	2479.05	7.76	2649.69	8.15	2663	8.18
2866.31	7.81	2867.64	7.98	3641.11	7.81	4194.93	7.81	4562.7	7.79
5503.63	7.56	5521.59	7.56	5818.74	8.88	6112.16	9.78	6208.58	7.68
6434.4	7.83	6883.14	7.98	6915.19	8.74	6939.52	7.97	7050.76	8.04
7184.64	8.1	7205.6	10.72	7233.47	8.69	7311.4	8.57	7416.28	8.43

7575.73	7.68	7728.43	7.86	7953.49	8.22	8119.22	8.2	8987.7	7.91
9850.6	7.8110652.85	7.7111546.12	7.7111546.12	7.6711591.16	7.8211755.21	7.8211755.21	8.35		
11969.35	8.7712136.88	12.9112177.89	12.9112177.89	9.8612214.74	10.1212299.26	10.1212299.26	11.13		
12321.54	14.0112327.76	12.9112334.06	12.9112334.06	10.6212345.87	11.0512375.86	11.0512375.86	8.96		
12394.21	7.5712405.62	6.7112421.25	6.7112421.25	6.1512445.97	5.2712449.24	5.2712449.24	5.12		
12472.47	5.0412490.85	5.3112498.94	5.3112498.94	5.1512505.29	4.6512511.25	4.6512511.25	4.91		
12518.21	5.3112525.37	5.3312550.13	5.3312550.13	5.7312573.32	5.8712599.43	5.8712599.43	6.03		
12624.09	6.1712642.97	6.2912662.57	6.2912662.57	6.3712664.15	6.3412699.48	6.3412699.48	5.72		
12749	4.8112769.69	4.4312783.57	4.4312783.57	4.1612799.67	3.7512818.01	3.7512818.01	3.39		
12844.83	2.9712864.49	2.7112869.54	2.7112869.54	2.6212883.85	2.5612883.86	2.5612883.86	2.56		
12902.81	2.3512906.34	2.3112927.94	2.3112927.94	1.5112929.29	1.4612951.67	1.4612951.67	.23		
12951.78	.2212974.72	-.1912980.28	-.1912980.28	-.3312997.21	-.7813015.24	-.7813015.24	-1.19		
13020.16	-1.313031.29	-2.3313042.88	-2.3313042.88	2.8213059.46	8.7313061.99	8.7313061.99	8.71		
13111.31	8.5713169.04	8.413220.94	8.413220.94	8.2113267.13	8.0813304.66	8.0813304.66	7.94		
13344.81	7.813366.47	9.4113411.92	9.4113411.92	12.8113433.41	14.4113458.08	14.4113458.08	15.05		
13491.32	15.8913536.11	17.13579.31	17.13579.31	18.0813627.63	19.3813662.81	19.3813662.81	20.17		
13674.46	20.48 13704.7	20.413750.79	20.413750.79	20.0713790.46	20.0413827.18	20.0413827.18	19.85		
13875.99	19.6513938.41	19.48 13987	19.48 13987	19.2614024.19	18.9914097.78	18.9914097.78	18.69		
14194	18.4214251.47	18.1614312.19	18.1614312.19	18.0314313.31	18.0214358.55	18.0214358.55	17.67		
14400.08	17.39 14429.2	17.3214494.76	17.3214494.76	16.9614540.58	16.6214589.93	16.6214589.93	16.31		
14641.68	16.0114654.75	15.9314661.24	15.9314661.24	15.73 14669.9	15.314677.27	15.314677.27	15.62		
14683.31	15.7114689.88	15.6814707.65	15.6814707.65	15.5614738.37	15.3914761.39	15.3914761.39	15.26		
14794.02	15.08 14851.7	14.7114890.88	14.7114890.88	14.4714924.66	14.2714976.34	14.2714976.34	13.94		
15019.7	13.6715068.07	13.3815102.81	13.3815102.81	13.215140.17	12.9715166.82	12.9715166.82	12.81		
15199.57	12.5915241.79	12.3815269.37	12.3815269.37	12.215298.12	12.0215325.17	12.0215325.17	11.86		
15346.69	11.72 15358.6	11.6515372.97	11.6515372.97	11.58 15408.3	11.3815456.35	11.3815456.35	11.06		
15514.05	10.7815572.45	10.4315628.96	10.4315628.96	10.0515662.79	9.8415688.63	9.8415688.63	9.66		
15700.22	9.5115709.88	9.1615723.81	9.1615723.81	8.9515728.12	9.3715729.13	9.3715729.13	9.47		
15733.12	9.4115774.43	9.1615814.74	9.1615814.74	8.9915865.29	8.4915913.34	8.4915913.34	8.38		
16048.56	7.5416094.22	6.9416113.31	6.9416113.31	7.1116142.16	4.5716265.52	4.5716265.52	5.91		
16401.84	5.5616485.67	2.6816555.87	2.6816555.87	1.4916572.82	.1716584.76	.1716584.76	-.73		
16612.44	-2.9516621.09	-3.1216634.33	-3.1216634.33	-3.5316669.46	-6.6916690.53	-6.6916690.53	-6.69		
16724.61	-4.2216759.29	-3.7916765.19	-3.7916765.19	-3.6716786.69	-3.5116812.74	-3.5116812.74	-3.55		
16813.97	-3.5116822.57	-3.5516838.18	-3.5516838.18	-3.5716839.25	-3.5816868.97	-3.5816868.97	-3.41		
16910.88	-3.0916913.91	-3.0616953.92	-3.0616953.92	-2.716983.89	-2.4716987.97	-2.4716987.97	-2.46		
16995.83	-1.9317024.23	.0517055.88	.0517055.88	2.3317062.63	2.817075.71	2.817075.71	3.68		
17090.65	4.5717119.74	6.517119.78	6.517119.78	6.5 17149.8	6.75 17161.6	6.75 17161.6	6.87		
17162.27	6.8317173.41	7.1317183.53	7.1317183.53	7.817188.59	8.7817193.66	8.7817193.66	10.08		
17201.83	11.417215.88	9.5517421.21	9.5517421.21	7.2117425.15	7.1617521.49	7.1617521.49	5.95		
17561.85	10.9417617.47	7.4817735.04	7.4817735.04	7.4917765.78	7.617886.38	7.617886.38	6.31		
17903.73	7.0618040.97	12.6918064.66	12.6918064.66	9.9318233.91	9.0918457.83	9.0918457.83	7.8		
18560.1	7.59 18743.5	6.5918783.86	6.5918783.86	7.8218804.98	9.5118839.95	9.5118839.95	12.36		
18862.42	10.8918887.32	10.7619131.01	10.7619131.01	10.3219131.42	10.3219436.59	10.3219436.59	10.3		
19445.1	10.3119618.97	10.719702.72	10.719702.72	11.9619758.67	12.6919923.19	12.6919923.19	16.46		
20074.22	15.7520088.97	14.5920096.97	14.5920096.97	13.9720207.64	12.02 20271.6	12.02 20271.6	9.98		
20341.52	9.9820720.42	10.2421034.95	10.2421034.95	10.58 21347.4	10.7921679.03	10.7921679.03	11.08		
21988.76	11.3222316.55	11.38	11.38						

Manning's n Values									
Sta	n	Val	Sta	num=	n	Val	Sta	n	Val
0	.063	12345.87	.105	12405.62	.034	13111.31	.062	16113.31	.034
17201.83	.079								

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	12345.87	17201.83	2559	4481.46	2515.69	.1		.3	
Blocked Obstructions									
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev	
012345.87		8.77	017201.83		-4.2317561.85	22316.55		8.77	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	7.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.034	0.079
W.S. Elev (ft)	7.21	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)		8428.62	70.08
E.G. Slope (ft/ft)	0.000072	Area (sq ft)		8428.62	70.08
Q Total (cfs)	9361.00	Flow (cfs)		9352.79	8.21
Top Width (ft)	1868.46	Top Width (ft)		1757.60	110.87
Vel Total (ft/s)	1.10	Avg. Vel. (ft/s)		1.11	0.12
Max Chl Dpth (ft)	11.44	Hydr. Depth (ft)		4.80	0.63
Conv. Total (cfs)	1105746.0	Conv. (cfs)		1104775.0	970.3
Length Wtd. (ft)	4479.86	Wetted Per. (ft)		1760.42	110.95
Min Ch El (ft)	-4.23	Shear (lb/sq ft)		0.02	0.00
Alpha	1.01	Stream Power (lb/ft s)		0.02	0.00
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	1394.72	20150.85	63.61
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	8919.31	166.15

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 9.16153*

INPUT

Description: Interpolated Cross Section at River Mile 9.16

Station	Elevation	Data	num=	272						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	18.39	128.5	15.37	267.32	14.66	435.74	12.94	599.92	12.29	
695.67	12.47	790.22	12.67	959.39	9.08	1114.84	8.94	1247.09	12.81	
1303.89	9.28	1409.44	10.14	1620.45	10.09	1630.43	10.08	1870.46	7.39	
2008.94	7.54	2171.13	7.38	2322.42	7.3	2482.28	7.65	2494.75	7.67	
2685.22	7.32	2686.46	7.47	3411.06	7.25	3929.89	7.27	4274.42	7.27	
5155.91	6.99	5172.73	7	5451.11	8.22	5726	9.07	5816.32	7.17	
6027.87	7.33	6448.26	7.42	6478.29	8.11	6501.08	7.41	6605.29	7.46	
6730.72	7.51	6750.35	9.89	6776.46	8.03	6849.46	7.92	6947.71	7.8	
7097.09	7.12	7240.15	7.29	7450.99	7.63	7606.25	7.62	8419.85	7.28	
9228.24	7.23	9979.8	7.1610816	.64	7.2110858	.83	7.3511012	.51	7.83	
11213.12	8.211370.07		11.9711408	.49	9.211443	.01	9.4311522	.19	10.35	
11543.06	12.9611548	.89	11.9611554	.79	9.8811565	.85	10.2711604	.23	8.34	
11627.73	7.0511642	.33	6.2711662	.34	5.7411693	.97	4.9311698	.16	4.79	
11727.89	4.5811751	.42	4.9311761	.78	4.67	11769.9	3.8911777	.53	4.27	
11786.44	4.83	11795.6	4.8511827	.29	5.3611856	.97	5.511890	.39	5.66	
11921.96	5.7811946	.12	5.9	11971.2	5.9611973	.23	5.9312018	.44	5.37	
12081.83	4.5412108	.31	4.1812126	.07	3.9312146	.68	3.4812170	.15	3.13	
12204.48	2.7912229	.65	2.61	12236.1	2.5412254	.42	2.4912254	.43	2.49	
12278.69	2.312283	.21	2.2612310	.85	1.5412312	.58	1.4912341	.22	.39	
12341.36	.3812370	.73	.0212377	.84	-.1112399	.52	-.5312422	.59	-.9	
12428.89	-1.0112443	.14	-1.9512457	.97	2.7312479	.19	8.0912482	.42	8.08	
12545.56	7.9512619	.45	7.8112685	.88	7.6312744	.99	7.5112793	.03	7.38	
12844.41	7.2512872	.13	8.7112930	.31	11.8112957	.82	13.2712989	.39	13.85	
13031.94	14.6213089	.26	15.6213144	.55	16.59	13206.4	17.8213251	.42	18.49	
13266.34	18.7713305	.05	18.7113364	.04	18.3413414	.81	18.3813461	.81	18.18	
13524.28	1813604	.17	17.8913666	.36	17.6713713	.96	17.3513808	.16	17.09	
13931.31	16.914004	.86	16.6514082	.58	16.5914084	.01	16.5814141	.92	16.22	
14195.07	15.9414232	.35	15.9414316	.25	15.65	14374.9	15.314438	.06	15.01	
14504.3	14.7414521	.02	14.6714529	.34	14.414540	.41	13.7814549	.86	14.29	
14557.58	14.4414565	.99	14.4314588	.74	14.3114628	.05	14.1614657	.52	14.06	
14699.28	13.914773	.11	13.5614823	.25	13.3414866	.49	13.1514932	.63	12.84	
14988.14	12.615050	.05	12.3315094	.51	12.1915142	.33	11.9815176	.44	11.83	
15218.36	11.6315272	.39	11.4615307	.69	11.29	15344.5	11.13	15379.1	10.98	

15406.65	10.86	15421.9	10.7915440.29	10.7415485.51	10.5615547.01	10.25
15620.87	10.0515695.61	9.7215767.94	9.3615811.24	9.1815844.31	8.99	
15859.15	8.8115871.51	8.3215889.33	8.0515894.86	8.715896.14	8.85	
15901.26	8.7915954.13	8.5616005.71	8.4516070.42	7.8716131.91	7.88	
16304.99	7.1116363.44	6.5716387.86	6.7216424.79	4.4116582.69	5.62	
16757.15	5.2916864.45	2.67 16954.3	1.58 16976	.3816991.28	-.42	
17026.71	-2.4817037.79	-2.6417054.73	-3.1417099.69	-7.5417118.85	-7.54	
17164.24	-3.9917210.43	-3.5117218.28	-3.3617246.91	-3.0517281.62	-3.04	
17283.25	-2.9817294.71	-3.02 17315.5	-3.0117316.93	-3.0217356.51	-2.88	
17412.32	-2.5717416.36	-2.5417469.66	-2.1717509.58	-1.9317515.01	-1.94	
17525.47	-1.48 17563.3	.2817605.46	2.3417614.44	2.7517631.86	3.51	
17651.76	4.2317690.51	5.917690.56	5.917730.54	6.117746.27	6.21	
17747.16	6.1417761.99	5.9217775.48	6.3117782.21	7.4717788.96	9.12	
17799.85	10.617813.41	8.9218011.77	6.8618015.57	6.8218108.64	5.72	
18147.63	10.2718201.35	7.1218314.93	7.1418344.62	7.2918461.12	6.37	
18477.88	7.0818610.46	12.2918633.34	9.7918796.84	9.1319013.14	8	
19111.94	7.83 19289.1	6.5819328.09	7.6319348.49	9.1219382.27	11.68	
19403.97	10.3319428.03	10.219663.44	9.5819663.84	9.5819958.63	9.5	
19966.84	9.5220134.81	10.0520215.71	11.2820269.76	11.9420428.68	15.34	
20574.58	14.6720588.83	13.6220596.56	13.0520703.47	11.2720765.25	9.42	
20832.79	9.4221198.81	9.8121502.65	10.3221804.47	10.6422124.82	11.08	
22424.03	11.4222740.67	11.52				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06511565.85	.10211642.33	.03812545.56	.06316131.91	.038				
17799.85	.08								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
11565.8517799.85 2559 4481.46 2515.69 .1 .3

Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
011565.85	8.34		017799.85	-3.8418147.6322740.67	8.34			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	6.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.038	0.080
W.S. Elev (ft)	6.91	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)		10339.63	65.60
E.G. Slope (ft/ft)	0.000068	Area (sq ft)		10339.63	65.60
Q Total (cfs)	9361.00	Flow (cfs)		9353.96	7.04
Top Width (ft)	2407.47	Top Width (ft)		2295.98	111.49
Vel Total (ft/s)	0.90	Avg. Vel. (ft/s)		0.90	0.11
Max Chl Dpth (ft)	10.75	Hydr. Depth (ft)		4.50	0.59
Conv. Total (cfs)	1136982.0	Conv. (cfs)		1136127.0	855.2
Length Wtd. (ft)	4480.06	Wetted Per. (ft)		2297.95	111.57
Min Ch El (ft)	-3.84	Shear (lb/sq ft)		0.02	0.00
Alpha	1.01	Stream Power (lb/ft s)		0.02	0.00
Frotn Loss (ft)	0.27	Cum Volume (acre-ft)	1394.72	19185.41	59.69
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	8710.79	159.73

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 8.31538*

INPUT
Description: Interpolated Cross Section at River Mile 8.32

Station Elevation Data		num= 272		Elev Sta		Elev Sta		Elev Sta	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	16.82	119.83	14.09	249.29	13.44	406.35	11.88	559.46	11.29
648.75	11.44	736.93	11.63	894.69	8.41	1039.66	8.29	1162.98	11.78
1215.96	8.6	1314.38	9.38	1511.17	9.35	1520.47	9.35	1744.32	6.91
1873.46	7.05	2024.71	6.9	2165.79	6.83	2314.87	7.14	2326.5	7.17
2504.12	6.83	2505.29	6.96	3181.02	6.68	3664.85	6.73	3986.15	6.74
4808.19	6.42	4823.88	6.43	5083.48	7.57	5339.83	8.36	5424.06	6.66
5621.34	6.82	6013.38	6.87	6041.39	7.48	6062.64	6.85	6159.82	6.88
6276.79	6.91	6295.09	9.05	6319.45	7.38	6387.52	7.27	6479.15	7.16
6618.45	6.56	6751.86	6.73	6948.48	7.04	7093.27	7.04	7852.01	6.66
8605.87	6.65	9306.75	6.61	10087.15	6.74	10126.49	6.87	10269.81	7.3
10456.89	7.64	10603.25	11.02	10639.09	8.53	10671.28	8.74	10745.12	9.56
10764.59	11.92	10770.02	11.02	10775.52	9.15	10785.84	9.49	10832.61	7.72
10861.25	6.54	10879.04	5.82	10903.43	5.34	10941.97	4.61	10947.08	4.45
10983.31	4.12	11011.99	4.54	11024.61	4.18	11034.51	3.13	11043.8	3.62
11054.67	4.36	11065.83	4.36	11104.45	5.11	11140.63	5.13	11181.35	5.28
11219.82	5.39	11249.27	5.51	11279.83	5.54	11282.31	5.52	11337.41	5.03
11414.65	4.27	11446.93	3.93	11468.57	3.7	11493.7	3.21	11522.3	2.88
11564.13	2.61	11594.8	2.51	11602.67	2.45	11625	2.42	11625.01	2.42
11654.57	2.25	11660.08	2.22	11693.77	1.56	11695.87	1.53	11730.78	.55
11730.95	.55	11766.74	.22	11775.41	.11	11801.83	-.27	11829.94	-.61
11837.62	-.71	11854.98	-1.56	11873.06	2.64	11898.92	7.45	11902.86	7.44
11979.8	7.34	12069.85	7.22	12150.81	7.05	12222.85	6.95	12281.4	6.82
12344.02	6.7	12377.8	8	12448.7	10.81	12482.22	12.13	12520.7	12.66
12572.55	13.34	12642.42	14.24	12709.8	15.11	12785.17	16.25	12840.04	16.8
12858.22	17.06	12905.39	17.03	12977.28	16.61	13039.16	16.72	13096.44	16.51
13172.58	16.35	13269.93	16.31	13345.72	16.08	13403.74	15.72	13518.53	15.48
13668.62	15.38	13758.26	15.13	13852.98	15.15	13854.71	15.14	13925.29	14.77
13990.07	14.51	14035.49	14.57	14137.75	14.33	14209.22	13.98	14286.2	13.71
14366.92	13.48	14387.3	13.41	14397.43	13.07	14410.93	12.26	14422.44	12.96
14431.85	13.18	14442.1	13.18	144469.82	13.06	14517.74	12.93	14553.64	12.85
14604.54	12.72	14694.52	12.41	14755.63	12.21	14808.32	12.04	14888.93	11.75
14956.58	11.53	15032.02	11.29	15086.21	11.18	15144.49	10.99	15186.05	10.86
15237.14	10.66	15302.99	10.55	15346.01	10.38	15390.87	10.23	15433.04	10.1
15466.62	9.99	15485.2	9.93	15507.61	9.89	15562.72	9.75	15637.67	9.45
15727.68	9.31	15818.77	9.02	15906.91	8.68	15959.68	8.51	15999.99	8.32
16018.08	8.11	16033.14	7.47	16054.86	7.16	16061.59	8.03	16063.16	8.24
16069.39	8.16	16133.83	7.95	16196.69	7.91	16275.54	7.25	16350.49	7.38
16561.42	6.68	16632.65	6.19	16662.42	6.32	16707.42	4.24	16899.85	5.33
17112.47	5.02	17243.23	2.65	17352.74	1.67	17379.18	.59	17397.8	-.11
17440.98	-2.01	17454.48	-2.17	17475.12	-2.75	17529.92	-8.38	17547.16	-8.38
17603.86	-3.76	17661.57	-3.23	17671.38	-3.05	17707.14	-2.6	17750.5	-2.54
17752.54	-2.45	17766.85	-2.48	17792.82	-2.45	17794.6	-2.46	17844.05	-2.35
17913.77	-2.06	17918.82	-2.03	17985.39	-1.63	18035.26	-1.41	18042.04	-1.42
18055.11	-1.03	18102.37	.51	18155.03	2.35	18166.26	2.69	18188.01	3.35
18212.88	3.88	18261.28	5.31	18261.35	5.31	18311.29	5.45	18330.93	5.55
18332.04	5.45	18350.57	4.71	18367.42	4.82	18375.82	6.16	18384.27	8.16
18397.86	9.81	18410.95	8.29	18602.33	6.51	18605.99	6.47	18695.79	5.5
18733.4	9.59	18785.24	6.76	18894.82	6.78	18923.47	6.99	19035.87	6.42
19052.03	7.11	19179.94	11.89	19202.02	9.65	19359.76	9.18	19568.45	8.2
19663.77	8.06	19834.71	6.58	19872.32	7.44	19892	8.74	19924.59	11.01
19945.53	9.77	19968.75	9.63	20195.86	8.85	20196.25	8.85	20480.67	8.7
20488.59	8.73	20650.65	9.4	20728.7	10.61	20780.85	11.19	20934.17	14.23
21074.94	13.62	21088.69	12.65	21096.14	12.14	21199.29	10.53	21258.89	8.86
21324.06	8.85	21677.2	9.38	21970.34	10.05	22261.55	10.48	22570.62	11.07
22859.29	11.53	23164.79	11.65						

Manning's n Values		num= 6		Sta n Val		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val

0 .06610785.84 .09910879.04 .041 11979.8 .06417112.47 .041
 18397.86 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 10785.8418397.86 2559 4481.46 2515.69 .1 .3
 Blocked Obstructions num= 3
 Sta L Sta R Elev Sta L Sta R Elev Sta L Sta R Elev
 010785.84 7.92 018397.86 -3.4519179.9423164.79 7.92

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	6.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.041	0.080
W.S. Elev (ft)	6.64	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)		12139.29	72.25
E.G. Slope (ft/ft)	0.000052	Area (sq ft)		12139.29	72.25
Q Total (cfs)	9361.00	Flow (cfs)		9354.74	6.26
Top Width (ft)	3014.86	Top Width (ft)		2847.07	167.79
Vel Total (ft/s)	0.77	Avg. Vel. (ft/s)		0.77	0.09
Max Chl Dpth (ft)	10.09	Hydr. Depth (ft)		4.26	0.43
Conv. Total (cfs)	1298815.0	Conv. (cfs)		1297946.0	869.1
Length Wtd. (ft)	4480.12	Wetted Per. (ft)		2848.62	167.87
Min Ch El (ft)	-3.45	Shear (lb/sq ft)		0.01	0.00
Alpha	1.01	Stream Power (lb/ft s)		0.01	0.00
Froctn Loss (ft)	0.24	Cum Volume (acre-ft)	1394.72	18029.10	55.71
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	8446.23	151.67

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 7.46923*

INPUT
 Description: Interpolated Cross Section at River Mile 7.47
 Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	15.25	111.17	12.82	231.26	12.23	376.97	10.83	519	10.29
601.83	10.42	683.63	10.59	829.99	7.73	964.47	7.64	1078.88	10.75
1128.02	7.93	1219.33	8.63	1401.88	8.61	1410.51	8.61	1618.17	6.44
1737.97	6.56	1878.28	6.43	2009.17	6.36	2147.46	6.64	2158.25	6.66
2323.03	6.33	2324.11	6.45	2950.97	6.12	3399.82	6.18	3697.88	6.21
4460.47	5.86	4475.02	5.86	4715.85	6.91	4953.66	7.64	5031.8	6.15
5214.81	6.32	5578.51	6.31	5604.48	6.85	5624.2	6.29	5714.35	6.3
5822.86	6.31	5839.84	8.21	5862.44	6.72	5925.59	6.61	6010.59	6.53
6139.82	6	6263.58	6.16	6445.98	6.45	6580.3	6.45	7284.16	6.03
7983.51	6.06	8633.7	6.07	9357.66	6.28	9394.16	6.4	9527.11	6.78
9700.67	7.07	9836.44	10.08	9869.69	7.86	9899.55	8.05	9968.05	8.78
9986.11	10.87	9991.14	10.07	9996.25	8.4110005.82		8.7210060.99		7.1
10094.76	6.0210115.75		5.3810144.51		4.9310189.97		4.27	10196	4.11
10238.73	3.6610272.56		4.1610287.44		3.6910299.12		2.3710310.08		2.97
10322.89	3.8910336.06		3.8810381.61		4.6310424.28		4.7610472.31		4.91
10517.69	5.0110552.42		5.1210588.47		5.1310591.38		5.110656.38		4.68
10747.48	3.9910785.55		3.6810811.08		3.4610840.71		2.9410874.44		2.63
10923.79	2.4310959.96		2.410969.24		2.3610995.57		2.3510995.59		2.35
11030.45	2.2111036.95		2.1711076.68		1.5911079.16		1.5611120.34		.71
11120.54	.7111162.76		.4311172.97		.3311204.13		-.0111237.29		-.32
11246.35	-.4111266.83		-1.1811288.15		2.5511318.66		6.81	11323.3	6.8
11414.04	6.7211520.26		6.6211615.74		6.4611700.71		6.3911769.76		6.26
11843.62	6.1411883.47		7.311967.09		9.812006.63		10.9912052.01		11.46

12113.17	12.0712195.57	12.8612275.04	13.6112363.94	14.6912428.66	15.11
12450.09	15.3612505.74	15.3512590.53	14.8712663.51	15.0612731.07	14.84
12820.87	14.7 12935.7	14.7113025.09	14.513093.51	14.0813228.91	13.87
13405.93	13.8613511.65	13.6213623.37	13.7113625.42	13.713708.66	13.31
13785.06	13.0513838.64	13.1913959.24	13.0214043.54	12.6614134.33	12.4
14229.54	12.2114253.58	12.1614265.53	11.7414281.45	10.7414295.03	11.63
14306.12	11.9114318.21	11.9214350.91	11.8114407.42	11.7114449.77	11.64
14509.8	11.5414615.93	11.24 14688	11.0714750.15	10.9214845.23	10.65
14925.01	10.46 15014	10.2515077.91	10.1715146.64	10.15195.67	9.89
15255.93	9.715333.59	9.6315384.33	9.4715437.24	9.3415486.98	9.22
15526.58	9.13 15548.5	9.0715574.93	9.0515639.92	8.9315728.32	8.64
15834.49	8.5815941.93	8.3216045.89	7.9916108.13	7.8416155.67	7.65
16177	7.4116194.77	6.6316220.39	6.2616228.33	7.3616230.17	7.62
16237.53	7.5316313.52	7.3516387.67	7.3616480.67	6.6416569.07	6.88
16817.85	6.2516901.86	5.8116936.97	5.9316990.05	4.0817217.01	5.03
17467.79	4.7617622.02	2.6417751.17	1.7717782.36	.817804.33	.2
17855.25	-1.5417871.17	-1.717895.52	-2.3517960.15	-9.2317975.48	-9.23
18043.49	-3.53 18112.7	-2.9518124.47	-2.7318167.37	-2.1418219.38	-2.03
18221.82	-1.9218238.99	-1.9518270.14	-1.8918272.28	-1.8918331.59	-1.82
18415.22	-1.5418421.27	-1.5118501.12	-1.0918560.94	-.8718569.08	-.9
18584.76	-.5918641.44	.72 18704.6	2.3518718.07	2.6418744.17	3.19
18773.99	3.5418832.04	4.718832.13	4.718892.04	4.818915.59	4.89
18916.93	4.7718939.15	3.4918959.36	3.3318969.44	4.8618979.57	7.2
18995.88	919008.49	7.6719192.88	6.1619196.42	6.1319282.94	5.27
19319.18	8.9119369.12	6.419474.71	6.4319502.31	6.6919610.61	6.48
19626.19	7.1319749.43	11.48 19770.7	9.5219922.69	9.2320123.77	8.4
20215.61	8.3 20380.3	6.5720416.54	7.2520435.51	8.3620466.91	10.34
20487.09	9.2120509.46	9.0620728.29	8.1120728.66	8.1121002.71	7.9
21010.34	7.9421166.48	8.7521241.69	9.9321291.93	10.4421439.67	13.11
21575.29	12.5221588.54	11.6821595.73	11.2221695.11	9.7921752.54	8.3
21815.33	8.2922155.59	8.9522438.04	9.7922718.62	10.3323016.42	11.06
23294.56	11.6423588.92	11.79			

Manning's n Values		num= 6		Sta		n Val		Sta		n Val	
0	.06810005.82	.09710115.75	.04411414.04	.06516936.97	.044						
18995.88	.081										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	10005.82	18995.88	2559	4481.46	2515.69	.1	.3		
Blocked Obstructions		num= 3		Sta		Elev		Sta	
	010005.82	7.49	018995.88	-3.07	19749.43	23588.92	7.49		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	6.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.044	0.081
W.S. Elev (ft)	6.39	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)		13801.82	70.29
E.G. Slope (ft/ft)	0.000057	Area (sq ft)		13801.82	70.29
Q Total (cfs)	9361.00	Flow (cfs)		9354.53	6.47
Top Width (ft)	3740.42	Top Width (ft)		3610.87	129.55
Vel Total (ft/s)	0.67	Avg. Vel. (ft/s)		0.68	0.09
Max Chl Dpth (ft)	9.46	Hydr. Depth (ft)		3.82	0.54
Conv. Total (cfs)	1240886.0	Conv. (cfs)		1240028.0	857.6
Length Wtd. (ft)	4480.08	Wetted Per. (ft)		3612.25	129.62
Min Ch El (ft)	-3.07	Shear (lb/sq ft)		0.01	0.00
Alpha	1.01	Stream Power (lb/ft s)		0.01	0.00
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	1394.72	16694.69	51.59

C & E Loss (ft) 0.00 Cum SA (acres) 991.74 8114.04 143.08

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 6.62307*

INPUT

Description: Interpolated Cross Section at River Mile 6.62

Station Elevation Data		num= 272									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	13.68	102.5	11.54	213.23	11.01	347.58	9.77	478.54	9.29		
554.92	9.39	630.34	9.55	765.28	7.06	889.28	6.99	994.77	9.71		
1040.08	7.25	1124.27	7.87	1292.6	7.87	1300.55	7.87	1492.02	5.97		
1602.49	6.07	1731.86	5.96	1852.54	5.89	1980.06	6.13	1990.01	6.15		
2141.93	5.84	2142.93	5.94	2720.92	5.55	3134.78	5.64	3409.61	5.69		
4112.75	5.29	4126.17	5.29	4348.22	6.25	4567.49	6.93	4639.54	5.63		
4808.29	5.82	5143.63	5.75	5167.58	6.22	5185.76	5.72	5268.89	5.72		
5368.93	5.71	5384.59	7.37	5405.42	6.07	5463.65	5.96	5542.03	5.89		
5661.18	5.45	5775.29	5.59	5943.48	5.85	6067.32	5.87	6716.32	5.4		
7361.15	5.48	7960.65	5.52	8628.18	5.81	8661.83	5.92	8784.42	6.25		
8944.44	6.51	9069.63	9.14	9100.28	7.19	9127.82	7.35	9190.98	8		
9207.63	9.82	9212.27	9.12	9216.98	7.67	9225.81	7.94	9289.37	6.47		
9328.28	5.51	9352.46	4.93	9385.6	4.53	9437.98	3.93	9444.92	3.77		
9494.15	3.21	9533.12	3.78	9550.27	3.21	9563.73	1.61	9576.36	2.33		
9591.12	3.41	9606.29	3.39	9658.77	4.26	9707.93	4.39	9763.27	4.53		
9815.55	4.62	9855.56	4.73	9897.1	4.71	9900.46	4.69	9975.34	4.33		
10080.31	3.72	10124.17	3.44	10153.58	3.23	10187.72	2.68	10226.59	2.37		
10283.44	2.25	10325.11	2.3	10335.8	2.27	10366.14	2.28	10366.17	2.28		
10406.33	2.15	10413.81	2.12	10459.6	1.62	10462.46	1.59	10509.9	.87		
10510.13	.87	10558.77	.64	10570.54	.55	10606.44	.25	10644.64	-.03		
10655.08	-.11	10678.67	-.79	10703.24	2.46	10738.39	6.18	10743.74	6.16		
10848.29	6.11	10970.67	6.03	11080.67	5.88	11178.57	5.83	11258.13	5.71		
11343.23	5.59	11389.13	6.61	11485.47	8.81	11531.03	9.84	11583.32	10.27		
11653.79	10.81	11748.73	11.47	11840.29	12.12	11942.71	13.13	12017.28	13.42		
12041.97	13.65	12106.08	13.67	12203.78	13.14	12287.86	13.41	12365.7	13.18		
12469.16	13.05	12601.46	13.12	12704.45	12.91	12783.28	12.45	12939.28	12.26		
13143.24	12.34	13265.04	12.11	13393.76	12.27	13396.12	12.26	13492.02	11.86		
13580.05	11.61	13641.78	11.82	13780.74	11.71	13877.86	11.34	13982.46	11.1		
14092.16	10.95	14119.86	10.91	14133.63	10.41	14151.97	9.22	14167.61	10.3		
14180.39	10.65	14194.32	10.67	14232	10.56	14297.11	10.48	14345.9	10.44		
14415.07	10.36	14537.34	10.09	14620.38	9.94	14691.98	9.81	14801.52	9.56		
14893.45	9.39	14995.97	9.21	15069.61	9.16	15148.8	9.02	15205.29	8.91		
15274.71	8.74	15364.19	8.71	15422.65	8.56	15483.61	8.45	15540.92	8.34		
15586.55	8.26	15611.8	8.21	15642.25	8.21	15717.13	8.11	15818.98	7.84		
15941.31	7.84	16065.09	7.62	16184.86	7.31	16256.57	7.17	16311.35	6.98		
16335.92	6.7	16356.4	5.79	16385.91	5.37	16395.06	6.69	16397.19	7.01		
16405.66	6.91	16493.22	6.74	16578.65	6.81	16685.8	6.02	16787.65	6.39		
17074.28	5.82	17171.07	5.43	17211.53	5.54	17272.68	3.91	17534.17	4.74		
17823.11	4.49	18000.8	2.63	18149.6	1.86	18185.54	1.01	18210.85	.52		
18269.52	-1.06	18287.86	-1.22	18315.92	-1.96	18390.38	-10.08	18403.79	-10.08		
18483.12	-3.31	18563.84	-2.67	18577.56	-2.42	18627.6	-1.69	18688.26	-1.53		
18691.11	-1.41	18711.13	-1.42	18747.46	-1.33	18749.95	-1.33	18819.13	-1.29		
18916.67	-1.02	18923.72	-.99	19016.86	-.56	19086.62	-.33	19096.12	-.38		
19114.4	-.14	19180.51	.94	19254.18	2.36	19269.88	2.59	19300.32	3.03		
19335.1	3.21	19402.81	4.11	19402.92	4.11	19472.78	4.15	19500.26	4.23		
19501.81	4.08	19527.73	2.28	19551.3	1.84	19563.06	3.55	19574.88	6.24		
19593.89	8.21	19606.03	7.04	19783.44	5.82	19786.84	5.79	19870.08	5.04		
19904.95	8.23	19953.01	6.04	20054.59	6.08	20081.15	6.39	20185.35	6.53		

20200.34	7.1520318.92	11.0820339.38	9.3820485.62	9.2720679.08	8.61
20767.45	8.5420925.91	6.5720960.77	7.0620979.02	7.9821009.23	9.67
21028.65	8.6621050.17	8.4921260.71	7.3721261.07	7.3721524.74	7.1
21532.09	7.1421682.32	8.121754.68	9.2521803.02	9.6821945.16	11.99
22075.65	11.45 22088.4	10.7122095.31	10.3122190.93	9.0522246.19	7.74
22306.6	7.7322633.98	8.5222905.73	9.5323175.69	10.1823462.22	11.05
23729.83	11.7524013.04	11.93			

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.069	9225.81	.094	9352.46	.047	10848.29	.066	17823.11	.047
19593.89	.081								

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

9225.81	19593.89	2559	4481.46	2515.69	.1	.3
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Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	9225.81	7.07	019593.99	-2.68	20318.92	24013.04	7.07	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	6.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.047	0.081
W.S. Elev (ft)	6.14	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)		15414.75	83.93
E.G. Slope (ft/ft)	0.000053	Area (sq ft)		15414.75	83.93
Q Total (cfs)	9361.00	Flow (cfs)		9354.29	6.71
Top Width (ft)	5025.06	Top Width (ft)		4770.96	254.11
Vel Total (ft/s)	0.60	Avg. Vel. (ft/s)		0.61	0.08
Max Chl Dpth (ft)	8.82	Hydr. Depth (ft)		3.23	0.33
Conv. Total (cfs)	1288538.0	Conv. (cfs)		1287614.0	924.1
Length Wtd. (ft)	4479.89	Wetted Per. (ft)		4772.33	254.16
Min Ch El (ft)	-2.68	Shear (lb/sq ft)		0.01	0.00
Alpha	1.01	Stream Power (lb/ft s)		0.01	0.00
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	1394.72	15191.78	47.14
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	7682.88	132.00

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 5.77692*

INPUT

Description: Interpolated Cross Section at River Mile 5.78

Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	12.12	93.84	10.27	195.2	9.8	318.19	8.72	438.08	8.28
508	8.36	577.05	8.5	700.58	6.38	814.1	6.34	910.67	8.68
952.15	6.58	1029.22	7.12	1183.31	7.13	1190.59	7.13	1365.88	5.5
1467	5.58	1585.43	5.48	1695.91	5.43	1812.65	5.63	1821.76	5.64
1960.84	5.34	1961.75	5.44	2490.88	4.99	2869.74	5.1	3121.33	5.16
3765.02	4.72	3777.31	4.73	3980.59	5.59	4181.32	6.22	4247.28	5.12
4401.76	5.32	4708.75	5.19	4730.67	5.59	4747.32	5.16	4823.42	5.14
4915.01	5.12	4929.34	6.54	4948.41	5.41	5001.72	5.31	5073.46	5.26
5182.54	4.89	5287.01	5.02	5440.97	5.26	5554.35	5.29	6148.47	4.77
6738.78	4.9	7287.6	4.98	7898.69	5.35	7929.5	5.45	8041.72	5.73
8188.21	5.94	8302.82	8.19	8330.88	6.53	8356.09	6.66	8413.91	7.21
8429.15	8.78	8433.4	8.18	8437.71	6.93	8445.79	7.16	8517.75	5.85
8561.8	4.99	8589.17	4.49	8626.68	4.13	8685.98	3.6	8693.84	3.43

8749.57	2.75	8793.69	3.4	8813.11	2.72	8828.34	.85	8842.64	1.68
8859.34	2.94	8876.52	2.91	8935.94	3.9	8991.58	4.02	9054.24	4.15
9113.42	4.23	9158.71	4.34	9205.73	4.3	9209.54	4.28	9294.31	3.98
9413.14	3.44	9462.79	3.19	9496.08	3	9534.73	2.41	9578.73	2.12
9643.09	2.07	9690.27	2.2	9702.37	2.18	9736.72	2.22	9736.74	2.22
9782.21	2.1	9790.68	2.08	9842.51	1.64	9845.75	1.62	9899.46	1.03
9899.71	1.03	9954.78	.84	9968.11	.7710008	.75	.510051	.99	.26
10063.81	.1810090	.52	-.4110118	.32	2.3710158	.12	5.5410164	.17	5.53
10282.53	5.4910421	.07	5.4410545	.61	5.310656	.43	5.27	10746.5	5.15
10842.83	5.04	10894.8	5.911003	.86	7.811055	.44	8.711114	.63	9.07
11194.4	9.5311301	.88	10.0911405	.53	10.6311521	.48	11.5711605	.89	11.73
11633.85	11.9411706	.43	11.9911817	.02	11.4111912	.21	11.7512000	.33	11.51
12117.45	11.412267	.22	11.5412383	.82	11.3212473	.06	10.8112649	.65	10.65
12880.55	10.8213018	.44	10.5913164	.15	10.8313166	.83	10.8213275	.39	10.41
13375.04	10.1713444	.93	10.4513602	.23	10.3913712	.18	10.02	13830.6	9.8
13954.78	9.6913986	.13	9.6414001	.72	9.0814022	.49	7.71	14040.2	8.97
14054.67	9.3914070	.43	9.4214113	.08	9.314186	.79	9.2614242	.03	9.23
14320.33	9.1814458	.75	8.9314552	.75	8.814633	.81	8.6914757	.82	8.46
14861.88	8.3214977	.95	8.1615061	.31	8.1515150	.96	8.03	15214.9	7.94
15293.5	7.7815394	.79	7.815460	.97	7.6515529	.98	7.5615594	.86	7.47
15646.51	7.4	15675.1	7.3615709	.57	7.3615794	.34	7.315909	.64	7.03
16048.12	7.1116188	.25	6.9116323	.84	6.6216405	.02	6.5116467	.03	6.31
16494.85	616518	.03	4.9516551	.44	4.4716561	.79	6.0216564	.21	6.39
16573.79	6.2716672	.92	6.1316769	.63	6.2716890	.93	5.417006	.23	5.89
17330.71	5.3917440	.28	5.0617486	.08	5.1417555	.31	3.7517851	.33	4.45
18178.43	4.2218379	.58	4.2218548	.04	1.9518588	.72	1.2318617	.37	.83
18683.78	-.5918704	.55	-.7518736	.32	-1.5618820	.62	-10.9218832	.11	-10.92
18922.74	-3.0819014	.98	-2.3919030	.66	-2.1119087	.83	-1.2319157	.13	-1.03
19160.39	-.8719183	.27	-.8919224	.78	-.7719227	.63	-.7719306	.67	-.77
19418.11	-.519426	.18	-.4719532	.59	-.0219612	.31	.219623	.15	.14
19644.04	.3119719	.58	1.1719803	.75	2.36	19821.7	2.5419856	.47	2.87
19896.22	2.8619973	.58	3.5	19973.7	3.520053	.53	3.520084	.92	3.57
20086.7	3.3920116	.31	1.0720143	.25	.3420156	.68	2.2420170	.18	5.27
20191.91	7.420203	.56	6.41	20374	5.4720377	.26	5.4520457	.23	4.82
20490.73	7.5620536	.89	5.6820634	.48	5.7220659	.99	6.0920760	.09	6.59
20774.49	7.17	20888.4	10.6820908	.06	9.2421048	.54	9.3221234	.39	8.81
21319.28	8.7821471	.51	6.56	21505	6.8721522	.54	7.5921551	.55	9
21570.21	8.121590	.88	7.9221793	.14	6.6321793	.48	6.6322046	.78	6.3
22053.83	6.3522198	.15	7.4522267	.67	8.5722314	.11	8.9322450	.65	10.87
22576.01	10.3722588	.26	9.73	22594.9	9.3922686	.76	8.3122739	.84	7.18
22797.88	7.1723112	.37	8.0823373	.43	9.2723632	.76	10.0223908	.01	11.05
24165.1	11.8524437	.16	12.07						

Manning's n Values		num= 6	
Sta	n Val	Sta	n Val
0	.071	8445.79	.091
20191.91	.082	8589.17	.051
		10118.32	.068
		17851.33	.051

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	8445.79	20191.91	2559	4481.46	2515.69		.1	.3
Blocked Obstructions		num= 3						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	8445.79	6.64	020191.91	-2.29	20888.424437.16			6.64

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	5.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.		0.051	0.082
W.S. Elev (ft)	5.89	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)		17079.39	104.27

E.G. Slope (ft/ft)	0.000060	Area (sq ft)	17079.39	104.27
Q Total (cfs)	9361.00	Flow (cfs)	9352.77	8.23
Top Width (ft)	6080.15	Top Width (ft)	5793.80	286.35
Vel Total (ft/s)	0.54	Avg. Vel. (ft/s)	0.55	0.08
Max Chl Dpth (ft)	8.18	Hydr. Depth (ft)	2.95	0.36
Conv. Total (cfs)	1209628.0	Conv. (cfs)	1208564.0	1063.4
Length Wtd. (ft)	4479.57	Wetted Per. (ft)	5795.20	286.41
Min Ch El (ft)	-2.29	Shear (lb/sq ft)	0.01	0.00
Alpha	1.01	Stream Power (lb/ft s)	0.01	0.00
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)	1394.72	13520.28
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	7139.42
				116.40

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 4.93076*

INPUT
 Description: Interpolated Cross Section at River Mile 4.93

Station Elevation Data		num= 272									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	10.55	85.17	8.99	177.18	8.58	288.81	7.66	397.62	7.28		
461.08	7.34	523.75	7.46	635.88	5.71	738.91	5.69	826.56	7.65		
864.21	5.9	934.17	6.36	1074.03	6.39	1080.64	6.39	1239.73	5.03		
1331.52	5.1	1439.01	5.01	1539.29	4.96	1645.24	5.12	1653.51	5.13		
1779.75	4.85	1780.57	4.93	2260.83	4.42	2604.71	4.56	2833.06	4.63		
3417.3	4.15	3428.46	4.16	3612.96	4.93	3795.15	5.51	3855.02	4.61		
3995.23	4.81	4273.87	4.63	4293.77	4.96	4308.87	4.6	4377.95	4.56		
4461.08	4.52	4474.09	5.7	4491.4	4.76	4539.78	4.66	4604.9	4.62		
4703.91	4.33	4798.73	4.45	4938.47	4.67	5041.37	4.71	5580.63	4.14		
6116.42	4.31	6614.55	4.43	7169.2	4.88	7197.16	4.97	7299.02	5.2		
7431.99	5.38	7536.01	7.25	7561.48	5.86	7584.36	5.97	7636.84	6.43		
7650.67	7.73	7654.53	7.23	7658.44	6.19	7665.78	6.38	7746.13	5.23		
7795.32	4.48	7825.88	4.04	7867.77	3.72	7933.98	3.27	7942.76	3.09		
8004.99	2.29	8054.26	3.01	8075.94	2.23	8092.95	.1	8108.91	1.03		
8127.57	2.47	8146.75	2.42	8213.1	3.53	8275.24	3.65	8345.2	3.78		
8411.28	3.84	8461.86	3.95	8514.37	3.89	8518.61	3.86	8613.27	3.64		
8745.96	3.17	8801.41	2.94	8838.58	2.76	8881.74	2.14	8930.88	1.87		
9002.74	1.89	9055.42	2.1	9068.94	2.09	9107.29	2.15	9107.32	2.15		
9158.09	2.05	9167.55	2.03	9225.43	1.67	9229.04	1.65	9289.01	1.2		
9289.3	1.19	9350.79	1.05	9365.67	1	9411.05	.76	9459.34	.55		
9472.54	.48	9502.36	-.02	9533.41	2.28	9577.85	4.9	9584.61	4.89		
9716.78	4.88	9871.47	4.85	10010.54	4.71	10134.3	4.71	10234.87	4.59		
10342.43	4.49	10400.47	5.21	10522.25	6.81	10579.85	7.56	10645.95	7.88		
10735.02	8.26	10855.03	8.71	10970.78	9.15	11100.25	10.01	11194.51	10.04		
11225.73	10.23	11306.77	10.31	11430.27	9.67	11536.55	10.09	11634.96	9.84		
11765.74	9.75	11932.99	9.95	12063.18	9.74	12162.83	9.18	12360.03	9.04		
12617.86	9.31	12771.83	9.07	12934.54	9.39	12937.53	9.38	13058.76	8.96		
13170.04	8.72	13248.07	9.07	13423.73	9.07	13546.5	8.71	13678.73	8.5		
13817.4	8.42	13852.41	8.38	13869.82	7.75	13893.01	6.19	13912.78	7.65		
13928.94	8.12	13946.54	8.16	13994.17	8.05	14076.48	8.03	14138.16	8.03		
14225.59		814380.16	7.78	14485.13	7.67	14575.64	7.58	14714.12	7.37		
14830.32	7.25	14959.92	7.12	15053	7.14	15153.12	7.04	15224.52	6.97		
15312.28	6.81	15425.4	6.88	15499.29	6.74	15576.35	6.66	15648.8	6.59		
15706.48	6.53	15738.4	6.5	15776.9	6.52	15871.55	6.48	16000.3	6.23		
16154.93	6.37	16311.4	6.21	16462.82	5.93	16553.47	5.84	16622.7	5.64		
16653.78	5.31	16679.66	4.11	16716.97	3.58	16728.53	5.35	16731.22	5.78		
16741.93	5.64	16852.62	5.53	16960.61	5.72	17096.06	4.78	17224.81	5.39		
17587.14	4.96	17709.5	4.68	17760.63	4.75	17837.95	3.58	18168.49	4.15		

18533.74	3.9518758.37	2.6118946.47	2.04	18991.9	1.4419023.89	1.14
19098.05	-.1219121.24	-.2719156.71	-1.1719250.85	-11.7719260.42	-11.77	
19362.37	-2.8519466.12	-2.1119483.75	-1.7919548.06	-.7819626.01	-.52	
19629.68	-.34 19655.4	-.36 19702.1	-.21 19705.3	-.2119794.21	-.24	
19919.56	.0119928.63	.0520048.33	.5220137.99	.7320150.19	.66	
20173.69	.7620258.65	1.3920353.33	2.3720373.51	2.4920412.63	2.71	
20457.33	2.5120544.35	2.920544.48	2.920634.27	2.8520669.58	2.9	
20671.59	2.7120704.89	-.1420735.19	-1.15 20750.3	.9420765.48	4.31	
20789.92	6.6 20801.1	5.7820964.55	5.1220967.69	5.1121044.38	4.59	
21076.5	6.8821120.77	5.3221214.37	5.3721238.84	5.7821334.83	6.64	
21348.64	7.1921457.89	10.2721476.74	9.1121611.47	9.3721789.71	9.01	
21871.12	9.0122017.11	6.5622049.23	6.6822066.04	7.2122093.88	8.33	
22111.76	7.5422131.59	7.3622325.57	5.89 22325.9	5.8922568.81	5.5	
22575.58	5.5622713.99	6.822780.65	7.8922825.19	8.1822956.15	9.75	
23076.37	9.323088.12	8.7623094.48	8.4723182.58	7.5623233.49	6.62	
23289.14	6.6123590.76	7.6523841.12	9.0124089.84	9.8724353.81	11.04	
24600.36	11.9624861.29	12.21				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	
0	.072	7665.78	.088	7825.88	.054	8213.1	.06918946.47	.054
20789.92	.082							

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

7665.78	20789.92	2559	4481.46	2515.69	.1	.3
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Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	7665.78	6.22	020789.92	-1.921457.89	24861.29	6.22		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	5.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.		0.057	0.082
W.S. Elev (ft)	5.59	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)		18432.31	118.04
E.G. Slope (ft/ft)	0.000073	Area (sq ft)		18432.31	118.04
Q Total (cfs)	9361.00	Flow (cfs)		9351.23	9.77
Top Width (ft)	7031.03	Top Width (ft)		6706.36	324.67
Vel Total (ft/s)	0.50	Avg. Vel. (ft/s)		0.51	0.08
Max Chl Dpth (ft)	7.49	Hydr. Depth (ft)		2.75	0.36
Conv. Total (cfs)	1093014.0	Conv. (cfs)		1091873.0	1140.5
Length Wtd. (ft)	4479.38	Wetted Per. (ft)		6707.83	324.71
Min Ch El (ft)	-1.90	Shear (lb/sq ft)		0.01	0.00
Alpha	1.01	Stream Power (lb/ft s)		0.01	0.00
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	1394.72	11693.56	35.29
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	6496.41	98.75

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 4.08461*

INPUT

Description: Interpolated Cross Section at River Mile 4.08

Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8.98	76.5	7.71	159.15	7.37	259.42	6.61	357.16	6.28
414.17	6.31	470.46	6.42	571.18	5.04	663.72	5.03	742.46	6.62
776.28	5.23	839.11	5.61	964.74	5.66	970.68	5.65	1113.58	4.56

1196.03	4.61	1292.59	4.53	1382.66	4.49	1477.83	4.62	1485.26	4.62
1598.65	4.36	1599.39	4.42	2030.79	3.86	2339.67	4.01	2544.79	4.11
3069.58	3.58	3079.6	3.59	3245.33	4.27	3408.99	4.8	3462.76	4.1
3588.71	4.31	3838.99	4.07	3856.87	4.33	3870.43	4.03	3932.48	3.99
4007.15	3.92	4018.84	4.86	4034.38	4.1	4077.84	4.01	4136.34	3.99
4225.27	3.77	4310.44	3.88	4435.97	4.08	4528.4	4.13	5012.78	3.51
5494.05	3.73	5941.5	3.88	6439.71	4.42	6464.83	4.5	6556.33	4.68
6675.76	4.81	6769.2	6.3	6792.08	5.19	6812.63	5.28	6859.77	5.64
6872.19	6.69	6875.66	6.29	6879.18	5.45	6885.76	5.61	6974.51	4.61
7028.83	3.96	7062.59	3.6	7108.86	3.32	7181.99	2.93	7191.68	2.76
7260.42	1.83	7314.83	2.63	7338.77	1.75	7357.56	-.66	7375.19	.39
7395.8	1.99	7416.98	1.94	7490.26	3.17	7558.89	3.28	7636.16	3.4
7709.14	3.45	7765.01	3.56	7823	3.47	7827.69	3.45	7932.24	3.29
8078.79	2.9	8140.02	2.69	8181.09	2.53	8228.75	1.87	8283.02	1.61
8362.39	1.72	8420.58	2	8435.51	2.01	8477.86	2.08	8477.89	2.08
8533.98	2	8544.42	1.98	8608.34	1.7	8612.33	1.68	8678.57	1.36
8678.89	1.35	8746.8	1.26	8763.24	1.22	8813.36	1.02	8866.69	.84
8881.27	.78	8914.21	.36	8948.5	2.18	8997.58	4.27	9005.05	4.25
9151.02	4.26	9321.88	4.26	9475.47	4.13	9612.16	4.15	9723.23	4.03
9842.04	3.94	9906.13	4.51	10040.64	5.81	10104.25	6.42	10177.26	6.68
10275.63	6.99	10408.19	7.33	10536.02	7.66	10679.02	8.45	10783.13	8.35
10817.61	8.52	10907.12	8.63	11043.52	7.94	11160.9	8.43	11269.58	8.17
11414.03	8.11	11598.75	8.36	11742.54	8.15	11852.6	7.54	12070.4	7.43
12355.17	7.78	12525.22	7.56	12704.93	7.96	12708.23	7.95	12842.13	7.51
12965.03	7.28	13051.22	7.71	13245.22	7.76	13380.82	7.38	13526.86	7.2
13680.02	7.16	13718.69	7.13	13737.92	6.42	13763.53	6.47	13785.36	6.32
13803.21	6.86	13822.65	6.91	13875.25	6.81	13966.16	6.81	14034.29	6.82
14130.85	6.82	14301.56	6.62	14417.5	6.54	14517.48	6.46	14670.41	6.28
14798.76	6.18	14941.9	6.07	15044.7	6.13	15155.27	6.05	15234.13	5.99
15331.06	5.85	15456	5.97	15537.62	5.83	15622.72	5.77	15702.74	5.71
15766.44	5.66	15801.7	5.64	15844.22	5.67	15948.76	5.67	16090.96	5.42
16261.75	5.64	16434.56	5.51	16601.79	5.25	16701.91	5.17	16778.38	4.97
16812.7	4.61	16841.29	3.27	16882.49	2.68	16895.26	4.68	16898.24	5.16
16910.06	5.01	17032.31	4.92	17151.59	5.18	17301.19	4.17	17443.38	4.89
17843.57	4.54	17978.71	4.31	18035.19	4.35	18120.58	3.42	18485.66	3.86
18889.06	3.68	19137.15	2.61	19344.91	2.14	19395.08	1.65	19430.41	1.45
19512.32	.35	19537.93	.21	19577.11	-.78	19681.08	-12.62	19688.74	-12.62
19801.99	-2.62	19917.25	-1.82	19936.85	-1.48	20008.29	-.32	20094.89	-.02
20098.96	.19	20127.54	.17	20179.42	.36	20182.98	.35	20281.74	.29
20421.01	.53	20431.09	.57	20564.06	1.05	20663.67	1.27	20677.22	1.18
20703.33	1.21	20797.72	1.61	20902.9	2.38	20925.33	2.44	20968.78	2.55
21018.45	2.17	21115.12	2.32	21115.27	2.32	21215.02	2.22	21254.25	2.24
21256.47	2.02	21293.47	-1.35	21327.13	-2.64	21343.92	-.37	21360.79	3.35
21387.94	5.82	21398.64	5.16	21555.11	4.77	21558.11	4.77	21631.53	4.37
21662.28	6.22	21704.66	4.96	21794.25	5.02	21817.68	5.48	21909.58	6.7
21922.79	7.21	22027.37	9.87	22045.42	8.97	22174.39	9.41	22345.02	9.21
22422.96	9.25	22562.71	6.55	22593.46	6.48	22609.56	6.83	22636.2	7.65
22653.32	6.98	22672.3	6.79	22857.99	5.15	22858.31	5.15	23090.85	4.7
23097.33	4.77	23229.83	6.15	23293.64	7.21	23336.28	7.42	23461.64	8.63
23576.73	8.22	23587.97	7.79	23594.07	7.56	23678.4	6.82	23727.13	6.07
23780.42	6.05	24069.14	7.22	24308.82	8.75	24546.91	9.72	24799.61	11.03
25035.63	12.07	25285.41	12.35						

Manning's n	Values	num=	6						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.074	6885.76	.086	7108.86	.057	7490.26	.071	9344.91	.057
21387.94	.083								

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	6885.76	21387.94		2559	4481.46	2515.69	.1		.3

Blocked Obstructions num= 3
 Sta L Sta R Elev Sta L Sta R Elev Sta L Sta R Elev
 0 6885.76 5.7921837.9425285.41 5.79 021387.94 -1.52

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	5.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.		0.060	0.083
W.S. Elev (ft)	5.23	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)		19240.93	120.05
E.G. Slope (ft/ft)	0.000088	Area (sq ft)		19240.93	120.05
Q Total (cfs)	9361.00	Flow (cfs)		9350.96	10.04
Top Width (ft)	8184.44	Top Width (ft)		7826.88	357.57
Vel Total (ft/s)	0.48	Avg. Vel. (ft/s)		0.49	0.08
Max Chl Dpth (ft)	6.75	Hydr. Depth (ft)		2.46	0.34
Conv. Total (cfs)	999097.6	Conv. (cfs)		998025.7	1071.9
Length Wtd. (ft)	4326.21	Wetted Per. (ft)		7828.40	357.60
Min Ch El (ft)	-1.52	Shear (lb/sq ft)		0.01	0.00
Alpha	1.01	Stream Power (lb/ft s)		0.01	0.00
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	1394.72	9755.64	28.41
C & E Loss (ft)	0.00	Cum SA (acres)	991.74	5748.82	79.05

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 3.23846*

INPUT

Description: Interpolated Cross Section at River Mile 3.24

Station Elevation Data		num= 272	
Sta	Elev	Sta	Elev
0	7.41	67.84	6.44
367.25	5.28	417.17	5.38
688.34	4.55	744.06	4.85
1060.54	4.12	1146.16	4.06
1417.56	3.86	1418.22	3.91
2721.86	3.01	2730.75	3.02
3182.18	3.81	3404.11	3.51
3553.22	3.32	3563.58	4.02
3746.64	3.21	3822.16	3.31
4871.69	3.15	5268.45	3.34
5919.53	4.25	6002.39	5.36
6093.72	5.64	6096.79	5.34
6262.35	3.45	6299.3	3.15
6515.84	1.37	6575.4	2.25
6664.02	1.52	6687.21	1.45
7007.01	3.06	7068.16	3.17
7411.62	2.62	7478.64	2.44
7722.04	1.54	7785.73	1.9
7909.86	1.95	7921.29	1.94
8068.48	1.52	8142.81	1.46
8290	1.08	8326.05	.74
8585.27	3.65	8772.29	3.67
9341.64	3.39	9411.8	3.8
9816.25	5.71	9961.34	5.95
10409.49	6.81	10507.46	6.94
11062.33	6.45	11264.51	6.77
12092.47	6.26	12278.62	6.04
12760.02	5.83	12854.36	6.32
			141.12
			506.47
			855.46
			1226.03
			1800.74
			2877.7
			3419.96
			3577.37
			3933.46
			5710.23
			6022.67
			6099.91
			6349.94
			6601.6
			6767.42
			7131.63
			7523.59
			7802.07
			7991.26
			8160.8
			8363.59
			8940.4
			9559.03
			10101.27
			10656.76
			11421.91
			12475.33
			13066.72
			230.03
			588.54
			860.72
			1310.42
			2074.63
			3022.82
			3431.99
			3615.91
			4015.42
			5732.5
			6040.9
			6105.75
			6429.99
			6622.17
			6842.54
			7136.77
			7575.77
			7848.44
			7995.62
			8215.66
			8417.31
			9090.02
			9628.66
			10257.79
			10785.25
			11542.38
			12478.94
			13215.14
			316.71
			658.35
			987.44
			1317.01
			2256.52
			3070.5
			3487.01
			3667.78
			4444.94
			5813.63
			6082.69
			6202.88
			6440.6
			6641.47
			6927.12
			7251.2
			7635.17
			7848.47
			8068.13
			8274.05
			8425.49
			9211.6
			9708.57
			10371.75
			10904.21
			11780.78
			12625.5
			13375

13542.64	5.8913584.97	5.8713606.01	5.0913634.04	3.1513657.95	4.99
13677.48	5.5913698.77	5.6613756.34	5.5513855.85	5.5813930.41	5.62
14036.11	5.6414222.97	5.4714349.88	5.414459.31	5.3514626.71	5.18
14767.19	5.1114923.87	5.03 15036.4	5.1315157.43	5.0615243.75	5.02
15349.85	4.89 15486.6	5.0515575.94	4.9315669.09	4.8815756.68	4.83
15826.41	4.8 15865	4.7815911.54	4.8316025.97	4.8516181.62	4.62
16368.56	4.916557.72	4.8116740.77	4.5616850.36	4.516934.06	4.31
16971.62	3.917002.91	2.4217048.02	1.79 17062	4.0117065.25	4.55
17078.2	4.3917212.01	4.3217342.56	4.6317506.31	3.5517661.96	4.39
18100	4.1118247.92	3.9218309.74	3.9618403.21	3.2518802.82	3.57
19244.38	3.4119515.93	2.5919743.34	2.2319798.26	1.8619836.94	1.76
19926.59	.8319954.62	.6819997.51	-.3820111.31	-13.4620117.05	-13.46
20241.62	-2.3920368.39	-1.5420389.94	-1.1720468.51	.1320563.77	.49
20568.25	.7220599.68	.7120656.74	.9220660.66	.9120769.28	.82
20922.46	1.0520933.54	1.09 21079.8	1.5921189.35	1.821204.26	1.7
21232.97	1.6621336.79	1.8321452.48	2.3821477.14	2.3821524.94	2.38
21579.56	1.8321685.89	1.721686.05	1.721795.76	1.5521838.91	1.58
21841.36	1.3321882.06	-2.5721919.07	-4.1321937.54	-1.6821956.09	2.39
21985.95	521996.18	4.5322145.67	4.4322148.53	4.4222218.67	4.14
22248.05	5.5222288.54	4.622374.14	4.6622396.52	5.1822484.32	6.75
22496.95	7.2422596.86	9.4722614.11	8.8322737.32	9.4622900.33	9.41
22974.79	9.4923108.31	6.5523137.69	6.2923153.07	6.4523178.52	6.98
23194.88	6.4323213.01	6.2223390.42	4.4223390.72	4.4123612.89	3.9
23619.08	3.9723745.66	5.523806.63	6.5423847.37	6.6723967.13	7.51
24077.09	7.1524087.83	6.8224093.65	6.6424174.22	6.0824220.78	5.51
24271.69	5.4824547.53	6.7924776.51	8.4825003.98	9.5625245.41	11.02
25470.9	12.1825709.53	12.48			

Manning's n Values	num=	6									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.075	6105.75	.083	6349.94	.06	6767.42	.071	18802.82	.06		
21985.95	.083										

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
6105.75	21985.95	2559	4481.46	2515.69	.1	.3	

Blocked Obstructions	num=	2									
Sta L	Sta R	Elev	Sta L	Sta R	Elev						
22974.79	25709.53	5.37	21985.95		-1.13						

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	4.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.075	0.063	0.083
W.S. Elev (ft)	4.85	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	6844.69	19862.49	124.40
E.G. Slope (ft/ft)	0.000084	Area (sq ft)	6844.69	19862.49	124.40
Q Total (cfs)	9361.00	Flow (cfs)	1490.64	7859.63	10.73
Top Width (ft)	15373.09	Top Width (ft)	5386.38	9637.21	349.51
Vel Total (ft/s)	0.35	Avg. Vel. (ft/s)	0.22	0.40	0.09
Max Chl Dpth (ft)	5.98	Hydr. Depth (ft)	1.27	2.06	0.36
Conv. Total (cfs)	1021539.0	Conv. (cfs)	162669.5	857698.6	1170.4
Length Wtd. (ft)	4151.81	Wetted Per. (ft)	5386.47	9638.68	349.54
Min Ch El (ft)	-1.13	Shear (lb/sq ft)	0.01	0.01	0.00
Alpha	1.14	Stream Power (lb/ft s)	0.00	0.00	0.00
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	1193.67	7744.16	21.35
C & E Loss (ft)	0.00	Cum SA (acres)	833.53	4850.47	58.63

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 2.39230*

INPUT
 Description: Interpolated Cross Section at River Mile 2.39

Station	Elevation	Data	num=	272						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
0	5.84	59.17	5.16	123.09	4.94	200.65	4.5	276.25	4.27	
320.33	4.25	363.87	4.34	441.77	3.69	513.35	3.73	574.25	4.56	
600.4	3.88	649	4.1	746.17	4.18	750.76	4.18	861.29	3.61	
925.06	3.63	999.74	3.58	1069.41	3.55	1143.02	3.61	1148.76	3.6	
1236.46	3.37	1237.04	3.4	1570.69	2.73	1809.6	2.93	1968.24	3.05	
2374.14	2.44	2381.89	2.45	2510.07	2.96	2636.65	3.38	2678.24	3.08	
2775.65	3.31	2969.23	2.96	2983.06	3.07	2993.55	2.91	3041.54	2.83	
3099.29	2.73	3108.33	3.18	3120.36	2.79	3153.97	2.7	3199.22	2.72	
3268	2.65	3333.87	2.74	3430.96	2.9	3502.45	2.96	3877.09	2.26	
4249.33	2.57	4595.4	2.79	4980.74	3.49	5000.17	3.55	5070.93	3.63	
5163.31	3.68	5235.58	4.42	5253.27	3.86	5269.16	3.9	5305.62	4.07	
5315.24	4.6	5317.92	4.39	5320.64	3.98	5325.73	4.05	5431.26	3.37	
5495.87	2.93	5536.01	2.71	5591.03	2.51	5677.99	2.27	5689.52	2.08	
5771.26	.92	5835.96	1.87	5864.44	.77	5886.78	-2.18	5907.75	-.91	
5932.25	1.05	5957.44	.97	6044.58	2.43	6126.2	2.54	6218.08	2.65	
6304.87	2.68	6371.3	2.78	6440.27	2.64	6445.85	2.63	6570.17	2.59	
6744.45	2.35	6817.26	2.2	6866.09	2.07	6922.78	1.34	6987.31	1.11	
7081.7	1.36	7150.89	1.8	7168.64	1.83	7219.01	1.94	7219.05	1.94	
7285.74	1.9	7298.16	1.89	7374.17	1.75	7378.92	1.75	7457.69	1.68	
7458.06	1.68	7538.82	1.67	7558.37	1.66	7617.97	1.54	7681.4	1.42	
7698.73	1.37	7737.9	1.13	7778.68	2	7837.04	2.99	7845.92	2.98	
8019.51	3.03	8222.69	3.08	8405.34	2.97	8567.88	3.02	8699.97	2.92	
8841.25	2.84	8917.47	3.1	9077.42	3.8	9153.06	4.13	9239.88	4.29	
9356.87	4.44	9514.49	4.56	9666.51	4.68	9836.56	5.32	9960.37	4.98	
10001.37	5.110107.81		5.2610270.01		4.47	10409.6	5.1210538.84		4.84	
10710.62	4.810930.27		5.1811101.27		4.9711232.15		4.2711491.15		4.22	
11829.78	4.7412032.01		4.5312245.72		5.0812249.64		5.0712408.86		4.6	
12555.01	4.3912657.51		4.9512888.21		5.1313049.46		4.7413223.13		4.6	
13405.26	4.6313451.24		4.6113474.11		3.7613504.56		1.6413530.53		3.66	
13551.76	4.3313574.88		4.4113637.43		4.313745.53		4.3513826.54		4.41	
13941.38	4.4614144.38		4.3114282.25		4.2714401.14		4.2314583.01		4.09	
14735.63	4.0414905.85		3.99	15028.1	4.1215159.59		4.0815253.37		4.05	
15368.63	3.93	15517.2	4.1315614.26		4.0215715.46		3.9915810.62		3.96	
15886.37	3.93	15928.3	3.9215978.86		3.9916103.18		4.0316272.28		3.81	
16475.37	4.1716680.88		4.116879.75		3.8716998.81		3.8417089.74		3.64	
17130.55	3.217164.54		1.5817213.55		.8917228.73		3.3417232.27		3.93	
17246.33	3.7617391.71		3.7117533.54		4.0917711.44		2.9317880.54		3.9	
18356.43	3.6818517.13		3.5518584.29		3.5718685.84		3.0919119.98		3.27	
19599.7	3.1419894.72		2.5820141.77		2.3220201.44		2.0820243.46		2.08	
20340.86	1.320371.32		1.15	20417.9	.0120541.54		-14.3120545.37		-14.31	
20681.25	-2.1620819.53		-1.2620843.03		-.8520928.74		.5921032.64		.99	
21037.53	1.2421071.82		1.2421134.06		1.4821138.33		1.4721256.82		1.34	
21423.9	1.5721435.99		1.621595.53		2.1321715.04		2.3321731.29		2.22	
21762.61	2.121875.86		2.0622002.05		2.3922028.96		2.3322081.09		2.22	
22140.67	1.4922256.66		1.122256.83		1.122376.51		.922423.57		.92	
22426.24	.6422470.64		-3.7822511.02		-5.6222531.16		-2.9922551.39		1.42	
22583.97	4.222593.72		3.922736.22		4.0822738.96		4.0822805.82		3.91	
22833.83	4.8422872.43		4.2422954.03		4.3122975.36		4.8823059.06		6.81	
23071.1	7.2623166.34		9.0623182.79		8.6923300.25		9.5123455.65		9.61	
23526.63	9.7323653.91		6.5423681.92		6.123696.58		6.0623720.84		6.31	
23736.44	5.8723753.72		5.6523922.85		3.6823923.13		3.6824134.93		3.1	
24140.83	3.18	24261.5	4.8624319.62		5.8624358.45		5.9224472.63		6.39	
24577.45	6.0724587.69		5.8424593.24		5.7324670.05		5.3424714.43		4.95	

24762.96 4.9225025.92 6.3625244.21 8.2225461.05 9.4125691.21 11.02
 25906.16 12.2826133.65 12.62

Manning's n Values num= 6
 Sta n Val Sta n Val Sta n Val Sta n Val
 0 .077 5325.73 .08 5591.03 .064 6044.58 .07220243.46 .064
 22583.97 .084

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5325.7322583.97 2559 4481.46 2515.69 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 022583.97 -.7423526.6326133.65 4.94

CROSS SECTION OUTPUT Profile #Calibration

Element	Left OB	Channel	Right OB
E.G. Elev (ft)	4.46		
Vel Head (ft)	0.00	0.067	0.084
W.S. Elev (ft)	4.46	2559.00	2515.69
Crit W.S. (ft)		6881.36	21224.08
E.G. Slope (ft/ft)	0.000104	6881.36	21224.09
Q Total (cfs)	9361.00	1696.21	7652.52
Top Width (ft)	19119.75	5095.46	13684.77
Vel Total (ft/s)	0.33	0.25	0.36
Max Chl Dpth (ft)	5.20	1.35	1.55
Conv. Total (cfs)	917641.3	166275.9	750162.4
Length Wtd. (ft)	4136.23	5095.56	13686.03
Min Ch El (ft)	-0.74	0.01	0.01
Alpha	1.07	0.00	0.00
Frctn Loss (ft)	0.41	790.49	5630.66
C & E Loss (ft)	0.00	525.64	3650.79

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 1.54615*

INPUT

Description: Interpolated Cross Section at River Mile 1.55

Station	Elevation	Data	num=	272
0	4.27	50.5	3.88	105.06
273.42	3.23	310.58	3.29	377.07
512.47	3.2	553.95	3.34	636.89
789.57	3.14	853.32	3.11	912.78
1055.37	2.88	1055.86	2.89	1340.65
2026.42	1.87	2033.03	1.89	2142.44
2369.13	2.8	2534.35	2.4	2546.16
2645.37	2.13	2653.08	2.35	2663.35
2789.36	2.09	2845.59	2.18	2928.45
3626.96	1.98	3922.35	2.25	4251.25
4407.08	3.12	4468.77	3.47	4483.87
4536.76	3.55	4539.05	3.45	4541.37
4729.38	2.42	4772.72	2.26	4832.11
5026.68	.46	5096.53	1.48	5127.27
5200.47	.57	5227.67	.48	5321.74
5602.74	2.29	5674.45	2.39	5748.9
6077.27	2.07	6155.88	1.95	6208.6
6441.35	1.18	6516.05	1.7	6535.21

6661.62	1.85	6675.03	1.85	6757.09	1.77	6762.21	1.78	6847.24	1.84
6847.65	1.84	6934.83	1.87	6955.93	1.88	7020.28	1.79	7088.75	1.71
7107.46	1.67	7149.75	1.51	7193.77	1.91	7256.78	2.35	7266.36	2.34
7453.76	2.42	7673.1	2.49	7870.27	2.38	8045.74	2.46	8188.33	2.36
8340.85	2.29	8423.13	2.4	8595.81	2.8	8677.47	2.99	8771.19	3.1
8897.48	3.17	9067.65	3.18	9231.76	3.19	9415.33	3.76	9548.98	3.29
9593.25	3.39	9708.16	3.58	9883.25	2.7310033	.95	3.4610173	.47	3.17
10358.91	3.1510596	.04	3.5910780	.64	3.3910921	.93	2.6411201	.53	2.61
11567.09	3.2211785	.41	3.0112016	.11	3.6412020	.34	3.6312192	.23	3.15
12350.01	2.9412460	.66	3.5712709	.71	3.8112883	.78	3.4213071	.27	3.3
13267.88	3.3613317	.52	3.36	13342.2	2.4313375	.08	.1213403	.12	2.33
13426.03	3.0613450	.99	3.1513518	.51	3.0513635	.22	3.1313722	.67	3.21
13846.64	3.2814065	.79	3.1614214	.62	3.1314342	.97	3.12	14539.3	2.99
14704.06	2.9714887	.82	2.94	15019.8	3.1115161	.74	3.0915262	.98	3.07
15387.42	2.96	15547.8	3.2215652	.58	3.1115761	.83	3.0915864	.56	3.08
15946.33	3.07	15991.6	3.0616046	.18	3.1416180	.39	3.2216362	.94	3.01
16582.19	3.4316804	.04	3.417018	.72	3.1917147	.25	3.1717245	.42	2.97
17289.47	2.517326	.17	.7417379	.07	.017395	.46	2.6717399	.29	3.32
17414.46	3.13	17571.4	3.1117724	.52	3.5417916	.57	2.3218099	.12	3.4
18612.86	3.2518786	.34	3.1718858	.85	3.1718968	.47	2.9319437	.14	2.98
19955.01	2.87	20273.5	2.5620540	.21	2.4220604	.62	2.2920649	.98	2.39
20755.13	1.7720788	.01	1.63	20838.3	.4120971	.77	-15.1520973	.68	-15.15
21120.87	-1.9321270	.66	-.9821296	.13	-.5421388	.97	1.0421501	.52	1.5
21506.81	1.7721543	.96	1.7721611	.38	2.0421616	.01	2.0321744	.36	1.87
21925.35	2.0821938	.45	2.1222111	.27	2.6622240	.72	2.8722258	.33	2.74
22292.26	2.5522414	.93	2.2822551	.62	2.3922580	.77	2.2822637	.25	2.06
22701.79	1.1422827	.43	.522827	.62	.522957	.25	.2523008	.24	.26
23011.13	-.0423059	.22	-4.9923102	.96	-7.1123124	.78	-4.29	23146.7	.46
23181.98	3.423191	.25	3.2823326	.78	3.7323329	.38	3.7423392	.97	3.69
23419.6	4.1723456	.31	3.8823533	.91	3.95	23554.2	4.58	23633.8	6.86
23645.25	7.2823735	.83	8.6623751	.46	8.5623863	.17	9.5524010	.96	9.81
24078.46	9.9624199	.51	6.5424226	.15	5.9124240	.09	5.6824263	.17	5.64
24278	5.3124294	.44	5.0824455	.27	2.9424455	.55	2.9424656	.96	2.3
24662.57	2.3924777	.34	4.2124832	.61	5.1824869	.54	5.1724978	.12	5.28
25077.8	525087	.54	4.8725092	.82	4.8125165	.87	4.625208	.08	4.39
25254.23	4.3625504	.31	5.93	25711.9	7.9625918	.13	9.25	26137	11.01
26341.43	12.3926557	.78	12.76						

Manning's n Values		num= 6	
Sta	n Val	Sta	n Val
0	.078	4545.72	.078
23181.98	.084	4832.11	.067
		5409.85	.073
		20788.01	.067

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4545.72	23181.98	2559	4481.46	2515.7	.1	.3
Blocked Obstructions		num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev		
24078.46	26557.78	4.52	023181.98		-.36		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	4.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.078	0.070	0.084
W.S. Elev (ft)	4.05	Reach Len. (ft)	2559.00	4481.46	2515.70
Crit W.S. (ft)		Flow Area (sq ft)	6741.49	26749.98	118.05
E.G. Slope (ft/ft)	0.000096	Area (sq ft)	6741.49	26749.98	118.05
Q Total (cfs)	9361.00	Flow (cfs)	1641.61	7707.99	11.40
Top Width (ft)	23486.20	Top Width (ft)	4517.01	18636.26	332.93
Vel Total (ft/s)	0.28	Avg. Vel. (ft/s)	0.24	0.29	0.10
Max Chl Dpth (ft)	4.41	Hydr. Depth (ft)	1.49	1.44	0.35

Conv. Total (cfs)	956404.9	Conv. (cfs)	167722.3	787517.9	1164.8
Length Wtd. (ft)	4167.22	Wetted Per. (ft)	4517.05	18637.29	332.94
Min Ch El (ft)	-0.36	Shear (lb/sq ft)	0.01	0.01	0.00
Alpha	1.02	Stream Power (lb/ft s)	0.00	0.00	0.00
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	390.34	3162.87	7.19
C & E Loss (ft)	0.00	Cum SA (acres)	243.29	1988.19	19.32

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 0.7

INPUT

Description: Cross Section at River Mile 0.7

Station Elevation Data		num= 168		Elev		Sta		Elev		Sta	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2.7	226.5	2.2	527.6	2.7	808.2	2.6	1110.6	1.6		
1391.7	2	1678.7	1.3	1962.6	2.3	2230.1	1.4	2476.5	1.8		
2741.4	1	3004.6	1.4	3249.3	1.7	3535.5	2.6	3765.7	2.5		
3962.9	1.9	4073.2	1.7	4174	1.6	4282.1	0	4357.1	1.1		
4390.1	-.2	4416	-3.7	4440.3	-2.2	4468.7	.1	4497.9	0		
4598.9	1.7	4693.5	1.8	4800	1.9	4900.6	1.9	4977.6	2		
5064	1.8	5208.1	1.9	5410.1	1.8	5494.5	1.7	5551.1	1.6		
5616.8	.8	5691.6	.6	5801	1	5881.2	1.6	5960.2	1.8		
6037.5	1.8	6140	1.8	6236.8	2	6353.5	2.1	6496.1	2		
6686.8	1.7	6888	1.8	7123.5	1.9	7335.2	1.8	7523.6	1.9		
7676.7	1.8	7928.8	1.7	8114.2	1.8	8302.5	1.9	8438.1	1.9		
8620.8	1.8	8797	1.7	8994.1	2.2	9137.6	1.6	9308.5	1.9		
9496.5	1	9658.3	1.8	9808.1	1.5	10007.2	1.5	10261.8	2		
10460	1.8	10611.7	1	10911.9	1	11304.4	1.7	11538.8	1.5		
11786.5	2.2	11975.6	1.7	12145	1.5	12263.8	2.2	12531.2	2.5		
12718.1	2.1	12919.4	2	13130.5	2.1	13183.8	2.1	13210.3	1.1		
13245.6	-1.4	13275.7	1	13300.3	1.8	13327.1	1.9	13399.6	1.8		
13524.9	1.9	13618.8	2	13751.9	2.1	13987.2	2	14147	2		
14284.8	2	14495.6	1.9	14672.5	1.9	14869.8	1.9	15011.5	2.1		
15163.9	2.1	15272.6	2.1	15406.2	2	15578.4	2.3	15690.9	2.2		
15808.2	2.2	15918.5	2.2	16006.3	2.2	16054.9	2.2	16113.5	2.3		
16257.6	2.4	16453.6	2.2	16689	2.7	16927.2	2.7	17157.7	2.5		
17295.7	2.5	17401.1	2.3	17448.4	1.8	17487.8	-1.1	17544.6	-1.9		
17562.2	2	17566.3	2.7	17582.6	2.5	17751.1	2.5	17915.5	3		
18121.7	1.7	18317.7	2.9	21007.8	2.5	21056.5	2.7	21204.7	2.1		
21258.7	.8	21402	-16	21560.5	-1.7	21721.8	-7	21849.2	1.5		
21970.4	2	21976.1	2.3	22016.1	2.3	22088.7	2.6	22231.9	2.4		
22426.8	2.6	22627	3.2	22766.4	3.4	22821.9	3	22954	2.5		
23101.2	2.4	23193.4	1.9	23262.9	.8	23398.4	-1.1	23538	-1.4		
23592.9	-.4	23647.8	-6.2	23694.9	-8.6	23718.4	-5.6	23742	-1.5		
23780	2.6	23919.8	3.4	24113.8	3.6	24219.4	7.3	24426.1	9.6		
24630.3	10.2	24783.6	5.3	24987.7	2.2	25179	1.5	25345.6	4.5		
25587.4	3.9	25745.5	3.8	25982.7	5.5	26179.6	7.7	26375.2	9.1		
26582.8	11	26776.7	12.5	26981.9	12.9						

Manning's n Values		num= 10		Sta		n Val		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.085	226.5	.075	4174	.07	4598.9	.075	5551.1	.07		
5881.2	.075	21204.7	.07	21976.1	.075	23101.2	.07	23780	.085		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	3765.7	23780		0	0	.1	.3
Blocked Obstructions	num=		2				

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	23780	.3	24630.3	26981.9	4.09

CROSS SECTION OUTPUT Profile #Calibration

Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3.68		
Vel Head (ft)	0.00	0.075	0.085
W.S. Elev (ft)	3.68		
Crit W.S. (ft)	1.52		
E.G. Slope (ft/ft)	0.000080		
Q Total (cfs)	11080.00		
Top Width (ft)	24116.15		
Vel Total (ft/s)	0.27		
Max Chl Dpth (ft)	3.38		
Conv. Total (cfs)	1238277.0		
Length Wtd. (ft)			
Min Ch El (ft)	0.30		
Alpha	1.00		
Frothn Loss (ft)			
C & E Loss (ft)			

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 13.8

INPUT

Description: Cross Section at River Mile 13.8

Station Elevation Data		num= 79	
Sta	Elev	Sta	Elev
0	58.7	14.5	57.9
954.5	51.4	1189.4	47.4
2360.2	47.7	2979	47.2
3870.6	51.6	4116.8	51.3
5242.5	54.5	5540	54.1
6583.3	45.4	7011.5	42.8
8010.7	49	8086.7	41.7
8440.3	40.3	8446.6	37.9
8502.7	35.5	8537	33.9
8664.2	28.8	8674.2	27.5
8714.2	23	8724.2	23.6
8759.9	35.9	8773.7	35.9
9246.1	44.8	9408.5	53
10458.4	58.7	10756.9	60.6
11961	58.5	12247.7	58.6
13460.6	60.3	13760	59.7

Manning's n Values		num= 7	
Sta	n Val	Sta	n Val
0	.05	2360.2	.04
8773.7	.06	8954.9	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8502.7	8773.7	1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

Element	Left OB	Channel	Right OB
E.G. Elev (ft)	36.16		
Vel Head (ft)	0.31	0.060	0.020
W.S. Elev (ft)	35.85		
Crit W.S. (ft)			

E.G. Slope (ft/ft)	0.000354	Area (sq ft)	0.22	1479.24
Q Total (cfs)	6585.00	Flow (cfs)	0.03	6584.97
Top Width (ft)	258.40	Top Width (ft)	1.26	257.14
Vel Total (ft/s)	4.45	Avg. Vel. (ft/s)	0.14	4.45
Max Chl Dpth (ft)	12.85	Hydr. Depth (ft)	0.18	5.75
Conv. Total (cfs)	349790.3	Conv. (cfs)	1.7	349788.6
Length Wtd. (ft)	2280.69	Wetted Per. (ft)	1.31	260.52
Min Ch El (ft)	23.00	Shear (lb/sq ft)	0.00	0.13
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.56
Frctn Loss (ft)	0.82	Cum Volume (acre-ft)	0.00	2462.74
C & E Loss (ft)	0.00	Cum SA (acres)	0.02	374.96

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 13.375*

INPUT

Description: Interpolated Cross Section at River Mile 13.38

Station Elevation Data		num= 161	
Sta	Elev	Sta	Elev
1106.32	58.32	1120.99	57.55
1591.89	56.29	1746.05	54.88
2259.66	47.91	2309.26	47.13
2898.69	45.75	3206.86	46.09
4478.87	52.87	4721.2	51.43
5269.97	50.42	5317.72	50.34
5966.31	52.87	6108.45	52.94
6629.59	52.92	6709.37	52.8
7602.72	44.27	7656.9	44.33
8553.12	43.39	8669.93	46.16
9126.89	45.95	9208.19	47.7
9515.55	40.07	9534.33	41.04
9649.05	37.47	9658.96	36.64
9705.79	35.21	9738.53	33.43
9802.24	31.35	9819.68	31.44
9869.52	26.81	9872.32	26.48
9907.71	22.58	9910.53	22.73
9919.74	23.19	9921.71	23.35
9931.78	24.52	9933.33	25
9956.09	31.17	9961.89	34.71
9998.05	40.78	10011.74	41.19
10104.57	42.56	10128.59	42.64
10357.2	43.49	10468.38	43.88
10794.5	53.49	10852.6	53.81
11333.7	55.85	11384.19	56.41
11723.47	57.44	11791.52	57.84
12343.29	58.55	12371.67	58.35
12953.29	56.44	12974.66	56.51
13574.74	57.95	13575.91	57.95
14183.68	58.56	14201.12	58.61
14774.23	59.79	14831.61	59.93
15141.58	59.31	15286.23	59.31
15760.79	63.58		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
1106.32	.04	9705.79	.02
		9979.31	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9705.79	9979.31		1530.69	2280.69	1205.25	.1
							.3

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	35.34	Element			
Vel Head (ft)	0.32	Wt. n-Val.			0.020
W.S. Elev (ft)	35.02	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1459.32	
E.G. Slope (ft/ft)	0.000362	Area (sq ft)		1459.32	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	253.19	Top Width (ft)		253.19	
Vel Total (ft/s)	4.51	Avg. Vel. (ft/s)		4.51	
Max Chl Dpth (ft)	12.44	Hydr. Depth (ft)		5.76	
Conv. Total (cfs)	346058.0	Conv. (cfs)		346058.0	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		255.92	
Min Ch El (ft)	22.58	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.58	
Frctn Loss (ft)	0.78	Cum Volume (acre-ft)		2385.81	
C & E Loss (ft)	0.00	Cum SA (acres)		361.60	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.95*

INPUT

Description: Interpolated Cross Section at River Mile 12.95

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2212.65	57.94	2227.48	57.2	2394.26	56.63	2471.72	56.42	2620	55.83
2703.68	55.59	2859.57	54.22	2927.56	53.69	3143.19	51.24	3188.87	50.63
3378.96	47.59	3429.12	46.86	3635.24	46.33	3739.32	45.96	3917.82	45.56
4025.19	45.4	4336.82	45.67	4626.57	46.65	5259.45	46.06	5504.71	46.44
5623.15	51.83	5868.2	50.46	6169.64	49.69	6171.35	49.69	6226.66	49.64
6423.15	49.55	6471.43	49.48	6738.7	48.66	6783.47	48.54	7019.11	50.54
7127.32	51.55	7271.06	51.6	7306.71	51.61	7543.61	51.74	7574.47	51.78
7798.07	51.64	7878.74	51.51	8227.61	49.76	8480.23	46.65	8587.15	45.45
8782.15	43.34	8836.94	43.4	8945.79	43.52	9383.73	41.27	9683.38	42.31
9743.23	42.57	9861.36	45.22	9890.95	44.98	10139.09	42.41	10186.29	41.98
10323.47	44.89	10405.68	46.41	10422.62	44.97	10483.41	40.02	10607	39.75
10716.49	39.24	10735.49	40.13	10770.9	41.97	10831.45	39.32	10845.05	39.11
10851.5	37.04	10861.52	36.29	10868.68	36.93	10893.99	36.31	10905.19	35.83
10908.88	34.91	10940.07	32.95	10951.51	32.31	10974.64	30.78	10980.81	30.48
11000.75	30.43	11017.37	30.48	11029.19	28.68	11034.45	28.38	11055.74	27.25
11064.84	26.11	11067.5	25.81	11073.93	25.06	11083.02	23.91	11092.12	22.68
11101.21	22.15	11104.52	22.31	11107.89	22.46	11111.2	22.61	11114.24	22.74
11115.28	22.77	11117.58	22.92	11120.95	23.13	11124.26	23.39	11127.6	23.97
11129.35	24.34	11131.17	24.92	11142.97	27.11	11149.89	28.36	11153.45	29.44
11157.77	30.74	11164.56	34.05	11165.51	34.53	11173.09	34.66	11184.92	35.91
11204.3	40.46	11218.45	40.84	11220.68	40.87	11243.22	40.84	11278.05	41.23
11314.45	42.05	11339.29	41.81	11378.91	41.81	11399.98	41.57	11436.38	41.99
11575.69	42.44	11690.67	42.96	11711.03	43.85	11864.53	50.09	11900.7	50.47
12027.9	51.88	12087.98	52.18	12299.81	53.13	12338.8	53.41	12345.11	53.44
12585.48	54.01	12637.69	54.95	12652.26	55.04	12734.44	55.51	12902.96	55.98
12988.53	56.18	13058.9	56.57	13253.29	57.69	13308.1	57.94	13472.45	57.48
13629.49	57.31	13658.83	57.12	13881.42	56.07	13949.49	55.51	14078.41	55.35
14260.27	55.48	14282.38	55.55	14494.49	56.57	14597.19	57.01	14698.19	57.18
14902.91	57.31	14904.12	57.3	15109.2	57.29	15232.36	57.23	15311.6	57.41
15532.61	58.17	15550.65	58.21	15716.73	58.36	15884.24	58.62	15960.46	58.9
16143.29	59.46	16202.63	59.56	16232.99	59.48	16294.02	59.13	16451.26	59.02
16523.16	58.91	16672.74	58.92	16852.9	59.07	16863.85	59.21	17045.38	61.61
17163.47	63.16								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2212.65 .0410908.88 .01911184.92 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 10908.881184.92 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	34.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.019	
W.S. Elev (ft)	34.24	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1447.56	
E.G. Slope (ft/ft)	0.000321	Area (sq ft)		1447.56	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	245.38	Top Width (ft)		245.38	
Vel Total (ft/s)	4.55	Avg. Vel. (ft/s)		4.55	
Max Chl Dpth (ft)	12.09	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	367340.2	Conv. (cfs)		367340.2	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		247.66	
Min Ch El (ft)	22.15	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.53	
Frctn Loss (ft)	0.72	Cum Volume (acre-ft)		2309.72	
C & E Loss (ft)	0.00	Cum SA (acres)		348.55	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.525*

INPUT

Description: Interpolated Cross Section at River Mile 12.53

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3318.97	57.56	3333.97	56.85	3502.61	56.1	3580.92	55.83	3730.85	55.13
3815.47	54.88	3973.1	53.56	4041.84	53.08	4259.87	50.85	4306.06	50.25
4498.27	47.27	4548.98	46.59	4757.4	46.09	4862.64	45.68	5043.12	45.21
5151.68	45.05	5466.78	45.26	5759.75	46.13	6399.68	45.49	6647.67	45.81
6767.42	50.8	7015.2	49.49	7319.99	48.73	7321.72	48.73	7377.65	48.7
7576.32	48.67	7625.14	48.63	7895.38	47.69	7940.65	47.55	8178.92	49.3
8288.33	50.22	8433.67	50.25	8469.72	50.26	8709.25	50.38	8740.46	50.42
8966.54	50.36	9048.11	50.21	9400.86	48.49	9656.29	45.53	9764.4	44.39
9961.57	42.41	10016.97	42.46	10127.03	42.58	10569.85	40.51	10872.83	41.48
10933.35	41.76	11052.8	44.28	11082.71	44.07	11333.61	41.51	11381.34	41.12
11520.04	43.82	11603.17	45.11	11620.3	43.75	11681.76	39.19	11806.73	38.99
11917.44	38.42	11936.64	39.22	11972.46	41.01	12033.68	38.68	12047.43	38.52
12053.95	36.61	12064.08	35.93	12071.32	36.54	12096.92	36.01	12108.24	35.5
12111.96	34.62	12141.6	32.48	12152.47	31.76	12174.45	29.98	12180.31	29.67
12199.26	29.51	12215.05	29.52	12226.28	27.83	12231.29	27.54	12251.51	26.48
12260.16	25.42	12262.69	25.13	12268.8	24.44	12277.44	23.37	12286.08	22.22
12294.72	21.73	12298.5	21.91	12302.36	22.05	12306.15	22.18	12309.63	22.33
12310.82	22.36	12313.45	22.49	12317.31	22.67	12321.1	22.93	12324.92	23.67
12326.93	24.16	12329	24.85	12342.51	26.91	12350.44	28.09	12354.51	29.1
12359.46	30.31	12367.23	33.39	12368.31	33.84	12376.99	34.04	12390.54	35.92
12410.55	40.14	12425.17	40.49	12427.47	40.51	12450.76	40.28	12486.73	40.59
12524.33	41.53	12549.99	40.97	12590.92	40.67	12612.68	40.28	12650.28	40.87
12794.18	41.38	12912.95	42.04	12933.99	42.91	13092.54	48.63	13129.91	48.97
13261.3	50.27	13323.36	50.55	13542.18	51.35	13582.45	51.67	13588.97	51.7
13837.26	52.18	13891.19	53.49	13906.24	53.61	13991.13	54.22	14165.21	54.73
14253.6	54.92	14326.29	55.29	14527.08	56.4	14583.7	56.61	14753.47	56.12

14915.68	56.04	14946	55.915175.92	55.1815246.23	54.6	15379.4	54.35
15567.26	54.5215590.09	54.59	15809.2	55.7715915.28	56.2616019.61		56.5
16231.08	56.6516232.33	56.6516444.17	56.7216571.39	56.716653.24			56.89
16881.54	57.7716900.17	57.817071.73	57.9617244.76	58.2917323.49			58.58
17512.34	59.1417573.64	59.19	17605	59.0917668.05	58.6217830.46		58.61
17904.74	58.5118059.25	58.5418245.35	58.7518256.66	58.8918444.17			61.23
18566.16	62.74						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3318.97 .0412111.96 .01912390.54 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 12111.9612390.54 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	33.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.019	
W.S. Elev (ft)	33.53	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1449.03	
E.G. Slope (ft/ft)	0.000311	Area (sq ft)		1449.03	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	240.47	Top Width (ft)		240.47	
Vel Total (ft/s)	4.54	Avg. Vel. (ft/s)		4.54	
Max Chl Dpth (ft)	11.80	Hydr. Depth (ft)		6.03	
Conv. Total (cfs)	373216.2	Conv. (cfs)		373216.2	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		242.45	
Min Ch El (ft)	21.73	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.53	
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)		2233.89	
C & E Loss (ft)	0.00	Cum SA (acres)		335.83	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.1*

INPUT
 Description: Interpolated Cross Section at River Mile 12.1

Station	Elevation	Data	num=	161					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4425.3	57.17	4440.46	56.51	4610.95	55.57	4690.13	55.23	4841.71	54.44
4927.25	54.18	5086.62	52.9	5156.12	52.47	5376.55	50.46	5423.25	49.87
5617.57	46.95	5668.84	46.32	5879.55	45.85	5985.95	45.41	6168.42	44.86
6278.17	44.7	6596.74	44.85	6892.94	45.6	7539.91	44.92	7790.62	45.17
7911.69	49.77	8162.2	48.52	8470.35	47.78	8472.09	47.78	8528.64	47.75
8729.5	47.8	8778.85	47.77	9052.07	46.72	9097.84	46.57	9338.73	48.05
9449.34	48.89	9596.28	48.91	9632.73	48.92	9874.89	49.01	9906.44	49.06
10135.02	49.0810217.49	48.9210574.11	47.2110832.36	44.4110941.66	43.32				
11140.99	41.49	11197	41.5311308.28	41.6411755.97	39.7412062.28				
12123.47	40.9412244.23	43.3412274.47	43.1712528.13	40.6212576.39	40.26				
12716.62	42.7612800.65	43.8112817.98	42.5312880.11	38.3513006.46	38.23				
13118.39	37.59	13137.8	38.3113174.01	40.05	13235.9	38.0413249.81	37.92		
13256.4	36.1713266.64	35.5713273.96	36.1513299.84	35.7313311.29	35.17				
13315.05	34.3313343.13	32.0113353.43	31.2213374.26	29.1813379.82	28.86				
13397.77	28.613412.73	28.5613423.38	26.9713428.12	26.6913447.29	25.71				
13455.47	24.7313457.87	24.4613463.66	23.8213471.85	22.8313480.04	21.76				
13488.23	21.313492.49	21.4813496.84	21.64	13501.1	21.7713505.02	21.92			
13506.36	21.9413509.32	22.0613513.67	22.2113517.93	22.4813522.24	23.37				
13524.5	23.9813526.84	24.7813542.06	26.7113550.98	27.8213555.57	28.76				

13561.14	29.8813569.89	32.7313571.12	33.1613580.89	33.4313596.15	35.93
13616.8	39.8213631.89	40.1513634.26	40.1313658.29	39.7213695.41	39.95
13734.21	41.0113760.69	40.1313802.93	39.5213825.38	38.9913864.18	39.75
14012.68	40.3314135.23	41.1214156.94	41.9514320.56	47.1714359.11	47.47
14494.7	48.6714558.74	48.9114784.54	49.5814826.09	49.9214832.82	49.97
15089.04	50.3415144.69	52.0415160.23	52.1815247.82	52.9215427.46	53.47
15518.66	53.6715593.67	54.0115800.88	55.11 15859.3	55.2816034.49	54.77
16201.88	54.7916233.16	54.6816470.41	54.316542.97	53.716680.39	53.36
16874.25	53.5616897.81	53.63 17123.9	54.9717233.37	55.5117341.03	55.82
17559.25	5617560.54	5617779.15	56.1617910.42	56.1717994.89	56.36
18230.46	57.3718249.69	57.418426.73	57.5618605.28	57.9518686.52	58.25
18881.4	58.8118944.66	58.8218977.02	58.7119042.07	58.1219209.68	58.2
19286.32	58.1219445.76	58.15 19637.8	58.4319649.47	58.5619842.96	60.85
19968.85	62.33				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4425.3	.0413315.05	.0313343.13	.01913596.15				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	13315.05	13596.15		1530.69	2280.69	1205.25	.1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	33.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.019	
W.S. Elev (ft)	32.84	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1451.94	
E.G. Slope (ft/ft)	0.000289	Area (sq ft)		1451.94	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	237.18	Top Width (ft)		237.18	
Vel Total (ft/s)	4.54	Avg. Vel. (ft/s)		4.54	
Max Chl Dpth (ft)	11.54	Hydr. Depth (ft)		6.12	
Conv. Total (cfs)	387416.0	Conv. (cfs)		387416.0	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		238.96	
Min Ch El (ft)	21.30	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.50	
Frctn Loss (ft)	0.62	Cum Volume (acre-ft)		2157.94	
C & E Loss (ft)	0.00	Cum SA (acres)		323.33	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 11.675*

INPUT
 Description: Interpolated Cross Section at River Mile 11.68

Station Elevation Data	num=	161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5531.62	56.79	5546.95	56.16	5719.3	55.04	5799.34	54.64	5952.57	53.74
6039.04	53.47	6200.14	52.24	6270.4	51.87	6493.23	50.07	6540.44	49.49
6736.87	46.63	6788.7	46.05	7001.71	45.61	7109.26	45.14	7293.72	44.52
7404.66	44.35	7726.7	44.43	8026.12	45.08	8680.13	44.35	8933.58	44.54
9055.97	48.73	9309.2	47.55	9620.7	46.82	9622.47	46.82	9679.62	46.8
9882.67	46.92	9932.57	46.91	10208.75	45.76	10255.02	45.59	10498.53	46.81
10610.35	47.57	10758.89	47.57	10795.73	47.57	11040.53	47.64	11072.43	47.7
11303.49	47.81	11386.86	47.62	11747.37	45.94	12008.42	43.29	12118.91	42.25
12320.42	40.56	12377.04	40.59	12489.52	40.71	12942.09	38.97	13251.73	39.82
13313.59	40.13	13435.66	42.41	13466.23	42.26	13722.66	39.73	13771.44	39.4
13913.19	41.71	13998.14	42.52	14015.65	41.31	14078.47	37.51	14206.19	37.47
14319.33	36.76	14338.96	37.41	14375.56	39.09	14438.13	37.41	14452.19	37.33

14458.84	35.74	14469.2	35.22	14476.6	35.7714502.76	35.4414514.33	34.83
14518.14	34.0314544.67	31.54	14554.4	30.6814574.07	28.3814579.32	28.05	
14596.28	27.6814610.42	27.6114620.47	26.1114624.95	25.8414643.06	24.94		
14650.79	24.0314653.06	23.7914658.53	23.1914666.26	22.28	14674	21.3	
14681.73	20.8814686.47	21.0714691.31	21.2314696.05	21.3614700.41	21.51		
14701.9	21.53	14705.2	21.6314710.03	21.7514714.77	22.0214719.56	23.07	
14722.08	23.814724.68	24.71	14741.6	26.5214751.53	27.5614756.63	28.43	
14762.83	29.4614772.56	32.0714773.92	32.4714784.79	32.8114801.76	35.93		
14823.06	39.5114838.61	39.814841.05	39.7714865.82	39.16	14904.1	39.32	
14944.1	40.4914971.39	39.2915014.94	38.3815038.08	37.715078.08	38.63		
15231.17	39.2815357.52	40.2	15379.9	40.9915548.57	45.7215588.32	45.98	
15728.1	47.0615794.12	47.28	16026.9	47.8116069.74	48.1816076.68	48.23	
16340.82	48.516398.19	50.5916414.21	50.7516504.51	51.63	16689.7	52.22	
16783.73	52.4116861.06	52.7417074.67	53.81	17134.9	53.95	17315.5	53.41
17488.07	53.5417520.32	53.4517764.91	53.4217839.71	52.817981.38	52.36		
18181.24	52.618205.53	52.6718438.61	54.1818551.47	54.7718662.45	55.15		
18887.42	55.3518888.75	55.3519114.12	55.619249.46	55.6319336.53	55.83		
19579.39	56.9719599.21	57.0119781.72	57.17	19965.8	57.6120049.55	57.93	
20250.46	58.4820315.67	58.4520349.03	58.32	20416.1	57.6220588.89	57.79	
20667.9	57.7220832.28	57.7621030.25	58.1221042.28	58.2421241.76	60.47		
21371.54	61.91						

Manning's n Values	num=	4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
5531.62	.0414518.14	.0314544.67	.01814801.76	.05			

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	14518.14	14801.76		1530.69	2280.69	1205.25	.1 .3

CROSS SECTION OUTPUT	Profile #	Calibration			
E.G. Elev (ft)	32.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.018	
W.S. Elev (ft)	32.23	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1465.35	
E.G. Slope (ft/ft)	0.000252	Area (sq ft)		1465.35	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	235.80	Top Width (ft)		235.80	
Vel Total (ft/s)	4.49	Avg. Vel. (ft/s)		4.49	
Max Chl Dpth (ft)	11.35	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	414510.6	Conv. (cfs)		414510.6	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		237.45	
Min Ch El (ft)	20.88	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.44	
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)		2081.57	
C & E Loss (ft)	0.00	Cum SA (acres)		310.95	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 11.25*

INPUT

Description: Interpolated Cross Section at River Mile 11.25

Station	Elevation	Data	num=	161					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6637.95	56.41	6653.44	55.81	6827.64	54.51	6908.54	54.05	7063.42	53.05
7150.83	52.77	7313.67	51.59	7384.68	51.26	7609.91	49.68	7657.62	49.1
7856.17	46.31	7908.56	45.78	8123.86	45.38	8232.57	44.87	8419.02	44.17
8531.16	44	8856.66	44.02	9159.31	44.56	9820.36	43.7810076.53	43.91	
10200.24	47.7	10456.2	46.5810771.06	45.8710772.84	45.8610830.61	45.86			

11035.85	46.0411086.28	46.0611365.44	44.7911412.21	44.6111658.34	45.56
11771.36	46.24 11921.5	46.2311958.74	46.2312206.18	46.2712238.41	46.34
12471.96	46.5212556.23	46.3312920.62	44.6713184.48	42.1613296.16	41.18
13499.84	39.6313557.07	39.6513670.77	39.76 14128.2	38.2114441.18	38.99
14503.7	39.3114627.09	41.4614657.99	41.3614917.18	38.8314966.48	38.53
15109.76	40.6315195.63	41.2215213.33	40.0915276.82	36.6715405.91	36.71
15520.28	35.9315540.12	36.4915577.11	38.1215640.36	36.7615654.56	36.73
15661.29	35.3115671.76	34.8615679.24	35.3815705.68	35.1615717.38	34.5
15721.22	33.74 15746.2	31.0615755.36	30.1315773.89	27.5815778.82	27.24
15794.79	26.76 15808.1	26.6515817.56	25.2515821.78	24.9915838.83	24.16
15846.11	23.3415848.24	23.1215853.39	22.5715860.67	21.7415867.96	20.85
15875.24	20.4515880.46	20.6515885.78	20.82 15891	20.94 15895.8	21.1
15897.45	21.1115901.07	21.215906.39	21.2915911.61	21.5615916.88	22.78
15919.65	23.6215922.52	24.6315941.15	26.3315952.08	27.2915957.69	28.09
15964.51	29.0315975.23	31.4115976.73	31.7915988.69	32.1916007.38	35.94
16029.31	39.1916045.32	39.4616047.85	39.416073.36	38.616112.78	38.68
16153.98	39.9816182.09	38.4616226.94	37.2316250.79	36.416291.99	37.51
16449.66	38.23 16579.8	39.2816602.85	40.0416776.59	44.2616817.53	44.48
16961.5	45.45 17029.5	45.6417269.27	46.0317313.39	46.4317320.54	46.49
17592.6	46.6717651.69	49.1317668.19	49.32 17761.2	50.3317951.95	50.96
18048.8	51.1518128.44	51.4618348.46	52.52 18410.5	52.6218596.52	52.06
18774.27	52.2918807.48	52.2319059.41	52.5319136.46	51.919282.38	51.36
19488.22	51.6319513.24	51.7119753.32	53.3819869.56	54.0219983.88	54.47
20215.59	54.720216.96	54.720449.09	55.0320588.49	55.120678.17	55.3
20928.32	56.5820948.74	56.6121136.72	56.7721326.31	57.2721412.58	57.61
21619.52	58.1621686.69	58.0821721.05	57.9421790.13	57.12 21968.1	57.38
22049.48	57.3222218.79	57.38 22422.7	57.822435.09	57.9222640.55	60.09
22774.22	61.49				

Manning's n Values	num=	4
Sta n Val	Sta n Val	Sta n Val
6637.95	.0415721.22	.04 15746.2 .01716007.38 .05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
15721.22	16007.38	1530.69	2280.69	1205.25	.1	.3	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	32.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.017	
W.S. Elev (ft)	31.71	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1494.49	
E.G. Slope (ft/ft)	0.000213	Area (sq ft)		1494.49	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	236.26	Top Width (ft)		236.26	
Vel Total (ft/s)	4.41	Avg. Vel. (ft/s)		4.41	
Max Chl Dpth (ft)	11.26	Hydr. Depth (ft)		6.33	
Conv. Total (cfs)	451583.1	Conv. (cfs)		451583.1	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		237.86	
Min Ch El (ft)	20.45	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.37	
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)		2004.09	
C & E Loss (ft)	0.00	Cum SA (acres)		298.59	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 10.825*

INPUT
 Description: Interpolated Cross Section at River Mile 10.83

Station Elevation Data		num= 161	
Sta	Elev	Sta	Elev
7744.27	56.03	7759.93	55.46
8262.62	52.06	8427.19	50.93
8975.48	45.99	9028.42	45.51
9657.65	43.65	9986.62	43.61
11344.51	46.67	11603.2	45.61
12189.02	45.17	12239.99	45.21
12932.37	44.91	13084.11	44.88
13640.44	45.23	13725.6	45.03
14679.26	38.7	14737.1	38.72
15693.82	38.51	15818.52	40.53
16306.34	39.57	16393.12	39.93
16721.23	35.11	16741.28	35.58
16863.74	34.88	16874.32	34.51
16924.31	33.44	16947.73	30.59
16993.3	25.85	17005.78	25.69
17041.43	22.65	17043.43	22.45
17068.74	20.03	17074.44	20.24
17092.99	20.71	17096.94	20.77
17117.23	23.44	17120.36	24.56
17166.2	28.61	17177.89	30.75
17235.56	38.87	17252.04	39.11
17363.86	39.46	17392.79	37.62
17668.16	37.17	17802.08	38.36
18194.9	43.84	18264.88	44.01
18844.38	44.83	18905.19	47.68
19313.86	49.89	19395.83	50.19
20060.46	51.03	20094.64	51.01
20795.21	50.67	20820.96	50.75
21543.76	54.05	21545.18	54.05
22277.25	56.18	22298.26	56.21
22988.58	57.83	23057.7	57.71
23431.06	56.93	23605.3	56.99
24176.91	61.07		

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
7744.27	.0416924.31		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	16924.31	17212.99		1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT		Profile #Calibration	
E.G. Elev (ft)	31.54	Element	Left OB
Vel Head (ft)	0.29	Wt. n-Val.	0.017
W.S. Elev (ft)	31.25	Reach Len. (ft)	1530.69
Crit W.S. (ft)		Flow Area (sq ft)	2280.69
E.G. Slope (ft/ft)	0.000202	Area (sq ft)	1532.44
Q Total (cfs)	6585.00	Flow (cfs)	6585.00
Top Width (ft)	241.50	Top Width (ft)	241.50
Vel Total (ft/s)	4.30	Avg. Vel. (ft/s)	4.30
Max Chl Dpth (ft)	11.22	Hydr. Depth (ft)	6.35
Conv. Total (cfs)	463221.3	Conv. (cfs)	463221.3
Length Wtd. (ft)	2280.69	Wetted Per. (ft)	243.09
Min Ch El (ft)	20.03	Shear (lb/sq ft)	0.08
Alpha	1.00	Stream Power (lb/ft s)	0.34
Frcn Loss (ft)	0.45	Cum Volume (acre-ft)	1924.85
C & E Loss (ft)	0.00	Cum SA (acres)	286.08

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 10.4*

INPUT

Description: Interpolated Cross Section at River Mile 10.4

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8850.6	55.65	8866.42	55.11	9044.33	53.45	9126.96	52.87	9285.14	51.66
9374.41	51.36	9540.71	50.27	9613.24	50.05	9843.27	48.91	9892	48.34
10094.78	45.67	10148.28	45.24	10368.17	44.9	10479.2	44.33	10669.61	43.48
10784.14	43.31	1116.58	43.19	11425.67	43.51	12100.81	42.64	12362.44	42.65
12488.79	45.63	12750.2	44.64	13071.76	43.95	13073.58	43.95	13132.59	43.97
13342.2	44.29	13393.7	44.35	13678.81	42.85	13726.57	42.64	13977.95	43.07
14093.38	43.59	14246.72	43.54	14284.75	43.54	14537.46	43.54	14570.38	43.62
14808.91	43.95	14894.97	43.74	15267.12	42.13	15536.61	39.92	15650.67	39.04
15858.69	37.77	15917.13	37.78	16033.25	37.88	16500.44	36.68	16820.09	37.33
16883.94	37.68	17009.95	39.59	17041.51	39.55	17306.22	37.05	17356.58	36.81
17502.91	38.51	17590.61	38.63	17608.68	37.65	17673.53	35.17	1805.37	35.19
17922.17	34.28	17942.43	34.67	17980.22	36.21	18044.81	35.48	18059.32	35.54
18066.19	34.44	18076.88	34.15	18084.52	34.61	18111.52	34.58	18123.47	33.84
18127.4	33.15	18149.27	30.12	18157.29	29.05	18173.51	25.99	18177.83	25.61
18191.81	24.93	18203.46	24.73	18211.75	23.54	18215.44	23.29	18230.37	22.62
18236.75	21.95	18238.61	21.77	18243.12	21.33	18249.5	20.65	18255.87	19.93
18262.25	19.61	18268.42	19.82	18274.72	19.99	18280.9	20.11	18286.58	20.28
18288.53	20.28	18292.81	20.34	18299.11	20.37	18305.29	20.65	18311.53	22.18
18314.8	23.26	18318.19	24.49	18340.24	25.94	18353.17	26.75	18359.81	27.41
18367.88	28.17	18380.56	30.09	18382.34	30.42	18396.49	30.95	18418.6	35.95
18441.81	38.55	18458.76	38.77	18461.43	38.66	18488.43	37.48	18530.14	37.4
18573.74	38.94	18603.49	36.79	18650.96	34.95	18676.19	33.82	18719.79	35.26
18886.65	36.12	19024.37	37.44	19048.76	38.13	19232.62	41.35	19275.94	41.48
19428.3	42.23	19500.26	42.37	19753.99	42.49	19800.69	42.94	19808.25	43.01
20096.16	42.99	20158.69	46.23	20176.15	46.46	20274.58	47.75	20476.44	48.45
20578.93	48.63	20663.21	48.91	20896.05	49.94	20961.7	49.96	21158.56	49.35
21346.65	49.78	21381.8	49.79	21648.41	50.77	21729.94	50.12	1884.36	49.37
22102.2	49.71	22128.67	49.79	22382.73	51.78	22505.74	52.53	22626.72	53.12
22871.93	53.42	22873.39	53.42	23119.03	53.91	23266.55	54.03	23361.46	54.24
23626.18	55.78	23647.78	55.81	23846.72	55.97	24047.35	56.62	24138.64	56.97
24357.63	57.51	24428.71	57.34	24465.08	57.17	24538.18	56.11	24726.52	56.57
24812.64	56.53	24991.81	56.6	25207.6	57.17	25220.71	57.28	25438.14	59.33
25579.6	60.65								

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8850.6	.04	18127.4	.06	18149.27	.017	18418.6	.05		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	18127.4	18418.6		1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	31.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.017	
W.S. Elev (ft)	30.82	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1569.94	
E.G. Slope (ft/ft)	0.000194	Area (sq ft)		1569.94	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	248.64	Top Width (ft)		248.64	
Vel Total (ft/s)	4.19	Avg. Vel. (ft/s)		4.19	

Max Chl Dpth (ft)	11.22	Hydr. Depth (ft)	6.31
Conv. Total (cfs)	472312.3	Conv. (cfs)	472312.3
Length Wtd. (ft)	2280.69	Wetted Per. (ft)	250.26
Min Ch El (ft)	19.60	Shear (lb/sq ft)	0.08
Alpha	1.00	Stream Power (lb/ft s)	0.32
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	1843.63
C & E Loss (ft)	0.00	Cum SA (acres)	273.25

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.975*

INPUT
 Description: Interpolated Cross Section at River Mile 9.98
 Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9956.92	55.27	9972.91	54.76	10152.68	52.92	10236.17	52.28	10396	50.96
10486.2	50.65	10654.24	49.61	10727.52	49.44	10959.94	48.52	11009.19	47.96
11214.08	45.35	11268.14	44.97	11490.32	44.66	11602.51	44.05	11794.91	43.13
11910.64	42.94	12246.54	42.78	12558.86	42.98	13241.04	42.07	13505.4	42.02
13633.06	44.6	13897.2	43.68	14222.12	43.14	223.96	43.14	283.58	43.02
14495.37	43.42	14547.41	43.49	14835.5	41.88	14883.76	41.66	15137.76	41.82
15254.39	42.26	15409.33	42.21	15447.76	42.19	15703.1	42.17	15736.37	42.26
15977.38	42.67	16064.34	42.44	16440.38	40.86	16712.68	38.79	16827.92	37.98
17038.11	36.84	17097.17	36.85	17214.5	36.94	17686.55	35.91	18009.54	36.5
18074.05	36.87	18201.38	38.65	18233.27	38.64	18500.74	36.15	18551.62	35.95
18699.48	37.44	18788.09	37.33	18806.36	36.44	18871.88	34.16	19005.1	34.43
19123.12	33.45	19143.59	33.76	19181.77	35.23	19247.03	34.84	19261.7	34.95
19268.64	34.01	19279.44	33.79	19287.16	34.22	19314.45	34.31	19326.52	33.5
19330.49	32.86	19350.8	29.65	19358.25	28.51	19373.32	25.19	19377.34	24.8
19390.32	24.02	19401.15	23.77	19408.85	22.68	19412.28	22.44	19426.14	21.85
19432.06	21.26	19433.8	21.11	19437.99	20.71	19443.91	20.11	19449.83	19.47
19455.76	19.18	19462.41	19.41	19469.2	19.58	19475.85	19.71	19481.97	19.87
19484.07	19.87	19488.69	19.91	19495.47	19.91	19502.13	20.19	19508.85	21.88
19512.38	23.08	19516.03	24.41	19539.78	25.75	19553.71	26.48	19560.88	27.07
19569.57	27.74	19583.23	29.43	19585.14	29.73	19600.39	30.33	19624.21	35.96
19648.06	38.23	19665.47	38.42	19668.22	38.31	19695.96	36.92	19738.82	36.77
19783.62	38.42	19814.19	35.95	19862.96	33.81	19888.89	32.53	19933.69	34.14
20105.14	35.07	20246.65	36.52	20271.71	37.18	20460.63	39.89	20505.15	39.98
20661.7	40.62	20735.64	40.74	20996.36	40.71	21044.33	41.2	21052.1	41.27
21347.94	41.16	21412.19	44.77	21430.13	45.03	21531.27	46.45	21738.68	47.19
21843.99	47.37	21930.6	47.63	22169.84	48.64	22237.3	48.63	22439.57	47.99
22632.85	48.53	22668.97	48.56	22942.91	49.88	23026.68	49.22	23185.35	48.37
23409.19	48.75	23436.39	48.83	23697.44	50.98	23823.84	51.78	23948.14	52.44
24200.1	52.75	24201.6	52.75	24454	53.34	24605.58	53.5	24703.1	53.71
24975.1	55.38	24997.3	55.41	25201.71	55.58	25407.87	56.26	25501.68	56.65
25726.69	57.18	25799.73	56.96	25837.09	56.79	25912.21	55.61	26105.73	56.16
26194.22	56.14	26378.32	56.21	26600.05	56.85	26613.52	56.95	26836.94	58.95
26982.29	60.23								

Manning's n Values	num= 4		
Sta n Val Sta n Val Sta n Val			
9956.92 .04	19330.49 .06	19350.8 .01	19624.21 .05

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.			
19330.49	19624.21	1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	30.65	Element	Left OB	Channel	Right OB
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Vel Head (ft)	0.26	Wt. n-Val.		0.017	
W.S. Elev (ft)	30.39	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1605.11	
E.G. Slope (ft/ft)	0.000187	Area (sq ft)		1605.11	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	254.52	Top Width (ft)		254.52	
Vel Total (ft/s)	4.10	Avg. Vel. (ft/s)		4.10	
Max Chl Dpth (ft)	11.21	Hydr. Depth (ft)		6.31	
Conv. Total (cfs)	481917.3	Conv. (cfs)		481917.3	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		256.20	
Min Ch El (ft)	19.18	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.30	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		1760.51	
C & E Loss (ft)	0.00	Cum SA (acres)		260.08	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.55000*

INPUT

Description: Interpolated Cross Section at River Mile 9.55

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11063.25	54.89	11079.4	54.4111261.02	52.3911345.37	51.6911506.85	50.27			
11597.98	49.9511767.76		48.9511841.79	48.8312076.62	48.1312126.37	47.57			
12333.38	45.03	12388	44.712612.47	44.4312725.82	43.7812920.21	42.78			
13037.13	42.59	13376.5	42.3613692.04	42.4614381.26	41.514648.35	41.39			
14777.33	43.57	15044.2	42.7115372.47	42.0415374.33	42.0415434.57	42.08			
15648.55	42.5415701.13		42.6315992.18	40.9116040.94	40.6816297.56	40.58			
16415.4	40.9316571.94		40.8616610.76	40.8516868.74	40.816902.36	40.9			
17145.86	41.3917233.71		41.1517613.63	39.5917888.74	37.6718005.18	36.91			
18217.53	35.91	18277.2	35.9118395.74	35.9918872.67	35.1519198.99	35.68			
19264.17	36.0519392.82		37.7119425.03	37.7319695.27	35.2619746.67	35.09			
19896.06	36.3819985.58		36.0420004.04	35.2220070.23	33.3220204.83	33.67			
20324.07	32.6220344.75		32.8620383.32	34.2720449.26	34.220464.07	34.35			
20471.09	33.58	20482	33.44	20489.8	33.8420517.37	34.0120529.56	33.17		
20533.57	32.5620552.34		29.1720559.21	27.9620573.13	24.3920576.84	23.99			
20588.83	23.120598.83		22.8120605.94	21.8220609.11	21.5920621.91	21.07			
20627.38	20.5720628.98		20.4320632.85	20.0920638.32	19.5720643.79	19.01			
20649.26	18.7520656.39		18.9920663.67	19.17	20670.8	19.2820677.36	19.46		
20679.61	19.4620684.56		19.4820691.83	19.4520698.96	19.7420706.17	21.59			
20709.96	22.920713.87		24.3420739.33	25.5620754.26	26.2120761.94	26.73			
20771.26	27.3120785.89		28.7620787.95	29.0520804.29	29.7120829.82	35.96			
20854.31	37.9120872.19		38.0720875.01	37.9320903.49	36.3620947.51	36.13			
20993.51	37.9121024.89		35.1221074.97	32.6621101.59	31.2421147.59	33.02			
21323.64	34.0221468.93		35.621494.67	36.2221688.65	38.4321734.36	38.49			
21895.1	39.0221971.02		39.1122238.72	38.9422287.98	39.4622295.96	39.53			
22599.72	39.3222665.69		43.3222684.11	43.622787.96	45.1623000.93	45.94			
23109.06	46.1223197.98		46.3623443.64	47.35	23512.9	47.323720.59	46.63		
23919.04	47.2823956.13		47.3424237.41	49.24323.43	48.324486.35	47.38			
24716.17	47.79	24744.1	47.8625012.15	50.1925141.93	51.0425269.56	51.76			
25528.27	52.125529.81		52.125788.97	52.7825944.61	52.9726044.74	53.18			
26324.03	54.9926346.83		55.0126556.71	55.1826768.39	55.9226864.71	56.33			
27095.75	56.8627170.74		56.5927209.11	56.427286.23	55.1127484.94	55.75			
27575.8	55.7427764.83		55.83	27992.5	56.5328006.33	56.6328235.73	58.57		
28384.97	59.81								

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
11063.25	.0420533.57		.0720552.34		.01620829.82		.05		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
20533.57	20829.82	1530.69	2280.69	1205.25	.1	.3
Blocked Obstructions		num=	2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
020533.57	16.92	0829.82	228384.97	30.39		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	30.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.016	
W.S. Elev (ft)	30.01	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1646.37	
E.G. Slope (ft/ft)	0.000155	Area (sq ft)		1646.37	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	257.80	Top Width (ft)		257.80	
Vel Total (ft/s)	4.00	Avg. Vel. (ft/s)		4.00	
Max Chl Dpth (ft)	11.26	Hydr. Depth (ft)		6.39	
Conv. Total (cfs)	529235.6	Conv. (cfs)		529235.6	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		259.63	
Min Ch El (ft)	18.75	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.25	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		1675.39	
C & E Loss (ft)	0.00	Cum SA (acres)		246.66	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.12500*

INPUT

Description: Interpolated Cross Section at River Mile 9.13

Station Elevation Data	num=	161							
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
12169.57 54.5112185.89		54.0712369.37	51.8512454.58	51.0912617.71	49.57				
12709.77 49.2412881.28		48.2912956.07	48.23 13193.3	47.7413243.56	47.19				
13452.69 44.713507.87		44.4313734.63	44.1913849.13	43.5114045.51	42.43				
14163.62 42.2414506.46		41.9514825.23	41.9415521.49	40.9315791.31	40.76				
15921.61 42.53 16191.2		41.7416522.83	41.08 16524.7	41.0816585.55	41.13				
16801.72 41.6616854.84		41.7817148.87	39.9417198.12	39.6917457.37	39.33				
17576.41 39.6117734.55		39.5117773.77	39.518034.39	39.4418068.34	39.54				
18314.33 40.1118403.08		39.8518786.88	38.31 19064.8	36.5519182.43	35.84				
19396.96 34.9919457.23		34.9819576.99	35.0520058.79	34.3820388.44	34.85				
20454.29 35.2420584.25		36.7720616.79	36.8320889.79	34.3720941.72	34.23				
21092.63 35.3221183.07		34.7421201.71	3421268.59	32.4821404.55	32.9				
21525.01 31.7921545.91		31.9521584.87	33.3121651.48	33.5621666.45	33.76				
21673.54 33.1521684.56		33.0821692.44	33.4521720.29	33.7321732.61	32.84				
21736.66 32.2721753.87		28.721760.18	27.4221772.94	23.5921776.34	23.18				
21787.34 22.1821796.51		21.8521803.03	20.9621805.94	20.7421817.68	20.3				
21822.7 19.8721824.17		19.7621827.72	19.4721832.73	19.0221837.75	18.55				
21842.77 18.3321850.38		18.5821858.14	18.7621865.75	18.8721872.75	19.05				
21875.15 19.0421880.43		19.05 21888.2	18.99 21895.8	19.2821903.49	21.29				
21907.53 22.7221911.71		24.2721938.87	25.36 21954.8	25.94 21963	26.39				
21972.94 26.8821988.56		28.121990.75	28.3622008.19	29.0922035.44	35.97				
22060.56 37.5922078.91		37.73 22081.8	37.5622111.03	35.822156.19	35.49				
22203.39 37.3922235.59		34.2822286.98	31.5122314.29	29.9522361.49	31.9				
22542.13 32.9622691.22		34.6822717.62	35.2722916.66	36.9722963.56	36.99				
23128.5 37.41 23206.4		37.4723481.08	37.1723531.63	37.7123539.82	37.79				
23851.5 37.4823919.19		41.8723938.09	42.1724044.65	43.8724263.17	44.68				
24374.12 44.8624465.37		45.0824717.43	46.06 24788.5	45.9725001.61	45.28				
25205.24 46.0325243.29		46.12 25531.9	48.1225620.17	47.425787.34	46.38				

26023.16	46.8326051.82	46.926326.86	49.3926460.02	50.2926590.99	51.09
26856.44	51.4526858.02	51.4527123.94	52.2227283.64	52.4327386.38	52.65
27672.96	54.5927696.35	54.6127911.71	54.7828128.91	55.5928227.74	56.01
28464.81	56.5328541.76	56.2228581.12	56.0228660.26	54.6128864.15	55.34
28957.38	55.3429151.34	55.4429384.95	56.2229399.14	56.3129634.53	58.2
29787.66	59.39				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
12169.57	.0421736.66	.0821753.87	.01622035.44	.05			

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

21736.66	22035.44	1530.69	2280.69	1205.25	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
021736.66	18.622035.44	29787.66	29.85		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	29.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.018	
W.S. Elev (ft)	29.63	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1682.06	
E.G. Slope (ft/ft)	0.000186	Area (sq ft)		1682.06	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	260.91	Top Width (ft)		260.91	
Vel Total (ft/s)	3.91	Avg. Vel. (ft/s)		3.91	
Max Chl Dpth (ft)	11.30	Hydr. Depth (ft)		6.45	
Conv. Total (cfs)	483008.9	Conv. (cfs)		483008.9	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		262.93	
Min Ch El (ft)	18.33	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.29	
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)		1588.26	
C & E Loss (ft)	0.00	Cum SA (acres)		233.09	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 8.70000*

INPUT
 Description: Interpolated Cross Section at River Mile 8.7

Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
13275.9	54.1213292.38	53.7213477.71	51.3213563.79	50.513728.57	48.88				
13821.56	48.5413994.81	47.6314070.35	47.6214309.98	47.3514360.75	46.81				
14571.99	44.3814627.73	44.1614856.78	43.9514972.44	43.24 15170.8	42.09				
15290.11	41.8915636.42	41.5415958.41	41.4116661.72	40.3616934.27	40.12				
17065.88	41.5 17338.2	40.7717673.18	40.1317675.08	40.1317736.54	40.18				
17954.9	40.7918008.55	40.9218305.55	38.9718355.31	38.7118617.17	38.08				
18737.42	38.2818897.16	38.1718936.78	38.1619200.03	38.0719234.33	38.18				
19482.8	38.8319572.45	38.5519960.14	37.0420240.87	35.4320359.68	34.77				
20576.38	34.0620637.27	34.0420758.23	34.1121244.91	33.6221577.89	34.02				
21644.41	34.4221775.68	35.8321808.55	35.9222084.31	33.4722136.77	33.37				
22289.2	34.2522380.56	33.4422399.39	32.7822466.94	31.6522604.28	32.14				
22725.96	30.9622747.06	31.0422786.43	32.3522853.71	32.9222868.83	33.17				
22875.98	32.7122887.12	32.7222895.08	33.0622923.21	33.4422935.66	32.5				
22939.75	31.98 22955.4	28.2322961.14	26.8722972.75	22.7922975.85	22.37				
22985.86	21.27 22994.2	20.8923000.13	20.123002.77	19.923013.45	19.53				

23018.02	19.1823019.36	19.0923022.58	18.8523027.15	18.4823031.71	18.09
23036.27	17.923044.36	18.1623052.61	18.35 23060.7	18.4623068.14	18.64
23070.69	18.6323076.31	18.6223084.55	18.5423092.64	18.8323100.81	20.99
23105.11	22.5423109.54	24.1923138.42	25.1723155.35	25.6723164.06	26.05
23174.63	26.4523191.23	27.4423193.55	27.6823212.09	28.4823241.05	35.97
23266.81	37.2823285.63	37.3823288.59	37.223318.56	35.2423364.87	34.85
23413.27	36.8723446.29	33.4423498.98	30.3723526.99	28.6623575.39	30.78
23760.62	31.91 23913.5	33.7623940.58	34.3224144.68	35.5224192.77	35.49
24361.9	35.824441.78	35.8424723.45	35.3924775.28	35.9724783.67	36.06
25103.28	35.6525172.69	40.4125192.07	40.7425301.34	42.5725525.42	43.42
25639.19	43.625732.76	43.825991.22	44.77 26064.1	44.6426282.63	43.92
26491.43	44.7726530.45	44.89 26826.4	47.2326916.91	46.527088.33	45.39
27330.15	45.8727359.54	45.9427641.56	48.5927778.12	49.5427912.41	50.41
28184.62	50.828186.23	50.8128458.91	51.6528622.67	51.928728.03	52.12
29021.89	54.1929045.87	54.2129266.71	54.3929489.43	55.2529590.77	55.68
29833.87	56.229912.77	55.8529953.14	55.6430034.29	54.1130243.36	54.93
30338.96	54.9530537.85	55.05 30777.4	55.930791.95	55.9931033.32	57.82
31190.35	58.97				

Manning's n Values		num= 4		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
13275.9	.0422939.75		.0822961.14		.01623241.05		.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	22939.75	23241.05		1530.69	2280.69	1205.25	.1	.3

Blocked Obstructions		num= 2		Sta		Elev	
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta	Elev
	022939.75		20.323241.05		31190.35		29.3

CROSS SECTION OUTPUT		Profile #Calibration			
E.G. Elev (ft)	29.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.020	
W.S. Elev (ft)	29.15	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1687.55	
E.G. Slope (ft/ft)	0.000230	Area (sq ft)		1687.55	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	263.15	Top Width (ft)		263.15	
Vel Total (ft/s)	3.90	Avg. Vel. (ft/s)		3.90	
Max Chl Dpth (ft)	11.25	Hydr. Depth (ft)		6.41	
Conv. Total (cfs)	434294.7	Conv. (cfs)		434294.7	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		265.39	
Min Ch El (ft)	17.90	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.36	
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)		1500.05	
C & E Loss (ft)	0.00	Cum SA (acres)		219.37	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 8.27500*

INPUT

Description: Interpolated Cross Section at River Mile 8.28

Station Elevation Data		num= 161		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
14382.22	53.7414398.87	53.3714586.06	50.79 14673	49.9114839.43	48.18		
14933.35	47.8315108.33	46.9815184.63	47.0115426.66	46.9615477.93	46.42		
15691.29	44.0615747.59	43.8915978.94	43.7116095.76	42.97 16296.1	41.74		

16416.61	41.5416766.38	41.12 17091.6	40.8917801.94	39.7918077.22	39.49
18210.15	40.47 18485.2	39.818823.54	39.1718825.45	39.1718887.53	39.24
19108.07	39.9119162.26	40.0719462.24	38.0119512.49	37.7319776.98	36.84
19898.43	36.9520059.77	36.8320099.78	36.8120365.67	36.720400.31	36.81
20651.28	37.5420741.82	37.2621133.39	35.7721416.93	34.321536.94	33.7
21755.8	33.13 21817.3	33.1121939.47	33.1722431.02	32.8522767.34	33.19
22834.52	33.6122967.11	34.8923000.31	35.0223278.83	32.5823331.81	32.51
23485.78	33.1923578.05	32.1523597.07	31.5623665.29	30.8123804.01	31.38
23926.91	30.1423948.22	30.1323987.98	31.3824055.94	32.29 24071.2	32.57
24078.43	32.2824089.69	32.3724097.72	32.6824126.13	33.16 24138.7	32.17
24142.83	31.6824156.94	27.7524162.11	26.3324172.56	21.9924175.35	21.56
24184.37	20.3524191.88	19.9324197.22	19.25 24199.6	19.0524209.22	18.75
24213.34	18.4924214.54	18.4224217.45	18.2324221.56	17.9424225.67	17.63
24229.78	17.4824238.35	17.7524247.08	17.9324255.65	18.0424263.53	18.23
24266.23	18.2124272.18	18.1924280.92	18.0824289.48	18.3724298.13	20.69
24302.68	22.3624307.38	24.1224337.96	24.98 24355.9	25.424365.12	25.72
24376.31	26.03 24393.9	26.7824396.36	26.9924415.99	27.8624446.66	35.98
24473.06	36.9624492.34	37.0424495.38	36.8324526.09	34.6824573.55	34.21
24623.15	36.3524656.99	32.6124710.99	29.2224739.69	27.3724789.29	29.66
24979.12	30.8625135.78	32.8425163.53	33.3625372.69	34.0625421.98	33.99
25595.3	34.1925677.16	34.225965.81	33.6226018.93	34.2226027.53	34.32
26355.06	33.8126426.19	38.9626446.05	39.3126558.03	41.2826787.66	42.17
26904.26	42.3427000.14	42.5327265.02	43.48 27339.7	43.3127563.64	42.57
27777.62	43.5227817.61	43.67 28120.9	46.3528213.65	45.628389.32	44.39
28637.13	44.9128667.25	44.9828956.27	47.7929096.21	48.829233.83	49.73
29512.79	50.1529514.44	50.1629793.88	51.09 29961.7	51.3730069.67	51.59
30370.81	53.7930395.39	53.82 30621.7	53.9930849.95	54.91 30953.8	55.36
31202.92	55.8831283.79	55.4831325.15	55.2531408.31	53.6131622.57	54.53
31720.54	54.5531924.36	54.6632169.85	55.5832184.76	55.6732432.11	57.44
32593.04	58.56				

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val Sta n Val
14382.22 .0424142.83 .0924162.11 .01524446.66 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
24142.8324446.66 1530.69 2280.69 1205.25 .1 .3
Blocked Obstructions num= 2
Sta L Sta R Elev Sta L Sta R Elev
024142.83 2224446.6632593.04 28.76

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.019	
W.S. Elev (ft)	28.63	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1672.47	
E.G. Slope (ft/ft)	0.000223	Area (sq ft)		1672.47	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	265.09	Top Width (ft)		265.09	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)		3.94	
Max Chl Dpth (ft)	11.15	Hydr. Depth (ft)		6.31	
Conv. Total (cfs)	440501.6	Conv. (cfs)		440501.6	
Length Wtd. (ft)	2280.69	Wetted Per. (ft)		267.60	
Min Ch El (ft)	17.48	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.34	
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)		1412.09	
C & E Loss (ft)	0.00	Cum SA (acres)		205.54	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 7.85000*

INPUT

Description: Interpolated Cross Section at River Mile 7.85

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
15488.55	53.3615505.36	53.0215694.41	50.26	15782.2	49.3215950.28				47.49
16045.14	47.1316221.85	46.3216298.91	46.4116543.34	46.5816595.12	46.04				
16810.59	43.7416867.45	43.6217101.09	43.4817219.07	42.7	17421.4				41.39
17543.1	41.1917896.34	40.7118224.78	40.3618942.17	39.2219220.18	38.86				
19354.43	39.43 19632.2	38.8319973.89	38.2119975.82	38.2220038.52	38.29				
20261.25	39.0420315.97	39.2120618.93	37.0420669.68	36.7520936.79	35.59				
21059.44	35.6221222.38	35.4921262.79	35.4621531.31	35.33	21566.3				35.45
21819.75	36.26 21911.2	35.9622306.64	34.522592.99	33.1822714.19	32.64				
22935.22	32.222997.33	32.1723120.72	32.2323617.14	32.0923956.79	32.36				
24024.64	32.7924158.54	33.9524192.07	34.1124473.35	31.6924526.86	31.65				
24682.35	32.1324775.54	30.8524794.74	30.3424863.64	29.9725003.74	30.62				
25127.85	29.3125149.38	29.2225189.53	30.4225258.16	31.6525273.58	31.98				
25280.88	31.8525292.25	32.0125300.36	32.2925329.05	32.8725341.75	31.84				
25345.92	31.3925358.47	27.2825363.07	25.7925372.38	21.225374.86	20.75				
25382.88	19.4325389.56	18.9825394.31	18.3925396.43	18.2	25405				17.98
25408.65	17.7925409.73	17.7425412.31	17.625415.97	17.3925419.63	17.17				
25423.29	17.0525432.33	17.3325441.55	17.52	25450.6	17.6325458.92				17.82
25461.77	17.825468.05	17.7625477.28	17.6225486.32	17.9125495.45	20.4				
25500.26	22.1825505.22	24.0525537.51	24.7925556.44	25.1425566.18	25.38				
25578	25.625596.56	26.1225599.16	26.325619.89	27.2425652.27	35.99				
25679.31	36.6425699.06	36.6925702.17	36.4625733.63	34.1225782.23	33.58				
25833.03	35.84 25867.7	31.77	25923	28.0825952.39	26.08	26003.2			28.54
26197.61	29.8126358.07	31.9226386.49	32.4126600.71	32.626651.18	32.5				
26828.7	32.5826912.54	32.5727208.17	31.8527262.57	32.4827271.38	32.58				
27606.84	31.97 27679.7	37.5127700.04	37.8827814.72	39.9928049.91	40.91				
28169.32	41.0828267.53	41.2528538.81	42.18 28615.3	41.9828844.66	41.21				
29063.82	42.2729104.77	42.45 29415.4	45.4729510.39	44.729690.31	43.39				
29944.12	43.9529974.96	44.0230270.98	47	30414.3	48.0530555.25				49.05
30840.96	49.530842.65	49.5131128.86	50.5331300.73	50.8331411.31	51.06				
31719.74	53.431744.92	53.42 31976.7	53.5932210.47	54.5732316.83	55.04				
32571.98	55.55 32654.8	55.1132697.17	54.8732782.34	53.133001.78	54.12				
33102.12	54.1633310.87	54.28 33562.3	55.2633577.57	55.3433830.91	57.06				
33995.72	58.14								

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
15488.55	.0425345.92	.125363.07	.01525652.27						.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	25345.92	25652.27	1530.69	2280.69	1205.25	.1		.3

Blocked Obstructions		num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev		
025345.92	23.725652.27	33995.72	28.2				

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.019	
W.S. Elev (ft)	28.10	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1650.88	
E.G. Slope (ft/ft)	0.000238	Area (sq ft)		1650.88	

Q Total (cfs)	6585.00	Flow (cfs)	6585.00
Top Width (ft)	267.10	Top Width (ft)	267.10
Vel Total (ft/s)	3.99	Avg. Vel. (ft/s)	3.99
Max Chl Dpth (ft)	11.05	Hydr. Depth (ft)	6.18
Conv. Total (cfs)	427226.5	Conv. (cfs)	427226.5
Length Wtd. (ft)	2280.69	Wetted Per. (ft)	269.94
Min Ch El (ft)	17.05	Shear (lb/sq ft)	0.09
Alpha	1.00	Stream Power (lb/ft s)	0.36
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	1325.08
C & E Loss (ft)	0.00	Cum SA (acres)	191.61

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 7.42500*

INPUT

Description: Interpolated Cross Section at River Mile 7.43

Station Elevation Data		num= 161	
Sta	Elev	Sta	Elev
16594.87	52.9816611.85	52.6716802.75	49.7316891.41
17156.93	46.4217335.38	45.6617413.19	45.817660.02
17929.89	43.4217987.31	43.3518223.24	43.2418342.38
18669.59	40.84 19026.3	40.2919357.96	39.84 20082.4
20498.7	38.4 20779.2	37.8621124.24	37.26 21126.2
21414.42	38.1621469.69	38.3621775.61	36.0721826.86
22220.45	34.322384.99	34.1422425.79	34.1222696.96
22988.22	34.9823080.57	34.6723479.89	33.2323769.06
24114.65	31.2724177.37	31.2424301.96	31.2924803.26
25214.76	31.9825349.97	33.0125383.84	33.2125667.88
25878.92	31.0625973.02	29.5625992.42	29.12 26062
26328.8	28.4826350.54	28.3126391.08	29.4626460.39
26483.33	31.4226494.81	31.65 26503	31.926531.98
26549.01	31.09 26560	26.8126564.03	25.2426572.19
26581.39	18.5226587.24	18.0226591.41	17.5326593.27
26603.97	17.126604.91	17.0726607.18	16.9826610.38
26616.79	16.6326626.31	16.9226636.03	17.1126645.55
26657.31	17.3826663.93	17.3326673.64	17.1626683.16
26697.83	2226703.06	23.9726737.05	24.5926756.99
26779.68	25.1726799.23	25.4626801.97	25.6226823.79
26885.57	36.3226905.78	36.3526908.96	36.126941.16
27042.92	35.32 27078.4	30.94 27135	26.94 27165.1
27416.1	28.7527580.35	3127609.44	31.4527828.72
28062.1	30.9728147.92	30.9328450.53	30.0728506.22
28858.62	30.14 28933.2	36.0528954.02	36.4529071.41
29434.39	39.8229534.91	39.98 29812.6	40.89 29890.9
30350.01	41.0230391.94	41.22 30709.9	44.5830807.14
31251.11	42.9931282.68	43.0631585.69	46.2 31732.4
32169.13	48.8532170.86	48.8632463.83	49.9632639.76
33068.67	5333094.44	53.02 33331.7	53.233570.98
33941.04	55.2334025.81	54.7434069.18	54.4834156.37
34483.71	53.7634697.38	53.8934954.75	54.9534970.39
35398.41	57.72		55.02 35229.7

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
16594.87	.0426549.01	.126564.03	.01426857.88
			.05

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

26549.0126857.88 1530.69 2280.7 1205.25 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 026549.01 25.426857.8835398.41 27.66

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.		0.018	
W.S. Elev (ft)	27.57	Reach Len. (ft)	1530.69	2280.70	1205.25
Crit W.S. (ft)		Flow Area (sq ft)		1623.41	
E.G. Slope (ft/ft)	0.000217	Area (sq ft)		1623.41	
Q Total (cfs)	6585.00	Flow (cfs)		6585.00	
Top Width (ft)	269.20	Top Width (ft)		269.20	
Vel Total (ft/s)	4.06	Avg. Vel. (ft/s)		4.06	
Max Chl Dpth (ft)	10.94	Hydr. Depth (ft)		6.03	
Conv. Total (cfs)	446923.8	Conv. (cfs)		446923.8	
Length Wtd. (ft)	2280.70	Wetted Per. (ft)		272.47	
Min Ch El (ft)	16.63	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.33	
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)		1239.37	
C & E Loss (ft)	0.01	Cum SA (acres)		177.57	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 7.0

INPUT

Description: Cross Section at River Mile 7.0

Station Elevation Data	num=	87
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
17701.2 52.6 17911.1 49.2 18172 46.1 18448.9 45 18776.7 45.8		
19049.2 43.1 19345.4 43 19672 40.7 22274.6 36.3 22340.5 36.4		
22623.4 37.5 22932.3 35.1 23256.4 33.1 23547.6 32.8 23862.6 32.6		
24156.7 33.7 25068.7 30.5 25357.4 30.3 26335.7 30.7 26575.6 32.3		
26862.4 29.9 27075.5 30 27190.1 27.9 27403.2 29.1 27551.7 27.4		
27734.9 32.3 27752.1 30.8 27765 24.7 27772 19.6 27779.9 17.6		
27790.1 16.5 27800.1 16.4 27810.3 16.2 27820.3 16.5 27830.5 16.7		
27840.5 16.8 27849.7 17 27859.8 16.9 27870 16.7 27880 17		
27890.1 19.8 27900.9 23.9 27936.6 24.4 27968.3 24.7 28001.9 24.8		
28027.7 26 28063.5 36 28112.5 36 28148.7 33 28199.6 32.3		
28252.8 34.8 28289.1 30.1 28377.8 23.5 28431 26.3 28634.6 27.7		
28832.4 30.5 29109.6 29.5 29383.3 29.3 29692.9 28.3 29759.1 29.1		
30110.4 28.3 30186.7 34.6 30328.1 37.4 30574.4 38.4 30802.3 38.7		
31086.4 39.6 31406.7 38.5 31679.1 40 32004.4 43.7 32292.3 41.4		
32590.4 42.1 32900.4 45.4 33198.1 47.7 33497.3 48.2 33798.8 49.4		
34094.6 50 34417.6 52.6 34686.7 52.8 35042.9 54.4 35310.1 54.9		
35441.2 54.1 35530.4 52.1 35760.2 53.3 36083.9 53.5 36363.2 54.7		
36628.5 56.3 36801.1 57.3		

Manning's n Values	num=	9
Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val		
17701.2 .04 18448.9 .05 19672 .04 25068.7 .05 27752.1 .11		
27765 .014 28027.7 .11 28289.1 .05 28832.4 .04		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
27752.1 28063.5	1574.27 2316.18 1729.73	.1	.3
Blocked Obstructions	num=	2	

Sta L	Sta R	Elev	Sta L	Sta R	Elev
17701.2	27734.9	27.11	28112.5	36801.1	27.11

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.019	
W.S. Elev (ft)	26.80	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1523.14	
E.G. Slope (ft/ft)	0.000375	Area (sq ft)		1523.14	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	270.00	Top Width (ft)		270.00	
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)		4.71	
Max Chl Dpth (ft)	10.60	Hydr. Depth (ft)		5.64	
Conv. Total (cfs)	370306.7	Conv. (cfs)		370306.7	
Length Wtd. (ft)	2316.18	Wetted Per. (ft)		273.73	
Min Ch El (ft)	16.20	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.61	
Frothn Loss (ft)	0.67	Cum Volume (acre-ft)		1156.99	
C & E Loss (ft)	0.00	Cum SA (acres)		163.45	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 6.39818*

INPUT
 Description: Interpolated Cross Section at River Mile 6.40
 Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17637.45	49.9117832.37	46.8218074.65	4418331.79	42.9918636.19	43.72				
18889.24	41.26 19164.3	41.1719467.59	39.0721884.42	35.0521945.62	35.14				
22208.33	36.1322495.18	33.9522796.15	32.1323066.56	31.8523359.08	31.67				
23632.18	32.6624479.09	29.7524747.18	29.5625655.66	29.9225878.43	31.37				
26144.76	29.1826281.38	29.2426342.65	29.326449.07	27.4326646.96	28.61				
26784.86	27.1226954.99	31.6426970.96	30.2926976.04	2826979.83	26.26				
26981.96	25.3726985.41	23.9826985.52	23.9426985.62	23.88 26992.7	19.6				
26993.41	19.1826995.97	18.6426999.79	17.8627002.33	17.3127006.87	16.86				
27009.62	16.5327013.84	16.0427013.96	16.0327021.04	15.8527022.99	15.83				
27025.12	15.8127028.13	15.7727030.96	15.6327036.63	15.4727046.47	15.83				
27052.09	15.98 27056.5	16.0627066.33	16.1627067.55	16.1827075.38	16.38				
27083.01	16.3327085.31	16.3227095.34	16.1527098.46	16.2427105.18	16.5				
27113.92	18.9327115.11	19.2527125.73	23.2327129.38	23.327144.83	23.68				
27150.09	23.8727160.84	24.0227184.41	24.2527192.02	24.3227225.06	24.44				
27250.44	25.6 27253.8	26.5127267.71	30.3527285.64	35.4127314.13	35.32				
27326.05	35.3627334.08	35.3727338.25	35.0527369.86	32.4627380.78	32.3				
27420.17	31.7727472.76	34.1527508.64	29.67 27648.9	25.9127850.15	27.18				
28045.67	29.7328319.67	28.8228590.21	28.6428896.23	27.7328961.67	28.45				
29308.91	27.7329384.33	33.45 29524.1	3629767.55	36.9129992.82	37.18				
30273.64	3830590.24	37 30859.5	38.3631181.04	41.7331465.62	39.64				
31760.27	40.27 32066.7	44.21 32109.7	44.5332153.43	44.9532203.52	45.93				
32242.21	46.3232360.96	47.2832656.71	47.9332716.57	48.232954.73	49.12				
33049.95	49.3133247.11	49.7333440.57	51.2733566.38	52.2533832.37	52.45				
33877.7	52.6434143.36	53.834184.45	53.9834204.98	54.0334331.39	54.26				
34448.57	54.4634457.39	54.4134578.16	53.7134666.33	51.8134842.59	52.72				
34893.48	52.98 35155.3	53.1535213.44	53.1935469.59	54.2635489.52	54.37				
35587	55.0235751.75	56.0335922.36	57.04						

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val
 17637.45 .0426970.96 .01427285.64 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 26970.9627285.64 1574.27 2316.18 1729.73 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 27285.6435922.36 26.51

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	26.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.		0.014	
W.S. Elev (ft)	26.12	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1508.27	
E.G. Slope (ft/ft)	0.000208	Area (sq ft)		1508.27	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	272.19	Top Width (ft)		272.19	
Vel Total (ft/s)	4.75	Avg. Vel. (ft/s)		4.75	
Max Chl Dpth (ft)	10.65	Hydr. Depth (ft)		5.54	
Conv. Total (cfs)	497339.2	Conv. (cfs)		497339.2	
Length Wtd. (ft)	2316.18	Wetted Per. (ft)		275.43	
Min Ch El (ft)	15.47	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.34	
Froctn Loss (ft)	0.46	Cum Volume (acre-ft)		1076.40	
C & E Loss (ft)	0.01	Cum SA (acres)		149.04	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 5.79636*

INPUT

Description: Interpolated Cross Section at River Mile 5.80

Station Elevation Data		num=	134						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17573.71	47.2217753.64	44.43	17977.3	41.8918214.67	40.9918495.68	41.63			
18729.28	39.42 18983.2	39.3319263.17	37.4421494.24	33.7921550.74	33.87				
21793.25	34.7722058.06	32.822335.89	31.1622585.52	30.922855.55	30.73				
23107.67	31.6323889.48	28.9924136.97	28.8224975.61	29.1325181.27	30.44				
25427.12	28.4725553.25	28.52 25609.8	28.625708.04	26.9725890.72	28.11				
26018.03	26.8426175.07	30.9926189.82	29.7726195.48	27.33 26199.7	25.44				
26202.07	24.5626205.91	23.2226206.03	23.1826206.14	23.1326214.03	19.15				
26214.83	18.7626217.68	18.2626221.93	17.5426224.76	17.0226229.81	16.55				
26232.87	16.1526237.58	15.5726237.71	15.56 26245.6	15.2626247.77	15.25				
26250.14	15.2326253.49	15.1826256.65	14.9626262.96	14.7426272.63	15.16				
26278.16	15.34 26282.5	15.4226292.16	15.5126293.36	15.5426301.06	15.75				
26308.56	15.7426310.83	15.7326320.69	15.5926323.75	15.6926330.36	16				
26338.95	18.3926340.12	18.7126350.57	22.5626354.15	22.6526369.35	23.18				
26374.51	23.4926385.09	23.6426408.26	23.8726415.74	23.9526448.22	24.07				
26473.17	25.1926476.48	26.0626490.16	29.7926507.79	34.8126535.95	34.63				
26547.73	34.7126555.66	34.7426559.78	34.4426591.02	31.9226601.81	31.75				
26640.74	31.2426692.72	33.5126728.18	29.2326814.83	23.23 26866.8	25.52				
27065.7	26.6627258.94	28.9527529.73	28.1427797.11	27.9728099.56	27.15				
28164.23	27.8128507.42	27.1528581.96	32.31 28720.1	34.628960.71	35.42				
29183.35	35.6629460.88	36.429773.79	35.5 30039.9	36.7330357.69	39.75				
30638.94	37.8730930.15	38.4531232.99	43.01 31275.5	43.3231318.71	43.83				
31368.22	45.3931406.46	45.8631523.82	46.8531816.11	47.6731875.28	47.96				
32110.65	48.8532204.76	49.0332399.62	49.4732590.82	50.9732715.16	51.91				
32978.04	52.0933022.84	52.28 33285.4	53.3833326.02	53.57 33346.3	53.61				
33471.23	53.8433587.05	54.0233595.77	53.9733715.12	53.3233802.26	51.52				

33976.46 52.4134026.75 52.6634285.52 52.8434342.98 52.8734596.14 53.92
 34615.83 54.0334712.17 54.75 34875 55.7735043.62 56.78

Manning's n Values num= 3
 Sta n Val Sta n Val
 17573.71 .0426189.82 .01426507.79 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 26189.8226507.79 1574.27 2316.18 1729.73 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 26507.7935043.62 25.93

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	26.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.014	
W.S. Elev (ft)	25.67	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1558.52	
E.G. Slope (ft/ft)	0.000189	Area (sq ft)		1558.52	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	275.84	Top Width (ft)		275.84	
Vel Total (ft/s)	4.60	Avg. Vel. (ft/s)		4.60	
Max Chl Dpth (ft)	10.93	Hydr. Depth (ft)		5.65	
Conv. Total (cfs)	521059.7	Conv. (cfs)		521059.7	
Length Wtd. (ft)	2316.18	Wetted Per. (ft)		278.77	
Min Ch El (ft)	14.74	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.30	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)		994.87	
C & E Loss (ft)	0.01	Cum SA (acres)		134.47	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 5.19454*

INPUT

Description: Interpolated Cross Section at River Mile 5.19

Station Elevation Data	num=	134
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
17509.96 44.5317674.92 42.0517879.95 39.7918097.56 38.9818355.17 39.55		
18569.32 37.5818802.09 37.519058.76 35.8121104.07 32.5421155.86 32.61		
21378.18 33.421620.94 31.6521875.64 30.1822104.48 29.9622352.03 29.8		
22583.15 30.5923299.87 28.2423526.75 28.0824295.57 28.35 24484.1 29.5		
24709.49 27.7524825.11 27.824876.96 27.8924967.02 26.525134.49 27.62		
25251.19 26.5525395.16 30.3325408.68 29.2625414.92 26.6625419.57 24.62		
25422.18 23.7425426.41 22.4625426.55 22.4325426.67 22.3825435.37 18.69		
25436.24 18.3425439.39 17.8725444.06 17.2325447.19 16.7225452.76 16.25		
25456.13 15.7825461.31 15.1125461.46 15.125470.16 14.6825472.55 14.66		
25475.17 14.6425478.86 14.625482.34 14.2925489.29 14.01 25498.8 14.49		
25504.24 14.7125508.49 14.79 25518 14.8725519.17 14.8925526.74 15.13		
25534.11 15.1625536.34 15.1525546.03 15.0425549.04 15.1425555.54 15.49		
25563.98 17.8525565.14 18.16 25575.4 21.8925578.92 2225593.86 22.69		
25598.94 23.1225609.33 23.26 25632.1 23.4925639.46 23.5725671.39 23.71		
25695.91 24.7925699.16 25.62 25712.6 29.2425729.94 34.2225757.76 33.95		
25769.4 34.0725777.24 34.1225781.31 33.8425812.18 31.3925822.85 31.2		
25861.32 30.7225912.68 32.8625947.72 28.826033.35 23.0926084.71 25.13		
26281.25 26.15 26472.2 28.18 26739.8 27.4527004.02 27.31 27302.9 26.58		
27366.8 27.1627705.93 26.5827779.59 31.1627916.09 33.228153.86 33.93		
28373.87 34.1528648.13 34.828957.33 34 29220.3 35.0929534.33 37.78		
29812.26 36.1130100.03 36.6230399.29 41.8230441.29 42.11 30484 42.7		

30532.92	44.84	30570.7	45.430686.68	46.4330975.52	47.431033.98	47.72
31266.57	48.5731359.58	48.7431552.13	49.231741.07	50.6731863.94	51.56	
32123.72	51.7432167.99	51.9232427.44	52.9632467.57	53.1532487.62	53.2	
32611.07	53.4232725.52	53.5932734.14	53.5432852.08	52.9332938.19	51.23	
33110.34	52.0933160.03	52.3333415.74	52.5233472.52	52.5633722.69	53.57	
33742.14	53.7333837.35	54.4833998.25	55.534164.88	56.51		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 17509.96 .0425408.68 .01425729.94 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 25408.6825729.94 1574.27 2316.18 1729.73 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 25729.9434164.88 25.34

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.014	
W.S. Elev (ft)	25.27	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1620.93	
E.G. Slope (ft/ft)	0.000169	Area (sq ft)		1620.93	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	279.71	Top Width (ft)		279.71	
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)		4.42	
Max Chl Dpth (ft)	11.26	Hydr. Depth (ft)		5.79	
Conv. Total (cfs)	551469.8	Conv. (cfs)		551469.8	
Length Wtd. (ft)	2316.18	Wetted Per. (ft)		282.44	
Min Ch El (ft)	14.01	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.27	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		910.34	
C & E Loss (ft)	0.01	Cum SA (acres)		119.70	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 4.59272*

INPUT
 Description: Interpolated Cross Section at River Mile 4.59
 Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17446.22	41.8417596.19	39.66	17782.6	37.6817980.45	36.9718214.66	37.47			
18409.36	35.7418620.99	35.6618854.35	34.1920713.89	31.2820760.97	31.35				
20963.11	32.0321183.81	30.521415.38	29.2121623.44	29.0121848.51	28.87				
22058.64	29.5622710.26	27.4822916.54	27.3523615.53	27.5623786.93	28.57				
23991.85	27.0324096.97	27.0724144.11	27.1924225.99	26.0324378.25	27.13				
24484.35	26.2724615.25	29.6724627.54	28.7524634.36	25.9924639.44	23.79				
24642.29	22.9224646.92	21.724647.06	21.67 24647.2	21.63 24656.7	18.23				
24657.66	17.9224661.09	17.4924666.21	16.9224669.62	16.4324675.71	15.94				
24679.39	15.424685.05	14.6424685.21	14.6324694.71	14.0924697.33	14.07				
24700.19	14.0624704.22	14.0224708.02	13.6224715.63	13.2824724.97	13.82				
24730.31	14.0724734.49	14.1524743.83	14.2324744.99	14.2524752.42	14.51				
24759.67	14.5724761.85	14.5724771.38	14.4824774.34	14.5924780.71	14.99				
24789.01	17.3224790.15	17.6224800.23	21.2224803.69	21.3524818.37	22.19				
24823.36	22.7424833.57	22.8824855.95	23.1224863.18	23.1924894.55	23.35				
24918.65	24.3824921.84	25.1724935.05	28.6824952.08	33.6324979.57	33.27				
24991.07	33.4324998.82	33.4925002.84	33.2425033.35	30.8525043.88	30.65				
25081.89	30.1925132.64	32.2225167.26	28.3625251.87	22.9525302.61	24.74				

25496.8	25.6325685.47	27.4125949.87	26.7726210.93	26.6526506.23	26.01
26569.37	26.5226904.45	26.0126977.22	30.0227112.09	31.827347.02	32.44
27564.39	32.6327835.37	33.228140.88	32.5 28400.7	33.4528710.97	35.81
28985.57	34.35 29269.9	34.7929565.59	40.6329607.09	40.929649.28	41.58
29697.62	44.329734.95	44.9529849.54	4630134.92	47.1330192.69	47.48
30422.5	48.2930514.39	48.4630704.64	48.9430891.32	50.3731012.72	51.21
31269.39	51.3931313.13	51.5631569.48	52.5531609.13	52.7431628.94	52.78
31750.92	53 31864	53.1531872.51	53.131989.04	52.5432074.12	50.94
32244.21	51.7832293.31	52.0132545.96	52.2132602.06	52.2532849.24	53.22
32868.46	53.3732962.53	54.2133121.51	55.2333286.14	56.25	

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 17446.22 .0424627.54 .01624952.08 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 24627.5424952.08 1574.27 2316.18 1729.73 .1 .3

Blocked Obstructions num= 1
 Sta L Sta R Elev
 24952.0833286.14 25

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.016	
W.S. Elev (ft)	24.86	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1681.78	
E.G. Slope (ft/ft)	0.000199	Area (sq ft)		1681.78	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	283.61	Top Width (ft)		283.61	
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)		4.26	
Max Chl Dpth (ft)	11.58	Hydr. Depth (ft)		5.93	
Conv. Total (cfs)	508620.4	Conv. (cfs)		508620.4	
Length Wtd. (ft)	2316.18	Wetted Per. (ft)		286.18	
Min Ch El (ft)	13.28	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.31	
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)		822.53	
C & E Loss (ft)	0.01	Cum SA (acres)		104.72	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 3.99090*

INPUT

Description: Interpolated Cross Section at River Mile 3.99

Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17382.47	39.1517517.46	37.2817685.25	35.5817863.33	34.9618074.15	35.38				
18249.4	33.918439.89	33.8318649.93	32.5620323.71	30.0320366.09	30.08				
20548.03	30.6720746.69	29.3420955.13	28.24 21142.4	28.0621344.98	27.94				
21534.12	28.5222120.65	26.7322306.32	26.6122935.48	26.7823089.77	27.64				
23274.21	26.3223368.83	26.3523411.26	26.4923484.96	25.5723622.01	26.63				
23717.51	25.9923835.33	29.02 23846.4	28.2323853.79	25.3223859.31	22.97				
23862.4	22.123867.42	20.9423867.58	20.9123867.72	20.8723878.03	17.77				
23879.07	17.5 23882.8	17.123888.34	16.623892.04	16.1423898.65	15.63				
23902.64	15.0323908.79	14.1823908.96	14.1623919.27	13.523922.11	13.49				
23925.21	13.4723929.58	13.4423933.71	12.9423941.96	12.5523951.13	13.15				
23956.38	13.4423960.49	13.5123969.66	13.58 23970.8	13.61 23978.1	13.89				
23985.22	13.9823987.37	13.9823996.72	13.9323999.63	14.0324005.89	14.49				
24014.04	16.7824015.16	17.0724025.07	20.5524028.46	20.724042.88	21.7				

24047.79	22.3624057.82	22.5	24079.8	22.7424086.89	22.8124117.72	22.98	
24141.39	23.9824144.53	24.72	24157.5	28.1224174.23	33.0424201.38	32.59	
24212.75	32.78	24220.4	32.8624224.38	32.6324254.51	30.3124264.91	30.1	
24302.47	29.66	24352.6	31.57	24386.8	27.9324470.38	22.8224520.51	24.35
24712.36	25.1124898.74	26.6425159.94	26.0925417.83	25.9825709.56	25.44		
25771.94	25.8726102.96	25.4426174.85	28.8726308.09	30.426540.17	30.95		
26754.91	31.1127022.61	31.627324.42	3127581.09	31.8227887.62	33.84		
28158.89	32.5828439.78	32.9628731.89	39.4428772.88	39.6928814.56	40.46		
28862.32	43.76	28899.2	44.49	29012.4	45.5829294.33	46.8729351.39	47.24
29578.42	48.01	29669.2	48.1729857.15	48.6730041.57	50.07	30161.5	50.87
30415.06	51.0430458.27	51.230711.52	52.1330750.69	52.3230770.26	52.37		
30890.76	52.5831002.47	52.7131010.88	52.67	31126	52.1531210.05	50.65	
31378.08	51.4731426.59	51.6931676.18	51.89	31731.6	51.9431975.79	52.87	
31994.78	53.03	32087.7	53.9432244.76	54.97	32407.4	55.99	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
17382.47	.04	23846.4	.016	24174.23	.05

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	23846.4	24174.23		1574.27	2316.18	1729.73		.1	.3
Blocked Obstructions			num=	1					
Sta L	Sta R	Elev							
24174.23	32407.4	24.6							

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	24.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.		0.016	
W.S. Elev (ft)	24.44	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1742.47	
E.G. Slope (ft/ft)	0.000180	Area (sq ft)		1742.47	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	287.47	Top Width (ft)		287.47	
Vel Total (ft/s)	4.11	Avg. Vel. (ft/s)		4.11	
Max Chl Dpth (ft)	11.89	Hydr. Depth (ft)		6.06	
Conv. Total (cfs)	534906.0	Conv. (cfs)		534906.0	
Length Wtd. (ft)	2316.18	Wetted Per. (ft)		289.94	
Min Ch El (ft)	12.55	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.28	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		731.49	
C & E Loss (ft)	0.01	Cum SA (acres)		89.54	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 3.38909*

INPUT

Description: Interpolated Cross Section at River Mile 3.39

Station Elevation Data			num=	134						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
17318.73	36.4517438.74	34.9	17587.9	33.4717746.22	32.9617933.64	33.3				
18089.44	32.0618258.79	31.9918445.52	30.9319933.54	28.7819971.21	28.82					
20132.96	29.320309.57	28.1920494.87	27.2720661.36	27.1120841.46	27					
21009.61	27.4921531.04	25.98	21696.1	25.8722255.44	25.99	22392.6	26.71			
22556.58	25.622640.69	25.6222678.41	25.7922743.94	25.122865.77	26.14					
22950.68	25.7123055.42	28.3623065.26	27.7223073.23	24.6423079.18	22.15					
23082.51	21.2923087.92	20.1823088.09	20.1523088.25	20.1223099.37	17.32					
23100.49	17.08	23104.5	16.7223110.48	16.2923114.47	15.85	23121.6	15.32			
23125.9	14.6523132.53	13.7223132.71	13.723143.83	12.9123146.88	12.9					

23150.23	12.8923154.95	12.85	23159.4	12.2723168.29	11.83	23177.3	12.47
23182.45	12.823186.49	12.8723195.49	12.9423196.61	12.9623203.78	13.26		
23210.77	13.3923212.88	13.423222.07	13.3723224.92	13.4823231.07	13.99		
23239.08	16.2423240.17	16.53	23249.9	19.8923253.24	20.05	23267.4	21.2
23272.21	21.9823282.06	22.1323303.64	22.3623310.61	22.4423340.88	22.62		
23364.12	23.5723367.21	24.2723379.95	27.5623396.37	32.44	23423.2		31.9
23434.42	32.1423441.98	32.2323445.91	32.0323475.67	29.7723485.95	29.55		
23523.04	29.1323572.56	30.9323606.34	27.49	23688.9	22.6823738.41		23.95
23927.91	24.5924112.01	25.86	24370	25.4124624.74	25.3224912.89		24.86
24974.51	25.2325301.47	24.8625372.48	27.7325504.09	2925733.32	29.45		
25945.44	29.5926209.85	3026507.96	29.526761.49	30.1827064.26	31.86		
27332.21	30.8227609.66	31.1427898.18	38.2427938.68	38.4827979.85	39.33		
28027.02	43.2228063.44	44.0428175.26	45.1528453.73	46.6	28510.1		47
28734.35	47.7428824.01	47.8929009.65	48.4129191.81	49.7729310.28	50.52		
29560.73	50.6829603.42	50.8429853.56	51.7129892.25	51.9129911.58	51.96		
30030.6	52.1630140.95	52.2730149.25	52.2330262.96	51.7730345.98	50.37		
30511.95	51.1530559.86	51.37	30806.4	51.5830861.14	51.6231102.33		52.52
31121.09	52.731212.88	53.6731368.01	54.731528.65	55.73			

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 17318.73 .04233065.26 .01723396.37 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 23065.2623396.37 1574.27 2316.18 1729.73 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 23396.3731528.65 24.2

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	24.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.017	
W.S. Elev (ft)	24.03	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1806.80	
E.G. Slope (ft/ft)	0.000183	Area (sq ft)		1806.80	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	291.45	Top Width (ft)		291.45	
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)		3.97	
Max Chl Dpth (ft)	12.20	Hydr. Depth (ft)		6.20	
Conv. Total (cfs)	530026.6	Conv. (cfs)		530026.6	
Length Wtd. (ft)	2316.18	Wetted Per. (ft)		293.86	
Min Ch El (ft)	11.83	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.28	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		637.13	
C & E Loss (ft)	0.01	Cum SA (acres)		74.14	

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 2.78727*

INPUT

Description: Interpolated Cross Section at River Mile 2.79

Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17254.98	33.7617360.01	32.5117490.55	31.3717629.11	30.9517793.13	31.22				
17929.47	30.2218077.69	30.16	18241.1	29.319543.36	27.5219576.33				
19717.89	27.9419872.45	27.0420034.62	26.2920180.32	26.1620337.94	26.07				
20485.1	26.4520941.43	25.2221085.89	25.1321575.39	25.2121695.43	25.78				
21838.94	24.8821912.55	24.921945.57	25.0922002.91	24.6322109.54	25.64				

22183.84	25.4322275.51	27.722284.12	27.222292.67	23.9722299.04	21.33
22302.62	20.4722308.43	19.4222308.61	19.422308.78	19.37 22320.7	16.86
22321.9	16.6622326.21	16.3322332.62	15.97 22336.9	15.5522344.54	15.02
22349.16	14.2822356.27	13.2522356.46	13.2322368.39	12.3322371.66	12.32
22375.25	12.322380.31	12.2722385.08	11.622394.62	11.122403.47	11.8
22408.52	12.1722412.48	12.2322421.33	12.2922422.42	12.3222429.46	12.64
22436.32	12.822438.39	12.8122447.41	12.8222450.21	12.9322456.25	13.49
22464.11	15.7122465.19	15.9822474.74	19.2222478.01	19.422491.91	20.71
22496.63	21.61 22506.3	21.7522527.49	21.9822534.33	22.0622564.04	22.25
22586.86	23.1722589.89	23.8322602.39	27.0122618.52	31.8522645.01	31.22
22656.1	31.4922663.56	31.622667.44	31.4222696.83	29.2322706.98	29
22743.62	28.622792.52	30.2822825.88	27.0622907.41	22.5522956.32	23.56
23143.46	24.0723325.27	25.0923580.07	24.7323831.65	24.6524116.22	24.29
24177.07	24.5824499.98	24.2924570.11	26.5824700.09	27.624926.48	27.96
25135.96	28.07 25397.1	28.425691.51	2825941.89	28.55 26240.9	29.89
26505.53	29.0526779.53	29.3127064.48	37.0527104.47	37.2727145.13	38.21
27191.71	42.6827227.69	43.5827338.12	44.7327613.14	46.3427668.81	46.76
27890.27	47.4627978.82	47.6128162.16	48.1428342.06	49.4728459.06	50.18
28706.41	50.3328748.56	50.48 28995.6	51.329033.81	51.49 29052.9	51.54
29170.45	51.7429279.42	51.8329287.62	51.7929399.92	51.3829481.91	50.08
29645.82	50.8429693.14	51.0529936.62	51.2729990.68	51.3130228.88	52.17
30247.4	52.3630338.05	53.430491.26	54.4430649.91	55.47	

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 17254.98 .0422284.12 .01822618.52 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 22284.1222618.52 1574.27 2316.18 1729.73 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 22618.5230649.91 23.8

CROSS SECTION OUTPUT		Profile #Calibration			
E.G. Elev (ft)	23.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.018	
W.S. Elev (ft)	23.62	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1872.98	
E.G. Slope (ft/ft)	0.000185	Area (sq ft)		1872.98	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	295.40	Top Width (ft)		295.40	
Vel Total (ft/s)	3.83	Avg. Vel. (ft/s)		3.83	
Max Chl Dpth (ft)	12.52	Hydr. Depth (ft)		6.34	
Conv. Total (cfs)	526816.7	Conv. (cfs)		526816.7	
Length Wtd. (ft)	2316.18	Wetted Per. (ft)		297.80	
Min Ch El (ft)	11.10	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.28	
Frctn Loss (ft)	0.90	Cum Volume (acre-ft)		539.30	
C & E Loss (ft)	0.00	Cum SA (acres)		58.54	

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

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 2.18545*

INPUT
 Description: Interpolated Cross Section at River Mile 2.19

Station Elevation Data		num= 134	
Sta	Elev	Sta	Elev
17191.24	31.0717281.28	30.1317393.21	29.2617511.99
17769.51	28.3817896.58	28.3318036.69	27.6719153.18
19302.81	26.5719435.33	25.8919574.36	25.3219699.29
19960.58	25.4120351.82	24.4720475.67	24.3920895.35
21121.3	24.1721184.42	24.1721212.72	24.3921261.88
21417	25.15 21495.6	27.0521502.97	26.6921512.11
21522.73	19.6521528.93	18.6521529.12	18.64 21529.3
21543.31	16.2421547.91	15.9521554.76	15.6621559.33
21572.42	13.9 21580	12.7921580.22	12.7621592.95
21600.28	11.7121605.68	11.6921610.77	10.9321620.96
21634.6	11.5321638.48	11.5921647.16	11.6521648.23
21661.87	12.2121663.91	12.2321672.76	12.26 21675.5
21689.14	15.17 21690.2	15.4421699.57	18.5521702.78
21721.06	21.2321730.55	21.3721751.34	21.621758.05
21809.6	22.7621812.57	23.3821824.84	26.4521840.66
21877.77	30.8521885.14	30.9721888.97	30.8221917.99
21964.19	28.0722012.48	29.6422045.43	26.6222125.93
22359.01	23.5522538.54	24.3222790.13	24.0523038.55
23379.64	23.9423698.49	23.7223767.74	25.4423896.08
24326.48	26.5524584.34	26.824875.05	26.525122.29
25678.85	27.2925949.41	27.4826230.78	35.8626270.27
26356.41	42.1426391.94	43.1326500.98	44.326772.54
27046.2	47.1827133.63	47.3227314.67	47.8827492.31
27852.08	49.98 27893.7	50.1128137.64	50.8828175.37
28310.29	51.32 28417.9	51.39 28426	51.3628536.88
28779.7	50.5328826.42	50.7329066.83	50.9529120.22
29373.72	52.0329463.23	53.1329614.51	54.1729771.17

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
17191.24	.0421502.97	.01921518.91	.0321840.66

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	21502.97	21840.66	1574.27	2316.18	1729.73	.1	.3	

Blocked Obstructions		num= 1	
Sta L	Sta R	Elev	
21840.66	29771.17	22.9	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	22.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.030	
W.S. Elev (ft)	22.70	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1788.71	
E.G. Slope (ft/ft)	0.000589	Area (sq ft)		1788.71	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	294.43	Top Width (ft)		294.43	
Vel Total (ft/s)	4.01	Avg. Vel. (ft/s)		4.01	
Max Chl Dpth (ft)	12.33	Hydr. Depth (ft)		6.08	
Conv. Total (cfs)	295371.7	Conv. (cfs)	295371.7		
Length Wtd. (ft)	2316.18	Wetted Per. (ft)		296.70	
Min Ch El (ft)	10.37	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.89	
Frctn Loss (ft)	1.01	Cum Volume (acre-ft)		441.95	
C & E Loss (ft)	0.00	Cum SA (acres)		42.86	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less

than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 1.58363*

INPUT
 Description: Interpolated Cross Section at River Mile 1.58
 Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17127.49	28.3817202.55	27.7517295.86	27.1617394.88	26.9317512.11	27.05				
17609.55	26.5417715.48	26.4917832.28	26.04 18763	25.0218786.57	25.03				
18887.74	25.218998.21	24.7419114.11	24.3519218.24	24.2719330.89	24.2				
19436.07	24.3819762.21	23.7219865.46	23.6520215.31	23.64 20301.1	23.91				
20403.66	23.4520456.28	23.4520479.87	23.6820520.85	23.720597.06	24.66				
20650.17	24.8620715.68	26.3920721.83	26.1820731.54	22.6320738.78	19.68				
20742.84	18.8320749.43	17.8920749.64	17.8820749.83	17.8620763.36	15.94				
20764.73	15.8220769.62	15.56 20776.9	15.3520781.76	14.9720790.43	14.4				
20795.68	13.5320803.74	12.3320803.97	12.29 20817.5	11.1520821.22	11.14				
20825.3	11.1320831.04	11.1120836.46	10.2620847.29	9.64 20855.8	10.46				
20860.67	10.920864.48	10.9620872.99	11.0120874.05	11.0320880.82	11.4				
20887.43	11.6220889.42	11.65 20898.1	11.71 20900.8	11.8220906.61	12.48				
20914.18	14.6320915.21	14.89 20924.4	17.8820927.55	18.120940.94	19.72				
20945.48	20.8520954.79	20.9920975.19	21.2320981.77	21.321010.37	21.53				
21032.34	22.3621035.25	22.9321047.29	25.8921062.81	30.6721088.63	29.86				
21099.44	30.2121106.72	30.35 21110.5	30.2221139.16	28.1621149.05	27.9				
21184.76	27.5521232.44	28.9921264.97	26.1921344.45	22.2721392.12	22.78				
21574.56	23.0421751.81	23.55 22000.2	23.3622245.46	23.3322522.89	23.15				
22582.21	23.29 22897	23.1522965.38	24.2923092.08	24.823312.79	24.98				
23517	25.0423771.58	25.2 24058.6	2524302.69	25.2724594.19	25.95				
24852.17	25.5325119.29	25.6525397.08	34.6725436.06	34.86 25475.7	35.96				
25521.11	41.5925556.19	42.6725663.84	43.8825931.95	45.825986.22	46.28				
26202.12	46.926288.45	47.0426467.18	47.6126642.56	48.8626756.62	49.48				
26997.75	49.6327038.85	49.7527279.68	50.4627316.93	50.6627335.54	50.72				
27450.13	50.927556.37	50.9627564.37	50.9227673.85	50.627753.78	49.5				
27913.57	50.22 27959.7	50.428197.05	50.6428249.76	50.6928481.98	51.48				
28500.04	51.728588.41	52.8628737.77	53.928892.43	54.94					

Manning's n Values	num=	3
Sta	n Val	Sta
17127.49	.0420721.83	.01921062.81
		.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	20721.8321062.81		1574.27	2316.18	1729.73	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	21.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.019	
W.S. Elev (ft)	21.65	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1672.08	
E.G. Slope (ft/ft)	0.000280	Area (sq ft)		1672.08	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	279.70	Top Width (ft)		279.70	
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)		4.29	
Max Chl Dpth (ft)	12.01	Hydr. Depth (ft)		5.98	
Conv. Total (cfs)	428502.9	Conv. (cfs)		428502.9	
Length Wtd. (ft)	2316.18	Wetted Per. (ft)		281.89	

Min Ch El (ft)	9.64	Shear (lb/sq ft)	0.10
Alpha	1.00	Stream Power (lb/ft s)	0.44
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	349.94
C & E Loss (ft)	0.00	Cum SA (acres)	27.60

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: .981819*

INPUT
 Description: Interpolated Cross Section at River Mile 0.98
 Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17063.75	25.6917123.83	25.3617198.51	25.0517277.77	24.9317371.59	24.97				
17449.59	24.717534.38	24.6617627.86	24.4218372.82	23.7618391.69	23.77				
18472.67	23.8418561.08	23.5918653.85	23.3818737.21	23.3218827.37	23.27				
18911.55	23.34 19172.6	22.9619255.24	22.9219535.27	22.8619603.93	22.98				
19686.03	22.7319728.14	22.7219747.02	22.9819779.83	23.2319840.82	24.16				
19883.33	24.5819935.77	25.7319940.69	25.6619950.98	21.9619958.65	18.86				
19962.95	18.0219969.94	17.1319970.15	17.1219970.36	17.11 19984.7	15.49				
19986.14	15.419991.32	15.1819999.04	15.0320004.19	14.6820013.38	14.1				
20018.93	13.1520027.48	11.8620027.72	11.8320042.06	10.57 20046	10.56				
20050.32	10.5420056.41	10.5220062.14	9.5920073.62	8.9120081.96	9.79				
20086.74	10.2620090.48	10.3220098.82	10.3620099.86	10.38 20106.5	10.77				
20112.98	11.0320114.93	11.0620123.45	11.1520126.09	11.2720131.79	11.98				
20139.21	14.120140.22	14.3420149.24	17.2120152.33	17.4520165.45	19.22				
20169.91	20.4820179.04	20.6120199.03	20.8520205.49	20.9320233.54	21.16				
20255.07	21.9520257.93	22.4920269.73	25.3420284.96	30.0720310.45	29.17				
20321.12	29.56 20328.3	29.7220332.03	29.6120360.32	29.6220370.09	27.35				
20405.34	27.02 20452.4	28.3520484.51	25.7520562.96	22.1420610.02	22.39				
20790.11	22.5220965.08	22.7721210.27	22.6821452.37	22.6621726.22	22.57				
21784.78	22.6522095.51	22.57 22163	23.1522288.08	23.422505.94	23.49				
22707.53	23.5222958.82	23.623242.14	23.523483.09	23.6423770.83	23.97				
24025.49	23.7624289.16	23.8324563.37	33.4724601.86	33.6524640.99	34.83				
24685.81	41.0524720.43	42.22 24826.7	43.4525091.36	45.5425144.93	46.04				
25358.04	46.6325443.26	46.7525619.69	47.3525792.81	48.5625905.39	49.14				
26143.42	49.2726183.99	49.3926421.72	50.0526458.49	50.2526476.86	50.3				
26589.98	50.4826694.84	50.5226702.74	50.49 26810.8	50.2126889.71	49.21				
27047.44	49.927092.97	50.0827327.27	50.32 27379.3	50.3727608.52	51.13				
27626.35	51.3627713.58	52.5927861.02	53.6428013.69	54.68					

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
17063.75	.0419940.69		.0220284.96		.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
19940.69	20284.96	1574.28	2316.18	1729.73	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	21.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.020	
W.S. Elev (ft)	21.00	Reach Len. (ft)	1574.28	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)		1671.68	
E.G. Slope (ft/ft)	0.000283	Area (sq ft)		1671.68	
Q Total (cfs)	7169.00	Flow (cfs)		7169.00	
Top Width (ft)	260.81	Top Width (ft)		260.81	
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)		4.29	
Max Chl Dpth (ft)	12.09	Hydr. Depth (ft)		6.41	
Conv. Total (cfs)	426129.6	Conv. (cfs)		426129.6	

Length Wtd. (ft)	2316.18	Wetted Per. (ft)	263.04
Min Ch El (ft)	8.91	Shear (lb/sq ft)	0.11
Alpha	1.00	Stream Power (lb/ft s)	0.48
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	261.05
C & E Loss (ft)	0.00	Cum SA (acres)	13.23

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 0.38

INPUT
 Description: Interpolated Cross Section at River Mile 0.38

Station Elevation Data		num=	87
Sta	Elev	Sta	Elev
17000	23	19000	2219159.55
19183.06	17.219190.44	16.3719190.88	16.3619206.03
19221.18	14.7219236.32	13.7919242.19	12.7819251.47
19270.78	9.9719281.77	9.9419287.83	8.9219299.95
19312.81	9.6319316.48	9.6819324.66	9.7219325.67
19338.53	10.4419340.45	10.4819348.79	10.619351.38
19364.24	13.5619365.24	13.819374.07	16.54 19377.1
19394.33	20.119403.28	20.2319422.88	20.4719429.21
19477.81	21.5519480.61	22.0419492.18	24.78 19507.1
19542.79	28.9219549.88	29.0919553.56	29.0119581.48
19625.91	26.4919672.36	27.719704.05	25.3219781.48
23729.67	32.2823767.65	32.4423806.27	33.7123850.51
23989.56	43.0324250.76	45.2724303.63	45.824513.97
24772.2	47.0824943.06	48.2625054.18	48.79 25289.1
25563.76	49.6325600.05	49.8325618.18	49.8925729.82
25841.11	50.0525947.77	49.8226025.64	48.9226181.31
26457.49	50.0126508.84	50.0626735.07	50.7826752.67
26984.27	53.3727134.95	54.42	

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
17000	.0419159.55	.021 19507.1	.0623729.67

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
19159.55	19507.1	0	0	0	.1	.3	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	20.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.021	
W.S. Elev (ft)	20.31	Reach Len. (ft)	3694.00	3694.00	3694.00
Crit W.S. (ft)		Flow Area (sq ft)		1668.40	
E.G. Slope (ft/ft)	0.000292	Area (sq ft)		1668.40	
Q Total (cfs)	7374.00	Flow (cfs)		7374.00	
Top Width (ft)	236.73	Top Width (ft)		236.73	
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)		4.42	
Max Chl Dpth (ft)	12.13	Hydr. Depth (ft)		7.05	
Conv. Total (cfs)	431188.8	Conv. (cfs)		431188.8	
Length Wtd. (ft)	3694.00	Wetted Per. (ft)		239.01	
Min Ch El (ft)	8.18	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.56	
Frctn Loss (ft)	1.01	Cum Volume (acre-ft)		172.25	
C & E Loss (ft)	0.03	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River: Fish Creek

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9	n10	n11	n12	n13	n14	n15
Upper Fish Creek	43.3	.04	.027	.07	.04											
Upper Fish Creek	42.3916*	.04	.027	.07	.05											
Upper Fish Creek	41.4833*	.04	.028	.07	.05											
Upper Fish Creek	40.575*	.04	.028	.07	.05											
Upper Fish Creek	39.6666*	.04	.029	.07	.055											
Upper Fish Creek	38.7583*	.04	.029	.07	.055											
Upper Fish Creek	37.85*	.04	.029	.05												
Upper Fish Creek	36.9416*	.04	.029	.055												
Upper Fish Creek	36.0333*	.04	.029	.055												
Upper Fish Creek	35.125*	.04	.029	.06												
Upper Fish Creek	34.2166*	.04	.03	.055												
Upper Fish Creek	33.3083*	.04	.03	.055												
Upper Fish Creek	32.4	.04	.1	.07	.03	.06	.05	.04	.05	.04						
Upper Fish Creek	31.6071*	.04	.07	.029	.055											
Upper Fish Creek	30.8142*	.04	.07	.029	.06											
Upper Fish Creek	30.0214*	.04	.07	.028	.06											
Upper Fish Creek	29.2285*	.05	.07	.027	.05											
Upper Fish Creek	28.4357*	.04	.07	.026	.055											
Upper Fish Creek	27.6428*	.04	.07	.024	.055											
Upper Fish Creek	26.85	.05	.04	.05	.06	.04	.023	.06								
Lower Fish Creek	26.09	.05	.04	.05	.04	.05	.04	.06	.04	.05	.07	.022	.06	.04	.06	.04
Lower Fish Creek	25.1	.05	.04	.05	.04	.05	.04	.06	.04	.05	.07	.021	.06	.04	.06	.04
Lower Fish Creek	24.2625*	.05	.08	.021	.06											
Lower Fish Creek	23.425*	.05	.08	.021	.06											
Lower Fish Creek	22.5875*	.05	.08	.02	.06											
Lower Fish Creek	21.75*	.05	.09	.019	.06											
Lower Fish Creek	20.9125*	.05	.1	.017	.06											
Lower Fish Creek	20.075*	.05	.1	.016	.06											
Lower Fish Creek	19.2375*	.05	.1	.015	.06											
Lower Fish Creek	18.4	.05	.06	.04	.05	.11	.014	.05	.06	.07	.05					
Lower Fish Creek	17.5714*	.05	.11	.014	.06											
Lower Fish Creek	16.7428*	.05	.11	.014	.06											
Lower Fish Creek	15.9142*	.05	.11	.014	.06											
Lower Fish Creek	15.0857*	.05	.11	.02	.06											
Lower Fish Creek	14.2571*	.05	.11	.026	.06											
Lower Fish Creek	13.4285*	.05	.11	.032	.06											
Lower Fish Creek	12.6	.06	.04	.06	.04	.05	.11	.038	.11	.07	.06	.04	.11			
Lower Fish Creek	11.7	.06	.04	.06	.04	.05	.11	.03	.07	.05	.03	.11	.07	.06	.04	.11
Lower Fish Creek	10.8538*	.062	.107	.031	.061	.031	.079									
Lower Fish Creek	10.0076*	.063	.105	.034	.062	.034	.079									
Lower Fish Creek	9.16153*	.065	.102	.038	.063	.038	.08									
Lower Fish Creek	8.31538*	.066	.099	.041	.064	.041	.08									
Lower Fish Creek	7.46923*	.068	.097	.044	.065	.044	.081									
Lower Fish Creek	6.62307*	.069	.094	.047	.066	.047	.081									
Lower Fish Creek	5.77692*	.071	.091	.051	.068	.051	.082									
Lower Fish Creek	4.93076*	.072	.088	.054	.069	.054	.082									
Lower Fish Creek	4.08461*	.074	.086	.057	.07	.057	.083									
Lower Fish Creek	3.23846*	.075	.083	.06	.071	.06	.083									
Lower Fish Creek	2.39230*	.077	.08	.064	.072	.064	.084									
Lower Fish Creek	1.54615*	.078	.078	.067	.073	.067	.084									
Lower Fish Creek	0.7	.085	.075	.07	.075	.07	.075	.07	.075	.07	.085					

River: Judy Creek

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9
Lower Judy Creek	13.8	.05	.04	.05	.06	.02	.06	.04		
Lower Judy Creek	13.375*	.04	.02	.05						
Lower Judy Creek	12.95*	.04	.019	.05						

Lower Judy Creek	12.525*	.04	.019	.05						
Lower Judy Creek	12.1*	.04	.03	.019	.05					
Lower Judy Creek	11.675*	.04	.03	.018	.05					
Lower Judy Creek	11.25*	.04	.04	.017	.05					
Lower Judy Creek	10.825*	.04	.05	.017	.05					
Lower Judy Creek	10.4*	.04	.06	.017	.05					
Lower Judy Creek	9.975*	.04	.06	.017	.05					
Lower Judy Creek	9.55000*	.04	.07	.016	.05					
Lower Judy Creek	9.12500*	.04	.08	.016	.05					
Lower Judy Creek	8.70000*	.04	.08	.016	.05					
Lower Judy Creek	8.27500*	.04	.09	.015	.05					
Lower Judy Creek	7.85000*	.04	.1	.015	.05					
Lower Judy Creek	7.42500*	.04	.1	.014	.05					
Lower Judy Creek	7.0	.04	.05	.04	.05	.11	.014	.11	.05	.04
Lower Judy Creek	6.39818*	.04	.014	.05						
Lower Judy Creek	5.79636*	.04	.014	.05						
Lower Judy Creek	5.19454*	.04	.014	.05						
Lower Judy Creek	4.59272*	.04	.016	.05						
Lower Judy Creek	3.99090*	.04	.016	.05						
Lower Judy Creek	3.38909*	.04	.017	.05						
Lower Judy Creek	2.78727*	.04	.018	.05						
Lower Judy Creek	2.18545*	.04	.019	.03	.05					
Lower Judy Creek	1.58363*	.04	.019	.05						
Lower Judy Creek	.981819*	.04	.02	.05						
Lower Judy Creek	0.38	.04	.021	.06	.04					

SUMMARY OF REACH LENGTHS

River: Fish Creek

Reach	River Sta.	Left	Channel	Right
Upper Fish Creek	43.3	1903.5	4751.08	1745.42
Upper Fish Creek	42.3916*	1903.5	4751.08	1745.42
Upper Fish Creek	41.4833*	1903.5	4751.08	1745.42
Upper Fish Creek	40.575*	1903.5	4751.08	1745.42
Upper Fish Creek	39.6666*	1903.5	4751.08	1745.42
Upper Fish Creek	38.7583*	1903.5	4751.08	1745.42
Upper Fish Creek	37.85*	1903.5	4751.08	1745.42
Upper Fish Creek	36.9416*	1903.5	4751.08	1745.42
Upper Fish Creek	36.0333*	1903.5	4751.08	1745.42
Upper Fish Creek	35.125*	1903.5	4751.08	1745.42
Upper Fish Creek	34.2166*	1903.5	4751.08	1745.42
Upper Fish Creek	33.3083*	1903.5	4751.09	1745.42
Upper Fish Creek	32.4	2464.43	4273.14	2171
Upper Fish Creek	31.6071*	2464.43	4273.14	2171
Upper Fish Creek	30.8142*	2464.43	4273.14	2171
Upper Fish Creek	30.0214*	2464.43	4273.14	2171
Upper Fish Creek	29.2285*	2464.43	4273.14	2171
Upper Fish Creek	28.4357*	2464.43	4273.14	2171
Upper Fish Creek	27.6428*	2464.43	4273.14	2171
Upper Fish Creek	26.85	0	0	0
Lower Fish Creek	26.09	2826	4769	4679
Lower Fish Creek	25.1	2028.75	4406.38	2370.38
Lower Fish Creek	24.2625*	2028.75	4406.38	2370.38
Lower Fish Creek	23.425*	2028.75	4406.38	2370.38
Lower Fish Creek	22.5875*	2028.75	4406.38	2370.38
Lower Fish Creek	21.75*	2028.75	4406.38	2370.38
Lower Fish Creek	20.9125*	2028.75	4406.38	2370.38
Lower Fish Creek	20.075*	2028.75	4406.38	2370.38
Lower Fish Creek	19.2375*	2028.75	4406.38	2370.38

Lower Fish Creek	18.4	3217.29	4349	2885.43
Lower Fish Creek	17.5714*	3217.29	4349	2885.43
Lower Fish Creek	16.7428*	3217.29	4349	2885.43
Lower Fish Creek	15.9142*	3217.29	4349	2885.43
Lower Fish Creek	15.0857*	3217.29	4349	2885.43
Lower Fish Creek	14.2571*	3217.29	4349	2885.43
Lower Fish Creek	13.4285*	3217.29	4349	2885.43
Lower Fish Creek	12.6	1090	5078	2467
Lower Fish Creek	11.7	2559	4481.46	2515.69
Lower Fish Creek	10.8538*	2559	4481.46	2515.69
Lower Fish Creek	10.0076*	2559	4481.46	2515.69
Lower Fish Creek	9.16153*	2559	4481.46	2515.69
Lower Fish Creek	8.31538*	2559	4481.46	2515.69
Lower Fish Creek	7.46923*	2559	4481.46	2515.69
Lower Fish Creek	6.62307*	2559	4481.46	2515.69
Lower Fish Creek	5.77692*	2559	4481.46	2515.69
Lower Fish Creek	4.93076*	2559	4481.46	2515.69
Lower Fish Creek	4.08461*	2559	4481.46	2515.69
Lower Fish Creek	3.23846*	2559	4481.46	2515.69
Lower Fish Creek	2.39230*	2559	4481.46	2515.69
Lower Fish Creek	1.54615*	2559	4481.46	2515.7
Lower Fish Creek	0.7	0	0	0

River: Judy Creek

Reach	River Sta.	Left	Channel	Right
Lower Judy Creek	13.8	1530.69	2280.69	1205.25
Lower Judy Creek	13.375*	1530.69	2280.69	1205.25
Lower Judy Creek	12.95*	1530.69	2280.69	1205.25
Lower Judy Creek	12.525*	1530.69	2280.69	1205.25
Lower Judy Creek	12.1*	1530.69	2280.69	1205.25
Lower Judy Creek	11.675*	1530.69	2280.69	1205.25
Lower Judy Creek	11.25*	1530.69	2280.69	1205.25
Lower Judy Creek	10.825*	1530.69	2280.69	1205.25
Lower Judy Creek	10.4*	1530.69	2280.69	1205.25
Lower Judy Creek	9.975*	1530.69	2280.69	1205.25
Lower Judy Creek	9.55000*	1530.69	2280.69	1205.25
Lower Judy Creek	9.12500*	1530.69	2280.69	1205.25
Lower Judy Creek	8.70000*	1530.69	2280.69	1205.25
Lower Judy Creek	8.27500*	1530.69	2280.69	1205.25
Lower Judy Creek	7.85000*	1530.69	2280.69	1205.25
Lower Judy Creek	7.42500*	1530.69	2280.7	1205.25
Lower Judy Creek	7.0	1574.27	2316.18	1729.73
Lower Judy Creek	6.39818*	1574.27	2316.18	1729.73
Lower Judy Creek	5.79636*	1574.27	2316.18	1729.73
Lower Judy Creek	5.19454*	1574.27	2316.18	1729.73
Lower Judy Creek	4.59272*	1574.27	2316.18	1729.73
Lower Judy Creek	3.99090*	1574.27	2316.18	1729.73
Lower Judy Creek	3.38909*	1574.27	2316.18	1729.73
Lower Judy Creek	2.78727*	1574.27	2316.18	1729.73
Lower Judy Creek	2.18545*	1574.27	2316.18	1729.73
Lower Judy Creek	1.58363*	1574.27	2316.18	1729.73
Lower Judy Creek	.981819*	1574.28	2316.18	1729.73
Lower Judy Creek	0.38	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Fish Creek

Reach	River Sta.	Contr.	Expan.
Upper Fish Creek	43.3	.1	.3
Upper Fish Creek	42.3916*	.1	.3
Upper Fish Creek	41.4833*	.1	.3
Upper Fish Creek	40.575*	.1	.3
Upper Fish Creek	39.6666*	.1	.3
Upper Fish Creek	38.7583*	.1	.3
Upper Fish Creek	37.85*	.1	.3
Upper Fish Creek	36.9416*	.1	.3
Upper Fish Creek	36.0333*	.1	.3
Upper Fish Creek	35.125*	.1	.3
Upper Fish Creek	34.2166*	.1	.3
Upper Fish Creek	33.3083*	.1	.3
Upper Fish Creek	32.4	.1	.3
Upper Fish Creek	31.6071*	.1	.3
Upper Fish Creek	30.8142*	.1	.3
Upper Fish Creek	30.0214*	.1	.3
Upper Fish Creek	29.2285*	.1	.3
Upper Fish Creek	28.4357*	.1	.3
Upper Fish Creek	27.6428*	.1	.3
Upper Fish Creek	26.85	.1	.3
Lower Fish Creek	26.09	.1	.3
Lower Fish Creek	25.1	.1	.3
Lower Fish Creek	24.2625*	.1	.3
Lower Fish Creek	23.425*	.1	.3
Lower Fish Creek	22.5875*	.1	.3
Lower Fish Creek	21.75*	.1	.3
Lower Fish Creek	20.9125*	.1	.3
Lower Fish Creek	20.075*	.1	.3
Lower Fish Creek	19.2375*	.1	.3
Lower Fish Creek	18.4	.1	.3
Lower Fish Creek	17.5714*	.1	.3
Lower Fish Creek	16.7428*	.1	.3
Lower Fish Creek	15.9142*	.1	.3
Lower Fish Creek	15.0857*	.1	.3
Lower Fish Creek	14.2571*	.1	.3
Lower Fish Creek	13.4285*	.1	.3
Lower Fish Creek	12.6	.1	.3
Lower Fish Creek	11.7	.1	.3
Lower Fish Creek	10.8538*	.1	.3
Lower Fish Creek	10.0076*	.1	.3
Lower Fish Creek	9.16153*	.1	.3
Lower Fish Creek	8.31538*	.1	.3
Lower Fish Creek	7.46923*	.1	.3
Lower Fish Creek	6.62307*	.1	.3
Lower Fish Creek	5.77692*	.1	.3
Lower Fish Creek	4.93076*	.1	.3
Lower Fish Creek	4.08461*	.1	.3
Lower Fish Creek	3.23846*	.1	.3
Lower Fish Creek	2.39230*	.1	.3
Lower Fish Creek	1.54615*	.1	.3
Lower Fish Creek	0.7	.1	.3

River: Judy Creek

Reach	River Sta.	Contr.	Expan.
Lower Judy Creek	13.8	.1	.3
Lower Judy Creek	13.375*	.1	.3
Lower Judy Creek	12.95*	.1	.3
Lower Judy Creek	12.525*	.1	.3
Lower Judy Creek	12.1*	.1	.3
Lower Judy Creek	11.675*	.1	.3
Lower Judy Creek	11.25*	.1	.3
Lower Judy Creek	10.825*	.1	.3
Lower Judy Creek	10.4*	.1	.3
Lower Judy Creek	9.975*	.1	.3
Lower Judy Creek	9.55000*	.1	.3
Lower Judy Creek	9.12500*	.1	.3
Lower Judy Creek	8.70000*	.1	.3
Lower Judy Creek	8.27500*	.1	.3
Lower Judy Creek	7.85000*	.1	.3
Lower Judy Creek	7.42500*	.1	.3
Lower Judy Creek	7.0	.1	.3
Lower Judy Creek	6.39818*	.1	.3
Lower Judy Creek	5.79636*	.1	.3
Lower Judy Creek	5.19454*	.1	.3
Lower Judy Creek	4.59272*	.1	.3
Lower Judy Creek	3.99090*	.1	.3
Lower Judy Creek	3.38909*	.1	.3
Lower Judy Creek	2.78727*	.1	.3
Lower Judy Creek	2.18545*	.1	.3
Lower Judy Creek	1.58363*	.1	.3
Lower Judy Creek	.981819*	.1	.3
Lower Judy Creek	0.38	.1	.3

Profile Output Table - Standard Table 1

River	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
Fish Creek	Lower Fish Creek	0.7	11080.00	0.30	3.68	1.52	3.68	0.000080	0.27	41415.04	24116.15		0.04
Fish Creek	Lower Fish Creek	1.54615*	9361.00	-0.36	4.05		4.05	0.000096	0.29	33609.53	23486.20		0.04
Fish Creek	Lower Fish Creek	2.39230*	9361.00	-0.74	4.46		4.46	0.000104	0.36	28229.48	19119.75		0.05
Fish Creek	Lower Fish Creek	3.23846*	9361.00	-1.13	4.85		4.85	0.000084	0.40	26831.58	15373.09		0.05
Fish Creek	Lower Fish Creek	4.08461*	9361.00	-1.52	5.23		5.23	0.000088	0.49	19360.98	8184.44		0.05
Fish Creek	Lower Fish Creek	4.93076*	9361.00	-1.90	5.59		5.59	0.000073	0.51	18550.36	7031.03		0.05
Fish Creek	Lower Fish Creek	5.77692*	9361.00	-2.29	5.89		5.89	0.000060	0.55	17183.66	6080.15		0.06
Fish Creek	Lower Fish Creek	6.62307*	9361.00	-2.68	6.14		6.15	0.000053	0.61	15498.69	5025.06		0.06
Fish Creek	Lower Fish Creek	7.46923*	9361.00	-3.07	6.39		6.40	0.000057	0.68	13872.11	3740.42		0.06
Fish Creek	Lower Fish Creek	8.31538*	9361.00	-3.45	6.64		6.65	0.000052	0.77	12211.55	3014.86		0.07
Fish Creek	Lower Fish Creek	9.16153*	9361.00	-3.84	6.91		6.92	0.000068	0.90	10405.23	2407.47		0.08
Fish Creek	Lower Fish Creek	10.0076*	9361.00	-4.23	7.21		7.23	0.000072	1.11	8498.70	1868.46		0.09
Fish Creek	Lower Fish Creek	10.8538*	9361.00	-4.61	7.57		7.60	0.000091	1.48	6324.44	1236.59		0.12
Fish Creek	Lower Fish Creek	11.7	9361.00	-5.00	8.19		8.27	0.000202	2.28	4107.71	739.42		0.17
Fish Creek	Lower Fish Creek	12.6	9361.00	-5.80	9.46		9.56	0.000306	2.53	3702.25	513.00		0.17
Fish Creek	Lower Fish Creek	13.4285*	9183.00	-5.83	10.54		10.63	0.000186	2.35	3909.61	540.77		0.15
Fish Creek	Lower Fish Creek	14.2571*	9183.00	-5.86	11.22		11.30	0.000127	2.38	3864.39	539.63		0.16
Fish Creek	Lower Fish Creek	15.0857*	9183.00	-5.89	11.67		11.77	0.000086	2.48	3702.41	535.42		0.17
Fish Creek	Lower Fish Creek	15.9142*	9183.00	-5.91	11.96		12.07	0.000051	2.66	3454.90	524.52		0.18
Fish Creek	Lower Fish Creek	16.7428*	9183.00	-5.94	12.20		12.33	0.000065	2.88	3193.39	511.33		0.20
Fish Creek	Lower Fish Creek	17.5714*	9183.00	-5.97	12.50		12.65	0.000081	3.09	2972.71	503.30		0.22
Fish Creek	Lower Fish Creek	18.4	9183.00	-6.00	12.87		13.04	0.000098	3.29	2790.96	496.56		0.24

Fish Creek	Lower	Fish Creek	19.2375*	8910.00	-4.42	13.32		13.48	0.000102	3.23	2762.44	472.57	0.24
Fish Creek	Lower	Fish Creek	20.075*	8910.00	-2.84	13.79		13.96	0.000115	3.27	2721.32	452.27	0.24
Fish Creek	Lower	Fish Creek	20.9125*	8910.00	-1.26	14.32		14.49	0.000126	3.32	2683.31	427.48	0.23
Fish Creek	Lower	Fish Creek	21.75*	8910.00	0.32	14.93		15.11	0.000155	3.36	2651.77	410.73	0.23
Fish Creek	Lower	Fish Creek	22.5875*	8910.00	1.90	15.64		15.82	0.000170	3.40	2623.70	398.51	0.23
Fish Creek	Lower	Fish Creek	23.425*	8910.00	3.48	16.44		16.62	0.000191	3.45	2585.16	388.57	0.24
Fish Creek	Lower	Fish Creek	24.2625*	8910.00	5.06	17.29		17.48	0.000200	3.52	2527.86	379.70	0.24
Fish Creek	Lower	Fish Creek	25.1	8910.00	6.64	18.22		18.43	0.000227	3.66	2435.81	371.69	0.25
Fish Creek	Lower	Fish Creek	26.09	8898.00	7.89	19.36		19.58	0.000253	3.72	2393.90	369.66	0.26
Fish Creek	Upper	Fish Creek	26.85	2366.00	6.88	20.11		20.13	0.000020	1.06	2242.32	320.71	0.07
Fish Creek	Upper	Fish Creek	27.6428*	2334.00	7.84	20.21		20.23	0.000027	1.12	2085.39	314.89	0.08
Fish Creek	Upper	Fish Creek	28.4357*	2334.00	8.80	20.35		20.37	0.000038	1.20	1947.85	307.58	0.08
Fish Creek	Upper	Fish Creek	29.2285*	2334.00	9.76	20.54		20.56	0.000050	1.28	1830.45	299.23	0.09
Fish Creek	Upper	Fish Creek	30.0214*	2334.00	10.72	20.77		20.80	0.000061	1.35	1729.49	290.91	0.10
Fish Creek	Upper	Fish Creek	30.8142*	2334.00	11.68	21.06		21.09	0.000074	1.42	1646.33	282.58	0.10
Fish Creek	Upper	Fish Creek	31.6071*	2334.00	12.64	21.39		21.42	0.000082	1.48	1577.35	274.17	0.11
Fish Creek	Upper	Fish Creek	32.4	2334.00	13.60	21.77		21.81	0.000098	1.53	1521.80	266.42	0.11
Fish Creek	Upper	Fish Creek	33.3083*	2293.00	14.03	22.26		22.29	0.000106	1.55	1477.07	274.47	0.12
Fish Creek	Upper	Fish Creek	34.2166*	2293.00	14.45	22.79		22.83	0.000119	1.59	1443.08	283.24	0.12
Fish Creek	Upper	Fish Creek	35.125*	2293.00	14.88	23.36		23.40	0.000123	1.62	1415.72	292.00	0.13
Fish Creek	Upper	Fish Creek	36.0333*	2293.00	15.30	23.96		24.00	0.000134	1.64	1396.05	300.75	0.13
Fish Creek	Upper	Fish Creek	36.9416*	2293.00	15.73	24.61		24.65	0.000142	1.65	1388.82	309.53	0.14
Fish Creek	Upper	Fish Creek	37.85*	2293.00	16.15	25.28		25.33	0.000146	1.65	1390.60	318.15	0.14
Fish Creek	Upper	Fish Creek	38.7583*	2293.00	16.58	25.99		26.03	0.000154	1.63	1402.48	326.09	0.14
Fish Creek	Upper	Fish Creek	39.6666*	2293.00	17.00	26.72		26.76	0.000151	1.61	1420.75	334.30	0.14
Fish Creek	Upper	Fish Creek	40.575*	2293.00	17.43	27.42		27.46	0.000141	1.60	1431.72	342.34	0.14
Fish Creek	Upper	Fish Creek	41.4833*	2293.00	17.85	28.10		28.13	0.000143	1.60	1435.41	350.58	0.14
Fish Creek	Upper	Fish Creek	42.3916*	2293.00	18.28	28.76		28.80	0.000136	1.60	1433.76	359.10	0.14
Fish Creek	Upper	Fish Creek	43.3	2293.00	18.70	29.43		29.47	0.000140	1.60	1431.25	367.86	0.14
Judy Creek	Lower	Judy Creek	0.38	7374.00	8.18	20.31		20.61	0.000292	4.42	1668.40	236.73	0.29
Judy Creek	Lower	Judy Creek	.981819*	7169.00	8.91	21.00		21.29	0.000283	4.29	1671.68	260.81	0.30
Judy Creek	Lower	Judy Creek	1.58363*	7169.00	9.64	21.65		21.94	0.000280	4.29	1672.08	279.70	0.31
Judy Creek	Lower	Judy Creek	2.18545*	7169.00	10.37	22.70		22.95	0.000589	4.01	1788.71	294.43	0.29
Judy Creek	Lower	Judy Creek	2.78727*	7169.00	11.10	23.62		23.85	0.000185	3.83	1872.98	295.40	0.27
Judy Creek	Lower	Judy Creek	3.38909*	7169.00	11.83	24.03		24.27	0.000183	3.97	1806.80	291.45	0.28
Judy Creek	Lower	Judy Creek	3.99090*	7169.00	12.55	24.44		24.70	0.000180	4.11	1742.47	287.47	0.29
Judy Creek	Lower	Judy Creek	4.59272*	7169.00	13.28	24.86		25.14	0.000199	4.26	1681.78	283.61	0.31
Judy Creek	Lower	Judy Creek	5.19454*	7169.00	14.01	25.27		25.58	0.000169	4.42	1620.93	279.71	0.32
Judy Creek	Lower	Judy Creek	5.79636*	7169.00	14.74	25.67		26.00	0.000189	4.60	1558.52	275.84	0.34
Judy Creek	Lower	Judy Creek	6.39818*	7169.00	15.47	26.12		26.47	0.000208	4.75	1508.27	272.19	0.36
Judy Creek	Lower	Judy Creek	7.0	7169.00	16.20	26.80		27.14	0.000375	4.71	1523.14	270.00	0.35
Judy Creek	Lower	Judy Creek	7.42500*	6585.00	16.63	27.57		27.83	0.000217	4.06	1623.41	269.20	0.29
Judy Creek	Lower	Judy Creek	7.85000*	6585.00	17.05	28.10		28.35	0.000238	3.99	1650.88	267.10	0.28
Judy Creek	Lower	Judy Creek	8.27500*	6585.00	17.48	28.63		28.87	0.000223	3.94	1672.47	265.09	0.28
Judy Creek	Lower	Judy Creek	8.70000*	6585.00	17.90	29.15		29.39	0.000230	3.90	1687.55	263.15	0.27
Judy Creek	Lower	Judy Creek	9.12500*	6585.00	18.33	29.63		29.86	0.000186	3.91	1682.06	260.91	0.27
Judy Creek	Lower	Judy Creek	9.55000*	6585.00	18.75	30.01		30.26	0.000155	4.00	1646.37	257.80	0.28
Judy Creek	Lower	Judy Creek	9.975*	6585.00	19.18	30.39		30.65	0.000187	4.10	1605.11	254.52	0.29
Judy Creek	Lower	Judy Creek	10.4*	6585.00	19.60	30.82		31.09	0.000194	4.19	1569.94	248.64	0.29
Judy Creek	Lower	Judy Creek	10.825*	6585.00	20.03	31.25		31.54	0.000202	4.30	1532.44	241.50	0.30
Judy Creek	Lower	Judy Creek	11.25*	6585.00	20.45	31.71		32.01	0.000213	4.41	1494.49	236.26	0.31
Judy Creek	Lower	Judy Creek	11.675*	6585.00	20.88	32.23		32.54	0.000252	4.49	1465.35	235.80	0.32
Judy Creek	Lower	Judy Creek	12.1*	6585.00	21.30	32.84		33.16	0.000289	4.54	1451.94	237.18	0.32
Judy Creek	Lower	Judy Creek	12.525*	6585.00	21.73	33.53		33.85	0.000311	4.54	1449.03	240.47	0.33
Judy Creek	Lower	Judy Creek	12.95*	6585.00	22.15	34.24		34.56	0.000321	4.55	1447.56	245.38	0.33
Judy Creek	Lower	Judy Creek	13.375*	6585.00	22.58	35.02		35.34	0.000362	4.51	1459.32	253.19	0.33
Judy Creek	Lower	Judy Creek	13.8	6585.00	23.00	35.85		36.16	0.000354	4.45	1479.46	258.40	0.33

River	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)	
Fish Creek	Lower	Fish Creek	0.7	3.68	3.68	0.00		1676.79	9392.29	10.92	24116.15	
Fish Creek	Lower	Fish Creek	1.54615*	4.05	4.05	0.00	0.37	0.00	1641.61	7707.99	11.40	23486.20
Fish Creek	Lower	Fish Creek	2.39230*	4.46	4.46	0.00	0.41	0.00	1696.21	7652.52	12.27	19119.75
Fish Creek	Lower	Fish Creek	3.23846*	4.85	4.85	0.00	0.39	0.00	1490.64	7859.63	10.73	15373.09
Fish Creek	Lower	Fish Creek	4.08461*	5.23	5.23	0.00	0.37	0.00		9350.96	10.04	8184.44
Fish Creek	Lower	Fish Creek	4.93076*	5.59	5.59	0.00	0.36	0.00		9351.23	9.77	7031.03
Fish Creek	Lower	Fish Creek	5.77692*	5.89	5.89	0.00	0.30	0.00		9352.77	8.23	6080.15
Fish Creek	Lower	Fish Creek	6.62307*	6.15	6.14	0.01	0.25	0.00		9354.29	6.71	5025.06
Fish Creek	Lower	Fish Creek	7.46923*	6.40	6.39	0.01	0.25	0.00		9354.53	6.47	3740.42
Fish Creek	Lower	Fish Creek	8.31538*	6.65	6.64	0.01	0.24	0.00		9354.74	6.26	3014.86
Fish Creek	Lower	Fish Creek	9.16153*	6.92	6.91	0.01	0.27	0.00		9353.96	7.04	2407.47
Fish Creek	Lower	Fish Creek	10.0076*	7.23	7.21	0.02	0.31	0.00		9352.79	8.21	1868.46
Fish Creek	Lower	Fish Creek	10.8538*	7.60	7.57	0.03	0.36	0.00		9361.00		1236.59
Fish Creek	Lower	Fish Creek	11.7	8.27	8.19	0.08	0.66	0.01		9361.00		739.42
Fish Creek	Lower	Fish Creek	12.6	9.56	9.46	0.10	1.29	0.01		9361.00		513.00
Fish Creek	Lower	Fish Creek	13.4285*	10.63	10.54	0.09	1.07	0.00		9183.00		540.77
Fish Creek	Lower	Fish Creek	14.2571*	11.30	11.22	0.09	0.68	0.00		9183.00		539.63
Fish Creek	Lower	Fish Creek	15.0857*	11.77	11.67	0.10	0.46	0.00		9183.00		535.42
Fish Creek	Lower	Fish Creek	15.9142*	12.07	11.96	0.11	0.30	0.00		9183.00		524.52
Fish Creek	Lower	Fish Creek	16.7428*	12.33	12.20	0.13	0.25	0.01		9183.00		511.33
Fish Creek	Lower	Fish Creek	17.5714*	12.65	12.50	0.15	0.32	0.01		9183.00		503.30
Fish Creek	Lower	Fish Creek	18.4	13.04	12.87	0.17	0.39	0.01		9183.00		496.56
Fish Creek	Lower	Fish Creek	19.2375*	13.48	13.32	0.16	0.44	0.00		8910.00		472.57
Fish Creek	Lower	Fish Creek	20.075*	13.96	13.79	0.17	0.48	0.00		8910.00		452.27
Fish Creek	Lower	Fish Creek	20.9125*	14.49	14.32	0.17	0.53	0.00		8910.00		427.48
Fish Creek	Lower	Fish Creek	21.75*	15.11	14.93	0.18	0.62	0.00		8910.00		410.73
Fish Creek	Lower	Fish Creek	22.5875*	15.82	15.64	0.18	0.72	0.00		8910.00		398.51
Fish Creek	Lower	Fish Creek	23.425*	16.62	16.44	0.18	0.80	0.00		8910.00		388.57
Fish Creek	Lower	Fish Creek	24.2625*	17.48	17.29	0.19	0.86	0.00		8910.00		379.70
Fish Creek	Lower	Fish Creek	25.1	18.43	18.22	0.21	0.94	0.00		8910.00		371.69
Fish Creek	Lower	Fish Creek	26.09	19.58	19.36	0.21	1.15	0.00		8898.00		369.66
Fish Creek	Upper	Fish Creek	26.85	20.13	20.11	0.02	0.54	0.02		2366.00		320.71
Fish Creek	Upper	Fish Creek	27.6428*	20.23	20.21	0.02	0.10	0.00		2334.00		314.89
Fish Creek	Upper	Fish Creek	28.4357*	20.37	20.35	0.02	0.14	0.00		2334.00		307.58
Fish Creek	Upper	Fish Creek	29.2285*	20.56	20.54	0.03	0.19	0.00		2334.00		299.23
Fish Creek	Upper	Fish Creek	30.0214*	20.80	20.77	0.03	0.24	0.00		2334.00		290.91
Fish Creek	Upper	Fish Creek	30.8142*	21.09	21.06	0.03	0.29	0.00		2334.00		282.58
Fish Creek	Upper	Fish Creek	31.6071*	21.42	21.39	0.03	0.33	0.00		2334.00		274.17
Fish Creek	Upper	Fish Creek	32.4	21.81	21.77	0.04	0.38	0.00		2334.00		266.42
Fish Creek	Upper	Fish Creek	33.3083*	22.29	22.26	0.04	0.48	0.00		2293.00		274.47
Fish Creek	Upper	Fish Creek	34.2166*	22.83	22.79	0.04	0.54	0.00		2293.00		283.24
Fish Creek	Upper	Fish Creek	35.125*	23.40	23.36	0.04	0.58	0.00		2293.00		292.00
Fish Creek	Upper	Fish Creek	36.0333*	24.00	23.96	0.04	0.61	0.00		2293.00		300.75
Fish Creek	Upper	Fish Creek	36.9416*	24.65	24.61	0.04	0.65	0.00		2293.00		309.53
Fish Creek	Upper	Fish Creek	37.85*	25.33	25.28	0.04	0.68	0.00		2293.00		318.15
Fish Creek	Upper	Fish Creek	38.7583*	26.03	25.99	0.04	0.71	0.00		2293.00		326.09
Fish Creek	Upper	Fish Creek	39.6666*	26.76	26.72	0.04	0.73	0.00		2293.00		334.30
Fish Creek	Upper	Fish Creek	40.575*	27.46	27.42	0.04	0.69	0.00		2293.00		342.34
Fish Creek	Upper	Fish Creek	41.4833*	28.13	28.10	0.04	0.67	0.00		2293.00		350.58
Fish Creek	Upper	Fish Creek	42.3916*	28.80	28.76	0.04	0.66	0.00		2293.00		359.10
Fish Creek	Upper	Fish Creek	43.3	29.47	29.43	0.04	0.66	0.00		2293.00		367.86
Judy Creek	Lower	Judy Creek	0.38	20.61	20.31	0.30	1.01	0.03		7374.00		236.73
Judy Creek	Lower	Judy Creek	.981819*	21.29	21.00	0.29	0.67	0.00		7169.00		260.81
Judy Creek	Lower	Judy Creek	1.58363*	21.94	21.65	0.29	0.65	0.00		7169.00		279.70
Judy Creek	Lower	Judy Creek	2.18545*	22.95	22.70	0.25	1.01	0.00		7169.00		294.43
Judy Creek	Lower	Judy Creek	2.78727*	23.85	23.62	0.23	0.90	0.00		7169.00		295.40

Judy Creek	Lower	Judy Creek	3.38909*	24.27	24.03	0.24	0.43	0.01	7169.00	291.45	
Judy Creek	Lower	Judy Creek	3.99090*	24.70	24.44	0.26	0.42	0.01	7169.00	287.47	
Judy Creek	Lower	Judy Creek	4.59272*	25.14	24.86	0.28	0.44	0.01	7169.00	283.61	
Judy Creek	Lower	Judy Creek	5.19454*	25.58	25.27	0.30	0.43	0.01	7169.00	279.71	
Judy Creek	Lower	Judy Creek	5.79636*	26.00	25.67	0.33	0.41	0.01	7169.00	275.84	
Judy Creek	Lower	Judy Creek	6.39818*	26.47	26.12	0.35	0.46	0.01	7169.00	272.19	
Judy Creek	Lower	Judy Creek	7.0	27.14	26.80	0.34	0.67	0.00	7169.00	270.00	
Judy Creek	Lower	Judy Creek	7.42500*	27.83	27.57	0.26	0.67	0.01	6585.00	269.20	
Judy Creek	Lower	Judy Creek	7.85000*	28.35	28.10	0.25	0.52	0.00	6585.00	267.10	
Judy Creek	Lower	Judy Creek	8.27500*	28.87	28.63	0.24	0.53	0.00	6585.00	265.09	
Judy Creek	Lower	Judy Creek	8.70000*	29.39	29.15	0.24	0.52	0.00	6585.00	263.15	
Judy Creek	Lower	Judy Creek	9.12500*	29.86	29.63	0.24	0.47	0.00	6585.00	260.91	
Judy Creek	Lower	Judy Creek	9.55000*	30.26	30.01	0.25	0.39	0.00	6585.00	257.80	
Judy Creek	Lower	Judy Creek	9.975*	30.65	30.39	0.26	0.39	0.00	6585.00	254.52	
Judy Creek	Lower	Judy Creek	10.4*	31.09	30.82	0.27	0.43	0.00	6585.00	248.64	
Judy Creek	Lower	Judy Creek	10.825*	31.54	31.25	0.29	0.45	0.00	6585.00	241.50	
Judy Creek	Lower	Judy Creek	11.25*	32.01	31.71	0.30	0.47	0.00	6585.00	236.26	
Judy Creek	Lower	Judy Creek	11.675*	32.54	32.23	0.31	0.53	0.00	6585.00	235.80	
Judy Creek	Lower	Judy Creek	12.1*	33.16	32.84	0.32	0.62	0.00	6585.00	237.18	
Judy Creek	Lower	Judy Creek	12.525*	33.85	33.53	0.32	0.68	0.00	6585.00	240.47	
Judy Creek	Lower	Judy Creek	12.95*	34.56	34.24	0.32	0.72	0.00	6585.00	245.38	
Judy Creek	Lower	Judy Creek	13.375*	35.34	35.02	0.32	0.78	0.00	6585.00	253.19	
Judy Creek	Lower	Judy Creek	13.8	36.16	35.85	0.31	0.82	0.00	0.03	6584.97	258.40

Profile Output Table - Junctions

River	Reach	River Sta	W.S. Elev (ft)	E.G. Elev (ft)	Q Total (cfs)
Fish Creek	Upper Fish Creek	26.85	20.11	20.13	2366.00
Judy Creek	Lower Judy Creek	0.38	20.31	20.61	7374.00
Junction:	Fish Junct.				
Fish Creek	Lower Fish Creek	26.09	19.36	19.58	8898.00

Table E.2

HEC-RAS Run, Fish and Judy Creeks, 100-Year Flood Calibrated

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

```

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
XXXXXXXX XXXX   X       XXX XXXX XXXXXXX 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: 100-Year Flood
 Project File : November2002.prj
 Run Date and Time: 11/15/2002 12:25:52 PM

Project in English units

PLAN DATA

Plan Title: 100 Year Flood
 Plan File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\November2002.p01

Geometry Title: 100-Year Flood From 2002 Calibration
 Geometry File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\November2002.g12

Flow Title : 100-Year Flood Calibrated
 Flow File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\November2002.f08

Plan Summary Information:

Number of:	Cross Sections =	79	Multiple Openings =	0
	Culverts =	0	Inline Weirs =	0
	Bridges =	0		

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculaton tolerance =	0.01
Maximum number of interations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
 Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Friction Slope
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 100-Year Flood Calibrated
 Flow File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\November2002.f08

Flow Data (cfs)

River	Reach	RS	Calibration
Fish Creek	Upper Fish Creek	43.3	25000
Fish Creek	Upper Fish Creek	32.4	25400
Fish Creek	Upper Fish Creek	26.85	25700
Fish Creek	Lower Fish Creek	26.09	43600
Fish Creek	Lower Fish Creek	25.1	43600
Fish Creek	Lower Fish Creek	18.4	44800
Fish Creek	Lower Fish Creek	12.6	45600
Fish Creek	Lower Fish Creek	11.7	45600
Fish Creek	Lower Fish Creek	0.7	53000
Judy Creek	Lower Judy Creek	13.8	19900
Judy Creek	Lower Judy Creek	7.0	21500
Judy Creek	Lower Judy Creek	0.38	22100

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Fish Creek	Lower Fish Creek	Calibration		Normal S = .00008

GEOMETRY DATA

Geometry Title: 100-Year Flood From 2002 Calibration
 Geometry File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\November2002.g12

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Fish Creek	Upper Fish Creek		Fish Junct.
Fish Creek	Lower Fish Creek	Fish Junct.	
Judy Creek	Lower Judy Creek		Fish Junct.

JUNCTION INFORMATION

Name: Fish Junct.
 Description: Confluence of Fish and Judy Creek
 Energy computation Method

Length across Junction		Tributary		Length	Angle
River	Reach	River	Reach		
Fish Creek	Upper Fish Creek to Fish Creek	Fish Creek	Lower Fish Creek	3915	
Judy Creek	Lower Judy Creek to Fish Creek	Fish Creek	Lower Fish Creek	3694	

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 43.3

INPUT

Description: Cross Section at River Mile 43.3

Station Elevation Data num= 62									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3	95.5	63.1	87.2	195.6	35	1377.1	35.7	1387.5	37.1
1507	37.6	1802.5	39	1914.9	40.9	2104.3	38.2	2170.4	38.4
2182.2	37.3	2197.8	27.1	2203.6	25.7	2212.1	21.6	2222.7	18.7
2231.9	19.3	2242.5	18.7	2252.4	19.1	2261.6	21.5	2272.2	22.2
2282.1	23.4	2292.8	23.5	2302	24	2311.9	24.2	2322.5	25
2332.4	24.9	2342.3	25.3	2351.9	25.7	2405.5	27.5	2452.6	27.9
2505.3	28.1	2551.4	28.1	2562.1	29.4	2577.3	34.4	2587.3	35.1
2721.7	40.7	2906.1	42.2	3074.5	34.9	3160.8	34.5	3185	35.9
3475.7	32.8	3562.3	42.5	3907.5	44.9	4205.9	44.9	4504.3	43.2
4806.6	41.6	5103.9	39.6	5129.4	39.7	5282.4	39.8	5407.4	40.5
5701.3	42.8	5925.6	43.2	6115.3	51.7	6309.9	55.6	6604.2	56.5
6910.5	54.9	7207.6	52.8	7509.9	53.1	7808.3	51.6	8106.9	54.4
8409.5	53.4	8705.2	56.6						

Manning's n Values num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3	.04	2182.2	.027	2562.1	.07	2721.7	.04

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	2182.2	2577.3		1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
3	2170.4	31.63	2562.1	8705.2	31.63

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	39.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.040	0.029	0.041
W.S. Elev (ft)	39.29	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	5356.43	5234.78	2596.39
E.G. Slope (ft/ft)	0.000137	Area (sq ft)	5356.43	5234.78	2596.39
Q Total (cfs)	25000.00	Flow (cfs)	4989.77	17259.17	2751.06
Top Width (ft)	2855.06	Top Width (ft)	1789.08	395.10	670.88
Vel Total (ft/s)	1.90	Avg. Vel. (ft/s)	0.93	3.30	1.06
Max Chl Dpth (ft)	20.59	Hydr. Depth (ft)	2.99	13.25	3.87
Conv. Total (cfs)	2134256.0	Conv. (cfs)	425977.6	1473420.0	234858.6
Length Wtd. (ft)	4010.97	Wetted Per. (ft)	1790.06	402.93	671.50
Min Ch El (ft)	18.70	Shear (lb/sq ft)	0.03	0.11	0.03
Alpha	2.17	Stream Power (lb/ft s)	0.02	0.37	0.04
Frctn Loss (ft)	0.66	Cum Volume (acre-ft)	7393.13	8346.65	6364.30
C & E Loss (ft)	0.01	Cum SA (acres)	1945.92	647.96	1723.13

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 42.3916*

INPUT

Description: Interpolated Cross Section at River Mile 42.39

Station Elevation Data num= 154									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.75	93.31	77.59	85.42	102.3	78.16	198.07	50.39	242.58	37.5
266.58	37.52	305.9	37.1	386.03	37.04	479.14	37.12	574.75	37.11

676.79	37.21	760.81	37.27	862.64	37.72	956.16	37.67	1010.33	37.57
1044.37	37.28	1120.15	37.56	1228.92	37.63	1270.14	37.66	1334.67	37.61
1427.27	37.29	1461.38	37.05	1525.6	37.14	1613.87	37.11	1695.17	37.65
1713.79	37.71	1723.85	38.74	1726.74	38.96	1743.34	38.64	1782.6	37.5
1812.83	37.4	1875.54	37.76	1921.76	38.05	1953	37.38	1977.44	37.13
2016.89	37.08	2092.76	37.22	2186.47	37.53	2243.5	37.66	2281	38.08
2306.08	38.42	2383.46	39.33	2481.03	38.24	2559.2	37.46	2580.2	37.33
2593.78	36.94	2619.3	36.75	2701.61	37.17	2713.39	36.4	2716.3	36.17
2719.46	34.24	2721.85	32.55	2724.96	30.71	2730.06	27.89	2733.4	26.06
2735.2	25.69	2739.75	24.76	2740.3	24.54	2745.4	22.48	2749.07	21
2750.49	20.67	2755.59	19.49	2760.68	18.28	2769.12	18.82	2778.83	18.28
2788.36	18.66	2796.28	20.63	2797.22	20.87	2807.42	21.53	2813.73	22.28
2816.95	22.66	2827.25	22.78	2831.18	22.99	2836.11	23.29	2845.64	23.55
2849.15	23.84	2855.84	24.32	2865.37	24.23	2874.9	24.6	2884.15	24.98
2931.34	26.51	2935.74	26.65	2981.08	27.05	3013.18	27.18	3031.81	27.19
3045.98	27.15	3063.96	26.97	3072.86	26.94	3076.19	26.98	3080.36	27.52
3085.77	28.28	3086.49	28.39	3101.12	33.37	3111.49	34.08	3112.41	34.13
3250.85	39.22	3255.48	39.25	3442.04	40.58	3563.17	35.93	3616.65	33.89
3706.13	33.55	3731.22	34.84	3799.83	34.2	3898.18	33.35	3948.94	33.46
4032.64	32.43	4083.73	37.34	4122.43	41.14	4283.73	42.01	4480.35	43.11
4502.5	43.1	4691.43	43.03	4789.75	43	4896.61	42.44	5086.54	41.67
5099.14	41.61	5412.58	40.3	5720.84	38.62	5735.79	38.68	5747.28	38.78
5905.92	39.69	5976.7	40.41	6035.53	40.86	6121.7	41.68	6215.24	42.39
6340.26	43.27	6430.19	43.43	6572.83	43.62	6637.38	46.16	6769.52	51.33
6855.5	52.82	6971.29	54.91	7083.03	55.26	7276.44	55.79	7281.74	55.77
7509.13	54.51	7594.02	54.11	7743.71	53.17	7902.07	52.18	7999.93	52.27
8161.19	52.41	8215.51	52.46	8372.04	51.78	8524.91	50.96	8595.19	51.47
8756.8	52.82	8834.52	53.64	8907.06	53.6	9071.62	53.02	9148.27	52.61
9186.86	52.88	9318.42	54.17	9360.04	54.93	9454.87	56.27		

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2.75	.04	2716.3	.027	3086.49	.07	3101.12	.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 2716.3 3101.12 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
2.75	2716.3	30.85	3101.12	9454.87	30.85

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	38.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.040	0.029	0.042
W.S. Elev (ft)	38.55	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	2625.04	5124.61	2814.43
E.G. Slope (ft/ft)	0.000192	Area (sq ft)	2625.04	5124.61	2814.43
Q Total (cfs)	25000.00	Flow (cfs)	1472.55	20089.05	3438.39
Top Width (ft)	3433.43	Top Width (ft)	2316.14	384.82	732.46
Vel Total (ft/s)	2.37	Avg. Vel. (ft/s)	0.56	3.92	1.22
Max Chl Dpth (ft)	20.27	Hydr. Depth (ft)	1.13	13.32	3.84
Conv. Total (cfs)	1805396.0	Conv. (cfs)	106341.6	1450748.0	248306.2
Length Wtd. (ft)	4193.08	Wetted Per. (ft)	2316.42	390.19	733.00
Min Ch El (ft)	18.28	Shear (lb/sq ft)	0.01	0.16	0.05
Alpha	2.24	Stream Power (lb/ft s)	0.01	0.62	0.06
Frctn Loss (ft)	0.89	Cum Volume (acre-ft)	7218.75	7781.70	6255.90
C & E Loss (ft)	0.00	Cum SA (acres)	1856.22	605.43	1695.01

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 41.4833*

INPUT

Description: Interpolated Cross Section at River Mile 41.48

Station Elevation Data		num= 154	
Sta	Elev	Sta	Elev
2.5	91.12	92.07	83.64
	121.66	76.93	236.28
	51.7	289.55	40
318.28	40.03	365.34	39.18
	461.25	39.01	572.7
	39.13	687.13	39.07
809.28	39.21	909.84	39.29
	1031.72	40.15	1143.65
	40	1208.49	39.77
1249.24	39.18	1339.93	39.7
	1470.13	39.79	1519.46
	39.82	1596.7	39.7
1707.54	39.02	1748.37	38.52
	1825.22	38.68	1930.89
	38.56	2028.19	39.61
2050.47	39.72	2062.52	40.69
	2065.97	40.82	2085.85
	40.13	2132.84	37.71
2169.01	37.41	2244.08	37.93
	2299.4	38.33	2336.79
	36.86	2366.05	36.27
2413.27	36.03	2504.07	36.02
	2616.24	36.27	2684.49
	36.32	2729.38	36.66
2759.4	36.99	2852.01	37.76
	2968.8	36.7	3062.36
	36.02	3087.5	36.01
3103.76	35.39	3134.3	35.3
	3232.81	35.95	3246.92
	35.28	3250.4	35.03
3253.84	33.06	3256.44	31.12
	3259.82	29.29	3265.36
	26.69	3268.99	25.02
3270.96	24.68	3275.9	23.82
	3276.5	23.62	3282.04
	21.75	3286.03	20.4
3287.58	20.1	3293.12	19.01
	3298.67	17.85	3306.33
	18.35	3315.17	17.85
3324.33	18.21	3331.94	20.02
	3332.84	20.24	3342.65
	20.87	3348.71	21.56
3351.81	21.92	3361.71	22.06
	3365.48	22.27	3370.22
	22.58	3379.38	22.91
3382.76	23.2	3389.19	23.64
	3398.35	23.57	3407.51
	23.91	3416.39	24.25
3461.76	25.67	3465.99	25.81
	3509.57	26.19	3540.42
	26.34	3558.33	26.29
3571.95	26.2	3589.23	25.83
	3597.78	25.78	3600.99
	25.86	3604.99	26.4
3610.19	27.26	3610.89	27.37
	3624.95	32.33	3635.69
	33.07	3636.64	33.11
3779.99	37.73	3784.79	37.76
	3977.99	38.96	4103.42
	34.73	4158.8	32.89
4251.46	32.59	4277.44	33.77
	4348.5	33.21	4450.34
	32.52	4502.9	33.25
4589.57	32.06	4642.49	36.37
	4682.55	39.79	4849.6
	40.43	5053.2	41.32
5076.14	41.3	5271.78	41.15
	5373.59	41.1	5484.25
	40.56	5680.94	40.07
5693.99	40.03	6018.57	39
	6337.78	37.64	6353.27
	37.7	6365.16	37.85
6529.44	39.58	6602.74	40.64
	6663.65	41.21	6752.9
	42.21	6849.75	42.93
6979.22	43.75	7072.35	43.9
	7220.05	44.03	7286.9
	46.32	7423.73	50.96
7512.77	52.27	7632.68	54.23
	7748.39	54.59	7948.67
	55.08	7954.16	55.06
8189.64	53.69	8277.55	53.33
	8432.56	52.47	8596.55
	51.57	8697.89	51.64
8864.87	51.77	8921.13	51.83
	9083.22	51.22	9241.52
	50.31	9314.3	50.71
9481.66	51.95	9562.13	52.89
	9637.25	53.02	9807.66
	52.4	9887.04	51.81
9927	51.95	10063.23	53.16
	10106.34	54.26	10204.53
	55.93		

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
2.5	.041	3250.4	.028
		3610.89	.07
		3624.95	.043

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	3250.4	3624.95		1903.5	4751.08	1745.42	.1
							.3

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Elev
2.5	3250.4	30.06	3624.95
			10204.53
			30.06

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	37.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.041	0.030	0.043
W.S. Elev (ft)	37.63	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	1160.79	4941.60	2928.91
E.G. Slope (ft/ft)	0.000231	Area (sq ft)	1160.79	4941.60	2928.91
Q Total (cfs)	25000.00	Flow (cfs)	753.35	20511.38	3735.28
Top Width (ft)	2127.59	Top Width (ft)	961.31	374.55	791.73

Vel Total (ft/s)	2.77	Avg. Vel. (ft/s)	0.65	4.15	1.28
Max Chl Dpth (ft)	19.78	Hydr. Depth (ft)	1.21	13.19	3.70
Conv. Total (cfs)	1644373.0	Conv. (cfs)	49551.5	1349134.0	245687.4
Length Wtd. (ft)	4185.93	Wetted Per. (ft)	961.38	379.46	792.18
Min Ch El (ft)	17.85	Shear (lb/sq ft)	0.02	0.19	0.05
Alpha	1.88	Stream Power (lb/ft s)	0.01	0.78	0.07
Frctn Loss (ft)	0.99	Cum Volume (acre-ft)	7136.03	7232.74	6140.83
C & E Loss (ft)	0.00	Cum SA (acres)	1784.61	564.02	1664.48

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 40.575*

INPUT
Description: Interpolated Cross Section at River Mile 40.58

Station Elevation Data		num= 154							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.25	88.93	106.56	81.85	141.01	75.71	274.49	53.01	336.53	42.5
369.98	42.53	424.79	41.25	536.48	40.98	666.26	41.13	799.52	41.02
941.76	41.2	1058.86	41.31	1200.79	42.57	1331.15	42.33	1406.65	41.97
1454.11	41.09	1559.72	41.84	1711.34	41.95	1768.79	41.99	1858.73	41.79
1987.81	40.75	2035.35	39.98	2124.85	40.21	2247.9	40.01	2361.21	41.57
2387.16	41.74	2401.19	42.64	2405.21	42.68	2428.35	41.62	2483.07	37.92
2525.2	37.42	2612.61	38.09	2677.04	38.61	2720.58	36.35	2754.65	35.42
2809.64	34.98	2915.38	34.82	3046	35.01	3125.49	34.98	3177.77	35.23
3212.72	35.56	3320.57	36.2	3456.57	35.16	3565.53	34.59	3594.8	34.69
3613.73	33.84	3649.3	33.85	3764.02	34.72	3780.45	34.16	3784.5	33.9
3788.21	31.89	3791.03	29.69	3794.68	27.87	3800.67	25.49	3804.59	23.98
3806.71	23.68	3812.06	22.88	3812.7	22.69	3818.69	21.01	3823	19.8
3824.68	19.53	3830.66	18.53	3836.65	17.43	3843.55	17.88	3851.5	17.43
3860.29	17.77	3867.59	19.41	3868.46	19.61	3877.87	20.2	3883.69	20.85
3886.66	21.18	3896.16	21.34	3899.79	21.54	3904.33	21.87	3913.12	22.26
3916.36	22.56	3922.53	22.96	3931.32	22.9	3940.11	23.21	3948.64	23.53
3992.17	24.83	3996.23	24.96	4038.05	25.34	4067.66	25.49	4084.84	25.38
4097.91	25.25	4114.49	24.7	4122.7	24.62	4125.78	24.75	4129.62	25.29
4134.61	26.23	4135.28	26.36	4148.77	31.3	4159.88	32.05	4160.86	32.1
4309.14	36.25	4314.1	36.28	4513.93	37.34	4643.67	33.53	4700.95	31.88
4796.79	31.64	4823.67	32.71	4897.16	32.22	5002.5	31.69	5056.86	33.05
5146.51	31.69	5201.24	35.39	5242.68	38.43	5415.46	38.86	5626.05	39.54
5649.77	39.5	5852.13	39.28	5957.44	39.2	6071.9	38.68	6275.34	38.48
6288.83	38.44	6624.56	37.7	6954.73	36.65	6970.74	36.72	6983.04	36.93
7152.96	39.47	7228.77	40.86	7291.78	41.57	7384.09	42.74	7484.27	43.47
7618.18	44.22	7714.5	44.37	7867.28	44.45	7936.42	46.49	8077.95	50.59
8170.04	51.72	8294.07	53.54	8413.75	53.92	8620.91	54.37	8626.59	54.35
8870.14	52.87	8961.07	52.54	9121.4	51.76	9291.02	50.95	9395.84	51.02
9568.55	51.14	9626.74	51.19	9794.4	50.66	9958.13	49.67	10033.41	49.95
10206.51	51.07	10289.75	52.13	10367.45	52.45	10543.7	51.78	10625.81	51.02
10667.14	51.03	10808.05	52.16	10852.64	53.58	10954.2	55.6		

Manning's n Values		num= 4			
Sta	n Val	Sta	n Val	Sta	n Val
2.25	.041	3784.5	.028	4135.28	.07
				4148.77	.043

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
3784.5 4148.77 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions		num= 2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev

2.25 3784.5 29.29 4148.77 10954.2 29.29

CROSS SECTION OUTPUT Profile #Calibration

Element	Left OB	Channel	Right OB
E.G. Elev (ft)	36.86		
Vel Head (ft)	0.22	0.041	0.030
W.S. Elev (ft)	36.64	1903.50	4751.08
Crit W.S. (ft)		1692.02	4735.28
E.G. Slope (ft/ft)	0.000243	1692.02	4735.28
Q Total (cfs)	25000.00	1298.18	19979.36
Top Width (ft)	2346.97	1069.47	364.27
Vel Total (ft/s)	2.65	0.77	4.22
Max Chl Dpth (ft)	19.21	1.58	13.00
Conv. Total (cfs)	1603345.0	83257.1	1281352.0
Length Wtd. (ft)	4117.09	1069.54	368.84
Min Ch El (ft)	17.43	0.02	0.19
Alpha	2.06	0.02	0.82
Frctn Loss (ft)	1.06	7073.70	6705.02
C & E Loss (ft)	0.00	1740.24	523.72

Warning: Divided flow computed for this cross-section.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 39.6666*

INPUT
 Description: Interpolated Cross Section at River Mile 39.67

Station	Elevation	Data	num=	154
Sta	Elev	Sta	Elev	Sta
2	86.73	121.05	80.07	160.37
421.68	45.04	484.23	43.32	611.7
1074.24	43.2	1207.89	43.33	1369.87
1658.97	42.99	1779.51	43.98	1952.54
2268.07	42.48	2322.33	41.45	2424.48
2723.84	43.75	2739.86	44.59	2744.44
2881.39	37.43	2981.15	38.26	3054.68
3206.01	33.93	3326.7	33.62	3475.77
3666.04	34.13	3789.13	34.63	3944.34
4123.71	32.29	4164.29	32.4	4295.23
4322.59	30.71	4325.61	28.26	4329.54
4342.47	22.67	4348.21	21.94	4348.9
4361.77	18.96	4368.2	18.05	4374.63
4396.25	17.32	4403.25	18.8	4404.08
4421.52	20.44	4430.62	20.62	4434.09
4449.97	21.92	4455.88	22.28	4464.3
4522.59	24	4526.47	24.11	4566.54
4623.88	24.3	4639.76	23.57	4647.62
4659.03	25.21	4659.67	25.35	4672.6
4838.29	34.77	4843.41	34.79	5049.87
5342.12	30.69	5369.89	31.64	5445.82
5703.44	31.31	5759.99	34.41	5802.81
6223.41	37.7	6432.48	37.4	6541.29
6883.68	36.86	7230.54	36.4	7571.67
7776.48	39.36	7854.81	41.09	7919.91
8257.14	44.69	8356.66	44.84	8514.5
8827.32	51.17	8955.45	52.85	9079.12

9550.65	52.05	9644.59	51.75	9810.25	51.05	9985.49	50.3310093.79	50.4
10272.24	50.510332.36		50.5510505.58		50.0910674.75		49.0310752.52	49.19
10931.37	50.211017.37		51.3711097.64		51.8811279.75		51.1611364.58	50.22
11407.28	50.111552.87		51.1511598.93		52.9111703.87		55.27	

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2	.042	4318.6	.029	4659.67	.07	4672.6	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4318.6 4672.6 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
2	4318.6	28.51	4672.6	11703.87	28.51

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	35.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.042	0.031	0.044
W.S. Elev (ft)	35.58	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	2258.83	4511.13	3089.01
E.G. Slope (ft/ft)	0.000272	Area (sq ft)	2258.83	4511.13	3089.01
Q Total (cfs)	25000.00	Flow (cfs)	2003.21	19300.41	3696.38
Top Width (ft)	2627.95	Top Width (ft)	1206.58	354.00	1067.37
Vel Total (ft/s)	2.54	Avg. Vel. (ft/s)	0.89	4.28	1.20
Max Chl Dpth (ft)	18.58	Hydr. Depth (ft)	1.87	12.74	2.89
Conv. Total (cfs)	1514876.0	Conv. (cfs)	121384.8	1169509.0	223982.1
Length Wtd. (ft)	4049.20	Wetted Per. (ft)	1206.65	358.32	1067.69
Min Ch El (ft)	17.00	Shear (lb/sq ft)	0.03	0.21	0.05
Alpha	2.24	Stream Power (lb/ft s)	0.03	0.92	0.06
Frctn Loss (ft)	1.16	Cum Volume (acre-ft)	6987.37	6200.76	5899.63
C & E Loss (ft)	0.00	Cum SA (acres)	1690.51	484.55	1590.64

Warning: Divided flow computed for this cross-section.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 38.7583*

INPUT Description: Interpolated Cross Section at River Mile 38.76

Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.75	84.54	135.53	78.29	179.72	73.26	350.92	55.63	430.48	47.5
473.38	47.55	543.68	45.39	686.93	44.91	853.38	45.15	1024.29	44.93
1206.72	45.2	1356.92	45.35	1538.95	47.42	1706.14	46.99	1802.97	46.38
1863.84	44.89	1999.29	46.12	2193.75	46.27	2267.44	46.33	2382.79	45.97
2548.34	44.2	2609.32	42.92	2724.11	43.27	2881.92	42.92	3027.26	45.49
3060.53	45.76	3078.52	46.54	3083.68	46.4	3113.36	44.59	3183.55	38.33
3237.58	37.44	3349.69	38.42	3432.32	39.16	3488.16	35.31	3531.86	33.7
3602.39	32.87	3738.01	32.42	3905.54	32.5	4007.48	32.3	4074.53	32.38
4119.36	32.7	4257.68	33.06	4432.11	32.08	4571.85	31.73	4609.4	32.04
4633.68	30.75	4679.29	30.95	4826.43	32.27	4847.51	31.93	4852.7	31.63
4856.96	29.53	4860.2	26.83	4864.39	25.04	4871.27	23.09	4875.78	21.91
4878.22	21.66	4884.36	21	4885.1	20.85	4891.98	19.54	4896.94	18.6
4898.86	18.39	4905.74	17.57	4912.62	16.58	4917.98	16.92	4924.17	16.58
4932.22	16.88	4938.91	18.19	4939.7	18.34	4948.32	18.87	4953.65	19.41

4956.37	19.7	4965.07	19.9	4968.39	20.09	4972.55	20.46	4980.6	20.97
4983.57	21.28	4989.22	21.6	4997.27	21.57	5005.32	21.82	5013.13	22.08
5053	23.16	5056.72	23.26	5095.02	23.64	5122.13	23.81	5137.88	23.57
5149.84	23.35	5165.03	22.43	5172.55	22.31	5175.36	22.51	5178.88	23.07
5183.45	24.18	5184.06	24.33	5196.43	29.23	5208.27	30.02	5209.32	30.08
5367.43	33.28	5372.72	33.3	5585.81	34.11	5724.16	31.12	5785.25	29.87
5887.45	29.73	5916.11	30.58	5994.48	30.24	6106.81	30.02	6164.78	32.64
6260.38	30.94	6318.74	33.44	6362.93	35.72	6547.18	35.71	6771.75	35.96
6797.05	35.9	7012.84	35.53	7125.13	35.41	7247.19	34.93	7464.13	35.28
7478.52	35.27	7836.53	35.1	8188.61	34.69	8205.69	34.76	8218.81	35.08
8400	39.26	8480.85	41.31	8548.04	42.28	8646.47	43.8	8753.3	44.54
8896.09	45.16	8998.81	45.31	9161.73	45.28	9235.46	46.83	9386.38	49.86
9484.59	50.63	9616.84	52.17	9744.48	52.58	9965.38	52.96	9971.44	52.94
10231.16	51.23	10328.12	50.97	10499.09	50.35	10679.97	49.72	10791.74	49.77
10975.92	49.86	11037.97	49.91	11216.75	49.53	11391.36	48.39	11471.63	48.43
11656.22	49.32	11744.98	50.62	11827.84	51.31	12015.79	50.54	12103.34	49.43
12147.42	49.18	12297.68	50.14	12345.23	52.23	12453.53	54.93		

Manning's n Values	num=	4
Sta n Val Sta n Val Sta n Val		
1.75 .042 4852.7 .029 5184.06 .07 5196.43 .045		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
4852.7 5196.43	1903.5 4751.08 1745.42	.1	.3

Blocked Obstructions	num=	2
Sta L Sta R Elev Sta L Sta R Elev		
1.75 4852.7 27.72 5196.43 12453.53 27.72		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	34.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.042	0.031	0.045
W.S. Elev (ft)	34.42	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	2781.51	4259.06	3103.83
E.G. Slope (ft/ft)	0.000300	Area (sq ft)	2781.51	4259.06	3103.83
Q Total (cfs)	25000.00	Flow (cfs)	2771.33	18772.58	3456.09
Top Width (ft)	2825.45	Top Width (ft)	1340.40	343.73	1141.32
Vel Total (ft/s)	2.46	Avg. Vel. (ft/s)	1.00	4.41	1.11
Max Chl Dpth (ft)	17.84	Hydr. Depth (ft)	2.08	12.39	2.72
Conv. Total (cfs)	1444195.0	Conv. (cfs)	160093.6	1084450.0	199650.6
Length Wtd. (ft)	4000.40	Wetted Per. (ft)	1340.48	347.88	1141.59
Min Ch El (ft)	16.58	Shear (lb/sq ft)	0.04	0.23	0.05
Alpha	2.45	Stream Power (lb/ft s)	0.04	1.01	0.06
Frctn Loss (ft)	1.20	Cum Volume (acre-ft)	6877.25	5722.48	5775.56
C & E Loss (ft)	0.00	Cum SA (acres)	1634.86	446.50	1546.39

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

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 37.85*

INPUT
Description: Interpolated Cross Section at River Mile 37.85

Station Elevation Data	num=	154
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1.5 82.35 150.02 76.51 199.08 72.04 389.13 56.94 477.46 50		
525.09 50.06 603.13 47.47 762.15 46.88 946.94 47.16 1136.68 46.88		

1339.21	47.2	1505.94	47.37	1708.03	49.85	1893.63	49.32	2001.13	48.58
2068.7	46.79	2219.08	48.26	2434.96	48.43	2516.76	48.49	2644.82	48.06
2828.6	45.93	2896.3	44.39	3023.73	44.81	3198.93	44.38	3360.28	47.45
3397.21	47.77	3417.19	48.49	3422.92	48.27	3455.87	46.08	3533.78	38.54
3593.77	37.44	3718.23	38.59	3809.96	39.44	3871.95	34.8	3920.47	32.84
3998.76	31.82	4149.32	31.21	4335.3	31.24	4448.48	30.96	4522.91	30.95
4572.68	31.27	4726.24	31.49	4919.88	30.54	5075.02	30.29	5116.7	30.72
5143.65	29.2	5194.29	29.5	5357.64	31.04	5381.03	30.81	5386.8	30.5
5391.34	28.36	5394.78	25.39	5399.25	23.62	5406.58	21.9	5411.38	20.87
5413.98	20.65	5420.51	20.06	5421.3	19.93	5428.63	18.81	5433.9	18
5435.95	17.82	5443.28	17.09	5450.6	16.15	5455.2	16.45	5460.5	16.15
5468.18	16.43	5474.56	17.57	5475.32	17.71	5483.54	18.21	5488.63	18.7
5491.22	18.96	5499.52	19.18	5502.69	19.36	5506.66	19.75	5514.34	20.32
5517.18	20.64	5522.57	20.92	5530.25	20.9	5537.93	21.13	5545.38	21.36
5583.41	22.32	5586.96	22.42	5623.5	22.78	5649.37	22.96	5664.39	22.66
5675.81	22.4	5690.3	21.3	5697.47	21.15	5700.16	21.39	5703.51	21.96
5707.88	23.15	5708.46	23.32	5720.25	28.2	5732.46	29.01	5733.54	29.07
5896.58	31.8	5902.03	31.82	6121.76	32.49	6264.41	29.92	6327.4	28.87
6432.78	28.78	6462.33	29.51	6543.14	29.25	6658.96	29.19	6718.74	32.43
6817.31	30.57	6877.49	32.46	6923.06	34.37	7113.04	34.14	7344.59	34.17
7370.68	34.1	7593.19	33.65	7708.98	33.51	7834.83	33.06	8058.52	33.68
8073.36	33.69	8442.51	33.8	8805.55	33.71	8823.16	33.78	8836.69	34.16
9023.52	39.15	9106.88	41.54	9176.16	42.63	9277.66	44.33	9387.81	45.08
9535.05	45.64	9640.97	45.78	9808.95	45.69	9884.98	46.99	10040.6	49.49
10141.86	50.08	10278.23	51.48	10409.84	51.91	10637.61	52.25	10643.86	52.24
10911.66	50.41	11011.64	50.18	11187.93	49.64	11374.44	49.11	11489.69	49.15
11679.6	49.22	11743.59	49.28	11927.93	48.97	12107.97	47.74	12190.74	47.67
12381.07	48.45	12472.6	49.86	12558.03	50.73	12751.84	49.92	12842.11	48.64
12887.56	48.25	13042.5	49.14	13091.52	51.56	13203.2	54.6		

Manning's n Values

Sta	n Val	Sta	n Val
1.5	.043	5386.8	.029

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	5386.8	5720.25		1903.5	4751.08	1745.42	.1

Blocked Obstructions

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1.5	5386.8	26.94	5720.25	13203.2	26.94

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	33.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.043	0.029	0.046
W.S. Elev (ft)	33.21	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	3291.16	3999.38	3061.68
E.G. Slope (ft/ft)	0.000299	Area (sq ft)	3291.16	3999.38	3061.68
Q Total (cfs)	25000.00	Flow (cfs)	3357.19	18417.29	3225.53
Top Width (ft)	3080.67	Top Width (ft)	1475.51	333.45	1271.71
Vel Total (ft/s)	2.41	Avg. Vel. (ft/s)	1.02	4.61	1.05
Max Chl Dpth (ft)	17.06	Hydr. Depth (ft)	2.23	11.99	2.41
Conv. Total (cfs)	1445759.0	Conv. (cfs)	194147.3	1065079.0	186533.3
Length Wtd. (ft)	3919.14	Wetted Per. (ft)	1475.59	337.52	1271.95
Min Ch El (ft)	16.15	Shear (lb/sq ft)	0.04	0.22	0.04
Alpha	2.73	Stream Power (lb/ft s)	0.04	1.02	0.05
Frctn Loss (ft)	1.20	Cum Volume (acre-ft)	6744.56	5272.11	5652.03
C & E Loss (ft)	0.00	Cum SA (acres)	1573.34	409.57	1498.04

Warning: Divided flow computed for this cross-section.

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

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 36.9416*

INPUT
 Description: Interpolated Cross Section at River Mile 36.94
 Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.25	80.16	164.51	74.73	218.43	70.82	427.34	58.25	524.43	52.5		
576.79	52.56	662.57	49.54	837.38	48.85	1040.5	49.16	1249.07	48.83		
1471.69	49.2	1654.97	49.39	1877.11	52.27	2081.13	51.65	2199.29	50.79		
2273.57	48.69	2438.87	50.4	2676.17	50.6	2766.08	50.66	2906.85	50.15		
3108.87	47.66	3183.28	45.86	3323.36	46.34	3515.94	45.83	3693.3	49.4		
3733.9	49.79	3755.86	50.45	3762.15	50.13	3798.37	47.56	3884.02	38.75		
3949.96	37.45	4086.77	38.75	4187.6	39.71	4255.74	34.28	4309.07	31.99		
4395.13	30.77	4560.64	30.01	4765.07	29.98	4889.47	29.62	4971.29	29.53		
5026	29.85	5194.8	29.92	5407.65	29	5578.18	28.86	5624	29.4		
5653.63	27.65	5709.29	28.05	5888.85	29.82	5914.56	29.69	5920.9	29.37		
5925.72	27.18	5929.37	23.96	5934.11	22.2	5941.88	20.7	5946.97	19.83		
5949.73	19.64	5956.66	19.12	5957.5	19.01	5965.27	18.07	5970.87	17.4		
5973.04	17.25	5980.81	16.61	5988.58	15.73	5992.42	15.97	5996.83	15.73		
6004.14	15.99	6010.22	16.96	6010.94	17.08	6018.77	17.54	6023.61	17.98		
6026.08	18.21	6033.98	18.46	6036.99	18.63	6040.77	19.04	6048.08	19.68		
6050.78	20	6055.91	20.24	6063.22	20.23	6070.53	20.43	6077.62	20.63		
6113.83	21.49	6117.21	21.57	6151.99	21.93	6176.61	22.12	6190.9	21.75		
6201.77	21.45	6215.56	20.17	6222.39	19.99	6224.95	20.28	6228.15	20.85		
6232.3	22.13	6232.85	22.3	6244.08	27.17	6256.66	27.99	6257.77	28.06		
6425.73	30.32	6431.34	30.33	6657.7	30.87	6804.66	28.71	6869.54	27.86		
6978.11	27.83	7008.55	28.45	7091.8	28.26	7211.12	28.36	7272.7	32.23		
7374.25	30.2	7436.24	31.48	7483.19	33.01	7678.9	32.57	7917.44	32.38		
7944.32	32.3	8173.54	31.77	8292.83	31.61	8422.48	31.18	8652.92	32.09		
8668.21	32.1	9048.5	32.5	9422.49	32.72	9440.63	32.8	9454.57	33.23		
9647.04	39.04	9732.92	41.77	9804.29	42.99	9908.85	44.8510022.33		45.62		
10174.01	46.1110283.12		46.2510456.18		46.11	10534.5	47.1610694.82		49.12		
10799.14	49.5310939.62		50.79	11075.2		51.2511309.84	51.5411316.28		51.53		
11592.17	49.5911695.17		49.411876.78		48.9312068.91		48.4812187.64		48.52		
12383.29	48.59	12449.2	48.6412639.11		48.4112824.58		47.112909.85		46.91		
13105.93	47.5713200.21		49.113288.23		50.1613487.88		49.313580.88		47.84		
13627.7	47.3313787.32		48.1313837.82		50.8813952.87		54.27				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1.25	.043	5920.9	.029	6244.08	.046

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5920.9 6244.08 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	5920.9	26.16	6244.08	13952.87	26.16

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	32.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.043	0.029	0.046
W.S. Elev (ft)	32.02	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	3873.47	3756.46	3249.00
E.G. Slope (ft/ft)	0.000314	Area (sq ft)	3873.47	3756.46	3249.00
Q Total (cfs)	25000.00	Flow (cfs)	4250.78	17343.01	3406.21

Top Width (ft)	3701.70	Top Width (ft)	1612.57	323.18	1765.96
Vel Total (ft/s)	2.30	Avg. Vel. (ft/s)	1.10	4.62	1.05
Max Chl Dpth (ft)	16.29	Hydr. Depth (ft)	2.40	11.62	1.84
Conv. Total (cfs)	1411899.0	Conv. (cfs)	240066.7	979463.0	192368.8
Length Wtd. (ft)	3779.38	Wetted Per. (ft)	1612.66	327.23	1766.19
Min Ch El (ft)	15.73	Shear (lb/sq ft)	0.05	0.22	0.04
Alpha	2.87	Stream Power (lb/ft s)	0.05	1.04	0.04
Frctn Loss (ft)	1.19	Cum Volume (acre-ft)	6588.02	4849.15	5525.60
C & E Loss (ft)	0.01	Cum SA (acres)	1505.87	373.76	1437.18

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

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 36.0333*

INPUT
Description: Interpolated Cross Section at River Mile 36.03
Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1	77.97	178.99	72.94	237.78	69.59	465.55	59.56	571.41	55
628.49	55.07	722.02	51.61	912.6	50.82	1134.06	51.17	1361.45	50.79
1604.17	51.2	1803.99	51.42	2046.19	54.7	2268.62	53.98	2397.46	52.99
2478.44	50.59	2658.65	52.54	2917.37	52.76	3015.41	52.83	3168.88	52.24
3389.14	49.39	3470.27	47.33	3622.99	47.87	3832.95	47.28	4026.32	51.36
4070.59	51.8	4094.53	52.4	4101.39	51.99	4140.88	49.05	4234.25	38.96
4306.15	37.46	4455.3	38.91	4565.24	39.99	4639.54	33.76	4697.68	31.13
4791.51	29.71	4971.95	28.81	5194.83	28.73	5330.47	28.28	5419.67	28.1
5479.32	28.42	5663.35	28.35	5895.42	27.46	6081.35	27.43	6131.3	28.08
6163.6	26.1	6224.29	26.6	6420.05	28.59	6448.09	28.57	6455	28.23
6460.09	26.01	6463.96	22.53	6468.97	20.78	6477.19	19.5	6482.57	18.79
6485.48	18.63	6492.82	18.18	6493.7	18.09	6501.92	17.34	6507.84	16.8
6510.13	16.68	6518.35	16.12	6526.57	15.3	6529.63	15.5	6533.17	15.3
6540.11	15.54	6545.88	16.35	6546.56	16.45	6553.99	16.88	6558.58	17.26
6560.93	17.47	6568.43	17.74	6571.29	17.91	6574.88	18.33	6581.82	19.03
6584.38	19.36	6589.26	19.56	6596.2	19.57	6603.14	19.74	6609.87	19.91
6644.24	20.65	6647.45	20.72	6680.47	21.08	6703.85	21.28	6717.42	20.85
6727.74	20.5	6740.83	19.03	6747.31	18.83	6749.74	19.16	6752.78	19.74
6756.72	21.1	6757.24	21.29	6767.9	26.13	6780.85	26.98	6782	27.05
6954.87	28.84	6960.66	28.85	7193.64	29.25	7344.91	27.51	7411.69	26.86
7523.44	26.87	7554.77	27.38	7640.46	27.26	7763.28	27.53	7826.66	32.02
7931.18	29.83	7994.99	30.51	8043.31	31.65	8244.76	30.99	8490.29	30.59
8517.95	30.5	8753.89	29.9	8876.67	29.71	9010.12	29.3	9247.32	30.49
9263.05	30.52	9654.48	31.2110039	44	31.7410058	11	31.8210072	45	32.31
10270.56	38.9310358	95	41.9910432	42	43.3410540	04	45.3810656	84	46.15
10812.97	46.5810925	28	46.72	11103.4	46.5211184	02	47.3311349	03	48.75
11456.41	48.9911601	01	50.1111740	56	50.5811982	08	50.8311988	71	50.82
12272.68	48.7812378	69	48.6112565	62	48.2312763	38	47.8712885	59	47.9
13086.97	47.9513154	81	48.13350	29	47.8513541	19	46.4613628	96	46.15
13830.78	46.713927	83	48.3514018	42	49.5914223	92	48.6814319	65	47.05
14367.84	46.414532	13	47.1314584	12	50.214702	53	53.93		

Sta	n Val	Sta	n Val	Sta	n Val
1	.043	6455	.029	6767.9	.047

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
6455 6767.9 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 1 6455 25.37 6767.914702.53 25.37

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	31.06				
Vel Head (ft)	0.21	Wt. n-Val.	0.043	0.029	0.047
W.S. Elev (ft)	30.85	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	4546.58	3529.57	3810.27
E.G. Slope (ft/ft)	0.000314	Area (sq ft)	4546.58	3529.57	3810.27
Q Total (cfs)	25000.00	Flow (cfs)	5287.11	15990.86	3722.03
Top Width (ft)	4345.26	Top Width (ft)	1739.06	312.90	2293.30
Vel Total (ft/s)	2.10	Avg. Vel. (ft/s)	1.16	4.53	0.98
Max Chl Dpth (ft)	15.55	Hydr. Depth (ft)	2.61	11.28	1.66
Conv. Total (cfs)	1409824.0	Conv. (cfs)	298155.8	901771.8	209896.5
Length Wtd. (ft)	3589.91	Wetted Per. (ft)	1739.16	317.00	2293.50
Min Ch El (ft)	15.30	Shear (lb/sq ft)	0.05	0.22	0.03
Alpha	3.06	Stream Power (lb/ft s)	0.06	0.99	0.03
Frctn Loss (ft)	1.06	Cum Volume (acre-ft)	6404.05	4451.80	5384.17
C & E Loss (ft)	0.01	Cum SA (acres)	1432.64	339.08	1355.86

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

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 35.125*

INPUT
 Description: Interpolated Cross Section at River Mile 35.13
 Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.75	75.77	193.48	71.16	257.14	68.37	503.76	60.87	618.39	57.5
680.19	57.58	781.46	53.68	987.83	52.79	1227.62	53.18	1473.84	52.74
1736.65	53.2	1953.02	53.44	2215.26	57.12	2456.12	56.31	2595.62	55.19
2683.3	52.5	2878.44	54.68	3158.58	54.92	3264.73	55	3430.91	54.33
3669.4	51.12	3757.25	48.79	3922.62	49.4	4149.97	48.74	4359.34	53.32
4407.27	53.81	4433.2	54.35	4440.62	53.85	4483.38	50.54	4584.49	39.17
4662.33	37.47	4823.84	39.08	4942.88	40.27	5023.33	33.25	5086.28	30.27
5187.88	28.66	5383.26	27.61	5624.6	27.47	5771.46	26.94	5868.06	26.68
5932.64	26.99	6131.91	26.79	6383.19	25.92	6584.51	26	6638.6	26.76
6673.58	24.55	6739.29	25.15	6951.26	27.36	6981.62	27.45	6989.1	27.1
6994.47	24.83	6998.54	21.1	7003.83	19.36	7012.49	18.3	7018.16	17.75
7021.24	17.63	7028.97	17.24	7029.9	17.16	7038.56	16.6	7044.8	16.2
7047.23	16.11	7055.89	15.64	7064.55	14.88	7066.85	15.02	7069.5	14.88
7076.07	15.1	7081.53	15.74	7082.18	15.82	7089.21	16.21	7093.56	16.55
7095.79	16.73	7102.89	17.02	7105.6	17.18	7108.99	17.62	7115.56	18.39
7117.99	18.72	7122.6	18.88	7129.17	18.9	7135.74	19.04	7142.11	19.18
7174.66	19.81	7177.69	19.87	7208.95	20.22	7231.08	20.43	7243.93	19.94
7253.7	19.55	7266.1	17.9	7272.23	17.67	7274.53	18.04	7277.41	18.63
7281.14	20.08	7281.64	20.28	7291.73	25.1	7305.04	25.96	7306.22	26.03
7484.02	27.35	7489.97	27.36	7729.59	27.63	7885.16	26.31	7953.84	25.85
8068.77	25.92	8100.99	26.32	8189.12	26.27	8315.43	26.7	8380.62	31.82
8488.12	29.46	8553.75	29.53	8603.44	30.3	8810.62	29.42	9063.14	28.81
9091.59	28.7	9334.24	28.02	9460.52	27.81	9597.77	27.43	9841.71	28.89
9857.89	28.9310260.47	29.9110656.38	30.7610675.58	30.8410690.33	31.39				
10894.08	38.8210984.99	42.2211060.55	43.7111171.23	45.9111291.36	46.69				
11451.93	47.0611567.43	47.19111750.63	46.9411833.54	47.512003.25	48.38				

12113.68	48.44	12262.4	49.4212405.92	49.9112654.31	50.1212661.13	50.12
12953.18	47.9613062.21	47.8213254.47	47.5213457.86	47.2513583.55	47.27	
13790.65	47.3113860.43	47.3614061.47	47.29 14257.8	45.8214348.07	45.38	
14555.64	45.8214655.45	47.5914748.62	49.0214959.97	48.0615058.42	46.25	
15107.98	45.4815276.95	46.1215330.41	49.53 15452.2	53.6		

Manning's n Values num= 3
 Sta n Val Sta n Val
 .75 .044 6989.1 .029 7291.73 .048

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 6989.1 7291.73 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .75 6989.1 24.6 7291.73 15452.2 24.6

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	29.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.044	0.029	0.048
W.S. Elev (ft)	29.83	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	5543.36	3355.95	5011.61
E.G. Slope (ft/ft)	0.000276	Area (sq ft)	5543.36	3355.95	5011.61
Q Total (cfs)	25000.00	Flow (cfs)	6407.10	14077.63	4515.27
Top Width (ft)	4855.37	Top Width (ft)	1874.96	302.63	2677.78
Vel Total (ft/s)	1.80	Avg. Vel. (ft/s)	1.16	4.19	0.90
Max Chl Dpth (ft)	14.95	Hydr. Depth (ft)	2.96	11.09	1.87
Conv. Total (cfs)	1504634.0	Conv. (cfs)	385613.3	847267.1	271753.2
Length Wtd. (ft)	3306.77	Wetted Per. (ft)	1875.07	306.83	2677.97
Min Ch El (ft)	14.88	Shear (lb/sq ft)	0.05	0.19	0.03
Alpha	3.22	Stream Power (lb/ft s)	0.06	0.79	0.03
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	6183.59	4076.30	5207.43
C & E Loss (ft)	0.02	Cum SA (acres)	1353.67	305.51	1256.26

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 34.2166*

INPUT

Description: Interpolated Cross Section at River Mile 34.22

Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.5	73.58	207.97	69.38	276.49	67.15	541.98	62.18	665.36	60
731.9	60.09	840.91	55.76	1063.05	54.76	1321.18	55.19	1586.23	54.69
1869.14	55.2	2102.05	55.46	2384.34	59.55	2643.61	58.64	2793.78	57.39
2888.17	54.4	3098.23	56.82	3399.79	57.08	3514.05	57.16	3692.94	56.42
3949.67	52.84	4044.23	50.26	4222.24	50.94	4466.98	50.19	4692.36	55.28
4743.96	55.82	4771.86	56.3	4779.86	55.71	4825.89	52.03	4934.73	39.38
5018.52	37.48	5192.38	39.24	5320.52	40.55	5407.12	32.73	5474.89	29.41
5584.25	27.61	5794.57	26.4	6054.37	26.21	6212.46	25.6	6316.44	25.25
6385.96	25.56	6600.47	25.22	6870.96	24.38	7087.67	24.56	7145.9	25.44
7183.55	23	7254.29	23.7	7482.47	26.14	7515.14	26.34	7523.2	25.97
7528.85	23.65	7533.13	19.66	7538.68	17.94	7547.79	17.1	7553.76	16.71
7556.99	16.62	7565.12	16.3	7566.1	16.24	7575.21	15.87	7581.77	15.6
7584.32	15.54	7593.42	15.16	7602.53	14.45	7604.07	14.55	7605.83	14.45
7612.03	14.65	7617.19	15.12	7617.8	15.19	7624.44	15.55	7628.54	15.83
7630.64	15.99	7637.34	16.3	7639.9	16.45	7643.1	16.91	7649.31	17.74
7651.59	18.08	7655.94	18.2	7662.15	18.23	7668.35	18.35	7674.36	18.46

7705.07	18.97	7707.94	19.03	7737.44	19.37	7758.32	19.59	7770.45	19.03
7779.67	18.6	7791.37	16.77	7797.16	16.52	7799.33	16.92	7802.04	17.52
7805.56	19.05	7806.03	19.26	7815.55	24.07	7829.24	24.95	7830.45	25.02
8013.17	25.87	8019.28	25.87	8265.53	26.02	8425.4	25.11	8495.99	24.85
8614.1	24.97	8647.22	25.26	8737.78	25.28	8867.59	25.86	8934.58	31.61
9045.05	29.09	9112.5	28.55	9163.57	28.94	9376.48	27.85	9635.99	27.02
9665.23	26.9	9914.6	26.1510044	.36	25.9110185	.41	25.5510436	.11	27.29
10452.74	27.3410866	.45	28.6111273	.32	29.7811293	.05	29.8611308	.22	30.46
11517.6	38.7111611	.03	42.4511688	.67	44.0611802	.42	46.4411925	.87	47.23
12090.89	47.5312209	.59	47.6612397	.85	47.3612483	.06	47.6612657	.47	48.01
12770.95	47.8912923	.79	48.7313071	.28	49.2413326	.55	49.4113333	.55	49.41
13633.69	47.1413745	.74	47.0413943	.31	46.8114152	.33	46.63	14281.5	46.65
14494.33	46.6714566	.04	46.7314772	.64	46.7214974	.42	45.1715067	.18	44.62
15280.49	44.9515383	.06	46.8315478	.81	48.4415696	.01	47.4415797	.19	45.46
15848.12	44.5516021	.77	45.1116076	.71	48.8516201	.87	53.27		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 .5 .044 7523.2 .03 7815.55 .048

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 7523.2 7815.55 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .5 7523.2 23.82 7815.5516201.87 23.82

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	29.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.044	0.030	0.048
W.S. Elev (ft)	29.11	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	7216.03	3276.58	7309.48
E.G. Slope (ft/ft)	0.000192	Area (sq ft)	7216.03	3276.58	7309.48
Q Total (cfs)	25000.00	Flow (cfs)	7860.86	11145.43	5993.72
Top Width (ft)	5407.13	Top Width (ft)	2029.91	292.35	3084.87
Vel Total (ft/s)	1.40	Avg. Vel. (ft/s)	1.09	3.40	0.82
Max Chl Dpth (ft)	14.66	Hydr. Depth (ft)	3.55	11.21	2.37
Conv. Total (cfs)	1805144.0	Conv. (cfs)	567599.0	804764.0	432780.8
Length Wtd. (ft)	2980.04	Wetted Per. (ft)	2030.01	296.73	3085.07
Min Ch El (ft)	14.45	Shear (lb/sq ft)	0.04	0.13	0.03
Alpha	2.89	Stream Power (lb/ft s)	0.05	0.45	0.02
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	5904.81	3714.60	4960.58
C & E Loss (ft)	0.01	Cum SA (acres)	1268.36	273.06	1140.81

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 33.3083*

INPUT

Description: Interpolated Cross Section at River Mile 33.31

Station Elevation Data num= 154										
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev										
.25 71.39 222.45 67.6 295.85 65.92 580.19 63.49 712.34 62.5										
783.6 62.59 900.35 57.83 1138.28 56.73 1414.74 57.19 1698.61 56.65										
2001.62 57.2 2251.07 57.48 2553.42 61.97 2831.11 60.97 2991.94 59.6										
3093.03 56.3 3318.01 58.96 3640.99 59.24 3763.38 59.33 3954.97 58.51										
4229.93 54.57 4331.22 51.73 4521.87 52.47 4783.99 51.65 5025.38 57.24										
5080.64 57.84 5110.53 58.25 5119.09 57.57 5168.39 53.51 5284.96 39.59										

5374.71	37.49	5560.92	39.41	5698.16	40.82	5790.91	32.22	5863.49	28.56
5980.63	26.55	6205.89	25.2	6484.13	24.96	6653.45	24.26	6764.82	23.83
6839.28	24.13	7069.02	23.65	7358.73	22.84	7590.84	23.13	7653.2	24.12
7693.53	21.45	7769.28	22.25	8013.67	24.91	8048.67	25.22	8057.3	24.83
8063.22	22.48	8067.71	18.23	8073.54	16.52	8083.1	15.9	8089.35	15.67
8092.75	15.61	8101.27	15.36	8102.3	15.32	8111.85	15.13	8118.74	15
8121.41	14.97	8130.96	14.68	8140.52	14.03	8141.28	14.08	8142.17	14.03
8148	14.21	8152.84	14.51	8153.42	14.56	8159.66	14.88	8163.52	15.12
8165.49	15.25	8171.79	15.58	8174.2	15.73	8177.21	16.2	8183.05	17.09
8185.2	17.44	8189.29	17.52	8195.12	17.57	8200.95	17.65	8206.61	17.74
8235.49	18.14	8238.18	18.18	8265.92	18.52	8285.56	18.74	8296.96	18.13
8305.63	17.65	8316.63	15.63	8322.08	15.36	8324.12	15.81	8326.67	16.41
8329.98	18.03	8330.42	18.25	8339.38	23.03	8353.43	23.93	8354.67	24.01
8542.31	24.39	8548.59	24.39	8801.47	24.4	8965.65	23.9	9038.14	23.84
9159.43	24.02	9193.44	24.19	9286.44	24.29	9419.74	25.03	9488.54	31.41
9601.99	28.72	9671.25	27.58	9723.7	27.59	9942.34	26.27	10208.84	25.23
10238.86	25.110494.95	24.2810628.21	24.2810628.21	24.0110773.05	23.68	11030.5	25.7		
11047.58	25.7611472.44	27.3111890.26	28.7911910.53	28.88	11926.1	29.54			
12141.12	38.612237.06	42.67	12316.8	44.4112433.61	46.9712560.38	47.76			
12729.85	4812851.74	48.1313045.08	47.7713132.58	47.8313311.68	47.64				
13428.23	47.3513585.17	48.0513736.64	48.5713998.78	48.7114005.98	48.71				
14314.19	46.3214429.26	46.2514632.16	46.11	14846.8	46.0214979.45	46.02			
15198.02	46.0415271.66	46.0915483.82	46.1615691.03	44.5315786.29	43.86				
16005.34	44.0716110.68	46.08	16209	47.8716432.05	46.8216535.96	44.67			
16588.26	43.6316766.58	44.11	16823	48.1816951.53	52.93				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 .25 .045 8057.3 .03 8339.38 .049

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 8057.3 8339.38 1903.5 4751.09 1745.42 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .25 8057.3 23.03 8339.3816951.53 23.03

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.045	0.030	0.049
W.S. Elev (ft)	28.70	Reach Len. (ft)	1903.50	4751.09	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	9670.15	3284.89	10871.81
E.G. Slope (ft/ft)	0.000106	Area (sq ft)	9670.15	3284.89	10871.81
Q Total (cfs)	25000.00	Flow (cfs)	8831.67	8514.96	7653.37
Top Width (ft)	5858.70	Top Width (ft)	2196.50	282.08	3380.11
Vel Total (ft/s)	1.05	Avg. Vel. (ft/s)	0.91	2.59	0.70
Max Chl Dpth (ft)	14.67	Hydr. Depth (ft)	4.40	11.65	3.22
Conv. Total (cfs)	2427924.0	Conv. (cfs)	857704.8	826946.9	743272.3
Length Wtd. (ft)	2655.35	Wetted Per. (ft)	2196.60	286.68	3380.35
Min Ch El (ft)	14.03	Shear (lb/sq ft)	0.03	0.08	0.02
Alpha	2.48	Stream Power (lb/ft s)	0.03	0.20	0.01
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	5535.86	3356.77	4596.32
C & E Loss (ft)	0.01	Cum SA (acres)	1176.01	241.73	1011.29

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

CROSS SECTION RIVER: Fish Creek

REACH: Upper Fish Creek RS: 32.4

INPUT

Description: Cross Section at River Mile 32.4

Station Elevation Data num= 97									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.2	315.2	64.7	618.4	64.8	835.3	65.1	959.8	59.9
1213.5	58.7	1508.3	59.2	1811	58.6	2134.1	59.2	2400.1	59.5
2722.5	64.4	3018.6	63.3	3190.1	61.8	3297.9	58.2	3537.8	61.1
3882.2	61.4	4012.7	61.5	4217	60.6	4510.2	56.3	4618.2	53.2
4821.5	54	5101	53.1	5358.4	59.2	5449.2	60.2	5510.9	55
5635.2	39.8	5730.9	37.5	6075.8	41.1	6174.7	31.7	6252.1	27.7
6377	25.5	6617.2	24	6913.9	23.7	7213.2	22.4	7292.6	22.7
7846.5	21.3	8094	21.7	8160.5	22.8	8203.5	19.9	8582.2	24.1
8591.4	23.7	8597.6	21.3	8602.3	16.8	8608.4	15.1	8618.4	14.7
8628.5	14.6	8638.5	14.4	8648.5	14.4	8658.5	14.4	8668.5	14.2
8678.5	13.6	8688.5	13.9	8698.5	14.4	8708.5	15	8718.8	16.8
8765.9	17.3	8812.8	17.9	8831.6	16.7	8841.9	14.5	8847	14.2
8851.3	15.3	8854.4	17	8863.2	22	8878.9	23	9077.9	22.9
9505.9	22.7	9835.1	23.3	9971.9	24.2	10042.5	31.2	10230	26.6
10508.2	24.7	10812.5	23.3	11075.3	22.4	11360.7	21.8	11624.9	24.1
12528	27.9	12863.1	42.9	13064.8	47.5	13194.9	48.3	13493.9	48.6
13782.1	48	14085.5	46.8	14402	47.9	14678.4	48	14994.7	45.5
15321	45.4	15677.4	45.4	15901.7	45.4	16195	45.6	16505.4	43.1
16730.2	43.2	16939.2	47.3	17168.1	46.2	17328.4	42.7	17511.4	43.1
17569.3	47.5	17701.2	52.6						

Manning's n Values num= 8									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	7846.5	.055	8582.2	.07	8597.6	.03	8863.2	.05
8878.9	.04	15321	.05	15901.7	.04				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	8591.4	8863.2	2464.43	4273.14	2171	.1	.3	

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	8582.2	22.25	8878.9	17701.2	22.25

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.045	0.031	0.040
W.S. Elev (ft)	28.51	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	12554.91	3349.10	15453.69
E.G. Slope (ft/ft)	0.000048	Area (sq ft)	12554.91	3349.10	15453.69
Q Total (cfs)	25400.00	Flow (cfs)	8844.23	5813.37	10742.39
Top Width (ft)	6168.71	Top Width (ft)	2355.03	271.80	3541.88
Vel Total (ft/s)	0.81	Avg. Vel. (ft/s)	0.70	1.74	0.70
Max Chl Dpth (ft)	14.91	Hydr. Depth (ft)	5.33	12.32	4.36
Conv. Total (cfs)	3671604.0	Conv. (cfs)	1278446.0	840330.6	1552828.0
Length Wtd. (ft)	2830.04	Wetted Per. (ft)	2355.13	276.69	3542.19
Min Ch El (ft)	13.60	Shear (lb/sq ft)	0.02	0.04	0.01
Alpha	1.63	Stream Power (lb/ft s)	0.01	0.06	0.01
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	5050.26	2994.98	4068.90
C & E Loss (ft)	0.00	Cum SA (acres)	1076.56	211.53	872.61

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 31.6071*

INPUT

Description: Interpolated Cross Section at River Mile 31.61

Station	Elevation	Data	num=	195	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67.73	168.71	65.39	259.62	63.85	294.66	63.27	320.24	62.89				
472	62.5	509.35	62.53	599.81	62.6	628.29	62.59	688	62.63				
695.9	62.63	698.78	62.58	790.55	62.6	818.52	62.63	821.57	62.64				
848.66	62.66	850.88	62.58	863.5	62.12	975.15	58.19	999.5	58.09				
1072.18	57.8	1074.97	57.8	1107.61	57.71	1232.91	57.23	1242.32	57.24				
1491.65	57.61	1525.54	57.67	1532.42	57.69	1720.5	57.63	1757.76	57.61				
1839.96	57.56	1976.86	57.92	1996.06	57.98	2168.23	58.04	2180.44	58.04				
2242.4	57.68	2344.7	57.05	2438.48	57.06	2486.29	57.63	2527.79	58.12				
2590.49	58.89	2627.55	59.36	2669.32	59.87	2716.33	60.47	2766.04	61.15				
2805.2	61.06	2874.21	60.72	2913.93	60.6	3066.87	60.13	3197.6	59.17				
3219.15	59.01	3241.12	58.84	3305.09	57.04	3350.64	55.76	3473.36	57				
3474.39	57.01	3594.38	58.23	3714.85	58.32	3773.69	58.34	3803.81	58.34				
3944.28	58.45	3971.26	58.47	4006.03	58.49	4076.87	58.52	4201.47	58.03				
4284.44	57.76	4320.73	57.32	4413.48	56.3	4488.27	55.45	4516.34	55.08				
4539.09	54.82	4582.33	54.29	4641.47	52.87	4692.05	51.76	4720.3	51.91				
4898.61	52.37	4918.41	52.3	5107.25	51.26	5182.58	49.26	5191.8	49.22				
5329.6	51.8	5437.46	53.9	5444.09	54.03	5536.34	54.89	5599.03	50.43				
5725.32	37.41	5822.55	35.44	6172.96	38.54	6273.45	30.49	6352.08	27.06				
6478.98	25.18	6723.02	23.9	7024.47	23.65	7328.55	22.55	7409.22	22.81				
7833.21	21.92	7971.98	21.66	8075.9	21.82	8223.44	21.98	8271.21	22.63				
8291	22.91	8334.69	20.42	8498.11	21.95	8541.91	22.37	8559.08	22.82				
8617.12	23.18	8634.16	22.98	8642.72	23.05	8719.45	23.8	8727.74	23.5				
8728.79	25.04	8732.5	23.51	8735.28	22.52	8735.95	22.23	8741.37	17.44				
8742.38	17.1	8743.88	16.89	8744.5	16.6	8748.41	15.47	8755.96	14.74				
8758.7	14.61	8759.94	14.58	8763.42	14.56	8771.6	14.41	8772.57	14.39				
8781.72	14.26	8783.14	14.22	8790.87	14.15	8794.67	14.01	8800.01	13.82				
8806.21	13.69	8809.16	13.58	8817.75	13.44	8818.31	13.41	8821.97	13.09				
8829.29	12.64	8839.2	13.07	8840.65	13.16	8849.1	13.56	8852	13.72				
8859.01	14.18	8863.37	14.92	8869.22	15.91	8874.73	15.99	8886.09	16.31				
8897.45	16.57	8908.81	16.94	8912.67	17.17	8915.88	17.21	8937.89	17.49				
8962.36	17.81	8980.99	16.72	8988.9	15.15	8991.2	14.71	8996.25	14.49				
8999.12	15.21	9000.51	15.57	9003.58	17.22	9012.3	22.07	9026.37	22.95				
9057.32	22.99	9095.9	23.04	9204.66	22.98	9588.11	22.81	9883.05	23.32				
10005.61	24.09	10068.87	30.09	10236.85	26.15	10486.1	24.52	10758.73	23.31				
10994.18	22.54	11249.87	22.02	11486.58	23.99	12295.69	27.24	12595.91	40.1				
12776.62	44.04	12893.18	44.72	13161.06	44.98	13419.26	44.46	13691.09	43.43				
13974.65	44.37	14222.28	44.45	14505.66	42.31	14798	42.22	15117.31	42.22				
15318.27	42.21	15581.04	42.38	15859.14	40.24	16060.54	40.32	16247.79	43.83				
16452.86	42.89	16596.48	39.89	16760.44	40.23	16812.31	44	16930.48	48.37				

Manning's n	Values	num=	4
Sta	n Val	Sta	n Val
0	.047	8728.79	.07
			8735.95
			.029
			9012.3
			.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
8728.79	9012.3	2464.43	4273.14	2171	.1	.3		
Blocked Obstructions		num=	2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev			
0	8728.79	21.99	9012.31	16930.48	21.99			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.37	Element	Left OB	Channel	Right OB
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Vel Head (ft)	0.03	Wt. n-Val.	0.047	0.030	0.055
W.S. Elev (ft)	28.34	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	12605.12	3531.23	13704.38
E.G. Slope (ft/ft)	0.000067	Area (sq ft)	12605.12	3531.23	13704.38
Q Total (cfs)	25400.00	Flow (cfs)	9838.90	7504.95	8056.15
Top Width (ft)	5905.58	Top Width (ft)	2406.05	283.51	3216.01
Vel Total (ft/s)	0.85	Avg. Vel. (ft/s)	0.78	2.13	0.59
Max Chl Dpth (ft)	15.70	Hydr. Depth (ft)	5.24	12.46	4.26
Conv. Total (cfs)	3102527.0	Conv. (cfs)	1201790.0	916705.5	984032.0
Length Wtd. (ft)	2945.43	Wetted Per. (ft)	2406.97	288.49	3216.32
Min Ch El (ft)	12.64	Shear (lb/sq ft)	0.02	0.05	0.02
Alpha	2.32	Stream Power (lb/ft s)	0.02	0.11	0.01
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	4338.54	2657.51	3342.29
C & E Loss (ft)	0.00	Cum SA (acres)	941.88	184.29	704.20

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 30.8142*

INPUT

Description: Interpolated Cross Section at River Mile 30.81

Station Elevation Data		num=		195					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	66.27	171.36	63.95	263.71	62.15	299.3	61.47	325.28	61.07
479.43	60.25	517.36	60.3	609.25	60.41	638.18	60.39	698.83	60.39
706.85	60.37	709.78	60.27	802.99	60.18	831.4	60.2	834.5	60.23
862.02	60.22	864.27	60.15	877.09	59.76	990.5	56.47	1015.24	56.39
1089.06	56.16	1091.89	56.17	1125.05	56.14	1252.31	55.76	1261.88	55.77
1515.12	56.09	1549.56	56.14	1556.54	56.17	1747.58	56.43	1785.43	56.46
1868.92	56.52	2007.98	57	2027.48	57.07	2202.36	56.89	2214.77	56.87
2277.7	56.09	2381.61	54.71	2476.87	54.62	2525.42	55.04	2567.58	55.4
2631.26	56	2668.91	56.39	2711.34	56.79	2759.09	57.28	2809.58	57.89
2849.36	57.85	2919.45	57.43	2959.8	57.35	3115.15	56.95	3247.93	56.16
3269.82	56.02	3292.13	55.89	3357.11	54.39	3403.38	53.31	3528.03	54.33
3529.08	54.34	3650.95	55.36	3773.32	55.43	3833.09	55.43	3863.68	55.41
4006.37	55.5	4033.77	55.52	4069.09	55.53	4141.04	55.54	4267.61	55.11
4351.88	54.91	4388.74	54.57	4482.95	53.86	4558.92	53.24	4587.43	52.9
4610.54	52.71	4654.46	52.28	4714.53	51.11	4765.91	50.31	4794.59	50.52
4975.71	50.74	4995.82	50.66	5187.64	49.18	5264.15	45.42	5273.52	45.13
5413.49	47.06	5523.04	48.75	5529.78	48.86	5623.49	49.58	5687.16	45.87
5815.44	35.02	5914.2	33.38	6270.13	35.98	6372.19	29.27	6452.07	26.42
6580.96	24.86	6828.85	23.8	7135.04	23.61	7443.91	22.7	7525.85	22.92
7956.5	22.2	8097.46	22.01	8203.01	22.18	8352.88	22.25	8401.4	22.78
8421.51	23.01	8465.88	20.94	8631.87	22.21	8676.37	22.57	8693.81	23.3
8752.76	23.38	8770.07	22.79	8778.76	22.84	8856.69	23.5	8865.11	23.26
8866.19	26.37	8870.39	24.56	8873.54	23.51	8874.29	23.17	8880.44	18.09
8881.59	17.65	8883.29	17.58	8883.99	17.15	8888.42	15.84	8896.97	14.64
8900.08	14.48	8901.49	14.45	8905.43	14.45	8914.7	14.23	8915.8	14.19
8926.17	14.1	8927.77	14.05	8936.53	13.89	8940.85	13.62	8946.9	13.24
8953.93	12.97	8957.27	12.81	8967	12.68	8967.63	12.65	8971.78	12.21
8980.08	11.68	8989.89	12.25	8991.33	12.36	8999.71	12.72	9002.58	12.87
9009.53	13.35	9013.85	14.08	9019.64	15.02	9025.1	15.11	9036.35	15.65
9047.61	16.04	9058.87	16.66	9062.69	17.08	9065.88	17.11	9087.68	17.4
9111.93	17.73	9130.38	16.74	9138.22	15.3	9140.5	14.93	9145.5	14.77
9148.35	15.47	9149.72	15.85	9152.76	17.44	9161.41	22.13	9173.84	22.9
9201.19	22.99	9235.29	23.11	9331.42	23.07	9670.33	22.92	9931	23.34
10039.33	23.98	10095.23	28.98	10243.7	25.69	10464	24.33	10704.96	23.33

10913.05	22.6811139.05	22.2511348.25	23.8812063.37	26.5812328.72	37.29
12488.44	40.5812591.46	41.1512828.22	41.3513056.43	40.9213296.68	40.06
13547.3	40.8413766.16	40.9114016.62	39.12 14275	39.0414557.22	39.03
14734.83	39.0314967.08	39.1715212.87	37.3815390.88	37.4415556.37	40.37
15737.63	39.5815864.56	37.0816009.47	37.3616055.32	40.516159.76	44.14

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	8866.19	.07	8874.29	.029
				9161.41	.054

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

8866.19	9161.41	2464.43	4273.14	2171	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	8866.19	21.73	9161.41	16159.76	21.73

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.050	0.031	0.054
W.S. Elev (ft)	28.12	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	12256.15	3697.56	11825.89
E.G. Slope (ft/ft)	0.000079	Area (sq ft)	12256.15	3697.56	11825.89
Q Total (cfs)	25400.00	Flow (cfs)	9423.96	8521.04	7455.00
Top Width (ft)	5648.44	Top Width (ft)	2461.71	295.22	2891.51
Vel Total (ft/s)	0.91	Avg. Vel. (ft/s)	0.77	2.30	0.63
Max Chl Dpth (ft)	16.44	Hydr. Depth (ft)	4.98	12.52	4.09
Conv. Total (cfs)	2860561.0	Conv. (cfs)	1061331.0	959644.1	839585.3
Length Wtd. (ft)	3047.40	Wetted Per. (ft)	2464.03	300.38	2891.80
Min Ch El (ft)	11.68	Shear (lb/sq ft)	0.02	0.06	0.02
Alpha	2.53	Stream Power (lb/ft s)	0.02	0.14	0.01
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	3635.27	2302.95	2706.08
C & E Loss (ft)	0.00	Cum SA (acres)	804.19	155.91	552.01

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 30.0214*

INPUT
 Description: Interpolated Cross Section at River Mile 30.02

Station	Elevation	Data	num=	195					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	64.8	174.02	62.51	267.79	60.44	303.94	59.68	330.32	59.26
486.86	58	525.38	58.06	618.7	58.22	648.07	58.18	709.66	58.14
717.81	58.11	720.77	57.95	815.44	57.76	844.29	57.77	847.43	57.81
875.37	57.78	877.67	57.73	890.68	57.39	1005.85	54.76	1030.97	54.69
1105.93	54.51	1108.81	54.54	1142.48	54.57	1271.72	54.29	1281.43	54.3
1538.6	54.58	1573.57	54.62	1580.66	54.66	1774.66	55.23	1813.1	55.31
1897.88	55.48	2039.09	56.07	2058.9	56.17	2236.49	55.73	2249.09	55.7
2313	54.49	2418.51	52.37	2515.25	52.17	2564.56	52.45	2607.37	52.68
2672.04	53.11	2710.27	53.42	2753.36	53.71	2801.85	54.1	2853.12	54.64
2893.51	54.65	2964.7	54.15	3005.66	54.09	3163.42	53.78	3298.26	53.15
3320.49	53.04	3343.15	52.93	3409.14	51.74	3456.12	50.87	3582.7	51.67
3583.77	51.67	3707.53	52.49	3831.8	52.54	3892.49	52.52	3923.56	52.47
4068.45	52.55	4096.27	52.57	4132.15	52.57	4205.21	52.56	4333.74	52.18
4419.32	52.07	4456.75	51.81	4552.42	51.41	4629.56	51.04	4658.52	50.73
4681.98	50.61	4726.58	50.27	4787.59	49.35	4839.76	48.87	4868.89	49.12

5052.82	49.11	5073.24	49.03	5268.03	47.1	5345.73	41.58	5355.24	41.04
5497.38	42.33	5608.63	43.6	5615.48	43.69	5710.63	44.27	5775.29	41.3
5905.56	32.63	6005.85	31.32	6367.29	33.42	6470.94	28.06	6552.05	25.78
6682.94	24.53	6934.67	23.7	7245.6	23.56	7559.26	22.85	7642.47	23.03
8079.8	22.47	8222.95	22.37	8330.13	22.53	8482.32	22.53	8531.59	22.93
8552.01	23.12	8597.07	21.46	8765.64	22.47	8810.82	22.78	8828.53	23.77
8888.39	23.57	8905.97	22.6	8914.8	22.63	8993.94	23.21	9002.49	23.01
9003.58	27.71	9008.28	25.62	9011.8	24.5	9012.64	24.1	9019.51	18.73
9020.79	18.19	9022.69	18.27	9023.48	17.71	9028.43	16.21	9037.98	14.54
9041.46	14.35	9043.04	14.33	9047.44	14.34	9057.79	14.04	9059.03	14
9070.62	13.94	9072.41	13.87	9082.2	13.64	9087.02	13.23	9093.78	12.66
9101.64	12.26	9105.38	12.04	9116.25	11.92	9116.96	11.89	9121.6	11.32
9130.87	10.72	9140.59	11.42	9142.01	11.55	9150.32	11.88	9153.16	12.02
9160.04	12.53	9164.32	13.24	9170.06	14.13	9175.47	14.24	9186.62	14.98
9197.77	15.51	9208.93	16.38	9212.71	16.98	9215.87	17.02	9237.47	17.31
9261.49	17.64	9279.77	16.76	9287.54	15.45	9289.79	15.14	9294.75	15.06
9297.57	15.74	9298.93	16.12	9301.95	17.67	9310.51	22.2	9321.31	22.84
9345.07	22.99	9374.68	23.19	9458.17	23.15	9752.54	23.03	9978.96	23.36
10073.04	23.88	10121.6	27.87	10250.56	25.24	10441.89	24.15	10651.18	23.34
10831.93	22.82	11028.22	22.47	11209.93	23.78	11831.06	25.93	12061.53	34.49
12200.25	37.11	12289.73	37.57	12495.38	37.73	12693.59	37.38	12902.26	36.69
13119.94	37.31	13310.04	37.36	13527.59	35.92	13752.01	35.86	13997.13	35.85
14151.4	35.84	14353.12	35.95	14566.61	34.52	14721.22	34.57	14864.96	36.9
15022.39	36.27	15132.64	34.27	15258.5	34.49	15298.33	37.15	15389.04	39.91

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.052	9003.58	.07	9012.64	.028	9310.51	.057

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9003.58	9310.51		2464.43	4273.14	2171	.1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	9003.58	21.47	9310.51	15389.04	21.47

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.052	0.030	0.057
W.S. Elev (ft)	27.83	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	11627.51	3843.01	9897.53
E.G. Slope (ft/ft)	0.000097	Area (sq ft)	11627.51	3843.01	9897.53
Q Total (cfs)	25400.00	Flow (cfs)	9038.88	10080.77	6280.35
Top Width (ft)	5401.19	Top Width (ft)	2524.61	306.93	2569.64
Vel Total (ft/s)	1.00	Avg. Vel. (ft/s)	0.78	2.62	0.63
Max Chl Dpth (ft)	17.11	Hydr. Depth (ft)	4.61	12.52	3.85
Conv. Total (cfs)	2581957.0	Conv. (cfs)	918818.5	1024729.0	638409.5
Length Wtd. (ft)	3174.68	Wetted Per. (ft)	2528.48	312.37	2569.90
Min Ch El (ft)	10.72	Shear (lb/sq ft)	0.03	0.07	0.02
Alpha	3.04	Stream Power (lb/ft s)	0.02	0.19	0.01
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	2959.66	1933.09	2164.74
C & E Loss (ft)	0.00	Cum SA (acres)	663.13	126.37	415.92

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 29.2285*

INPUT

Description: Interpolated Cross Section at River Mile 29.23

Station Elevation Data num= 194											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	63.34	176.67	61.07	271.88	58.74	308.58	57.89	335.36	57.44		
494.29	55.75	533.4	55.83	628.14	56.03	657.96	55.98	720.49	55.89		
728.76	55.85	731.77	55.64	827.88	55.34	857.17	55.33	860.36	55.39		
888.73	55.34	891.06	55.3	904.27	55.02	1021.2	53.04	1046.7	52.99		
1122.81	52.87	1125.73	52.91	1159.92	53	1291.13	52.82	1300.99	52.83		
1562.08	53.06	1597.58	53.1	1604.78	53.14	1801.75	54.03	1840.77	54.16		
1926.85	54.45	2070.21	55.14	2090.31	55.26	2270.61	54.58	2283.41	54.53		
2348.29	52.89	2455.42	50.03	2553.63	49.73	2603.7	49.86	2647.16	49.96		
2712.81	50.22	2751.62	50.45	2795.37	50.63	2844.6	50.91	2896.65	51.39		
2937.67	51.45	3009.94	50.86	3051.53	50.84	3211.69	50.61	3348.6	50.14		
3371.16	50.06	3394.17	49.98	3461.16	49.08	3508.86	48.42	3637.37	49		
3638.46	49.01	3764.11	49.61	3890.27	49.65	3951.89	49.61	3983.43	49.54		
4130.54	49.6	4158.78	49.61	4195.2	49.61	4269.39	49.58	4399.87	49.26		
4486.75	49.23	4524.76	49.06	4621.89	48.97	4700.21	48.83	4729.6	48.55		
4753.43	48.5	4798.71	48.26	4860.65	47.59	4913.62	47.42	4943.19	47.72		
5129.92	47.48	5150.66	47.39	5348.42	45.02	5427.3	37.74	5436.96	36.95		
5581.27	37.59	5694.22	38.45	5701.17	38.52	5797.78	38.96	5863.42	36.74		
5995.67	30.24	6097.5	29.27	6464.46	30.86	6569.69	26.84	6652.04	25.14		
6784.93	24.21	7040.49	23.6	7356.17	23.52	7674.62	23	7759.1	23.14		
8203.1	22.75	8348.43	22.72	8457.25	22.89	8611.76	22.81	8661.79	23.08		
8682.51	23.22	8728.26	21.98	8899.4	22.73	8945.27	22.98	8963.25	24.24		
9024.03	23.77	9041.88	22.4	9050.84	22.42	9131.19	22.91	9139.87	22.77		
9140.98	29.04	9146.17	26.67	9150.05	25.49	9150.99	25.03	9158.58	19.37		
9160	18.74	9162.97	18.26	9168.43	16.58	9179	14.44	9182.84	14.22		
9184.58	14.21	9189.45	14.24	9200.89	13.85	9202.25	13.8	9215.07	13.78		
9217.05	13.7	9227.87	13.39	9233.2	12.84	9240.67	12.07	9249.35	11.55		
9253.48	11.26	9265.5	11.16	9266.28	11.14	9271.41	10.43	9281.65	9.76		
9291.29	10.6	9292.7	10.74	9300.92	11.05	9303.74	11.17	9310.56	11.7		
9314.8	12.39	9320.48	13.23	9325.84	13.37	9336.88	14.32	9347.93	14.98		
9358.98	16.1	9362.73	16.89	9365.86	16.93	9387.26	17.22	9411.05	17.56		
9429.16	16.79	9436.85	15.6	9439.09	15.35	9444	15.35	9446.8	16		
9448.15	16.39	9451.13	17.89	9459.61	22.27	9468.78	22.79	9488.94	22.99		
9514.08	23.27	9584.93	23.24	9834.75	23.14	10026.91	23.39	10106.76	23.77		
10147.97	26.76	10257.41	24.79	10419.79	23.96	10597.41	23.35	10750.81	22.96		
10917.39	22.69	11071.61	23.67	11598.74	25.27	11794.34	31.69	11912.07	33.65		
11988.01	33.99	12162.54	34.11	12330.76	33.84	12507.85	33.32	12692.59	33.78		
12853.93	33.81	13038.55	32.73	13229.01	32.68	13437.04	32.67	13567.96	32.66		
13739.16	32.73	13920.34	31.65	14051.55	31.69	14173.55	33.44	14307.16	32.96		
14400.72	31.46	14507.54	31.62	14541.34	33.51	14618.33	35.69				

Manning's n Values num= 4											
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.054	9140.98	.07	9158.58	.027	9459.61	.059				

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
9140.98	9459.61		2464.43	4273.14	2171		.1	.3	

Blocked Obstructions num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
0	9140.98	21.21	10147.97	14618.33	21.21	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.054	0.030	0.059
W.S. Elev (ft)	27.46	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	10709.71	3959.62	7922.70

E.G. Slope (ft/ft)	0.000124	Area (sq ft)	10709.71	3959.62	7922.70
Q Total (cfs)	25400.00	Flow (cfs)	8454.88	11732.22	5212.90
Top Width (ft)	5108.33	Top Width (ft)	2587.27	315.17	2205.89
Vel Total (ft/s)	1.12	Avg. Vel. (ft/s)	0.79	2.96	0.66
Max Chl Dpth (ft)	17.70	Hydr. Depth (ft)	4.14	12.56	3.59
Conv. Total (cfs)	2280019.0	Conv. (cfs)	758948.0	1053138.0	467933.8
Length Wtd. (ft)	3335.33	Wetted Per. (ft)	2591.36	320.40	2206.08
Min Ch El (ft)	9.76	Shear (lb/sq ft)	0.03	0.10	0.03
Alpha	3.44	Stream Power (lb/ft s)	0.03	0.28	0.02
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	2327.79	1550.38	1720.67
C & E Loss (ft)	0.00	Cum SA (acres)	518.53	95.86	296.91

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 28.4357*

INPUT
Description: Interpolated Cross Section at River Mile 28.44

Station Elevation Data		num= 195							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	61.87	179.33	59.63	275.97	57.04	313.21	56.1	340.4	55.63
501.72	53.5	541.42	53.6	637.58	53.84	667.85	53.77	731.32	53.64
739.71	53.59	742.77	53.33	840.32	52.92	870.05	52.9	873.3	52.97
902.09	52.91	904.45	52.87	917.87	52.65	1036.55	51.33	1062.43	51.29
1139.69	51.22	1142.65	51.28	1177.35	51.43	1310.53	51.34	1320.54	51.35
1585.56	51.54	1621.59	51.58	1628.9	51.63	1828.83	52.83	1868.43	53.01
1955.81	53.41	2101.33	54.21	2121.73	54.35	2304.74	53.42	2317.73	53.35
2383.59	51.29	2492.33	47.68	2592.01	47.29	2642.83	47.28	2686.94	47.25
2753.59	47.34	2792.98	47.49	2837.39	47.55	2887.36	47.72	2940.19	48.14
2981.82	48.25	3055.18	47.57	3097.4	47.58	3259.97	47.44	3398.93	47.13
3421.83	47.08	3445.18	47.02	3513.18	46.43	3561.6	45.98	3692.05	46.34
3693.14	46.34	3820.68	46.74	3948.74	46.77	4011.29	46.69	4043.3	46.6
4192.62	46.65	4221.29	46.66	4258.26	46.65	4333.56	46.6	4466	46.33
4554.19	46.38	4592.77	46.3	4691.36	46.53	4770.86	46.62	4800.69	46.38
4824.88	46.39	4870.84	46.25	4933.7	45.83	4987.47	45.98	5017.49	46.32
5207.03	45.85	5228.08	45.75	5428.81	42.94	5508.88	33.9	5518.68	32.86
5665.16	32.86	5779.81	33.3	5786.86	33.34	5884.92	33.65	5951.55	32.17
6085.79	27.85	6189.14	27.21	6561.62	28.3	6668.43	25.63	6752.02	24.5
6886.91	23.89	7146.31	23.5	7466.74	23.47	7789.97	23.15	7875.72	23.25
8326.4	23.02	8473.91	23.08	8584.37	23.24	8741.2	23.09	8791.98	23.24
8813.02	23.33	8859.46	22.5	9033.16	23	9079.72	23.19	9097.97	24.71
9159.67	23.97	9177.78	22.21	9186.88	22.21	9268.44	22.61	9277.25	22.53
9278.37	30.38	9284.05	27.72	9288.31	26.49	9289.34	25.96	9297.65	20.01
9299.2	19.29	9301.5	19.66	9302.45	18.82	9308.44	16.95	9320.01	14.34
9324.22	14.09	9326.13	14.09	9331.46	14.13	9343.99	13.66	9345.48	13.61
9359.51	13.61	9361.69	13.52	9373.54	13.14	9379.37	12.45	9387.56	11.49
9397.06	10.84	9401.59	10.49	9414.75	10.4	9415.61	10.38	9421.22	9.54
9432.44	8.8	9441.99	9.77	9443.38	9.93	9451.53	10.21	9454.32	10.31
9461.07	10.88	9465.27	11.55	9470.9	12.34	9476.21	12.5	9487.15	13.65
9498.09	14.44	9509.04	15.81	9512.75	16.8	9515.85	16.84	9537.04	17.13
9560.61	17.47	9578.56	16.81	9586.17	15.76	9588.39	15.56	9593.25	15.64
9596.02	16.27	9597.36	16.66	9600.31	18.11	9608.71	22.34	9616.24	22.74
9632.81	23	9653.47	23.35	9711.69	23.32	9916.97	23.2510074.86	23.41	
10140.47	23.6610174.33	25.6610264.26	24.3310397.69	23.7810543.64	23.37				
10669.68	23.110806.57	22.9210933.28	23.5611366.43	24.6111527.15	28.88				
11623.89	30.1911686.29	30.41	11829.7	30.4911967.92	29.95				
12265.24	30.2512397.81	30.2712549.51	29.5412706.01	29.512876.95	29.48				

12984.53 29.47 13125.2 29.5213274.08 28.7913381.89 28.8113482.13 29.97
 13591.92 29.65 13668.8 28.6413756.58 28.7513784.35 30.0113847.61 31.46

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 0 .056 9278.37 .07 9297.65 .026 9608.71 .061

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9278.37 9608.71 2464.43 4273.14 2171 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 0 9278.37 20.9410174.3313847.61 20.94

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.056	0.028	0.061
W.S. Elev (ft)	26.94	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	9404.64	4028.44	5874.62
E.G. Slope (ft/ft)	0.000159	Area (sq ft)	9404.64	4028.44	5874.62
Q Total (cfs)	25400.00	Flow (cfs)	7289.52	14207.20	3903.27
Top Width (ft)	4829.32	Top Width (ft)	2661.90	321.96	1845.46
Vel Total (ft/s)	1.32	Avg. Vel. (ft/s)	0.78	3.53	0.66
Max Chl Dpth (ft)	18.14	Hydr. Depth (ft)	3.53	12.51	3.18
Conv. Total (cfs)	2015028.0	Conv. (cfs)	578291.3	1127083.0	309653.8
Length Wtd. (ft)	3569.90	Wetted Per. (ft)	2665.92	327.46	1845.58
Min Ch El (ft)	8.80	Shear (lb/sq ft)	0.03	0.12	0.03
Alpha	4.16	Stream Power (lb/ft s)	0.03	0.43	0.02
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	1758.80	1158.57	1376.85
C & E Loss (ft)	0.01	Cum SA (acres)	370.04	64.61	195.95

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 27.6428*

INPUT
 Description: Interpolated Cross Section at River Mile 27.64

Station Elevation Data	num=	195
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 60.41 181.98 58.19 280.05 55.33 317.85 54.3 345.44 53.82		
509.15 51.25 549.43 51.36 647.02 51.65 677.74 51.57 742.15 51.4		
750.67 51.33 753.77 51.01 852.77 50.5 882.94 50.47 886.23 50.55		
915.45 50.47 917.85 50.45 931.46 50.29 1051.9 49.61 1078.17 49.59		
1156.56 49.58 1159.57 49.65 1194.79 49.86 1329.94 49.87 1340.1 49.88		
1609.04 50.02 1645.61 50.05 1653.03 50.11 1855.91 51.63 1896.1 51.86		
1984.77 52.37 2132.44 53.29 2153.15 53.45 2338.87 52.27 2352.05 52.18		
2418.88 49.7 2529.23 45.34 2630.4 44.85 2681.97 44.69 2726.73 44.53		
2794.36 44.45 2834.34 44.52 2879.4 44.47 2930.11 44.54 2983.73 44.88		
3025.98 45.05 3100.42 44.29 3143.26 44.33 3308.24 44.26 3449.26 44.12		
3472.5 44.09 3496.2 44.07 3565.21 43.77 3614.34 43.53 3746.72 43.67		
3747.83 43.68 3877.26 43.87 4007.22 43.88 4070.69 43.78 4103.18 43.67		
4254.71 43.7 4283.8 43.71 4321.31 43.69 4397.73 43.62 4532.14 43.41		
4621.63 43.54 4660.78 43.55 4760.83 44.09 4841.5 44.42 4871.78 44.2		
4896.32 44.29 4942.96 44.24 5006.76 44.07 5061.33 44.54 5091.79 44.93		
5284.13 44.22 5305.49 44.12 5509.2 40.86 5590.45 30.06 5600.4 28.77		
5749.05 28.12 5865.39 28.15 5872.55 28.17 5972.06 28.33 6039.68 27.6		
6175.91 25.46 6280.79 25.15 6658.79 25.74 6767.18 24.41 6852 23.86		

6988.89	23.57	7252.14	23.41	7577.31	23.42	7905.32	23.3	7992.34	23.36
8449.69	23.3	8599.39	23.43	8711.48	23.6	8870.64	23.36	8922.17	23.39
8943.52	23.43	8990.65	23.02	9166.93	23.26	9214.18	23.39	9232.7	25.19
9295.3	24.16	9313.69	22.02	9322.92	22	9405.68	22.31	9414.62	22.28
9415.77	31.71	9421.94	28.78	9426.57	27.48	9427.68	26.9	9436.72	20.66
9438.41	19.83	9440.9	20.35	9441.94	19.37	9448.45	17.32	9461.03	14.24
9465.6	13.96	9467.67	13.96	9473.47	14.02	9487.09	13.48	9488.71	13.41
9503.96	13.45	9506.32	13.35	9519.2	12.88	9525.54	12.06	9534.44	10.91
9544.78	10.12	9549.69	9.72	9564	9.64	9564.93	9.62	9571.04	8.66
9583.23	7.84	9592.68	8.95	9594.07	9.12	9602.13	9.37	9604.9	9.46
9611.58	10.05	9615.75	10.7	9621.32	11.45	9626.58	11.62	9637.41	12.99
9648.25	13.91	9659.09	15.53	9662.77	16.7	9665.84	16.74	9686.83	17.04
9710.18	17.39	9727.95	16.83	9735.49	15.91	9737.68	15.78	9742.5	15.92
9745.25	16.53	9746.57	16.94	9749.5	18.34	9757.82	22.4	9763.71	22.69
9776.69	23	9792.86	23.42	9838.45	23.41	9999.18	23.3610122.81	23.43	
10174.18	23.55	10200.7	24.5510271.11	23.8810375.59	23.610489.87	23.38			
10588.56	23.2410695.74	23.1410794.96	23.4511134.12	23.9511259.96	26.08				
11335.71	26.7311384.57	26.8411496.86	26.8611605.09	26.7611719.03	26.58				
11837.89	26.7211941.69	26.7212060.47	26.3512183.01	26.3212316.86	26.3				
12401.09	26.2912511.24	26.312627.81	25.9312712.23	25.9312790.72	26.51				
12876.68	26.3412936.88	25.8313005.61	25.8813027.35	26.5113076.89	27.23				

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
0	.059	9415.77	.07
		9436.72	.024
		9757.82	.063

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9415.77	9757.82	2464.43	4273.14	2171	.1	.3	
Blocked Obstructions		num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev			
0	9415.77	20.68	9759.8213076.89	20.68				

CROSS SECTION OUTPUT		Profile #Calibration			
E.G. Elev (ft)	26.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.059	0.026	0.063
W.S. Elev (ft)	26.15	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	7757.59	4008.69	3816.97
E.G. Slope (ft/ft)	0.000218	Area (sq ft)	7757.59	4008.69	3816.97
Q Total (cfs)	25400.00	Flow (cfs)	5119.19	17866.30	2414.51
Top Width (ft)	5421.49	Top Width (ft)	3283.08	329.05	1809.35
Vel Total (ft/s)	1.63	Avg. Vel. (ft/s)	0.66	4.46	0.63
Max Chl Dpth (ft)	18.31	Hydr. Depth (ft)	2.36	12.18	2.11
Conv. Total (cfs)	1718473.0	Conv. (cfs)	346345.8	1208770.0	163357.4
Length Wtd. (ft)	3740.72	Wetted Per. (ft)	3286.75	334.49	1809.42
Min Ch El (ft)	7.84	Shear (lb/sq ft)	0.03	0.16	0.03
Alpha	5.31	Stream Power (lb/ft s)	0.02	0.73	0.02
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	1273.32	764.36	1135.34
C & E Loss (ft)	0.00	Cum SA (acres)	201.87	32.67	104.88

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 26.85

INPUT
Description: Interpolated Cross Section at River Mile 26.85
Station Elevation Data num= 123

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.94	184.64	56.75	284.14	53.63	322.49	52.51	516.58	49		
557.45	49.13	656.46	49.46	752.98	49.15	761.62	49.07	764.77	48.7		
865.21	48.08	895.82	48.04	899.16	48.13	931.24	48.02	945.05	47.92		
1093.9	47.89	1173.44	47.93	1176.49	48.02	1212.22	48.29	1359.65	48.41		
1632.52	48.5	1669.62	48.53	1882.99	50.43	1923.77	50.71	2163.56	52.36		
2184.57	52.54	2386.37	51.01	2454.18	48.1	2566.14	43	2721.1	42.1		
2766.52	41.81	2835.14	41.56	2875.7	41.55	2921.42	41.39	2972.87	41.35		
3070.13	41.85	3145.66	41	3189.13	41.07	3499.59	41.11	3523.17	41.11		
3617.23	41.12	3801.39	41.01	3802.52	41.01	4065.69	40.99	4130.09	40.87		
4163.05	40.73	4346.31	40.76	4384.37	40.73	4598.27	40.48	4728.79	40.79		
4830.3	41.65	4912.15	42.21	4942.87	42.03	4967.77	42.18	5079.82	42.31		
5166.09	43.53	5382.91	42.48	5589.59	38.78	5682.12	24.68	5832.94	23.39		
5950.98	23	8572.99	23.57	8838.6	23.95	9052.36	23.54	9300.69	23.52		
9348.63	23.6	9367.42	25.66	9430.94	24.36	9449.59	21.83	9458.96	21.79		
9552	22.04	9553.16	33.05	9559.83	29.83	9564.83	28.47	9566.03	27.83		
9575.79	21.3	9577.61	20.38	9580.31	21.04	9581.43	19.93	9588.46	17.69		
9602.04	14.14	9606.98	13.83	9609.22	13.84	9615.48	13.91	9630.19	13.29		
9631.94	13.22	9648.41	13.29	9650.96	13.17	9664.87	12.63	9671.72	11.67		
9681.33	10.33	9692.49	9.41	9697.8	8.95	9713.25	8.88	9714.26	8.86		
9720.85	7.77	9734.02	6.88	9743.38	8.12	9744.75	8.31	9752.74	8.53		
9755.48	8.61	9762.1	9.23	9766.22	9.86	9771.74	10.56	9776.95	10.75		
9787.68	12.32	9798.41	13.38	9809.15	15.25	9812.79	16.61	9815.83	16.65		
9836.62	16.95	9859.74	17.3	9877.34	16.85	9884.81	16.06	9886.98	15.99		
9891.75	16.21	9894.47	16.8	9895.78	17.21	9898.68	18.56	9906.92	22.47		
9920.56	23	9932.25	23.51	2306.17	23						

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.061	9553.16	.023
			9906.92
			.065

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9553.16	9906.92		0	0	0		.1	.3
Blocked Obstructions	num=		1						
Sta L	Sta R	Elev							
0	9553.16	20.42							

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.061	0.023	0.065
W.S. Elev (ft)	25.30	Reach Len. (ft)	3915.00	3915.00	3915.00
Crit W.S. (ft)		Flow Area (sq ft)	7405.72	3961.66	4921.35
E.G. Slope (ft/ft)	0.000211	Area (sq ft)	7405.72	3961.66	4921.35
Q Total (cfs)	25700.00	Flow (cfs)	4053.48	19010.97	2635.54
Top Width (ft)	6589.66	Top Width (ft)	3853.31	337.11	2399.25
Vel Total (ft/s)	1.58	Avg. Vel. (ft/s)	0.55	4.80	0.54
Max Chl Dpth (ft)	18.42	Hydr. Depth (ft)	1.92	11.75	2.05
Conv. Total (cfs)	1769927.0	Conv. (cfs)	279158.3	1309262.0	181506.6
Length Wtd. (ft)	3915.00	Wetted Per. (ft)	3856.57	342.42	2401.57
Min Ch El (ft)	6.88	Shear (lb/sq ft)	0.03	0.15	0.03
Alpha	6.87	Stream Power (lb/ft s)	0.01	0.73	0.01
Froctn Loss (ft)	0.88	Cum Volume (acre-ft)	844.38	373.42	917.58
C & E Loss (ft)	0.02	Cum SA (acres)			

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: Fish Creek
 REACH: Lower Fish Creek RS: 26.09

INPUT

Description: Cross Section at River Mile 26.09

Station Elevation Data		num= 117	
Sta	Elev	Sta	Elev
0	57.55	181.9	55.45
750.3	46.95	753.4	46.55
931	46.35	1156	46.45
1855	49.25	2152.1	51.55
2793	38.75	2878	38.85
3746	38.35	4068.7	39.05
5089.3	44.35	5315.9	42.95
7698.8	20.85	7959.3	21.15
8468.9	22.35	8721.6	23.75
9531.5	26.05	9599.6	24.85
10424.5	42.95	10430.4	40.05
10468.9	44.63	10490.2	42.16
10532.7	35.41	10552.1	24.2
10583.8	12.99	10593.8	11.39
10633.8	11.49	10643.8	11.49
10683.8	10.69	10693.8	10.29
10733.8	8.39	10743.8	7.89
10783.8	12.39	10793.8	12.59
10939.1	18.66	10950.7	22.95
11022.5	20.75	11242.6	20.25
14591.4	19.15	14624.4	21.35
15301	43.35	15595.8	44.95
16268.1	45.45	16363.2	45.25
17215.7	49.35	17468.8	51.55

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
0	.063	10464.6	.07
		10556.2	.022
		10950.7	.067

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	10514.97	10950.7		2826	4769		.1	.3

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Elev
010514.97	20.17	10950.7	17468.8
		20.17	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	24.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.063	0.022	0.067
W.S. Elev (ft)	24.46	Reach Len. (ft)	2826.00	4769.00	4679.00
Crit W.S. (ft)		Flow Area (sq ft)	11384.18	4348.08	15497.41
E.G. Slope (ft/ft)	0.000239	Area (sq ft)	11384.18	4348.08	15497.41
Q Total (cfs)	43600.00	Flow (cfs)	7605.10	22133.91	13860.99
Top Width (ft)	8678.98	Top Width (ft)	4601.99	394.39	3682.60
Vel Total (ft/s)	1.40	Avg. Vel. (ft/s)	0.67	5.09	0.89
Max Chl Dpth (ft)	16.57	Hydr. Depth (ft)	2.47	11.02	4.21
Conv. Total (cfs)	2817623.0	Conv. (cfs)	491474.6	1430390.0	895757.6
Length Wtd. (ft)	4374.41	Wetted Per. (ft)	4602.41	398.96	3683.35
Min Ch El (ft)	7.89	Shear (lb/sq ft)	0.04	0.16	0.06
Alpha	6.92	Stream Power (lb/ft s)	0.02	0.83	0.06
Frcn Loss (ft)	0.99	Cum Volume (acre-ft)	34324.67	63265.05	13848.36
C & E Loss (ft)	0.01	Cum SA (acres)	13029.73	13328.90	6167.96

Warning: Divided flow computed for this cross-section.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 25.1

INPUT
 Description: Cross Section at River Mile 25.1

Station Elevation Data num= 115									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	56.3	181.9	54.2	317.7	49.6	508.9	45.6	646.7	46.1
750.3	45.7	753.4	45.3	882.5	45.2	885.8	45.3	917.4	45.2
931	45.1	1156	45.2	1159	45.3	1194.2	45.6	1644.8	45.9
1855	48	2152.1	50.3	2350.9	48.1	2528	38.9	2725.4	37.7
2793	37.5	2878	37.6	3024.5	38.2	3098.9	37.1	3470.8	37.1
3746	37.1	4068.7	37.8	4319.2	37.7	4658.5	37.4	4869.4	38.7
5089.3	43.1	5315.9	41.7	5531.9	37.3	5628.6	21.2	7444.3	19
7698.8	19.6	7959.3	19.9	8063.9	20.1	8138.8	19.9	8284.4	20.3
8468.9	21.1	8721.6	22.5	8995.7	23	9216.3	22.6	9512.7	22.5
9531.5	24.8	9599.6	23.6	9619.6	20.8	10204.9	20.7	10380.1	25.2
10424.5	41.7	10430.4	38.8	10446	41.9	10452	43.7	10464.6	43.66
10468.9	43.38	10490.2	40.91	10499.6	39.24	10514.97	41.15	10525.1	35.95
10532.7	34.16	10552.1	22.95	10577.3	16.14	10583.8	11.74	10593.8	10.14
10603.8	9.64	10613.8	8.74	10623.8	9.14	10633.8	10.24	10643.8	10.24
10653.8	10.24	10663.8	9.94	10673.8	9.64	10683.8	9.44	10693.8	9.04
10703.8	8.84	10713.8	8.24	10723.8	7.44	10733.8	7.14	10743.8	6.64
10753.8	6.64	10763.8	7.54	10773.8	10.44	10783.8	11.14	10793.8	11.34
10803.8	12.04	10813.8	13.34	10907.8	16.14	10939.1	17.41	10950.7	21.7
10972.2	19.74	10981.2	20.6	10990.4	21.11	11022.5	19.5	11242.6	19
11335	19.3	11432.9	19.2	11720.9	18.4	14591.4	17.9	14624.4	20.1
14662.2	33.3	14691.4	35.5	15049.4	41.9	15301	42.1	15595.8	43.7
15925.7	43.8	16126.2	43.8	16172.7	44.1	16268.1	44.2	16363.2	44
16653.9	44.9	16889.9	45.3	17127.1	45.7	17215.7	48.1	17468.8	50.3

Manning's n Values num= 15									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	508.9	.04	1194.2	.05	2725.4	.04	3470.8	.05
5089.3	.04	5628.6	.07	8721.6	.04	9216.3	.05	10464.6	.07
10552.1	.021	10939.1	.07	15301	.04	16363.2	.06	17215.7	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 10514.97 10950.7 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
010514.97	18.92	10950.7	17468.8	18.92	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	23.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.066	0.023	0.070
W.S. Elev (ft)	23.50	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	12715.93	4480.62	16561.21
E.G. Slope (ft/ft)	0.000214	Area (sq ft)	12715.93	4480.62	16561.21
Q Total (cfs)	43600.00	Flow (cfs)	8813.17	20783.13	14003.70
Top Width (ft)	8702.36	Top Width (ft)	4619.39	399.54	3683.42
Vel Total (ft/s)	1.29	Avg. Vel. (ft/s)	0.69	4.64	0.85

Max Chl Dpth (ft)	16.86	Hydr. Depth (ft)	2.75	11.21	4.50
Conv. Total (cfs)	2981239.0	Conv. (cfs)	602618.6	1421088.0	957531.7
Length Wtd. (ft)	3344.25	Wetted Per. (ft)	4619.88	403.70	3684.22
Min Ch El (ft)	6.64	Shear (lb/sq ft)	0.04	0.15	0.06
Alpha	6.34	Stream Power (lb/ft s)	0.03	0.69	0.05
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	33542.91	62781.76	12126.57
C & E Loss (ft)	0.01	Cum SA (acres)	12730.61	13285.43	5772.35

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 24.2625*

INPUT

Description:

Station Elevation Data		num= 223	
Sta	Elev	Sta	Elev
.12	53.51	63.26	52.98
493.91	42	575.19	42.09
696.23	41.74	697.25	41.83
818.68	41.36	856.41	41.35
1087.12	41.4	1101.63	40.87
1596.06	41.49	1800.01	43.33
2644.55	34.31	2710.14	34.14
3367.8	33.79	3634.83	33.79
4724.85	35.19	4938.22	39.04
5821.25	19.48	6110.31	19.3
6946.81	18.46	7223.25	18.14
7722.95	18.97	7764.6	19.07
7964.3	20.63	8028.07	21.11
8217.41	20.96	8328.46	21.34
8580.73	22.57	8594.09	22.38
8955.07	22.3	8985.49	21.97
9299.62	23.26	9314.51	23.17
9438.36	20.75	9505.18	21.09
9631.06	21.15	9665.3	21.31
9775.78	20.84	9828.22	20.67
9996.23	23.25	10020.55	24.71
10114.9	39.22	10120.63	36.67
10157.99	40.62	10166.79	39.69
10213.38	34.07	10214.53	33.61
10246.08	21.49	10248.24	21.10
10294.82	10.12	10296.78	10.04
10329.88	9.15	10341.57	10.06
10376.63	9.69	10377.39	9.67
10411.7	8.74	10415.43	8.67
10430.35	7.91	10435.07	7.61
10446.76	6.81	10450.25	6.74
10465.16	5.61	10470.14	5.06
10505.74	9.48	10514.69	9.81
10590.78	14.24	10616.72	15.36
10676.32	19.02	10685.2	19.76
10943.05	18.2	11034.2	18.61
11506.62	18.12	11805.73	18.28
13043.32	18.71	13059.81	18.68
13368.54	18.24	13406.06	17.45
13818.48	17.28	13847.03	17.71
14278.95	19.73	14316.24	31.27
			33.19
			34.51
			35.47
			36.56

14698.19	38.4814946.37	38.6615237.17	40.0715562.59	40.1615760.37	40.17
15806.24	40.4315900.35	40.5215994.16	40.3516131.44	40.7316218.75	41.69
16280.91	4216290.23	42.0416473.48	42.4116513.71	42.4816747.69	42.84
16766.94	43.316835.08	44.9217084.75	46.79		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.12	.06410202.69	.0810225.66	.02110655.11	.068			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 10202.6910655.11 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.12510202.69	18.3012510655.11	17084.75	18.30125		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	22.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.064	0.021	0.068
W.S. Elev (ft)	22.75	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	11314.43	4705.68	15901.67
E.G. Slope (ft/ft)	0.000197	Area (sq ft)	11314.43	4705.68	15901.67
Q Total (cfs)	43600.00	Flow (cfs)	6973.76	23575.89	13050.35
Top Width (ft)	8500.00	Top Width (ft)	4454.60	411.79	3633.61
Vel Total (ft/s)	1.37	Avg. Vel. (ft/s)	0.62	5.01	0.82
Max Chl Dpth (ft)	17.69	Hydr. Depth (ft)	2.54	11.43	4.38
Conv. Total (cfs)	3105594.0	Conv. (cfs)	496735.3	1679293.0	929566.1
Length Wtd. (ft)	3422.56	Wetted Per. (ft)	4455.06	415.46	3634.26
Min Ch El (ft)	5.06	Shear (lb/sq ft)	0.03	0.14	0.05
Alpha	7.42	Stream Power (lb/ft s)	0.02	0.70	0.04
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	32983.32	62317.13	11243.31
C & E Loss (ft)	0.00	Cum SA (acres)	12519.30	13244.40	5573.27

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 23.425*

INPUT

Description:

Station Elevation Data num= 223

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.25	50.72	61.45	50.41	170.15	46.26	171.34	46.24	299.07	42.22
478.91	38.41	557.7	38.28	608.52	38.24	666.53	37.85	669	37.66
675.04	37.65	676.03	37.84	696.14	38.13	705.97	38.07	708.88	37.77
793.74	37.5	830.31	37.5	833.41	37.57	863.14	37.52	875.93	37.45
1053.96	37.61	1068.02	36.54	1087.56	36.55	1090.38	36.62	1123.49	36.85
1547.31	37.08	1745.02	38.65	2024.47	40.38	2211.46	38.72	2378.03	31.83
2563.7	30.93	2627.29	30.77	2707.23	30.85	2845.03	31.3	2915.01	30.47
3264.81	30.47	3523.66	30.47	3827.18	31	4062.8	30.93	4381.93	30.7
4580.3	31.68	4787.13	34.97	5000.27	33.92	5203.44	30.62	5294.39	18.55
5643.13	18.21	5923.33	18.22	6224.02	18.78	6515.95	18.19	6553.96	17.78
6734.22	17.58	7002.2	17.29	7077.48	17.42	7241.57	17.74	7434.18	17.93
7486.59	18.05	7526.97	18.16	7564.23	19.54	7584.98	19.79	7655.43	20.36
7720.56	21.17	7782.37	21.95	7792.38	21.91	7819.51	21.84	7898.6	20.82
7965.91	20.83	8073.56	20.95	8203.6	21.89	8232.36	22.02	8256.67	22.4
8318.11	22.42	8331.07	22.01	8461.41	22.19	8574.13	22.01	8668.9	21.99
8680.98	22	8710.47	21.36	8872.72	21.35	8947.69	21.48	8965.37	23.25

9014.99	22.65	9029.42	22.74	9048.24	21.02	9059.53	21.25	9125.29	21.29
9149.48	20.71	9214.25	21.4	9280.88	21.47	9294.33	22.87	9307.53	22.79
9336.28	21.56	9369.47	21.88	9397.36	22.93	9431.53	21.57	9457.45	22.17
9476.57	20.97	9527.4	20.63	9587.99	21.85	9598.76	21.55	9623.52	21.36
9690.27	23.3	9713.84	25.58	9763.55	26.95	9763.93	27.06	9800.58	35.35
9805.31	36.73	9810.86	34.54	9825.53	36.82	9831.17	38.15	9843.03	38.09
9847.07	37.86	9855.61	37.05	9867.1	36.49	9875.95	35.62	9890.4	37.69
9902.64	31.69	9903.95	31.27	9914.12	29.59	9916.7	28.67	9926.37	25.04
9940.07	20.04	9942.53	19.56	9967.01	15.65	9973.77	14.62	9982.47	11.31
9995.84	10.09	9998.08	10.0310009.22		9.6710022.59		8.9310027.56		9.02
10035.97	9.1510049.34		9.8810057.15		9.8310062.72		9.810076.09		9.73
10089.47	9.4310090.33		9.4210102.85		9.1110116.22		8.8510120.55		8.72
10129.6	8.4410133.87		8.3610139.56		8.1210142.97		7.9210145.25		7.73
10150.95	7.3410156.35		6.9910156.64		6.9710162.33		6.5910168.02		6.21
10169.72	6.1510173.71		6.14	10179.4	5.67	10183.1	5.5110185.09		5.4
10190.78	4.3410196.47		3.4810203.97		3.4810211.88		4.4710219.77		6.97
10227.67	7.8110235.57		8.2810243.47		9.1310251.38		10.4210253.36		10.56
10302.74	13.2110325.63		14.5810343.25		14.9410350.36		16.3210359.53		19.83
10380.44	18.29	10389.2	18.9110398.15		19.2710429.38		17.9710569.28		17.3
10643.5	17.4110733.39		17.9210828.64		18.1410878.02		18.1911108.82		17.83
11199.32	17.8611494.31		18.2211768.35		17.6912410.28		17.8312698.83		18.51
12714.88	19.2812731.13		19.2612746.63		18.7312918.96		18.2812950.28		18.58
13035.62	18.4213072.62		16.8613094.12		16.6813137.01		16.6313295.69		16.68
13479.37	16.5813507.52		17.4513657.15		17.8113765.73		17.79	13901.4	17.72
13933.51	19.3613970.28		29.2413998.69		30.8814081.13		31.9914227.92		33.41
14346.97	35.0614591.74		35.2214878.54		36.4315199.49		36.5215394.54		36.53
15439.78	36.7615532.59		36.8415625.11		36.69	15760.5	37.0215846.61		38.68
15907.92	39.1115917.11		39.1616097.84		39.616137.51		39.6516368.27		39.97
16387.26	40.3716454.47		41.74	16700.7	43.28				

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .25 .062 9890.4 .08 9940.07 .02110359.53 .066

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9890.410359.53 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .259890.402 17.682510359.53 16700.7 17.6825

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	22.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.062	0.022	0.066
W.S. Elev (ft)	22.07	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	10236.40	4898.62	14711.06
E.G. Slope (ft/ft)	0.000207	Area (sq ft)	10236.40	4898.62	14711.06
Q Total (cfs)	43600.00	Flow (cfs)	7475.34	23912.55	12212.12
Top Width (ft)	7956.31	Top Width (ft)	3947.24	425.01	3584.05
Vel Total (ft/s)	1.46	Avg. Vel. (ft/s)	0.73	4.88	0.83
Max Chl Dpth (ft)	18.59	Hydr. Depth (ft)	2.59	11.53	4.10
Conv. Total (cfs)	3031040.0	Conv. (cfs)	519679.7	1662382.0	848977.5
Length Wtd. (ft)	3455.06	Wetted Per. (ft)	3947.75	428.35	3584.61
Min Ch El (ft)	3.48	Shear (lb/sq ft)	0.03	0.15	0.05
Alpha	6.26	Stream Power (lb/ft s)	0.02	0.72	0.04
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	32481.47	61831.36	10410.39
C & E Loss (ft)	0.00	Cum SA (acres)	12323.65	13202.07	5376.89

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 22.5875*

INPUT

Description:

Station Elevation Data		num= 223									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.38	47.94	59.64	47.84	164.91	42.28	166.06	42.27	289.76	38.53		
463.92	34.81	540.22	34.46	589.43	34.31	645.61	33.84	648	33.57		
653.85	33.55	654.81	33.85	674.28	34.33	683.8	34.26	686.62	34		
768.8	33.63	804.22	33.64	807.22	33.71	836	33.67	848.39	33.62		
1020.8	33.83	1034.42	32.22	1053.34	32.23	1056.07	32.29	1088.13	32.47		
1498.57	32.66	1690.03	33.97	1960.65	35.41	2141.73	34.04	2303.05	28.29		
2482.85	27.54	2544.43	27.41	2621.85	27.47	2755.29	27.85	2823.06	27.16		
3161.81	27.16	3412.48	27.16	3706.42	27.6	3934.59	27.54	4243.65	27.35		
4435.75	28.16	4636.05	30.91	4842.46	30.04	5039.2	27.29	5127.28	17.23		
5465.01	16.94	5736.36	17.13	6027.55	18.16	6310.26	17.48	6347.06	16.89		
6521.63	16.7	6781.15	16.43	6854.05	16.53	7012.96	16.8	7199.48	16.97		
7250.24	17.12	7289.34	17.25	7325.42	19.29	7345.52	19.63	7413.74	20.59		
7476.81	21.71	7536.68	22.79	7546.37	22.72	7572.64	22.55	7649.23	20.83		
7714.42	20.69	7818.67	20.56	7944.6	21.59	7972.45	21.75	7995.99	22.3		
8055.49	22.26	8068.04	21.64	8194.27	21.78	8303.43	21.63	8395.2	21.68		
8406.9	21.7	8435.46	20.75	8592.59	20.75	8665.18	20.97	8682.31	22.47		
8730.36	22.04	8744.34	22.31	8762.56	21.13	8773.49	21.47	8837.18	21.54		
8860.6	20.68	8923.33	21.72	8987.85	21.82	9000.88	23.92	9013.66	23.81		
9041.5	21.97	9073.64	22.45	9100.65	24.02	9133.75	21.99	9158.84	22.89		
9177.36	21.09	9226.59	20.6	9285.25	22.43	9295.69	21.97	9319.67	21.35		
9384.31	23.35	9407.13	26.45	9455.27	27.82	9455.64	27.92	9491.13	33.11		
9495.71	34.25	9501.09	32.41	9515.3	34.28	9520.76	35.38	9532.24	35.3		
9536.16	35.1	9544.42	34.4	9555.56	34.27	9564.12	33.81	9578.12	35.96		
9591.9	29.31	9593.38	28.93	9604.83	27.31	9607.73	26.49	9618.62	23.13		
9634.05	18.58	9636.83	18.11	9664.39	14.72	9672.01	13.86	9681.8	11.09		
9696.86	10.07	9699.38	10.01	9711.93	9.68	9726.99	9.03	9732.58	9.09		
9742.05	9.16	9757.12	9.71	9765.91	9.62	9772.18	9.58	9787.24	9.48		
9802.31	9.18	9803.28	9.16	9817.37	8.84	9832.43	8.56	9837.31	8.43		
9847.5	8.14	9852.31	8.05	9858.72	7.73	9862.56	7.45	9865.13	7.22		
9871.54	6.76	9877.62	6.36	9877.95	6.34	9884.36	5.94	9890.77	5.54		
9892.69	5.51	9897.17	5.53	9903.58	4.89	9907.75	4.69	9909.99	4.57		
9916.4	3.08	9922.81	1.9	9929.06	1.9	9935.91	2.94	9942.76	5.23		
9949.61	6.15	9956.46	6.76	9963.31	7.67	9970.16	8.97	9971.88	9.13		
10014.7	12.17	10034.55	13.81	10049.83	14.48	10055.99	15.77	10063.94	18.89		
10084.56	17.57	10093.2	18.07	10102.02	18.35	10132.81	17.21	10270.77	16.37		
10343.95	16.61	10432.59	17.23	10526.5	17.62	10575.2	17.76	10802.78	17.54		
10892.02	17.61	11182.89	18.17	11453.11	17.39	12086.08	17.65	12370.61	18.71		
12386.43	19.87	12402.46	19.83	12417.74	19.04	12587.66	18.38	12618.55	18.83		
12702.7	18.61	12739.18	16.27	12760.38	16.12	12802.67	15.92	12959.14	16.02		
13140.25	15.88	13168.02	17.19	13315.55	17.74	13422.63	17.73	13556.41	17.63		
13588.06	18.99	13624.32	17.22	13652.33	28.57	13733.63	29.47	13878.37	30.26		
13995.76	31.63	14237.11	31.78	14519.91	32.81	14836.38	32.88	15028.71	32.9		
15073.32	33.09	15164.84	33.16	15256.07	33.04	15389.57	33.32	15474.48	35.67		
15534.93	36.21	15543.99	36.29	15722.2	36.78	15761.32	36.83	15988.86	37.11		
16007.59	37.44	16073.85	38.56	16316.65	39.76						

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.38	.06	9578.12	.08	9634.05	.02	10063.94	.064		

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

9578.1210063.94 2028.75 4406.38 2370.38 .1 .3
Blocked Obstructions num= 2
Sta L Sta R Elev Sta L Sta R Elev
.3759578.11917.0637510063.9416316.6517.06375

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	21.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.060	0.022	0.064
W.S. Elev (ft)	21.31	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	9418.66	5028.40	12788.85
E.G. Slope (ft/ft)	0.000215	Area (sq ft)	9418.66	5028.40	12788.85
Q Total (cfs)	43600.00	Flow (cfs)	8176.78	25169.62	10253.60
Top Width (ft)	7009.04	Top Width (ft)	3035.52	439.16	3534.36
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)	0.87	5.01	0.80
Max Chl Dpth (ft)	19.41	Hydr. Depth (ft)	3.10	11.45	3.62
Conv. Total (cfs)	2975521.0	Conv. (cfs)	558031.5	1717723.0	699766.2
Length Wtd. (ft)	3566.70	Wetted Per. (ft)	3035.92	442.36	3534.86
Min Ch El (ft)	1.90	Shear (lb/sq ft)	0.04	0.15	0.05
Alpha	5.76	Stream Power (lb/ft s)	0.04	0.76	0.04
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	32023.77	61329.27	9662.17
C & E Loss (ft)	0.01	Cum SA (acres)	12161.05	13158.37	5183.21

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 21.75*

INPUT

Description:

Station Elevation Data	num=	223								
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev										
.5 45.15 57.83 45.27 159.67 38.31 160.78 38.29 280.44 34.84										
448.92 31.21 522.73 30.65 570.34 30.38 624.69 29.83 627 29.48										
632.66 29.46 633.59 29.86 652.43 30.52 661.63 30.45 664.36 30.23										
743.86 29.77 778.12 29.79 781.03 29.85 808.87 29.83 820.86 29.79										
987.64 30.04 1000.81 27.9 1019.12 27.9 1021.76 27.95 1052.78 28.1										
1449.83 28.25 1635.05 29.3 1896.84 30.45 2072.01 29.35 2228.06 24.75										
2402 24.15 2461.57 24.05 2536.47 24.1 2665.56 24.4 2731.12 23.85										
3058.82 23.85 3301.31 23.85 3585.66 24.2 3806.39 24.15 4105.37 24										
4291.2 24.65 4484.97 26.85 4684.64 26.15 4874.97 23.95 4960.18 15.9										
5286.89 15.68 5549.39 16.04 5831.08 17.55 6104.57 16.76 6140.17 15.99										
6309.05 15.82 6560.09 15.57 6630.62 15.64 6784.35 15.87 6964.79 16.02										
7013.89 16.19 7051.71 16.34 7086.62 19.03 7106.06 19.47 7172.06 20.82										
7233.07 22.25 7290.98 23.64 7300.35 23.53 7325.77 23.26 7399.87 20.84										
7462.93 20.56 7563.77 20.17 7685.59 21.29 7712.54 21.48 7735.31 22.2										
7792.87 22.11 7805.01 21.27 7927.12 21.37 8032.72 21.24 8121.5 21.37										
8132.82 21.4 8160.45 20.14 8312.45 20.16 8382.68 20.47 8399.24 21.69										
8445.72 21.44 8459.25 21.88 8476.87 21.24 8487.45 21.7 8549.06 21.79										
8571.72 20.64 8632.4 22.03 8694.82 22.18 8707.42 24.98 8719.79 24.83										
8746.72 22.37 8777.81 23.02 8803.94 25.12 8835.96 22.42 8860.23 23.61										
8878.15 21.21 8925.77 20.56 8982.52 23 8992.62 22.39 9015.81 21.34										
9078.35 23.4 9100.43 27.32 9146.99 28.69 9147.36 28.78 9181.69 30.87										
9186.12 31.77 9191.32 30.28 9205.06 31.74 9210.35 32.61 9221.45 32.51										
9225.24 32.34 9233.24 31.76 9244.01 32.06 9252.29 32 9265.83 34.22										
9281.16 26.93 9282.8 26.59 9295.54 25.03 9298.76 24.3 9310.88 21.22										
9328.03 17.12 9331.12 16.67 9361.77 13.79 9370.24 13.09 9381.13 10.88										
9397.88 10.05 9400.69 10 9414.63 9.69 9431.39 9.12 9437.61 9.15										

9448.14	9.16	9464.89	9.53	9474.67	9.42	9481.64	9.36	9498.39	9.22
9515.14	8.93	9516.22	8.91	9531.89	8.58	9548.64	8.27	9554.07	8.14
9565.39	7.84	9570.75	7.74	9577.88	7.35	9582.15	6.99	9585	6.72
9592.13	6.19	9598.9	5.74	9599.26	5.71	9606.38	5.29	9613.51	4.87
9615.65	4.86	9620.64	4.93	9627.77	4.11	9632.4	3.88	9634.89	3.73
9642.02	1.83	9649.15	.32	9654.15	.32	9659.95	1.41	9665.75	3.5
9671.55	4.49	9677.35	5.23	9683.15	6.22	9688.95	7.51	9690.4	7.71
9726.66	11.14	9743.47	13.02	9756.4	14.01	9761.62	15.22	9768.35	17.95
9788.68	16.85	9797.19	17.22	9805.89	17.42	9836.25	16.43	9972.26	15.44
10044.4	15.82	10131.79	16.54	10224.37	17.09	10272.38	17.33	10496.74	17.25
10584.71	17.34	10871.47	18.12	11137.87	17.09	11761.89	17.48	12042.39	18.91
12057.98	20.46	12073.79	20.41	12088.86	19.35	12256.37	18.49	12286.82	19.09
12369.78	18.78	12405.75	15.67	12426.65	15.32	12468.34	15.22	12622.59	15.35
12801.14	15.19	12828.51	16.94	12973.96	17.67	13079.52	17.66	13211.41	17.54
13242.62	18.62	13278.36	25.19	13305.98	26.27	13386.12	26.96	13528.81	27.11
13644.54	28.21	13882.48	28.34	14161.28	29.16	14473.27	29.25	14662.89	29.26
14706.86	29.42	14797.08	29.48	14887.02	29.39	15018.64	29.62	15102.34	32.65
15161.94	33.32	15170.88	33.41	15346.56	33.97	15385.13	34.01	15609.45	34.25
15627.91	34.51	15693.24	35.39	15932.6	36.25				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.5	.058	9265.83	.09	9310.88	.019	9768.35	.063

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9265.83 9768.35 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.59265.835	16.445	9768.35	15932.6	16.445	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	20.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.058	0.019	0.063
W.S. Elev (ft)	20.44	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	8365.87	5068.05	10469.98
E.G. Slope (ft/ft)	0.000212	Area (sq ft)	8365.87	5068.05	10469.98
Q Total (cfs)	43600.00	Flow (cfs)	7417.36	28684.37	7498.27
Top Width (ft)	6496.76	Top Width (ft)	2563.47	454.21	3479.08
Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)	0.89	5.66	0.72
Max Chl Dpth (ft)	20.12	Hydr. Depth (ft)	3.26	11.16	3.01
Conv. Total (cfs)	2994001.0	Conv. (cfs)	509348.1	1969749.0	514904.4
Length Wtd. (ft)	3721.89	Wetted Per. (ft)	2563.79	457.45	3479.57
Min Ch El (ft)	0.32	Shear (lb/sq ft)	0.04	0.15	0.04
Alpha	6.40	Stream Power (lb/ft s)	0.04	0.83	0.03
Frctn Loss (ft)	0.82	Cum Volume (acre-ft)	31609.62	60818.61	9029.34
C & E Loss (ft)	0.01	Cum SA (acres)	12030.66	13113.18	4992.39

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 20.9125*

INPUT

Description:

Station	Elevation	Data	num=	223					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.62	42.36	56.02	42.71	154.43	34.33	155.5	34.31	271.13	31.14

433.93	27.61	505.25	26.84	551.26	26.45	603.76	25.82	606	25.38
611.47	25.37	612.36	25.87	630.57	26.72	639.46	26.64	642.1	26.47
718.92	25.9	752.03	25.94	754.84	25.98	781.74	25.99	793.32	25.97
954.48	26.26	967.21	23.57	984.9	23.58	987.45	23.61	1017.42	23.73
1401.08	23.84	1580.06	24.63	1833.02	25.49	2002.29	24.66	2153.08	21.21
2321.16	20.76	2378.71	20.69	2451.09	20.73	2575.82	20.95	2639.17	20.54
2955.82	20.54	3190.14	20.54	3464.9	20.8	3678.19	20.76	3967.09	20.65
4146.65	21.14	4333.89	22.79	4526.83	22.26	4710.74	20.61	4793.07	14.58
5108.76	14.41	5362.42	14.96	5634.61	16.94	5898.88	16.05	5933.28	15.09
6096.46	14.94	6339.04	14.71	6407.19	14.76	6555.74	14.94	6730.09	15.06
6777.54	15.26	6814.08	15.43	6847.81	18.77	6866.6	19.32	6930.37	21.05
6989.33	22.78	7045.29	24.48	7054.34	24.34	7078.91	23.97	7150.5	20.86
7211.43	20.42	7308.88	19.78	7426.59	20.98	7452.63	21.21	7474.63	22.1
7530.25	21.96	7541.98	20.91	7659.98	20.97	7762.02	20.86	7847.8	21.06
7858.74	21.1	7885.44	19.53	8032.31	19.57	8100.17	19.96	8116.18	20.91
8161.09	20.83	8174.16	21.45	8191.19	21.35	8201.41	21.92	8260.95	22.04
8282.84	20.61	8341.48	22.35	8401.79	22.53	8413.96	26.03	8425.92	25.84
8451.94	22.78	8481.99	23.59	8507.23	26.21	8538.17	22.84	8561.62	24.33
8578.93	21.33	8624.95	20.52	8679.79	23.58	8689.54	22.82	8711.96	21.33
8772.39	23.45	8793.72	28.19	8838.72	29.57	8839.07	29.63	8872.24	28.62
8876.52	29.29	8881.54	28.16	8894.83	29.2	8899.94	29.83	8910.66	29.72
8914.33	29.59	8922.05	29.12	8932.46	29.85	8940.46	30.19	8953.55	32.49
8970.42	24.55	8972.23	24.25	8986.24	22.75	8989.8	22.12	9003.13	19.31
9022.01	15.66	9025.42	15.22	9059.15	12.87	9068.48	12.33	9080.47	10.66
9098.91	10.02	9101.99	9.98	9117.34	9.7	9135.78	9.22	9142.63	9.22
9154.22	9.17	9172.66	9.35	9183.43	9.22	9191.1	9.14	9209.54	8.97
9227.98	8.68	9229.17	8.66	9246.42	8.31	9264.85	7.97	9270.83	7.84
9283.29	7.54	9289.19	7.43	9297.03	6.96	9301.73	6.53	9304.88	6.21
9312.72	5.62	9320.17	5.11	9320.57	5.08	9328.41	4.64	9336.26	4.2
9338.61	4.22	9344.11	4.32	9351.95	3.33	9357.05	3.06	9359.8	2.9
9367.64	.57	9375.49	-1.26	9379.24	-1.26	9383.99	-.12	9388.74	1.76
9393.49	2.83	9398.24	3.7	9402.99	4.76	9407.74	6.05	9408.93	6.28
9438.62	10.1	9452.39	12.24	9462.98	13.54	9467.25	14.68	9472.76	17.01
9492.8	16.12	9501.19	16.38	9509.77	16.5	9539.69	15.67	9673.74	14.5
9744.85	15.02	9830.98	15.85	9922.24	16.56	9969.56	16.9	10190.7	16.96
10277.41	17.08	10560.05	18.06	10822.62	16.79	11437.69	17.31	11714.17	19.11
11729.54	21.04	11745.12	20.98	11759.97	19.67	11925.08	18.59	11955.09	19.34
12036.86	18.96	12072.31	15.08	12092.91	14.64	12134	14.51	12286.05	14.69
12462.03	14.49	12489.01	16.68	12632.37	17.61	12736.42	17.61	12866.41	17.45
12897.17	18.25	12932.4	23.16	12959.62	23.96	13038.62	24.44	13179.26	23.95
13293.33	24.79	13527.85	24.89	13802.65	25.53	14110.16	25.61	14297.06	25.63
14340.4	25.75	14429.33	25.81	14517.97	25.73	14647.7	25.91	14730.21	29.64
14788.95	30.42	14797.76	30.53	14970.92	31.15	15008.93	31.18	15230.04	31.38
15248.23	31.59	15312.62	32.21	15548.55	32.74				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.62	.056	8953.55	.1	9003.13	.017	9472.76	.061

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

8953.55	9472.76	2028.75	4406.38	2370.38	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.6258953	55215.826259	472.763155	48.5515	82625	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	19.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.056	0.017	0.061
W.S. Elev (ft)	19.50	Reach Len. (ft)	2028.75	4406.38	2370.38

Crit W.S. (ft)		Flow Area (sq ft)	7404.42	5039.64	8020.57
E.G. Slope (ft/ft)	0.000227	Area (sq ft)	7404.42	5039.64	8020.57
Q Total (cfs)	43600.00	Flow (cfs)	6761.73	31578.92	5259.35
Top Width (ft)	5982.43	Top Width (ft)	2147.31	470.53	3364.59
Vel Total (ft/s)	2.13	Avg. Vel. (ft/s)	0.91	6.27	0.66
Max Chl Dpth (ft)	20.76	Hydr. Depth (ft)	3.45	10.71	2.38
Conv. Total (cfs)	2891237.0	Conv. (cfs)	448389.1	2094086.0	348762.2
Length Wtd. (ft)	3823.48	Wetted Per. (ft)	2147.61	474.03	3364.98
Min Ch El (ft)	-1.26	Shear (lb/sq ft)	0.05	0.15	0.03
Alpha	6.31	Stream Power (lb/ft s)	0.04	0.95	0.02
Frctn Loss (ft)	1.02	Cum Volume (acre-ft)	31242.38	60307.38	8526.24
C & E Loss (ft)	0.01	Cum SA (acres)	11920.96	13066.41	4806.18

Warning: Divided flow computed for this cross-section.

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

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 20.075*

INPUT

Description:

Station Elevation Data		num= 223	
Sta	Elev	Sta	Elev
.75	39.58	54.22	40.14
418.93	24.02	487.77	23.03
590.28	21.28	591.14	21.88
693.98	22.03	725.93	22.09
921.32	22.47	933.61	19.25
1352.34	19.43	1525.07	19.95
2240.31	17.38	2295.86	17.33
2852.83	17.23	3078.97	17.23
4002.11	17.63	4182.81	18.73
4930.64	13.14	5175.45	13.87
5883.87	14.06	6117.99	13.86
6541.18	14.34	6576.46	14.52
6745.59	23.32	6799.59	25.32
6959.94	20.29	7053.99	19.38
7267.64	21.81	7278.96	20.54
7584.66	20.8	7610.42	18.92
7876.46	20.22	7889.08	21.03
7993.96	20.57	8050.55	22.67
8157.16	23.19	8186.16	24.16
8279.72	21.46	8324.13	20.48
8466.42	23.5	8487.01	29.06
8566.93	26.8	8571.77	26.03
8603.41	26.83	8610.87	26.48
8659.68	22.16	8661.66	21.91
8716	14.21	8719.71	13.77
8799.93	10	8803.29	9.97
8860.31	9.18	8880.43	9.17
8940.81	8.42	8942.11	8.41
9001.19	7.25	9007.62	7.12
9033.32	5.05	9041.45	4.49
9061.57	3.58	9067.57	3.71
9093.26	-.69	9101.83	-2.84
9115.42	1.16	9119.12	2.17
9150.58	9.07	9161.3	11.46
			13.07
			13.07
			14.13
			16.08

9196.92	15.4	9205.19	15.53	9213.64	15.58	9243.13	14.9	9375.23	13.57
9445.31	14.23	9530.18	15.15	9620.11	16.03	9666.74	16.46	9884.66	16.68
9970.11	16.82	10248.64	18.01	10507.38	16.51	11113.49	17.14	11385.94	19.3
11401.09	21.63	11416.45	21.55	11431.08	19.98	11593.79	18.69	11623.36	19.59
11703.94	19.14	11738.87	14.49	11759.17	13.96	11799.67	13.81	11949.5	14.03
12122.92	13.79	12149.51	16.42	12290.78	17.54	12393.31	17.53	12521.41	17.36
12551.72	17.88	12586.44	21.13	12613.27	21.65	12691.11	21.93	12829.71	20.8
12942.11	21.37	13173.23	21.45	13444.02	21.91	13747.06	21.97	13931.23	22
13973.94	22.08	14061.57	22.12	14148.93	22.08	14276.77	22.21	14358.07	26.63
14415.96	27.52	14424.64	27.65	14595.28	28.33	14632.74	28.36	14850.62	28.52
14868.55	28.66	14932.01	29.03	15164.5	29.23				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.75	.054	8641.27	.1	8695.39	.016	9177.17	.059

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

8641.27	9177.17	2028.75	4406.38	2370.38	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.74999998641.268	15.20759177.175	15164.5	15.2075		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	18.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.	0.054	0.018	0.059
W.S. Elev (ft)	18.39	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	8405.45	4890.39	5383.55
E.G. Slope (ft/ft)	0.000304	Area (sq ft)	8405.45	4890.39	5383.55
Q Total (cfs)	43600.00	Flow (cfs)	7067.35	32976.65	3556.00
Top Width (ft)	7763.33	Top Width (ft)	4334.90	487.45	2940.98
Vel Total (ft/s)	2.33	Avg. Vel. (ft/s)	0.84	6.74	0.66
Max Chl Dpth (ft)	21.23	Hydr. Depth (ft)	1.94	10.03	1.83
Conv. Total (cfs)	2499837.0	Conv. (cfs)	405211.3	1890739.0	203886.0
Length Wtd. (ft)	3756.72	Wetted Per. (ft)	4335.17	491.53	2941.32
Min Ch El (ft)	-2.84	Shear (lb/sq ft)	0.04	0.19	0.03
Alpha	6.34	Stream Power (lb/ft s)	0.03	1.27	0.02
Frctn Loss (ft)	0.93	Cum Volume (acre-ft)	30874.22	59805.14	8161.54
C & E Loss (ft)	0.04	Cum SA (acres)	11770.01	13017.96	4634.62

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 19.2375*

INPUT Description:

Station Elevation Data num= 223

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.87	36.79	52.41	37.57	143.94	26.38	144.94	26.36	252.5	23.76		
403.94	20.42	470.28	19.21	513.08	18.58	561.92	17.81	564	17.19		
569.09	17.19	569.92	17.89	586.86	19.11	595.13	19.01	597.59	18.94		
669.04	18.17	699.84	18.24	702.45	18.26	727.48	18.3	738.25	18.32		
888.16	18.69	900	14.92	916.45	14.93	918.83	14.94	946.71	14.98		
1303.6	15.01	1470.08	15.28	1705.39	15.56	1862.84	15.29	2003.11	14.14		
2159.46	13.99	2213	13.96	2280.32	13.98	2396.35	14.05	2455.28	13.91		
2749.83	13.91	2967.8	13.91	3223.38	14	3421.79	13.99	3690.52	13.95		
3857.56	14.11	4031.72	14.66	4211.2	14.49	4382.27	13.94	4458.86	11.93		

4752.52	11.87	4988.47	12.79	5241.67	15.71	5487.49	14.62	5519.49	13.3
5671.29	13.18	5896.94	13	5960.33	12.99	6098.51	13.08	6260.7	13.15
6304.83	13.41	6338.83	13.61	6370.21	18.26	6387.68	19.01	6447	21.5
6501.84	23.86	6553.9	26.16	6562.32	25.95	6585.17	25.39	6651.77	20.89
6708.45	20.15	6799.09	18.99	6908.59	20.38	6932.81	20.67	6953.28	21.9
7005.02	21.65	7015.93	20.17	7125.69	20.15	7220.61	20.09	7300.41	20.45
7310.58	20.5	7335.41	18.31	7472.04	18.39	7535.16	18.94	7550.05	19.36
7591.83	19.61	7603.99	20.6	7619.83	21.58	7629.34	22.37	7684.72	22.55
7705.08	20.54	7759.63	22.98	7815.73	23.24	7827.06	28.14	7838.17	27.88
7862.38	23.59	7890.33	24.73	7913.81	28.4	7942.59	23.68	7964.41	25.78
7980.51	21.58	8023.32	20.44	8074.33	24.73	8083.4	23.66	8104.25	21.31
8160.46	23.55	8180.31	29.93	8222.16	31.32	8222.49	31.34	8253.35	24.14
8257.33	24.32	8262	23.9	8274.36	24.12	8279.11	24.28	8289.09	24.15
8292.5	24.07	8299.68	23.84	8309.37	25.43	8316.81	26.57	8328.98	29.03
8348.94	19.78	8351.08	19.57	8367.66	18.18	8371.87	17.75	8387.65	15.49
8409.98	12.75	8414.01	12.33	8453.92	11.01	8464.95	10.81	8479.13	10.23
8500.95	9.97	8504.6	9.95	8522.76	9.73	8544.58	9.41	8552.68	9.35
8566.39	9.18	8588.21	8.99	8600.94	8.81	8610.02	8.7	8631.83	8.46
8653.65	8.17	8655.06	8.15	8675.46	7.78	8697.28	7.39	8704.34	7.25
8719.09	6.95	8726.06	6.81	8735.34	6.19	8740.91	5.6	8744.63	5.2
8753.91	4.47	8762.72	3.86	8763.19	3.83	8772.47	3.35	8781.75	2.87
8784.53	2.93	8791.04	3.11	8800.32	1.78	8806.35	1.43	8809.6	1.23
8818.88	-1.94	8828.16	-4.42	8829.41	-4.42	8832.06	-3.19	8834.71	-1.71
8837.36	-.5	8840.01	.65	8842.66	1.85	8845.31	3.14	8845.98	3.43
8862.54	8.03	8870.22	10.68	8876.13	12.6	8878.51	13.58	8881.59	15.14
8901.05	14.67	8909.19	14.69	8917.52	14.66	8946.57	14.13	9076.71	12.63
9145.76	13.43	9229.38	14.46	9317.98	15.5	9363.92	16.03	9578.62	16.39
9662.8	16.56	9937.22	17.95	10192.14	16.2	10789.3	16.97	11057.72	19.5
11072.65	22.21	11087.77	22.13	11102.19	20.29	11262.49	18.81	11291.63	19.85
11371.02	19.32	11405.44	13.89	11425.44	13.28	11465.33	13.11	11612.95	13.36
11783.81	13.1	11810	16.16	11949.19	17.47	12050.21	17.47	12176.41	17.27
12206.28	17.51	12240.49	19.11	12266.91	19.34	12343.61	19.41	12480.15	17.65
12590.9	17.95	12818.6	18.01	13085.39	18.26	13383.95	18.33	13565.4	18.36
13607.48	18.41	13693.82	18.44	13779.88	18.43	13905.83	18.51	13985.94	23.61
14042.97	24.63	14051.52	24.78	14219.64	25.52	14256.55	25.54	14471.21	25.66
14488.88	25.73	14551.39	25.85	14780.45	25.71				

Manning's n Values num= 4

Sta	n	Val	Sta	n	Val	Sta	n	Val	Sta	n	Val
.87	.052	8328.98	.1	8367.66	.015	8881.59	.057				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
8328.98 8881.59 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.87499998328	.98414	588758881	58814780	4514	58875

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	17.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.	0.052	0.015	0.057
W.S. Elev (ft)	17.55	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	15369.88	4844.29	3905.74
E.G. Slope (ft/ft)	0.000191	Area (sq ft)	15369.88	4844.29	3905.74
Q Total (cfs)	43600.00	Flow (cfs)	12079.35	29611.81	1908.84
Top Width (ft)	8647.05	Top Width (ft)	5480.44	508.34	2658.27
Vel Total (ft/s)	1.81	Avg. Vel. (ft/s)	0.79	6.11	0.49
Max Chl Dpth (ft)	21.97	Hydr. Depth (ft)	2.80	9.53	1.47
Conv. Total (cfs)	3154353.0	Conv. (cfs)	873911.5	2142342.0	138099.6
Length Wtd. (ft)	3589.78	Wetted Per. (ft)	5481.26	513.57	2658.63

Min Ch El (ft)	-4.42	Shear (lb/sq ft)	0.03	0.11	0.02
Alpha	7.82	Stream Power (lb/ft s)	0.03	0.69	0.01
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	30320.57	59312.77	7908.80
C & E Loss (ft)	0.03	Cum SA (acres)	11541.45	12967.59	4482.27

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 18.4

INPUT
 Description: Cross Section at River Mile 18.4

Station Elevation Data		num= 112									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1	34	50.6	35	138.7	22.4	452.8	15.4	541	13.8		
543	13.1	547.9	13.1	548.7	13.9	565	15.3	644.1	14.3		
855	14.9	866.4	10.6	4574.4	10.6	4801.5	11.7	5045.2	15.1		
5281.8	13.9	5312.6	12.4	5458.7	12.3	5736.9	12.1	6026	12.2		
6101.2	12.7	6131.4	18	6258.1	24.4	6308.2	27	6338.3	26.1		
6402.4	20.9	6544.2	18.6	6672.9	20.4	6692.6	21.8	6742.4	21.5		
6752.9	19.8	6949.9	19.7	7036.5	20.2	7060.4	17.7	7191.9	17.8		
7307.2	19	7343.3	22.6	7396.6	22.8	7416.2	20.5	7468.7	23.3		
7522.7	23.6	7533.6	29.2	7544.3	28.9	7567.6	24	7594.5	25.3		
7617.1	29.5	7644.8	24.1	7665.8	26.5	7681.3	21.7	7722.5	20.4		
7771.6	25.3	7800.4	21.3	7854.5	23.6	7873.6	30.8	7914.2	32.2		
7943.9	21.9	7988.5	21.2	8016.7	27.3	8038.2	17.4	8062.9	15.56		
8079.9	13.58	8108.3	10.88	8151.3	10.08	8205.9	9.94	8257.7	9.42		
8309.7	8.6	8368	7.9	8421.1	6.96	8444.5	6.5	8454.5	5.8		
8464.5	4.7	8474.5	3.9	8484.5	3.2	8494.5	2.7	8504.5	2.2		
8514.5	2.5	8524.5	1	8534.5	.4	8544.5	-3.2	8554.5	-6		
8564.5	2	8574.5	7	8586	14.2	8778.2	11.7	9061.1	15.6		
9355.5	16.3	9625.8	17.9	9876.9	15.9	10465.1	16.8	10729.5	19.7		
10744.2	22.8	10759.1	22.7	10773.3	20.6	10931.2	18.9	10959.9	20.1		
11038.1	19.5	11072	13.3	11091.7	12.6	11131	12.4	11276.4	12.7		
11444.7	12.4	11470.5	15.9	11607.6	17.4	11707.1	17.4	11996.1	16.9		
12130.6	14.5	13534.9	14.8	13613.8	20.6	13678.4	21.9	13844	22.7		
14109.2	22.8	14396.4	22.2								

Manning's n Values		num= 10									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1	.05	6026	.07	6402.4	.04	7307.2	.05	7873.6	.11		
8038.2	.014	8778.2	.07	10465.1	.06	11444.7	.07	11707.1	.05		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	8016.7	8586		3217.29	4349	2885.43		.1	.3

Blocked Obstructions		num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev		
1	8016.7	13.97	8586	14396.4	13.97		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	17.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.050	0.014	0.042
W.S. Elev (ft)	17.02	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	16872.59	4938.61	7007.34
E.G. Slope (ft/ft)	0.000147	Area (sq ft)	16872.59	4938.61	7007.34
Q Total (cfs)	44800.00	Flow (cfs)	12409.36	27441.62	4949.02
Top Width (ft)	10083.13	Top Width (ft)	5745.49	542.64	3794.99

Vel Total (ft/s)	1.55	Avg. Vel. (ft/s)	0.74	5.56	0.71
Max Chl Dpth (ft)	23.02	Hydr. Depth (ft)	2.94	9.10	1.85
Conv. Total (cfs)	3695352.0	Conv. (cfs)	1023592.0	2263537.0	408222.6
Length Wtd. (ft)	3889.97	Wetted Per. (ft)	5746.03	550.34	3795.53
Min Ch El (ft)	-6.00	Shear (lb/sq ft)	0.03	0.08	0.02
Alpha	7.91	Stream Power (lb/ft s)	0.02	0.46	0.01
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	29569.74	58817.97	7611.87
C & E Loss (ft)	0.00	Cum SA (acres)	11280.03	12914.43	4306.69

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 17.5714*

INPUT
Description: Interpolated Cross Section at River Mile 17.57
Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.86	32.49	55.66	33.03	99.58	27.91	153.01	21.92	205.31	20.95
334.61	18.4	460.08	16.12	500.09	15.45	597.55	14.12	599.76	13.53
605.17	13.53	605.94	14.13	606.05	14.21	624.06	15.32	711.47	14.01
735.88	13.94	854.35	14.17	944.51	15.01	955.62	11.84	957.11	11.38
999.57	10.74	1080.46	10.9	1249.24	10.89	1433.32	10.39	1539.05	10.41
1663.25	10.39	1779.17	10.37	1911.65	10.44	2057.51	10.39	2058.15	10.41
3010.36	10.4	3961.94	10.37	4175.31	10.59	4386.13	10.73	4454.92	10.37
4938.99	10.43	4961.92	10.56	4979.11	10.43	5054.36	10.44	5059.37	10.46
5155.54	10.84	5170.19	11.34	5190.58	11.07	5305.3	11.46	5321.15	11.63
5435.79	12.74	5545.35	13.95	5574.59	14.28	5707.13	13.81	5836.02	13.29
5870.06	12.01	6031.5	11.91	6338.9	11.73	6658.35	11.8	6741.44	12.23
6774.81	16.77	6914.81	22.25	6970.17	24.47	7003.43	23.7	7074.26	19.24
7230.95	17.26	7373.16	18.8	7394.93	20	7449.96	19.74	7461.56	18.28
7679.24	18.18	7774.93	18.61	7801.34	16.46	7946.64	16.54	8074.05	17.57
8113.94	20.65	8172.83	20.82	8194.49	18.85	8252.5	21.24	8284.15	21.38
8312.17	21.52	8324.21	26.33	8336.04	26.08	8361.78	21.9	8391.51	23.04
8416.48	26.66	8434.47	23.95	8447.09	22.05	8470.29	24.12	8487.42	20.01
8532.94	18.92	8587.2	23.14	8587.97	23.06	8619.02	19.89	8678.8	22.21
8699.91	28.51	8708.35	28.78	8737.65	29.05	8744.77	29.25	8763.76	24.18
8777.59	20.5	8824.27	20.06	8826.87	20.1	8840.83	22.86	8845.29	23.42
8849.75	23.78	8858.03	25.24	8872.42	19.13	8879.19	16.24	8886.82	15.55
8894.57	14.88	8903.49	14.29	8920.22	12.55	8948.17	10.18	8990.49	9.4
9044.22	9.16	9095.2	8.61	9146.37	7.79	9203.75	7.07	9256	6.15
9279.03	5.71	9288.87	5.08	9298.72	4.12	9308.56	3.41	9318.4	2.79
9328.24	2.34	9338.08	1.89	9347.92	2.13	9357.76	.82	9360.71	.66
9367.6	.1	9377.44	-3.28	9387.29	-5.97	9399.89	.99	9405.13	2.81
9409.6	5.04	9412.5	6.64	9414.51	7.91	9421.2	10.92	9427	14.07
9442.82	13.58	9617.55	11.3	9673.79	11.87	9786.64	13	9832	14.38
9895.28	14.55	9898.03	14.59	10061.91	14.92	10189.91	14.92	10197.97	14.94
10371.99	16.87	10398.35	16.54	10457.89	16.79	10706.84	14.85	10841.32	14.91
11162.99	15.22	11208.34	15.51	11271.62	16.38	11290	16.22	11296.94	16.22
11325.41	16.48	11552.14	18.62	11566.71	21.27	11581.49	21.19	11595.56	19.39
11600.68	19.34	11752.11	17.93	11780.57	18.96	11858.09	18.45	11891.71	13.14
11911.24	12.54	11950.2	12.37	11954	12.38	12094.35	12.64	12149.11	12.56
12261.21	12.61	12286.79	15.66	12307.31	15.89	12422.72	17.39	12491.88	17.63
12521.36	17.61	12662.74	17.31	12688.05	16.96	12807.89	16.47	12812.5	16.39
12884.22	14.94	12941.24	14.06	14333.51	14.31	14411.73	19.29	14475.78	20.4
14639.96	21.09	14902.89	21.17	15187.63	20.66				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.86	.054	8858.03	.11	8879.19	.014	9427	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
8858.03 9427 3217.29 4349 2885.43 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.86	8858.03	13.42	9427	15187.63	13.42

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	16.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.054	0.014	0.055
W.S. Elev (ft)	16.41	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	18151.93	5031.81	7279.76
E.G. Slope (ft/ft)	0.000153	Area (sq ft)	18151.93	5031.81	7279.76
Q Total (cfs)	44800.00	Flow (cfs)	12467.57	28415.50	3916.93
Top Width (ft)	10622.78	Top Width (ft)	6328.10	548.21	3746.48
Vel Total (ft/s)	1.47	Avg. Vel. (ft/s)	0.69	5.65	0.54
Max Chl Dpth (ft)	22.38	Hydr. Depth (ft)	2.87	9.18	1.94
Conv. Total (cfs)	3623126.0	Conv. (cfs)	1008294.0	2298057.0	316775.3
Length Wtd. (ft)	3899.18	Wetted Per. (ft)	6328.90	554.58	3746.98
Min Ch El (ft)	-5.97	Shear (lb/sq ft)	0.03	0.09	0.02
Alpha	9.43	Stream Power (lb/ft s)	0.02	0.49	0.01
Froctn Loss (ft)	0.58	Cum Volume (acre-ft)	28276.30	58320.25	7138.68
C & E Loss (ft)	0.01	Cum SA (acres)	10834.16	12859.98	4056.92

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 16.7428*

INPUT
Description: Interpolated Cross Section at River Mile 16.74
Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.71	30.97	60.73	31.07	108.82	26.51	167.33	21.44	224.59	20.56
366.17	18.07	503.57	16.03	547.37	15.5	654.09	14.45	656.51	13.95
662.44	13.96	663.29	14.46	663.41	14.53	683.13	15.34	778.84	13.72
805.56	13.52	935.29	13.68	1034.02	15.11	1046.18	12.56	1047.81	12.16
1094.3	10.89	1182.88	11.2	1367.7	11.17	1569.26	10.17	1685.04	10.23
1821.04	10.17	1947.98	10.14	2093.04	10.29	2252.76	10.17	2253.46	10.23
3296.13	10.2	4338.11	10.14	4571.76	10.57	4802.61	10.86	4877.93	10.14
5407.99	10.26	5433.1	10.51	5451.93	10.26	5534.33	10.28	5539.81	10.3
5645.12	10.63	5661.16	11.56	5683.48	10.94	5809.11	11.22	5826.46	11.36
5952	12.13	6071.96	13.18	6103.97	13.46	6249.11	13.12	6390.25	12.69
6427.52	11.61	6604.29	11.53	6940.9	11.36	7290.7	11.4	7381.69	11.75
7418.23	15.53	7571.53	20.09	7632.15	21.95	7668.57	21.3	7746.12	17.58
7917.7	15.92	8073.42	17.2	8097.25	18.19	8157.51	17.97	8170.21	16.76
8408.58	16.67	8513.36	17.02	8542.28	15.23	8701.38	15.29	8840.89	16.13
8884.57	18.7	8949.06	18.84	8972.78	17.19	9036.3	19.19	9070.96	19.3
9101.64	19.44	9114.83	23.46	9127.77	23.26	9155.97	19.8	9188.51	20.78
9215.86	23.82	9235.56	21.58	9249.37	20	9274.78	21.73	9293.54	18.32
9343.39	17.43	9402.8	20.98	9403.64	20.92	9437.64	18.49	9503.1	20.83
9526.21	26.22	9535.46	26.5	9567.54	26.13	9575.34	26.31	9596.14	22.11
9611.27	19.09	9662.39	18.88	9665.24	19.01	9680.53	21.78	9685.41	22.03
9690.29	21.89	9699.36	23.19	9713.52	17.69	9720.17	15.08	9727.68	14.27
9735.31	13.53	9744.09	13.01	9760.55	11.53	9788.05	9.48	9829.68	8.72

9882.55	8.39	9932.7	7.8	9983.05	6.99	10039.5	6.2410090.91	5.34
10113.57	4.9110123.25	4.3710132.93	3.5410142.61	2.9310152.29	2.38			
10161.98	1.9810171.66	1.5810181.34	1.7610191.02	.6410193.93	.5			
10200.71	-.2110210.39	-3.3610220.07	-5.9410235.29	-.0310241.61	1.54			
10247	4.23	10250.5	6.2710252.92	7.83	10261	10.51	10268	13.94
10283.68	13.1710456.91	10.910512.66	11.2610624.54	11.95	10669.5	14.09		
10732.23	13.5410734.96	13.5710897.43	13.8511024.32	13.5311032.31	13.53			
11204.82	16.3611230.96	15.5311289.99	15.6811536.79	13.8	11670.1	13.71		
11988.99	13.8312033.95	14.3412096.69	15.9812114.91	15.6512121.78	15.57			
12150.01	15.7712374.78	17.5312389.23	19.7512403.87	19.6712417.83	18.17			
12422.9	18.1312573.02	16.9712601.23	17.8312678.09	17.4112711.41	12.98			
12730.77	12.48	12769.4	12.3412773.17	12.3512912.31	12.5812966.59	12.52		
13077.73	12.8213103.08	15.4213123.43	15.6613237.83	17.38	13306.4	17.86		
13335.63	17.8213475.78	17.4513500.88	16.8213619.68	16.0413624.25	15.95			
13695.35	14.3513751.87	13.6115132.12	13.8315209.66	17.9715273.16	18.9			
15435.92	19.4715696.58	19.5415978.86	19.11					

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.71	.053	9699.36	.11	9720.17	.014	10268	.064

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9699.36 10268 3217.29 4349 2885.43 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.71	9699.36	12.87	10268	15978.86	12.87

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	16.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.053	0.015	0.064
W.S. Elev (ft)	15.85	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	19763.45	5146.60	7774.33
E.G. Slope (ft/ft)	0.000147	Area (sq ft)	19763.45	5146.60	7774.33
Q Total (cfs)	44800.00	Flow (cfs)	13426.86	27774.92	3598.23
Top Width (ft)	11542.50	Top Width (ft)	7172.51	549.79	3820.20
Vel Total (ft/s)	1.37	Avg. Vel. (ft/s)	0.68	5.40	0.46
Max Chl Dpth (ft)	21.79	Hydr. Depth (ft)	2.76	9.36	2.04
Conv. Total (cfs)	3693155.0	Conv. (cfs)	1106863.0	2289667.0	296625.3
Length Wtd. (ft)	3876.22	Wetted Per. (ft)	7173.17	555.43	3820.71
Min Ch El (ft)	-5.94	Shear (lb/sq ft)	0.03	0.09	0.02
Alpha	9.69	Stream Power (lb/ft s)	0.02	0.46	0.01
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	26876.11	57812.15	6640.09
C & E Loss (ft)	0.01	Cum SA (acres)	10335.59	12805.17	3806.31

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 15.9142*

INPUT

Description: Interpolated Cross Section at River Mile 15.91

Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.57	29.46	65.79	29.1	118.05	25.11	181.64	20.96	243.87	20.17
397.74	17.74	547.06	15.95	594.66	15.54	710.64	14.77	713.27	14.38
719.71	14.38	720.63	14.79	720.76	14.84	742.19	15.36	846.21	13.44
875.25	13.09	1016.23	13.18	1123.52	15.22	1136.75	13.29	1138.52	12.93

1189.04	11.03	1285.3	11.5	1486.16	11.46	1705.21	9.96	1831.03	10.04
1978.83	9.96	2116.78	9.91	2274.43	10.13	2448.01	9.96	2448.76	10.04
3581.91	10	4714.29	9.91	4968.2	10.56	5219.09	10.99	5300.95	9.91
5876.99	10.09	5904.28	10.47	5924.74	10.09	6014.29	10.13	6020.25	10.14
6134.7	10.42	6152.13	11.79	6176.38	10.81	6312.91	10.99	6331.76	11.09
6468.2	11.53	6598.56	12.4	6633.36	12.65	6791.08	12.44	6944.47	12.08
6984.97	11.22	7177.09	11.14	7542.9	10.99	7923.05	11	8021.93	11.28
8061.64	14.3	8228.24	17.94	8294.12	19.42	8333.7	18.9	8417.99	15.92
8604.45	14.58	8773.68	15.59	8799.58	16.39	8865.07	16.21	8878.87	15.24
9137.91	15.15	9251.79	15.42	9283.21	13.99	9456.13	14.03	9607.74	14.7
9655.21	16.75	9725.3	16.86	9751.07	15.54	9820.1	17.13	9857.77	17.22
9891.11	17.36	9905.44	20.59	9919.51	20.45	9950.15	17.71	9985.52	18.52
10015.24	20.97	10036.65	19.21	10051.66	17.95	10079.28	19.35	10099.66	16.63
10153.83	15.95	10218.4	18.83	10219.31	18.77	10256.27	17.08	10327.4	19.44
10352.52	23.92	10362.57	24.22	10397.43	23.21	10405.91	23.36	10428.51	20.05
10444.96	17.69	10500.51	17.71	10503.6	17.91	10520.22	20.71	10525.53	20.65
10530.83	19.99	10540.69	21.13	10554.62	16.25	10561.16	13.92	10568.54	13
10576.04	12.18	10584.68	11.74	10600.87	10.51	10627.92	8.77	10668.87	8.04
10720.87	7.61	10770.2	6.98	10819.72	6.18	10875.24	5.41	10925.81	4.53
10948.1	4.12	10957.62	3.65	10967.15	2.96	10976.67	2.44	10986.19	1.98
10995.72	1.63	11005.24	1.28	11014.76	1.38	11024.29	.46	11027.14	.34
11033.81	-.51	11043.33	-3.44	11052.86	-5.91	11070.68	-1.04	11078.09	.27
11084.4	3.43	11088.5	5.91	11091.34	7.74	11100.8	10.11	11109	13.81
11124.55	12.75	11296.26	10.51	11351.53	10.65	11462.43	10.9	11507	13.79
11569.18	12.54	11571.89	12.56	11732.94	12.78	11858.73	12.15	11866.64	12.13
12037.66	15.85	12063.57	14.53	12122.08	14.57	12366.73	12.75	12498.88	12.5
12815	12.45	12859.56	13.17	12921.75	15.58	12939.81	15.07	12946.62	14.92
12974.61	15.05	13197.42	16.45	13211.74	18.22	13226.26	18.16	13240.09	16.96
13245.12	16.93	13393.93	16	13421.9	16.69	13498.09	16.36	13531.12	12.82
13550.31	12.42	13588.6	12.31	13592.33	12.32	13730.26	12.52	13784.08	12.47
13894.24	13.03	13919.38	15.18	13939.54	15.43	14052.95	17.36	14120.92	18.09
14149.89	18.03	14288.83	17.6	14313.7	16.68	14431.47	15.61	14436	15.52
14506.48	13.76	14562.51	13.17	14593.72	13.34	14600.6	16.66	14607.54	17.4
16231.88	17.86	16490.27	17.91	16770.09	17.57				

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .57 .05210540.69 .1110561.16 .014 11109 .069

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 10540.69 11109 3217.29 4349 2885.43 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .5710540.69 12.33 1110916770.09 12.33

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	15.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.052	0.015	0.069
W.S. Elev (ft)	15.34	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	21988.54	5290.78	8413.75
E.G. Slope (ft/ft)	0.000135	Area (sq ft)	21988.54	5290.78	8413.75
Q Total (cfs)	44800.00	Flow (cfs)	14651.32	26514.46	3634.22
Top Width (ft)	12801.84	Top Width (ft)	8427.13	551.83	3822.88
Vel Total (ft/s)	1.26	Avg. Vel. (ft/s)	0.67	5.01	0.43
Max Chl Dpth (ft)	21.25	Hydr. Depth (ft)	2.61	9.59	2.20
Conv. Total (cfs)	3854552.0	Conv. (cfs)	1260586.0	2281281.0	312685.2
Length Wtd. (ft)	3797.83	Wetted Per. (ft)	8427.63	557.09	3823.39
Min Ch El (ft)	-5.91	Shear (lb/sq ft)	0.02	0.08	0.02
Alpha	9.54	Stream Power (lb/ft s)	0.01	0.40	0.01

Frctn Loss (ft)	0.57	Cum Volume (acre-ft)	25334.23	57291.12	6103.93
C & E Loss (ft)	0.03	Cum SA (acres)	9759.50	12750.17	3553.17

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 15.0857*

INPUT
 Description: Interpolated Cross Section at River Mile 15.09

Station Elevation Data		num= 188							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.43	27.94	70.86	27.13	127.29	23.71	195.95	20.48	263.16	19.78
429.3	17.4	590.54	15.86	641.94	15.59	767.18	15.1	770.02	14.8
776.98	14.81	777.97	15.11	778.11	15.15	801.26	15.38	913.57	13.15
944.94	12.67	1097.17	12.69	1213.03	15.33	1227.31	14.02	1229.22	13.71
1283.78	11.17	1387.73	11.8	1604.62	11.74	1841.16	9.74	1977.02	9.86
2136.62	9.74	2285.59	9.69	2455.83	9.97	2643.25	9.74	2644.07	9.86
3867.68	9.8	5090.47	9.69	5364.65	10.54	5635.57	11.11	5723.96	9.69
6345.99	9.91	6375.46	10.43	6397.56	9.91	6494.25	9.97	6500.68	9.98
6624.27	10.22	6643.1	12.02	6669.29	10.68	6816.71	10.75	6837.07	10.81
6984.4	10.92	7125.17	11.63	7162.75	11.83	7333.06	11.75	7498.7	11.48
7542.43	10.83	7749.88	10.76	8144.9	10.62	8555.4	10.6	8662.17	10.8
8705.05	13.07	8884.96	15.79	8956.1	16.89	8998.83	16.5	9089.85	14.26
9291.19	13.24	9473.94	13.99	9501.91	14.59	9572.62	14.45	9587.53	13.72
9867.25	13.64	9990.22	13.8310024	15	12.7610210	87	12.7710374	59	13.27
10425.85	14.810501	53	14.8810529	36	13.89	10603.9	15.0810644	58	15.14
10680.58	15.2910696	05	17.7210711	25	17.6310744	33	15.6110782	53	16.26
10814.62	18.1310837	73	16.8310853	95	15.8910883	77	16.9710905	78	14.94
10964.28	14.4711033	99	16.6711034	98	16.6311074	89	15.68	11151.7	18.06
11178.82	21.6311189	67	21.9411227	32	20.2811236	47	20.4211260	88	17.99
11278.64	16.2911338	64	16.5311341	97	16.8211359	92	19.6311365	65	19.26
11371.37	18.0911382	01	19.0711395	71	14.8111402	15	12.7611409	41	11.72
11416.78	10.8311425	28	10.47	11441.2	9.4711467	79	8.0711508	06	7.36
11559.19	6.84	11607.7	6.17	11656.4	5.3711710	99	4.5811760	72	3.72
11782.63	3.32	11792	2.9411801	36	2.3811810	73	1.9511820	09	1.57
11829.46	1.2711838	82	.9711848	18	1.0111857	55	.2811860	36	.18
11866.91	-.8211876	28	-3.5211885	64	-5.8911906	07	-2.0511914	57	-.99
11921.8	2.62	11926.5	5.5511929	75	7.66	11940.6	9.71	11950	13.69
11965.41	12.3412135	62	10.1	12190.4	10.0412300	32	9.85	12344.5	13.49
12406.14	11.5312408	82	11.5412568	46	11.7112693	13	10.7712700	98	10.72
12870.49	15.3412896	18	13.5212954	17	13.4613196	67	11.713327	66	11.3
13641	11.0613685	17	1213746	81	15.1913764	71	14.4913771	47	14.26
13799.21	14.3414020	06	15.3714034	25	16.6914048	64	16.6514062	36	15.74
14067.34	15.7214214	84	15.0414242	56	15.5614318	08	15.3114350	82	12.66
14369.85	12.36	14407.8	12.29	14411.5	12.2914548	22	12.4614601	56	12.43
14710.75	13.2314735	67	14.9414755	66	15.214868	07	17.3514935	44	18.31
14964.16	18.2415101	87	17.7515126	53	16.5315243	26	15.1815247	75	15.09
15317.61	13.1715373	15	12.7316729	33	12.8616805	53	15.3416867	92	15.9
17027.84	16.2417283	96	16.2917561	31	16.03				

Manning's n Values		num= 4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.43	.05111382	.01	.1111402	.15	.02	11950	.073

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11382.01	11950		3217.29	4349 2885.43	.1	.3
Blocked Obstructions			num=	2			

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.4311382.01	11.78	1195017561.31	11.78		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	14.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.051	0.022	0.073
W.S. Elev (ft)	14.85	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	25331.55	5439.18	8642.65
E.G. Slope (ft/ft)	0.000167	Area (sq ft)	25331.55	5439.18	8642.65
Q Total (cfs)	44800.00	Flow (cfs)	19101.32	21689.46	4009.22
Top Width (ft)	13939.03	Top Width (ft)	9523.45	554.40	3861.17
Vel Total (ft/s)	1.14	Avg. Vel. (ft/s)	0.75	3.99	0.46
Max Chl Dpth (ft)	20.74	Hydr. Depth (ft)	2.66	9.81	2.24
Conv. Total (cfs)	3471129.0	Conv. (cfs)	1479981.0	1680511.0	310636.8
Length Wtd. (ft)	3693.78	Wetted Per. (ft)	9523.79	559.54	3861.72
Min Ch El (ft)	-5.89	Shear (lb/sq ft)	0.03	0.10	0.02
Alpha	6.16	Stream Power (lb/ft s)	0.02	0.40	0.01
Frothn Loss (ft)	0.66	Cum Volume (acre-ft)	23586.73	56755.48	5539.02
C & E Loss (ft)	0.01	Cum SA (acres)	9096.60	12694.95	3298.67

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 14.2571*

INPUT
 Description: Interpolated Cross Section at River Mile 14.26

Station Elevation Data		num= 188							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.29	26.43	75.92	25.17	136.53	22.3	210.26	20	282.44	19.38
460.87	17.07	634.03	15.77	689.23	15.64	823.73	15.42	826.78	15.23
834.25	15.24	835.31	15.44	835.47	15.47	860.32	15.4	980.94	12.86
1014.63	12.25	1178.12	12.19	1302.54	15.44	1317.87	14.75	1319.93	14.49
1378.52	11.31	1490.15	12.1	1723.08	12.03	1977.11	9.53	2123.02	9.67
2294.42	9.53	2454.39	9.46	2637.22	9.81	2838.5	9.53	2839.38	9.67
4153.45	9.6	5466.65	9.46	5761.1	10.53	6052.04	11.24	6146.97	9.46
6815	9.74	6846.64	10.39	6870.37	9.74	6974.22	9.81	6981.12	9.82
7113.85	10.01	7134.06	12.25	7162.19	10.56	7320.52	10.51	7342.38	10.54
7500.6	10.31	7651.78	10.85	7692.13	11.01	7875.04	11.07	8052.92	10.87
8099.89	10.44	8322.68	10.37	8746.9	10.25	9187.75	10.2	9302.42	10.33
9348.47	11.83	9541.67	13.63	9618.07	14.36	9663.97	14.1	9761.71	12.6
9977.94	11.9	10174.2	12.39	10204.24	12.78	10280.18	12.68	10296.19	12.2
10596.59	12.12	10728.65	12.24	10765.09	11.52	10965.61	11.52	11141.43	11.83
11196.48	12.85	11277.76	12.91	11307.65	12.23	11387.7	13.02	11431.38	13.06
11470.05	13.21	11486.67	14.85	11502.98	14.81	11538.51	13.51	11579.53	13.99
11614	15.29	11638.82	14.45	11656.24	13.84	11688.26	14.58	11711.89	13.25
11774.72	12.99	11849.59	14.51	11850.66	14.49	11893.51	14.27	11976	16.67
12005.13	19.34	12016.78	19.66	12057.22	17.35	12067.04	17.47	12093.25	15.93
12112.33	14.88	12176.76	15.35	12180.34	15.72	12199.61	18.55	12205.76	17.87
12211.92	16.19	12223.34	17.01	12236.81	13.38	12243.14	11.61	12250.27	10.45
12257.52	9.48	12265.87	9.19	12281.52	8.44	12307.67	7.37	12347.25	6.68
12397.52	6.06	12445.2	5.36	12493.07	4.57	12546.74	3.75	12595.62	2.91
12617.17	2.53	12626.37	2.22	12635.58	1.81	12644.78	1.47	12653.99	1.16
12663.19	.91	12672.4	.66	12681.61	.64	12690.81	.11	12693.57	.02
12700.02	-1.12	12709.22	-3.61	12718.43	-5.86	12741.47	-3.07	12751.04	-2.26
12759.2	1.81	12764.51	5.19	12768.17	7.57	12780.4	9.31	12791	13.56
12806.27	11.93	12974.97	9.71	13029.26	9.42	13138.21	8.8	13182	13.19

13243.09	10.5213245.75	10.5313403.97	10.6413527.54	9.3813535.32	9.31
13703.33	14.8213728.79	12.5113786.27	12.3514026.61	10.6514156.44	10.1
14467	9.6714510.78	10.8414571.88	14.7914589.62	13.9214596.31	13.61
14623.8	13.6314842.69	14.2814856.76	15.1714871.03	15.1314884.62	14.53
14889.56	14.5115035.76	14.0715063.23	14.4215138.08	14.2715170.53	12.5
15189.38	12.31 15227	12.2615230.67	12.2615366.17	12.3915419.04	12.39
15527.26	13.4415551.96	14.715571.77	14.9615683.19	17.3415749.96	18.54
15778.42	18.4415914.91	17.915939.35	16.3916055.05	14.75 16059.5	14.66
16128.74	12.5816183.79	12.2917527.94	12.3717603.46	14.0317665.29	14.4
17823.8	14.6318077.64	14.6618352.54	14.49		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.29	.04912223.34	.1112243.14	.026	12791	.078		

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

12223.34	12791	3217.29	4349	2885.43	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.2912223.34	11.24	1279118352.54	11.24		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	14.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.049	0.028	0.078
W.S. Elev (ft)	14.22	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	28068.05	5516.07	8197.87
E.G. Slope (ft/ft)	0.000190	Area (sq ft)	28068.05	5516.07	8197.87
Q Total (cfs)	44800.00	Flow (cfs)	22813.30	18293.96	3692.75
Top Width (ft)	15261.77	Top Width (ft)	10690.72	557.31	4013.74
Vel Total (ft/s)	1.07	Avg. Vel. (ft/s)	0.81	3.32	0.45
Max Chl Dpth (ft)	20.08	Hydr. Depth (ft)	2.63	9.90	2.04
Conv. Total (cfs)	3252063.0	Conv. (cfs)	1656033.0	1327971.0	268058.9
Length Wtd. (ft)	3620.78	Wetted Per. (ft)	10691.13	562.46	4014.33
Min Ch El (ft)	-5.86	Shear (lb/sq ft)	0.03	0.12	0.02
Alpha	4.21	Stream Power (lb/ft s)	0.03	0.39	0.01
Frctn Loss (ft)	0.72	Cum Volume (acre-ft)	21614.71	56208.60	4981.26
C & E Loss (ft)	0.01	Cum SA (acres)	8350.10	12639.46	3037.85

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 13.4285*

INPUT

Description: Interpolated Cross Section at River Mile 13.43

Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.14	24.91	80.98	23.2	145.76	20.9	224.58	19.52	301.72	18.99
492.43	16.73	677.51	15.69	736.52	15.69	880.27	15.75	883.53	15.65
891.52	15.67	892.66	15.77	892.82	15.78	919.39	15.42	1048.31	12.57
1084.31	11.82	1259.06	11.7	1392.05	15.54	1408.44	15.47	1410.63	15.27
1473.26	11.46	1592.58	12.4	1841.54	12.31	2113.05	9.31	2269.01	9.49
2452.21	9.31	2623.2	9.23	2818.61	9.66	3033.75	9.31	3034.69	9.49
4439.23	9.4	5842.82	9.23	6157.55	10.51	6468.52	11.37	6569.99	9.23
7284	9.57	7317.82	10.34	7343.19	9.57	7454.18	9.65	7461.56	9.66
7603.42	9.81	7625.03	12.47	7655.1	10.43	7824.32	10.27	7847.69	10.27
8016.8	9.71	8178.39	10.08	8221.52	10.19	8417.02	10.38	8607.15	10.27

8657.35	10.04	8895.47	9.99	9348.9	9.87	9820.09	9.8	9942.66	9.85
9991.88	10.610198.39	11.4810280.04	11.4810280.04	11.84	10329.1	11.710433.58	10.94		
10664.69	10.5710874.46	10.7910906.56	10.7910906.56	10.9810987.73	10.9211004.84	10.68			
11325.93	10.611467.08	10.6511506.03	10.2911720.36	10.2611908.28	10.4				
11967.12	10.912053.99	10.9212085.94	10.58	12171.5	10.9712218.19	10.98			
12259.52	11.1312277.28	11.9812294.72	11.99	12332.7	11.4112376.54	11.73			
12413.38	12.4512439.91	12.0812458.52	11.7912492.75	12.212518.01	11.56				
12585.16	11.512665.19	12.3512666.33	12.3412712.13	12.8712800.31	15.28				
12831.44	17.0512843.89	17.3812887.11	14.4312897.61	14.5312925.63	13.86				
12946.02	13.4813014.88	14.1813018.71	14.6313039.31	17.4813045.88	16.49				
13052.46	14.313064.67	14.96	13077.9	11.9413084.12	10.4413091.14	9.17			
13098.26	8.1313106.47	7.9213121.85	7.4213147.54	6.6713186.44	6				
13235.84	5.28	13282.7	4.5513329.75	3.7613382.49	2.9113430.53	2.1			
13451.7	1.7313460.75	1.5113469.79	1.2213478.84	.9813487.89	.75				
13496.93	.5513505.98	.3513515.03	.2713524.07	-.0813526.79	-.14				
13533.12	-1.4213542.17	-3.6813551.21	-5.8313576.86	-4.0813587.52	-3.53				
13596.6	1.0113602.51	4.8213606.58	7.49	13620.2	8.9	13632	13.43		
13647.14	11.5113814.32	9.3113868.13	8.8113976.11	7.75	14019.5	12.9			
14080.05	9.5114082.68	9.5114239.49	9.5714361.95	814369.66	7.91				
14536.17	14.3114561.39	11.5114618.36	11.2314856.55	9.614985.22	8.9				
15293	8.2915336.39	9.6715396.94	14.415414.52	13.3415421.16	12.95				
15448.4	12.9115665.33	13.215679.28	13.6415693.41	13.6215706.88	13.32				
15711.78	13.3115856.67	13.1115883.89	13.2915958.07	13.2215990.23	12.34				
16008.92	12.25	16046.2	12.2316049.83	12.2316184.13	12.3316236.52	12.34			
16343.78	13.6516368.25	14.4616387.88	14.73	16498.3	17.3316564.48	18.77			
16592.69	18.6516727.96	18.0516752.18	16.2416866.84	14.3216871.25	14.23				
16939.87	11.9916994.42	11.8418326.55	11.8918401.39	12.7118462.67	12.9				
18619.76	13.0118871.33	13.0319143.77	12.94						

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
.14	.04813064.67	.1113084.12	.032
		13632	.082

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	13064.67	13632		3217.29	4349	2885.43	.1	.3	

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Elev
.1413064.67	10.69	1363219143.77	10.69

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	13.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.048	0.035	0.082
W.S. Elev (ft)	13.51	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	30470.42	5547.76	7897.92
E.G. Slope (ft/ft)	0.000207	Area (sq ft)	30470.42	5547.76	7897.92
Q Total (cfs)	44800.00	Flow (cfs)	25931.62	15671.61	3196.77
Top Width (ft)	17053.41	Top Width (ft)	11617.82	561.00	4874.59
Vel Total (ft/s)	1.02	Avg. Vel. (ft/s)	0.85	2.82	0.40
Max Chl Dpth (ft)	19.34	Hydr. Depth (ft)	2.62	9.89	1.62
Conv. Total (cfs)	3111886.0	Conv. (cfs)	1801255.0	1088577.0	222053.4
Length Wtd. (ft)	3569.51	Wetted Per. (ft)	11618.20	566.27	4875.84
Min Ch El (ft)	-5.83	Shear (lb/sq ft)	0.03	0.13	0.02
Alpha	3.10	Stream Power (lb/ft s)	0.03	0.36	0.01
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	19452.92	55656.30	4448.17
C & E Loss (ft)	0.00	Cum SA (acres)	7526.26	12583.63	2743.47

Warning: Divided flow computed for this cross-section.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 12.6

INPUT

Description: Interpolated Cross Section at River Mile 12.6

Station Elevation Data num= 81									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	23.4	155	19.5	321	18.6	524	16.4	721	15.6
950	16.1	1154	11.4	1340	11.2	1499	16.2	1568	11.6
1695	12.7	1960	12.6	2249	9.1	2415	9.3	2610	9.1
2792	9	3000	9.5	3229	9.1	3230	9.3	4725	9.2
6219	9	6554	10.5	6885	11.5	6993	9	7753	9.4
7789	10.3	7816	9.4	7942	9.5	8093	9.6	8116	12.7
8148	10.3	8353	10	8533	9.1	8705	9.3	8959	9.7
13005	8.9	13241	9.7	13482	10.2	13671	15.1	13717	11.5
13758	11.8	13853	13	13879	16.4	13886	15.1	13893	12.4
13906	12.9	13919	10.5	13932	7.9	13939	6.78	14360	-.3
14384	-5.8	14424	-4.8	14434	.2	14445	7.4	14460	8.5
14473	13.3	14488	11.1	14707	8.2	14814	6.7	14857	12.6
14917	8.5	15075	8.5	15204	6.5	15369	13.8	15394	10.5
15814	7.7	16119	6.9	16162	8.5	16222	14	16246	12.3
16273	12.2	16534	12.1	16869	12.2	17054	12.3	17204	14.5
17379	19	17541	18.2	17565	16.1	17683	13.8	17751	11.4
19935	11.4								

Manning's n Values num= 12									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1154	.04	4725	.06	6885	.04	13482	.05
13758	.11	13932	.038	14473	.11	14707	.07	16222	.06
16869	.04	17751	.11						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	13906	14473		1090	5078		.1	.3

Blocked Obstructions num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
0	13932	10.14	14445	19935	10.14	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	12.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.043	0.038	0.081
W.S. Elev (ft)	12.78	Reach Len. (ft)	1090.00	5078.00	2467.00
Crit W.S. (ft)		Flow Area (sq ft)	30431.99	5512.80	7745.99
E.G. Slope (ft/ft)	0.000209	Area (sq ft)	30431.99	5512.80	7745.99
Q Total (cfs)	45600.00	Flow (cfs)	28146.49	14319.76	3133.75
Top Width (ft)	17809.23	Top Width (ft)	12472.66	564.92	4771.65
Vel Total (ft/s)	1.04	Avg. Vel. (ft/s)	0.92	2.60	0.40
Max Chl Dpth (ft)	18.58	Hydr. Depth (ft)	2.44	9.76	1.62
Conv. Total (cfs)	3153109.0	Conv. (cfs)	1946249.0	990170.2	216689.7
Length Wtd. (ft)	2694.12	Wetted Per. (ft)	12473.21	574.70	4773.78
Min Ch El (ft)	-5.80	Shear (lb/sq ft)	0.03	0.13	0.02
Alpha	2.44	Stream Power (lb/ft s)	0.03	0.33	0.01
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	17203.83	55104.16	3930.04
C & E Loss (ft)	0.00	Cum SA (acres)	6636.61	12527.42	2423.98

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: Fish Creek
 REACH: Lower Fish Creek RS: 11.7

INPUT

Description: Cross Section at River Mile 11.7

Station Elevation Data num= 109									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	23.1	154.5	19.2	321.4	18.3	523.9	16.1	721.3	15.3
950.1	15.8	1153.5	11.1	1340.4	10.9	1499.4	15.9	1567.7	11.3
1694.6	12.4	1960.3	12.3	2248.9	8.8	2415.4	9	2610.4	8.8
2792.3	8.7	2999.5	9.2	3228.5	8.8	3230	9	4725	8.9
6219.3	8.7	6554	10.2	6884.5	11.2	6993.1	8.7	7752.9	9.1
7789	10	7816.4	9.1	7941.7	9.2	8092.5	9.3	8116.1	12.4
8147.5	10	8353.4	9.7	8533	8.8	8705	9	8958.5	9.4
13005.1	8.6	13240.6	9.4	13481.8	9.9	13670.5	14.8	13716.7	11.2
13758.2	11.5	13853.4	12.7	13878.5	16.1	13885.5	14.8	13892.6	12.1
13905.9	12.6	13919.1	10.2	13932.2	7.6	13951.4	5.8	14045.3	7.2
14136.4	2.8	14142.7	2.7	14152.6	2.4	14162.7	1.4	14172.6	-1.1
14182.7	-1.6	14192.6	-1.3	14202.7	-1.9	14207.6	-3.1	14212.7	3
14220	10	14345.6	8.9	14384.6	16.7	14490.7	23.9	14771.9	20.9
15535.7	8.4	15555.8	7.7	15564.2	7.9	15576.9	4.9	15631.2	6.5
15691.2	6.1	15728.1	2.7	15759	1.3	15783.9	-3.9	15809	-5
15833.9	-5	15859	-4.3	15883.9	-4.7	15909	-4.1	15933.9	-3.5
15959	2.9	15978.2	7.7	15992.5	8.2	16005.8	13	16020.8	10.8
16240.1	7.9	16347.2	6.4	16390.3	12.3	16449.7	8.2	16608.1	8.2
16736.9	6.2	16902	13.5	16927.3	10.2	17347.2	7.4	17652.3	6.6
17695.4	8.2	17755.3	13.7	17779.3	12	17805.9	11.9	18066.6	11.8
18401.6	11.9	18587.3	12	18736.5	14.2	18912.2	18.7	19073.5	17.9
19097.8	15.8	19216	13.5	19284.3	11.1	21468.3	11.1		

Manning's n Values num= 15									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.11	1153.5	.045	4725	.05	6884.5	.045	13481.8	.09
13758.2	.11	13932.2	.03	14220	.09	14490.7	.05	15535.7	.03
16005.8	.11	16240.1	.09	17755.3	.06	18401.6	.04	19284.3	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	13905.9	16005.8		2559	4481.46	2515.69	.1	.3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	13905.9	9.62	16005.8	21468.3	9.62

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	12.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.046	0.031	0.095
W.S. Elev (ft)	12.27	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	30132.39	8057.16	7044.80
E.G. Slope (ft/ft)	0.000160	Area (sq ft)	30132.39	8057.16	7044.80
Q Total (cfs)	45600.00	Flow (cfs)	22948.67	20560.16	2091.17
Top Width (ft)	18031.69	Top Width (ft)	12134.77	1159.04	4737.88
Vel Total (ft/s)	1.01	Avg. Vel. (ft/s)	0.76	2.55	0.30
Max Chl Dpth (ft)	17.27	Hydr. Depth (ft)	2.48	6.95	1.49
Conv. Total (cfs)	3609247.0	Conv. (cfs)	1816391.0	1627340.0	165516.3
Length Wtd. (ft)	3614.16	Wetted Per. (ft)	12135.26	1169.37	4739.78
Min Ch El (ft)	-5.00	Shear (lb/sq ft)	0.02	0.07	0.01
Alpha	3.18	Stream Power (lb/ft s)	0.02	0.18	0.00
Frcn Loss (ft)	0.55	Cum Volume (acre-ft)	16446.08	54313.20	3511.20
C & E Loss (ft)	0.00	Cum SA (acres)	6328.74	12426.94	2154.70

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: Fish Creek
 REACH: Lower Fish Creek RS: 10.8538*

INPUT
 Description: Interpolated Cross Section at River Mile 10.85

Station Elevation Data		num= 271									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	21.53	145.83	17.92	303.37	17.09	494.51	15.05	680.84	14.3		
789.5	14.52	896.81	14.76	1088.8	10.43	1265.21	10.25	1415.3	14.87		
1479.76	10.63	1599.55	11.65	1839.03	11.57	1850.34	11.56	2122.75	8.33		
2279.91	8.51	2463.98	8.33	2635.67	8.23	2817.1	8.66	2831.25	8.69		
3047.41	8.31	3048.82	8.49	3871.16	8.38	4459.96	8.36	4850.97	8.32		
5851.35	8.13	5870.44	8.13	6186.37	9.54	6498.33	10.49	6600.84	8.19		
6840.92	8.33	7318.02	8.54	7352.1	9.37	7377.96	8.54	7496.23	8.62		
7638.57	8.7	7660.85	11.56	7690.49	9.34	7773.33	9.22	7884.84	9.07		
8054.36	8.24	8216.72	8.43	8456	8.81	8632.19	8.78	9555.54	8.54		
10472.96	8.39	11325.9	8.2512275.61		8.1412323.49		8.3	12497.9	8.88		
12725.57	9.3312903.69		13.86	12947.3	10.5312986.47		10.8113076.33		11.92		
13100.02	15.0513106.63		13.8513113.33		11.3613125.88		11.8213147.48		9.58		
13160.7	8.0813168.91		7.1613180.17		6.5513197.96		5.613200.32		5.46		
13217.04	5.4913230.29		5.6913236.11		5.6413240.68		5.4113244.97		5.56		
13249.99	5.7813255.14		5.8213272.97		6.113289.67		6.2413308.47		6.41		
13326.23	6.5613339.82		6.6813353.93		6.7913355.07		6.7513380.51		6.07		
13416.17	5.0913431.07		4.6713441.06		4.3913452.66		4.0213465.87		3.64		
13485.18	3.1513499.33		2.8113502.97		2.7113513.27		2.6313526.93		2.4		
13529.47	2.3513545.02		1.4913545.99		1.4313562.11		.0713562.19		.06		
13578.71	-.3913582.71		-.5513594.91		-1.0413607.88		-1.4813611.43		-1.6		
13619.45	-2.7213627.79		2.9113639.73		9.3613641.55		9.3513677.07		9.18		
13718.64	8.9913756.01		8.7913789.27		8.64	13816.3	8.5	13845.2	8.35		
13860.8	10.1113893.53		13.8113909.01		15.5613926.77		16.2413950.71		17.16		
13982.96	18.3914014.06		19.5714048.86		20.9414074.19		21.8614082.58		22.19		
14104.36	22.0814137.55		21.8114166.11		21.714192.55		21.51	14227.7	21.3		
14272.64	21.0714307.63		20.8514334.41		20.6214387.41		20.3	14456.7	19.94		
14498.07	19.68	14541.8	19.47	14542.6	19.4614575.18		19.1214605.09		18.83		
14626.06	18.6914673.26		18.2814706.26		17.9414741.79		17.6114779.06		17.27		
14788.47	17.1814793.15		17.0614799.38		16.8114804.69		16.9514809.03		16.97		
14813.76	16.9314826.56		16.8114848.68		16.6114865.26		16.4714888.75		16.26		
14930.29	15.87	14958.5	15.6114982.83		15.3815020.04		15.0315051.27		14.74		
15086.1	14.4215111.11		14.215138.02		13.96	15157.2	13.7815180.79		13.55		
15211.19	13.315231.05		13.115251.75		12.9115271.23		12.7315286.72		12.59		
15295.3	12.5115305.65		12.4215331.09		12.215365.69		11.8615407.24		11.52		
15449.29	11.1315489.98		10.7415514.34		10.5115532.95		10.32	15541.3	10.21		
15548.25	1015558.28		9.8415561.39		10.0415562.11		10.0915564.99		10.04		
15594.74	9.7715623.76		9.5415660.16		9.115694.76		8.8815792.13		7.97		
15825.01	7.3215838.75		7.5115859.53		4.7415948.36		6.2116046.52		5.83		
16106.88	2.6916157.43		1.3916169.64		-.0516178.24		-1.0416198.17		-3.43		
16204.4	-3.5916213.93		-3.9316239.23		-5.8516262.22		-5.8516284.98		-4.45		
16308.15	-4.0716312.09		-3.9916326.46		-3.9616343.87		-4.0516344.68		-4.04		
16350.43	-4.0816360.86		-4.1316361.58		-4.1416381.43		-3.9316409.43		-3.61		
16411.45	-3.5816438.19		-3.2416458.21		-316460.94		-2.9816466.18		-2.38		
16485.16	-.1716506.31		2.3316510.81		2.8516519.55		3.8416529.53		4.91		
16548.97	7.1	16549	7.116569.05		7.416576.94		7.5316577.39		7.51		
16584.82	8.3416591.59		9.2916594.97		10.0916598.36		11.0516603.81		12.2		
16618.34	10.1716830.66		7.5516834.73		7.516934.35		6.1716976.08		11.62		
17033.58	7.8417155.16		7.8517186.94		7.917311.64		6.2617329.58		7.04		

17471.49	13.117495.98	10.0617670.98	9.0417902.51	7.618008.26	7.35
18197.9	6.5918239.63	8.0118261.47	9.8918297.62	13.0318320.86	11.44
18346.61	11.3318598.58	11.0618599.01	11.0618914.56	11.118923.35	11.11
19103.14	11.3519189.73	12.6419247.59	13.4519417.69	17.5819573.86	16.82
19589.12	15.5719597.39	14.8819711.82	12.7619777.95	10.5419850.25	10.54
20242.03	10.6720567.26	10.8420890.33	10.9521233.23	11.0921553.49	11.21
21892.42	11.24				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06213125.88	.10713168.91	.03113639.73	.06115948.36	.031				
16603.81	.079								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 13125.8816603.81 2559 4481.46 2515.69 .1 .3

Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
013125.88	9.19		016603.81	-4.6116618.3421892.42	9.19			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	11.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.062	0.032	0.079
W.S. Elev (ft)	11.72	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	27566.82	13102.97	5978.56
E.G. Slope (ft/ft)	0.000144	Area (sq ft)	27566.82	13102.97	5978.56
Q Total (cfs)	45600.00	Flow (cfs)	14096.75	29585.92	1917.33
Top Width (ft)	18339.00	Top Width (ft)	11778.04	1967.56	4593.39
Vel Total (ft/s)	0.98	Avg. Vel. (ft/s)	0.51	2.26	0.32
Max Chl Dpth (ft)	16.33	Hydr. Depth (ft)	2.34	6.66	1.30
Conv. Total (cfs)	3797903.0	Conv. (cfs)	1174081.0	2464133.0	159689.0
Length Wtd. (ft)	3864.80	Wetted Per. (ft)	11778.54	1973.33	4594.53
Min Ch El (ft)	-4.61	Shear (lb/sq ft)	0.02	0.06	0.01
Alpha	3.55	Stream Power (lb/ft s)	0.01	0.13	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	14751.27	53224.72	3135.14
C & E Loss (ft)	0.00	Cum SA (acres)	5626.34	12266.11	1885.25

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: Fish Creek
 REACH: Lower Fish Creek RS: 10.0076*

INPUT

Description: Interpolated Cross Section at River Mile 10.01

Station Elevation Data	num=	272							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	19.96	137.17	16.65	285.34	15.87	465.13	13.99	640.38	13.3
742.58	13.5	843.51	13.72	1024.09	9.75	1190.03	9.6	1331.19	13.84
1391.83	9.95	1504.49	10.89	1729.74	10.83	1740.38	10.82	1996.61	7.86
2144.43	8.02	2317.55	7.85	2479.05	7.76	2649.69	8.15	2663	8.18
2866.31	7.81	2867.64	7.98	3641.11	7.81	4194.93	7.81	4562.7	7.79
5503.63	7.56	5521.59	7.56	5818.74	8.88	6112.16	9.78	6208.58	7.68
6434.4	7.83	6883.14	7.98	6915.19	8.74	6939.52	7.97	7050.76	8.04
7184.64	8.1	7205.6	10.72	7233.47	8.69	7311.4	8.57	7416.28	8.43
7575.73	7.68	7728.43	7.86	7953.49	8.22	8119.22	8.2	8987.7	7.91
9850.6	7.8110652.85	7.7111546.12	7.6711591.16	7.8211755.21	8.35				
11969.35	8.7712136.88	12.9112177.89	9.8612214.74	10.1212299.26	11.13				
12321.54	14.0112327.76	12.9112334.06	10.6212345.87	11.0512375.86	8.96				

12394.21	7.5712405.62	6.7112421.25	6.1512445.97	5.2712449.24	5.12
12472.47	5.0412490.85	5.3112498.94	5.1512505.29	4.6512511.25	4.91
12518.21	5.3112525.37	5.3312550.13	5.7312573.32	5.8712599.43	6.03
12624.09	6.1712642.97	6.2912662.57	6.3712664.15	6.3412699.48	5.72
12749	4.8112769.69	4.4312783.57	4.1612799.67	3.7512818.01	3.39
12844.83	2.9712864.49	2.7112869.54	2.6212883.85	2.5612883.86	2.56
12902.81	2.3512906.34	2.3112927.94	1.5112929.29	1.4612951.67	.23
12951.78	.2212974.72	-.1912980.28	-.3312997.21	-.7813015.24	-1.19
13020.16	-1.313031.29	-2.3313042.88	2.8213059.46	8.7313061.99	8.71
13111.31	8.5713169.04	8.413220.94	8.2113267.13	8.0813304.66	7.94
13344.81	7.813366.47	9.4113411.92	12.8113433.41	14.4113458.08	15.05
13491.32	15.8913536.11	1713579.31	18.0813627.63	19.3813662.81	20.17
13674.46	20.48 13704.7	20.413750.79	20.0713790.46	20.0413827.18	19.85
13875.99	19.6513938.41	19.48 13987	19.2614024.19	18.9914097.78	18.69
14194	18.4214251.47	18.1614312.19	18.0314313.31	18.0214358.55	17.67
14400.08	17.39 14429.2	17.3214494.76	16.9614540.58	16.6214589.93	16.31
14641.68	16.0114654.75	15.9314661.24	15.73 14669.9	15.314677.27	15.62
14683.31	15.7114689.88	15.6814707.65	15.5614738.37	15.3914761.39	15.26
14794.02	15.08 14851.7	14.7114890.88	14.4714924.66	14.2714976.34	13.94
15019.7	13.6715068.07	13.3815102.81	13.215140.17	12.9715166.82	12.81
15199.57	12.5915241.79	12.3815269.37	12.215298.12	12.0215325.17	11.86
15346.69	11.72 15358.6	11.6515372.97	11.58 15408.3	11.3815456.35	11.06
15514.05	10.7815572.45	10.4315628.96	10.0515662.79	9.8415688.63	9.66
15700.22	9.5115709.88	9.1615723.81	8.9515728.12	9.3715729.13	9.47
15733.12	9.4115774.43	9.1615814.74	8.9915865.29	8.4915913.34	8.38
16048.56	7.5416094.22	6.9416113.31	7.1116142.16	4.5716265.52	5.91
16401.84	5.5616485.67	2.6816555.87	1.4916572.82	.1716584.76	-.73
16612.44	-2.9516621.09	-3.1216634.33	-3.5316669.46	-6.6916690.53	-6.69
16724.61	-4.2216759.29	-3.7916765.19	-3.6716786.69	-3.5116812.74	-3.55
16813.97	-3.5116822.57	-3.5516838.18	-3.5716839.25	-3.5816868.97	-3.41
16910.88	-3.0916913.91	-3.0616953.92	-2.716983.89	-2.4716987.97	-2.46
16995.83	-1.9317024.23	.0517055.88	2.3317062.63	2.817075.71	3.68
17090.65	4.5717119.74	6.517119.78	6.5 17149.8	6.75 17161.6	6.87
17162.27	6.8317173.41	7.1317183.53	7.817188.59	8.7817193.66	10.08
17201.83	11.417215.88	9.5517421.21	7.2117425.15	7.1617521.49	5.95
17561.85	10.9417617.47	7.4817735.04	7.4917765.78	7.617886.38	6.31
17903.73	7.0618040.97	12.6918064.66	9.9318233.91	9.0918457.83	7.8
18560.1	7.59 18743.5	6.5918783.86	7.8218804.98	9.5118839.95	12.36
18862.42	10.8918887.32	10.7619131.01	10.3219131.42	10.3219436.59	10.3
19445.1	10.3119618.97	10.719702.72	11.9619758.67	12.6919923.19	16.46
20074.22	15.7520088.97	14.5920096.97	13.9720207.64	12.02 20271.6	9.98
20341.52	9.9820720.42	10.2421034.95	10.58 21347.4	10.7921679.03	11.08
21988.76	11.3222316.55	11.38			

Manning's n Values		num= 6		n Val		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06312345.87		.10512405.62		.03413111.31		.06216113.31		.034
17201.83	.079								

Bank Sta:	Left	Right	Lengths:		Left Channel	Right	Coeff	Contr.	Expan.
	12345.87	17201.83	2559	4481.46	2515.69		.1		.3
Blocked Obstructions			num= 3						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev	
012345.87		8.77	017201.83		-4.2317561.85	22316.55		8.77	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	11.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.063	0.035	0.079
W.S. Elev (ft)	11.23	Reach Len. (ft)	2559.00	4481.46	2515.69

Crit W.S. (ft)		Flow Area (sq ft)	25511.96	17832.54	5536.32
E.G. Slope (ft/ft)	0.000118	Area (sq ft)	25511.96	17832.54	5536.32
Q Total (cfs)	45600.00	Flow (cfs)	11448.65	32441.81	1709.54
Top Width (ft)	17962.32	Top Width (ft)	11138.32	2814.58	4009.42
Vel Total (ft/s)	0.93	Avg. Vel. (ft/s)	0.45	1.82	0.31
Max Chl Dpth (ft)	15.46	Hydr. Depth (ft)	2.29	6.34	1.38
Conv. Total (cfs)	4195433.0	Conv. (cfs)	1053335.0	2984812.0	157286.6
Length Wtd. (ft)	3953.71	Wetted Per. (ft)	11138.83	2818.35	4010.20
Min Ch El (ft)	-4.23	Shear (lb/sq ft)	0.02	0.05	0.01
Alpha	2.77	Stream Power (lb/ft s)	0.01	0.08	0.00
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	13192.17	51633.39	2802.63
C & E Loss (ft)	0.00	Cum SA (acres)	4953.21	12020.11	1636.83

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 9.16153*

INPUT

Description: Interpolated Cross Section at River Mile 9.16

Station Elevation Data		num= 272		Elev Sta		Elev Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	18.39	128.5	15.37	267.32	14.66	435.74	12.94	599.92	12.29
695.67	12.47	790.22	12.67	959.39	9.08	1114.84	8.94	1247.09	12.81
1303.89	9.28	1409.44	10.14	1620.45	10.09	1630.43	10.08	1870.46	7.39
2008.94	7.54	2171.13	7.38	2322.42	7.3	2482.28	7.65	2494.75	7.67
2685.22	7.32	2686.46	7.47	3411.06	7.25	3929.89	7.27	4274.42	7.27
5155.91	6.99	5172.73	7	5451.11	8.22	5726	9.07	5816.32	7.17
6027.87	7.33	6448.26	7.42	6478.29	8.11	6501.08	7.41	6605.29	7.46
6730.72	7.51	6750.35	9.89	6776.46	8.03	6849.46	7.92	6947.71	7.8
7097.09	7.12	7240.15	7.29	7450.99	7.63	7606.25	7.62	8419.85	7.28
9228.24	7.23	9979.8	7.16	10816.64	7.21	10858.83	7.35	11012.51	7.83
11213.12	8.21	11370.07	11.97	11408.49	9.21	11443.01	9.43	11522.19	10.35
11543.06	12.96	11548.89	11.96	11554.79	9.88	11565.85	10.27	11604.23	8.34
11627.73	7.05	11642.33	6.27	11662.34	5.74	11693.97	4.93	11698.16	4.79
11727.89	4.58	11751.42	4.93	11761.78	4.67	11769.9	3.89	11777.53	4.27
11786.44	4.83	11795.6	4.85	11827.29	5.36	11856.97	5.51	11890.39	5.66
11921.96	5.78	11946.12	5.9	11971.2	5.96	11973.23	5.93	12018.44	5.37
12081.83	4.54	12108.31	4.18	12126.07	3.93	12146.68	3.48	12170.15	3.13
12204.48	2.79	12229.65	2.61	12236.1	2.54	12254.42	2.49	12254.43	2.49
12278.69	2.31	12283.21	2.26	12310.85	1.54	12312.58	1.49	12341.22	.39
12341.36	.38	12370.73	.02	12377.84	-.11	12399.52	-.53	12422.59	-.9
12428.89	-1.01	12443.14	-1.95	12457.97	2.73	12479.19	8.09	12482.42	8.08
12545.56	7.95	12619.45	7.81	12685.88	7.63	12744.99	7.51	12793.03	7.38
12844.41	7.25	12872.13	8.71	12930.31	11.81	12957.82	13.27	12989.39	13.85
13031.94	14.62	13089.26	15.62	13144.55	16.59	13206.4	17.82	13251.42	18.49
13266.34	18.77	13305.05	18.71	13364.04	18.34	13414.81	18.38	13461.81	18.18
13524.28	1813	13604.17	17.89	13666.36	17.67	13713.96	17.35	13808.16	17.09
13931.31	16.91	14004.86	16.65	14082.58	16.59	14084.01	16.58	14141.92	16.22
14195.07	15.94	14232.35	15.94	14316.25	15.65	14374.9	15.31	14438.06	15.01
14504.3	14.74	14521.02	14.67	14529.34	14.41	14540.41	13.78	14549.86	14.29
14557.58	14.44	14565.99	14.43	14588.74	14.31	14628.05	14.16	14657.52	14.06
14699.28	13.91	14773.11	13.56	14823.25	13.34	14866.49	13.15	14932.63	12.84
14988.14	12.61	15050.05	12.33	15094.51	12.19	15142.33	11.98	15176.44	11.83
15218.36	11.63	15272.39	11.46	15307.69	11.29	15344.5	11.13	15379.1	10.98
15406.65	10.86	15421.9	10.79	15440.29	10.74	15485.51	10.56	15547.01	10.25
15620.87	10.05	15695.61	9.72	15767.94	9.36	15811.24	9.18	15844.31	8.99
15859.15	8.81	15871.51	8.32	15889.33	8.05	15894.86	8.71	15896.14	8.85
15901.26	8.79	15954.13	8.56	16005.71	8.45	16070.42	7.87	16131.91	7.88

16304.99	7.1116363.44	6.5716387.86	6.7216424.79	4.4116582.69	5.62
16757.15	5.2916864.45	2.67 16954.3	1.58 16976	.3816991.28	-.42
17026.71	-2.4817037.79	-2.6417054.73	-3.1417099.69	-7.5417118.85	-7.54
17164.24	-3.9917210.43	-3.5117218.28	-3.3617246.91	-3.0517281.62	-3.04
17283.25	-2.9817294.71	-3.02 17315.5	-3.0117316.93	-3.0217356.51	-2.88
17412.32	-2.5717416.36	-2.5417469.66	-2.1717509.58	-1.9317515.01	-1.94
17525.47	-1.48 17563.3	.2817605.46	2.3417614.44	2.7517631.86	3.51
17651.76	4.2317690.51	5.917690.56	5.917730.54	6.117746.27	6.21
17747.16	6.1417761.99	5.9217775.48	6.3117782.21	7.4717788.96	9.12
17799.85	10.617813.41	8.9218011.77	6.8618015.57	6.8218108.64	5.72
18147.63	10.2718201.35	7.1218314.93	7.1418344.62	7.2918461.12	6.37
18477.88	7.0818610.46	12.2918633.34	9.7918796.84	9.1319013.14	8
19111.94	7.83 19289.1	6.5819328.09	7.6319348.49	9.1219382.27	11.68
19403.97	10.3319428.03	10.219663.44	9.5819663.84	9.5819958.63	9.5
19966.84	9.5220134.81	10.0520215.71	11.2820269.76	11.9420428.68	15.34
20574.58	14.6720588.83	13.6220596.56	13.0520703.47	11.2720765.25	9.42
20832.79	9.4221198.81	9.8121502.65	10.3221804.47	10.6422124.82	11.08
22424.03	11.4222740.67	11.52			

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06511565.85		.10211642.33		.03812545.56		.06316131.91		.038
17799.85	.08								

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

11565.85	17799.85	2559	4481.46	2515.69	.1	.3
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Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
011565.85	8.34		017799.85	-3.84	18147.63	22740.67	8.34	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	10.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.065	0.039	0.080
W.S. Elev (ft)	10.79	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	24148.16	22405.14	5248.25
E.G. Slope (ft/ft)	0.000112	Area (sq ft)	24148.16	22405.14	5248.25
Q Total (cfs)	45600.00	Flow (cfs)	10246.57	33795.69	1557.74
Top Width (ft)	17710.68	Top Width (ft)	10492.84	3721.67	3496.18
Vel Total (ft/s)	0.88	Avg. Vel. (ft/s)	0.42	1.51	0.30
Max Chl Dpth (ft)	14.63	Hydr. Depth (ft)	2.30	6.02	1.50
Conv. Total (cfs)	4308057.0	Conv. (cfs)	968044.3	3192845.0	147167.3
Length Wtd. (ft)	4001.96	Wetted Per. (ft)	10493.38	3724.39	3496.86
Min Ch El (ft)	-3.84	Shear (lb/sq ft)	0.02	0.04	0.01
Alpha	2.23	Stream Power (lb/ft s)	0.01	0.06	0.00
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	11733.49	49563.57	2491.22
C & E Loss (ft)	0.00	Cum SA (acres)	4317.83	11683.89	1420.10

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 8.31538*

INPUT
 Description: Interpolated Cross Section at River Mile 8.32

Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	16.82	119.83	14.09	249.29	13.44	406.35	11.88	559.46	11.29
648.75	11.44	736.93	11.63	894.69	8.41	1039.66	8.29	1162.98	11.78

1215.96	8.6	1314.38	9.38	1511.17	9.35	1520.47	9.35	1744.32	6.91
1873.46	7.05	2024.71	6.9	2165.79	6.83	2314.87	7.14	2326.5	7.17
2504.12	6.83	2505.29	6.96	3181.02	6.68	3664.85	6.73	3986.15	6.74
4808.19	6.42	4823.88	6.43	5083.48	7.57	5339.83	8.36	5424.06	6.66
5621.34	6.82	6013.38	6.87	6041.39	7.48	6062.64	6.85	6159.82	6.88
6276.79	6.91	6295.09	9.05	6319.45	7.38	6387.52	7.27	6479.15	7.16
6618.45	6.56	6751.86	6.73	6948.48	7.04	7093.27	7.04	7852.01	6.66
8605.87	6.65	9306.75	6.61	10087.15	6.74	10126.49	6.87	10269.81	7.3
10456.89	7.64	10603.25	11.02	10639.09	8.53	10671.28	8.74	10745.12	9.56
10764.59	11.92	10770.02	11.02	10775.52	9.15	10785.84	9.49	10832.61	7.72
10861.25	6.54	10879.04	5.82	10903.43	5.34	10941.97	4.61	10947.08	4.45
10983.31	4.12	11011.99	4.54	11024.61	4.18	11034.51	3.13	11043.8	3.62
11054.67	4.36	11065.83	4.36	11104.45	5.11	11140.63	5.13	11181.35	5.28
11219.82	5.39	11249.27	5.51	11279.83	5.54	11282.31	5.52	11337.41	5.03
11414.65	4.27	11446.93	3.93	11468.57	3.7	11493.7	3.21	11522.3	2.88
11564.13	2.61	11594.8	2.51	11602.67	2.45	11625	2.42	11625.01	2.42
11654.57	2.25	11660.08	2.22	11693.77	1.56	11695.87	1.53	11730.78	.55
11730.95	.55	11766.74	.22	11775.41	.11	11801.83	-.27	11829.94	-.61
11837.62	-.71	11854.98	-1.56	11873.06	2.64	11898.92	7.45	11902.86	7.44
11979.8	7.34	12069.85	7.22	12150.81	7.05	12222.85	6.95	12281.4	6.82
12344.02	6.7	12377.8	8	12448.7	10.81	12482.22	12.13	12520.7	12.66
12572.55	13.34	12642.42	14.24	12709.8	15.11	12785.17	16.25	12840.04	16.8
12858.22	17.06	12905.39	17.03	12977.28	16.61	13039.16	16.72	13096.44	16.51
13172.58	16.35	13269.93	16.31	13345.72	16.08	13403.74	15.72	13518.53	15.48
13668.62	15.38	13758.26	15.13	13852.98	15.15	13854.71	15.14	13925.29	14.77
13990.07	14.51	14035.49	14.57	14137.75	14.33	14209.22	13.98	14286.2	13.71
14366.92	13.48	14387.3	13.41	14397.43	13.07	14410.93	12.26	14422.44	12.96
14431.85	13.18	14442.1	13.18	14469.82	13.06	14517.74	12.93	14553.64	12.85
14604.54	12.72	14694.52	12.41	14755.63	12.21	14808.32	12.04	14888.93	11.75
14956.58	11.53	15032.02	11.29	15086.21	11.18	15144.49	10.99	15186.05	10.86
15237.14	10.66	15302.99	10.55	15346.01	10.38	15390.87	10.23	15433.04	10.1
15466.62	9.99	15485.2	9.93	15507.61	9.89	15562.72	9.75	15637.67	9.45
15727.68	9.31	15818.77	9.02	15906.91	8.68	15959.68	8.51	15999.99	8.32
16018.08	8.11	16033.14	7.47	16054.86	7.16	16061.59	8.03	16063.16	8.24
16069.39	8.16	16133.83	7.95	16196.69	7.91	16275.54	7.25	16350.49	7.38
16561.42	6.68	16632.65	6.19	16662.42	6.32	16707.42	4.24	16899.85	5.33
17112.47	5.02	17243.23	2.65	17352.74	1.67	17379.18	.59	17397.8	-.11
17440.98	-2.01	17454.48	-2.17	17475.12	-2.75	17529.92	-8.38	17547.16	-8.38
17603.86	-3.76	17661.57	-3.23	17671.38	-3.05	17707.14	-2.6	17750.5	-2.54
17752.54	-2.45	17766.85	-2.48	17792.82	-2.45	17794.6	-2.46	17844.05	-2.35
17913.77	-2.06	17918.82	-2.03	17985.39	-1.63	18035.26	-1.41	18042.04	-1.42
18055.11	-1.03	18102.37	.51	18155.03	2.35	18166.26	2.69	18188.01	3.35
18212.88	3.88	18261.28	5.31	18261.35	5.31	18311.29	5.45	18330.93	5.55
18332.04	5.45	18350.57	4.71	18367.42	4.82	18375.82	6.16	18384.27	8.16
18397.86	9.81	18410.95	8.29	18602.33	6.51	18605.99	6.47	18695.79	5.5
18733.4	9.59	18785.24	6.76	18894.82	6.78	18923.47	6.99	19035.87	6.42
19052.03	7.11	19179.94	11.89	19202.02	9.65	19359.76	9.18	19568.45	8.2
19663.77	8.06	19834.71	6.58	19872.32	7.44	19892	8.74	19924.59	11.01
19945.53	9.77	19968.75	9.63	20195.86	8.85	20196.25	8.85	20480.67	8.7
20488.59	8.73	20650.65	9.4	20728.7	10.61	20780.85	11.19	20934.17	14.23
21074.94	13.62	21088.69	12.65	21096.14	12.14	21199.29	10.53	21258.89	8.86
21324.06	8.85	21677.2	9.38	21970.34	10.05	22261.55	10.48	22570.62	11.07
22859.29	11.53	23164.79	11.65						

Manning's n Values		num= 6		n Val		Sta		n Val		Sta	
0	.06610785.84	.09910879.04	.041	11979.8	.06417112.47	.041					
18397.86	.08										

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

10785.8418397.86 2559 4481.46 2515.69 .1 .3
Blocked Obstructions num= 3
Sta L Sta R Elev Sta L Sta R Elev Sta L Sta R Elev
010785.84 7.92 018397.86 -3.4519179.9423164.79 7.92

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	10.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.066	0.043	0.080
W.S. Elev (ft)	10.36	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	22860.06	26849.96	5381.42
E.G. Slope (ft/ft)	0.000104	Area (sq ft)	22860.06	26849.96	5381.42
Q Total (cfs)	45600.00	Flow (cfs)	9228.85	34729.26	1641.89
Top Width (ft)	17769.42	Top Width (ft)	9855.07	4698.39	3215.96
Vel Total (ft/s)	0.83	Avg. Vel. (ft/s)	0.40	1.29	0.31
Max Chl Dpth (ft)	13.81	Hydr. Depth (ft)	2.32	5.71	1.67
Conv. Total (cfs)	4477507.0	Conv. (cfs)	906189.3	3410099.0	161219.1
Length Wtd. (ft)	4042.75	Wetted Per. (ft)	9855.64	4700.52	3216.61
Min Ch El (ft)	-3.45	Shear (lb/sq ft)	0.02	0.04	0.01
Alpha	1.91	Stream Power (lb/ft s)	0.01	0.05	0.00
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	10352.71	47029.88	2184.27
C & E Loss (ft)	0.00	Cum SA (acres)	3720.15	11250.76	1226.28

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 7.46923*

INPUT

Description: Interpolated Cross Section at River Mile 7.47

Station Elevation Data		num= 272							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	15.25	111.17	12.82	231.26	12.23	376.97	10.83	519	10.29
601.83	10.42	683.63	10.59	829.99	7.73	964.47	7.64	1078.88	10.75
1128.02	7.93	1219.33	8.63	1401.88	8.61	1410.51	8.61	1618.17	6.44
1737.97	6.56	1878.28	6.43	2009.17	6.36	2147.46	6.64	2158.25	6.66
2323.03	6.33	2324.11	6.45	2950.97	6.12	3399.82	6.18	3697.88	6.21
4460.47	5.86	4475.02	5.86	4715.85	6.91	4953.66	7.64	5031.8	6.15
5214.81	6.32	5578.51	6.31	5604.48	6.85	5624.2	6.29	5714.35	6.3
5822.86	6.31	5839.84	8.21	5862.44	6.72	5925.59	6.61	6010.59	6.53
6139.82	6	6263.58	6.16	6445.98	6.45	6580.3	6.45	7284.16	6.03
7983.51	6.06	8633.7	6.07	9357.66	6.28	9394.16	6.4	9527.11	6.78
9700.67	7.07	9836.44	10.08	9869.69	7.86	9899.55	8.05	9968.05	8.78
9986.11	10.87	9991.14	10.07	9996.25	8.4110005.82		8.7210060.99		7.1
10094.76	6.0210115.75		5.3810144.51		4.9310189.97		4.27	10196	4.11
10238.73	3.6610272.56		4.1610287.44		3.6910299.12		2.3710310.08		2.97
10322.89	3.8910336.06		3.8810381.61		4.6310424.28		4.7610472.31		4.91
10517.69	5.0110552.42		5.1210588.47		5.1310591.38		5.110656.38		4.68
10747.48	3.9910785.55		3.6810811.08		3.4610840.71		2.9410874.44		2.63
10923.79	2.4310959.96		2.410969.24		2.3610995.57		2.3510995.59		2.35
11030.45	2.211036.95		2.1711076.68		1.5911079.16		1.5611120.34		.71
11120.54	.7111162.76		.4311172.97		.3311204.13		-.0111237.29		-.32
11246.35	-.4111266.83		-1.1811288.15		2.5511318.66		6.81	11323.3	6.8
11414.04	6.7211520.26		6.6211615.74		6.4611700.71		6.3911769.76		6.26
11843.62	6.1411883.47		7.311967.09		9.812006.63		10.9912052.01		11.46
12113.17	12.0712195.57		12.8612275.04		13.6112363.94		14.6912428.66		15.11
12450.09	15.3612505.74		15.3512590.53		14.8712663.51		15.0612731.07		14.84
12820.87	14.7	12935.7	14.7113025.09		14.513093.51		14.0813228.91		13.87
13405.93	13.8613511.65		13.6213623.37		13.7113625.42		13.713708.66		13.31

13785.06	13.0513838.64	13.1913959.24	13.0214043.54	12.6614134.33	12.4
14229.54	12.2114253.58	12.1614265.53	11.7414281.45	10.7414295.03	11.63
14306.12	11.9114318.21	11.9214350.91	11.8114407.42	11.7114449.77	11.64
14509.8	11.5414615.93	11.24 14688	11.0714750.15	10.9214845.23	10.65
14925.01	10.46 15014	10.2515077.91	10.1715146.64	1015195.67	9.89
15255.93	9.715333.59	9.6315384.33	9.4715437.24	9.3415486.98	9.22
15526.58	9.13 15548.5	9.0715574.93	9.0515639.92	8.9315728.32	8.64
15834.49	8.5815941.93	8.3216045.89	7.9916108.13	7.8416155.67	7.65
16177	7.4116194.77	6.6316220.39	6.2616228.33	7.3616230.17	7.62
16237.53	7.5316313.52	7.3516387.67	7.3616480.67	6.6416569.07	6.88
16817.85	6.2516901.86	5.8116936.97	5.9316990.05	4.0817217.01	5.03
17467.79	4.7617622.02	2.6417751.17	1.7717782.36	.817804.33	.2
17855.25	-1.5417871.17	-1.717895.52	-2.3517960.15	-9.2317975.48	-9.23
18043.49	-3.53 18112.7	-2.9518124.47	-2.7318167.37	-2.1418219.38	-2.03
18221.82	-1.9218238.99	-1.9518270.14	-1.8918272.28	-1.8918331.59	-1.82
18415.22	-1.5418421.27	-1.5118501.12	-1.0918560.94	-.8718569.08	-.9
18584.76	-.5918641.44	.72 18704.6	2.3518718.07	2.6418744.17	3.19
18773.99	3.5418832.04	4.718832.13	4.718892.04	4.818915.59	4.89
18916.93	4.7718939.15	3.4918959.36	3.3318969.44	4.8618979.57	7.2
18995.88	919008.49	7.6719192.88	6.1619196.42	6.1319282.94	5.27
19319.18	8.9119369.12	6.419474.71	6.4319502.31	6.6919610.61	6.48
19626.19	7.1319749.43	11.48 19770.7	9.5219922.69	9.2320123.77	8.4
20215.61	8.3 20380.3	6.5720416.54	7.2520435.51	8.3620466.91	10.34
20487.09	9.2120509.46	9.0620728.29	8.1120728.66	8.1121002.71	7.9
21010.34	7.9421166.48	8.7521241.69	9.9321291.93	10.4421439.67	13.11
21575.29	12.5221588.54	11.6821595.73	11.2221695.11	9.7921752.54	8.3
21815.33	8.2922155.59	8.9522438.04	9.7922718.62	10.3323016.42	11.06
23294.56	11.6423588.92	11.79			

Manning's n Values		num= 6	
Sta	n Val	Sta	n Val
0	.06810005.82	.09710115.75	.04411414.04
18995.88	.081		.06516936.97

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	10005.82	18995.88		2559	4481.46	2515.69	.1	.3

Blocked Obstructions		num= 3	
Sta L	Sta R	Elev	Sta R
010005.82	7.49	018995.88	-3.0719749.4323588.92

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	9.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.068	0.045	0.081
W.S. Elev (ft)	9.96	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	21760.29	31263.16	5126.92
E.G. Slope (ft/ft)	0.000098	Area (sq ft)	21760.29	31263.16	5126.92
Q Total (cfs)	45600.00	Flow (cfs)	8388.13	35729.04	1482.83
Top Width (ft)	18039.57	Top Width (ft)	9226.11	5796.45	3017.01
Vel Total (ft/s)	0.78	Avg. Vel. (ft/s)	0.39	1.14	0.29
Max Chl Dpth (ft)	13.03	Hydr. Depth (ft)	2.36	5.39	1.70
Conv. Total (cfs)	4597998.0	Conv. (cfs)	845803.0	3602677.0	149518.1
Length Wtd. (ft)	4075.90	Wetted Per. (ft)	9226.71	5798.25	3017.56
Min Ch El (ft)	-3.07	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	1.71	Stream Power (lb/ft s)	0.01	0.04	0.00
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	9042.06	44040.54	1880.83
C & E Loss (ft)	0.00	Cum SA (acres)	3159.67	10710.90	1046.29

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 6.62307*

INPUT

Description: Interpolated Cross Section at River Mile 6.62

Station Elevation Data		num= 272		Elev Sta		Elev Sta		Elev Sta	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	13.68	102.5	11.54	213.23	11.01	347.58	9.77	478.54	9.29
554.92	9.39	630.34	9.55	765.28	7.06	889.28	6.99	994.77	9.71
1040.08	7.25	1124.27	7.87	1292.6	7.87	1300.55	7.87	1492.02	5.97
1602.49	6.07	1731.86	5.96	1852.54	5.89	1980.06	6.13	1990.01	6.15
2141.93	5.84	2142.93	5.94	2720.92	5.55	3134.78	5.64	3409.61	5.69
4112.75	5.29	4126.17	5.29	4348.22	6.25	4567.49	6.93	4639.54	5.63
4808.29	5.82	5143.63	5.75	5167.58	6.22	5185.76	5.72	5268.89	5.72
5368.93	5.71	5384.59	7.37	5405.42	6.07	5463.65	5.96	5542.03	5.89
5661.18	5.45	5775.29	5.59	5943.48	5.85	6067.32	5.87	6716.32	5.4
7361.15	5.48	7960.65	5.52	8628.18	5.81	8661.83	5.92	8784.42	6.25
8944.44	6.51	9069.63	9.14	9100.28	7.19	9127.82	7.35	9190.98	8
9207.63	9.82	9212.27	9.12	9216.98	7.67	9225.81	7.94	9289.37	6.47
9328.28	5.51	9352.46	4.93	9385.6	4.53	9437.98	3.93	9444.92	3.77
9494.15	3.21	9533.12	3.78	9550.27	3.21	9563.73	1.61	9576.36	2.33
9591.12	3.41	9606.29	3.39	9658.77	4.26	9707.93	4.39	9763.27	4.53
9815.55	4.62	9855.56	4.73	9897.1	4.71	9900.46	4.69	9975.34	4.33
10080.31	3.72	10124.17	3.44	10153.58	3.23	10187.72	2.68	10226.59	2.37
10283.44	2.25	10325.11	2.3	10335.8	2.27	10366.14	2.28	10366.17	2.28
10406.33	2.15	10413.81	2.12	10459.6	1.62	10462.46	1.59	10509.9	.87
10510.13	.87	10558.77	.64	10570.54	.55	10606.44	.25	10644.64	-.03
10655.08	-.11	10678.67	-.79	10703.24	2.46	10738.39	6.18	10743.74	6.16
10848.29	6.11	10970.67	6.03	11080.67	5.88	11178.57	5.83	11258.13	5.71
11343.23	5.59	11389.13	6.61	11485.47	8.81	11531.03	9.84	11583.32	10.27
11653.79	10.81	11748.73	11.47	11840.29	12.12	11942.71	13.13	12017.28	13.42
12041.97	13.65	12106.08	13.67	12203.78	13.14	12287.86	13.41	12365.7	13.18
12469.16	13.05	12601.46	13.12	12704.45	12.91	12783.28	12.45	12939.28	12.26
13143.24	12.34	13265.04	12.11	13393.76	12.27	13396.12	12.26	13492.02	11.86
13580.05	11.61	13641.78	11.82	13780.74	11.71	13877.86	11.34	13982.46	11.1
14092.16	10.95	14119.86	10.91	14133.63	10.41	14151.97	9.22	14167.61	10.3
14180.39	10.65	14194.32	10.67	14232	10.56	14297.11	10.48	14345.9	10.44
14415.07	10.36	14537.34	10.09	14620.38	9.94	14691.98	9.81	14801.52	9.56
14893.45	9.39	14995.97	9.21	15069.61	9.16	15148.8	9.02	15205.29	8.91
15274.71	8.74	15364.19	8.71	15422.65	8.56	15483.61	8.45	15540.92	8.34
15586.55	8.26	15611.8	8.21	15642.25	8.21	15717.13	8.11	15818.98	7.84
15941.31	7.84	16065.09	7.62	16184.86	7.31	16256.57	7.17	16311.35	6.98
16335.92	6.7	16356.4	5.79	16385.91	5.37	16395.06	6.69	16397.19	7.01
16405.66	6.91	16493.22	6.74	16578.65	6.81	16685.8	6.02	16787.65	6.39
17074.28	5.82	17171.07	5.43	17211.53	5.54	17272.68	3.91	17534.17	4.74
17823.11	4.49	18000.8	2.63	18149.6	1.86	18185.54	1.01	18210.85	.52
18269.52	-1.06	18287.86	-1.22	18315.92	-1.96	18390.38	-10.08	18403.79	-10.08
18483.12	-3.31	18563.84	-2.67	18577.56	-2.42	18627.6	-1.69	18688.26	-1.53
18691.11	-1.41	18711.13	-1.42	18747.46	-1.33	18749.95	-1.33	18819.13	-1.29
18916.67	-1.02	18923.72	-.99	19016.86	-.56	19086.62	-.33	19096.12	-.38
19114.4	-.14	19180.51	.94	19254.18	2.36	19269.88	2.59	19300.32	3.03
19335.1	3.21	19402.81	4.11	19402.92	4.11	19472.78	4.15	19500.26	4.23
19501.81	4.08	19527.73	2.28	19551.3	1.84	19563.06	3.55	19574.88	6.24
19593.89	8.21	19606.03	7.04	19783.44	5.82	19786.84	5.79	19870.08	5.04
19904.95	8.23	19953.01	6.04	20054.59	6.08	20081.15	6.39	20185.35	6.53
20200.34	7.15	20318.92	11.08	20339.38	9.38	20485.62	9.27	20679.08	8.61
20767.45	8.54	20925.91	6.57	20960.77	7.06	20979.02	7.98	21009.23	9.67
21028.65	8.66	21050.17	8.49	21260.71	7.37	21261.07	7.37	21524.74	7.1
21532.09	7.14	21682.32	8.12	21754.68	9.25	21803.02	9.68	21945.16	11.99

22075.65	11.45	22088.4	10.7122095.31	10.3122190.93	9.0522246.19	7.74
22306.6	7.7322633.98		8.5222905.73	9.5323175.69	10.1823462.22	11.05
23729.83	11.7524013.04		11.93			

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.069	9225.81	.094	9352.46	.047	10848.29	.066	17823.11	.047
19593.89	.081								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9225.8119593.89 2559 4481.46 2515.69 .1 .3

Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	9225.81	7.07	019593.99	-2.68	20318.92	24013.04		7.07

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	9.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.069	0.049	0.081
W.S. Elev (ft)	9.55	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	20537.76	35704.93	4882.91
E.G. Slope (ft/ft)	0.000100	Area (sq ft)	20537.76	35704.93	4882.91
Q Total (cfs)	45600.00	Flow (cfs)	7880.77	36296.92	1422.31
Top Width (ft)	18781.33	Top Width (ft)	8804.93	7089.59	2886.81
Vel Total (ft/s)	0.75	Avg. Vel. (ft/s)	0.38	1.02	0.29
Max Chl Dpth (ft)	12.23	Hydr. Depth (ft)	2.33	5.04	1.69
Conv. Total (cfs)	4555487.0	Conv. (cfs)	787296.9	3626100.0	142090.2
Length Wtd. (ft)	4100.14	Wetted Per. (ft)	8805.51	7091.24	2887.27
Min Ch El (ft)	-2.68	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	1.53	Stream Power (lb/ft s)	0.01	0.03	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	7799.63	40595.69	1591.79
C & E Loss (ft)	0.00	Cum SA (acres)	2630.04	10048.04	875.81

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 5.77692*

INPUT

Description: Interpolated Cross Section at River Mile 5.78

Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	12.12	93.84	10.27	195.2	9.8	318.19	8.72	438.08	8.28
508	8.36	577.05	8.5	700.58	6.38	814.1	6.34	910.67	8.68
952.15	6.58	1029.22	7.12	1183.31	7.13	1190.59	7.13	1365.88	5.5
1467	5.58	1585.43	5.48	1695.91	5.43	1812.65	5.63	1821.76	5.64
1960.84	5.34	1961.75	5.44	2490.88	4.99	2869.74	5.1	3121.33	5.16
3765.02	4.72	3777.31	4.73	3980.59	5.59	4181.32	6.22	4247.28	5.12
4401.76	5.32	4708.75	5.19	4730.67	5.59	4747.32	5.16	4823.42	5.14
4915.01	5.12	4929.34	6.54	4948.41	5.41	5001.72	5.31	5073.46	5.26
5182.54	4.89	5287.01	5.02	5440.97	5.26	5554.35	5.29	6148.47	4.77
6738.78	4.9	7287.6	4.98	7898.69	5.35	7929.5	5.45	8041.72	5.73
8188.21	5.94	8302.82	8.19	8330.88	6.53	8356.09	6.66	8413.91	7.21
8429.15	8.78	8433.4	8.18	8437.71	6.93	8445.79	7.16	8517.75	5.85
8561.8	4.99	8589.17	4.49	8626.68	4.13	8685.98	3.6	8693.84	3.43
8749.57	2.75	8793.69	3.4	8813.11	2.72	8828.34	.85	8842.64	1.68
8859.34	2.94	8876.52	2.91	8935.94	3.9	8991.58	4.02	9054.24	4.15
9113.42	4.23	9158.71	4.34	9205.73	4.3	9209.54	4.28	9294.31	3.98
9413.14	3.44	9462.79	3.19	9496.08	3	9534.73	2.41	9578.73	2.12

9643.09	2.07	9690.27	2.2	9702.37	2.18	9736.72	2.22	9736.74	2.22
9782.21	2.1	9790.68	2.08	9842.51	1.64	9845.75	1.62	9899.46	1.03
9899.71	1.03	9954.78	.84	9968.11	.77	10008.75	.51	10051.99	.26
10063.81	.18	10090.52	-.41	10118.32	2.37	10158.12	5.54	10164.17	5.53
10282.53	5.49	10421.07	5.44	10545.61	5.31	10656.43	5.27	10746.5	5.15
10842.83	5.04	10894.8	5.91	11003.86	7.81	11055.44	8.71	11114.63	9.07
11194.4	9.53	11301.88	10.09	11405.53	10.63	11521.48	11.57	11605.89	11.73
11633.85	11.94	11706.43	11.99	11817.02	11.41	11912.21	11.75	12000.33	11.51
12117.45	11.41	12267.22	11.54	12383.82	11.32	12473.06	10.81	12649.65	10.65
12880.55	10.82	13018.44	10.59	13164.15	10.83	13166.83	10.82	13275.39	10.41
13375.04	10.17	13444.93	10.45	13602.23	10.39	13712.18	10.02	13830.6	9.8
13954.78	9.69	13986.13	9.64	14001.72	9.08	14022.49	7.71	14040.2	8.97
14054.67	9.39	14070.43	9.42	14113.08	9.31	14186.79	9.26	14242.03	9.23
14320.33	9.18	14458.75	8.93	14552.75	8.81	14633.81	8.69	14757.82	8.46
14861.88	8.32	14977.95	8.16	15061.31	8.15	15150.96	8.03	15214.9	7.94
15293.5	7.78	15394.79	7.81	15460.97	7.65	15529.98	7.56	15594.86	7.47
15646.51	7.4	15675.1	7.36	15709.57	7.36	15794.34	7.31	15909.64	7.03
16048.12	7.11	16188.25	6.91	16323.84	6.62	16405.02	6.51	16467.03	6.31
16494.85	6.16	16518.03	4.95	16551.44	4.47	16561.79	6.02	16564.21	6.39
16573.79	6.27	16672.92	6.13	16769.63	6.27	16890.93	5.41	17006.23	5.89
17330.71	5.39	17440.28	5.06	17486.08	5.14	17555.31	3.75	17851.33	4.45
18178.43	4.22	18379.58	2.62	18548.04	1.95	18588.72	1.23	18617.37	.83
18683.78	-.59	18704.55	-.75	18736.32	-1.56	18820.62	-10.92	18832.11	-10.92
18922.74	-3.08	19014.98	-2.39	19030.66	-2.11	19087.83	-1.23	19157.13	-1.03
19160.39	-.87	19183.27	-.89	19224.78	-.77	19227.63	-.77	19306.67	-.77
19418.11	-.51	19426.18	-.47	19532.59	-.02	19612.31	.21	19623.15	.14
19644.04	.31	19719.58	1.17	19803.75	2.36	19821.7	2.54	19856.47	2.87
19896.22	2.86	19973.58	3.5	19973.7	3.52	20053.53	3.52	20084.92	3.57
20086.7	3.39	20116.31	1.07	20143.25	.34	20156.68	2.24	20170.18	5.27
20191.91	7.42	20203.56	6.41	20374	5.47	20377.26	5.45	20457.23	4.82
20490.73	7.56	20536.89	5.68	20634.48	5.72	20659.99	6.09	20760.09	6.59
20774.49	7.17	20888.4	10.68	20908.06	9.24	21048.54	9.32	21234.39	8.81
21319.28	8.78	21471.51	6.56	21505	6.87	21522.54	7.59	21551.55	9
21570.21	8.12	21590.88	7.92	21793.14	6.63	21793.48	6.63	22046.78	6.3
22053.83	6.35	22198.15	7.45	22267.67	8.57	22314.11	8.93	22450.65	10.87
22576.01	10.37	22588.26	9.73	22594.9	9.39	22686.76	8.31	22739.84	7.18
22797.88	7.17	23112.37	8.08	23373.43	9.27	23632.76	10.02	23908.01	11.05
24165.1	11.85	24437.16	12.07						

Manning's n Values		num= 6	
Sta	n Val	Sta	n Val
0	.071	8445.79	.091
20191.91	.082	8589.17	.051
		10118.32	.068
		17851.33	.051

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	8445.79	20191.91	2559	4481.46	2515.69	.1	.3	
Blocked Obstructions		num= 3						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	8445.79	6.64	020191.91	-2.29	20888.42	4437.16	6.64	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	9.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.071	0.053	0.082
W.S. Elev (ft)	9.13	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	19318.40	40259.20	4596.52
E.G. Slope (ft/ft)	0.000105	Area (sq ft)	19318.40	40259.20	4596.52
Q Total (cfs)	45600.00	Flow (cfs)	7363.27	36876.32	1360.40
Top Width (ft)	19326.11	Top Width (ft)	8174.36	8569.00	2582.76
Vel Total (ft/s)	0.71	Avg. Vel. (ft/s)	0.38	0.92	0.30

Max Chl Dpth (ft)	11.42	Hydr. Depth (ft)	2.36	4.70	1.78
Conv. Total (cfs)	4442190.0	Conv. (cfs)	717303.9	3592360.0	132525.6
Length Wtd. (ft)	4112.77	Wetted Per. (ft)	8174.83	8570.65	2583.13
Min Ch El (ft)	-2.29	Shear (lb/sq ft)	0.02	0.03	0.01
Alpha	1.40	Stream Power (lb/ft s)	0.01	0.03	0.00
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	6628.92	36688.09	1318.06
C & E Loss (ft)	0.00	Cum SA (acres)	2131.31	9242.56	717.87

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 4.93076*

INPUT

Description: Interpolated Cross Section at River Mile 4.93

Station	Elevation	Data	num=	272						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	10.55	85.17	8.99	177.18	8.58	288.81	7.66	397.62	7.28	
461.08	7.34	523.75	7.46	635.88	5.71	738.91	5.69	826.56	7.65	
864.21	5.9	934.17	6.36	1074.03	6.39	1080.64	6.39	1239.73	5.03	
1331.52	5.1	1439.01	5.01	1539.29	4.96	1645.24	5.12	1653.51	5.13	
1779.75	4.85	1780.57	4.93	2260.83	4.42	2604.71	4.56	2833.06	4.63	
3417.3	4.15	3428.46	4.16	3612.96	4.93	3795.15	5.51	3855.02	4.61	
3995.23	4.81	4273.87	4.63	4293.77	4.96	4308.87	4.6	4377.95	4.56	
4461.08	4.52	4474.09	5.7	4491.4	4.76	4539.78	4.66	4604.9	4.62	
4703.91	4.33	4798.73	4.45	4938.47	4.67	5041.37	4.71	5580.63	4.14	
6116.42	4.31	6614.55	4.43	7169.2	4.88	7197.16	4.97	7299.02	5.2	
7431.99	5.38	7536.01	7.25	7561.48	5.86	7584.36	5.97	7636.84	6.43	
7650.67	7.73	7654.53	7.23	7658.44	6.19	7665.78	6.38	7746.13	5.23	
7795.32	4.48	7825.88	4.04	7867.77	3.72	7933.98	3.27	7942.76	3.09	
8004.99	2.29	8054.26	3.01	8075.94	2.23	8092.95	.1	8108.91	1.03	
8127.57	2.47	8146.75	2.42	8213.1	3.53	8275.24	3.65	8345.2	3.78	
8411.28	3.84	8461.86	3.95	8514.37	3.89	8518.61	3.86	8613.27	3.64	
8745.96	3.17	8801.41	2.94	8838.58	2.76	8881.74	2.14	8930.88	1.87	
9002.74	1.89	9055.42	2.1	9068.94	2.09	9107.29	2.15	9107.32	2.15	
9158.09	2.05	9167.55	2.03	9225.43	1.67	9229.04	1.65	9289.01	1.2	
9289.3	1.19	9350.79	1.05	9365.67	1	9411.05	.76	9459.34	.55	
9472.54	.48	9502.36	-.02	9533.41	2.28	9577.85	4.9	9584.61	4.89	
9716.78	4.88	9871.47	4.85	10010.54	4.71	10134.3	4.71	10234.87	4.59	
10342.43	4.49	10400.47	5.21	10522.25	6.81	10579.85	7.56	10645.95	7.88	
10735.02	8.26	10855.03	8.71	10970.78	9.15	11100.25	10.01	11194.51	10.04	
11225.73	10.23	11306.77	10.31	11430.27	9.67	11536.55	10.09	11634.96	9.84	
11765.74	9.75	11932.99	9.95	12063.18	9.74	12162.83	9.18	12360.03	9.04	
12617.86	9.31	12771.83	9.07	12934.54	9.39	12937.53	9.38	13058.76	8.96	
13170.04	8.72	13248.07	9.07	13423.73	9.07	13546.5	8.71	13678.73	8.5	
13817.4	8.42	13852.41	8.38	13869.82	7.75	13893.01	6.19	13912.78	7.65	
13928.94	8.12	13946.54	8.16	13994.17	8.05	14076.48	8.03	14138.16	8.03	
14225.59		814380.16	7.78	14485.13	7.67	14575.64	7.58	14714.12	7.37	
14830.32	7.25	14959.92	7.12	15053	7.14	15153.12	7.04	15224.52	6.97	
15312.28	6.81	15425.4	6.88	15499.29	6.74	15576.35	6.66	15648.8	6.59	
15706.48	6.53	15738.4	6.5	15776.9	6.52	15871.55	6.48	16000.3	6.23	
16154.93	6.37	16311.4	6.21	16462.82	5.93	16553.47	5.84	16622.7	5.64	
16653.78	5.31	16679.66	4.11	16716.97	3.58	16728.53	5.35	16731.22	5.78	
16741.93	5.64	16852.62	5.53	16960.61	5.72	17096.06	4.78	17224.81	5.39	
17587.14	4.96	17709.5	4.68	17760.63	4.75	17837.95	3.58	18168.49	4.15	
18533.74	3.95	18758.37	2.61	18946.47	2.04	18991.9	1.44	19023.89	1.14	
19098.05	-.12	19121.24	-.27	19156.71	-1.17	19250.85	-11.77	19260.42	-11.77	
19362.37	-2.85	19466.12	-2.11	19483.75	-1.79	19548.06	-.78	19626.01	-.52	
19629.68	-.34	19655.4	-.36	19702.1	-.21	19705.3	-.21	19794.21	-.24	

19919.56	.0119928.63	.0520048.33	.5220137.99	.7320150.19	.66
20173.69	.7620258.65	1.3920353.33	2.3720373.51	2.4920412.63	2.71
20457.33	2.5120544.35	2.920544.48	2.920634.27	2.8520669.58	2.9
20671.59	2.7120704.89	-.1420735.19	-1.15 20750.3	.9420765.48	4.31
20789.92	6.6 20801.1	5.7820964.55	5.1220967.69	5.1121044.38	4.59
21076.5	6.8821120.77	5.3221214.37	5.3721238.84	5.7821334.83	6.64
21348.64	7.1921457.89	10.2721476.74	9.1121611.47	9.3721789.71	9.01
21871.12	9.0122017.11	6.5622049.23	6.6822066.04	7.2122093.88	8.33
22111.76	7.5422131.59	7.3622325.57	5.89 22325.9	5.8922568.81	5.5
22575.58	5.5622713.99	6.822780.65	7.8922825.19	8.1822956.15	9.75
23076.37	9.323088.12	8.7623094.48	8.4723182.58	7.5623233.49	6.62
23289.14	6.6123590.76	7.6523841.12	9.0124089.84	9.8724353.81	11.04
24600.36	11.9624861.29	12.21			

Manning's n Values	num=	6									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.072	7665.78	.088	7825.88	.054	8213.1	.069	18946.47	.054		
20789.92	.082										

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.	
7665.78	20789.92	2559	4481.46	2515.69	.1		.3	
Blocked Obstructions	num=	3						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	7665.78	6.22	020789.92	-1.92	1457.89	24861.29	6.22	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	8.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.072	0.060	0.082
W.S. Elev (ft)	8.64	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	17453.87	44668.01	4244.27
E.G. Slope (ft/ft)	0.000132	Area (sq ft)	17453.87	44668.01	4244.27
Q Total (cfs)	45600.00	Flow (cfs)	7272.74	36896.37	1430.88
Top Width (ft)	20144.56	Top Width (ft)	7502.85	10377.57	2264.14
Vel Total (ft/s)	0.69	Avg. Vel. (ft/s)	0.42	0.83	0.34
Max Chl Dpth (ft)	10.54	Hydr. Depth (ft)	2.33	4.30	1.87
Conv. Total (cfs)	3965081.0	Conv. (cfs)	632390.7	3208270.0	124420.5
Length Wtd. (ft)	4136.19	Wetted Per. (ft)	7503.18	10379.25	2264.43
Min Ch El (ft)	-1.90	Shear (lb/sq ft)	0.02	0.04	0.02
Alpha	1.24	Stream Power (lb/ft s)	0.01	0.03	0.01
Frctn Loss (ft)	0.60	Cum Volume (acre-ft)	5548.80	32319.43	1062.77
C & E Loss (ft)	0.00	Cum SA (acres)	1670.81	8267.95	577.91

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 4.08461*

INPUT

Description: Interpolated Cross Section at River Mile 4.08

Station Elevation Data	num=	272									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8.98	76.5	7.71	159.15	7.37	259.42	6.61	357.16	6.28		
414.17	6.31	470.46	6.42	571.18	5.04	663.72	5.03	742.46	6.62		
776.28	5.23	839.11	5.61	964.74	5.66	970.68	5.65	1113.58	4.56		
1196.03	4.61	1292.59	4.53	1382.66	4.49	1477.83	4.62	1485.26	4.62		
1598.65	4.36	1599.39	4.42	2030.79	3.86	2339.67	4.01	2544.79	4.11		
3069.58	3.58	3079.6	3.59	3245.33	4.27	3408.99	4.8	3462.76	4.1		
3588.71	4.31	3838.99	4.07	3856.87	4.33	3870.43	4.03	3932.48	3.99		

4007.15	3.92	4018.84	4.86	4034.38	4.1	4077.84	4.01	4136.34	3.99
4225.27	3.77	4310.44	3.88	4435.97	4.08	4528.4	4.13	5012.78	3.51
5494.05	3.73	5941.5	3.88	6439.71	4.42	6464.83	4.5	6556.33	4.68
6675.76	4.81	6769.2	6.3	6792.08	5.19	6812.63	5.28	6859.77	5.64
6872.19	6.69	6875.66	6.29	6879.18	5.45	6885.76	5.61	6974.51	4.61
7028.83	3.96	7062.59	3.6	7108.86	3.32	7181.99	2.93	7191.68	2.76
7260.42	1.83	7314.83	2.63	7338.77	1.75	7357.56	-.66	7375.19	.39
7395.8	1.99	7416.98	1.94	7490.26	3.17	7558.89	3.28	7636.16	3.4
7709.14	3.45	7765.01	3.56	7823	3.47	7827.69	3.45	7932.24	3.29
8078.79	2.9	8140.02	2.69	8181.09	2.53	8228.75	1.87	8283.02	1.61
8362.39	1.72	8420.58	2	8435.51	2.01	8477.86	2.08	8477.89	2.08
8533.98	2	8544.42	1.98	8608.34	1.7	8612.33	1.68	8678.57	1.36
8678.89	1.35	8746.8	1.26	8763.24	1.22	8813.36	1.02	8866.69	.84
8881.27	.78	8914.21	.36	8948.5	2.18	8997.58	4.27	9005.05	4.25
9151.02	4.26	9321.88	4.26	9475.47	4.13	9612.16	4.15	9723.23	4.03
9842.04	3.94	9906.13	4.51	10040.64	5.81	10104.25	6.42	10177.26	6.68
10275.63	6.99	10408.19	7.33	10536.02	7.66	10679.02	8.45	10783.13	8.35
10817.61	8.52	10907.12	8.63	11043.52	7.94	11160.9	8.43	11269.58	8.17
11414.03	8.11	11598.75	8.36	11742.54	8.15	11852.6	7.54	12070.4	7.43
12355.17	7.78	12525.22	7.56	12704.93	7.96	12708.23	7.95	12842.13	7.51
12965.03	7.28	13051.22	7.71	13245.22	7.76	13380.82	7.38	13526.86	7.2
13680.02	7.16	13718.69	7.13	13737.92	6.42	13763.53	4.67	13785.36	6.32
13803.21	6.86	13822.65	6.91	13875.25	6.81	13966.16	6.81	14034.29	6.82
14130.85	6.82	14301.56	6.62	14417.5	6.54	14517.48	6.46	14670.41	6.28
14798.76	6.18	14941.9	6.07	15044.7	6.13	15155.27	6.05	15234.13	5.99
15331.06	5.85	15456	5.97	15537.62	5.83	15622.72	5.77	15702.74	5.71
15766.44	5.66	15801.7	5.64	15844.22	5.67	15948.76	5.67	16090.96	5.42
16261.75	5.64	16434.56	5.51	16601.79	5.25	16701.91	5.17	16778.38	4.97
16812.7	4.61	16841.29	3.27	16882.49	2.68	16895.26	4.68	16898.24	5.16
16910.06	5.01	17032.31	4.92	17151.59	5.18	17301.19	4.17	17443.38	4.89
17843.57	4.54	17978.71	4.31	18035.19	4.35	18120.58	3.42	18485.66	3.86
18889.06	3.68	19137.15	2.61	19344.91	2.14	19395.08	1.65	19430.41	1.45
19512.32	.35	19537.93	.21	19577.11	-.78	19681.08	-12.62	19688.74	-12.62
19801.99	-2.62	19917.25	-1.82	19936.85	-1.48	20008.29	-.32	20094.89	-.02
20098.96	.19	20127.54	.17	20179.42	.36	20182.98	.35	20281.74	.29
20421.01	.53	20431.09	.57	20564.06	1.05	20663.67	1.27	20677.22	1.18
20703.33	1.21	20797.72	1.61	20902.9	2.38	20925.33	2.44	20968.78	2.55
21018.45	2.17	21115.12	2.32	21115.27	2.32	21215.02	2.22	21254.25	2.24
21256.47	2.02	21293.47	-1.35	21327.13	-2.64	21343.92	-.37	21360.79	3.35
21387.94	5.82	21398.64	5.16	21555.11	4.77	21558.11	4.77	21631.53	4.37
21662.28	6.22	21704.66	4.96	21794.25	5.02	21817.68	5.48	21909.58	6.7
21922.79	7.21	22027.37	9.87	22045.42	8.97	22174.39	9.41	22345.02	9.21
22422.96	9.25	22562.71	6.55	22593.46	6.48	22609.56	6.83	22636.2	7.65
22653.32	6.98	22672.3	6.79	22857.99	5.15	22858.31	5.15	23090.85	4.7
23097.33	4.77	23229.83	6.15	23293.64	7.21	23336.28	7.42	23461.64	8.63
23576.73	8.22	23587.97	7.79	23594.07	7.56	23678.4	6.82	23727.13	6.07
23780.42	6.05	24069.14	7.22	24308.82	8.75	24546.91	9.72	24799.61	11.03
25035.63	12.07	25285.41	12.35						

Manning's n Values		num= 6	
Sta	n Val	Sta	n Val
0	.074	6885.76	.086
21387.94	.083	7108.86	.057
		7490.26	.071
		9434.91	.057

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	6885.76	21387.94		2559	4481.46	2515.69		.1	.3
Blocked Obstructions		num= 3							
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev	
0	6885.76	5.79	21837.94	25285.41	5.79	021387.94		-1.52	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	8.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.074	0.063	0.083
W.S. Elev (ft)	8.05	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	14926.06	48867.52	3751.06
E.G. Slope (ft/ft)	0.000156	Area (sq ft)	14926.06	48867.52	3751.06
Q Total (cfs)	45600.00	Flow (cfs)	6309.51	37985.89	1304.60
Top Width (ft)	22325.18	Top Width (ft)	6829.58	13394.24	2101.36
Vel Total (ft/s)	0.68	Avg. Vel. (ft/s)	0.42	0.78	0.35
Max Chl Dpth (ft)	9.57	Hydr. Depth (ft)	2.19	3.65	1.79
Conv. Total (cfs)	3647859.0	Conv. (cfs)	504741.1	3038753.0	104364.3
Length Wtd. (ft)	4062.10	Wetted Per. (ft)	6829.76	13396.08	2101.62
Min Ch El (ft)	-1.52	Shear (lb/sq ft)	0.02	0.04	0.02
Alpha	1.17	Stream Power (lb/ft s)	0.01	0.03	0.01
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	4597.69	27507.95	831.89
C & E Loss (ft)	0.00	Cum SA (acres)	1249.82	7045.13	451.86

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 3.23846*

INPUT

Description: Interpolated Cross Section at River Mile 3.24

Station Elevation Data		num= 272									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7.41	67.84	6.44	141.12	6.15	230.03	5.55	316.71	5.28		
367.25	5.28	417.17	5.38	506.47	4.36	588.54	4.38	658.35	5.59		
688.34	4.55	744.06	4.85	855.46	4.92	860.72	4.91	987.44	4.09		
1060.54	4.12	1146.16	4.06	1226.03	4.02	1310.42	4.11	1317.01	4.11		
1417.56	3.86	1418.22	3.91	1800.74	3.29	2074.63	3.47	2256.52	3.58		
2721.86	3.01	2730.75	3.02	2877.7	3.61	3022.82	4.09	3070.5	3.59		
3182.18	3.81	3404.11	3.51	3419.96	3.7	3431.99	3.47	3487.01	3.41		
3553.22	3.32	3563.58	4.02	3577.37	3.45	3615.91	3.36	3667.78	3.36		
3746.64	3.21	3822.16	3.31	3933.46	3.49	4015.42	3.55	4444.94	2.89		
4871.69	3.15	5268.45	3.34	5710.23	3.95	5732.5	4.02	5813.63	4.15		
5919.53	4.25	6002.39	5.36	6022.67	4.52	6040.9	4.59	6082.69	4.86		
6093.72	5.64	6096.79	5.34	6099.91	4.72	6105.75	4.83	6202.88	3.99		
6262.35	3.45	6299.3	3.15	6349.94	2.91	6429.99	2.6	6440.6	2.42		
6515.84	1.37	6575.4	2.25	6601.6	1.26	6622.17	-1.42	6641.47	-0.26		
6664.02	1.52	6687.21	1.45	6767.42	2.8	6842.54	2.91	6927.12	3.03		
7007.01	3.06	7068.16	3.17	7131.63	3.06	7136.77	3.04	7251.2	2.94		
7411.62	2.62	7478.64	2.44	7523.59	2.3	7575.77	1.6	7635.17	1.36		
7722.04	1.54	7785.73	1.9	7802.07	1.92	7848.44	2.01	7848.47	2.01		
7909.86	1.95	7921.29	1.94	7991.26	1.72	7995.62	1.72	8068.13	1.52		
8068.48	1.52	8142.81	1.46	8160.8	1.44	8215.66	1.28	8274.05	1.13		
8290	1.08	8326.05	.74	8363.59	2.09	8417.31	3.63	8425.49	3.61		
8585.27	3.65	8772.29	3.67	8940.4	3.55	9090.02	3.58	9211.6	3.47		
9341.64	3.39	9411.8	3.8	9559.03	4.8	9628.66	5.27	9708.57	5.49		
9816.25	5.71	9961.34	5.95	10101.27	6.17	10257.79	6.88	10371.75	6.67		
10409.49	6.81	10507.46	6.94	10656.76	6.21	10785.25	6.77	10904.21	6.5		
11062.33	6.45	11264.51	6.77	11421.91	6.56	11542.38	5.91	11780.78	5.83		
12092.47	6.26	12278.62	6.04	12475.33	6.52	12478.94	6.51	12625.5	6.06		
12760.02	5.83	12854.36	6.32	13066.72	6.44	13215.14	6.06	13375	5.9		
13542.64	5.89	13584.97	5.87	13606.01	5.09	13634.04	3.15	13657.95	4.99		
13677.48	5.59	13698.77	5.66	13756.34	5.55	13855.85	5.58	13930.41	5.62		
14036.11	5.64	14222.97	5.47	14349.88	5.41	14459.31	5.35	14626.71	5.18		
14767.19	5.11	14923.87	5.03	15036.4	5.13	15157.43	5.06	15243.75	5.02		

15349.85	4.89	15486.6	5.0515575.94	4.9315669.09	4.8815756.68	4.83
15826.41	4.8	15865	4.7815911.54	4.8316025.97	4.8516181.62	4.62
16368.56	4.916557.72	4.8116740.77	4.8116740.77	4.5616850.36	4.516934.06	4.31
16971.62	3.917002.91	2.4217048.02	1.79	17062	4.0117065.25	4.55
17078.2	4.3917212.01	4.3217342.56	4.6317506.31	3.5517661.96	4.39	
18100	4.1118247.92	3.9218309.74	3.9618403.21	3.2518802.82	3.57	
19244.38	3.4119515.93	2.5919743.34	2.2319798.26	1.8619836.94	1.76	
19926.59	.8319954.62	.6819997.51	-.3820111.31	-13.4620117.05	-13.46	
20241.62	-2.3920368.39	-1.5420389.94	-1.1720468.51	.1320563.77	.49	
20568.25	.7220599.68	.7120656.74	.9220660.66	.9120769.28	.82	
20922.46	1.0520933.54	1.09	21079.8	1.5921189.35	1.821204.26	1.7
21232.97	1.6621336.79	1.8321452.48	2.3821477.14	2.3821524.94	2.38	
21579.56	1.8321685.89	1.721686.05	1.721795.76	1.5521838.91	1.58	
21841.36	1.3321882.06	-2.5721919.07	-4.1321937.54	-1.6821956.09	2.39	
21985.95	521996.18	4.5322145.67	4.4322148.53	4.4222218.67	4.14	
22248.05	5.5222288.54	4.622374.14	4.6622396.52	5.1822484.32	6.75	
22496.95	7.2422596.86	9.4722614.11	8.8322737.32	9.4622900.33	9.41	
22974.79	9.4923108.31	6.5523137.69	6.2923153.07	6.4523178.52	6.98	
23194.88	6.4323213.01	6.2223390.42	4.4223390.72	4.4123612.89	3.9	
23619.08	3.9723745.66	5.523806.63	6.5423847.37	6.6723967.13	7.51	
24077.09	7.1524087.83	6.8224093.65	6.6424174.22	6.0824220.78	5.51	
24271.69	5.4824547.53	6.7924776.51	8.4825003.98	9.5625245.41	11.02	
25470.9	12.1825709.53	12.48				

Manning's n Values		num= 6		n Val		Sta		n Val		Sta	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.075	6105.75	.083	6349.94	.06	6767.42	.07118802.82		.06		
21985.95	.083										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	6105.75	21985.95	2559	4481.46	2515.69	.1		.3	
Blocked Obstructions		num= 2		Sta L		Sta R		Elev	
22974.79	25709.53	5.37	021985.95	-1.13					

CROSS SECTION OUTPUT		Profile #Calibration			
E.G. Elev (ft)	7.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.075	0.065	0.083
W.S. Elev (ft)	7.51	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	22572.05	55732.52	3463.27
E.G. Slope (ft/ft)	0.000111	Area (sq ft)	22572.05	55732.52	3463.27
Q Total (cfs)	45600.00	Flow (cfs)	11258.55	33371.40	970.04
Top Width (ft)	24087.56	Top Width (ft)	6105.75	15880.20	2101.62
Vel Total (ft/s)	0.56	Avg. Vel. (ft/s)	0.50	0.60	0.28
Max Chl Dpth (ft)	8.64	Hydr. Depth (ft)	3.70	3.51	1.65
Conv. Total (cfs)	4330386.0	Conv. (cfs)	1069164.0	3169102.0	92119.8
Length Wtd. (ft)	3996.31	Wetted Per. (ft)	6106.07	15881.73	2101.77
Min Ch El (ft)	-1.13	Shear (lb/sq ft)	0.03	0.02	0.01
Alpha	1.05	Stream Power (lb/ft s)	0.01	0.01	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	3496.25	22127.32	623.57
C & E Loss (ft)	0.00	Cum SA (acres)	869.87	5539.25	330.49

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: Fish Creek
REACH: Lower Fish Creek RS: 2.39230*

INPUT

Description: Interpolated Cross Section at River Mile 2.39

Station Elevation Data		num= 272									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	5.84	59.17	5.16	123.09	4.94	200.65	4.5	276.25	4.27		
320.33	4.25	363.87	4.34	441.77	3.69	513.35	3.73	574.25	4.56		
600.4	3.88	649	4.1	746.17	4.18	750.76	4.18	861.29	3.61		
925.06	3.63	999.74	3.58	1069.41	3.55	1143.02	3.61	1148.76	3.6		
1236.46	3.37	1237.04	3.4	1570.69	2.73	1809.6	2.93	1968.24	3.05		
2374.14	2.44	2381.89	2.45	2510.07	2.96	2636.65	3.38	2678.24	3.08		
2775.65	3.31	2969.23	2.96	2983.06	3.07	2993.55	2.91	3041.54	2.83		
3099.29	2.73	3108.33	3.18	3120.36	2.79	3153.97	2.7	3199.22	2.72		
3268	2.65	3333.87	2.74	3430.96	2.9	3502.45	2.96	3877.09	2.26		
4249.33	2.57	4595.4	2.79	4980.74	3.49	5000.17	3.55	5070.93	3.63		
5163.31	3.68	5235.58	4.42	5253.27	3.86	5269.16	3.9	5305.62	4.07		
5315.24	4.6	5317.92	4.39	5320.64	3.98	5325.73	4.05	5431.26	3.37		
5495.87	2.93	5536.01	2.71	5591.03	2.51	5677.99	2.27	5689.52	2.08		
5771.26	.92	5835.96	1.87	5864.44	.77	5886.78	-2.18	5907.75	-.91		
5932.25	1.05	5957.44	.97	6044.58	2.43	6126.2	2.54	6218.08	2.65		
6304.87	2.68	6371.3	2.78	6440.27	2.64	6445.85	2.63	6570.17	2.59		
6744.45	2.35	6817.26	2.2	6866.09	2.07	6922.78	1.34	6987.31	1.11		
7081.7	1.36	7150.89	1.8	7168.64	1.83	7219.01	1.94	7219.05	1.94		
7285.74	1.9	7298.16	1.89	7374.17	1.75	7378.92	1.75	7457.69	1.68		
7458.06	1.68	7538.82	1.67	7558.37	1.66	7617.97	1.54	7681.4	1.42		
7698.73	1.37	7737.9	1.13	7778.68	2	7837.04	2.99	7845.92	2.98		
8019.51	3.03	8222.69	3.08	8405.34	2.97	8567.88	3.02	8699.97	2.92		
8841.25	2.84	8917.47	3.1	9077.42	3.8	9153.06	4.13	9239.88	4.29		
9356.87	4.44	9514.49	4.56	9666.51	4.68	9836.56	5.32	9960.37	4.98		
10001.37	5.110107.81		5.2610270.01		4.47	10409.6	5.1210538.84		4.84		
10710.62	4.810930.27		5.1811101.27		4.9711232.15		4.2711491.15		4.22		
11829.78	4.7412032.01		4.5312245.72		5.0812249.64		5.0712408.86		4.6		
12555.01	4.3912657.51		4.9512888.21		5.1313049.46		4.7413223.13		4.6		
13405.26	4.6313451.24		4.6113474.11		3.7613504.56		1.6413530.53		3.66		
13551.76	4.3313574.88		4.4113637.43		4.313745.53		4.3513826.54		4.41		
13941.38	4.4614144.38		4.3114282.25		4.2714401.14		4.2314583.01		4.09		
14735.63	4.0414905.85		3.99	15028.1	4.1215159.59		4.0815253.37		4.05		
15368.63	3.93	15517.2	4.1315614.26		4.0215715.46		3.9915810.62		3.96		
15886.37	3.93	15928.3	3.9215978.86		3.9916103.18		4.0316272.28		3.81		
16475.37	4.1716680.88		4.116879.75		3.8716998.81		3.8417089.74		3.64		
17130.55	3.217164.54		1.5817213.55		.8917228.73		3.3417232.27		3.93		
17246.33	3.7617391.71		3.7117533.54		4.0917711.44		2.9317880.54		3.9		
18356.43	3.6818517.13		3.5518584.29		3.5718685.84		3.0919119.98		3.27		
19599.7	3.1419894.72		2.5820141.77		2.3220201.44		2.0820243.46		2.08		
20340.86	1.320371.32		1.15	20417.9	.0120541.54		-14.3120545.37		-14.31		
20681.25	-2.1620819.53		-1.2620843.03		-.8520928.74		.5921032.64		.99		
21037.53	1.2421071.82		1.2421134.06		1.4821138.33		1.4721256.82		1.34		
21423.9	1.5721435.99		1.621595.53		2.1321715.04		2.3321731.29		2.22		
21762.61	2.121875.86		2.0622002.05		2.3922028.96		2.3322081.09		2.22		
22140.67	1.4922256.66		1.122256.83		1.122376.51		.922423.57		.92		
22426.24	.6422470.64		-3.7822511.02		-5.6222531.16		-2.9922551.39		1.42		
22583.97	4.222593.72		3.922736.22		4.0822738.96		4.0822805.82		3.91		
22833.83	4.8422872.43		4.2422954.03		4.3122975.36		4.8823059.06		6.81		
23071.1	7.2623166.34		9.0623182.79		8.6923300.25		9.5123455.65		9.61		
23526.63	9.7323653.91		6.5423681.92		6.123696.58		6.0623720.84		6.31		
23736.44	5.8723753.72		5.6523922.85		3.6823923.13		3.6824134.93		3.1		
24140.83	3.18	24261.5	4.8624319.62		5.8624358.45		5.9224472.63		6.39		
24577.45	6.0724587.69		5.8424593.24		5.7324670.05		5.3424714.43		4.95		
24762.96	4.9225025.92		6.3625244.21		8.2225461.05		9.4125691.21		11.02		
25906.16	12.2826133.65		12.62								

Manning's n Values num= 6
 Sta n Val Sta n Val Sta n Val Sta n Val
 0 .077 5325.73 .08 5591.03 .064 6044.58 .07220243.46 .064
 22583.97 .084

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 5325.7322583.97 2559 4481.46 2515.69 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 022583.97 -.7423526.6326133.65 4.94

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	7.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.077	0.069	0.084
W.S. Elev (ft)	7.09	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	20788.45	65371.17	3511.42
E.G. Slope (ft/ft)	0.000097	Area (sq ft)	20788.45	65371.17	3511.42
Q Total (cfs)	45600.00	Flow (cfs)	9808.60	34856.57	934.83
Top Width (ft)	24546.54	Top Width (ft)	5325.73	17258.24	1962.57
Vel Total (ft/s)	0.51	Avg. Vel. (ft/s)	0.47	0.53	0.27
Max Chl Dpth (ft)	7.83	Hydr. Depth (ft)	3.90	3.79	1.79
Conv. Total (cfs)	4622804.0	Conv. (cfs)	994368.6	3533664.0	94770.9
Length Wtd. (ft)	4061.93	Wetted Per. (ft)	5327.10	17259.51	1962.68
Min Ch El (ft)	-0.74	Shear (lb/sq ft)	0.02	0.02	0.01
Alpha	1.03	Stream Power (lb/ft s)	0.01	0.01	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	2222.61	15897.73	422.17
C & E Loss (ft)	0.00	Cum SA (acres)	534.09	3834.60	213.13

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: Fish Creek
 REACH: Lower Fish Creek RS: 1.54615*

INPUT
 Description: Interpolated Cross Section at River Mile 1.55
 Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4.27	50.5	3.88	105.06	3.72	171.26	3.44	235.79	3.27
273.42	3.23	310.58	3.29	377.07	3.02	438.16	3.08	490.14	3.53
512.47	3.2	553.95	3.34	636.89	3.44	640.8	3.44	735.15	3.14
789.57	3.14	853.32	3.11	912.78	3.09	975.61	3.1	980.51	3.1
1055.37	2.88	1055.86	2.89	1340.65	2.16	1544.56	2.38	1679.97	2.53
2026.42	1.87	2033.03	1.89	2142.44	2.3	2250.48	2.67	2285.98	2.57
2369.13	2.8	2534.35	2.4	2546.16	2.44	2555.11	2.34	2596.07	2.25
2645.37	2.13	2653.08	2.35	2663.35	2.14	2692.04	2.05	2730.65	2.09
2789.36	2.09	2845.59	2.18	2928.45	2.31	2989.47	2.38	3309.25	1.63
3626.96	1.98	3922.35	2.25	4251.25	3.02	4267.83	3.07	4328.23	3.1
4407.08	3.12	4468.77	3.47	4483.87	3.19	4497.43	3.21	4528.55	3.29
4536.76	3.55	4539.05	3.45	4541.37	3.24	4545.72	3.28	4659.64	2.75
4729.38	2.42	4772.72	2.26	4832.11	2.1	4926	1.93	4938.44	1.74
5026.68	.46	5096.53	1.48	5127.27	.29	5151.39	-2.94	5174.02	-1.55
5200.47	.57	5227.67	.48	5321.74	2.07	5409.85	2.17	5509.04	2.28
5602.74	2.29	5674.45	2.39	5748.9	2.23	5754.92	2.21	5889.13	2.25
6077.27	2.07	6155.88	1.95	6208.6	1.83	6269.79	1.07	6339.46	.85
6441.35	1.18	6516.05	1.7	6535.21	1.74	6589.58	1.87	6589.62	1.87
6661.62	1.85	6675.03	1.85	6757.09	1.77	6762.21	1.78	6847.24	1.84
6847.65	1.84	6934.83	1.87	6955.93	1.88	7020.28	1.79	7088.75	1.71

7107.46	1.67	7149.75	1.51	7193.77	1.91	7256.78	2.35	7266.36	2.34
7453.76	2.42	7673.1	2.49	7870.27	2.38	8045.74	2.46	8188.33	2.36
8340.85	2.29	8423.13	2.4	8595.81	2.8	8677.47	2.99	8771.19	3.1
8897.48	3.17	9067.65	3.18	9231.76	3.19	9415.33	3.76	9548.98	3.29
9593.25	3.39	9708.16	3.58	9883.25	2.7310033.95		3.4610173.47		3.17
10358.91	3.1510596.04		3.5910780.64		3.3910921.93		2.6411201.53		2.61
11567.09	3.2211785.41		3.0112016.11		3.6412020.34		3.6312192.23		3.15
12350.01	2.9412460.66		3.5712709.71		3.8112883.78		3.4213071.27		3.3
13267.88	3.3613317.52		3.36 13342.2		2.4313375.08		.1213403.12		2.33
13426.03	3.0613450.99		3.1513518.51		3.0513635.22		3.1313722.67		3.21
13846.64	3.2814065.79		3.1614214.62		3.1314342.97		3.12 14539.3		2.99
14704.06	2.9714887.82		2.94 15019.8		3.1115161.74		3.0915262.98		3.07
15387.42	2.96 15547.8		3.2215652.58		3.1115761.83		3.0915864.56		3.08
15946.33	3.07 15991.6		3.0616046.18		3.1416180.39		3.2216362.94		3.01
16582.19	3.4316804.04		3.417018.72		3.1917147.25		3.1717245.42		2.97
17289.47	2.517326.17		.7417379.07		017395.46		2.6717399.29		3.32
17414.46	3.13 17571.4		3.1117724.52		3.5417916.57		2.3218099.12		3.4
18612.86	3.2518786.34		3.1718858.85		3.1718968.47		2.9319437.14		2.98
19955.01	2.87 20273.5		2.5620540.21		2.4220604.62		2.2920649.98		2.39
20755.13	1.7720788.01		1.63 20838.3		.4120971.77		-15.1520973.68		-15.15
21120.87	-1.9321270.66		-.9821296.13		-.5421388.97		1.0421501.52		1.5
21506.81	1.7721543.96		1.7721611.38		2.0421616.01		2.0321744.36		1.87
21925.35	2.0821938.45		2.1222111.27		2.6622240.72		2.8722258.33		2.74
22292.26	2.5522414.93		2.2822551.62		2.3922580.77		2.2822637.25		2.06
22701.79	1.1422827.43		.522827.62		.522957.25		.2523008.24		.26
23011.13	-.0423059.22		-4.9923102.96		-7.1123124.78		-4.29 23146.7		.46
23181.98	3.423191.25		3.2823326.78		3.7323329.38		3.7423392.97		3.69
23419.6	4.1723456.31		3.8823533.91		3.95 23554.2		4.58 23633.8		6.86
23645.25	7.2823735.83		8.6623751.46		8.5623863.17		9.5524010.96		9.81
24078.46	9.9624199.51		6.5424226.15		5.9124240.09		5.6824263.17		5.64
24278	5.3124294.44		5.0824455.27		2.9424455.55		2.9424656.96		2.3
24662.57	2.3924777.34		4.2124832.61		5.1824869.54		5.1724978.12		5.28
25077.8	525087.54		4.8725092.82		4.8125165.87		4.625208.08		4.39
25254.23	4.3625504.31		5.93 25711.9		7.9625918.13		9.25 26137		11.01
26341.43	12.3926557.78		12.76						

Manning's n Values		num=	6
Sta	n Val	Sta	n Val
0	.078	4545.72	.078
23181.98	.084	4832.11	.067
		5409.85	.073
		20788.01	.067

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4545.72	23181.98	2559	4481.46	2515.7	.1		.3

Blocked Obstructions		num=	2		
Sta L	Sta R	Elev	Sta L	Sta R	Elev
24078.46	26557.78	4.52	023181.98		-.36

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	6.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.078	0.071	0.084
W.S. Elev (ft)	6.75	Reach Len. (ft)	2559.00	4481.46	2515.70
Crit W.S. (ft)		Flow Area (sq ft)	19002.28	77029.04	3658.08
E.G. Slope (ft/ft)	0.000076	Area (sq ft)	19002.28	77029.04	3658.08
Q Total (cfs)	45600.00	Flow (cfs)	8205.40	36482.85	911.74
Top Width (ft)	25025.39	Top Width (ft)	4545.72	18636.26	1843.41
Vel Total (ft/s)	0.46	Avg. Vel. (ft/s)	0.43	0.47	0.25
Max Chl Dpth (ft)	7.11	Hydr. Depth (ft)	4.18	4.13	1.98
Conv. Total (cfs)	5218507.0	Conv. (cfs)	939034.0	4175132.0	104340.9
Length Wtd. (ft)	4125.52	Wetted Per. (ft)	4548.24	18637.29	1843.49

Min Ch El (ft)	-0.36	Shear (lb/sq ft)	0.02	0.02	0.01
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.01	0.00
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	1053.83	8572.65	215.14
C & E Loss (ft)	0.00	Cum SA (acres)	244.13	1988.19	103.23

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: Fish Creek
REACH: Lower Fish Creek RS: 0.7

INPUT

Description: Cross Section at River Mile 0.7

Station Elevation Data		num= 168							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2.7	226.5	2.2	527.6	2.7	808.2	2.6	1110.6	1.6
1391.7	2	1678.7	1.3	1962.6	2.3	2230.1	1.4	2476.5	1.8
2741.4	1	3004.6	1.4	3249.3	1.7	3535.5	2.6	3765.7	2.5
3962.9	1.9	4073.2	1.7	4174	1.6	4282.1	0	4357.1	1.1
4390.1	-.2	4416	-3.7	4440.3	-2.2	4468.7	.1	4497.9	0
4598.9	1.7	4693.5	1.8	4800	1.9	4900.6	1.9	4977.6	2
5064	1.8	5208.1	1.9	5410.1	1.8	5494.5	1.7	5551.1	1.6
5616.8	.8	5691.6	.6	5801	1	5881.2	1.6	5960.2	1.8
6037.5	1.8	6140	1.8	6236.8	2	6353.5	2.1	6496.1	2
6686.8	1.7	6888	1.8	7123.5	1.9	7335.2	1.8	7523.6	1.9
7676.7	1.8	7928.8	1.7	8114.2	1.8	8302.5	1.9	8438.1	1.9
8620.8	1.8	8797	1.7	8994.1	2.2	9137.6	1.6	9308.5	1.9
9496.5	1	9658.3	1.8	9808.1	1.5	10007.2	1.5	10261.8	2
10460	1.8	10611.7	1	10911.9	1	11304.4	1.7	11538.8	1.5
11786.5	2.2	11975.6	1.7	12145	1.5	12263.8	2.2	12531.2	2.5
12718.1	2.1	12919.4	2	13130.5	2.1	13183.8	2.1	13210.3	1.1
13245.6	-1.4	13275.7	1	13300.3	1.8	13327.1	1.9	13399.6	1.8
13524.9	1.9	13618.8	2	13751.9	2.1	13987.2	2	14147	2
14284.8	2	14495.6	1.9	14672.5	1.9	14869.8	1.9	15011.5	2.1
15163.9	2.1	15272.6	2.1	15406.2	2	15578.4	2.3	15690.9	2.2
15808.2	2.2	15918.5	2.2	16006.3	2.2	16054.9	2.2	16113.5	2.3
16257.6	2.4	16453.6	2.2	16689	2.7	16927.2	2.7	17157.7	2.5
17295.7	2.5	17401.1	2.3	17448.4	1.8	17487.8	-1	17544.6	-9
17562.2	2	17566.3	2.7	17582.6	2.5	17751.1	2.5	17915.5	3
18121.7	1.7	18317.7	2.9	21007.8	2.5	21056.5	2.7	21204.7	2.1
21258.7	.8	21402	-16	21560.5	-1.7	21721.8	-7	21849.2	1.5
21970.4	2	21976.1	2.3	22016.1	2.3	22088.7	2.6	22231.9	2.4
22426.8	2.6	22627	3.2	22766.4	3.4	22821.9	3	22954	2.5
23101.2	2.4	23193.4	1.9	23262.9	.8	23398.4	-1	23538	-4
23592.9	-.4	23647.8	-6.2	23694.9	-8.6	23718.4	-5.6	23742	-5
23780	2.6	23919.8	3.4	24113.8	3.6	24219.4	7.3	24426.1	9.6
24630.3	10.2	24783.6	5.3	24987.7	2.2	25179	1.5	25345.6	4.5
25587.4	3.9	25745.5	3.8	25982.7	5.5	26179.6	7.7	26375.2	9.1
26582.8	11	26776.7	12.5	26981.9	12.9				

Manning's n Values		num= 10							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.085	226.5	.075	4174	.07	4598.9	.075	5551.1	.07
5881.2	.075	21204.7	.07	21976.1	.075	23101.2	.07	23780	.085

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
3765.7 23780 0 0 0 .1 .3

Blocked Obstructions num= 2
Sta L Sta R Elev Sta L Sta R Elev

0 23780 .3 24630.3 26981.9 4.09

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	6.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.075	0.074	0.085
W.S. Elev (ft)	6.42	Reach Len. (ft)			
Crit W.S. (ft)	2.34	Flow Area (sq ft)	16874.73	89624.13	3792.40
E.G. Slope (ft/ft)	0.000080	Area (sq ft)	16874.73	89624.13	3792.40
Q Total (cfs)	53000.00	Flow (cfs)	8081.71	43904.88	1013.42
Top Width (ft)	25511.48	Top Width (ft)	3765.70	20014.30	1731.48
Vel Total (ft/s)	0.48	Avg. Vel. (ft/s)	0.48	0.49	0.27
Max Chl Dpth (ft)	6.12	Hydr. Depth (ft)	4.48	4.48	2.19
Conv. Total (cfs)	5924818.0	Conv. (cfs)	903445.8	4908083.0	113289.1
Length Wtd. (ft)		Wetted Per. (ft)	3769.44	20014.88	1731.58
Min Ch El (ft)	0.30	Shear (lb/sq ft)	0.02	0.02	0.01
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.01	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 RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 13.8

INPUT

Description: Cross Section at River Mile 13.8

Station Elevation Data		num= 79							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.7	14.5	57.9	253.3	57.6	480.1	57	699	54.9
954.5	51.4	1189.4	47.4	1492.7	46.5	1772.2	46.1	2076.9	46.5
2360.2	47.7	2979	47.2	3218.8	47.7	3334.6	53.9	3574.2	52.4
3870.6	51.6	4116.8	51.3	4469.1	50.5	4805.3	54.2	4980.7	54.3
5242.5	54.5	5540	54.1	5881.1	52.3	6128.1	48.9	6423.3	45.2
6583.3	45.4	7011.5	42.8	7363	44.2	7478.5	47.1	7796.2	43.7
8010.7	49	8086.7	41.7	8314.6	40.9	8367.8	43.9	8427	40.6
8440.3	40.3	8446.6	37.9	8456.4	37	8463.4	37.7	8499.1	36.5
8502.7	35.5	8537	33.9	8581.8	32.1	8622	32.4	8635	30.4
8664.2	28.8	8674.2	27.5	8684.2	26.3	8694.2	25	8704.2	23.6
8714.2	23	8724.2	23.6	8734.2	24.7	8748.8	28.9	8754.4	31.6
8759.9	35.9	8773.7	35.9	8791.8	41.1	8807.1	41.6	8954.9	44.1
9246.1	44.8	9408.5	53	9561.1	55.1	9851.5	56.9	10144.3	57.9
10458.4	58.7	10756.9	60.6	11057.1	59.8	11356	57.3	11646.3	57.4
11961	58.5	12247.7	58.6	12554.3	58.3	12851.6	59	13163.2	59.3
13460.6	60.3	13760	59.7	14068	59.7	14358.1	64		

Manning's n Values		num= 7					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	2360.2	.04	5881.1	.05	8446.6	.06
8773.7	.06	8954.9	.04				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
8502.7	8773.7	1530.69	2280.69	1205.25	.1		.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	41.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.	0.059	0.020	0.060
W.S. Elev (ft)	41.31	Reach Len. (ft)	1530.69	2280.69	1205.25

Crit W.S. (ft)		Flow Area (sq ft)	291.06	2959.20	51.63
E.G. Slope (ft/ft)	0.000332	Area (sq ft)	291.06	2959.20	51.63
Q Total (cfs)	19900.00	Flow (cfs)	295.52	19567.05	37.43
Top Width (ft)	509.32	Top Width (ft)	213.68	271.00	24.64
Vel Total (ft/s)	6.03	Avg. Vel. (ft/s)	1.02	6.61	0.73
Max Chl Dpth (ft)	18.31	Hydr. Depth (ft)	1.36	10.92	2.10
Conv. Total (cfs)	1091439.0	Conv. (cfs)	16207.9	1073178.0	2052.9
Length Wtd. (ft)	2268.17	Wetted Per. (ft)	214.39	274.40	25.37
Min Ch El (ft)	23.00	Shear (lb/sq ft)	0.03	0.22	0.04
Alpha	1.18	Stream Power (lb/ft s)	0.03	1.48	0.03
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	2755.31	4568.77	3916.68
C & E Loss (ft)	0.00	Cum SA (acres)	1583.62	424.17	1257.21

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 13.375*

INPUT

Description: Interpolated Cross Section at River Mile 13.38

Station Elevation Data		num= 161		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1106.32	58.32	1120.99	57.55	1285.91	57.16	1362.51	57.01	1509.14	56.52
1591.89	56.29	1746.05	54.88	1813.28	54.29	2026.51	51.62	2071.69	51.02
2259.66	47.91	2309.26	47.13	2513.09	46.56	2616.01	46.23	2792.52	45.9
2898.69	45.75	3206.86	46.09	3493.38	47.18	4119.23	46.63	4361.76	47.07
4478.87	52.87	4721.2	51.43	5019.29	50.65	5020.97	50.64	5075.67	50.59
5269.97	50.42	5317.72	50.34	5582.01	49.63	5626.28	49.52	5859.31	51.79
5966.31	52.87	6108.45	52.94	6143.71	52.95	6377.97	53.11	6408.49	53.14
6629.59	52.92	6709.37	52.8	7054.35	51.03	7304.16	47.78	7409.89	46.52
7602.72	44.27	7656.9	44.33	7764.54	44.46	8197.62	42.03	8493.93	43.14
8553.12	43.39	8669.93	46.16	8699.18	45.88	8944.57	43.3	8991.25	42.84
9126.89	45.95	9208.19	47.7	9224.95	46.19	9285.05	40.86	9407.27	40.51
9515.55	40.07	9534.33	41.04	9569.35	42.94	9629.23	39.96	9642.68	39.71
9649.05	37.47	9658.96	36.64	9666.04	37.31	9691.07	36.58	9702.15	36.17
9705.79	35.21	9738.53	33.43	9750.54	32.85	9774.83	31.57	9781.3	31.29
9802.24	31.35	9819.68	31.44	9832.09	29.54	9837.62	29.23	9859.97	28.03
9869.52	26.81	9872.32	26.48	9879.07	25.68	9888.61	24.46	9898.16	23.14
9907.71	22.58	9910.53	22.73	9913.42	22.87	9916.25	23.01	9918.85	23.15
9919.74	23.19	9921.71	23.35	9924.59	23.58	9927.42	23.85	9930.27	24.27
9931.78	24.52	9933.33	25	9943.42	27.29	9949.35	28.63	9952.39	29.78
9956.09	31.17	9961.89	34.71	9962.71	35.21	9969.19	35.28	9979.31	35.91
9998.05	40.78	10011.74	41.19	10013.89	41.23	10035.69	41.41	10069.37	41.87
10104.57	42.56	10128.59	42.64	10166.91	42.96	10187.28	42.86	10222.48	43.11
10357.2	43.49	10468.38	43.88	10488.08	44.81	10636.51	51.54	10671.49	51.97
10794.5	53.49	10852.6	53.81	11057.45	54.91	11095.15	55.16	11101.25	55.18
11333.7	55.85	11384.19	56.41	11398.28	56.47	11477.75	56.81	11640.72	57.24
11723.47	57.44	11791.52	57.84	11979.5	58.98	12032.5	59.27	12191.43	58.84
12343.29	58.55	12371.67	58.35	12586.92	56.95	12652.74	56.41	12777.42	56.35
12953.29	56.44	12974.66	56.51	13179.78	57.37	13279.09	57.75	13376.76	57.86
13574.74	57.95	13575.91	57.95	13774.23	57.85	13893.33	57.77	13969.96	57.94
14183.68	58.56	14201.12	58.61	14361.74	58.75	14523.72	58.96	14597.42	59.22
14774.23	59.79	14831.61	59.93	14860.97	59.86	14919.99	59.63	15072.04	59.43
15141.58	59.31	15286.23	59.31	15460.45	59.38	15471.04	59.53	15646.58	61.99
15760.79	63.58								

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
1106.32	.05	9705.79	.02
		9979.31	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9705.79 9979.31 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	41.23	Element	0.050	0.020	0.050
Vel Head (ft)	0.67	Wt. n-Val.	1530.69	2280.69	1205.25
W.S. Elev (ft)	40.56	Reach Len. (ft)	271.89	2965.17	41.54
Crit W.S. (ft)		Flow Area (sq ft)	271.89	2965.17	41.54
E.G. Slope (ft/ft)	0.000334	Area (sq ft)	259.54	19601.70	38.76
Q Total (cfs)	19900.00	Flow (cfs)	222.59	273.52	17.88
Top Width (ft)	513.99	Top Width (ft)	0.95	6.61	0.93
Vel Total (ft/s)	6.07	Avg. Vel. (ft/s)	1.22	10.84	2.32
Max Chl Dpth (ft)	17.98	Hydr. Depth (ft)	14190.7	1071758.0	2119.2
Conv. Total (cfs)	1088068.0	Conv. (cfs)	223.21	276.33	18.47
Length Wtd. (ft)	2263.50	Wetted Per. (ft)	0.03	0.22	0.05
Min Ch El (ft)	22.58	Shear (lb/sq ft)	0.02	1.48	0.04
Alpha	1.17	Stream Power (lb/ft s)	2745.42	4413.68	3915.39
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	1575.95	409.91	1256.62
C & E Loss (ft)	0.00	Cum SA (acres)			

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.95*

INPUT

Description: Interpolated Cross Section at River Mile 12.95

Station	Elevation	Data	num=	161					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2212.65	57.94	2227.48	57.2	2394.26	56.63	2471.72	56.42	2620	55.83
2703.68	55.59	2859.57	54.22	2927.56	53.69	3143.19	51.24	3188.87	50.63
3378.96	47.59	3429.12	46.86	3635.24	46.33	3739.32	45.96	3917.82	45.56
4025.19	45.4	4336.82	45.67	4626.57	46.65	5259.45	46.06	5504.71	46.44
5623.15	51.83	5868.2	50.46	6169.64	49.69	6171.35	49.69	6226.66	49.64
6423.15	49.55	6471.43	49.48	6738.7	48.66	6783.47	48.54	7019.11	50.54
7127.32	51.55	7271.06	51.6	7306.71	51.61	7543.61	51.74	7574.47	51.78
7798.07	51.64	7878.74	51.51	8227.61	49.76	8480.23	46.65	8587.15	45.45
8782.15	43.34	8836.94	43.4	8945.79	43.52	9383.73	41.27	9683.38	42.31
9743.23	42.57	9861.36	45.22	9890.95	44.98	10139.09	42.41	10186.29	41.98
10323.47	44.89	10405.68	46.41	10422.62	44.97	10483.41	40.02	10607	39.75
10716.49	39.24	10735.49	40.13	10770.9	41.97	10831.45	39.32	10845.05	39.11
10851.5	37.04	10861.52	36.29	10868.68	36.93	10893.99	36.31	10905.19	35.83
10908.88	34.91	10940.07	32.95	10951.51	32.31	10974.64	30.78	10980.81	30.48
11000.75	30.43	11017.37	30.48	11029.19	28.68	11034.45	28.38	11055.74	27.25
11064.84	26.11	11067.5	25.81	11073.93	25.06	11083.02	23.91	11092.12	22.68
11101.21	22.15	11104.52	22.31	11107.89	22.46	11111.2	22.61	11114.24	22.74
11115.28	22.77	11117.58	22.92	11120.95	23.13	11124.26	23.39	11127.6	23.97
11129.35	24.34	11131.17	24.92	11142.97	27.11	11149.89	28.36	11153.45	29.44
11157.77	30.74	11164.56	34.05	11165.51	34.53	11173.09	34.66	11184.92	35.91
11204.3	40.46	11218.45	40.84	11220.68	40.87	11243.22	40.84	11278.05	41.23
11314.45	42.05	11339.29	41.81	11378.91	41.81	11399.98	41.57	11436.38	41.99
11575.69	42.44	11690.67	42.96	11711.03	43.85	11864.53	50.09	11900.7	50.47
12027.9	51.88	12087.98	52.18	12299.81	53.13	12338.8	53.41	12345.11	53.44
12585.48	54.01	12637.69	54.95	12652.26	55.04	12734.44	55.51	12902.96	55.98
12988.53	56.18	13058.9	56.57	13253.29	57.69	13308.1	57.94	13472.45	57.48
13629.49	57.31	13658.83	57.12	13881.42	56.07	13949.49	55.51	14078.41	55.35
14260.27	55.48	14282.38	55.55	14494.49	56.57	14597.19	57.01	14698.19	57.18

14902.91	57.314904.12	57.3	15109.2	57.2915232.36	57.23	15311.6	57.41
15532.61	58.1715550.65	58.215716.73	58.3615884.24	58.6215960.46	58.9		
16143.29	59.4616202.63	59.5616232.99	59.4816294.02	59.1316451.26	59.02		
16523.16	58.9116672.74	58.92	16852.9	59.0716863.85	59.2117045.38	61.61	
17163.47	63.16						

Manning's n Values num= 3
 Sta n Val Sta n Val
 2212.65 .0510908.88 .01911184.92 .0049

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 10908.8811184.92 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	40.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.	0.050	0.019	0.005
W.S. Elev (ft)	39.86	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	267.47	2980.99	33.26
E.G. Slope (ft/ft)	0.000294	Area (sq ft)	267.47	2980.99	33.26
Q Total (cfs)	19900.00	Flow (cfs)	213.46	19418.98	267.56
Top Width (ft)	556.73	Top Width (ft)	263.86	276.04	16.83
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)	0.80	6.51	8.04
Max Chl Dpth (ft)	17.71	Hydr. Depth (ft)	1.01	10.80	1.98
Conv. Total (cfs)	1160399.0	Conv. (cfs)	12447.2	1132350.0	15601.6
Length Wtd. (ft)	2265.33	Wetted Per. (ft)	264.40	278.48	17.29
Min Ch El (ft)	22.15	Shear (lb/sq ft)	0.02	0.20	0.04
Alpha	1.15	Stream Power (lb/ft s)	0.01	1.28	0.28
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	2735.94	4258.01	3914.36
C & E Loss (ft)	0.00	Cum SA (acres)	1567.41	395.53	1256.14

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.525*

INPUT

Description: Interpolated Cross Section at River Mile 12.53

Station Elevation Data num= 161									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3318.97	57.56	3333.97	56.85	3502.61	56.1	3580.92	55.83	3730.85	55.13
3815.47	54.88	3973.1	53.56	4041.84	53.08	4259.87	50.85	4306.06	50.25
4498.27	47.27	4548.98	46.59	4757.4	46.09	4862.64	45.68	5043.12	45.21
5151.68	45.05	5466.78	45.26	5759.75	46.13	6399.68	45.49	6647.67	45.81
6767.42	50.8	7015.2	49.49	7319.99	48.73	7321.72	48.73	7377.65	48.7
7576.32	48.67	7625.14	48.63	7895.38	47.69	7940.65	47.55	8178.92	49.3
8288.33	50.22	8433.67	50.25	8469.72	50.26	8709.25	50.38	8740.46	50.42
8966.54	50.36	9048.11	50.21	9400.86	48.49	9656.29	45.53	9764.4	44.39
9961.57	42.41	110016.97	42.46	10127.03	42.58	10569.85	40.51	10872.83	41.48
10933.35	41.76	11052.8	44.28	11082.71	44.07	11333.61	41.51	11381.34	41.12
11520.04	43.82	11603.17	45.11	11620.3	43.75	11681.76	39.19	11806.73	38.99
11917.44	38.42	11936.64	39.22	11972.46	41.01	12033.68	38.68	12047.43	38.52
12053.95	36.61	12064.08	35.93	12071.32	36.54	12096.92	36.01	12108.24	35.5
12111.96	34.62	12141.6	32.48	12152.47	31.76	12174.45	29.98	12180.31	29.67
12199.26	29.51	12215.05	29.52	12226.28	27.83	12231.29	27.54	12251.51	26.48
12260.16	25.42	12262.69	25.13	12268.8	24.44	12277.44	23.37	12286.08	22.22
12294.72	21.73	12298.5	21.91	12302.36	22.05	12306.15	22.18	12309.63	22.33
12310.82	22.36	12313.45	22.49	12317.31	22.67	12321.1	22.93	12324.92	23.67
12326.93	24.16	12329	24.85	12342.51	26.91	12350.44	28.09	12354.51	29.1

12359.46	30.3112367.23	33.3912368.31	33.8412376.99	34.0412390.54	35.92
12410.55	40.1412425.17	40.4912427.47	40.512450.76	40.2812486.73	40.59
12524.33	41.5312549.99	40.9712590.92	40.6712612.68	40.2812650.28	40.87
12794.18	41.3812912.95	42.0412933.99	42.913092.54	48.6313129.91	48.97
13261.3	50.2713323.36	50.5513542.18	51.3513582.45	51.6713588.97	51.7
13837.26	52.1813891.19	53.4913906.24	53.6113991.13	54.2214165.21	54.73
14253.6	54.9214326.29	55.2914527.08	56.4 14583.7	56.6114753.47	56.12
14915.68	56.04 14946	55.915175.92	55.1815246.23	54.6 15379.4	54.35
15567.26	54.5215590.09	54.59 15809.2	55.7715915.28	56.2616019.61	56.5
16231.08	56.6516232.33	56.6516444.17	56.7216571.39	56.716653.24	56.89
16881.54	57.7716900.17	57.817071.73	57.9617244.76	58.2917323.49	58.58
17512.34	59.1417573.64	59.19 17605	59.0917668.05	58.6217830.46	58.61
17904.74	58.5118059.25	58.5418245.35	58.7518256.66	58.8918444.17	61.23
18566.16	62.74				

Manning's n Values num= 3
 Sta n Val Sta n Val
 3318.97 .0512111.96 .01912390.54 .049

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 12111.9612390.54 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	39.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.	0.050	0.019	0.049
W.S. Elev (ft)	39.19	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	274.62	2994.27	25.32
E.G. Slope (ft/ft)	0.000301	Area (sq ft)	274.62	2994.27	25.32
Q Total (cfs)	19900.00	Flow (cfs)	192.06	19689.72	18.22
Top Width (ft)	638.47	Top Width (ft)	344.39	278.58	15.50
Vel Total (ft/s)	6.04	Avg. Vel. (ft/s)	0.70	6.58	0.72
Max Chl Dpth (ft)	17.46	Hydr. Depth (ft)	0.80	10.75	1.63
Conv. Total (cfs)	1146607.0	Conv. (cfs)	11066.0	1134492.0	1049.7
Length Wtd. (ft)	2272.95	Wetted Per. (ft)	344.86	280.79	15.84
Min Ch El (ft)	21.73	Shear (lb/sq ft)	0.01	0.20	0.03
Alpha	1.17	Stream Power (lb/ft s)	0.01	1.32	0.02
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	2726.42	4101.59	3913.55
C & E Loss (ft)	0.00	Cum SA (acres)	1556.72	381.01	1255.69

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.1*

INPUT
 Description: Interpolated Cross Section at River Mile 12.1

Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4425.3	57.17	4440.46	56.51	4610.95	55.57	4690.13	55.23	4841.71	54.44
4927.25	54.18	5086.62	52.9	5156.12	52.47	5376.55	50.46	5423.25	49.87
5617.57	46.95	5668.84	46.32	5879.55	45.85	5985.95	45.41	6168.42	44.86
6278.17	44.7	6596.74	44.85	6892.94	45.6	7539.91	44.92	7790.62	45.17
7911.69	49.77	8162.2	48.52	8470.35	47.78	8472.09	47.78	8528.64	47.75
8729.5	47.8	8778.85	47.77	9052.07	46.72	9097.84	46.57	9338.73	48.05
9449.34	48.89	9596.28	48.91	9632.73	48.92	9874.89	49.01	9906.44	49.06
10135.02	49.08	10217.49	48.92	10574.11	47.21	10832.36	44.41	10941.66	43.32
11140.99	41.49	11197	41.53	11308.28	41.64	11755.97	39.74	12062.28	40.65
12123.47	40.94	12244.23	43.34	12274.47	43.17	12528.13	40.62	12576.39	40.26

12716.62	42.7612800.65	43.8112817.98	42.5312880.11	38.3513006.46	38.23
13118.39	37.59 13137.8	38.3113174.01	40.05 13235.9	38.0413249.81	37.92
13256.4	36.1713266.64	35.5713273.96	36.1513299.84	35.7313311.29	35.17
13315.05	34.3313343.13	32.0113353.43	31.2213374.26	29.1813379.82	28.86
13397.77	28.613412.73	28.5613423.38	26.9713428.12	26.6913447.29	25.71
13455.47	24.7313457.87	24.4613463.66	23.8213471.85	22.8313480.04	21.76
13488.23	21.313492.49	21.4813496.84	21.64 13501.1	21.7713505.02	21.92
13506.36	21.9413509.32	22.0613513.67	22.2113517.93	22.4813522.24	23.37
13524.5	23.9813526.84	24.7813542.06	26.7113550.98	27.8213555.57	28.76
13561.14	29.8813569.89	32.7313571.12	33.1613580.89	33.4313596.15	35.93
13616.8	39.8213631.89	40.1513634.26	40.1313658.29	39.7213695.41	39.95
13734.21	41.0113760.69	40.1313802.93	39.5213825.38	38.9913864.18	39.75
14012.68	40.3314135.23	41.1214156.94	41.9514320.56	47.1714359.11	47.47
14494.7	48.6714558.74	48.9114784.54	49.5814826.09	49.9214832.82	49.97
15089.04	50.3415144.69	52.0415160.23	52.1815247.82	52.9215427.46	53.47
15518.66	53.6715593.67	54.0115800.88	55.11 15859.3	55.2816034.49	54.77
16201.88	54.7916233.16	54.6816470.41	54.316542.97	53.716680.39	53.36
16874.25	53.5616897.81	53.63 17123.9	54.9717233.37	55.5117341.03	55.82
17559.25	5617560.54	5617779.15	56.1617910.42	56.1717994.89	56.36
18230.46	57.3718249.69	57.418426.73	57.5618605.28	57.9518686.52	58.25
18881.4	58.8118944.66	58.8218977.02	58.7119042.07	58.1219209.68	58.2
19286.32	58.1219445.76	58.15 19637.8	58.4319649.47	58.5619842.96	60.85
19968.85	62.33				

Manning's n Values	num=	4
Sta n Val Sta	n Val Sta	n Val Sta
4425.3 .0513315.05	.0313343.13	.01913596.15 .049

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
13315.0513596.15	1530.69 2280.69 1205.25	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	39.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.	0.050	0.019	0.049
W.S. Elev (ft)	38.51	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	290.30	2999.79	17.72
E.G. Slope (ft/ft)	0.000301	Area (sq ft)	290.30	2999.79	17.72
Q Total (cfs)	19900.00	Flow (cfs)	177.14	19711.93	10.93
Top Width (ft)	652.91	Top Width (ft)	358.10	281.10	13.71
Vel Total (ft/s)	6.02	Avg. Vel. (ft/s)	0.61	6.57	0.62
Max Chl Dpth (ft)	17.21	Hydr. Depth (ft)	0.81	10.67	1.29
Conv. Total (cfs)	1147449.0	Conv. (cfs)	10214.3	1136605.0	629.9
Length Wtd. (ft)	2273.79	Wetted Per. (ft)	358.51	283.20	13.96
Min Ch El (ft)	21.30	Shear (lb/sq ft)	0.02	0.20	0.02
Alpha	1.18	Stream Power (lb/ft s)	0.01	1.31	0.01
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	2716.49	3944.67	3912.95
C & E Loss (ft)	0.00	Cum SA (acres)	1544.38	366.36	1255.29

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 11.675*

INPUT

Description: Interpolated Cross Section at River Mile 11.68

Station Elevation Data	num=	161
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
5531.62 56.79 5546.95 56.16 5719.3 55.04 5799.34 54.64 5952.57 53.74		

6039.04	53.47	6200.14	52.24	6270.4	51.87	6493.23	50.07	6540.44	49.49
6736.87	46.63	6788.7	46.05	7001.71	45.61	7109.26	45.14	7293.72	44.52
7404.66	44.35	7726.7	44.43	8026.12	45.08	8680.13	44.35	8933.58	44.54
9055.97	48.73	9309.2	47.55	9620.7	46.82	9622.47	46.82	9679.62	46.8
9882.67	46.92	9932.57	46.9110208.75		45.7610255.02		45.5910498.53		46.81
10610.35	47.5710758.89		47.5710795.73		47.5711040.53		47.6411072.43		47.7
11303.49	47.811386.86		47.6211747.37		45.9412008.42		43.2912118.91		42.25
12320.42	40.5612377.04		40.5912489.52		40.712942.09		38.9713251.73		39.82
13313.59	40.1313435.66		42.413466.23		42.2613722.66		39.7313771.44		39.4
13913.19	41.713998.14		42.5214015.65		41.3114078.47		37.5114206.19		37.47
14319.33	36.7614338.96		37.414375.56		39.0914438.13		37.414452.19		37.33
14458.84	35.74	14469.2	35.22	14476.6	35.7714502.76		35.4414514.33		34.83
14518.14	34.0314544.67		31.54	14554.4	30.6814574.07		28.3814579.32		28.05
14596.28	27.6814610.42		27.6114620.47		26.1114624.95		25.8414643.06		24.94
14650.79	24.0314653.06		23.7914658.53		23.1914666.26		22.28	14674	21.3
14681.73	20.8814686.47		21.0714691.31		21.2314696.05		21.3614700.41		21.51
14701.9	21.53	14705.2	21.6314710.03		21.7514714.77		22.0214719.56		23.07
14722.08	23.814724.68		24.71	14741.6	26.5214751.53		27.5614756.63		28.43
14762.83	29.4614772.56		32.0714773.92		32.4714784.79		32.8114801.76		35.93
14823.06	39.5114838.61		39.814841.05		39.7714865.82		39.16	14904.1	39.32
14944.1	40.4914971.39		39.2915014.94		38.3815038.08		37.715078.08		38.63
15231.17	39.2815357.52		40.2	15379.9	40.9915548.57		45.7215588.32		45.98
15728.1	47.0615794.12		47.06	16026.9	47.8116069.74		48.1816076.68		48.23
16340.82	48.516398.19		50.5916414.21		50.7516504.51		51.63	16689.7	52.22
16783.73	52.4116861.06		52.7417074.67		53.81	17134.9	53.95	17315.5	53.41
17488.07	53.5417520.32		53.4517764.91		53.4217839.71		52.817981.38		52.36
18181.24	52.618205.53		52.6718438.61		54.1818551.47		54.7718662.45		55.15
18887.42	55.3518888.75		55.3519114.12		55.619249.46		55.6319336.53		55.83
19579.39	56.9719599.21		57.0119781.72		57.17	19965.8	57.6120049.55		57.93
20250.46	58.4820315.67		58.4520349.03		58.32	20416.1	57.6220588.89		57.79
20667.9	57.7220832.28		57.7621030.25		58.1221042.28		58.2421241.76		60.47
21371.54	61.91								

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
5531.62	.0514518.14	.0314544.67	.01814801.76

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	14518.14	14801.76		1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	38.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.	0.050	0.018	0.048
W.S. Elev (ft)	37.86	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	316.82	3004.74	12.15
E.G. Slope (ft/ft)	0.000272	Area (sq ft)	316.82	3004.74	12.15
Q Total (cfs)	19900.00	Flow (cfs)	165.10	19729.30	5.59
Top Width (ft)	681.23	Top Width (ft)	373.53	283.62	24.08
Vel Total (ft/s)	5.97	Avg. Vel. (ft/s)	0.52	6.57	0.46
Max Chl Dpth (ft)	16.98	Hydr. Depth (ft)	0.85	10.59	0.50
Conv. Total (cfs)	1207496.0	Conv. (cfs)	10018.1	1197139.0	339.4
Length Wtd. (ft)	2273.83	Wetted Per. (ft)	373.89	285.68	24.25
Min Ch El (ft)	20.88	Shear (lb/sq ft)	0.01	0.18	0.01
Alpha	1.20	Stream Power (lb/ft s)	0.01	1.17	0.00
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	2705.82	3787.48	3912.54
C & E Loss (ft)	0.00	Cum SA (acres)	1531.52	351.57	1254.76

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 11.25*

INPUT

Description: Interpolated Cross Section at River Mile 11.25

Station Elevation Data		num= 161		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6637.95	56.41	6653.44	55.81	6827.64	54.51	6908.54	54.05	7063.42	53.05
7150.83	52.77	7313.67	51.59	7384.68	51.26	7609.91	49.68	7657.62	49.1
7856.17	46.31	7908.56	45.78	8123.86	45.38	8232.57	44.87	8419.02	44.17
8531.16	44	8856.66	44.02	9159.31	44.56	9820.36	43.78	10076.53	43.91
10200.24	47.7	10456.2	46.58	10771.06	45.87	10772.84	45.86	10830.61	45.86
11035.85	46.04	11086.28	46.06	11365.44	44.79	11412.21	44.61	11658.34	45.56
11771.36	46.24	11921.5	46.23	11958.74	46.23	12206.18	46.27	12238.41	46.34
12471.96	46.52	12556.23	46.33	12920.62	44.67	13184.48	42.16	13296.16	41.18
13499.84	39.63	13557.07	39.65	13670.77	39.76	14128.2	38.21	14441.18	38.99
14503.7	39.31	14627.09	41.46	14657.99	41.36	14917.18	38.83	14966.48	38.53
15109.76	40.63	15195.63	41.22	15213.33	40.09	15276.82	36.67	15405.91	36.71
15520.28	35.93	15540.12	36.49	15577.11	38.12	15640.36	36.76	15654.56	36.73
15661.29	35.31	15671.76	34.86	15679.24	35.38	15705.68	35.16	15717.38	34.5
15721.22	33.74	15746.2	31.06	15755.36	30.13	15773.89	27.58	15778.82	27.24
15794.79	26.76	15808.1	26.65	15817.56	25.25	15821.78	24.99	15838.83	24.16
15846.11	23.34	15848.24	23.12	15853.39	22.57	15860.67	21.74	15867.96	20.85
15875.24	20.45	15880.46	20.65	15885.78	20.82	15891	20.94	15895.8	21.1
15897.45	21.11	15901.07	21.21	15906.39	21.29	15911.61	21.56	15916.88	22.78
15919.65	23.62	15922.52	24.63	15941.15	26.33	15952.08	27.29	15957.69	28.09
15964.51	29.03	15975.23	31.41	15976.73	31.79	15988.69	32.19	16007.38	35.94
16029.31	39.19	16045.32	39.46	16047.85	39.41	16073.36	38.61	16112.78	38.68
16153.98	39.98	16182.09	38.46	16226.94	37.23	16250.79	36.41	16291.99	37.51
16449.66	38.23	16579.8	39.28	16602.85	40.04	16776.59	44.26	16817.53	44.48
16961.5	45.45	17029.5	45.64	17269.27	46.03	17313.39	46.43	17320.54	46.49
17592.6	46.67	17651.69	49.13	17668.19	49.32	17761.2	50.33	17951.95	50.96
18048.8	51.15	18128.44	51.46	18348.46	52.52	18410.5	52.62	18596.52	52.06
18774.27	52.29	18807.48	52.23	19059.41	52.53	19136.46	51.91	19282.38	51.36
19488.22	51.63	19513.24	51.71	19753.32	53.38	19869.56	54.02	19983.88	54.47
20215.59	54.72	20216.96	54.72	20449.09	55.03	20588.49	55.12	20678.17	55.3
20928.32	56.58	20948.74	56.61	21136.72	56.77	21326.31	57.27	21412.58	57.61
21619.52	58.16	21686.69	58.08	21721.05	57.94	21790.13	57.12	21968.1	57.38
22049.48	57.32	22218.79	57.38	22422.7	57.82	22435.09	57.92	22640.55	60.09
22774.22	61.49								

Manning's n Values		num= 4		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
6637.95	.0515721.22	15746.2	.04	1716007.38	.017		.048

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	15721.22	16007.38		1530.69	2280.69	1205.25	.1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	37.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.050	0.017	0.048
W.S. Elev (ft)	37.29	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	376.21	3024.24	32.08
E.G. Slope (ft/ft)	0.000241	Area (sq ft)	376.21	3024.24	32.08
Q Total (cfs)	19900.00	Flow (cfs)	177.39	19713.14	9.47
Top Width (ft)	752.42	Top Width (ft)	398.27	286.16	67.99
Vel Total (ft/s)	5.80	Avg. Vel. (ft/s)	0.47	6.52	0.30
Max Chl Dpth (ft)	16.84	Hydr. Depth (ft)	0.94	10.57	0.47

Conv. Total (cfs)	1281924.0	Conv. (cfs)	11427.2	1269887.0	609.9
Length Wtd. (ft)	2272.00	Wetted Per. (ft)	398.59	288.26	68.12
Min Ch El (ft)	20.45	Shear (lb/sq ft)	0.01	0.16	0.01
Alpha	1.25	Stream Power (lb/ft s)	0.01	1.03	0.00
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	2693.65	3629.65	3911.93
C & E Loss (ft)	0.01	Cum SA (acres)	1517.96	336.66	1253.49

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 10.825*

INPUT
 Description: Interpolated Cross Section at River Mile 10.83

Station Elevation Data		num= 161		Elev Sta Elev Sta Elev Sta Elev Sta Elev					
7744.27	56.03	7759.93	55.46	7935.99	53.98	8017.75	53.46	8174.28	52.35
8262.62	52.06	8427.19	50.93	8498.96	50.65	8726.59	49.29	8774.81	48.72
8975.48	45.99	9028.42	45.51	9246.01	45.14	9355.88	44.6	9544.31	43.82
9657.65	43.65	9986.62	43.61	10292.49	44.03	10960.58	43.21	11219.49	43.28
11344.51	46.67	11603.2	45.61	11921.41	44.91	11923.21	44.91	11981.6	44.91
12189.02	45.17	12239.99	45.21	12522.12	43.82	12569.39	43.62	12818.14	44.31
12932.37	44.91	13084.11	44.88	13121.74	44.88	13371.82	44.91	13404.4	44.98
13640.44	45.23	13725.6	45.03	14093.87	43.41	14360.55	41.04	14473.42	40.11
14679.26	38.7	14737.1	38.72	14852.01	38.82	15314.32	37.44	15630.64	38.16
15693.82	38.51	15818.52	40.53	15849.75	40.45	16111.7	37.94	16161.53	37.67
16306.34	39.57	16393.12	39.93	16411.01	38.87	16475.17	35.84	16605.64	35.95
16721.23	35.11	16741.28	35.58	16778.67	37.16	16842.58	36.12	16856.94	36.14
16863.74	34.88	16874.32	34.51	16881.88	35	16908.6	34.87	16920.42	34.17
16924.31	33.44	16947.73	30.59	16956.32	29.59	16973.7	26.78	16978.33	26.42
16993.3	25.85	17005.78	25.69	17014.66	24.39	17018.61	24.14	17034.6	23.39
17041.43	22.65	17043.43	22.45	17048.26	21.95	17055.09	21.21	17061.91	20.39
17068.74	20.03	17074.44	20.24	17080.25	20.41	17085.95	20.53	17091.19	20.69
17092.99	20.71	17096.94	20.77	17102.75	20.83	17108.45	21.11	17114.2	22.48
17117.23	23.44	17120.36	24.56	17140.69	26.14	17152.62	27.02	17158.75	27.75
17166.2	28.61	17177.89	30.75	17179.53	31.11	17192.59	31.57	17212.99	35.94
17235.56	38.87	17252.04	39.11	17254.64	39.03	17280.89	38.04	17321.46	38.04
17363.86	39.46	17392.79	37.62	17438.95	36.09	17463.49	35.11	17505.89	36.39
17668.16	37.17	17802.08	38.36	17825.8	39.08	18004.6	42.81	18046.73	42.98
18194.9	43.84	18264.88	44.01	18511.63	44.26	18557.04	44.69	18564.39	44.75
18844.38	44.83	18905.19	47.68	18922.17	47.89	19017.89	49.04	19214.19	49.7
19313.86	49.89	19395.83	50.19	19622.26	51.23	19686.1	51.29	19877.54	50.7
20060.46	51.03	20094.64	51.02	20353.91	51.65	20433.2	51.20	20583.37	50.37
20795.21	50.67	20820.96	50.75	21068.03	52.58	21187.65	53.28	21305.3	53.79
21543.76	54.05	21545.18	54.05	21784.06	54.47	21927.52	54.57	22019.81	54.77
22277.25	56.18	22298.26	56.21	22491.72	56.37	22686.83	56.94	22775.61	57.29
22988.58	57.83	23057.7	57.71	23093.06	57.56	23164.15	56.62	23347.31	56.98
23431.06	56.93	23605.3	56.99	23815.15	57.48	23827.9	57.62	24039.35	59.71
24176.91	61.07								

Manning's n Values		num= 4		Sta n Val Sta n Val	
7744.27	.0516924.31	.0516947.73	.01717212.99	.047	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	16924.31	17212.99	1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	37.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.	0.050	0.017	0.047
W.S. Elev (ft)	36.77	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	467.51	3052.73	96.48
E.G. Slope (ft/ft)	0.000235	Area (sq ft)	467.51	3052.73	96.48
Q Total (cfs)	19900.00	Flow (cfs)	224.84	19643.40	31.75
Top Width (ft)	896.96	Top Width (ft)	435.56	288.68	172.72
Vel Total (ft/s)	5.50	Avg. Vel. (ft/s)	0.48	6.43	0.33
Max Chl Dpth (ft)	16.74	Hydr. Depth (ft)	1.07	10.57	0.56
Conv. Total (cfs)	1298072.0	Conv. (cfs)	14666.5	1281334.0	2071.3
Length Wtd. (ft)	2267.15	Wetted Per. (ft)	435.85	290.87	172.83
Min Ch El (ft)	20.03	Shear (lb/sq ft)	0.02	0.15	0.01
Alpha	1.35	Stream Power (lb/ft s)	0.01	0.99	0.00
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	2678.82	3470.56	3910.15
C & E Loss (ft)	0.01	Cum SA (acres)	1503.31	321.61	1250.16

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 10.4*

INPUT
 Description: Interpolated Cross Section at River Mile 10.4

Station Elevation Data		num= 161	
Sta	Elev	Sta	Elev
8850.6	55.65	8866.42	55.11
9374.41	51.36	9540.71	50.27
10094.78	45.67	10148.28	45.24
10784.14	43.31	11116.58	43.19
12488.79	45.63	12750.2	44.64
13342.2	44.29	13393.7	44.35
14093.38	43.59	14246.72	43.54
14808.91	43.95	14894.97	43.74
15858.69	37.77	15917.13	37.78
16883.94	37.68	17009.95	39.59
17502.91	38.51	17590.61	38.63
17922.17	34.28	17942.43	34.67
18066.19	34.44	18076.88	34.15
18127.4	33.15	18149.27	30.12
18191.81	24.93	18203.46	24.73
18236.75	21.95	18238.61	21.77
18262.25	19.61	18268.42	19.82
18288.53	20.28	18292.81	20.34
18314.8	23.26	18318.19	24.49
18367.88	28.17	18380.56	30.09
18441.81	38.55	18458.76	38.77
18573.74	38.94	18603.49	36.79
18886.65	36.12	19024.37	37.44
19428.3	42.23	19500.26	42.37
20096.16	42.99	20158.69	46.23
20578.93	48.63	20663.21	48.91
21346.65	49.78	21381.8	49.79
22102.2	49.71	22128.67	49.79
22871.93	53.42	22873.39	53.42
23626.18	55.78	23647.78	55.81
24357.63	57.51	24428.71	57.34
24812.64	56.53	24991.81	56.6
25579.6	60.65		

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 8850.6 .05 18127.4 .0618149.27 .017 18418.6 .047

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 18127.4 18418.6 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	36.88				
Vel Head (ft)	0.61	Wt. n-Val.	0.050	0.017	0.047
W.S. Elev (ft)	36.27	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	586.50	3080.63	244.31
E.G. Slope (ft/ft)	0.000227	Area (sq ft)	586.50	3080.63	244.31
Q Total (cfs)	19900.00	Flow (cfs)	298.23	19497.10	104.68
Top Width (ft)	1064.65	Top Width (ft)	484.99	291.20	288.46
Vel Total (ft/s)	5.09	Avg. Vel. (ft/s)	0.51	6.33	0.43
Max Chl Dpth (ft)	16.67	Hydr. Depth (ft)	1.21	10.58	0.85
Conv. Total (cfs)	1319690.0	Conv. (cfs)	19777.2	1292971.0	6941.7
Length Wtd. (ft)	2257.86	Wetted Per. (ft)	485.25	293.54	288.56
Min Ch El (ft)	19.60	Shear (lb/sq ft)	0.02	0.15	0.01
Alpha	1.52	Stream Power (lb/ft s)	0.01	0.94	0.01
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	2660.30	3310.00	3905.44
C & E Loss (ft)	0.01	Cum SA (acres)	1487.14	306.43	1243.78

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.975*

INPUT
 Description: Interpolated Cross Section at River Mile 9.98
 Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9956.92	55.27	9972.91	54.7610152.68	52.9210236.17	52.28	10396	50.96		
10486.2	50.6510654.24	49.6110727.52	49.4410959.94	48.5211009.19	47.96				
11214.08	45.3511268.14	44.9711490.32	44.6611602.51	44.0511794.91	43.13				
11910.64	42.9412246.54	42.7812558.86	42.9813241.04	42.07	13505.4	42.02			
13633.06	44.6	13897.2	43.6814222.12	4314223.96	4314283.58	43.02			
14495.37	43.4214547.41	43.49	14835.5	41.8814883.76	41.6615137.76	41.82			
15254.39	42.2615409.33	42.215447.76	42.19	15703.1	42.1715736.37	42.26			
15977.38	42.6716064.34	42.4416440.38	40.8616712.68	38.7916827.92	37.98				
17038.11	36.8417097.17	36.85	17214.5	36.9417686.55	35.9118009.54	36.5			
18074.05	36.8718201.38	38.6518233.27	38.6418500.74	36.1518551.62	35.95				
18699.48	37.4418788.09	37.3318806.36	36.4418871.88	34.16	19005.1	34.43			
19123.12	33.4519143.59	33.7619181.77	35.2319247.03	34.84	19261.7	34.95			
19268.64	34.0119279.44	33.7919287.16	34.2219314.45	34.319326.52	33.5				
19330.49	32.86	19350.8	29.6519358.25	28.519373.32	25.1919377.34	24.8			
19390.32	24.0219401.15	23.7719408.85	22.6819412.28	22.4419426.14	21.85				
19432.06	21.26	19433.8	21.119437.99	20.7119443.91	20.1119449.83	19.47			
19455.76	19.1819462.41	19.41	19469.2	19.5819475.85	19.719481.97	19.87			
19484.07	19.8719488.69	19.9119495.47	19.9119502.13	20.1919508.85	21.88				
19512.38	23.0819516.03	24.4119539.78	25.7519553.71	26.4819560.88	27.07				
19569.57	27.7419583.23	29.4319585.14	29.7319600.39	30.3319624.21	35.96				
19648.06	38.2319665.47	38.4219668.22	38.319695.96	36.9219738.82	36.77				
19783.62	38.4219814.19	35.9519862.96	33.819888.89	32.5319933.69	34.14				
20105.14	35.0720246.65	36.5220271.71	37.1820460.63	39.8920505.15	39.98				
20661.7	40.6220735.64	40.7420996.36	40.7121044.33	41.2	21052.1	41.27			
21347.94	41.1621412.19	44.7721430.13	45.0321531.27	46.4521738.68	47.19				

21843.99	47.37	21930.6	47.6322169.84	48.64	22237.3	48.6322439.57	47.99
22632.85	48.5322668.97	48.5622942.91	49.8823026.68	49.223185.35	48.37		
23409.19	48.7523436.39	48.8323697.44	50.9823823.84	51.7823948.14	52.44		
24200.1	52.75	24201.6	52.75	24454	53.3424605.58	53.5	24703.1
24975.1	55.38	24997.3	55.4125201.71	55.5825407.87	56.2625501.68	56.65	
25726.69	57.1825799.73	56.9625837.09	56.7925912.21	55.6126105.73	56.16		
26194.22	56.1426378.32	56.2126600.05	56.8526613.52	56.9526836.94	58.95		
26982.29	60.23						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9956.92	.0519330.49	.06	19350.8	.01719624.21	.047		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	19330.49	19624.21		1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	36.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.050	0.017	0.047
W.S. Elev (ft)	35.79	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	732.31	3107.65	452.74
E.G. Slope (ft/ft)	0.000217	Area (sq ft)	732.31	3107.65	452.74
Q Total (cfs)	19900.00	Flow (cfs)	410.03	19243.63	246.35
Top Width (ft)	1156.60	Top Width (ft)	505.56	293.02	358.03
Vel Total (ft/s)	4.64	Avg. Vel. (ft/s)	0.56	6.19	0.54
Max Chl Dpth (ft)	16.61	Hydr. Depth (ft)	1.45	10.61	1.26
Conv. Total (cfs)	1351820.0	Conv. (cfs)	27853.4	1307232.0	16734.4
Length Wtd. (ft)	2244.06	Wetted Per. (ft)	505.78	295.53	358.14
Min Ch El (ft)	19.18	Shear (lb/sq ft)	0.02	0.14	0.02
Alpha	1.73	Stream Power (lb/ft s)	0.01	0.88	0.01
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	2637.13	3148.00	3895.79
C & E Loss (ft)	0.01	Cum SA (acres)	1469.73	291.13	1234.84

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.55000*

INPUT

Description: Interpolated Cross Section at River Mile 9.55

Station	Elevation	Data	num=	161					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11063.25	54.89	11079.4	54.4111261.02	52.3911345.37	51.6911506.85	50.27			
11597.98	49.9511767.76	48.9511841.79	48.8312076.62	48.1312126.37	47.57				
12333.38	45.03	12388	44.712612.47	44.4312725.82	43.7812920.21	42.78			
13037.13	42.59	13376.5	42.3613692.04	42.4614381.26	41.514648.35	41.39			
14777.33	43.57	15044.2	42.7115372.47	42.0415374.33	42.0415434.57	42.08			
15648.55	42.5415701.13	42.6315992.18	40.9116040.94	40.6816297.56	40.58				
16415.4	40.9316571.94	40.8616610.76	40.8516868.74	40.816902.36	40.9				
17145.86	41.3917233.71	41.1517613.63	39.5917888.74	37.6718005.18	36.91				
18217.53	35.91	18277.2	35.9118395.74	35.9918872.67	35.1519198.99	35.68			
19264.17	36.0519392.82	37.7119425.03	37.7319695.27	35.2619746.67	35.09				
19896.06	36.3819985.58	36.0420004.04	35.2220070.23	33.3220204.83	33.67				
20324.07	32.6220344.75	32.8620383.32	34.2720449.26	34.220464.07	34.35				
20471.09	33.58	20482	33.44	20489.8	33.8420517.37	34.0120529.56	33.17		
20533.57	32.5620552.34	29.1720559.21	27.9620573.13	24.3920576.84	23.99				
20588.83	23.120598.83	22.8120605.94	21.8220609.11	21.5920621.91	21.07				
20627.38	20.5720628.98	20.4320632.85	20.0920638.32	19.5720643.79	19.01				

20649.26	18.7520656.39	18.9920663.67	19.17	20670.8	19.2820677.36	19.46
20679.61	19.4620684.56	19.4820691.83	19.45	20698.96	19.7420706.17	21.59
20709.96	22.920713.87	24.3420739.33	25.56	20754.26	26.2120761.94	26.73
20771.26	27.3120785.89	28.7620787.95	29.05	20804.29	29.7120829.82	35.96
20854.31	37.9120872.19	38.0720875.01	37.93	20903.49	36.3620947.51	36.13
20993.51	37.9121024.89	35.1221074.97	32.66	21101.59	31.2421147.59	33.02
21323.64	34.0221468.93	35.621494.67	36.22	21688.65	38.4321734.36	38.49
21895.1	39.0221971.02	39.1122238.72	38.94	22287.98	39.4622295.96	39.53
22599.72	39.3222665.69	43.3222684.11	43.62	22787.96	45.1623000.93	45.94
23109.06	46.1223197.98	46.3623443.64	47.35	23512.9	47.323720.59	46.63
23919.04	47.2823956.13	47.3424237.41	49	24323.43	48.324486.35	47.38
24716.17	47.79	24744.1	47.86	25012.15	50.1925141.93	51.76
25528.27	52.125529.81	52.125788.97	52.78	25944.61	52.9726044.74	53.18
26324.03	54.9926346.83	55.0126556.71	55.18	26768.39	55.9226864.71	56.33
27095.75	56.8627170.74	56.5927209.11	56.42	27286.23	55.1127484.94	55.75
27575.8	55.7427764.83	55.83	27992.5	56.5328006.33	56.6328235.73	58.57
28384.97	59.81					

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
11063.25	.0520533.57	.0720552.34	.01620829.82	.046			

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

20533.57	20829.82	1530.69	2280.69	1205.25	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
020533.57	16.92	0829.82	28384.97	30.39	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	35.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.050	0.016	0.046
W.S. Elev (ft)	35.38	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	974.05	3148.21	728.38
E.G. Slope (ft/ft)	0.000179	Area (sq ft)	974.05	3148.21	728.38
Q Total (cfs)	19900.00	Flow (cfs)	536.60	18914.45	448.96
Top Width (ft)	1624.36	Top Width (ft)	903.72	293.88	426.75
Vel Total (ft/s)	4.10	Avg. Vel. (ft/s)	0.55	6.01	0.62
Max Chl Dpth (ft)	16.63	Hydr. Depth (ft)	1.08	10.71	1.71
Conv. Total (cfs)	1489122.0	Conv. (cfs)	40153.8	1415372.0	33595.4
Length Wtd. (ft)	2214.99	Wetted Per. (ft)	903.92	296.58	426.91
Min Ch El (ft)	18.75	Shear (lb/sq ft)	0.01	0.12	0.02
Alpha	2.04	Stream Power (lb/ft s)	0.01	0.71	0.01
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	2607.15	2984.23	3879.45
C & E Loss (ft)	0.02	Cum SA (acres)	1444.97	275.77	1223.98

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.12500*

INPUT

Description: Interpolated Cross Section at River Mile 9.13

Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12169.57	54.5112185.89	54.0712369.37	51.8512454.58	51.0912617.71	49.57				
12709.77	49.2412881.28	48.2912956.07	48.23	13193.3	47.7413243.56	47.19			
13452.69	44.713507.87	44.4313734.63	44.1913849.13	43.5114045.51	42.43				
14163.62	42.2414506.46	41.9514825.23	41.9415521.49	40.9315791.31	40.76				

15921.61	42.53	16191.2	41.7416522.83	41.08	16524.7	41.0816585.55	41.13
16801.72	41.6616854.84	41.7817148.87	39.9417198.12	39.6917457.37	39.33		
17576.41	39.6117773.55	39.5117773.77	39.518034.39	39.4418068.34	39.54		
18314.33	40.1118403.08	39.8518786.88	38.31	19064.8	36.5519182.43	35.84	
19396.96	34.9919457.23	34.9819576.99	35.0520058.79	34.3820388.44	34.85		
20454.29	35.2420584.25	36.7720616.79	36.8320889.79	34.3720941.72	34.23		
21092.63	35.3221183.07	34.7421201.71	3421268.59	32.4821404.55	32.9		
21525.01	31.7921545.91	31.9521584.87	33.3121651.48	33.5621666.45	33.76		
21673.54	33.1521684.56	33.0821692.44	33.4521720.29	33.7321732.61	32.84		
21736.66	32.2721753.87	28.721760.18	27.4221772.94	23.5921776.34	23.18		
21787.34	22.1821796.51	21.8521803.03	20.9621805.94	20.7421817.68	20.3		
21822.7	19.8721824.17	19.7621827.72	19.4721832.73	19.0221837.75	18.55		
21842.77	18.3321850.38	18.5821858.14	18.7621865.75	18.8721872.75	19.05		
21875.15	19.0421880.43	19.05	21888.2	18.99	21895.8	19.21	29
21907.53	22.7221911.71	24.2721938.87	25.36	21954.8	25.94	21963	26.39
21972.94	26.8821988.56	28.121990.75	28.3622008.19	29.0922035.44	35.97		
22060.56	37.5922078.91	37.73	22081.8	37.5622111.03	35.822156.19	35.49	
22203.39	37.3922235.59	34.2822286.98	31.5122314.29	29.9522361.49	31.9		
22542.13	32.9622691.22	34.6822717.62	35.2722916.66	36.9722963.56	36.99		
23128.5	37.41	23206.4	37.4723481.08	37.1723531.63	37.7123539.82	37.79	
23851.5	37.4823919.19	41.8723938.09	42.1724044.65	43.8724263.17	44.68		
24374.12	44.8624465.37	45.0824717.43	46.06	24788.5	45.9725001.61	45.28	
25205.24	46.0325243.29	46.12	25531.9	48.1225620.17	47.425787.34	46.38	
26023.16	46.8326051.82	46.926326.86	49.3926460.02	50.2926590.99	51.09		
26856.44	51.4526858.02	51.4527123.94	52.2227283.64	52.4327386.38	52.65		
27672.96	54.5927696.35	54.6127911.71	54.7828128.91	55.5928227.74	56.01		
28464.81	56.5328541.76	56.2228581.12	56.0228660.26	54.6128864.15	55.34		
28957.38	55.3429151.34	55.4429384.95	56.2229399.14	56.3129634.53	58.2		
29787.66	59.39						

Manning's n Values	num=	4
Sta	n Val	Sta
12169.57	.0521736.66	.0821753.87
		.01622035.44
		.046

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
21736.66	22035.44	1530.69	2280.69	1205.25	.1	.3	

Blocked Obstructions	num=	2
Sta L	Sta R	Elev
021736.66	18.622035.44	29787.66
		29.85

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	35.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.050	0.022	0.046
W.S. Elev (ft)	34.90	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	1382.05	3164.36	1016.42
E.G. Slope (ft/ft)	0.000301	Area (sq ft)	1382.05	3164.36	1016.42
Q Total (cfs)	19900.00	Flow (cfs)	945.32	18005.65	949.03
Top Width (ft)	2265.13	Top Width (ft)	1498.49	294.55	472.08
Vel Total (ft/s)	3.58	Avg. Vel. (ft/s)	0.68	5.69	0.93
Max Chl Dpth (ft)	16.57	Hydr. Depth (ft)	0.92	10.74	2.15
Conv. Total (cfs)	1147623.0	Conv. (cfs)	54516.2	1038377.0	54730.0
Length Wtd. (ft)	2180.10	Wetted Per. (ft)	1498.67	297.50	472.29
Min Ch El (ft)	18.33	Shear (lb/sq ft)	0.02	0.20	0.04
Alpha	2.29	Stream Power (lb/ft s)	0.01	1.14	0.04
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	2565.76	2818.97	3855.31
C & E Loss (ft)	0.01	Cum SA (acres)	1402.77	260.36	1211.54

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 8.70000*

INPUT

Description: Interpolated Cross Section at River Mile 8.7

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
13275.9	54.1213292.38	53.7213477.71	51.3213563.79	50.513728.57	48.88				
13821.56	48.5413994.81	47.6314070.35	47.6214309.98	47.3514360.75	46.81				
14571.99	44.3814627.73	44.1614856.78	43.9514972.44	43.24 15170.8	42.09				
15290.11	41.8915636.42	41.5415958.41	41.4116661.72	40.3616934.27	40.12				
17065.88	41.5 17338.2	40.7717673.18	40.1317675.08	40.1317736.54	40.18				
17954.9	40.7918008.55	40.9218305.55	38.9718355.31	38.7118617.17	38.08				
18737.42	38.2818897.16	38.1718936.78	38.1619200.03	38.0719234.33	38.18				
19482.8	38.8319572.45	38.5519960.14	37.0420240.87	35.4320359.68	34.77				
20576.38	34.0620637.27	34.0420758.23	34.1121244.91	33.6221577.89	34.02				
21644.41	34.4221775.68	35.8321808.55	35.9222084.31	33.4722136.77	33.37				
22289.2	34.2522380.56	33.4422399.39	32.7822466.94	31.6522604.28	32.14				
22725.96	30.9622747.06	31.0422786.43	32.3522853.71	32.9222868.83	33.17				
22875.98	32.7122887.12	32.7222895.08	33.0622923.21	33.4422935.66	32.5				
22939.75	31.98 22955.4	28.2322961.14	26.8722972.75	22.7922975.85	22.37				
22985.86	21.27 22994.2	20.8923000.13	20.123002.77	19.923013.45	19.53				
23018.02	19.1823019.36	19.0923022.58	18.8523027.15	18.4823031.71	18.09				
23036.27	17.923044.36	18.1623052.61	18.35 23060.7	18.4623068.14	18.64				
23070.69	18.6323076.31	18.6223084.55	18.5423092.64	18.8323100.81	20.99				
23105.11	22.5423109.54	24.1923138.42	25.1723155.35	25.6723164.06	26.05				
23174.63	26.4523191.23	27.4423193.55	27.6823212.09	28.4823241.05	35.97				
23266.81	37.2823285.63	37.3823288.59	37.223318.56	35.2423364.87	34.85				
23413.27	36.8723446.29	33.4423498.98	30.3723526.99	28.6623575.39	30.78				
23760.62	31.91 23913.5	33.7623940.58	34.3224144.68	35.5224192.77	35.49				
24361.9	35.824441.78	35.8424723.45	35.3924775.28	35.9724783.67	36.06				
25103.28	35.6525172.69	40.4125192.07	40.7425301.34	42.5725525.42	43.42				
25639.19	43.625732.76	43.825991.22	44.77 26064.1	44.6426282.63	43.92				
26491.43	44.7726530.45	44.89 26826.4	47.2326916.91	46.527088.33	45.39				
27330.15	45.8727359.54	45.9427641.56	48.5927778.12	49.5427912.41	50.41				
28184.62	50.828186.23	50.8128458.91	51.6528622.67	51.928728.03	52.12				
29021.89	54.1929045.87	54.2129266.71	54.3929489.43	55.2529590.77	55.68				
29833.87	56.229912.77	55.8529953.14	55.6430034.29	54.1130243.36	54.93				
30338.96	54.9530537.85	55.05 30777.4	55.930791.95	55.9931033.32	57.82				
31190.35	58.97								

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
13275.9	.0522939.75	.0822961.14	.01623241.05	.046					

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
22939.7523241.05			1530.69	2280.69	1205.25	.1		.3

Blocked Obstructions		num= 2							
Sta L	Sta R	Elev	Sta L	Sta R	Elev				
022939.75	20.323241.0531190.35	29.3							

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	34.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.	0.050	0.023	0.046
W.S. Elev (ft)	34.23	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	1712.33	3116.41	1221.02
E.G. Slope (ft/ft)	0.000335	Area (sq ft)	1712.33	3116.41	1221.02

Q Total (cfs)	19900.00	Flow (cfs)	1149.31	17437.84	1312.85
Top Width (ft)	2816.06	Top Width (ft)	2023.92	294.57	497.57
Vel Total (ft/s)	3.29	Avg. Vel. (ft/s)	0.67	5.60	1.08
Max Chl Dpth (ft)	16.33	Hydr. Depth (ft)	0.85	10.58	2.45
Conv. Total (cfs)	1087398.0	Conv. (cfs)	62801.9	952857.8	71738.3
Length Wtd. (ft)	2156.95	Wetted Per. (ft)	2024.08	297.79	497.78
Min Ch El (ft)	17.90	Shear (lb/sq ft)	0.02	0.22	0.05
Alpha	2.55	Stream Power (lb/ft s)	0.01	1.22	0.06
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	2511.39	2654.55	3824.36
C & E Loss (ft)	0.00	Cum SA (acres)	1340.88	244.94	1198.13

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: 8.27500*

INPUT
Description: Interpolated Cross Section at River Mile 8.28
Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
14382.22	53.7414398.87	53.3714586.06	50.79	14673	49.9114839.43	48.18			
14933.35	47.8315108.33	46.9815184.63	47.0115426.66	46.9615477.93	46.42				
15691.29	44.0615747.59	43.8915978.94	43.7116095.76	42.97	16296.1	41.74			
16416.61	41.5416766.38	41.12	17091.6	40.8917801.94	39.7918077.22	39.49			
18210.15	40.47	18485.2	39.818823.54	39.1718825.45	39.1718887.53	39.24			
19108.07	39.9119162.26	40.0719462.24	38.0119512.49	37.7319776.98	36.84				
19898.43	36.9520059.77	36.8320099.78	36.8120365.67	36.720400.31	36.81				
20651.28	37.5420741.82	37.2621133.39	35.7721416.93	34.321536.94	33.7				
21755.8	33.13	21817.3	33.1121939.47	33.1722431.02	32.8522767.34	33.19			
22834.52	33.6122967.11	34.8923000.31	35.0223278.83	32.5823331.81	32.51				
23485.78	33.1923578.05	32.1523597.07	31.5623665.29	30.8123804.01	31.38				
23926.91	30.1423948.22	30.1323987.98	31.3824055.94	32.29	24071.2	32.57			
24078.43	32.2824089.69	32.3724097.72	32.6824126.13	33.16	24138.7	32.17			
24142.83	31.6824156.94	27.7524162.11	26.3324172.56	21.9924175.35	21.56				
24184.37	20.3524191.88	19.9324197.22	19.25	24199.6	19.0524209.22	18.75			
24213.34	18.4924214.54	18.4224217.45	18.2324221.56	17.9424225.67	17.63				
24229.78	17.4824238.35	17.7524247.08	17.9324255.65	18.0424263.53	18.23				
24266.23	18.2124272.18	18.1924280.92	18.0824289.48	18.3724298.13	20.69				
24302.68	22.3624307.38	24.1224337.96	24.98	24355.9	25.424365.12	25.72			
24376.31	26.03	24393.9	26.7824396.36	26.9924415.99	27.8624446.66	35.98			
24473.06	36.9624492.34	37.0424495.38	36.8324526.09	34.6824573.55	34.21				
24623.15	36.3524656.99	32.6124710.99	29.2224739.69	27.3724789.29	29.66				
24979.12	30.8625135.78	32.8425163.53	33.3625372.69	34.0625421.98	33.99				
25595.3	34.1925677.16	34.225965.81	33.6226018.93	34.2226027.53	34.32				
26355.06	33.8126426.19	38.9626446.05	39.3126558.03	41.2826787.66	42.17				
26904.26	42.3427000.14	42.5327265.02	43.48	27339.7	43.3127563.64	42.57			
27777.62	43.5227817.61	43.67	28120.9	46.3528213.65	45.628389.32	44.39			
28637.13	44.9128667.25	44.9828956.27	47.7929096.21	48.829233.83	49.73				
29512.79	50.1529514.44	50.1629793.88	51.09	29961.7	51.3730069.67	51.59			
30370.81	53.7930395.39	53.82	30621.7	53.9930849.95	54.91	30953.8	55.36		
31202.92	55.8831283.79	55.4831325.15	55.2531408.31	53.6131622.57	54.53				
31720.54	54.5531924.36	54.6632169.85	55.5832184.76	55.6732432.11	57.44				
32593.04	58.56								

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
14382.22	.0524142.83	.0924162.11	.01524446.66
			.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 24142.8324446.66 1530.69 2280.69 1205.25 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 024142.83 2224446.6632593.04 28.76

CROSS SECTION OUTPUT Profile #Calibration

Element	Left OB	Channel	Right OB
E.G. Elev (ft)	33.93		
Vel Head (ft)	0.42	0.050	0.045
W.S. Elev (ft)	33.51	1530.69	1205.25
Crit W.S. (ft)		2030.95	1396.48
E.G. Slope (ft/ft)	0.000342	2030.95	1396.48
Q Total (cfs)	19900.00	1283.19	17046.79
Top Width (ft)	3031.81	2178.12	559.19
Vel Total (ft/s)	3.07	0.63	1.12
Max Chl Dpth (ft)	16.03	0.93	2.50
Conv. Total (cfs)	1075566.0	69354.4	84857.1
Length Wtd. (ft)	2152.53	2178.27	559.40
Min Ch El (ft)	17.48	0.02	0.05
Alpha	2.85	0.01	0.06
Frothn Loss (ft)	0.81	2445.62	3788.15
C & E Loss (ft)	0.00	1267.05	1183.51

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 7.85000*

INPUT
 Description: Interpolated Cross Section at River Mile 7.85
 Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
15488.55	53.3615505.36	53.0215694.41	50.26	15782.2	49.3215950.28	47.49			
16045.14	47.1316221.85	46.3216298.91	46.4116543.34	46.5816595.12	46.04				
16810.59	43.7416867.45	43.6217101.09	43.4817219.07	42.7	17421.4	41.39			
17543.1	41.1917896.34	40.7118224.78	40.3618942.17	39.2219220.18	38.86				
19354.43	39.43	19632.2	38.8319973.89	38.2119975.82	38.2220038.52	38.29			
20261.25	39.0420315.97	39.2120618.93	37.0420669.68	36.7520936.79	35.59				
21059.44	35.6221222.38	35.4921262.79	35.4621531.31	35.33	21566.3	35.45			
21819.75	36.26	21911.2	35.9622306.64	34.522592.99	33.1822714.19	32.64			
22935.22	32.222997.33	32.1723120.72	32.2323617.14	32.0923956.79	32.36				
24024.64	32.7924158.54	33.9524192.07	34.1124473.35	31.6924526.86	31.65				
24682.35	32.1324775.54	30.8524794.74	30.3424863.64	29.9725003.74	30.62				
25127.85	29.3125149.38	29.2225189.53	30.4225258.16	31.6525273.58	31.98				
25280.88	31.8525292.25	32.0125300.36	32.2925329.05	32.8725341.75	31.84				
25345.92	31.3925358.47	27.2825363.07	25.7925372.38	21.225374.86	20.75				
25382.88	19.4325389.56	18.9825394.31	18.3925396.43	18.2	25405	17.98			
25408.65	17.7925409.73	17.7425412.31	17.625415.97	17.3925419.63	17.17				
25423.29	17.0525432.33	17.3325441.55	17.52	25450.6	17.6325458.92	17.82			
25461.77	17.825468.05	17.7625477.28	17.6225486.32	17.9125495.45	20.4				
25500.26	22.1825505.22	24.0525537.51	24.7925556.44	25.1425566.18	25.38				
25578	25.625596.56	26.1225599.16	26.325619.89	27.2425652.27	35.99				
25679.31	36.6425699.06	36.6925702.17	36.4625733.63	34.1225782.23	33.58				
25833.03	35.84	25867.7	31.77	25923	28.0825952.39	26.08	26003.2	28.54	
26197.61	29.8126358.07	31.9226386.49	32.4126600.71	32.626651.18	32.5				
26828.7	32.5826912.54	32.5727208.17	31.8527262.57	32.4827271.38	32.58				
27606.84	31.97	27679.7	37.5127700.04	37.8827814.72	39.9928049.91	40.91			

28169.32	41.0828267.53	41.2528538.81	42.18 28615.3	41.9828844.66	41.21
29063.82	42.2729104.77	42.45 29415.4	45.4729510.39	44.729690.31	43.39
29944.12	43.9529974.96	44.0230270.98	47 30414.3	48.0530555.25	49.05
30840.96	49.530842.65	49.5131128.86	50.5331300.73	50.8331411.31	51.06
31719.74	53.431744.92	53.42 31976.7	53.5932210.47	54.5732316.83	55.04
32571.98	55.55 32654.8	55.1132697.17	54.8732782.34	53.133001.78	54.12
33102.12	54.1633310.87	54.28 33562.3	55.2633577.57	55.3433830.91	57.06
33995.72	58.14				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
15488.55	.0525345.92		.125363.07		.01525652.27		.045

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

25345.92	25652.27	1530.69	2280.69	1205.25	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
025345.92	23.72	5652.27	33995.72	28.2	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	33.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.050	0.024	0.045
W.S. Elev (ft)	32.65	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	2074.99	2933.98	1833.10
E.G. Slope (ft/ft)	0.000412	Area (sq ft)	2074.99	2933.98	1833.10
Q Total (cfs)	19900.00	Flow (cfs)	1452.81	17182.47	1264.73
Top Width (ft)	4310.55	Top Width (ft)	2260.99	293.99	1755.57
Vel Total (ft/s)	2.91	Avg. Vel. (ft/s)	0.70	5.86	0.69
Max Chl Dpth (ft)	15.60	Hydr. Depth (ft)	0.92	9.98	1.04
Conv. Total (cfs)	980162.6	Conv. (cfs)	71557.1	846312.2	62293.3
Length Wtd. (ft)	2113.81	Wetted Per. (ft)	2261.12	297.96	1755.81
Min Ch El (ft)	17.05	Shear (lb/sq ft)	0.02	0.25	0.03
Alpha	3.51	Stream Power (lb/ft s)	0.02	1.48	0.02
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	2373.48	2336.54	3743.47
C & E Loss (ft)	0.03	Cum SA (acres)	1189.05	214.11	1151.49

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 7.42500*

INPUT
 Description: Interpolated Cross Section at River Mile 7.43

Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
16594.87	52.9816611.85	52.6716802.75	49.7316891.41	48.7317061.14	46.79				
17156.93	46.4217335.38	45.6617413.19	45.817660.02	46.1917712.31	45.66				
17929.89	43.4217987.31	43.3518223.24	43.2418342.38	42.42 18546.7	41.05				
18669.59	40.84 19026.3	40.2919357.96	39.84 20082.4	38.6520363.13	38.23				
20498.7	38.4 20779.2	37.8621124.24	37.26 21126.2	37.2621189.51	37.35				
21414.42	38.1621469.69	38.3621775.61	36.0721826.86	35.7622096.59	34.35				
22220.45	34.322384.99	34.1422425.79	34.1222696.96	33.9722732.28	34.09				
22988.22	34.9823080.57	34.6723479.89	33.2323769.06	32.0623891.44	31.57				
24114.65	31.2724177.37	31.2424301.96	31.2924803.26	31.3225146.24	31.53				
25214.76	31.9825349.97	33.0125383.84	33.2125667.88	30.7925721.91	30.79				
25878.92	31.0625973.02	29.5625992.42	29.12 26062	29.1326203.47	29.86				
26328.8	28.4826350.54	28.3126391.08	29.4626460.39	31.0126475.96	31.38				

26483.33	31.4226494.81	31.65	26503	31.926531.98	32.5926544.79	31.5			
26549.01	31.09	26560	26.8126564.03	25.2426572.19	20.426574.36	19.94			
26581.39	18.5226587.24		18.0226591.41	17.5326593.27	17.3526600.77	17.21			
26603.97	17.126604.91		17.0726607.18	16.9826610.38	16.8526613.59	16.71			
26616.79	16.6326626.31		16.9226636.03	17.1126645.55	17.2126654.31	17.41			
26657.31	17.3826663.93		17.3326673.64	17.1626683.16	17.4626692.78	20.1			
26697.83	2226703.06		23.9726737.05	24.5926756.99	24.8726767.24	25.04			
26779.68	25.1726799.23		25.4626801.97	25.6226823.79	26.6226857.88	35.99			
26885.57	36.3226905.78		36.3526908.96	36.126941.16	33.5626990.91	32.94			
27042.92	35.32	27078.4	30.94	27135	26.94	27165.1	24.79	27217.1	27.42
27416.1	28.7527580.35		3127609.44	31.4527828.72	31.1527880.39	31			
28062.1	30.9728147.92		30.9328450.53	30.0728506.22	30.7328515.24	30.84			
28858.62	30.14	28933.2	36.0528954.02	36.4529071.41	38.6929312.15	39.66			
29434.39	39.8229534.91		39.98	29812.6	40.89	29890.9	40.6530125.68	39.86	
30350.01	41.0230391.94		41.22	30709.9	44.5830807.14	43.8	30991.3	42.4	
31251.11	42.9931282.68		43.0631585.69	46.2	31732.4	47.3131876.68	48.38		
32169.13	48.8532170.86		48.8632463.83	49.9632639.76	50.332752.96	50.53			
33068.67	5333094.44		53.02	33331.7	53.233570.98	54.2433679.86	54.72		
33941.04	55.2334025.81		54.7434069.18	54.4834156.37	52.634380.98	53.71			
34483.71	53.7634697.38		53.8934954.75	54.9534970.39	55.02	35229.7	56.68		
35398.41	57.72								

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 16594.87 .0526549.01 .126564.03 .01426857.88 .044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 26549.0126857.88 1530.69 2280.7 1205.25 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 026549.01 25.426857.8835398.41 27.66

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	32.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.050	0.022	0.044
W.S. Elev (ft)	31.95	Reach Len. (ft)	1530.69	2280.70	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	2529.33	2860.95	3157.05
E.G. Slope (ft/ft)	0.000318	Area (sq ft)	2529.33	2860.95	3157.05
Q Total (cfs)	19900.00	Flow (cfs)	1642.09	15505.09	2752.82
Top Width (ft)	4502.20	Top Width (ft)	2396.77	294.17	1811.25
Vel Total (ft/s)	2.33	Avg. Vel. (ft/s)	0.65	5.42	0.87
Max Chl Dpth (ft)	15.32	Hydr. Depth (ft)	1.06	9.73	1.74
Conv. Total (cfs)	1116149.0	Conv. (cfs)	92101.4	869647.9	154400.0
Length Wtd. (ft)	1969.33	Wetted Per. (ft)	2396.89	298.70	1811.53
Min Ch El (ft)	16.63	Shear (lb/sq ft)	0.02	0.19	0.03
Alpha	4.25	Stream Power (lb/ft s)	0.01	1.03	0.03
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	2292.58	2184.84	3674.43
C & E Loss (ft)	0.05	Cum SA (acres)	1107.22	198.72	1102.14

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 7.0

INPUT
 Description: Cross Section at River Mile 7.0
 Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17701.2	52.6	17911.1	49.2	18172	46.1	18448.9	45	18776.7	45.8
19049.2	43.1	19345.4	43	19672	40.7	22274.6	36.3	22340.5	36.4
22623.4	37.5	22932.3	35.1	23256.4	33.1	23547.6	32.8	23862.6	32.6
24156.7	33.7	25068.7	30.5	25357.4	30.3	26335.7	30.7	26575.6	32.3
26862.4	29.9	27075.5	30	27190.1	27.9	27403.2	29.1	27551.7	27.4
27734.9	32.3	27752.1	30.8	27765	24.7	27772	19.6	27779.9	17.6
27790.1	16.5	27800.1	16.4	27810.3	16.2	27820.3	16.5	27830.5	16.7
27840.5	16.8	27849.7	17	27859.8	16.9	27870	16.7	27880	17
27890.1	19.8	27900.9	23.9	27936.6	24.4	27968.3	24.7	28001.9	24.8
28027.7	26	28063.5	36	28112.5	36	28148.7	33	28199.6	32.3
28252.8	34.8	28289.1	30.1	28377.8	23.5	28431	26.3	28634.6	27.7
28832.4	30.5	29109.6	29.5	29383.3	29.3	29692.9	28.3	29759.1	29.1
30110.4	28.3	30186.7	34.6	30328.1	37.4	30574.4	38.4	30802.3	38.7
31086.4	39.6	31406.7	38.5	31679.1	40	32004.4	43.7	32292.3	41.4
32590.4	42.1	32900.4	45.4	33198.1	47.7	33497.3	48.2	33798.8	49.4
34094.6	50	34417.6	52.6	34686.7	52.8	35042.9	54.4	35310.1	54.9
35441.2	54.1	35530.4	52.1	35760.2	53.3	36083.9	53.5	36363.2	54.7
36628.5	56.3	36801.1	57.3						

Manning's n Values		num= 9	
Sta	n Val	Sta	n Val
17701.2	.04	18448.9	.05
27765	.014	28027.7	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	27752.1	28063.5	1574.27	2316.18	1729.73	.1	.3

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Elev
17701.2	27734.9	27.11	28112.5
		36801.1	27.11

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	31.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.050	0.032	0.044
W.S. Elev (ft)	31.29	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	3145.00	2793.08	4579.26
E.G. Slope (ft/ft)	0.000468	Area (sq ft)	3145.00	2793.08	4579.26
Q Total (cfs)	21500.00	Flow (cfs)	2651.11	12609.58	6239.31
Top Width (ft)	4748.50	Top Width (ft)	2587.25	294.54	1866.71
Vel Total (ft/s)	2.04	Avg. Vel. (ft/s)	0.84	4.51	1.36
Max Chl Dpth (ft)	15.09	Hydr. Depth (ft)	1.22	9.48	2.45
Conv. Total (cfs)	993742.1	Conv. (cfs)	122535.9	582822.0	288384.3
Length Wtd. (ft)	2138.26	Wetted Per. (ft)	2587.37	299.79	1867.05
Min Ch El (ft)	16.20	Shear (lb/sq ft)	0.04	0.27	0.07
Alpha	3.01	Stream Power (lb/ft s)	0.03	1.23	0.10
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	2192.88	2036.82	3567.41
C & E Loss (ft)	0.04	Cum SA (acres)	1019.65	183.31	1051.26

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 6.39818*

INPUT
 Description: Interpolated Cross Section at River Mile 6.40
 Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
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17637.45	49.9117832.37	46.8218074.65	4418331.79	42.9918636.19	43.72
18889.24	41.26 19164.3	41.1719467.59	39.0721884.42	35.0521945.62	35.14
22208.33	36.1322495.18	33.9522796.15	32.1323066.56	31.8523359.08	31.67
23632.18	32.6624479.09	29.7524747.18	29.5625655.66	29.9225878.43	31.37
26144.76	29.1826281.38	29.2426342.65	29.326449.07	27.4326646.96	28.61
26784.86	27.1226954.99	31.6426970.96	30.2926976.04	2826979.83	26.26
26981.96	25.3726985.41	23.9826985.52	23.9426985.62	23.88 26992.7	19.6
26993.41	19.1826995.97	18.6426999.79	17.8627002.33	17.3127006.87	16.86
27009.62	16.5327013.84	16.0427013.96	16.0327021.04	15.8527022.99	15.83
27025.12	15.8127028.13	15.7727030.96	15.6327036.63	15.4727046.47	15.83
27052.09	15.98 27056.5	16.0627066.33	16.1627067.55	16.1827075.38	16.38
27083.01	16.3327085.31	16.3227095.34	16.1527098.46	16.2427105.18	16.5
27113.92	18.9327115.11	19.2527125.73	23.2327129.38	23.327144.83	23.68
27150.09	23.8727160.84	24.0227184.41	24.2527192.02	24.3227225.06	24.44
27250.44	25.6 27253.8	26.5127267.71	30.3527285.64	35.4127314.13	35.32
27326.05	35.3627334.08	35.3727338.25	35.0527369.86	32.4627380.78	32.3
27420.17	31.7727472.76	34.1527508.64	29.67 27648.9	25.9127850.15	27.18
28045.67	29.7328319.67	28.8228590.21	28.6428896.23	27.7328961.67	28.45
29308.91	27.7329384.33	33.45 29524.1	3629767.55	36.9129992.82	37.18
30273.64	3830590.24	37 30859.5	38.3631181.04	41.7331465.62	39.64
31760.27	40.27 32066.7	44.21 32109.7	44.5332153.43	44.9532203.52	45.93
32242.21	46.3232360.96	47.2832656.71	47.9332716.57	48.232954.73	49.12
33049.95	49.3133247.11	49.3133440.57	51.2733566.38	52.2533832.37	52.45
33877.7	52.6434143.36	53.834184.45	53.9834204.98	54.0334331.39	54.26
34448.57	54.4634457.39	54.4134578.16	53.7134666.33	51.8134842.59	52.72
34893.48	52.98 35155.3	53.1535213.44	53.1935469.59	54.2635489.52	54.37
35587	55.0235751.75	56.0335922.36	57.04		

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
17637.45 .0526970.96 .01427285.64 .046

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
26970.9627285.64 1574.27 2316.18 1729.73 .1 .3
Blocked Obstructions num= 1
Sta L Sta R Elev
27285.6435922.36 26.51

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	30.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.	0.050	0.014	0.046
W.S. Elev (ft)	30.05	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	1648.32	2622.63	3278.87
E.G. Slope (ft/ft)	0.000239	Area (sq ft)	1648.32	2622.63	3278.87
Q Total (cfs)	21500.00	Flow (cfs)	822.97	18265.91	2411.12
Top Width (ft)	4267.28	Top Width (ft)	2138.32	295.11	1833.84
Vel Total (ft/s)	2.85	Avg. Vel. (ft/s)	0.50	6.96	0.74
Max Chl Dpth (ft)	14.58	Hydr. Depth (ft)	0.77	8.89	1.79
Conv. Total (cfs)	1391217.0	Conv. (cfs)	53252.4	1181946.0	156018.1
Length Wtd. (ft)	2216.86	Wetted Per. (ft)	2138.39	299.74	1834.02
Min Ch El (ft)	15.47	Shear (lb/sq ft)	0.01	0.13	0.03
Alpha	5.09	Stream Power (lb/ft s)	0.01	0.91	0.02
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	2106.27	1892.84	3411.39
C & E Loss (ft)	0.02	Cum SA (acres)	934.26	167.63	977.79

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek

REACH: Lower Judy Creek RS: 5.79636*

INPUT

Description: Interpolated Cross Section at River Mile 5.80

Station Elevation Data num= 134									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17573.71	47.2217753.64	44.43	17977.3	41.8918214.67	40.9918495.68	41.63			
18729.28	39.42	18983.2	39.3319263.17	37.4421494.24	33.7921550.74	33.87			
21793.25	34.7722058.06		32.822335.89	31.1622585.52	30.922855.55	30.73			
23107.67	31.6323889.48		28.9924136.97	28.8224975.61	29.1325181.27	30.44			
25427.12	28.4725553.25		28.52	25609.8	28.625708.04	26.9725890.72	28.11		
26018.03	26.8426175.07		30.9926189.82	29.7726195.48	27.33	26199.7	25.44		
26202.07	24.5626205.91		23.2226206.03	23.1826206.14	23.1326214.03	19.15			
26214.83	18.7626217.68		18.2626221.93	17.5426224.76	17.0226229.81	16.55			
26232.87	16.1526237.58		15.5726237.71	15.56	26245.6	15.2626247.77	15.25		
26250.14	15.2326253.49		15.1826256.65	14.9626262.96	14.7426272.63	15.16			
26278.16	15.34	26282.5	15.4226292.16	15.5126293.36	15.5426301.06	15.75			
26308.56	15.7426310.83		15.7326320.69	15.5926323.75	15.6926330.36	16			
26338.95	18.3926340.12		18.7126350.57	22.5626354.15	22.6526369.35	23.18			
26374.51	23.4926385.09		23.6426408.26	23.8726415.74	23.9526448.22	24.07			
26473.17	25.1926476.48		26.0626490.16	29.7926507.79	34.8126535.95	34.63			
26547.73	34.7126555.66		34.7426559.78	34.4426591.02	31.9226601.81	31.75			
26640.74	31.2426692.72		33.5126728.18	29.2326814.83	23.23	26866.8	25.52		
27065.7	26.6627258.94		28.9527529.73	28.1427797.11	27.9728099.56	27.15			
28164.23	27.8128507.42		27.1528581.96	32.31	28720.1	34.628960.71	35.42		
29183.35	35.6629460.88		36.429773.79	35.5	30039.9	36.7330357.69	39.75		
30638.94	37.8730930.15		38.4531232.99	43.01	31275.5	43.3231318.71	43.83		
31368.22	45.3931406.46		45.8631523.82	46.8531816.11	47.6731875.28	47.96			
32110.65	48.8532204.76		49.0332399.62	49.4732590.82	50.9732715.16	51.91			
32978.04	52.0933022.84		52.28	33285.4	53.3833326.02	53.57	33346.3	53.61	
33471.23	53.8433587.05		54.0233595.77	53.9733715.12	53.3233802.26	51.52			
33976.46	52.4134026.75		52.6634285.52	52.8434342.98	52.8734596.14	53.92			
34615.83	54.0334712.17		54.75	34875	55.7735043.62	56.78			

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
17573.71	.0526189.82		.01426507.79		.048

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	26189.82	26507.79		1574.27	2316.18	1729.73	.1	.3
Blocked Obstructions num= 1								
Sta L	Sta R	Elev						
26507.79	35043.62	25.93						

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	30.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.050	0.014	0.048
W.S. Elev (ft)	29.59	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	1986.69	2683.23	3660.51
E.G. Slope (ft/ft)	0.000216	Area (sq ft)	1986.69	2683.23	3660.51
Q Total (cfs)	21500.00	Flow (cfs)	925.92	17915.58	2658.51
Top Width (ft)	4285.26	Top Width (ft)	2168.70	299.17	1817.40
Vel Total (ft/s)	2.58	Avg. Vel. (ft/s)	0.47	6.68	0.73
Max Chl Dpth (ft)	14.85	Hydr. Depth (ft)	0.92	8.97	2.01
Conv. Total (cfs)	1461457.0	Conv. (cfs)	62938.9	1217807.0	180711.2
Length Wtd. (ft)	2206.22	Wetted Per. (ft)	2168.77	303.44	1817.64
Min Ch El (ft)	14.74	Shear (lb/sq ft)	0.01	0.12	0.03
Alpha	5.59	Stream Power (lb/ft s)	0.01	0.80	0.02
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)	2040.58	1751.78	3273.61

C & E Loss (ft) 0.02 Cum SA (acres) 856.43 151.83 905.29

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: 5.19454*

INPUT

Description: Interpolated Cross Section at River Mile 5.19

Station Elevation Data num= 134									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17509.96	44.5317674.92	42.0517879.95	39.7918097.56	38.9818355.17	39.55				
18569.32	37.5818802.09	37.519058.76	35.8121104.07	32.5421155.86	32.61				
21378.18	33.421620.94	31.6521875.64	30.1822104.48	29.9622352.03	29.8				
22583.15	30.5923299.87	28.2423526.75	28.0824295.57	28.35 24484.1	29.5				
24709.49	27.7524825.11	27.824876.96	27.8924967.02	26.525134.49	27.62				
25251.19	26.5525395.16	30.3325408.68	29.2625414.92	26.6625419.57	24.62				
25422.18	23.7425426.41	22.4625426.55	22.4325426.67	22.3825435.37	18.69				
25436.24	18.3425439.39	17.8725444.06	17.2325447.19	16.7225452.76	16.25				
25456.13	15.7825461.31	15.1125461.46	15.125470.16	14.6825472.55	14.66				
25475.17	14.6425478.86	14.625482.34	14.2925489.29	14.01 25498.8	14.49				
25504.24	14.7125508.49	14.79 25518	14.8725519.17	14.8925526.74	15.13				
25534.11	15.1625536.34	15.1525546.03	15.0425549.04	15.1425555.54	15.49				
25563.98	17.8525565.14	18.16 25575.4	21.8925578.92	2225593.86	22.69				
25598.94	23.1225609.33	23.26 25632.1	23.4925639.46	23.5725671.39	23.71				
25695.91	24.7925699.16	25.62 25712.6	29.2425729.94	34.2225757.76	33.95				
25769.4	34.0725777.24	34.1225781.31	33.8425812.18	31.3925822.85	31.2				
25861.32	30.7225912.68	32.8625947.72	28.826033.35	23.0926084.71	25.13				
26281.25	26.15 26472.2	28.18 26739.8	27.4527004.02	27.31 27302.9	26.58				
27366.8	27.1627705.93	26.5827779.59	31.1627916.09	33.228153.86	33.93				
28373.87	34.1528648.13	34.828957.33	34 29220.3	35.0929534.33	37.78				
29812.26	36.1130100.03	36.6230399.29	41.8230441.29	42.11 30484	42.7				
30532.92	44.84 30570.7	45.430686.68	46.4330975.52	47.431033.98	47.72				
31266.57	48.5731359.58	48.7431552.13	49.231741.07	50.6731863.94	51.56				
32123.72	51.7432167.99	51.9232427.44	52.9632467.57	53.1532487.62	53.2				
32611.07	53.4232725.52	53.5932734.14	53.5432852.08	52.9332938.19	51.23				
33110.34	52.0933160.03	52.3333415.74	52.5233472.52	52.5633722.69	53.57				
33742.14	53.7333837.35	54.4833998.25	55.534164.88	56.51					

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
17509.96	.0525408.68		.01425729.94		.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	25408.6825729.94		1574.27	2316.18	1729.73	.1	.3

Blocked Obstructions num= 1		
Sta L	Sta R	Elev
25729.9434164.88		25.34

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	29.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.	0.050	0.014	0.050
W.S. Elev (ft)	29.18	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	2436.75	2760.19	4006.46
E.G. Slope (ft/ft)	0.000193	Area (sq ft)	2436.75	2760.19	4006.46
Q Total (cfs)	21500.00	Flow (cfs)	1121.52	17564.37	2814.12
Top Width (ft)	4350.97	Top Width (ft)	2244.17	303.50	1803.29
Vel Total (ft/s)	2.34	Avg. Vel. (ft/s)	0.46	6.36	0.70

Max Chl Dpth (ft)	15.17	Hydr. Depth (ft)	1.09	9.09	2.22
Conv. Total (cfs)	1548724.0	Conv. (cfs)	80786.9	1265226.0	202711.2
Length Wtd. (ft)	2187.75	Wetted Per. (ft)	2244.24	307.54	1803.53
Min Ch El (ft)	14.01	Shear (lb/sq ft)	0.01	0.11	0.03
Alpha	6.08	Stream Power (lb/ft s)	0.01	0.69	0.02
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	1960.65	1607.06	3121.39
C & E Loss (ft)	0.03	Cum SA (acres)	776.69	135.81	833.41

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 4.59272*

INPUT

Description: Interpolated Cross Section at River Mile 4.59

Station Elevation Data num= 134									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17446.22	41.8417596.19	39.66	17782.6	37.6817980.45	36.9718214.66				
18409.36	35.7418620.99	35.6618854.35	34.1920713.89	31.2820760.97					
20963.11	32.0321183.81	30.521415.38	29.2121623.44	29.0121848.51					
22058.64	29.5622710.26	27.4822916.54	27.3523615.53	27.5623786.93					
23991.85	27.0324096.97	27.0724144.11	27.1924225.99	26.0324378.25					
24484.35	26.2724615.25	29.6724627.54	28.7524634.36	25.9924639.44					
24642.29	22.9224646.92	21.724647.06	21.67 24647.2	21.63 24656.7					
24657.66	17.9224661.09	17.4924666.21	16.9224669.62	16.4324675.71					
24679.39	15.424685.05	14.6424685.21	14.6324694.71	14.0924697.33					
24700.19	14.0624704.22	14.0224708.02	13.6224715.63	13.2824724.97					
24730.31	14.0724734.49	14.1524743.83	14.2324744.99	14.2524752.42					
24759.67	14.5724761.85	14.5724771.38	14.4824774.34	14.5924780.71					
24789.01	17.3224790.15	17.6224800.23	21.2224803.69	21.3524818.37					
24823.36	22.7424833.57	22.8824855.95	23.1224863.18	23.1924894.55					
24918.65	24.3824921.84	25.1724935.05	28.6824952.08	33.6324979.57					
24991.07	33.4324998.82	33.4925002.84	33.2425033.35	30.8525043.88					
25081.89	30.1925132.64	32.2225167.26	28.3625251.87	22.9525302.61					
25496.8	25.6325685.47	27.4125949.87	26.7726210.93	26.6526506.23					
26569.37	26.5226904.45	26.0126977.22	30.0227112.09	31.827347.02					
27564.39	32.6327835.37	32.228140.88	32.5 28400.7	33.4528710.97					
28985.57	34.35 29269.9	34.7929565.59	40.6329607.09	40.929649.28					
29697.62	44.329734.95	44.9529849.54	4630134.92	47.1330192.69					
30422.5	48.2930514.39	48.4630704.64	48.9430891.32	50.3731012.72					
31269.39	51.3931313.13	51.5631569.48	52.5531609.13	52.7431628.94					
31750.92	53 31864	53.1531872.51	53.131989.04	52.5432074.12					
32244.21	51.7832293.31	52.0132545.96	52.2132602.06	52.2532849.24					
32868.46	53.3732962.53	54.2133121.51	55.2333286.14	56.25					

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
17446.22	.0524627.54		.01624952.08		.052

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
24627.5424952.08		1574.27	2316.18	1729.73	.1	.3

Blocked Obstructions num= 1		
Sta L	Sta R	Elev
24952.0833286.14		25

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	29.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.050	0.016	0.052

W.S. Elev (ft)	28.80	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	2965.70	2849.00	4366.77
E.G. Slope (ft/ft)	0.000209	Area (sq ft)	2965.70	2849.00	4366.77
Q Total (cfs)	21500.00	Flow (cfs)	1515.34	16718.11	3266.55
Top Width (ft)	4387.11	Top Width (ft)	2287.28	307.94	1791.89
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)	0.51	5.87	0.75
Max Chl Dpth (ft)	15.52	Hydr. Depth (ft)	1.30	9.25	2.44
Conv. Total (cfs)	1487187.0	Conv. (cfs)	104818.4	1156417.0	225952.1
Length Wtd. (ft)	2167.08	Wetted Per. (ft)	2287.35	311.80	1792.11
Min Ch El (ft)	13.28	Shear (lb/sq ft)	0.02	0.12	0.03
Alpha	6.03	Stream Power (lb/ft s)	0.01	0.70	0.02
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	1863.03	1457.93	2955.14
C & E Loss (ft)	0.02	Cum SA (acres)	694.80	119.55	762.03

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 3.99090*

INPUT

Description: Interpolated Cross Section at River Mile 3.99

Station Elevation Data		num= 134							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17382.47	39.1517517.46	37.2817685.25	35.5817863.33	34.9618074.15	35.38				
18249.4	33.918439.89	33.8318649.93	32.5620323.71	30.0320366.09	30.08				
20548.03	30.6720746.69	29.3420955.13	28.24 21142.4	28.0621344.98	27.94				
21534.12	28.5222120.65	26.7322306.32	26.6122935.48	26.7823089.77	27.64				
23274.21	26.3223368.83	26.3523411.26	26.4923484.96	25.5723622.01	26.63				
23717.51	25.9923835.33	29.02 23846.4	28.2323853.79	25.3223859.31	22.97				
23862.4	22.123867.42	20.9423867.58	20.9123867.72	20.8723878.03	17.77				
23879.07	17.5 23882.8	17.123888.34	16.623892.04	16.1423898.65	15.63				
23902.64	15.0323908.79	14.1823908.96	14.1623919.27	13.523922.11	13.49				
23925.21	13.4723929.58	13.4423933.71	12.9423941.96	12.5523951.13	13.15				
23956.38	13.4423960.49	13.5123969.66	13.58 23970.8	13.61 23978.1	13.89				
23985.22	13.9823987.37	13.9823996.72	13.9323999.63	14.0324005.89	14.49				
24014.04	16.7824015.16	17.0724025.07	20.5524028.46	20.724042.88	21.7				
24047.79	22.3624057.82	22.5 24079.8	22.7424086.89	22.8124117.72	22.98				
24141.39	23.9824144.53	24.72 24157.5	28.1224174.23	33.0424201.38	32.59				
24212.75	32.78 24220.4	32.8624224.38	32.6324254.51	30.3124264.91	30.1				
24302.47	29.66 24352.6	31.57 24386.8	27.9324470.38	22.8224520.51	24.35				
24712.36	25.1124898.74	26.6425159.94	26.0925417.83	25.9825709.56	25.44				
25771.94	25.8726102.96	25.4426174.85	28.8726308.09	30.426540.17	30.95				
26754.91	31.1127022.61	31.627324.42	3127581.09	31.8227887.62	33.84				
28158.89	32.5828439.78	32.9628731.89	39.4428772.88	39.6928814.56	40.46				
28862.32	43.76 28899.2	44.49 29012.4	45.5829294.33	46.8729351.39	47.24				
29578.42	48.01 29669.2	48.1729857.15	48.6730041.57	50.07 30161.5	50.87				
30415.06	51.0430458.27	51.230711.52	52.1330750.69	52.3230770.26	52.37				
30890.76	52.5831002.47	52.7131010.88	52.67 31126	52.1531210.05	50.65				
31378.08	51.4731426.59	51.6931676.18	51.89 31731.6	51.9431975.79	52.87				
31994.78	53.03 32087.7	53.9432244.76	54.97 32407.4	55.99					

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
17382.47	.05	23846.4	.01624174.23
			.053

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 23846.424174.23 1574.27 2316.18 1729.73 .1 .3

Blocked Obstructions num= 1
 Sta L Sta R Elev

24174.23 32407.4 24.6

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.050	0.016	0.053
W.S. Elev (ft)	28.42	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	3604.11	2937.78	4721.71
E.G. Slope (ft/ft)	0.000181	Area (sq ft)	3604.11	2937.78	4721.71
Q Total (cfs)	21500.00	Flow (cfs)	1848.71	16241.45	3409.84
Top Width (ft)	4925.11	Top Width (ft)	2829.72	312.13	1783.27
Vel Total (ft/s)	1.91	Avg. Vel. (ft/s)	0.51	5.53	0.72
Max Chl Dpth (ft)	15.87	Hydr. Depth (ft)	1.27	9.41	2.65
Conv. Total (cfs)	1597391.0	Conv. (cfs)	137354.1	1206695.0	253341.4
Length Wtd. (ft)	2146.27	Wetted Per. (ft)	2829.78	315.84	1783.48
Min Ch El (ft)	12.55	Shear (lb/sq ft)	0.01	0.11	0.03
Alpha	6.37	Stream Power (lb/ft s)	0.01	0.58	0.02
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	1744.31	1304.08	2774.69
C & E Loss (ft)	0.02	Cum SA (acres)	602.34	103.07	691.04

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: 3.38909*

INPUT

Description: Interpolated Cross Section at River Mile 3.39

Station Elevation Data num= 134									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17318.73	36.4517438.74	34.9	17587.9	33.4717746.22	32.9617933.64		33.3		
18089.44	32.0618258.79	31.9918445.52		30.9319933.54	28.7819971.21		28.82		
20132.96	29.320309.57	28.1920494.87		27.2720661.36	27.1120841.46		27		
21009.61	27.4921531.04	25.98	21696.1	25.8722255.44	25.99	22392.6	26.71		
22556.58	25.622640.69	25.6222678.41		25.7922743.94	25.122865.77		26.14		
22950.68	25.7123055.42	28.3623065.26		27.7223073.23	24.6423079.18		22.15		
23082.51	21.2923087.92	20.1823088.09		20.1523088.25	20.1223099.37		17.32		
23100.49	17.08	23104.5	16.7223110.48	16.2923114.47	15.85	23121.6	15.32		
23125.9	14.6523132.53	13.7223132.71		13.723143.83	12.9123146.88		12.9		
23150.23	12.8923154.95	12.85	23159.4	12.2723168.29	11.83	23177.3	12.47		
23182.45	12.823186.49	12.8723195.49		12.9423196.61	12.9623203.78		13.26		
23210.77	13.3923212.88	13.423222.07		13.3723224.92	13.4823231.07		13.99		
23239.08	16.2423240.17	16.53	23249.9	19.8923253.24	20.05	23267.4	21.2		
23272.21	21.9823282.06	22.1323303.64		22.3623310.61	22.4423340.88		22.62		
23364.12	23.5723367.21	24.2723379.95		27.5623396.37	32.44	23423.2	31.9		
23434.42	32.1423441.98	32.2323445.91		32.0323475.67	29.7723485.95		29.55		
23523.04	29.1323572.56	30.9323606.34		27.49	23688.9	22.6823738.41	23.95		
23927.91	24.5924112.01	25.86	24370	25.4124624.74	25.3224912.89		24.86		
24974.51	25.2325301.47	24.8625372.48		27.7325504.09	2925733.32		29.45		
25945.44	29.5926209.85		3026507.96		29.526761.49	30.1827064.26	31.86		
27332.21	30.8227609.66	31.1427898.18		38.2427938.68	38.4827979.85		39.33		
28027.02	43.2228063.44	44.0428175.26		45.1528453.73	46.6	28510.1	47		
28734.35	47.7428824.01	47.8929009.65		48.4129191.81	49.7729310.28		50.52		
29560.73	50.6829603.42	50.8429853.56		51.7129892.25	51.9129911.58		51.96		
30030.6	52.1630140.95	52.2730149.25		52.2330262.96	51.7730345.98		50.37		
30511.95	51.1530559.86	51.37	30806.4	51.5830861.14	51.6231102.33		52.52		
31121.09	52.731212.88	53.6731368.01		54.731528.65	55.73				

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val

17318.73 .0523065.26 .01723396.37 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
23065.2623396.37 1574.27 2316.18 1729.73 .1 .3
Blocked Obstructions num= 1
Sta L Sta R Elev
23396.3731528.65 24.2

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft) 28.40 Element Left OB Channel Right OB
Vel Head (ft) 0.29 Wt. n-Val. 0.050 0.017 0.055
W.S. Elev (ft) 28.11 Reach Len. (ft) 1574.27 2316.18 1729.73
Crit W.S. (ft) 4497.07 Flow Area (sq ft) 3049.85 5209.58
E.G. Slope (ft/ft) 0.000166 Area (sq ft) 4497.07 3049.85 5209.58
Q Total (cfs) 21500.00 Flow (cfs) 2405.97 15428.49 3665.55
Top Width (ft) 4853.85 Top Width (ft) 2725.75 316.54 1811.56
Vel Total (ft/s) 1.69 Avg. Vel. (ft/s) 0.54 5.06 0.70
Max Chl Dpth (ft) 16.28 Hydr. Depth (ft) 1.65 9.63 2.88
Conv. Total (cfs) 1669309.0 Conv. (cfs) 186804.8 1197902.0 284601.3
Length Wtd. (ft) 2120.12 Wetted Per. (ft) 2725.81 320.17 1811.76
Min Ch El (ft) 11.83 Shear (lb/sq ft) 0.02 0.10 0.03
Alpha 6.51 Stream Power (lb/ft s) 0.01 0.50 0.02
Frctn Loss (ft) 0.33 Cum Volume (acre-ft) 1597.92 1144.90 2577.51
C & E Loss (ft) 0.02 Cum SA (acres) 501.95 86.35 619.67

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: 2.78727*

INPUT

Description: Interpolated Cross Section at River Mile 2.79

Station Elevation Data num= 134
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
17254.98 33.7617360.01 32.5117490.55 31.3717629.11 30.9517793.13 31.22
17929.47 30.2218077.69 30.16 18241.1 29.319543.36 27.5219576.33 27.56
19717.89 27.9419872.45 27.0420034.62 26.2920180.32 26.1620337.94 26.07
20485.1 26.4520941.43 25.2221085.89 25.1321575.39 25.2121695.43 25.78
21838.94 24.8821912.55 24.921945.57 25.0922002.91 24.6322109.54 25.64
22183.84 25.4322275.51 27.722284.12 27.222292.67 23.9722299.04 21.33
22302.62 20.4722308.43 19.4222308.61 19.422308.78 19.37 22320.7 16.86
22321.9 16.6622326.21 16.3322332.62 15.97 22336.9 15.5522344.54 15.02
22349.16 14.2822356.27 13.2522356.46 13.2322368.39 12.3322371.66 12.32
22375.25 12.322380.31 12.2722385.08 11.622394.62 11.122403.47 11.8
22408.52 12.1722412.48 12.2322421.33 12.2922422.42 12.3222429.46 12.64
22436.32 12.822438.39 12.8122447.41 12.8222450.21 12.9322456.25 13.49
22464.11 15.7122465.19 15.9822474.74 19.2222478.01 19.422491.91 20.71
22496.63 21.61 22506.3 21.7522527.49 21.9822534.33 22.0622564.04 22.25
22586.86 23.1722589.89 23.8322602.39 27.0122618.52 31.8522645.01 31.22
22656.1 31.4922663.56 31.622667.44 31.4222696.83 29.2322706.98 29
22743.62 28.622792.52 30.2822825.88 27.0622907.41 22.5522956.32 23.56
23143.46 24.0723325.27 25.0923580.07 24.7323831.65 24.6524116.22 24.29
24177.07 24.5824499.98 24.2924570.11 26.5824700.09 27.624926.48 27.96
25135.96 28.07 25397.1 28.425691.51 2825941.89 28.55 26240.9 29.89
26505.53 29.0526779.53 29.3127064.48 37.0527104.47 37.2727145.13 38.21
27191.71 42.6827227.69 43.5827338.12 44.7327613.14 46.3427668.81 46.76
27890.27 47.4627978.82 47.6128162.16 48.1428342.06 49.4728459.06 50.18
28706.41 50.3328748.56 50.48 28995.6 51.329033.81 51.49 29052.9 51.54

29170.45	51.7429279.42	51.8329287.62	51.7929399.92	51.3829481.91	50.08
29645.82	50.8429693.14	51.0529936.62	51.2729990.68	51.3130228.88	52.17
30247.4	52.3630338.05	53.430491.26	54.4430649.91	55.47	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
17254.98	.0522284.12		.01822618.52		.057

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	22284.12	22618.52		1574.27	2316.18	1729.73	.1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
22618.52	30649.91	23.8

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.050	0.018	0.057
W.S. Elev (ft)	27.82	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	5291.97	3170.85	5812.64
E.G. Slope (ft/ft)	0.000150	Area (sq ft)	5291.97	3170.85	5812.64
Q Total (cfs)	21500.00	Flow (cfs)	3090.78	14652.87	3756.34
Top Width (ft)	5231.33	Top Width (ft)	2891.60	320.96	2018.77
Vel Total (ft/s)	1.51	Avg. Vel. (ft/s)	0.58	4.62	0.65
Max Chl Dpth (ft)	16.72	Hydr. Depth (ft)	1.83	9.88	2.88
Conv. Total (cfs)	1755228.0	Conv. (cfs)	252327.0	1196239.0	306662.1
Length Wtd. (ft)	2027.27	Wetted Per. (ft)	2891.66	324.56	2018.94
Min Ch El (ft)	11.10	Shear (lb/sq ft)	0.02	0.09	0.03
Alpha	6.47	Stream Power (lb/ft s)	0.01	0.42	0.02
Frctn Loss (ft)	0.81	Cum Volume (acre-ft)	1421.03	979.51	2358.67
C & E Loss (ft)	0.05	Cum SA (acres)	400.44	69.40	543.62

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: Judy Creek
 REACH: Lower Judy Creek RS: 2.18545*

INPUT
 Description: Interpolated Cross Section at River Mile 2.19
 Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17191.24	31.0717281.28	30.1317393.21	29.2617511.99	28.9417652.62	29.13				
17769.51	28.3817896.58	28.3318036.69	27.6719153.18	26.2719181.45	26.29				
19302.81	26.5719435.33	25.8919574.36	25.3219699.29	25.2219834.42	25.14				
19960.58	25.4120351.82	24.4720475.67	24.3920895.35	24.4320998.27	24.84				
21121.3	24.1721184.42	24.1721212.72	24.3921261.88	24.17 21353.3	25.15				
21417	25.15 21495.6	27.0521502.97	26.6921512.11	23.321518.91	20.51				
21522.73	19.6521528.93	18.6521529.12	18.64 21529.3	18.6221542.03	16.4				
21543.31	16.2421547.91	15.9521554.76	15.6621559.33	15.2621567.48	14.71				
21572.42	13.9 21580	12.7921580.22	12.7621592.95	11.7421596.44	11.73				
21600.28	11.7121605.68	11.6921610.77	10.9321620.96	10.3721629.63	11.13				
21634.6	11.5321638.48	11.5921647.16	11.6521648.23	11.6721655.14	12.02				
21661.87	12.2121663.91	12.2321672.76	12.26 21675.5	12.3821681.43	12.99				
21689.14	15.17 21690.2	15.4421699.57	18.5521702.78	18.7521716.42	20.21				
21721.06	21.2321730.55	21.3721751.34	21.621758.05	21.6821787.21	21.89				
21809.6	22.7621812.57	23.3821824.84	26.4521840.66	31.2621866.82	30.54				
21877.77	30.8521885.14	30.9721888.97	30.8221917.99	28.6921928.02	28.45				

21964.19	28.0722012.48	29.6422045.43	26.6222125.93	22.4122174.22	23.17
22359.01	23.5522538.54	24.3222790.13	24.0523038.55	23.9923319.56	23.72
23379.64	23.9423698.49	23.7223767.74	25.4423896.08	26.224119.63	26.47
24326.48	26.5524584.34	26.824875.05	26.525122.29	26.9125417.54	27.92
25678.85	27.2925949.41	27.4826230.78	35.8626270.27	36.0726310.42	37.08
26356.41	42.1426391.94	43.1326500.98	44.326772.54	46.0726827.51	46.52
27046.2	47.1827133.63	47.3227314.67	47.8827492.31	49.1627607.84	49.83
27852.08	49.98 27893.7	50.1128137.64	50.8828175.37	51.0828194.22	51.13
28310.29	51.32 28417.9	51.39 28426	51.3628536.88	50.9928617.85	49.79
28779.7	50.5328826.42	50.7329066.83	50.9529120.22	5129355.43	51.83
29373.72	52.0329463.23	53.1329614.51	54.1729771.17	55.21	

Manning's n Values num= 3
 Sta n Val Sta n Val
 17191.24 .0521502.97 .01921518.91 .059

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 21502.9721840.66 1574.27 2316.18 1729.73 .1 .3

Blocked Obstructions num= 1
 Sta L Sta R Elev
 21840.6629771.17 22.9

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.050	0.057	0.059
W.S. Elev (ft)	27.11	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	5152.64	3159.02	6315.92
E.G. Slope (ft/ft)	0.000650	Area (sq ft)	5152.64	3159.02	6315.92
Q Total (cfs)	21500.00	Flow (cfs)	5576.94	9461.08	6461.98
Top Width (ft)	6481.92	Top Width (ft)	3017.90	324.03	3139.99
Vel Total (ft/s)	1.47	Avg. Vel. (ft/s)	1.08	2.99	1.02
Max Chl Dpth (ft)	16.74	Hydr. Depth (ft)	1.71	9.75	2.01
Conv. Total (cfs)	843290.1	Conv. (cfs)	218743.0	371090.2	253457.0
Length Wtd. (ft)	2051.87	Wetted Per. (ft)	3017.94	327.57	3140.14
Min Ch El (ft)	10.37	Shear (lb/sq ft)	0.07	0.39	0.08
Alpha	2.11	Stream Power (lb/ft s)	0.07	1.17	0.08
Frctn Loss (ft)	0.93	Cum Volume (acre-ft)	1232.30	811.23	2117.86
C & E Loss (ft)	0.03	Cum SA (acres)	293.66	52.26	441.19

Warning: Divided flow computed for this cross-section.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 1.58363*

INPUT
 Description: Interpolated Cross Section at River Mile 1.58
 Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17127.49	28.3817202.55	27.7517295.86	27.1617394.88	26.9317512.11	27.05				
17609.55	26.5417715.48	26.4917832.28	26.04 18763	25.0218786.57	25.03				
18887.74	25.218998.21	24.7419114.11	24.3519218.24	24.2719330.89	24.2				
19436.07	24.3819762.21	23.7219865.46	23.6520215.31	23.64 20301.1	23.91				
20403.66	23.4520456.28	23.4520479.87	23.6820520.85	23.720597.06	24.66				
20650.17	24.8620715.68	26.3920721.83	26.1820731.54	22.6320738.78	19.68				
20742.84	18.8320749.43	17.8920749.64	17.8820749.83	17.8620763.36	15.94				

20764.73	15.8220769.62	15.56	20776.9	15.3520781.76	14.9720790.43	14.4	
20795.68	13.5320803.74	12.3320803.97	12.29	20817.5	11.1520821.22	11.14	
20825.3	11.1320831.04	11.1120836.46	10.2620847.29	9.64	20855.8	10.46	
20860.67	10.920864.48	10.9620872.99	11.0120874.05	11.0320880.82	11.4	11.4	
20887.43	11.6220889.42	11.65	20898.1	11.71	20900.8	11.8220906.61	12.48
20914.18	14.6320915.21	14.89	20924.4	17.8820927.55	18.120940.94	19.72	
20945.48	20.8520954.79	20.9920975.19	21.2320981.77	21.321010.37	21.53	21.53	
21032.34	22.3621035.25	22.9321047.29	25.8921062.81	30.6721088.63	29.86	29.86	
21099.44	30.2121106.72	30.35	21110.5	30.2221139.16	28.1621149.05	27.9	
21184.76	27.5521232.44	28.9921264.97	26.1921344.45	22.2721392.12	22.78	22.78	
21574.56	23.0421751.81	23.55	22000.2	23.3622245.46	23.3322522.89	23.15	
22582.21	23.29	22897	23.1522965.38	24.2923092.08	24.823312.79	24.98	
23517	25.0423771.58	25.2	24058.6	25.24302.69	25.2724594.19	25.95	
24852.17	25.5325119.29	25.6525397.08	34.6725436.06	34.86	25475.7	35.96	
25521.11	41.5925556.19	42.6725663.84	43.8825931.95	45.825986.22	46.28	46.28	
26202.12	46.926288.45	47.0426467.18	47.6126642.56	48.8626756.62	49.48	49.48	
26997.75	49.6327038.85	49.7527279.68	50.4627316.93	50.6627335.54	50.72	50.72	
27450.13	50.927556.37	50.9627564.37	50.9227673.85	50.627753.78	49.5	49.5	
27913.57	50.22	27959.7	50.428197.05	50.6428249.76	50.6928481.98	51.48	
28500.04	51.728588.41	52.8628737.77	53.928892.43	54.94			

Manning's n Values	num=	3	
Sta n Val	Sta n Val	Sta n Val	
17127.49	.0520721.83	.01921062.81	.061

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
20721.8321062.81		1574.27	2316.18	1729.73	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	26.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.050	0.019	0.061
W.S. Elev (ft)	25.87	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	3682.02	2974.96	5724.58
E.G. Slope (ft/ft)	0.000256	Area (sq ft)	3682.02	2974.96	5724.58
Q Total (cfs)	21500.00	Flow (cfs)	2150.36	16207.31	3142.33
Top Width (ft)	6807.58	Top Width (ft)	2708.74	324.55	3774.29
Vel Total (ft/s)	1.74	Avg. Vel. (ft/s)	0.58	5.45	0.55
Max Chl Dpth (ft)	16.23	Hydr. Depth (ft)	1.36	9.17	1.52
Conv. Total (cfs)	1342502.0	Conv. (cfs)	134272.7	1012016.0	196213.3
Length Wtd. (ft)	2120.60	Wetted Per. (ft)	2708.76	327.93	3774.40
Min Ch El (ft)	9.64	Shear (lb/sq ft)	0.02	0.15	0.02
Alpha	7.45	Stream Power (lb/ft s)	0.01	0.79	0.01
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	1072.65	648.15	1878.80
C & E Loss (ft)	0.04	Cum SA (acres)	190.18	35.01	303.91

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: .981819*

INPUT

Description: Interpolated Cross Section at River Mile 0.98

Station Elevation Data	num=	134				
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev		
17063.75	25.6917123.83	25.3617198.51	25.0517277.77	24.9317371.59	24.97	
17449.59	24.717534.38	24.6617627.86	24.4218372.82	23.7618391.69	23.77	
18472.67	23.8418561.08	23.5918653.85	23.3818737.21	23.3218827.37	23.27	
18911.55	23.34	19172.6	22.9619255.24	22.9219535.27	22.8619603.93	22.98

19686.03	22.7319728.14	22.7219747.02	22.9819779.83	23.2319840.82	24.16
19883.33	24.5819935.77	25.7319940.69	25.6619950.98	21.9619958.65	18.86
19962.95	18.0219969.94	17.1319970.15	17.1219970.36	17.11 19984.7	15.49
19986.14	15.419991.32	15.1819999.04	15.0320004.19	14.6820013.38	14.1
20018.93	13.1520027.48	11.8620027.72	11.8320042.06	10.57 20046	10.56
20050.32	10.5420056.41	10.5220062.14	9.5920073.62	8.9120081.96	9.79
20086.74	10.2620090.48	10.3220098.82	10.3620099.86	10.38 20106.5	10.77
20112.98	11.0320114.93	11.0620123.45	11.1520126.09	11.2720131.79	11.98
20139.21	14.120140.22	14.3420149.24	17.2120152.33	17.4520165.45	19.22
20169.91	20.4820179.04	20.6120199.03	20.8520205.49	20.9320233.54	21.16
20255.07	21.9520257.93	22.4920269.73	25.3420284.96	30.0720310.45	29.17
20321.12	29.56 20328.3	29.7220332.03	29.6120360.32	27.6220370.09	27.35
20405.34	27.02 20452.4	28.3520484.51	25.7520562.96	22.1420610.02	22.39
20790.11	22.5220965.08	22.7721210.27	22.6821452.37	22.6621726.22	22.57
21784.78	22.6522095.51	22.57 22163	23.1522288.08	23.422505.94	23.49
22707.53	23.5222958.82	23.623242.14	23.523483.09	23.6423770.83	23.97
24025.49	23.7624289.16	23.8324563.37	33.4724601.86	33.6524640.99	34.83
24685.81	41.0524720.43	42.22 24826.7	43.4525091.36	45.5425144.93	46.04
25358.04	46.6325443.26	46.7525619.69	47.3525792.81	48.5625905.39	49.14
26143.42	49.2726183.99	49.3926421.72	50.0526458.49	50.2526476.86	50.3
26589.98	50.4826694.84	50.5226702.74	50.49 26810.8	50.2126889.71	49.21
27047.44	49.927092.97	50.0827327.27	50.32 27379.3	50.3727608.52	51.13
27626.35	51.3627713.58	52.5927861.02	53.6428013.69	54.68	

Manning's n Values num= 3
 Sta n Val Sta n Val
 17063.75 .0519940.69 .0220284.96 .063

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 19940.6920284.96 1574.28 2316.18 1729.73 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.050	0.020	0.063
W.S. Elev (ft)	25.50	Reach Len. (ft)	1574.28	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	4841.41	3072.25	8768.58
E.G. Slope (ft/ft)	0.000188	Area (sq ft)	4841.41	3072.25	8768.58
Q Total (cfs)	21500.00	Flow (cfs)	2821.50	13770.08	4908.43
Top Width (ft)	7004.12	Top Width (ft)	2828.02	329.14	3846.96
Vel Total (ft/s)	1.29	Avg. Vel. (ft/s)	0.58	4.48	0.56
Max Chl Dpth (ft)	16.59	Hydr. Depth (ft)	1.71	9.33	2.28
Conv. Total (cfs)	1568962.0	Conv. (cfs)	205898.7	1004871.0	358192.4
Length Wtd. (ft)	2046.76	Wetted Per. (ft)	2828.05	332.60	3847.07
Min Ch El (ft)	8.91	Shear (lb/sq ft)	0.02	0.11	0.03
Alpha	7.82	Stream Power (lb/ft s)	0.01	0.49	0.01
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	918.63	487.38	1591.05
C & E Loss (ft)	0.03	Cum SA (acres)	90.13	17.63	152.60

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 0.38

INPUT

Description: Interpolated Cross Section at River Mile 0.38

Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17000	23	19000	2219159.55	25.1519170.42	21.2919178.52	18.04			

19183.06	17.219190.44	16.3719190.88	16.3619206.03	15.0319213.03	14.79
19221.18	14.7219236.32	13.7919242.19	12.7819251.47	11.3619266.62	9.98
19270.78	9.9719281.77	9.9419287.83	8.9219299.95	8.1819308.13	9.12
19312.81	9.6319316.48	9.6819324.66	9.7219325.67	9.7419332.18	10.15
19338.53	10.4419340.45	10.4819348.79	10.619351.38	10.7219356.97	11.48
19364.24	13.5619365.24	13.819374.07	16.54 19377.1	16.819389.96	18.73
19394.33	20.119403.28	20.2319422.88	20.4719429.21	20.55 19456.7	20.8
19477.81	21.5519480.61	22.0419492.18	24.78 19507.1	29.4819532.26	28.49
19542.79	28.9219549.88	29.0919553.56	29.0119581.48	27.0819591.12	26.8
19625.91	26.4919672.36	27.719704.05	25.3219781.48	2223459.04	22
23729.67	32.2823767.65	32.4423806.27	33.7123850.51	40.5123884.68	41.76
23989.56	43.0324250.76	45.2724303.63	45.824513.97	46.3524598.07	46.47
24772.2	47.0824943.06	48.2625054.18	48.79 25289.1	48.9225329.13	49.03
25563.76	49.6325600.05	49.8325618.18	49.8925729.82	50.0625833.32	50.08
25841.11	50.0525947.77	49.8226025.64	48.9226181.31	49.5926226.25	49.76
26457.49	50.0126508.84	50.0626735.07	50.7826752.67	51.0326838.76	52.32
26984.27	53.3727134.95	54.42			

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 17000 .0519159.55 .021 19507.1 .065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 19159.55 19507.1 0 0 0 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.050	0.021	0.065
W.S. Elev (ft)	25.25	Reach Len. (ft)	3694.00	3694.00	3694.00
Crit W.S. (ft)		Flow Area (sq ft)	5762.10	3208.30	12205.11
E.G. Slope (ft/ft)	0.000128	Area (sq ft)	5762.10	3208.30	12205.11
Q Total (cfs)	22100.00	Flow (cfs)	3729.32	11536.36	6834.33
Top Width (ft)	6332.46	Top Width (ft)	2159.55	334.11	3838.80
Vel Total (ft/s)	1.04	Avg. Vel. (ft/s)	0.65	3.60	0.56
Max Chl Dpth (ft)	17.07	Hydr. Depth (ft)	2.67	9.60	3.18
Conv. Total (cfs)	1950778.0	Conv. (cfs)	329188.6	1018320.0	603269.5
Length Wtd. (ft)	3694.00	Wetted Per. (ft)	2161.83	337.70	3838.93
Min Ch El (ft)	8.18	Shear (lb/sq ft)	0.02	0.08	0.03
Alpha	6.35	Stream Power (lb/ft s)	0.01	0.27	0.01
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	727.02	320.40	1174.62
C & E Loss (ft)	0.01	Cum SA (acres)			

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.

SUMMARY OF MANNING'S N VALUES

River: Fish Creek

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9	n10	n11	n12	n13	n14	n15
Upper Fish Creek	43.3	.04	.027	.07	.04											
Upper Fish Creek	42.3916*	.04	.027	.07	.042											
Upper Fish Creek	41.4833*	.041	.028	.07	.043											
Upper Fish Creek	40.575*	.041	.028	.07	.043											
Upper Fish Creek	39.6666*	.042	.029	.07	.044											

Upper Fish Creek	38.7583*	.042	.029	.07	.045														
Upper Fish Creek	37.85*	.043	.029	.046															
Upper Fish Creek	36.9416*	.043	.029	.046															
Upper Fish Creek	36.0333*	.043	.029	.047															
Upper Fish Creek	35.125*	.044	.029	.048															
Upper Fish Creek	34.2166*	.044	.03	.048															
Upper Fish Creek	33.3083*	.045	.03	.049															
Upper Fish Creek	32.4	.04	.055	.07	.03	.05	.04	.05	.04										
Upper Fish Creek	31.6071*	.047	.07	.029	.055														
Upper Fish Creek	30.8142*	.05	.07	.029	.054														
Upper Fish Creek	30.0214*	.052	.07	.028	.057														
Upper Fish Creek	29.2285*	.054	.07	.027	.059														
Upper Fish Creek	28.4357*	.056	.07	.026	.061														
Upper Fish Creek	27.6428*	.059	.07	.024	.063														
Upper Fish Creek	26.85	.061	.023	.065															
Lower Fish Creek	26.09	.063	.07	.022	.067														
Lower Fish Creek	25.1	.05	.04	.05	.04	.05	.04	.07	.04	.05	.07	.021	.07	.04	.06	.04			
Lower Fish Creek	24.2625*	.064	.08	.021	.068														
Lower Fish Creek	23.425*	.062	.08	.021	.066														
Lower Fish Creek	22.5875*	.06	.08	.02	.064														
Lower Fish Creek	21.75*	.058	.09	.019	.063														
Lower Fish Creek	20.9125*	.056	.1	.017	.061														
Lower Fish Creek	20.075*	.054	.1	.016	.059														
Lower Fish Creek	19.2375*	.052	.1	.015	.057														
Lower Fish Creek	18.4	.05	.07	.04	.05	.11	.014	.07	.06	.07	.05								
Lower Fish Creek	17.5714*	.054	.11	.014	.055														
Lower Fish Creek	16.7428*	.053	.11	.014	.064														
Lower Fish Creek	15.9142*	.052	.11	.014	.069														
Lower Fish Creek	15.0857*	.051	.11	.02	.073														
Lower Fish Creek	14.2571*	.049	.11	.026	.078														
Lower Fish Creek	13.4285*	.048	.11	.032	.082														
Lower Fish Creek	12.6	.06	.04	.06	.04	.05	.11	.038	.11	.07	.06	.04	.11						
Lower Fish Creek	11.7	.11	.045	.05	.045	.09	.11	.03	.09	.05	.03	.11	.09	.06	.04	.11			
Lower Fish Creek	10.8538*	.062	.107	.031	.061	.031	.079												
Lower Fish Creek	10.0076*	.063	.105	.034	.062	.034	.079												
Lower Fish Creek	9.16153*	.065	.102	.038	.063	.038	.08												
Lower Fish Creek	8.31538*	.066	.099	.041	.064	.041	.08												
Lower Fish Creek	7.46923*	.068	.097	.044	.065	.044	.081												
Lower Fish Creek	6.62307*	.069	.094	.047	.066	.047	.081												
Lower Fish Creek	5.77692*	.071	.091	.051	.068	.051	.082												
Lower Fish Creek	4.93076*	.072	.088	.054	.069	.054	.082												
Lower Fish Creek	4.08461*	.074	.086	.057	.07	.057	.083												
Lower Fish Creek	3.23846*	.075	.083	.06	.071	.06	.083												
Lower Fish Creek	2.39230*	.077	.08	.064	.072	.064	.084												
Lower Fish Creek	1.54615*	.078	.078	.067	.073	.067	.084												
Lower Fish Creek	0.7	.085	.075	.07	.075	.07	.075	.07	.075	.07	.085								

River: Judy Creek

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9
Lower Judy Creek	13.8	.05	.04	.05	.06	.02	.06	.04		
Lower Judy Creek	13.375*	.05	.02	.05						
Lower Judy Creek	12.95*	.05	.019	.0049						
Lower Judy Creek	12.525*	.05	.019	.049						
Lower Judy Creek	12.1*	.05	.03	.019	.049					
Lower Judy Creek	11.675*	.05	.03	.018	.048					
Lower Judy Creek	11.25*	.05	.04	.017	.048					
Lower Judy Creek	10.825*	.05	.05	.017	.047					
Lower Judy Creek	10.4*	.05	.06	.017	.047					
Lower Judy Creek	9.975*	.05	.06	.017	.047					
Lower Judy Creek	9.55000*	.05	.07	.016	.046					
Lower Judy Creek	9.12500*	.05	.08	.016	.046					
Lower Judy Creek	8.70000*	.05	.08	.016	.046					
Lower Judy Creek	8.27500*	.05	.09	.015	.045					
Lower Judy Creek	7.85000*	.05	.1	.015	.045					
Lower Judy Creek	7.42500*	.05	.1	.014	.044					
Lower Judy Creek	7.0	.04	.05	.04	.05	.11	.014	.11	.05	.04
Lower Judy Creek	6.39818*	.05	.014	.046						

Lower Judy Creek	5.79636*	.05	.014	.048
Lower Judy Creek	5.19454*	.05	.014	.05
Lower Judy Creek	4.59272*	.05	.016	.052
Lower Judy Creek	3.99090*	.05	.016	.053
Lower Judy Creek	3.38909*	.05	.017	.055
Lower Judy Creek	2.78727*	.05	.018	.057
Lower Judy Creek	2.18545*	.05	.019	.059
Lower Judy Creek	1.58363*	.05	.019	.061
Lower Judy Creek	.981819*	.05	.02	.063
Lower Judy Creek	0.38	.05	.021	.065

SUMMARY OF REACH LENGTHS

River: Fish Creek

Reach	River Sta.	Left	Channel	Right
Upper Fish Creek	43.3	1903.5	4751.08	1745.42
Upper Fish Creek	42.3916*	1903.5	4751.08	1745.42
Upper Fish Creek	41.48333*	1903.5	4751.08	1745.42
Upper Fish Creek	40.575*	1903.5	4751.08	1745.42
Upper Fish Creek	39.6666*	1903.5	4751.08	1745.42
Upper Fish Creek	38.7583*	1903.5	4751.08	1745.42
Upper Fish Creek	37.85*	1903.5	4751.08	1745.42
Upper Fish Creek	36.9416*	1903.5	4751.08	1745.42
Upper Fish Creek	36.0333*	1903.5	4751.08	1745.42
Upper Fish Creek	35.125*	1903.5	4751.08	1745.42
Upper Fish Creek	34.2166*	1903.5	4751.08	1745.42
Upper Fish Creek	33.3083*	1903.5	4751.09	1745.42
Upper Fish Creek	32.4	2464.43	4273.14	2171
Upper Fish Creek	31.6071*	2464.43	4273.14	2171
Upper Fish Creek	30.8142*	2464.43	4273.14	2171
Upper Fish Creek	30.0214*	2464.43	4273.14	2171
Upper Fish Creek	29.2285*	2464.43	4273.14	2171
Upper Fish Creek	28.4357*	2464.43	4273.14	2171
Upper Fish Creek	27.6428*	2464.43	4273.14	2171
Upper Fish Creek	26.85	0	0	0
Lower Fish Creek	26.09	2826	4769	4679
Lower Fish Creek	25.1	2028.75	4406.38	2370.38
Lower Fish Creek	24.2625*	2028.75	4406.38	2370.38
Lower Fish Creek	23.425*	2028.75	4406.38	2370.38
Lower Fish Creek	22.5875*	2028.75	4406.38	2370.38
Lower Fish Creek	21.75*	2028.75	4406.38	2370.38
Lower Fish Creek	20.9125*	2028.75	4406.38	2370.38
Lower Fish Creek	20.075*	2028.75	4406.38	2370.38
Lower Fish Creek	19.2375*	2028.75	4406.38	2370.38
Lower Fish Creek	18.4	3217.29	4349	2885.43
Lower Fish Creek	17.5714*	3217.29	4349	2885.43
Lower Fish Creek	16.7428*	3217.29	4349	2885.43
Lower Fish Creek	15.9142*	3217.29	4349	2885.43
Lower Fish Creek	15.0857*	3217.29	4349	2885.43
Lower Fish Creek	14.2571*	3217.29	4349	2885.43
Lower Fish Creek	13.4285*	3217.29	4349	2885.43
Lower Fish Creek	12.6	1090	5078	2467
Lower Fish Creek	11.7	2559	4481.46	2515.69
Lower Fish Creek	10.8538*	2559	4481.46	2515.69
Lower Fish Creek	10.0076*	2559	4481.46	2515.69
Lower Fish Creek	9.16153*	2559	4481.46	2515.69

Lower Fish Creek	8.31538*	2559	4481.46	2515.69
Lower Fish Creek	7.46923*	2559	4481.46	2515.69
Lower Fish Creek	6.62307*	2559	4481.46	2515.69
Lower Fish Creek	5.77692*	2559	4481.46	2515.69
Lower Fish Creek	4.93076*	2559	4481.46	2515.69
Lower Fish Creek	4.08461*	2559	4481.46	2515.69
Lower Fish Creek	3.23846*	2559	4481.46	2515.69
Lower Fish Creek	2.39230*	2559	4481.46	2515.69
Lower Fish Creek	1.54615*	2559	4481.46	2515.7
Lower Fish Creek	0.7	0	0	0

River: Judy Creek

Reach	River Sta.	Left	Channel	Right
Lower Judy Creek	13.8	1530.69	2280.69	1205.25
Lower Judy Creek	13.375*	1530.69	2280.69	1205.25
Lower Judy Creek	12.95*	1530.69	2280.69	1205.25
Lower Judy Creek	12.525*	1530.69	2280.69	1205.25
Lower Judy Creek	12.1*	1530.69	2280.69	1205.25
Lower Judy Creek	11.675*	1530.69	2280.69	1205.25
Lower Judy Creek	11.25*	1530.69	2280.69	1205.25
Lower Judy Creek	10.825*	1530.69	2280.69	1205.25
Lower Judy Creek	10.4*	1530.69	2280.69	1205.25
Lower Judy Creek	9.975*	1530.69	2280.69	1205.25
Lower Judy Creek	9.55000*	1530.69	2280.69	1205.25
Lower Judy Creek	9.12500*	1530.69	2280.69	1205.25
Lower Judy Creek	8.70000*	1530.69	2280.69	1205.25
Lower Judy Creek	8.27500*	1530.69	2280.69	1205.25
Lower Judy Creek	7.85000*	1530.69	2280.69	1205.25
Lower Judy Creek	7.42500*	1530.69	2280.7	1205.25
Lower Judy Creek	7.0	1574.27	2316.18	1729.73
Lower Judy Creek	6.39818*	1574.27	2316.18	1729.73
Lower Judy Creek	5.79636*	1574.27	2316.18	1729.73
Lower Judy Creek	5.19454*	1574.27	2316.18	1729.73
Lower Judy Creek	4.59272*	1574.27	2316.18	1729.73
Lower Judy Creek	3.99090*	1574.27	2316.18	1729.73
Lower Judy Creek	3.38909*	1574.27	2316.18	1729.73
Lower Judy Creek	2.78727*	1574.27	2316.18	1729.73
Lower Judy Creek	2.18545*	1574.27	2316.18	1729.73
Lower Judy Creek	1.58363*	1574.27	2316.18	1729.73
Lower Judy Creek	.981819*	1574.28	2316.18	1729.73
Lower Judy Creek	0.38	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Fish Creek

Reach	River Sta.	Contr.	Expan.
Upper Fish Creek	43.3	.1	.3
Upper Fish Creek	42.3916*	.1	.3
Upper Fish Creek	41.4833*	.1	.3
Upper Fish Creek	40.575*	.1	.3
Upper Fish Creek	39.6666*	.1	.3
Upper Fish Creek	38.7583*	.1	.3

Upper Fish Creek	37.85*	.1	.3
Upper Fish Creek	36.9416*	.1	.3
Upper Fish Creek	36.0333*	.1	.3
Upper Fish Creek	35.125*	.1	.3
Upper Fish Creek	34.2166*	.1	.3
Upper Fish Creek	33.3083*	.1	.3
Upper Fish Creek	32.4	.1	.3
Upper Fish Creek	31.6071*	.1	.3
Upper Fish Creek	30.8142*	.1	.3
Upper Fish Creek	30.0214*	.1	.3
Upper Fish Creek	29.2285*	.1	.3
Upper Fish Creek	28.4357*	.1	.3
Upper Fish Creek	27.6428*	.1	.3
Upper Fish Creek	26.85	.1	.3
Lower Fish Creek	26.09	.1	.3
Lower Fish Creek	25.1	.1	.3
Lower Fish Creek	24.2625*	.1	.3
Lower Fish Creek	23.425*	.1	.3
Lower Fish Creek	22.5875*	.1	.3
Lower Fish Creek	21.75*	.1	.3
Lower Fish Creek	20.9125*	.1	.3
Lower Fish Creek	20.075*	.1	.3
Lower Fish Creek	19.2375*	.1	.3
Lower Fish Creek	18.4	.1	.3
Lower Fish Creek	17.5714*	.1	.3
Lower Fish Creek	16.7428*	.1	.3
Lower Fish Creek	15.9142*	.1	.3
Lower Fish Creek	15.0857*	.1	.3
Lower Fish Creek	14.2571*	.1	.3
Lower Fish Creek	13.4285*	.1	.3
Lower Fish Creek	12.6	.1	.3
Lower Fish Creek	11.7	.1	.3
Lower Fish Creek	10.8538*	.1	.3
Lower Fish Creek	10.0076*	.1	.3
Lower Fish Creek	9.16153*	.1	.3
Lower Fish Creek	8.31538*	.1	.3
Lower Fish Creek	7.46923*	.1	.3
Lower Fish Creek	6.62307*	.1	.3
Lower Fish Creek	5.77692*	.1	.3
Lower Fish Creek	4.93076*	.1	.3
Lower Fish Creek	4.08461*	.1	.3
Lower Fish Creek	3.23846*	.1	.3
Lower Fish Creek	2.39230*	.1	.3
Lower Fish Creek	1.54615*	.1	.3
Lower Fish Creek	0.7	.1	.3

River: Judy Creek

Reach	River Sta.	Contr.	Expan.
Lower Judy Creek	13.8	.1	.3
Lower Judy Creek	13.375*	.1	.3
Lower Judy Creek	12.95*	.1	.3
Lower Judy Creek	12.525*	.1	.3
Lower Judy Creek	12.1*	.1	.3
Lower Judy Creek	11.675*	.1	.3
Lower Judy Creek	11.25*	.1	.3
Lower Judy Creek	10.825*	.1	.3
Lower Judy Creek	10.4*	.1	.3

Lower Judy Creek	9.975*	.1	.3
Lower Judy Creek	9.55000*	.1	.3
Lower Judy Creek	9.12500*	.1	.3
Lower Judy Creek	8.70000*	.1	.3
Lower Judy Creek	8.27500*	.1	.3
Lower Judy Creek	7.85000*	.1	.3
Lower Judy Creek	7.42500*	.1	.3
Lower Judy Creek	7.0	.1	.3
Lower Judy Creek	6.39818*	.1	.3
Lower Judy Creek	5.79636*	.1	.3
Lower Judy Creek	5.19454*	.1	.3
Lower Judy Creek	4.59272*	.1	.3
Lower Judy Creek	3.99090*	.1	.3
Lower Judy Creek	3.38909*	.1	.3
Lower Judy Creek	2.78727*	.1	.3
Lower Judy Creek	2.18545*	.1	.3
Lower Judy Creek	1.58363*	.1	.3
Lower Judy Creek	.981819*	.1	.3
Lower Judy Creek	0.38	.1	.3

Profile Output Table - Standard Table 1

River	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
Fish Creek	Lower Fish Creek	0.7	53000.00	0.30	6.42	2.34	6.43	0.000080	0.49	110291.30	25511.48	0.04	
Fish Creek	Lower Fish Creek	1.54615*	45600.00	-0.36	6.75		6.75	0.000076	0.47	99689.40	25025.39	0.04	
Fish Creek	Lower Fish Creek	2.39230*	45600.00	-0.74	7.09		7.10	0.000097	0.53	89671.05	24546.54	0.05	
Fish Creek	Lower Fish Creek	3.23846*	45600.00	-1.13	7.51		7.51	0.000111	0.60	81767.84	24087.56	0.06	
Fish Creek	Lower Fish Creek	4.08461*	45600.00	-1.52	8.05		8.06	0.000156	0.78	67544.65	22325.18	0.07	
Fish Creek	Lower Fish Creek	4.93076*	45600.00	-1.90	8.64		8.65	0.000132	0.83	66366.15	20144.56	0.07	
Fish Creek	Lower Fish Creek	5.77692*	45600.00	-2.29	9.13		9.14	0.000105	0.92	64174.13	19326.11	0.07	
Fish Creek	Lower Fish Creek	6.62307*	45600.00	-2.68	9.55		9.56	0.000100	1.02	61125.60	18781.33	0.08	
Fish Creek	Lower Fish Creek	7.46923*	45600.00	-3.07	9.96		9.97	0.000098	1.14	58150.38	18039.57	0.09	
Fish Creek	Lower Fish Creek	8.31538*	45600.00	-3.45	10.36		10.38	0.000104	1.29	55091.44	17769.42	0.10	
Fish Creek	Lower Fish Creek	9.16153*	45600.00	-3.84	10.79		10.81	0.000112	1.51	51801.55	17710.68	0.11	
Fish Creek	Lower Fish Creek	10.0076*	45600.00	-4.23	11.23		11.27	0.000118	1.82	48880.82	17962.32	0.13	
Fish Creek	Lower Fish Creek	10.8538*	45600.00	-4.61	11.72		11.78	0.000144	2.26	46648.34	18339.00	0.15	
Fish Creek	Lower Fish Creek	11.7	45600.00	-5.00	12.27		12.32	0.000160	2.55	45234.36	18031.69	0.17	
Fish Creek	Lower Fish Creek	12.6	45600.00	-5.80	12.78		12.82	0.000209	2.60	43690.79	17809.23	0.15	
Fish Creek	Lower Fish Creek	13.4285*	44800.00	-5.83	13.51		13.56	0.000207	2.82	43916.10	17053.41	0.16	
Fish Creek	Lower Fish Creek	14.2571*	44800.00	-5.86	14.22		14.30	0.000190	3.32	41781.99	15261.77	0.19	
Fish Creek	Lower Fish Creek	15.0857*	44800.00	-5.89	14.85		14.97	0.000167	3.99	39413.38	13939.03	0.22	
Fish Creek	Lower Fish Creek	15.9142*	44800.00	-5.91	15.34		15.58	0.000135	5.01	35693.07	12801.84	0.29	
Fish Creek	Lower Fish Creek	16.7428*	44800.00	-5.94	15.85		16.13	0.000147	5.40	32684.38	11542.50	0.31	
Fish Creek	Lower Fish Creek	17.5714*	44800.00	-5.97	16.41		16.73	0.000153	5.65	30463.51	10622.78	0.33	
Fish Creek	Lower Fish Creek	18.4	44800.00	-6.00	17.02		17.31	0.000147	5.56	28818.55	10083.13	0.32	
Fish Creek	Lower Fish Creek	19.2375*	43600.00	-4.42	17.55		17.95	0.000191	6.11	24119.91	8647.05	0.35	
Fish Creek	Lower Fish Creek	20.075*	43600.00	-2.84	18.39		18.92	0.000304	6.74	18679.39	7763.33	0.38	
Fish Creek	Lower Fish Creek	20.9125*	43600.00	-1.26	19.50		19.94	0.000227	6.27	20464.62	5982.43	0.34	
Fish Creek	Lower Fish Creek	21.75*	43600.00	0.32	20.44		20.77	0.000212	5.66	23903.90	6496.76	0.30	
Fish Creek	Lower Fish Creek	22.5875*	43600.00	1.90	21.31		21.54	0.000215	5.01	27235.91	7009.04	0.26	
Fish Creek	Lower Fish Creek	23.425*	43600.00	3.48	22.07		22.27	0.000207	4.88	29846.08	7956.31	0.25	
Fish Creek	Lower Fish Creek	24.2625*	43600.00	5.06	22.75		22.97	0.000197	5.01	31921.78	8500.00	0.26	
Fish Creek	Lower Fish Creek	25.1	43600.00	6.64	23.50		23.66	0.000214	4.64	33757.75	8702.36	0.24	
Fish Creek	Lower Fish Creek	26.09	43600.00	7.89	24.46		24.67	0.000239	5.09	31229.67	8678.98	0.27	
Fish Creek	Upper Fish Creek	26.85	25700.00	6.88	25.30		25.56	0.000211	4.80	16288.74	6589.66	0.25	
Fish Creek	Upper Fish Creek	27.6428*	25400.00	7.84	26.15		26.37	0.000218	4.46	15583.25	5421.49	0.23	
Fish Creek	Upper Fish Creek	28.4357*	25400.00	8.80	26.94		27.05	0.000159	3.53	19307.70	4829.32	0.18	

Fish Creek	Upper Fish Creek	29.2285*	25400.00	9.76	27.46	27.53	0.000124	2.96	22592.03	5108.33	0.15
Fish Creek	Upper Fish Creek	30.0214*	25400.00	10.72	27.83	27.88	0.000097	2.62	25368.05	5401.19	0.13
Fish Creek	Upper Fish Creek	30.8142*	25400.00	11.68	28.12	28.15	0.000079	2.30	27779.60	5648.44	0.11
Fish Creek	Upper Fish Creek	31.6071*	25400.00	12.64	28.34	28.37	0.000067	2.13	29840.73	5905.58	0.11
Fish Creek	Upper Fish Creek	32.4	25400.00	13.60	28.51	28.53	0.000048	1.74	31357.71	6168.71	0.09
Fish Creek	Upper Fish Creek	33.3083*	25000.00	14.03	28.70	28.74	0.000106	2.59	23826.85	5858.70	0.13
Fish Creek	Upper Fish Creek	34.2166*	25000.00	14.45	29.11	29.20	0.000192	3.40	17802.09	5407.13	0.18
Fish Creek	Upper Fish Creek	35.125*	25000.00	14.88	29.83	29.99	0.000276	4.19	13910.92	4855.37	0.22
Fish Creek	Upper Fish Creek	36.0333*	25000.00	15.30	30.85	31.06	0.000314	4.53	11886.42	4345.26	0.24
Fish Creek	Upper Fish Creek	36.9416*	25000.00	15.73	32.02	32.26	0.000314	4.62	10878.93	3701.70	0.24
Fish Creek	Upper Fish Creek	37.85*	25000.00	16.15	33.21	33.46	0.000299	4.61	10352.23	3080.67	0.23
Fish Creek	Upper Fish Creek	38.7583*	25000.00	16.58	34.42	34.65	0.000300	4.41	10144.39	2825.45	0.22
Fish Creek	Upper Fish Creek	39.6666*	25000.00	17.00	35.58	35.80	0.000272	4.28	9858.97	2627.95	0.21
Fish Creek	Upper Fish Creek	40.575*	25000.00	17.43	36.64	36.86	0.000243	4.22	9438.04	2346.97	0.21
Fish Creek	Upper Fish Creek	41.4833*	25000.00	17.85	37.63	37.85	0.000231	4.15	9031.31	2127.59	0.20
Fish Creek	Upper Fish Creek	42.3916*	25000.00	18.28	38.55	38.74	0.000192	3.92	10564.08	3433.43	0.19
Fish Creek	Upper Fish Creek	43.3	25000.00	18.70	39.29	39.41	0.000137	3.30	13187.60	2855.06	0.16
Judy Creek	Lower Judy Creek	0.38	22100.00	8.18	25.25	25.36	0.000128	3.60	21175.51	6332.46	0.20
Judy Creek	Lower Judy Creek	.981819*	21500.00	8.91	25.50	25.71	0.000188	4.48	16682.23	7004.12	0.26
Judy Creek	Lower Judy Creek	1.58363*	21500.00	9.64	25.87	26.22	0.000256	5.45	12381.56	6807.58	0.32
Judy Creek	Lower Judy Creek	2.18545*	21500.00	10.37	27.11	27.18	0.000650	2.99	14627.57	6481.92	0.17
Judy Creek	Lower Judy Creek	2.78727*	21500.00	11.10	27.82	28.05	0.000150	4.62	14275.46	5231.33	0.26
Judy Creek	Lower Judy Creek	3.38909*	21500.00	11.83	28.11	28.40	0.000166	5.06	12756.50	4853.85	0.29
Judy Creek	Lower Judy Creek	3.99090*	21500.00	12.55	28.42	28.78	0.000181	5.53	11263.60	4925.11	0.32
Judy Creek	Lower Judy Creek	4.59272*	21500.00	13.28	28.80	29.22	0.000209	5.87	10181.47	4387.11	0.34
Judy Creek	Lower Judy Creek	5.19454*	21500.00	14.01	29.18	29.69	0.000193	6.36	9203.40	4350.97	0.37
Judy Creek	Lower Judy Creek	5.79636*	21500.00	14.74	29.59	30.16	0.000216	6.68	8330.44	4285.26	0.39
Judy Creek	Lower Judy Creek	6.39818*	21500.00	15.47	30.05	30.69	0.000239	6.96	7549.82	4267.28	0.41
Judy Creek	Lower Judy Creek	7.0	21500.00	16.20	31.29	31.49	0.000468	4.51	10517.34	4748.50	0.26
Judy Creek	Lower Judy Creek	7.42500*	19900.00	16.63	31.95	32.31	0.000318	5.42	8547.32	4502.20	0.31
Judy Creek	Lower Judy Creek	7.85000*	19900.00	17.05	32.65	33.11	0.000412	5.86	6842.06	4310.55	0.33
Judy Creek	Lower Judy Creek	8.27500*	19900.00	17.48	33.51	33.93	0.000342	5.59	6476.04	3031.81	0.31
Judy Creek	Lower Judy Creek	8.70000*	19900.00	17.90	34.23	34.66	0.000335	5.60	6049.76	2816.06	0.30
Judy Creek	Lower Judy Creek	9.12500*	19900.00	18.33	34.90	35.36	0.000301	5.69	5562.83	2265.13	0.31
Judy Creek	Lower Judy Creek	9.55000*	19900.00	18.75	35.38	35.91	0.000179	6.01	4850.64	1624.36	0.32
Judy Creek	Lower Judy Creek	9.975*	19900.00	19.18	35.79	36.37	0.000217	6.19	4292.70	1156.60	0.34
Judy Creek	Lower Judy Creek	10.4*	19900.00	19.60	36.27	36.88	0.000227	6.33	3911.44	1064.65	0.34
Judy Creek	Lower Judy Creek	10.825*	19900.00	20.03	36.77	37.40	0.000235	6.43	3616.73	896.96	0.35
Judy Creek	Lower Judy Creek	11.25*	19900.00	20.45	37.29	37.94	0.000241	6.52	3432.53	752.42	0.35
Judy Creek	Lower Judy Creek	11.675*	19900.00	20.88	37.86	38.53	0.000272	6.57	3333.71	681.23	0.36
Judy Creek	Lower Judy Creek	12.1*	19900.00	21.30	38.51	39.18	0.000301	6.57	3307.80	652.91	0.35
Judy Creek	Lower Judy Creek	12.525*	19900.00	21.73	39.19	39.85	0.000301	6.58	3294.21	638.47	0.35
Judy Creek	Lower Judy Creek	12.95*	19900.00	22.15	39.86	40.52	0.000294	6.51	3281.72	556.73	0.35
Judy Creek	Lower Judy Creek	13.375*	19900.00	22.58	40.56	41.23	0.000334	6.61	3278.60	513.99	0.35
Judy Creek	Lower Judy Creek	13.8	19900.00	23.00	41.31	41.98	0.000332	6.61	3301.89	509.32	0.35

Profile Output Table - Standard Table 2

River	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)	
Fish Creek	Lower Fish Creek	0.7		6.43	6.42	0.00			8081.71	43904.88	1013.42	25511.48
Fish Creek	Lower Fish Creek	1.54615*		6.75	6.75	0.00	0.32	0.00	8205.40	36482.85	911.74	25025.39
Fish Creek	Lower Fish Creek	2.39230*		7.10	7.09	0.00	0.35	0.00	9808.60	34856.57	934.83	24546.54
Fish Creek	Lower Fish Creek	3.23846*		7.51	7.51	0.01	0.42	0.00	11258.55	33371.40	970.04	24087.56
Fish Creek	Lower Fish Creek	4.08461*		8.06	8.05	0.01	0.54	0.00	6309.51	37985.89	1304.60	22325.18
Fish Creek	Lower Fish Creek	4.93076*		8.65	8.64	0.01	0.60	0.00	7272.74	36896.37	1430.88	20144.56
Fish Creek	Lower Fish Creek	5.77692*		9.14	9.13	0.01	0.49	0.00	7363.27	36876.32	1360.40	19326.11
Fish Creek	Lower Fish Creek	6.62307*		9.56	9.55	0.01	0.42	0.00	7880.77	36296.92	1422.31	18781.33

Fish Creek	Lower	Fish Creek	7.46923*	9.97	9.96	0.02	0.40	0.00	8388.13	35729.04	1482.83	18039.57
Fish Creek	Lower	Fish Creek	8.31538*	10.38	10.36	0.02	0.41	0.00	9228.85	34729.26	1641.89	17769.42
Fish Creek	Lower	Fish Creek	9.16153*	10.81	10.79	0.03	0.43	0.00	10246.57	33795.69	1557.74	17710.68
Fish Creek	Lower	Fish Creek	10.0076*	11.27	11.23	0.04	0.46	0.00	11448.65	32441.81	1709.54	17962.32
Fish Creek	Lower	Fish Creek	10.8538*	11.78	11.72	0.05	0.51	0.00	14096.75	29585.92	1917.33	18339.00
Fish Creek	Lower	Fish Creek	11.7	12.32	12.27	0.05	0.55	0.00	22948.67	20560.16	2091.17	18031.69
Fish Creek	Lower	Fish Creek	12.6	12.82	12.78	0.04	0.50	0.00	28146.49	14319.76	3133.75	17809.23
Fish Creek	Lower	Fish Creek	13.4285*	13.56	13.51	0.05	0.74	0.00	25931.62	15671.61	3196.77	17053.41
Fish Creek	Lower	Fish Creek	14.2571*	14.30	14.22	0.08	0.72	0.01	22813.30	18293.96	3692.75	15261.77
Fish Creek	Lower	Fish Creek	15.0857*	14.97	14.85	0.12	0.66	0.01	19101.32	21689.46	4009.22	13939.03
Fish Creek	Lower	Fish Creek	15.9142*	15.58	15.34	0.23	0.57	0.03	14651.32	26514.46	3634.22	12801.84
Fish Creek	Lower	Fish Creek	16.7428*	16.13	15.85	0.28	0.55	0.01	13426.86	27774.92	3598.23	11542.50
Fish Creek	Lower	Fish Creek	17.5714*	16.73	16.41	0.32	0.58	0.01	12467.57	28415.50	3916.93	10622.78
Fish Creek	Lower	Fish Creek	18.4	17.31	17.02	0.30	0.58	0.00	12409.36	27441.62	4949.02	10083.13
Fish Creek	Lower	Fish Creek	19.2375*	17.95	17.55	0.40	0.61	0.03	12079.35	29611.81	1908.84	8647.05
Fish Creek	Lower	Fish Creek	20.075*	18.92	18.39	0.54	0.93	0.04	7067.35	32976.65	3556.00	7763.33
Fish Creek	Lower	Fish Creek	20.9125*	19.94	19.50	0.44	1.02	0.01	6761.73	31578.92	5259.35	5982.43
Fish Creek	Lower	Fish Creek	21.75*	20.77	20.44	0.33	0.82	0.01	7417.36	28684.37	7498.27	6496.76
Fish Creek	Lower	Fish Creek	22.5875*	21.54	21.31	0.23	0.76	0.01	8176.78	25169.62	10253.60	7009.04
Fish Creek	Lower	Fish Creek	23.425*	22.27	22.07	0.21	0.73	0.00	7475.34	23912.55	12212.12	7956.31
Fish Creek	Lower	Fish Creek	24.2625*	22.97	22.75	0.21	0.69	0.00	6973.76	23575.89	13050.35	8500.00
Fish Creek	Lower	Fish Creek	25.1	23.66	23.50	0.16	0.69	0.01	8813.17	20783.13	14003.70	8702.36
Fish Creek	Lower	Fish Creek	26.09	24.67	24.46	0.21	0.99	0.01	7605.10	22133.91	13860.99	8678.98
Fish Creek	Upper	Fish Creek	26.85	25.56	25.30	0.27	0.88	0.02	4053.48	19010.97	2635.54	6589.66
Fish Creek	Upper	Fish Creek	27.6428*	26.37	26.15	0.22	0.80	0.00	5119.19	17866.30	2414.51	5421.49
Fish Creek	Upper	Fish Creek	28.4357*	27.05	26.94	0.11	0.67	0.01	7289.52	14207.20	3903.27	4829.32
Fish Creek	Upper	Fish Creek	29.2285*	27.53	27.46	0.07	0.47	0.00	8454.88	11732.22	5212.90	5108.33
Fish Creek	Upper	Fish Creek	30.0214*	27.88	27.83	0.05	0.35	0.00	9038.88	10080.77	6280.35	5401.19
Fish Creek	Upper	Fish Creek	30.8142*	28.15	28.12	0.03	0.27	0.00	9423.96	8521.04	7455.00	5648.44
Fish Creek	Upper	Fish Creek	31.6071*	28.37	28.34	0.03	0.21	0.00	9838.90	7504.95	8056.15	5905.58
Fish Creek	Upper	Fish Creek	32.4	28.53	28.51	0.02	0.16	0.00	8844.23	5813.37	10742.39	6168.71
Fish Creek	Upper	Fish Creek	33.3083*	28.74	28.70	0.04	0.20	0.01	8831.67	8514.96	7653.37	5858.70
Fish Creek	Upper	Fish Creek	34.2166*	29.20	29.11	0.09	0.44	0.01	7860.86	11145.43	5993.72	5407.13
Fish Creek	Upper	Fish Creek	35.125*	29.99	29.83	0.16	0.77	0.02	6407.10	14077.63	4515.27	4855.37
Fish Creek	Upper	Fish Creek	36.0333*	31.06	30.85	0.21	1.06	0.01	5287.11	15990.86	3722.03	4345.26
Fish Creek	Upper	Fish Creek	36.9416*	32.26	32.02	0.24	1.19	0.01	4250.78	17343.01	3406.21	3701.70
Fish Creek	Upper	Fish Creek	37.85*	33.46	33.21	0.25	1.20	0.00	3357.19	18417.29	3225.53	3080.67
Fish Creek	Upper	Fish Creek	38.7583*	34.65	34.42	0.23	1.20	0.00	2771.33	18772.58	3456.09	2825.45
Fish Creek	Upper	Fish Creek	39.6666*	35.80	35.58	0.22	1.16	0.00	2003.21	19300.41	3696.38	2627.95
Fish Creek	Upper	Fish Creek	40.575*	36.86	36.64	0.22	1.06	0.00	1298.18	19979.36	3722.46	2346.97
Fish Creek	Upper	Fish Creek	41.4833*	37.85	37.63	0.22	0.99	0.00	753.35	20511.38	3735.28	2127.59
Fish Creek	Upper	Fish Creek	42.3916*	38.74	38.55	0.20	0.89	0.00	1472.55	20089.05	3438.39	3433.43
Fish Creek	Upper	Fish Creek	43.3	39.41	39.29	0.12	0.66	0.01	4989.77	17259.17	2751.06	2855.06
Judy Creek	Lower	Judy Creek	0.38	25.36	25.25	0.11	0.68	0.01	3729.32	11536.36	6834.33	6332.46
Judy Creek	Lower	Judy Creek	.981819*	25.71	25.50	0.20	0.32	0.03	2821.50	13770.08	4908.43	7004.12
Judy Creek	Lower	Judy Creek	1.58363*	26.22	25.87	0.35	0.47	0.04	2150.36	16207.31	3142.33	6807.58
Judy Creek	Lower	Judy Creek	2.18545*	27.18	27.11	0.07	0.93	0.03	5576.94	9461.08	6461.98	6481.92
Judy Creek	Lower	Judy Creek	2.78727*	28.05	27.82	0.23	0.81	0.05	3090.78	14652.87	3756.34	5231.33
Judy Creek	Lower	Judy Creek	3.38909*	28.40	28.11	0.29	0.33	0.02	2405.97	15428.49	3665.55	4853.85
Judy Creek	Lower	Judy Creek	3.99090*	28.78	28.42	0.36	0.37	0.02	1848.71	16241.45	3409.84	4925.11
Judy Creek	Lower	Judy Creek	4.59272*	29.22	28.80	0.42	0.42	0.02	1515.34	16718.11	3266.55	4387.11
Judy Creek	Lower	Judy Creek	5.19454*	29.69	29.18	0.51	0.44	0.03	1121.52	17564.37	2814.12	4350.97
Judy Creek	Lower	Judy Creek	5.79636*	30.16	29.59	0.58	0.45	0.02	925.92	17915.58	2658.51	4285.26
Judy Creek	Lower	Judy Creek	6.39818*	30.69	30.05	0.64	0.50	0.02	822.97	18265.91	2411.12	4267.28
Judy Creek	Lower	Judy Creek	7.0	31.49	31.29	0.20	0.76	0.04	2651.11	12609.58	6239.31	4748.50
Judy Creek	Lower	Judy Creek	7.42500*	32.31	31.95	0.36	0.77	0.05	1642.09	15505.09	2752.82	4502.20
Judy Creek	Lower	Judy Creek	7.85000*	33.11	32.65	0.46	0.77	0.03	1452.81	17182.47	1264.73	4310.55
Judy Creek	Lower	Judy Creek	8.27500*	33.93	33.51	0.42	0.81	0.00	1283.19	17046.79	1570.02	3031.81
Judy Creek	Lower	Judy Creek	8.70000*	34.66	34.23	0.43	0.73	0.00	1149.31	17437.84	1312.85	2816.06
Judy Creek	Lower	Judy Creek	9.12500*	35.36	34.90	0.46	0.69	0.01	945.32	18005.65	949.03	2265.13

Judy Creek	Lower Judy Creek	9.55000*	35.91	35.38	0.53	0.53	0.02	536.60	18914.45	448.96	1624.36
Judy Creek	Lower Judy Creek	9.975*	36.37	35.79	0.58	0.44	0.01	410.03	19243.63	246.35	1156.60
Judy Creek	Lower Judy Creek	10.4*	36.88	36.27	0.61	0.50	0.01	298.23	19497.10	104.68	1064.65
Judy Creek	Lower Judy Creek	10.825*	37.40	36.77	0.63	0.52	0.01	224.84	19643.40	31.75	896.96
Judy Creek	Lower Judy Creek	11.25*	37.94	37.29	0.65	0.54	0.01	177.39	19713.14	9.47	752.42
Judy Creek	Lower Judy Creek	11.675*	38.53	37.86	0.66	0.58	0.00	165.10	19729.30	5.59	681.23
Judy Creek	Lower Judy Creek	12.1*	39.18	38.51	0.66	0.65	0.00	177.14	19711.93	10.93	652.91
Judy Creek	Lower Judy Creek	12.525*	39.85	39.19	0.66	0.68	0.00	192.06	19689.72	18.22	638.47
Judy Creek	Lower Judy Creek	12.95*	40.52	39.86	0.66	0.67	0.00	213.46	19418.98	267.56	556.73
Judy Creek	Lower Judy Creek	13.375*	41.23	40.56	0.67	0.71	0.00	259.54	19601.70	38.76	513.99
Judy Creek	Lower Judy Creek	13.8	41.98	41.31	0.67	0.76	0.00	295.52	19567.05	37.43	509.32

Profile Output Table - Junctions

River	Reach	River Sta	W.S. Elev (ft)	E.G. Elev (ft)	Q Total (cfs)
Fish Creek	Upper Fish Creek	26.85	25.30	25.56	25700.00
Judy Creek	Lower Judy Creek	0.38	25.25	25.36	22100.00
Junction:	Fish Junct.				
Fish Creek	Lower Fish Creek	26.09	24.46	24.67	43600.00

Table E.3

HEC-RAS Run, Fish and Judy Creeks, 100-Year Flood Hydraulically Smooth Report

HEC-RAS Version 3.0.1 Mar 2001

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

```
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   X
XXXXXXXX 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: 100-Year Design Max and Min n-Values
Project File : 2002design.prj
Run Date and Time: 11/15/2002 12:30:41 PM

Project in English units

PLAN DATA

Plan Title: 100-Year n-values at 0.016
Plan File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\2002design.p03

Geometry Title: 100-Year Flood with n-Values at 0.016
Geometry File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\2002design.g02

Flow Title : 100-Year Flood Calibrated
Flow File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\2002design.f08

Plan Summary Information:

Number of:	Cross Sections =	79	Multitple Openings =	0
	Culverts =	0	Inline Weirs =	0
	Bridges =	0		

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculaton tolerance =	0.01
Maximum number of interations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary	
Conveyance Calculation Method:	At breaks in n values only
Friction Slope Method:	Average Friction Slope
Computational Flow Regime:	Subcritical Flow

FLOW DATA

Flow Title: 100-Year Flood Calibrated
 Flow File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\2002design.f08

Flow Data (cfs)

River	Reach	RS	Calibration
Fish Creek	Upper Fish Creek	43.3	25000
Fish Creek	Upper Fish Creek	32.4	25400
Fish Creek	Upper Fish Creek	26.85	25700
Fish Creek	Lower Fish Creek	26.09	43600
Fish Creek	Lower Fish Creek	25.1	43600
Fish Creek	Lower Fish Creek	18.4	44800
Fish Creek	Lower Fish Creek	12.6	45600
Fish Creek	Lower Fish Creek	11.7	45600
Fish Creek	Lower Fish Creek	0.7	53000
Judy Creek	Lower Judy Creek	13.8	19900
Judy Creek	Lower Judy Creek	7.0	21500
Judy Creek	Lower Judy Creek	0.38	22100

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Fish Creek	Lower Fish Creek	Calibration		Normal S = .00008

GEOMETRY DATA

Geometry Title: 100-Year Flood with n-Values at 0.016
 Geometry File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\2002design.g02

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Fish Creek	Upper Fish Creek		Fish Junct.
Fish Creek	Lower Fish Creek	Fish Junct.	
Judy Creek	Lower Judy Creek		Fish Junct.

JUNCTION INFORMATION

Name: Fish Junct.
 Description: Confluence of Fish and Judy Creek
 Energy computation Method

Length across Junction		Tributary	Reach	Length	Angle
River	Reach	River			
Fish Creek	Upper Fish Creek	Fish Creek	Lower Fish Creek	3915	
Judy Creek	Lower Judy Creek	Fish Creek	Lower Fish Creek	3694	

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 43.3

INPUT

Description: Cross Section at River Mile 43.3

Station Elevation Data num= 62									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3	95.5	63.1	87.2	195.6	35	1377.1	35.7	1387.5	37.1
1507	37.6	1802.5	39	1914.9	40.9	2104.3	38.2	2170.4	38.4
2182.2	37.3	2197.8	27.1	2203.6	25.7	2212.1	21.6	2222.7	18.7
2231.9	19.3	2242.5	18.7	2252.4	19.1	2261.6	21.5	2272.2	22.2
2282.1	23.4	2292.8	23.5	2302	24	2311.9	24.2	2322.5	25
2332.4	24.9	2342.3	25.3	2351.9	25.7	2405.5	27.5	2452.6	27.9
2505.3	28.1	2551.4	28.1	2562.1	29.4	2577.3	34.4	2587.3	35.1
2721.7	40.7	2906.1	42.2	3074.5	34.9	3160.8	34.5	3185	35.9
3475.7	32.8	3562.3	42.5	3907.5	44.9	4205.9	44.9	4504.3	43.2
4806.6	41.6	5103.9	39.6	5129.4	39.7	5282.4	39.8	5407.4	40.5
5701.3	42.8	5925.6	43.2	6115.3	51.7	6309.9	55.6	6604.2	56.5
6910.5	54.9	7207.6	52.8	7509.9	53.1	7808.3	51.6	8106.9	54.4
8409.5	53.4	8705.2	56.6						

Manning's n Values num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
3	.04	2182.2	.016	2562.1	.07	2721.7	.04

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	2182.2	2577.3		1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
3	2170.4	31.63	2562.1	8705.2	31.63

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	38.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.040	0.019	0.041
W.S. Elev (ft)	37.74	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	2896.37	4622.88	1624.54
E.G. Slope (ft/ft)	0.000140	Area (sq ft)	2896.37	4622.88	1624.54
Q Total (cfs)	25000.00	Flow (cfs)	2115.09	21480.97	1403.94
Top Width (ft)	2331.78	Top Width (ft)	1352.53	395.10	584.15
Vel Total (ft/s)	2.73	Avg. Vel. (ft/s)	0.73	4.65	0.86
Max Chl Dpth (ft)	19.04	Hydr. Depth (ft)	2.14	11.70	2.78
Conv. Total (cfs)	2116043.0	Conv. (cfs)	179025.1	1818186.0	118831.9
Length Wtd. (ft)	4451.66	Wetted Per. (ft)	1353.16	402.93	584.63
Min Ch El (ft)	18.70	Shear (lb/sq ft)	0.02	0.10	0.02
Alpha	2.49	Stream Power (lb/ft s)	0.01	0.46	0.02
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)	5628.30	7660.17	4950.69
C & E Loss (ft)	0.01	Cum SA (acres)	1741.11	647.37	1514.63

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 42.3916*

INPUT Description: Interpolated Cross Section at River Mile 42.39

Station Elevation Data num= 154									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.75	93.31	77.59	85.42	102.3	78.16	198.07	50.39	242.58	37.5
266.58	37.52	305.9	37.1	386.03	37.04	479.14	37.12	574.75	37.11
676.79	37.21	760.81	37.27	862.64	37.72	956.16	37.67	1010.33	37.57
1044.37	37.28	1120.15	37.56	1228.92	37.63	1270.14	37.66	1334.67	37.61

1427.27	37.29	1461.38	37.05	1525.6	37.14	1613.87	37.11	1695.17	37.65
1713.79	37.71	1723.85	38.74	1726.74	38.96	1743.34	38.64	1782.6	37.5
1812.83	37.4	1875.54	37.76	1921.76	38.05	1953	37.38	1977.44	37.13
2016.89	37.08	2092.76	37.22	2186.47	37.53	2243.5	37.66	2281	38.08
2306.08	38.42	2383.46	39.33	2481.03	38.24	2559.2	37.46	2580.2	37.33
2593.78	36.94	2619.3	36.75	2701.61	37.17	2713.39	36.4	2716.3	36.17
2719.46	34.24	2721.85	32.55	2724.96	30.71	2730.06	27.89	2733.4	26.06
2735.2	25.69	2739.75	24.76	2740.3	24.54	2745.4	22.48	2749.07	21
2750.49	20.67	2755.59	19.49	2760.68	18.28	2769.12	18.82	2778.83	18.28
2788.36	18.66	2796.28	20.63	2797.22	20.87	2807.42	21.53	2813.73	22.28
2816.95	22.66	2827.25	22.78	2831.18	22.99	2836.11	23.29	2845.64	23.55
2849.15	23.84	2855.84	24.32	2865.37	24.23	2874.9	24.6	2884.15	24.98
2931.34	26.51	2935.74	26.65	2981.08	27.05	3013.18	27.18	3031.81	27.19
3045.98	27.15	3063.96	26.97	3072.86	26.94	3076.19	26.98	3080.36	27.52
3085.77	28.28	3086.49	28.39	3101.12	33.37	3111.49	34.08	3112.41	34.13
3250.85	39.22	3255.48	39.25	3442.04	40.58	3563.17	35.93	3616.65	33.89
3706.13	33.55	3731.22	34.84	3799.83	34.2	3898.18	33.35	3948.94	33.46
4032.64	32.43	4083.73	37.34	4122.43	41.14	4283.73	42.01	4480.35	43.11
4502.5	43.1	4691.43	43.03	4789.75	43	4896.61	42.44	5086.54	41.67
5099.14	41.61	5412.58	40.3	5720.84	38.62	5735.79	38.68	5747.28	38.78
5905.92	39.69	5976.7	40.41	6035.53	40.86	6121.7	41.68	6215.24	42.39
6340.26	43.27	6430.19	43.43	6572.83	43.62	6637.38	46.16	6769.52	51.33
6855.5	52.82	6971.29	54.91	7083.03	55.26	7276.44	55.79	7281.74	55.77
7509.13	54.51	7594.02	54.11	7743.71	53.17	7902.07	52.18	7999.93	52.27
8161.19	52.41	8215.51	52.46	8372.04	51.78	8524.91	50.96	8595.19	51.47
8756.8	52.82	8834.52	53.64	8907.06	53.6	9071.62	53.02	9148.27	52.61
9186.86	52.88	9318.42	54.17	9360.04	54.93	9454.87	56.27		

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 2.75 .04 2716.3 .016 3086.49 .07 3101.12 .042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 2716.3 3101.12 1903.5 4751.08 1745.42 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 2.75 2716.3 30.85 3101.12 9454.87 30.85

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	37.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.	0.040	0.019	0.042
W.S. Elev (ft)	36.91	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	8.10	4494.96	1700.89
E.G. Slope (ft/ft)	0.000176	Area (sq ft)	8.10	4494.96	1700.89
Q Total (cfs)	25000.00	Flow (cfs)	1.34	23426.83	1571.84
Top Width (ft)	1077.32	Top Width (ft)	63.92	384.82	628.58
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)	0.16	5.21	0.92
Max Chl Dpth (ft)	18.63	Hydr. Depth (ft)	0.13	11.68	2.71
Conv. Total (cfs)	1885630.0	Conv. (cfs)	100.8	1766974.0	118556.0
Length Wtd. (ft)	4558.22	Wetted Per. (ft)	63.94	390.19	628.98
Min Ch El (ft)	18.28	Shear (lb/sq ft)	0.00	0.13	0.03
Alpha	1.57	Stream Power (lb/ft s)	0.00	0.66	0.03
Frctn Loss (ft)	0.83	Cum Volume (acre-ft)	5564.84	7162.93	4884.06
C & E Loss (ft)	0.00	Cum SA (acres)	1710.16	604.84	1490.33

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 41.4833*

INPUT
 Description: Interpolated Cross Section at River Mile 41.48

Station Elevation Data		num= 154		Elev		Sta		Elev		Sta	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.5	91.12	92.07	83.64	121.66	76.93	236.28	51.7	289.55			40
318.28	40.03	365.34	39.18	461.25	39.01	572.7	39.13	687.13			39.07
809.28	39.21	909.84	39.29	1031.72	40.15	1143.65	40	1208.49			39.77
1249.24	39.18	1339.93	39.7	1470.13	39.79	1519.46	39.82	1596.7			39.7
1707.54	39.02	1748.37	38.52	1825.22	38.68	1930.89	38.56	2028.19			39.61
2050.47	39.72	2062.52	40.69	2065.97	40.82	2085.85	40.13	2132.84			37.71
2169.01	37.41	2244.08	37.93	2299.4	38.33	2336.79	36.86	2366.05			36.27
2413.27	36.03	2504.07	36.02	2616.24	36.27	2684.49	36.32	2729.38			36.66
2759.4	36.99	2852.01	37.76	2968.8	36.7	3062.36	36.02	3087.5			36.01
3103.76	35.39	3134.3	35.3	3232.81	35.95	3246.92	35.28	3250.4			35.03
3253.84	33.06	3256.44	31.12	3259.82	29.29	3265.36	26.69	3268.99			25.02
3270.96	24.68	3275.9	23.82	3276.5	23.62	3282.04	21.75	3286.03			20.4
3287.58	20.1	3293.12	19.01	3298.67	17.85	3306.33	18.35	3315.17			17.85
3324.33	18.21	3331.94	20.02	3332.84	20.24	3342.65	20.87	3348.71			21.56
3351.81	21.92	3361.71	22.06	3365.48	22.27	3370.22	22.58	3379.38			22.91
3382.76	23.2	3389.19	23.64	3398.35	23.57	3407.51	23.91	3416.39			24.25
3461.76	25.67	3465.99	25.81	3509.57	26.19	3540.42	26.34	3558.33			26.29
3571.95	26.2	3589.23	25.83	3597.78	25.78	3600.99	25.86	3604.99			26.4
3610.19	27.26	3610.89	27.37	3624.95	32.33	3635.69	33.07	3636.64			33.11
3779.99	37.73	3784.79	37.76	3977.99	38.96	4103.42	34.73	4158.8			32.89
4251.46	32.59	4277.44	33.77	4348.5	33.21	4450.34	32.52	4502.9			33.25
4589.57	32.06	4642.49	36.37	4682.55	39.79	4849.6	40.43	5053.2			41.32
5076.14	41.3	5271.78	41.15	5373.59	41.1	5484.25	40.56	5680.94			40.07
5693.99	40.03	6018.57	39	6337.78	37.64	6353.27	37.7	6365.16			37.85
6529.44	39.58	6602.74	40.64	6663.65	41.21	6752.9	42.21	6849.75			42.93
6979.22	43.75	7072.35	43.9	7220.05	44.03	7286.9	46.32	7423.73			50.96
7512.77	52.27	7632.68	54.23	7748.39	54.59	7948.67	55.08	7954.16			55.06
8189.64	53.69	8277.55	53.33	8432.56	52.47	8596.55	51.57	8697.89			51.64
8864.87	51.77	8921.13	51.83	9083.22	51.22	9241.52	50.31	9314.3			50.71
9481.66	51.95	9562.13	52.89	9637.25	53.02	9807.66	52.4	9887.04			51.81
9927	51.95	10063.23	53.16	10106.34	54.26	10204.53	55.93				

Manning's n Values		num= 4		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2.5	.041	3250.4	.016	3610.89	.07	3624.95	.043

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	3250.4	3624.95		1903.5	4751.08	1745.42	.1 .3

Blocked Obstructions		num= 2		Sta		Elev	
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Elev
2.5	3250.4	30.06	3624.95	10204.53	30.06		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	36.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.041	0.019	0.043
W.S. Elev (ft)	36.06	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	84.67	4353.51	1775.06
E.G. Slope (ft/ft)	0.000187	Area (sq ft)	84.67	4353.51	1775.06
Q Total (cfs)	25000.00	Flow (cfs)	22.68	23363.68	1613.64
Top Width (ft)	1360.21	Top Width (ft)	307.77	374.55	677.89
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)	0.27	5.37	0.91
Max Chl Dpth (ft)	18.21	Hydr. Depth (ft)	0.28	11.62	2.62

Conv. Total (cfs)	1828607.0	Conv. (cfs)	1659.1	1708919.0	118028.5
Length Wtd. (ft)	4547.38	Wetted Per. (ft)	307.81	379.46	678.22
Min Ch El (ft)	17.85	Shear (lb/sq ft)	0.00	0.13	0.03
Alpha	1.67	Stream Power (lb/ft s)	0.00	0.72	0.03
Frctn Loss (ft)	0.88	Cum Volume (acre-ft)	5562.82	6680.38	4814.42
C & E Loss (ft)	0.00	Cum SA (acres)	1702.04	563.42	1464.15

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 40.575*

INPUT
 Description: Interpolated Cross Section at River Mile 40.58
 Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.25	88.93	106.56	81.85	141.01	75.71	274.49	53.01	336.53	42.5
369.98	42.53	424.79	41.25	536.48	40.98	666.26	41.13	799.52	41.02
941.76	41.2	1058.86	41.31	1200.79	42.57	1331.15	42.33	1406.65	41.97
1454.11	41.09	1559.72	41.84	1711.34	41.95	1768.79	41.99	1858.73	41.79
1987.81	40.75	2035.35	39.98	2124.85	40.21	2247.9	40.01	2361.21	41.57
2387.16	41.74	2401.19	42.64	2405.21	42.68	2428.35	41.62	2483.07	37.92
2525.2	37.42	2612.61	38.09	2677.04	38.61	2720.58	36.35	2754.65	35.42
2809.64	34.98	2915.38	34.82	3046	35.01	3125.49	34.98	3177.77	35.23
3212.72	35.56	3320.57	36.2	3456.57	35.16	3565.53	34.59	3594.8	34.69
3613.73	33.84	3649.3	33.85	3764.02	34.72	3780.45	34.16	3784.5	33.9
3788.21	31.89	3791.03	29.69	3794.68	27.87	3800.67	25.49	3804.59	23.98
3806.71	23.68	3812.06	22.88	3812.7	22.69	3818.69	21.01	3823	19.8
3824.68	19.53	3830.66	18.53	3836.65	17.43	3843.55	17.88	3851.5	17.43
3860.29	17.77	3867.59	19.41	3868.46	19.61	3877.87	20.2	3883.69	20.85
3886.66	21.18	3896.16	21.34	3899.79	21.54	3904.33	21.87	3913.12	22.26
3916.36	22.56	3922.53	22.96	3931.32	22.9	3940.11	23.21	3948.64	23.53
3992.17	24.83	3996.23	24.96	4038.05	25.34	4067.66	25.49	4084.84	25.38
4097.91	25.25	4114.49	24.7	4122.7	24.62	4125.78	24.75	4129.62	25.29
4134.61	26.23	4135.28	26.36	4148.77	31.3	4159.88	32.05	4160.86	32.1
4309.14	36.25	4314.1	36.28	4513.93	37.34	4643.67	33.53	4700.95	31.88
4796.79	31.64	4823.67	32.71	4897.16	32.22	5002.5	31.69	5056.86	33.05
5146.51	31.69	5201.24	35.39	5242.68	38.43	5415.46	38.86	5626.05	39.54
5649.77	39.5	5852.13	39.28	5957.44	39.2	6071.9	38.68	6275.34	38.48
6288.83	38.44	6624.56	37.7	6954.73	36.65	6970.74	36.72	6983.04	36.93
7152.96	39.47	7228.77	40.86	7291.78	41.57	7384.09	42.74	7484.27	43.47
7618.18	44.22	7714.5	44.37	7867.28	44.45	7936.42	46.49	8077.95	50.59
8170.04	51.72	8294.07	53.54	8413.75	53.92	8620.91	54.37	8626.59	54.35
8870.14	52.87	8961.07	52.54	9121.4	51.76	9291.02	50.95	9395.84	51.02
9568.55	51.14	9626.74	51.19	9794.4	50.66	9958.13	49.67	10033.41	49.95
10206.51	51.07	10289.75	52.13	10367.45	52.45	10543.7	51.78	10625.81	51.02
10667.14	51.03	10808.05	52.16	10852.64	53.58	10954.2	55.6		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val
2.25	.041	3784.5	.016	4135.28	.07
				4148.77	.043

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 3784.5 4148.77 1903.5 4751.08 1745.42 .1 .3
 Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
2.25	3784.5	29.29	4148.77	10954.2	29.29

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	35.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.041	0.019	0.043
W.S. Elev (ft)	35.15	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	296.78	4192.73	1819.13
E.G. Slope (ft/ft)	0.000201	Area (sq ft)	296.78	4192.73	1819.13
Q Total (cfs)	25000.00	Flow (cfs)	101.98	23241.12	1656.90
Top Width (ft)	1792.31	Top Width (ft)	697.91	364.27	730.13
Vel Total (ft/s)	3.96	Avg. Vel. (ft/s)	0.34	5.54	0.91
Max Chl Dpth (ft)	17.72	Hydr. Depth (ft)	0.43	11.51	2.49
Conv. Total (cfs)	1761972.0	Conv. (cfs)	7187.3	1638008.0	116776.5
Length Wtd. (ft)	4533.07	Wetted Per. (ft)	697.95	368.84	730.42
Min Ch El (ft)	17.43	Shear (lb/sq ft)	0.01	0.14	0.03
Alpha	1.82	Stream Power (lb/ft s)	0.00	0.79	0.03
Frctn Loss (ft)	0.96	Cum Volume (acre-ft)	5554.48	6214.31	4742.42
C & E Loss (ft)	0.00	Cum SA (acres)	1680.06	523.13	1435.95

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 39.6666*

INPUT
 Description: Interpolated Cross Section at River Mile 39.67
 Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2	86.73	121.05	80.07	160.37	74.49	312.7	54.32	383.51	45
421.68	45.04	484.23	43.32	611.7	42.95	759.82	43.14	911.91	42.97
1074.24	43.2	1207.89	43.33	1369.87	45	1518.64	44.66	1604.81	44.18
1658.97	42.99	1779.51	43.98	1952.54	44.11	2018.11	44.16	2120.76	43.88
2268.07	42.48	2322.33	41.45	2424.48	41.74	2564.91	41.47	2694.24	43.53
2723.84	43.75	2739.86	44.59	2744.44	44.54	2770.86	43.1	2833.31	38.13
2881.39	37.43	2981.15	38.26	3054.68	38.88	3104.37	35.83	3143.26	34.56
3206.01	33.93	3326.7	33.62	3475.77	33.76	3566.48	33.64	3626.15	33.81
3666.04	34.13	3789.13	34.63	3944.34	33.62	4068.69	33.16	4102.1	33.37
4123.71	32.29	4164.29	32.4	4295.23	33.5	4313.98	33.05	4318.6	32.77
4322.59	30.71	4325.61	28.26	4329.54	26.45	4335.97	24.29	4340.18	22.95
4342.47	22.67	4348.21	21.94	4348.9	21.77	4355.33	20.28	4359.97	19.2
4361.77	18.96	4368.2	18.05	4374.63	17	4380.77	17.4	4387.83	17
4396.25	17.32	4403.25	18.8	4404.08	18.98	4413.09	19.54	4418.67	20.13
4421.52	20.44	4430.62	20.62	4434.09	20.81	4438.44	21.16	4446.86	21.62
4449.97	21.92	4455.88	22.28	4464.3	22.23	4472.72	22.52	4480.88	22.8
4522.59	24	4526.47	24.11	4566.54	24.49	4594.89	24.65	4611.36	24.47
4623.88	24.3	4639.76	23.57	4647.62	23.47	4650.57	23.63	4654.25	24.18
4659.03	25.21	4659.67	25.35	4672.6	30.27	4684.07	31.04	4685.09	31.09
4838.29	34.77	4843.41	34.79	5049.87	35.73	5183.91	32.32	5243.1	30.88
5342.12	30.69	5369.89	31.64	5445.82	31.23	5554.65	30.86	5610.82	32.84
5703.44	31.31	5759.99	34.41	5802.81	37.08	5981.32	37.29	6198.9	37.75
6223.41	37.7	6432.48	37.4	6541.29	37.3	6659.54	36.81	6869.73	36.88
6883.68	36.86	7230.54	36.4	7571.67	35.67	7588.21	35.74	7600.93	36.01
7776.48	39.36	7854.81	41.09	7919.91	41.92	8015.28	43.27	8118.78	44
8257.14	44.69	8356.66	44.84	8514.5	44.86	8585.94	46.66	8732.17	50.22
8827.32	51.17	8955.45	52.85	9079.12	53.25	9293.14	53.67	9299.01	53.65
9550.65	52.05	9644.59	51.75	9810.25	51.05	9985.49	50.3310093	79	50.4
10272.24	50.510332	36	50.5510505	58	50.0910674	75	49.0310752	52	49.19
10931.37	50.211017	37	51.3711097	64	51.8811279	75	51.1611364	58	50.22
11407.28	50.111552	87	51.1511598	93	52.9111703	87	55.27		

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 2 .042 4318.6 .016 4659.67 .07 4672.6 .044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4318.6 4672.6 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 2 4318.6 28.51 4672.6 11703.87 28.51

CROSS SECTION OUTPUT Profile #Calibration

Parameter	Value	Element	Left OB	Channel	Right OB
E.G. Elev (ft)	34.64	Element			
Vel Head (ft)	0.48	Wt. n-Val.	0.042	0.019	0.044
W.S. Elev (ft)	34.16	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	624.45	4007.87	1816.72
E.G. Slope (ft/ft)	0.000222	Area (sq ft)	624.45	4007.87	1816.72
Q Total (cfs)	25000.00	Flow (cfs)	273.22	23112.54	1614.24
Top Width (ft)	2084.86	Top Width (ft)	946.86	354.00	784.00
Vel Total (ft/s)	3.88	Avg. Vel. (ft/s)	0.44	5.77	0.89
Max Chl Dpth (ft)	17.16	Hydr. Depth (ft)	0.66	11.32	2.32
Conv. Total (cfs)	1677853.0	Conv. (cfs)	18337.1	1551177.0	108338.5
Length Wtd. (ft)	4523.72	Wetted Per. (ft)	946.91	358.32	784.25
Min Ch El (ft)	17.00	Shear (lb/sq ft)	0.01	0.16	0.03
Alpha	2.05	Stream Power (lb/ft s)	0.00	0.89	0.03
Frctn Loss (ft)	1.09	Cum Volume (acre-ft)	5534.35	5767.09	4669.57
C & E Loss (ft)	0.01	Cum SA (acres)	1644.13	483.96	1405.61

Warning: Divided flow computed for this cross-section.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 38.7583*

INPUT
 Description: Interpolated Cross Section at River Mile 38.76

Station	Elevation	Data	num=	154
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev
1.75	84.54	135.53	78.29	179.72 73.26 350.92 55.63 430.48 47.5
473.38	47.55	543.68	45.39	686.93 44.91 853.38 45.15 1024.29 44.93
1206.72	45.2	1356.92	45.35	1538.95 47.42 1706.14 46.99 1802.97 46.38
1863.84	44.89	1999.29	46.12	2193.75 46.27 2267.44 46.33 2382.79 45.97
2548.34	44.2	2609.32	42.92	2724.11 43.27 2881.92 42.92 3027.26 45.49
3060.53	45.76	3078.52	46.54	3083.68 46.4 3113.36 44.59 3183.55 38.33
3237.58	37.44	3349.69	38.42	3432.32 39.16 3488.16 35.31 3531.86 33.7
3602.39	32.87	3738.01	32.42	3905.54 32.5 4007.48 32.3 4074.53 32.38
4119.36	32.7	4257.68	33.06	4432.11 32.08 4571.85 31.73 4609.4 32.04
4633.68	30.75	4679.29	30.95	4826.43 32.27 4847.51 31.93 4852.7 31.63
4856.96	29.53	4860.2	26.83	4864.39 25.04 4871.27 23.09 4875.78 21.91
4878.22	21.66	4884.36	21	4885.1 20.85 4891.98 19.54 4896.94 18.6
4898.86	18.39	4905.74	17.57	4912.62 16.58 4917.98 16.92 4924.17 16.58
4932.22	16.88	4938.91	18.19	4939.7 18.34 4948.32 18.87 4953.65 19.41
4956.37	19.7	4965.07	19.9	4968.39 20.09 4972.55 20.46 4980.6 20.97
4983.57	21.28	4989.22	21.6	4997.27 21.57 5005.32 21.82 5013.13 22.08
5053	23.16	5056.72	23.26	5095.02 23.64 5122.13 23.81 5137.88 23.57
5149.84	23.35	5165.03	22.43	5172.55 22.31 5175.36 22.51 5178.88 23.07

5183.45	24.18	5184.06	24.33	5196.43	29.23	5208.27	30.02	5209.32	30.08
5367.43	33.28	5372.72	33.3	5585.81	34.11	5724.16	31.12	5785.25	29.87
5887.45	29.73	5916.11	30.58	5994.48	30.24	6106.81	30.02	6164.78	32.64
6260.38	30.94	6318.74	33.44	6362.93	35.72	6547.18	35.71	6771.75	35.96
6797.05	35.9	7012.84	35.53	7125.13	35.41	7247.19	34.93	7464.13	35.28
7478.52	35.27	7836.53	35.1	8188.61	34.69	8205.69	34.76	8218.81	35.08
8400	39.26	8480.85	41.31	8548.04	42.28	8646.47	43.8	8753.3	44.54
8896.09	45.16	8998.81	45.31	9161.73	45.28	9235.46	46.83	9386.38	49.86
9484.59	50.63	9616.84	52.17	9744.48	52.58	9965.38	52.96	9971.44	52.94
10231.16	51.23	10328.12	50.97	10499.09	50.35	10679.97	49.72	10791.74	49.77
10975.92	49.86	11037.97	49.91	11216.75	49.53	11391.36	48.39	11471.63	48.43
11656.22	49.32	11744.98	50.62	11827.84	51.31	12015.79	50.54	12103.34	49.43
12147.42	49.18	12297.68	50.14	12345.23	52.23	12453.53	54.93		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1.75	.042	4852.7	.016	5184.06	.07	5196.43	.045

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

4852.7	5196.43	1903.5	4751.08	1745.42	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1.75	4852.7	27.72	5196.43	12453.53	27.72

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	33.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.	0.042	0.019	0.045
W.S. Elev (ft)	33.01	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	927.68	3772.93	1689.82
E.G. Slope (ft/ft)	0.000259	Area (sq ft)	927.68	3772.93	1689.82
Q Total (cfs)	25000.00	Flow (cfs)	482.71	23065.47	1451.82
Top Width (ft)	2404.77	Top Width (ft)	1231.81	343.73	829.23
Vel Total (ft/s)	3.91	Avg. Vel. (ft/s)	0.52	6.11	0.86
Max Chl Dpth (ft)	16.43	Hydr. Depth (ft)	0.75	10.98	2.04
Conv. Total (cfs)	1552854.0	Conv. (cfs)	29982.9	1432693.0	90178.6
Length Wtd. (ft)	4528.63	Wetted Per. (ft)	1231.87	347.88	829.46
Min Ch El (ft)	16.58	Shear (lb/sq ft)	0.01	0.18	0.03
Alpha	2.26	Stream Power (lb/ft s)	0.01	1.07	0.03
Frctn Loss (ft)	1.08	Cum Volume (acre-ft)	5500.44	5342.77	4599.32
C & E Loss (ft)	0.01	Cum SA (acres)	1596.52	445.91	1373.29

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 37.85*

INPUT Description: Interpolated Cross Section at River Mile 37.85

Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.5	82.35	150.02	76.51	199.08	72.04	389.13	56.94	477.46	50
525.09	50.06	603.13	47.47	762.15	46.88	946.94	47.16	1136.68	46.88
1339.21	47.2	1505.94	47.37	1708.03	49.85	1893.63	49.32	2001.13	48.58
2068.7	46.79	2219.08	48.26	2434.96	48.43	2516.76	48.49	2644.82	48.06
2828.6	45.93	2896.3	44.39	3023.73	44.81	3198.93	44.38	3360.28	47.45

3397.21	47.77	3417.19	48.49	3422.92	48.27	3455.87	46.08	3533.78	38.54
3593.77	37.44	3718.23	38.59	3809.96	39.44	3871.95	34.8	3920.47	32.84
3998.76	31.82	4149.32	31.21	4335.3	31.24	4448.48	30.96	4522.91	30.95
4572.68	31.27	4726.24	31.49	4919.88	30.54	5075.02	30.29	5116.7	30.72
5143.65	29.2	5194.29	29.5	5357.64	31.04	5381.03	30.81	5386.8	30.5
5391.34	28.36	5394.78	25.39	5399.25	23.62	5406.58	21.9	5411.38	20.87
5413.98	20.65	5420.51	20.06	5421.3	19.93	5428.63	18.81	5433.9	18
5435.95	17.82	5443.28	17.09	5450.6	16.15	5455.2	16.45	5460.5	16.15
5468.18	16.43	5474.56	17.57	5475.32	17.71	5483.54	18.21	5488.63	18.7
5491.22	18.96	5499.52	19.18	5502.69	19.36	5506.66	19.75	5514.34	20.32
5517.18	20.64	5522.57	20.62	5530.25	20.9	5537.93	21.13	5545.38	21.36
5583.41	22.32	5586.96	22.42	5623.5	22.78	5649.37	22.96	5664.39	22.66
5675.81	22.4	5690.3	21.3	5697.47	21.15	5700.16	21.39	5703.51	21.96
5707.88	23.15	5708.46	23.32	5720.25	28.2	5732.46	29.01	5733.54	29.07
5896.58	31.8	5902.03	31.82	6121.76	32.49	6264.41	29.92	6327.4	28.87
6432.78	28.78	6462.33	29.51	6543.14	29.25	6658.96	29.19	6718.74	32.43
6817.31	30.57	6877.49	32.46	6923.06	34.37	7113.04	34.14	7344.59	34.17
7370.68	34.1	7593.19	33.65	7708.98	33.51	7834.83	33.06	8058.52	33.68
8073.36	33.69	8442.51	33.8	8805.55	33.71	8823.16	33.78	8836.69	34.16
9023.52	39.15	9106.88	41.54	9176.16	42.63	9277.66	44.33	9387.81	45.08
9535.05	45.64	9640.97	45.78	9808.95	45.69	9884.98	46.99	10040.6	49.49
10141.86	50.08	10278.23	51.48	10409.84	51.91	10637.61	52.25	10643.86	52.24
10911.66	50.41	11011.64	50.18	11187.93	49.64	11374.44	49.11	11489.69	49.15
11679.6	49.22	11743.59	49.28	11927.93	48.97	12107.97	47.74	12190.74	47.67
12381.07	48.45	12472.6	49.86	12558.03	50.73	12751.84	49.92	12842.11	48.64
12887.56	48.25	13042.5	49.14	13091.52	51.56	13203.2	54.6		

Manning's n Values			num= 3		
Sta	n	Val	Sta	n	Val
1.5	.043	5386.8	.016	5720.25	.046

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	5386.8	5720.25		1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions			num= 2		
Sta L	Sta R	Elev	Sta L	Sta R	Elev
1.5	5386.8	26.94	5720.25	13203.2	26.94

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	32.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.043	0.016	0.046
W.S. Elev (ft)	31.84	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	1322.34	3543.38	1563.68
E.G. Slope (ft/ft)	0.000216	Area (sq ft)	1322.34	3543.38	1563.68
Q Total (cfs)	25000.00	Flow (cfs)	649.26	23174.46	1176.28
Top Width (ft)	2570.94	Top Width (ft)	1389.82	333.45	847.67
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)	0.49	6.54	0.75
Max Chl Dpth (ft)	15.69	Hydr. Depth (ft)	0.95	10.63	1.84
Conv. Total (cfs)	1702021.0	Conv. (cfs)	44202.4	1577737.0	80082.1
Length Wtd. (ft)	4495.37	Wetted Per. (ft)	1389.89	337.52	847.86
Min Ch El (ft)	16.15	Shear (lb/sq ft)	0.01	0.14	0.02
Alpha	2.62	Stream Power (lb/ft s)	0.01	0.92	0.02
Froctn Loss (ft)	1.00	Cum Volume (acre-ft)	5451.28	4943.77	4534.14
C & E Loss (ft)	0.00	Cum SA (acres)	1539.24	408.98	1339.69

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 36.9416*

INPUT

Description: Interpolated Cross Section at River Mile 36.94

Station Elevation Data		num= 154							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.25	80.16	164.51	74.73	218.43	70.82	427.34	58.25	524.43	52.5
576.79	52.56	662.57	49.54	837.38	48.85	1040.5	49.16	1249.07	48.83
1471.69	49.2	1654.97	49.39	1877.11	52.27	2081.13	51.65	2199.29	50.79
2273.57	48.69	2438.87	50.4	2676.17	50.6	2766.08	50.66	2906.85	50.15
3108.87	47.66	3183.28	45.86	3323.36	46.34	3515.94	45.83	3693.3	49.4
3733.9	49.79	3755.86	50.45	3762.15	50.13	3798.37	47.56	3884.02	38.75
3949.96	37.45	4086.77	38.75	4187.6	39.71	4255.74	34.28	4309.07	31.99
4395.13	30.77	4560.64	30.01	4765.07	29.98	4889.47	29.62	4971.29	29.53
5026	29.85	5194.8	29.92	5407.65	29	5578.18	28.86	5624	29.4
5653.63	27.65	5709.29	28.05	5888.85	29.82	5914.56	29.69	5920.9	29.37
5925.72	27.18	5929.37	23.96	5934.11	22.2	5941.88	20.7	5946.97	19.83
5949.73	19.64	5956.66	19.12	5957.5	19.01	5965.27	18.07	5970.87	17.4
5973.04	17.25	5980.81	16.61	5988.58	15.73	5992.42	15.97	5996.83	15.73
6004.14	15.99	6010.22	16.96	6010.94	17.08	6018.77	17.54	6023.61	17.98
6026.08	18.21	6033.98	18.46	6036.99	18.63	6040.77	19.04	6048.08	19.68
6050.78	20	6055.91	20.24	6063.22	20.23	6070.53	20.43	6077.62	20.63
6113.83	21.49	6117.21	21.57	6151.99	21.93	6176.61	22.12	6190.9	21.75
6201.77	21.45	6215.56	20.17	6222.39	19.99	6224.95	20.28	6228.15	20.85
6232.3	22.13	6232.85	22.3	6244.08	27.17	6256.66	27.99	6257.77	28.06
6425.73	30.32	6431.34	30.33	6657.7	30.87	6804.66	28.71	6869.54	27.86
6978.11	27.83	7008.55	28.45	7091.8	28.26	7211.12	28.36	7272.7	32.23
7374.25	30.2	7436.24	31.48	7483.19	33.01	7678.9	32.57	7917.44	32.38
7944.32	32.3	8173.54	31.77	8292.83	31.61	8422.48	31.18	8652.92	32.09
8668.21	32.1	9048.5	32.5	9422.49	32.72	9440.63	32.8	9454.57	33.23
9647.04	39.04	9732.92	41.77	9804.29	42.99	9908.85	44.85	10022.33	45.62
10174.01	46.11	10283.12	46.25	10456.18	46.11	10534.5	47.16	10694.82	49.12
10799.14	49.53	10939.62	50.79	11075.2	51.25	11309.84	51.54	11316.28	51.53
11592.17	49.59	11695.17	49.41	11876.78	48.93	12068.91	48.48	12187.64	48.52
12383.29	48.59	12449.2	48.64	12639.11	48.41	12824.58	47.11	12909.85	46.91
13105.93	47.57	13200.21	49.11	13288.23	50.16	13487.88	49.31	13580.88	47.84
13627.7	47.33	13787.32	48.13	13837.82	50.88	13952.87	54.27		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1.25	.043	5920.9	.016	6244.08	.046

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	5920.9	6244.08		1903.5	4751.08	1745.42	.1 .3

Blocked Obstructions		num= 2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	5920.9	26.16	6244.08	13952.87	26.16

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	31.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.043	0.016	0.046
W.S. Elev (ft)	30.85	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	2034.84	3378.66	1697.38
E.G. Slope (ft/ft)	0.000228	Area (sq ft)	2034.84	3378.66	1697.38
Q Total (cfs)	25000.00	Flow (cfs)	1283.40	22470.14	1246.46
Top Width (ft)	2917.29	Top Width (ft)	1531.60	323.18	1062.51
Vel Total (ft/s)	3.52	Avg. Vel. (ft/s)	0.63	6.65	0.73
Max Chl Dpth (ft)	15.12	Hydr. Depth (ft)	1.33	10.45	1.60
Conv. Total (cfs)	1655299.0	Conv. (cfs)	84976.5	1487792.0	82530.3
Length Wtd. (ft)	4392.71	Wetted Per. (ft)	1531.68	327.23	1062.67

Min Ch El (ft)	15.73	Shear (lb/sq ft)	0.02	0.15	0.02
Alpha	3.22	Stream Power (lb/ft s)	0.01	0.98	0.02
Frctn Loss (ft)	1.01	Cum Volume (acre-ft)	5377.93	4566.28	4468.80
C & E Loss (ft)	0.01	Cum SA (acres)	1475.41	373.17	1301.42

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

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 36.0333*

INPUT
Description: Interpolated Cross Section at River Mile 36.03
Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1	77.97	178.99	72.94	237.78	69.59	465.55	59.56	571.41	55
628.49	55.07	722.02	51.61	912.6	50.82	1134.06	51.17	1361.45	50.79
1604.17	51.2	1803.99	51.42	2046.19	54.7	2268.62	53.98	2397.46	52.99
2478.44	50.59	2658.65	52.54	2917.37	52.76	3015.41	52.83	3168.88	52.24
3389.14	49.39	3470.27	47.33	3622.99	47.87	3832.95	47.28	4026.32	51.36
4070.59	51.8	4094.53	52.4	4101.39	51.99	4140.88	49.05	4234.25	38.96
4306.15	37.46	4455.3	38.91	4565.24	39.99	4639.54	33.76	4697.68	31.13
4791.51	29.71	4971.95	28.81	5194.83	28.73	5330.47	28.28	5419.67	28.1
5479.32	28.42	5663.35	28.35	5895.42	27.46	6081.35	27.43	6131.3	28.08
6163.6	26.1	6224.29	26.6	6420.05	28.59	6448.09	28.57	6455	28.23
6460.09	26.01	6463.96	22.53	6468.97	20.78	6477.19	19.5	6482.57	18.79
6485.48	18.63	6492.82	18.18	6493.7	18.09	6501.92	17.34	6507.84	16.8
6510.13	16.68	6518.35	16.12	6526.57	15.3	6529.63	15.5	6533.17	15.3
6540.11	15.54	6545.88	16.35	6546.56	16.45	6553.99	16.88	6558.58	17.26
6560.93	17.47	6568.43	17.74	6571.29	17.91	6574.88	18.33	6581.82	19.03
6584.38	19.36	6589.26	19.56	6596.2	19.57	6603.14	19.74	6609.87	19.91
6644.24	20.65	6647.45	20.72	6680.47	21.08	6703.85	21.28	6717.42	20.85
6727.74	20.5	6740.83	19.03	6747.31	18.83	6749.74	19.16	6752.78	19.74
6756.72	21.1	6757.24	21.29	6767.9	26.13	6780.85	26.98	6782	27.05
6954.87	28.84	6960.66	28.85	7193.64	29.25	7344.91	27.51	7411.69	26.86
7523.44	26.87	7554.77	27.38	7640.46	27.26	7763.28	27.53	7826.66	32.02
7931.18	29.83	7994.99	30.51	8043.31	31.65	8244.76	30.99	8490.29	30.59
8517.95	30.5	8753.89	29.9	8876.67	29.71	9010.12	29.3	9247.32	30.49
9263.05	30.52	9654.48	31.21	10039.44	31.74	10058.11	31.82	10072.45	32.31
10270.56	38.93	10358.95	41.99	10432.42	43.34	10540.04	45.38	10656.84	46.15
10812.97	46.58	10925.28	46.72	11103.4	46.52	11184.02	47.33	11349.03	48.75
11456.41	48.99	11601.01	50.11	11740.56	50.58	11982.08	50.83	11988.71	50.82
12272.68	48.78	12378.69	48.61	12565.62	48.23	12763.38	47.87	12885.59	47.9
13086.97	47.95	13154.81	48.13	13350.29	47.85	13541.19	46.46	13628.96	46.15
13830.78	46.71	13927.83	48.35	14018.42	49.59	14223.92	48.68	14319.65	47.05
14367.84	46.41	14532.13	47.13	14584.12	50.21	14702.53	53.93		

Sta	n Val	Sta	n Val	Sta	n Val
1	.043	6455	.016	6767.9	.047

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
6455 6767.9 1903.5 4751.08 1745.42 .1 .3

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1	6455	25.37	6767.9	14702.53	25.37

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	30.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.	0.043	0.016	0.047
W.S. Elev (ft)	29.86	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	2854.77	3219.33	2042.13
E.G. Slope (ft/ft)	0.000233	Area (sq ft)	2854.77	3219.33	2042.13
Q Total (cfs)	25000.00	Flow (cfs)	2148.28	21387.71	1464.01
Top Width (ft)	3363.03	Top Width (ft)	1673.54	312.90	1376.59
Vel Total (ft/s)	3.08	Avg. Vel. (ft/s)	0.75	6.64	0.72
Max Chl Dpth (ft)	14.56	Hydr. Depth (ft)	1.71	10.29	1.48
Conv. Total (cfs)	1638912.0	Conv. (cfs)	140833.7	1402103.0	95975.4
Length Wtd. (ft)	4224.31	Wetted Per. (ft)	1673.63	317.00	1376.73
Min Ch El (ft)	15.30	Shear (lb/sq ft)	0.02	0.15	0.02
Alpha	3.99	Stream Power (lb/ft s)	0.02	0.98	0.02
Frctn Loss (ft)	0.94	Cum Volume (acre-ft)	5271.09	4206.46	4393.88
C & E Loss (ft)	0.03	Cum SA (acres)	1405.38	338.48	1252.56

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 35.125*

INPUT

Description: Interpolated Cross Section at River Mile 35.13

Station Elevation Data		num= 154							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.75	75.77	193.48	71.16	257.14	68.37	503.76	60.87	618.39	57.5
680.19	57.58	781.46	53.68	987.83	52.79	1227.62	53.18	1473.84	52.74
1736.65	53.2	1953.02	53.44	2215.26	57.12	2456.12	56.31	2595.62	55.19
2683.3	52.5	2878.44	54.68	3158.58	54.92	3264.73	55	3430.91	54.33
3669.4	51.12	3757.25	48.79	3922.62	49.4	4149.97	48.74	4359.34	53.32
4407.27	53.81	4433.2	54.35	4440.62	53.85	4483.38	50.54	4584.49	39.17
4662.33	37.47	4823.84	39.08	4942.88	40.27	5023.33	33.25	5086.28	30.27
5187.88	28.66	5383.26	27.61	5624.6	27.47	5771.46	26.94	5868.06	26.68
5932.64	26.99	6131.91	26.79	6383.19	25.92	6584.51	26	6638.6	26.76
6673.58	24.55	6739.29	25.15	6951.26	27.36	6981.62	27.45	6989.1	27.1
6994.47	24.83	6998.54	21.1	7003.83	19.36	7012.49	18.3	7018.16	17.75
7021.24	17.63	7028.97	17.24	7029.9	17.16	7038.56	16.6	7044.8	16.2
7047.23	16.11	7055.89	15.64	7064.55	14.88	7066.85	15.02	7069.5	14.88
7076.07	15.1	7081.53	15.74	7082.18	15.82	7089.21	16.21	7093.56	16.55
7095.79	16.73	7102.89	17.02	7105.6	17.18	7108.99	17.62	7115.56	18.39
7117.99	18.72	7122.6	18.88	7129.17	18.9	7135.74	19.04	7142.11	19.18
7174.66	19.81	7177.69	19.87	7208.95	20.22	7231.08	20.43	7243.93	19.94
7253.7	19.55	7266.1	17.9	7272.23	17.67	7274.53	18.04	7277.41	18.63
7281.14	20.08	7281.64	20.28	7291.73	25.1	7305.04	25.96	7306.22	26.03
7484.02	27.35	7489.97	27.36	7729.59	27.63	7885.16	26.31	7953.84	25.85
8068.77	25.92	8100.99	26.32	8189.12	26.27	8315.43	26.7	8380.62	31.82
8488.12	29.46	8553.75	29.53	8603.44	30.3	8810.62	29.42	9063.14	28.81
9091.59	28.7	9334.24	28.02	9460.52	27.81	9597.77	27.43	9841.71	28.89
9857.89	28.93	10260.47	29.91	10656.38	30.76	10675.58	30.84	10690.33	31.39
10894.08	38.82	10984.99	42.22	11060.55	43.71	11171.23	45.91	11291.36	46.69
11451.93	47.06	11567.43	47.19	11750.63	46.94	11833.54	47.51	12003.25	48.38
12113.68	48.44	12262.4	49.42	12405.92	49.91	12654.31	50.12	12661.13	50.12
12953.18	47.96	13062.21	47.82	13254.47	47.52	13457.86	47.25	13583.55	47.27
13790.65	47.31	13860.43	47.36	14061.47	47.29	14257.8	45.82	14348.07	45.38
14555.64	45.82	14655.45	47.59	14748.62	49.02	14959.97	48.06	15058.42	46.25
15107.98	45.48	15276.95	46.12	15330.41	49.53	15452.2	53.6		

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val
 .75 .044 6989.1 .016 7291.73 .048

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 6989.1 7291.73 1903.5 4751.08 1745.42 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .75 6989.1 24.6 7291.73 15452.2 24.6

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	29.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.044	0.016	0.048
W.S. Elev (ft)	29.00	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	4010.59	3105.05	3090.26
E.G. Slope (ft/ft)	0.000210	Area (sq ft)	4010.59	3105.05	3090.26
Q Total (cfs)	25000.00	Flow (cfs)	3322.16	19561.52	2116.31
Top Width (ft)	4079.98	Top Width (ft)	1822.64	302.63	1954.71
Vel Total (ft/s)	2.45	Avg. Vel. (ft/s)	0.83	6.30	0.68
Max Chl Dpth (ft)	14.12	Hydr. Depth (ft)	2.20	10.26	1.58
Conv. Total (cfs)	1724215.0	Conv. (cfs)	229124.8	1349131.0	145959.2
Length Wtd. (ft)	3945.03	Wetted Per. (ft)	1822.75	306.83	1954.85
Min Ch El (ft)	14.88	Shear (lb/sq ft)	0.03	0.13	0.02
Alpha	5.20	Stream Power (lb/ft s)	0.02	0.84	0.01
Froctn Loss (ft)	0.71	Cum Volume (acre-ft)	5121.09	3861.56	4291.06
C & E Loss (ft)	0.05	Cum SA (acres)	1329.00	304.92	1185.82

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 34.2166*

INPUT
 Description: Interpolated Cross Section at River Mile 34.22
 Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.5	73.58	207.97	69.38	276.49	67.15	541.98	62.18	665.36	60
731.9	60.09	840.91	55.76	1063.05	54.76	1321.18	55.19	1586.23	54.69
1869.14	55.2	2102.05	55.46	2384.34	59.55	2643.61	58.64	2793.78	57.39
2888.17	54.4	3098.23	56.82	3399.79	57.08	3514.05	57.16	3692.94	56.42
3949.67	52.84	4044.23	50.26	4222.24	50.94	4466.98	50.19	4692.36	55.28
4743.96	55.82	4771.86	56.3	4779.86	55.71	4825.89	52.03	4934.73	39.38
5018.52	37.48	5192.38	39.24	5320.52	40.55	5407.12	32.73	5474.89	29.41
5584.25	27.61	5794.57	26.4	6054.37	26.21	6212.46	25.6	6316.44	25.25
6385.96	25.56	6600.47	25.22	6870.96	24.38	7087.67	24.56	7145.9	25.44
7183.55	23	7254.29	23.7	7482.47	26.14	7515.14	26.34	7523.2	25.97
7528.85	23.65	7533.13	19.66	7538.68	17.94	7547.79	17.1	7553.76	16.71
7556.99	16.62	7565.12	16.3	7566.1	16.24	7575.21	15.87	7581.77	15.6
7584.32	15.54	7593.42	15.16	7602.53	14.45	7604.07	14.55	7605.83	14.45
7612.03	14.65	7617.19	15.12	7617.8	15.19	7624.44	15.55	7628.54	15.83
7630.64	15.99	7637.34	16.3	7639.9	16.45	7643.1	16.91	7649.31	17.74
7651.59	18.08	7655.94	18.2	7662.15	18.23	7668.35	18.35	7674.36	18.46
7705.07	18.97	7707.94	19.03	7737.44	19.37	7758.32	19.59	7770.45	19.03
7779.67	18.6	7791.37	16.77	7797.16	16.52	7799.33	16.92	7802.04	17.52
7805.56	19.05	7806.03	19.26	7815.55	24.07	7829.24	24.95	7830.45	25.02
8013.17	25.87	8019.28	25.87	8265.53	26.02	8425.4	25.11	8495.99	24.85
8614.1	24.97	8647.22	25.26	8737.78	25.28	8867.59	25.86	8934.58	31.61
9045.05	29.09	9112.5	28.55	9163.57	28.94	9376.48	27.85	9635.99	27.02
9665.23	26.9	9914.6	26.15	10044.36	25.91	10185.41	25.55	10436.11	27.29

10452.74	27.3410866.45	28.6111273.32	29.7811293.05	29.8611308.22	30.46
11517.6	38.7111611.03	42.4511688.67	44.0611802.42	46.4411925.87	47.23
12090.89	47.5312209.59	47.6612397.85	47.3612483.06	47.6612657.47	48.01
12770.95	47.8912923.79	48.7313071.28	49.2413326.55	49.4113333.55	49.41
13633.69	47.1413745.74	47.0413943.31	46.8114152.33	46.63 14281.5	46.65
14494.33	46.6714566.04	46.7314772.64	46.7214974.42	45.1715067.18	44.62
15280.49	44.9515383.06	46.8315478.81	48.4415696.01	47.4415797.19	45.46
15848.12	44.5516021.77	45.1116076.71	48.8516201.87	53.27	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
.5	.044	7523.2	.016	7815.55	.048

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	7523.2	7815.55		1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.5	7523.2	23.82	7815.55	16201.87	23.82

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.044	0.016	0.048
W.S. Elev (ft)	28.42	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	5829.80	3074.85	5337.13
E.G. Slope (ft/ft)	0.000149	Area (sq ft)	5829.80	3074.85	5337.13
Q Total (cfs)	25000.00	Flow (cfs)	4931.63	16595.47	3472.90
Top Width (ft)	4900.03	Top Width (ft)	1987.98	292.35	2619.70
Vel Total (ft/s)	1.76	Avg. Vel. (ft/s)	0.85	5.40	0.65
Max Chl Dpth (ft)	13.97	Hydr. Depth (ft)	2.93	10.52	2.04
Conv. Total (cfs)	2044680.0	Conv. (cfs)	403344.5	1357297.0	284038.5
Length Wtd. (ft)	3582.31	Wetted Per. (ft)	1988.08	296.73	2619.86
Min Ch El (ft)	14.45	Shear (lb/sq ft)	0.03	0.10	0.02
Alpha	6.34	Stream Power (lb/ft s)	0.02	0.52	0.01
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	4906.09	3524.54	4122.22
C & E Loss (ft)	0.04	Cum SA (acres)	1245.74	272.47	1094.17

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 33.3083*

INPUT

Description: Interpolated Cross Section at River Mile 33.31

Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.25	71.39	222.45	67.6	295.85	65.92	580.19	63.49	712.34	62.5
783.6	62.59	900.35	57.83	1138.28	56.73	1414.74	57.19	1698.61	56.65
2001.62	57.2	2251.07	57.48	2553.42	61.97	2831.11	60.97	2991.94	59.6
3093.03	56.3	3318.01	58.96	3640.99	59.24	3763.38	59.33	3954.97	58.51
4229.93	54.57	4331.22	51.73	4521.87	52.47	4783.99	51.65	5025.38	57.24
5080.64	57.84	5110.53	58.25	5119.09	57.57	5168.39	53.51	5284.96	39.59
5374.71	37.49	5560.92	39.41	5698.16	40.82	5790.91	32.22	5863.49	28.56
5980.63	26.55	6205.89	25.2	6484.13	24.96	6653.45	24.26	6764.82	23.83
6839.28	24.13	7069.02	23.65	7358.73	22.84	7590.84	23.13	7653.2	24.12
7693.53	21.45	7769.28	22.25	8013.67	24.91	8048.67	25.22	8057.3	24.83
8063.22	22.48	8067.71	18.23	8073.54	16.52	8083.1	15.9	8089.35	15.67
8092.75	15.61	8101.27	15.36	8102.3	15.32	8111.85	15.13	8118.74	15
8121.41	14.97	8130.96	14.68	8140.52	14.03	8141.28	14.08	8142.17	14.03

8148	14.21	8152.84	14.51	8153.42	14.56	8159.66	14.88	8163.52	15.12
8165.49	15.25	8171.79	15.58	8174.2	15.73	8177.21	16.2	8183.05	17.09
8185.2	17.44	8189.29	17.52	8195.12	17.57	8200.95	17.65	8206.61	17.74
8235.49	18.14	8238.18	18.18	8265.92	18.52	8285.56	18.74	8296.96	18.13
8305.63	17.65	8316.63	15.63	8322.08	15.36	8324.12	15.81	8326.67	16.41
8329.98	18.03	8330.42	18.25	8339.38	23.03	8353.43	23.93	8354.67	24.01
8542.31	24.39	8548.59	24.39	8801.47	24.4	8965.65	23.9	9038.14	23.84
9159.43	24.02	9193.44	24.19	9286.44	24.29	9419.74	25.03	9488.54	31.41
9601.99	28.72	9671.25	27.58	9723.7	27.59	9942.34	26.27	10208.84	25.23
10238.86	25.11	10494.95	24.28	10628.21	24.01	10773.05	23.68	11030.5	25.7
11047.58	25.76	11472.44	27.31	11890.26	28.79	11910.53	28.88	11926.1	29.54
12141.12	38.61	12237.06	42.67	12316.8	44.41	12433.61	46.97	12560.38	47.76
12729.85	48.12	12851.74	48.13	13045.08	47.77	13132.58	47.83	13311.68	47.64
13428.23	47.35	13585.17	48.05	13736.64	48.57	13998.78	48.71	14005.98	48.71
14314.19	46.32	14429.26	46.25	14632.16	46.11	14846.8	46.02	14979.45	46.02
15198.02	46.04	15271.66	46.09	15483.82	46.16	15691.03	44.53	15786.29	43.86
16005.34	44.07	16110.68	46.08	16209	47.87	16432.05	46.82	16535.96	44.67
16588.26	43.63	16766.58	44.11	16823	48.18	16951.53	52.93		

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
.25 .045 8057.3 .016 8339.38 .049

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
8057.3 8339.38 1903.5 4751.09 1745.42 .1 .3

Blocked Obstructions num= 2
Sta L Sta R Elev Sta L Sta R Elev
.25 8057.3 23.03 8339.38 16951.53 23.03

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.045	0.016	0.049
W.S. Elev (ft)	28.09	Reach Len. (ft)	1903.50	4751.09	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	8354.84	3114.97	8899.95
E.G. Slope (ft/ft)	0.000089	Area (sq ft)	8354.84	3114.97	8899.95
Q Total (cfs)	25000.00	Flow (cfs)	6389.33	13366.30	5244.37
Top Width (ft)	5615.67	Top Width (ft)	2166.62	282.08	3166.97
Vel Total (ft/s)	1.23	Avg. Vel. (ft/s)	0.76	4.29	0.59
Max Chl Dpth (ft)	14.06	Hydr. Depth (ft)	3.86	11.04	2.81
Conv. Total (cfs)	2654383.0	Conv. (cfs)	678389.1	1419171.0	556822.4
Length Wtd. (ft)	3143.00	Wetted Per. (ft)	2166.71	286.68	3167.17
Min Ch El (ft)	14.03	Shear (lb/sq ft)	0.02	0.06	0.02
Alpha	6.68	Stream Power (lb/ft s)	0.02	0.26	0.01
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	4596.17	3186.98	3836.98
C & E Loss (ft)	0.03	Cum SA (acres)	1154.96	241.14	978.24

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 32.4

INPUT

Description: Cross Section at River Mile 32.4

Station Elevation Data num= 97										
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev										
0 69.2 315.2 64.7 618.4 64.8 835.3 65.1 959.8 59.9										
1213.5 58.7 1508.3 59.2 1811 58.6 2134.1 59.2 2400.1 59.5										
2722.5 64.4 3018.6 63.3 3190.1 61.8 3297.9 58.2 3537.8 61.1										

3882.2	61.4	4012.7	61.5	4217	60.6	4510.2	56.3	4618.2	53.2
4821.5	54	5101	53.1	5358.4	59.2	5449.2	60.2	5510.9	55
5635.2	39.8	5730.9	37.5	6075.8	41.1	6174.7	31.7	6252.1	27.7
6377	25.5	6617.2	24	6913.9	23.7	7213.2	22.4	7292.6	22.7
7846.5	21.3	8094	21.7	8160.5	22.8	8203.5	19.9	8582.2	24.1
8591.4	23.7	8597.6	21.3	8602.3	16.8	8608.4	15.1	8618.4	14.7
8628.5	14.6	8638.5	14.4	8648.5	14.4	8658.5	14.4	8668.5	14.2
8678.5	13.6	8688.5	13.9	8698.5	14.4	8708.5	15	8718.8	16.8
8765.9	17.3	8812.8	17.9	8831.6	16.7	8841.9	14.5	8847	14.2
8851.3	15.3	8854.4	17	8863.2	22	8878.9	23	9077.9	22.9
9505.9	22.7	9835.1	23.3	9971.9	24.2	10042.5	31.2	10230	26.6
10508.2	24.7	10812.5	23.3	11075.3	22.4	11360.7	21.8	11624.9	24.1
12528	27.9	12863.1	42.9	13064.8	47.5	13194.9	48.3	13493.9	48.6
13782.1	48	14085.5	46.8	14402	47.9	14678.4	48	14994.7	45.5
15321	45.4	15677.4	45.4	15901.7	45.4	16195	45.6	16505.4	43.1
16730.2	43.2	16939.2	47.3	17168.1	46.2	17328.4	42.7	17511.4	43.1
17569.3	47.5	17701.2	52.6						

Manning's n Values			num= 8						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	7846.5	.055	8582.2	.07	8597.6	.016	8863.2	.05
8878.9	.04	15321	.05	15901.7	.04				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	8591.4	8863.2		2464.43	4273.14		2171	.1	.3
Blocked Obstructions			num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev				
0	8582.2	22.25	8878.9	17701.2	22.25				

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.045	0.018	0.040
W.S. Elev (ft)	27.95	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	11233.62	3196.26	13473.49
E.G. Slope (ft/ft)	0.000048	Area (sq ft)	11233.62	3196.26	13473.49
Q Total (cfs)	25400.00	Flow (cfs)	7384.12	9344.32	8671.56
Top Width (ft)	6116.67	Top Width (ft)	2344.15	271.80	3500.72
Vel Total (ft/s)	0.91	Avg. Vel. (ft/s)	0.66	2.92	0.64
Max Chl Dpth (ft)	14.35	Hydr. Depth (ft)	4.79	11.76	3.85
Conv. Total (cfs)	3659781.0	Conv. (cfs)	1063947.0	1346385.0	1249449.0
Length Wtd. (ft)	3112.53	Wetted Per. (ft)	2344.23	276.69	3500.99
Min Ch El (ft)	13.60	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	4.12	Stream Power (lb/ft s)	0.01	0.10	0.01
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	4168.17	2842.80	3388.74
C & E Loss (ft)	0.00	Cum SA (acres)	1056.41	210.94	844.65

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 31.6071*

INPUT

Description: Interpolated Cross Section at River Mile 31.61

Station Elevation Data		num= 195							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67.73	168.71	65.39	259.62	63.85	294.66	63.27	320.24	62.89
472	62.5	509.35	62.53	599.81	62.6	628.29	62.59	688	62.63

695.9	62.63	698.78	62.58	790.55	62.6	818.52	62.63	821.57	62.64
848.66	62.66	850.88	62.58	863.5	62.12	975.15	58.19	999.5	58.09
1072.18	57.8	1074.97	57.8	1107.61	57.71	1232.91	57.23	1242.32	57.24
1491.65	57.61	1525.54	57.67	1532.42	57.69	1720.5	57.63	1757.76	57.61
1839.96	57.56	1976.86	57.92	1996.06	57.98	2168.23	58.04	2180.44	58.04
2242.4	57.68	2344.7	57.05	2438.48	57.06	2486.29	57.63	2527.79	58.12
2590.49	58.89	2627.55	59.36	2669.32	59.87	2716.33	60.47	2766.04	61.15
2805.2	61.06	2874.21	60.72	2913.93	60.6	3066.87	60.13	3197.6	59.17
3219.15	59.01	3241.12	58.84	3305.09	57.04	3350.64	55.76	3473.36	57
3474.39	57.01	3594.38	58.23	3714.85	58.32	3773.69	58.34	3803.81	58.34
3944.28	58.45	3971.26	58.47	4006.03	58.49	4076.87	58.52	4201.47	58.03
4284.44	57.76	4320.73	57.32	4413.48	56.3	4488.27	55.45	4516.34	55.08
4539.09	54.82	4582.33	54.29	4641.47	52.87	4692.05	51.76	4720.3	51.91
4898.61	52.37	4918.41	52.3	5107.25	51.26	5182.58	49.26	5191.8	49.22
5329.6	51.8	5437.46	53.9	5444.09	54.03	5536.34	54.89	5599.03	50.43
5725.32	37.41	5822.55	35.44	6172.96	38.54	6273.45	30.49	6352.08	27.06
6478.98	25.18	6723.02	23.9	7024.47	23.65	7328.55	22.55	7409.22	22.81
7833.21	21.92	7971.98	21.66	8075.9	21.82	8223.44	21.98	8271.21	22.63
8291	22.91	8334.69	20.42	8498.11	21.95	8541.91	22.37	8559.08	22.82
8617.12	23.18	8634.16	22.98	8642.72	23.05	8719.45	23.8	8727.74	23.5
8728.79	25.04	8732.5	23.51	8735.28	22.52	8735.95	22.23	8741.37	17.44
8742.38	17.1	8743.88	16.89	8744.5	16.6	8748.41	15.47	8755.96	14.74
8758.7	14.61	8759.94	14.58	8763.42	14.56	8771.6	14.41	8772.57	14.39
8781.72	14.26	8783.14	14.22	8790.87	14.15	8794.67	14.01	8800.01	13.82
8806.21	13.69	8809.16	13.58	8817.75	13.44	8818.31	13.41	8821.97	13.09
8829.29	12.64	8839.2	13.07	8840.65	13.16	8849.1	13.56	8852	13.72
8859.01	14.18	8863.37	14.92	8869.22	15.91	8874.73	15.99	8886.09	16.31
8897.45	16.57	8908.81	16.94	8912.67	17.17	8915.88	17.21	8937.89	17.49
8962.36	17.81	8980.99	16.72	8988.9	15.15	8991.2	14.71	8996.25	14.49
8999.12	15.21	9000.51	15.57	9003.58	17.22	9012.3	22.07	9026.37	22.95
9057.32	22.99	9095.9	23.04	9204.66	22.98	9588.11	22.81	9883.05	23.32
10005.61	24.0910068.87		30.0910236.85		26.15	10486.1	24.5210758.73		23.31
10994.18	22.5411249.87		22.0211486.58		23.9912295.69		27.2412595.91		40.1
12776.62	44.0412893.18		44.7213161.06		44.9813419.26		44.4613691.09		43.43
13974.65	44.3714222.28		44.4514505.66		42.31	14798	42.2215117.31		42.22
15318.27	42.2115581.04		42.3815859.14		40.2416060.54		40.3216247.79		43.83
16452.86	42.8916596.48		39.8916760.44		40.2316812.31		4416930.48		48.37

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 0 .047 8728.79 .07 8735.95 .016 9012.3 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 8728.79 9012.3 2464.43 4273.14 2171 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 0 8728.79 21.99 9012.316930.48 21.99

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.047	0.018	0.055
W.S. Elev (ft)	27.75	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	11177.99	3362.59	11804.95
E.G. Slope (ft/ft)	0.000064	Area (sq ft)	11177.99	3362.59	11804.95
Q Total (cfs)	25400.00	Flow (cfs)	7906.04	11274.13	6219.83
Top Width (ft)	5846.42	Top Width (ft)	2392.42	283.51	3170.50
Vel Total (ft/s)	0.96	Avg. Vel. (ft/s)	0.71	3.35	0.53
Max Chl Dpth (ft)	15.11	Hydr. Depth (ft)	4.67	11.86	3.72
Conv. Total (cfs)	3172326.0	Conv. (cfs)	987421.9	1408080.0	776823.8

Length Wtd. (ft)	3243.03	Wetted Per. (ft)	2393.32	288.49	3170.75
Min Ch El (ft)	12.64	Shear (lb/sq ft)	0.02	0.05	0.01
Alpha	5.61	Stream Power (lb/ft s)	0.01	0.16	0.01
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	3534.20	2521.09	2758.81
C & E Loss (ft)	0.00	Cum SA (acres)	922.42	183.70	678.41

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 30.8142*

INPUT
 Description: Interpolated Cross Section at River Mile 30.81

Station Elevation Data num= 195									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	66.27	171.36	63.95	263.71	62.15	299.3	61.47	325.28	61.07
479.43	60.25	517.36	60.3	609.25	60.41	638.18	60.39	698.83	60.39
706.85	60.37	709.78	60.27	802.99	60.18	831.4	60.2	834.5	60.23
862.02	60.22	864.27	60.15	877.09	59.76	990.5	56.47	1015.24	56.39
1089.06	56.16	1091.89	56.17	1125.05	56.14	1252.31	55.76	1261.88	55.77
1515.12	56.09	1549.56	56.14	1556.54	56.17	1747.58	56.43	1785.43	56.46
1868.92	56.52	2007.98	57	2027.48	57.07	2202.36	56.89	2214.77	56.87
2277.7	56.09	2381.61	54.71	2476.87	54.62	2525.42	55.04	2567.58	55.4
2631.26	56	2668.91	56.39	2711.34	56.79	2759.09	57.28	2809.58	57.89
2849.36	57.85	2919.45	57.43	2959.8	57.35	3115.15	56.95	3247.93	56.16
3269.82	56.02	3292.13	55.89	3357.11	54.39	3403.38	53.31	3528.03	54.33
3529.08	54.34	3650.95	55.36	3773.32	55.43	3833.09	55.43	3863.68	55.41
4006.37	55.5	4033.77	55.52	4069.09	55.53	4141.04	55.54	4267.61	55.11
4351.88	54.91	4388.74	54.57	4482.95	53.86	4558.92	53.24	4587.43	52.9
4610.54	52.71	4654.46	52.28	4714.53	51.11	4765.91	50.31	4794.59	50.52
4975.71	50.74	4995.82	50.66	5187.64	49.18	5264.15	45.42	5273.52	45.13
5413.49	47.06	5523.04	48.75	5529.78	48.86	5623.49	49.58	5687.16	45.87
5815.44	35.02	5914.2	33.38	6270.13	35.98	6372.19	29.27	6452.07	26.42
6580.96	24.86	6828.85	23.8	7135.04	23.61	7443.91	22.7	7525.85	22.92
7956.5	22.2	8097.46	22.01	8203.01	22.18	8352.88	22.25	8401.4	22.78
8421.51	23.01	8465.88	20.94	8631.87	22.21	8676.37	22.57	8693.81	23.3
8752.76	23.38	8770.07	22.79	8778.76	22.84	8856.69	23.5	8865.11	23.26
8866.19	26.37	8870.39	24.56	8873.54	23.51	8874.29	23.17	8880.44	18.09
8881.59	17.65	8883.29	17.58	8883.99	17.15	8888.42	15.84	8896.97	14.64
8900.08	14.48	8901.49	14.45	8905.43	14.45	8914.7	14.23	8915.8	14.19
8926.17	14.1	8927.77	14.05	8936.53	13.89	8940.85	13.62	8946.9	13.24
8953.93	12.97	8957.27	12.81	8967	12.68	8967.63	12.65	8971.78	12.21
8980.08	11.68	8989.89	12.25	8991.33	12.36	8999.71	12.72	9002.58	12.87
9009.53	13.35	9013.85	14.08	9019.64	15.02	9025.1	15.11	9036.35	15.65
9047.61	16.04	9058.87	16.66	9062.69	17.08	9065.88	17.11	9087.68	17.4
9111.93	17.73	9130.38	16.74	9138.22	15.3	9140.5	14.93	9145.5	14.77
9148.35	15.47	9149.72	15.85	9152.76	17.44	9161.41	22.13	9173.84	22.9
9201.19	22.99	9235.29	23.11	9331.42	23.07	9670.33	22.92	9931	23.34
10039.33	23.98	10095.23	28.98	10243.7	25.69	10464	24.33	10704.96	23.33
10913.05	22.68	11139.05	22.25	11348.25	23.88	12063.37	26.58	12328.72	37.29
12488.44	40.58	12591.46	41.15	12828.22	41.35	13056.43	40.92	13296.68	40.06
13547.3	40.84	13766.16	40.91	14016.62	39.12	14275	39.04	14557.22	39.03
14734.83	39.03	14967.08	39.17	15212.87	37.38	15390.88	37.44	15556.37	40.37
15737.63	39.58	15864.56	37.08	16009.47	37.36	16055.32	40.51	16159.76	44.14

Manning's n Values num= 4									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	8866.19	.07	8874.29	.016	9161.41	.054		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
8866.19 9161.41 2464.43 4273.14 2171 .1 .3
Blocked Obstructions num= 2
Sta L Sta R Elev Sta L Sta R Elev
0 8866.19 21.73 9161.41 16159.76 21.73

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.050	0.018	0.054
W.S. Elev (ft)	27.50	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	10744.81	3515.67	10059.82
E.G. Slope (ft/ft)	0.000073	Area (sq ft)	10744.81	3515.67	10059.82
Q Total (cfs)	25400.00	Flow (cfs)	7329.87	12505.57	5564.56
Top Width (ft)	5581.21	Top Width (ft)	2444.44	295.22	2841.56
Vel Total (ft/s)	1.04	Avg. Vel. (ft/s)	0.68	3.56	0.55
Max Chl Dpth (ft)	15.82	Hydr. Depth (ft)	4.40	11.91	3.54
Conv. Total (cfs)	2967337.0	Conv. (cfs)	856307.1	1460955.0	650075.4
Length Wtd. (ft)	3357.78	Wetted Per. (ft)	2446.75	300.38	2841.80
Min Ch El (ft)	11.68	Shear (lb/sq ft)	0.02	0.05	0.02
Alpha	5.90	Stream Power (lb/ft s)	0.01	0.19	0.01
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	2914.05	2183.72	2213.95
C & E Loss (ft)	0.00	Cum SA (acres)	785.59	155.31	528.59

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 30.0214*

INPUT
Description: Interpolated Cross Section at River Mile 30.02
Station Elevation Data num= 195

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	64.8	174.02	62.51	267.79	60.44	303.94	59.68	330.32	59.26
486.86	58	525.38	58.06	618.7	58.22	648.07	58.18	709.66	58.14
717.81	58.11	720.77	57.95	815.44	57.76	844.29	57.77	847.43	57.81
875.37	57.78	877.67	57.73	890.68	57.39	1005.85	54.76	1030.97	54.69
1105.93	54.51	1108.81	54.54	1142.48	54.57	1271.72	54.29	1281.43	54.3
1538.6	54.58	1573.57	54.62	1580.66	54.66	1774.66	55.23	1813.1	55.31
1897.88	55.48	2039.09	56.07	2058.9	56.17	2236.49	55.73	2249.09	55.7
2313	54.49	2418.51	52.37	2515.25	52.17	2564.56	52.45	2607.37	52.68
2672.04	53.11	2710.27	53.42	2753.36	53.71	2801.85	54.1	2853.12	54.64
2893.51	54.65	2964.7	54.15	3005.66	54.09	3163.42	53.78	3298.26	53.15
3320.49	53.04	3343.15	52.93	3409.14	51.74	3456.12	50.87	3582.7	51.67
3583.77	51.67	3707.53	52.49	3831.8	52.54	3892.49	52.52	3923.56	52.47
4068.45	52.55	4096.27	52.57	4132.15	52.57	4205.21	52.56	4333.74	52.18
4419.32	52.07	4456.75	51.81	4552.42	51.41	4629.56	51.04	4658.52	50.73
4681.98	50.61	4726.58	50.27	4787.59	49.35	4839.76	48.87	4868.89	49.12
5052.82	49.11	5073.24	49.03	5268.03	47.1	5345.73	41.58	5355.24	41.04
5497.38	42.33	5608.63	43.6	5615.48	43.69	5710.63	44.27	5775.29	41.3
5905.56	32.63	6005.85	31.32	6367.29	33.42	6470.94	28.06	6552.05	25.78
6682.94	24.53	6934.67	23.7	7245.6	23.56	7559.26	22.85	7642.47	23.03
8079.8	22.47	8222.95	22.37	8330.13	22.53	8482.32	22.53	8531.59	22.93
8552.01	23.12	8597.07	21.46	8765.64	22.47	8810.82	22.78	8828.53	23.77
8888.39	23.57	8905.97	22.6	8914.8	22.63	8993.94	23.21	9002.49	23.01
9003.58	27.71	9008.28	25.62	9011.8	24.5	9012.64	24.1	9019.51	18.73
9020.79	18.19	9022.69	18.27	9023.48	17.71	9028.43	16.21	9037.98	14.54

9041.46	14.35	9043.04	14.33	9047.44	14.34	9057.79	14.04	9059.03	14
9070.62	13.94	9072.41	13.87	9082.2	13.64	9087.02	13.23	9093.78	12.66
9101.64	12.26	9105.38	12.04	9116.25	11.92	9116.96	11.89	9121.6	11.32
9130.87	10.72	9140.59	11.42	9142.01	11.55	9150.32	11.88	9153.16	12.02
9160.04	12.53	9164.32	13.24	9170.06	14.13	9175.47	14.24	9186.62	14.98
9197.77	15.51	9208.93	16.38	9212.71	16.98	9215.87	17.02	9237.47	17.31
9261.49	17.64	9279.77	16.76	9287.54	15.45	9289.79	15.14	9294.75	15.06
9297.57	15.74	9298.93	16.12	9301.95	17.67	9310.51	22.2	9321.31	22.84
9345.07	22.99	9374.68	23.19	9458.17	23.15	9752.54	23.03	9978.96	23.36
10073.04	23.88	10121.6	27.87	10250.56	25.24	10441.89	24.15	10651.18	23.34
10831.93	22.82	11028.22	22.47	11209.93	23.78	11831.06	25.93	12061.53	34.49
12200.25	37.11	12289.73	37.57	12495.38	37.73	12693.59	37.38	12902.26	36.69
13119.94	37.31	13310.04	37.36	13527.59	35.92	13752.01	35.86	13997.13	35.85
14151.4	35.84	14353.12	35.95	14566.61	34.52	14721.22	34.57	14864.96	36.9
15022.39	36.27	15132.64	34.27	15258.5	34.49	15298.33	37.15	15389.04	39.91

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.052	9003.58	.07	9012.64	.016	9310.51	.057

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9003.58	9310.51		2464.43	4273.14	2171	.1	.3
Blocked Obstructions	num= 2							
Sta L	Sta R	Elev	Sta L	Sta R	Elev			
0	9003.58	21.47	9310.51	15389.04	21.47			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.052	0.018	0.057
W.S. Elev (ft)	27.20	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	10021.29	3647.15	8273.24
E.G. Slope (ft/ft)	0.000086	Area (sq ft)	10021.29	3647.15	8273.24
Q Total (cfs)	25400.00	Flow (cfs)	6709.89	14214.20	4475.91
Top Width (ft)	5320.85	Top Width (ft)	2501.76	305.77	2513.32
Vel Total (ft/s)	1.16	Avg. Vel. (ft/s)	0.67	3.90	0.54
Max Chl Dpth (ft)	16.48	Hydr. Depth (ft)	4.01	11.93	3.29
Conv. Total (cfs)	2731620.0	Conv. (cfs)	721608.9	1528653.0	481358.2
Length Wtd. (ft)	3479.97	Wetted Per. (ft)	2505.21	311.10	2513.53
Min Ch El (ft)	10.72	Shear (lb/sq ft)	0.02	0.06	0.02
Alpha	6.47	Stream Power (lb/ft s)	0.01	0.25	0.01
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	2326.63	1832.39	1757.09
C & E Loss (ft)	0.00	Cum SA (acres)	645.68	125.83	395.15

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 29.2285*

INPUT

Description: Interpolated Cross Section at River Mile 29.23

Station Elevation Data	num= 194								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	63.34	176.67	61.07	271.88	58.74	308.58	57.89	335.36	57.44
494.29	55.75	533.4	55.83	628.14	56.03	657.96	55.98	720.49	55.89
728.76	55.85	731.77	55.64	827.88	55.34	857.17	55.33	860.36	55.39
888.73	55.34	891.06	55.3	904.27	55.02	1021.2	53.04	1046.7	52.99
1122.81	52.87	1125.73	52.91	1159.92	53	1291.13	52.82	1300.99	52.83

1562.08	53.06	1597.58	53.1	1604.78	53.14	1801.75	54.03	1840.77	54.16
1926.85	54.45	2070.21	55.14	2090.31	55.26	2270.61	54.58	2283.41	54.53
2348.29	52.89	2455.42	50.03	2553.63	49.73	2603.7	49.86	2647.16	49.96
2712.81	50.22	2751.62	50.45	2795.37	50.63	2844.6	50.91	2896.65	51.39
2937.67	51.45	3009.94	50.86	3051.53	50.84	3211.69	50.61	3348.6	50.14
3371.16	50.06	3394.17	49.98	3461.16	49.08	3508.86	48.42	3637.37	49
3638.46	49.01	3764.11	49.61	3890.27	49.65	3951.89	49.61	3983.43	49.54
4130.54	49.6	4158.78	49.61	4195.2	49.61	4269.39	49.58	4399.87	49.26
4486.75	49.23	4524.76	49.06	4621.89	48.97	4700.21	48.83	4729.6	48.55
4753.43	48.5	4798.71	48.26	4860.65	47.59	4913.62	47.42	4943.19	47.72
5129.92	47.48	5150.66	47.39	5348.42	45.02	5427.3	37.74	5436.96	36.95
5581.27	37.59	5694.22	38.45	5701.17	38.52	5797.78	38.96	5863.42	36.74
5995.67	30.24	6097.5	29.27	6464.46	30.86	6569.69	26.84	6652.04	25.14
6784.93	24.21	7040.49	23.6	7356.17	23.52	7674.62	23	7759.1	23.14
8203.1	22.75	8348.43	22.72	8457.25	22.89	8611.76	22.81	8661.79	23.08
8682.51	23.22	8728.26	21.98	8899.4	22.73	8945.27	22.98	8963.25	24.24
9024.03	23.77	9041.88	22.4	9050.84	22.42	9131.19	22.91	9139.87	22.77
9140.98	29.04	9146.17	26.67	9150.05	25.49	9150.99	25.03	9158.58	19.37
9160	18.74	9162.97	18.26	9168.43	16.58	9179	14.44	9182.84	14.22
9184.58	14.21	9189.45	14.24	9200.89	13.85	9202.25	13.8	9215.07	13.78
9217.05	13.7	9227.87	13.39	9233.2	12.84	9240.67	12.07	9249.35	11.55
9253.48	11.26	9265.5	11.16	9266.28	11.14	9271.41	10.43	9281.65	9.76
9291.29	10.6	9292.7	10.74	9300.92	11.05	9303.74	11.17	9310.56	11.7
9314.8	12.39	9320.48	13.23	9325.84	13.37	9336.88	14.32	9347.93	14.98
9358.98	16.1	9362.73	16.89	9365.86	16.93	9387.26	17.22	9411.05	17.56
9429.16	16.79	9436.85	15.6	9439.09	15.35	9444	15.35	9446.8	16
9448.15	16.39	9451.13	17.89	9459.61	22.27	9468.78	22.79	9488.94	22.99
9514.08	23.27	9584.93	23.24	9834.75	23.14	10026.91	23.39	10106.76	23.77
10147.97	26.76	10257.41	24.79	10419.79	23.96	10597.41	23.35	10750.81	22.96
10917.39	22.69	11071.61	23.67	11598.74	25.27	11794.34	31.69	11912.07	33.65
11988.01	33.99	12162.54	34.11	12330.76	33.84	12507.85	33.32	12692.59	33.78
12853.93	33.81	13038.55	32.73	13229.01	32.68	13437.04	32.67	13567.96	32.66
13739.16	32.73	13920.34	31.65	14051.55	31.69	14173.55	33.44	14307.16	32.96
14400.72	31.46	14507.54	31.62	14541.34	33.51	14618.33	35.69		

Manning's n	Values	num=	4
Sta	n Val	Sta	n Val
0	.054	9140.98	.07
			9158.58
			.016
			9459.61
			.059

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
9140.98	9459.61		2464.43	4273.14	2171		.1	.3	

Blocked Obstructions	num=	2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	9140.98	21.21	10147.97	14618.33	21.21

CROSS SECTION OUTPUT	Profile #	Calibration			
E.G. Elev (ft)	26.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.054	0.020	0.059
W.S. Elev (ft)	26.81	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	9024.67	3754.14	6487.75
E.G. Slope (ft/ft)	0.000115	Area (sq ft)	9024.67	3754.14	6487.75
Q Total (cfs)	25400.00	Flow (cfs)	6154.94	15622.41	3622.65
Top Width (ft)	5069.05	Top Width (ft)	2569.33	313.74	2185.98
Vel Total (ft/s)	1.32	Avg. Vel. (ft/s)	0.68	4.16	0.56
Max Chl Dpth (ft)	17.05	Hydr. Depth (ft)	3.51	11.97	2.97
Conv. Total (cfs)	2365844.0	Conv. (cfs)	573292.5	1455125.0	337425.8
Length Wtd. (ft)	3633.16	Wetted Per. (ft)	2572.86	318.82	2186.16
Min Ch El (ft)	9.76	Shear (lb/sq ft)	0.03	0.08	0.02
Alpha	6.22	Stream Power (lb/ft s)	0.02	0.35	0.01

Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	1787.86	1469.37	1389.25
C & E Loss (ft)	0.01	Cum SA (acres)	502.23	95.45	278.04

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 28.4357*

INPUT
 Description: Interpolated Cross Section at River Mile 28.44
 Station Elevation Data num= 195

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	61.87	179.33	59.63	275.97	57.04	313.21	56.1	340.4	55.63
501.72	53.5	541.42	53.6	637.58	53.84	667.85	53.77	731.32	53.64
739.71	53.59	742.77	53.33	840.32	52.92	870.05	52.9	873.3	52.97
902.09	52.91	904.45	52.87	917.87	52.65	1036.55	51.33	1062.43	51.29
1139.69	51.22	1142.65	51.28	1177.35	51.43	1310.53	51.34	1320.54	51.35
1585.56	51.54	1621.59	51.58	1628.9	51.63	1828.83	52.83	1868.43	53.01
1955.81	53.41	2101.33	54.21	2121.73	54.35	2304.74	53.42	2317.73	53.35
2383.59	51.29	2492.33	47.68	2592.01	47.29	2642.83	47.28	2686.94	47.25
2753.59	47.34	2792.98	47.49	2837.39	47.55	2887.36	47.72	2940.19	48.14
2981.82	48.25	3055.18	47.57	3097.4	47.58	3259.97	47.44	3398.93	47.13
3421.83	47.08	3445.18	47.02	3513.18	46.43	3561.6	45.98	3692.05	46.34
3693.14	46.34	3820.68	46.74	3948.74	46.77	4011.29	46.69	4043.3	46.6
4192.62	46.65	4221.29	46.66	4258.26	46.65	4333.56	46.6	4466	46.33
4554.19	46.38	4592.77	46.3	4691.36	46.53	4770.86	46.62	4800.69	46.38
4824.88	46.39	4870.84	46.25	4933.7	45.83	4987.47	45.98	5017.49	46.32
5207.03	45.85	5228.08	45.75	5428.81	42.94	5508.88	33.9	5518.68	32.86
5665.16	32.86	5779.81	33.3	5786.86	33.34	5884.92	33.65	5951.55	32.17
6085.79	27.85	6189.14	27.21	6561.62	28.3	6668.43	25.63	6752.02	24.5
6886.91	23.89	7146.31	23.5	7466.74	23.47	7789.97	23.15	7875.72	23.25
8326.4	23.02	8473.91	23.08	8584.37	23.24	8741.2	23.09	8791.98	23.24
8813.02	23.33	8859.46	22.5	9033.16	23	9079.72	23.19	9097.97	24.71
9159.67	23.97	9177.78	22.21	9186.88	22.21	9268.44	22.61	9277.25	22.53
9278.37	30.38	9284.05	27.72	9288.31	26.49	9289.34	25.96	9297.65	20.01
9299.2	19.29	9301.5	19.66	9302.45	18.82	9308.44	16.95	9320.01	14.34
9324.22	14.09	9326.13	14.09	9331.46	14.13	9343.99	13.66	9345.48	13.61
9359.51	13.61	9361.69	13.52	9373.54	13.14	9379.37	12.45	9387.56	11.49
9397.06	10.84	9401.59	10.49	9414.75	10.4	9415.61	10.38	9421.22	9.54
9432.44	8.8	9441.99	9.77	9443.38	9.93	9451.53	10.21	9454.32	10.31
9461.07	10.88	9465.27	11.55	9470.9	12.34	9476.21	12.5	9487.15	13.65
9498.09	14.44	9509.04	15.81	9512.75	16.8	9515.85	16.84	9537.04	17.13
9560.61	17.47	9578.56	16.81	9586.17	15.76	9588.39	15.56	9593.25	15.64
9596.02	16.27	9597.36	16.66	9600.31	18.11	9608.71	22.34	9616.24	22.74
9632.81	23	9653.47	23.35	9711.69	23.32	9916.97	23.25	10074.86	23.41
10140.47	23.66	10174.33	25.66	10264.26	24.33	10397.69	23.78	10543.64	23.37
10669.68	23.11	10806.57	22.92	10933.28	23.56	11366.43	24.61	11527.15	28.88
11623.89	30.19	11686.29	30.41	11829.7	30.49	11967.92	30.31	12113.44	29.95
12265.24	30.25	12397.81	30.27	12549.51	29.54	12706.01	29.51	12876.95	29.48
12984.53	29.47	13125.2	29.52	13274.08	28.79	13381.89	28.81	13482.13	29.97
13591.92	29.65	13668.8	28.64	13756.58	28.75	13784.35	30.01	13847.61	31.46

Manning's n Values	num= 4
Sta n Val Sta n Val Sta n Val	Sta n Val
0 .056 9278.37 .07 9297.65 .016 9608.71 .061	

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
9278.37 9608.71	2464.43 4273.14 2171	.1	.3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 0 9278.37 20.9410174.3313847.61 20.94

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	26.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.056	0.019	0.061
W.S. Elev (ft)	26.25	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	7582.19	3807.64	4613.46
E.G. Slope (ft/ft)	0.000137	Area (sq ft)	7582.19	3807.64	4613.46
Q Total (cfs)	25400.00	Flow (cfs)	4764.56	18187.76	2447.68
Top Width (ft)	4773.76	Top Width (ft)	2634.27	319.94	1819.56
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)	0.63	4.78	0.53
Max Chl Dpth (ft)	17.45	Hydr. Depth (ft)	2.88	11.90	2.54
Conv. Total (cfs)	2168345.0	Conv. (cfs)	406740.4	1552651.0	208953.2
Length Wtd. (ft)	3840.09	Wetted Per. (ft)	2637.68	325.32	1819.67
Min Ch El (ft)	8.80	Shear (lb/sq ft)	0.02	0.10	0.02
Alpha	6.53	Stream Power (lb/ft s)	0.02	0.48	0.01
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	1318.09	1098.47	1112.62
C & E Loss (ft)	0.01	Cum SA (acres)	355.03	64.37	178.22

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 27.6428*

INPUT
 Description: Interpolated Cross Section at River Mile 27.64

Station	Elevation	Data	num=	195					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	60.41	181.98	58.19	280.05	55.33	317.85	54.3	345.44	53.82
509.15	51.25	549.43	51.36	647.02	51.65	677.74	51.57	742.15	51.4
750.67	51.33	753.77	51.01	852.77	50.5	882.94	50.47	886.23	50.55
915.45	50.47	917.85	50.45	931.46	50.29	1051.9	49.61	1078.17	49.59
1156.56	49.58	1159.57	49.65	1194.79	49.86	1329.94	49.87	1340.1	49.88
1609.04	50.02	1645.61	50.05	1653.03	50.11	1855.91	51.63	1896.1	51.86
1984.77	52.37	2132.44	53.29	2153.15	53.45	2338.87	52.27	2352.05	52.18
2418.88	49.7	2529.23	45.34	2630.4	44.85	2681.97	44.69	2726.73	44.53
2794.36	44.45	2834.34	44.52	2879.4	44.47	2930.11	44.54	2983.73	44.88
3025.98	45.05	3100.42	44.29	3143.26	44.33	3308.24	44.26	3449.26	44.12
3472.5	44.09	3496.2	44.07	3565.21	43.77	3614.34	43.53	3746.72	43.67
3747.83	43.68	3877.26	43.87	4007.22	43.88	4070.69	43.78	4103.18	43.67
4254.71	43.7	4283.8	43.71	4321.31	43.69	4397.73	43.62	4532.14	43.41
4621.63	43.54	4660.78	43.55	4760.83	44.09	4841.5	44.42	4871.78	44.2
4896.32	44.29	4942.96	44.24	5006.76	44.07	5061.33	44.54	5091.79	44.93
5284.13	44.22	5305.49	44.12	5509.2	40.86	5590.45	30.06	5600.4	28.77
5749.05	28.12	5865.39	28.15	5872.55	28.17	5972.06	28.33	6039.68	27.6
6175.91	25.46	6280.79	25.15	6658.79	25.74	6767.18	24.41	6852	23.86
6988.89	23.57	7252.14	23.41	7577.31	23.42	7905.32	23.3	7992.34	23.36
8449.69	23.3	8599.39	23.43	8711.48	23.6	8870.64	23.36	8922.17	23.39
8943.52	23.43	8990.65	23.02	9166.93	23.26	9214.18	23.39	9232.7	25.19
9295.3	24.16	9313.69	22.02	9322.92	22	9405.68	22.31	9414.62	22.28
9415.77	31.71	9421.94	28.78	9426.57	27.48	9427.68	26.9	9436.72	20.66
9438.41	19.83	9440.9	20.35	9441.94	19.37	9448.45	17.32	9461.03	14.24
9465.6	13.96	9467.67	13.96	9473.47	14.02	9487.09	13.48	9488.71	13.41
9503.96	13.45	9506.32	13.35	9519.2	12.88	9525.54	12.06	9534.44	10.91
9544.78	10.12	9549.69	9.72	9564	9.64	9564.93	9.62	9571.04	8.66

9583.23	7.84	9592.68	8.95	9594.07	9.12	9602.13	9.37	9604.9	9.46
9611.58	10.05	9615.75	10.7	9621.32	11.45	9626.58	11.62	9637.41	12.99
9648.25	13.91	9659.09	15.53	9662.77	16.7	9665.84	16.74	9686.83	17.04
9710.18	17.39	9727.95	16.83	9735.49	15.91	9737.68	15.78	9742.5	15.92
9745.25	16.53	9746.57	16.94	9749.5	18.34	9757.82	22.4	9763.71	22.69
9776.69	23	9792.86	23.42	9838.45	23.41	9999.18	23.3610122.81		23.43
10174.18	23.55	10200.7	24.5510271.11		23.8810375.59		23.610489.87		23.38
10588.56	23.2410695.74		23.1410794.96		23.4511134.12		23.9511259.96		26.08
11335.71	26.7311384.57		26.8411496.86		26.8611605.09		26.7611719.03		26.58
11837.89	26.7211941.69		26.7212060.47		26.3512183.01		26.3212316.86		26.3
12401.09	26.2912511.24		26.312627.81		25.9312712.23		25.9312790.72		26.51
12876.68	26.3412936.88		25.8313005.61		25.8813027.35		26.5113076.89		27.23

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.059	9415.77	.07	9436.72	.016	9757.82	.063

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

9415.77	9757.82	2464.43	4273.14	2171	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	9415.77	20.68	9759.82	13076.89	20.68

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.	0.059	0.018	0.063
W.S. Elev (ft)	25.48	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	5592.56	3788.10	2761.97
E.G. Slope (ft/ft)	0.000180	Area (sq ft)	5592.56	3788.10	2761.97
Q Total (cfs)	25400.00	Flow (cfs)	3002.96	21062.87	1334.18
Top Width (ft)	4845.91	Top Width (ft)	3051.24	328.08	1466.59
Vel Total (ft/s)	2.09	Avg. Vel. (ft/s)	0.54	5.56	0.48
Max Chl Dpth (ft)	17.64	Hydr. Depth (ft)	1.83	11.55	1.88
Conv. Total (cfs)	1891284.0	Conv. (cfs)	223600.0	1568341.0	99342.9
Length Wtd. (ft)	3988.79	Wetted Per. (ft)	3054.31	333.31	1466.64
Min Ch El (ft)	7.84	Shear (lb/sq ft)	0.02	0.13	0.02
Alpha	5.87	Stream Power (lb/ft s)	0.01	0.71	0.01
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)	945.40	725.91	928.82
C & E Loss (ft)	0.01	Cum SA (acres)	194.20	32.58	96.34

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 26.85

INPUT
 Description: Interpolated Cross Section at River Mile 26.85

Station Elevation Data num= 123

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.94	184.64	56.75	284.14	53.63	322.49	52.51	516.58	49
557.45	49.13	656.46	49.46	752.98	49.15	761.62	49.07	764.77	48.7
865.21	48.08	895.82	48.04	899.16	48.13	931.24	48.02	945.05	47.92
1093.9	47.89	1173.44	47.93	1176.49	48.02	1212.22	48.29	1359.65	48.41
1632.52	48.5	1669.62	48.53	1882.99	50.43	1923.77	50.71	2163.56	52.36
2184.57	52.54	2386.37	51.01	2454.18	48.1	2566.14	43	2721.1	42.1
2766.52	41.81	2835.14	41.56	2875.7	41.55	2921.42	41.39	2972.87	41.35
3070.13	41.85	3145.66	41	3189.13	41.07	3499.59	41.11	3523.17	41.11

3617.23	41.12	3801.39	41.01	3802.52	41.01	4065.69	40.99	4130.09	40.87
4163.05	40.73	4346.31	40.76	4384.37	40.73	4598.27	40.48	4728.79	40.79
4830.3	41.65	4912.15	42.21	4942.87	42.03	4967.77	42.18	5079.82	42.31
5166.09	43.53	5382.91	42.48	5589.59	38.78	5682.12	24.68	5832.94	23.39
5950.98	23	8572.99	23.57	8838.6	23.95	9052.36	23.54	9300.69	23.52
9348.63	23.6	9367.42	25.66	9430.94	24.36	9449.59	21.83	9458.96	21.79
9552	22.04	9553.16	33.05	9559.83	29.83	9564.83	28.47	9566.03	27.83
9575.79	21.3	9577.61	20.38	9580.31	21.04	9581.43	19.93	9588.46	17.69
9602.04	14.14	9606.98	13.83	9609.22	13.84	9615.48	13.91	9630.19	13.29
9631.94	13.22	9648.41	13.29	9650.96	13.17	9664.87	12.63	9671.72	11.67
9681.33	10.33	9692.49	9.41	9697.8	8.95	9713.25	8.88	9714.26	8.86
9720.85	7.77	9734.02	6.88	9743.38	8.12	9744.75	8.31	9752.74	8.53
9755.48	8.61	9762.1	9.23	9766.22	9.86	9771.74	10.56	9776.95	10.75
9787.68	12.32	9798.41	13.38	9809.15	15.25	9812.79	16.61	9815.83	16.65
9836.62	16.95	9859.74	17.3	9877.34	16.85	9884.81	16.06	9886.98	15.99
9891.75	16.21	9894.47	16.8	9895.78	17.21	9898.68	18.56	9906.92	22.47
9920.56	23	9932.25	23.51	2306.17	23				

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.061	9553.16	.016	9906.92	.065			

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

9553.16	9906.92	0	0	0	.1	.3
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Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	9553.16	20.42

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.061	0.016	0.065
W.S. Elev (ft)	24.69	Reach Len. (ft)	3915.00	3915.00	3915.00
Crit W.S. (ft)		Flow Area (sq ft)	5067.22	3756.31	3457.80
E.G. Slope (ft/ft)	0.000169	Area (sq ft)	5067.22	3756.31	3457.80
Q Total (cfs)	25700.00	Flow (cfs)	1957.34	22432.47	1310.19
Top Width (ft)	6549.31	Top Width (ft)	3813.87	336.19	2399.25
Vel Total (ft/s)	2.09	Avg. Vel. (ft/s)	0.39	5.97	0.38
Max Chl Dpth (ft)	17.81	Hydr. Depth (ft)	1.33	11.17	1.44
Conv. Total (cfs)	1977386.0	Conv. (cfs)	150599.9	1725979.0	100807.4
Length Wtd. (ft)	3915.00	Wetted Per. (ft)	3816.50	341.32	2400.96
Min Ch El (ft)	6.88	Shear (lb/sq ft)	0.01	0.12	0.02
Alpha	7.11	Stream Power (lb/ft s)	0.01	0.69	0.01
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	643.86	355.86	773.83
C & E Loss (ft)	0.02	Cum SA (acres)			

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: Fish Creek
REACH: Lower Fish Creek RS: 26.09

INPUT

Description: Cross Section at River Mile 26.09

Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	57.55	181.9	55.45	317.7	50.85	508.9	46.85	646.7	47.35

750.3	46.95	753.4	46.55	882.5	46.45	885.8	46.55	917.4	46.45
931	46.35	1156	46.45	1159	46.55	1194.2	46.85	1644.8	47.15
1855	49.25	2152.1	51.55	2350.9	49.35	2528	40.15	2725.4	38.95
2793	38.75	2878	38.85	3024.5	39.45	3098.9	38.35	3470.8	38.35
3746	38.35	4068.7	39.05	4319.2	38.95	4658.5	38.65	4869.4	39.95
5089.3	44.35	5315.9	42.95	5531.9	38.55	5628.6	22.45	7444.3	20.25
7698.8	20.85	7959.3	21.15	8063.9	21.35	8138.8	21.15	8284.4	21.55
8468.9	22.35	8721.6	23.75	8995.7	24.25	9216.3	23.85	9512.7	23.75
9531.5	26.05	9599.6	24.85	9619.6	22.05	10204.9	21.95	10380.1	26.45
10424.5	42.95	10430.4	40.05	10446	43.15	10452	44.95	10464.6	44.91
10468.9	44.63	10490.2	42.16	10499.6	40.49	10514.97	42.4	10525.1	37.2
10532.7	35.41	10552.1	24.2	10556.2	25.89	10557.9	23.81	10577.3	17.39
10583.8	12.99	10593.8	11.39	10603.8	10.89	10613.8	9.99	10623.8	10.39
10633.8	11.49	10643.8	11.49	10653.8	11.49	10663.8	11.19	10673.8	10.89
10683.8	10.69	10693.8	10.29	10703.8	10.09	10713.8	9.49	10723.8	8.69
10733.8	8.39	10743.8	7.89	10753.8	7.89	10763.8	8.79	10773.8	11.69
10783.8	12.39	10793.8	12.59	10803.8	13.29	10813.8	14.59	10907.8	17.39
10939.1	18.66	10950.7	22.95	10972.2	20.99	10981.2	21.85	10990.4	22.36
11022.5	20.75	11242.6	20.25	11335	20.55	11432.9	20.45	11720.9	19.65
14591.4	19.15	14624.4	21.35	14662.2	34.55	14691.4	36.75	15049.4	43.15
15301	43.35	15595.8	44.95	15925.7	45.05	16126.2	45.05	16172.7	45.35
16268.1	45.45	16363.2	45.25	16653.9	46.15	16889.9	46.55	17127.1	46.95
17215.7	49.35	17468.8	51.55						

Manning's n Values	num=	4					
Sta	n Val	Sta	n Val	Sta	n Val		
0	.063	10464.6	.07	10556.2	.016	10950.7	.067

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	10514.97	10950.7		2826	4769	4679	.1	.3

Blocked Obstructions	num=	2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev
010514.97	20.17	10950.7	17468.8	20.17	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	24.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.063	0.016	0.067
W.S. Elev (ft)	23.98	Reach Len. (ft)	2826.00	4769.00	4679.00
Crit W.S. (ft)		Flow Area (sq ft)	9260.54	4162.66	13762.10
E.G. Slope (ft/ft)	0.000215	Area (sq ft)	9260.54	4162.66	13762.10
Q Total (cfs)	43600.00	Flow (cfs)	5667.11	27152.32	10780.58
Top Width (ft)	8356.35	Top Width (ft)	4282.16	392.94	3681.25
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)	0.61	6.52	0.78
Max Chl Dpth (ft)	16.09	Hydr. Depth (ft)	2.16	10.59	3.74
Conv. Total (cfs)	2972966.0	Conv. (cfs)	386424.5	1851443.0	735098.6
Length Wtd. (ft)	4462.76	Wetted Per. (ft)	4282.47	397.17	3681.92
Min Ch El (ft)	7.89	Shear (lb/sq ft)	0.03	0.14	0.05
Alpha	10.38	Stream Power (lb/ft s)	0.02	0.92	0.04
Frotn Loss (ft)	0.95	Cum Volume (acre-ft)	32918.73	63114.07	13043.55
C & E Loss (ft)	0.04	Cum SA (acres)	12881.67	13327.85	6114.24

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 25.1

INPUT

Description: Cross Section at River Mile 25.1

Station Elevation Data num= 115									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	56.3	181.9	54.2	317.7	49.6	508.9	45.6	646.7	46.1
750.3	45.7	753.4	45.3	882.5	45.2	885.8	45.3	917.4	45.2
931	45.1	1156	45.2	1159	45.3	1194.2	45.6	1644.8	45.9
1855	48	2152.1	50.3	2350.9	48.1	2528	38.9	2725.4	37.7
2793	37.5	2878	37.6	3024.5	38.2	3098.9	37.1	3470.8	37.1
3746	37.1	4068.7	37.8	4319.2	37.7	4658.5	37.4	4869.4	38.7
5089.3	43.1	5315.9	41.7	5531.9	37.3	5628.6	21.2	7444.3	19
7698.8	19.6	7959.3	19.9	8063.9	20.1	8138.8	19.9	8284.4	20.3
8468.9	21.1	8721.6	22.5	8995.7	23	9216.3	22.6	9512.7	22.5
9531.5	24.8	9599.6	23.6	9619.6	20.8	10204.9	20.7	10380.1	25.2
10424.5	41.7	10430.4	38.8	10446	41.9	10452	43.7	10464.6	43.66
10468.9	43.38	10490.2	40.91	10499.6	39.24	10514.97	41.15	10525.1	35.95
10532.7	34.16	10552.1	22.95	10577.3	16.14	10583.8	11.74	10593.8	10.14
10603.8	9.64	10613.8	8.74	10623.8	9.14	10633.8	10.24	10643.8	10.24
10653.8	10.24	10663.8	9.94	10673.8	9.64	10683.8	9.44	10693.8	9.04
10703.8	8.84	10713.8	8.24	10723.8	7.44	10733.8	7.14	10743.8	6.64
10753.8	6.64	10763.8	7.54	10773.8	10.44	10783.8	11.14	10793.8	11.34
10803.8	12.04	10813.8	13.34	10907.8	16.14	10939.1	17.41	10950.7	21.7
10972.2	19.74	10981.2	20.6	10990.4	21.11	11022.5	19.5	11242.6	19
11335	19.3	11432.9	19.2	11720.9	18.4	14591.4	17.9	14624.4	20.1
14662.2	33.3	14691.4	35.5	15049.4	41.9	15301	42.1	15595.8	43.7
15925.7	43.8	16126.2	43.8	16172.7	44.1	16268.1	44.2	16363.2	44
16653.9	44.9	16889.9	45.3	17127.1	45.7	17215.7	48.1	17468.8	50.3

Manning's n Values num= 15									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	508.9	.04	1194.2	.05	2725.4	.04	3470.8	.05
5089.3	.04	5628.6	.07	8721.6	.04	9216.3	.05	10464.6	.07
10552.1	.016	10939.1	.07	15301	.04	16363.2	.06	17215.7	.04

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	10514.97	10950.7		2028.75	4406.38	2370.38	.1	.3

Blocked Obstructions num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
010514.97	18.92	10950.7	17468.8	18.92		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	23.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.066	0.019	0.070
W.S. Elev (ft)	23.12	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	11007.16	4332.58	15195.56
E.G. Slope (ft/ft)	0.000212	Area (sq ft)	11007.16	4332.58	15195.56
Q Total (cfs)	43600.00	Flow (cfs)	7017.88	24500.53	12081.59
Top Width (ft)	8678.31	Top Width (ft)	4597.05	398.90	3682.36
Vel Total (ft/s)	1.43	Avg. Vel. (ft/s)	0.64	5.65	0.80
Max Chl Dpth (ft)	16.48	Hydr. Depth (ft)	2.39	10.86	4.13
Conv. Total (cfs)	2994413.0	Conv. (cfs)	481981.9	1682677.0	829754.0
Length Wtd. (ft)	3533.73	Wetted Per. (ft)	4597.45	402.96	3683.10
Min Ch El (ft)	6.64	Shear (lb/sq ft)	0.03	0.14	0.05
Alpha	8.93	Stream Power (lb/ft s)	0.02	0.80	0.04
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	32261.29	62649.04	11488.31
C & E Loss (ft)	0.01	Cum SA (acres)	12593.64	13284.50	5718.76

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 24.2625*

INPUT

Description:

Station Elevation Data		num= 223		Elev Sta		Elev Sta		Elev Sta		Elev Sta	
.12	53.51	63.26	52.98	175.39	50.24	176.62	50.22	308.39	45.91		
493.91	42	575.19	42.09	627.61	42.17	687.45	41.85	689.99	41.76		
696.23	41.74	697.25	41.83	718	41.94	728.13	41.89	731.14	41.53		
818.68	41.36	856.41	41.35	859.61	41.44	890.27	41.36	903.46	41.27		
1087.12	41.4	1101.63	40.87	1121.78	40.88	1124.69	40.96	1158.84	41.22		
1596.06	41.49	1800.01	43.33	2088.28	45.34	2281.18	43.41	2453.02	35.36		
2644.55	34.31	2710.14	34.14	2792.62	34.22	2934.76	34.75	3006.95	33.79		
3367.8	33.79	3634.83	33.79	3947.94	34.4	4191	34.31	4520.22	34.05		
4724.85	35.19	4938.22	39.04	5158.08	37.81	5367.67	33.96	5461.49	19.88		
5821.25	19.48	6110.31	19.3	6420.5	19.39	6721.64	18.91	6760.85	18.68		
6946.81	18.46	7223.25	18.14	7300.91	18.3	7470.19	18.67	7668.88	18.88		
7722.95	18.97	7764.6	19.07	7803.03	19.8	7824.44	19.94	7897.11	20.13		
7964.3	20.63	8028.07	21.11	8038.39	21.11	8066.38	21.13	8147.97	20.8		
8217.41	20.96	8328.46	21.34	8462.6	22.2	8492.27	22.29	8517.34	22.5		
8580.73	22.57	8594.09	22.38	8728.56	22.59	8844.84	22.4	8942.6	22.29		
8955.07	22.3	8985.49	21.97	9152.86	21.94	9230.19	21.99	9248.44	24.02		
9299.62	23.26	9314.51	23.17	9333.92	20.91	9345.57	21.02	9413.41	21.04		
9438.36	20.75	9505.18	21.09	9573.91	21.11	9587.79	21.81	9601.4	21.77		
9631.06	21.15	9665.3	21.31	9694.07	21.83	9729.32	21.15	9756.05	21.45		
9775.78	20.84	9828.22	20.67	9890.72	21.28	9901.83	21.12	9927.37	21.37		
9996.23	23.25	10020.55	24.71	10071.82	26.07	10072.22	26.21	10110.02	37.59		
10114.9	39.22	10120.63	36.67	10135.77	39.36	10141.59	40.93	10153.81	40.87		
10157.99	40.62	10166.79	39.69	10178.65	38.71	10187.77	37.43	10202.69	39.42		
10213.38	34.07	10214.53	33.61	10223.41	31.88	10225.66	30.86	10234.12	26.96		
10246.08	21.49	10248.24		2110269.62	16.58	10275.54	15.38	10283.13	11.52		
10294.82	10.12	10296.78	10.04	10306.51	9.65	10318.2	8.84	10322.54	8.95		
10329.88	9.15	10341.57	10.06	10348.4	10.03	10353.26	10.02	10364.95	9.99		
10376.63	9.69	10377.39	9.67	10388.32	9.37	10400.01	9.15	10403.8	9.02		
10411.7	8.74	10415.43	8.67	10420.41	8.51	10423.39	8.38	10425.38	8.23		
10430.35	7.91	10435.07	7.61	10435.33	7.59	10440.3	7.23	10445.27	6.87		
10446.76	6.81	10450.25	6.74	10455.22	6.45	10458.45	6.32	10460.19	6.23		
10465.16	5.61	10470.14	5.06	10478.89	5.06	10487.84	6.01	10496.79	8.7		
10505.74	9.48	10514.69	9.81	10523.64	10.58	10532.59	11.88	10534.83	11.99		
10590.78	14.24	10616.72	15.36	10636.67	15.41	10644.73	16.86	10655.11	20.76		
10676.32	19.02	10685.2	19.76	10694.27	20.19	10725.94	18.73	10867.8	18.24		
10943.05	18.2	11034.2	18.61	11130.77	18.67	11180.85	18.63	11414.86	18.11		
11506.62	18.12	11805.73	18.28	12083.59	17.98	12734.48		1813027.05	18.31		
13043.32	18.71	13059.81	18.68	13075.52	18.42	13250.25	18.18	13282.01	18.32		
13368.54	18.24	13406.06	17.45	13427.86	17.36	13471.34	17.33	13632.24	17.34		
13818.48	17.28	13847.03	17.71	13998.74	17.88	14108.84	17.86	14246.4	17.81		
14278.95	19.73	14316.24	31.27	14345.04	33.19	14428.64	34.51	14577.47	36.56		
14698.19	38.48	14946.37	38.66	15237.17	40.07	15562.59	40.16	15760.37	40.17		
15806.24	40.43	15900.35	40.52	15994.16	40.35	16131.44	40.73	16218.75	41.69		
16280.91		4216290.23	42.04	16473.48	42.41	16513.71	42.48	16747.69	42.84		
16766.94	43.31	16835.08	44.92	17084.75	46.79						

Manning's n Values		num= 4		n Val		n Val		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.12	.064	10202.69	.081	10225.66	.016	10655.11	.068		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	10202.69	10655.11		2028.75	4406.38	2370.38	.1	.3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .12510202.6918.3012510655.1117084.7518.30125

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	22.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.064	0.016	0.068
W.S. Elev (ft)	22.36	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	9610.12	4543.45	14468.89
E.G. Slope (ft/ft)	0.000174	Area (sq ft)	9610.12	4543.45	14468.89
Q Total (cfs)	43600.00	Flow (cfs)	5671.32	27453.77	10474.91
Top Width (ft)	8092.08	Top Width (ft)	4048.82	410.93	3632.33
Vel Total (ft/s)	1.52	Avg. Vel. (ft/s)	0.59	6.04	0.72
Max Chl Dpth (ft)	17.30	Hydr. Depth (ft)	2.37	11.06	3.98
Conv. Total (cfs)	3306562.0	Conv. (cfs)	430104.8	2082055.0	794402.1
Length Wtd. (ft)	3604.00	Wetted Per. (ft)	4049.20	414.51	3632.93
Min Ch El (ft)	5.06	Shear (lb/sq ft)	0.03	0.12	0.04
Alpha	9.98	Stream Power (lb/ft s)	0.02	0.72	0.03
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	31781.17	62200.11	10681.19
C & E Loss (ft)	0.01	Cum SA (acres)	12392.31	13243.54	5519.74

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 23.425*

INPUT

Description:

Station Elevation Data	num=	223
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
.25 50.72 61.45 50.41 170.15 46.26 171.34 46.24 299.07 42.22		
478.91 38.41 557.7 38.28 608.52 38.24 666.53 37.85 669 37.66		
675.04 37.65 676.03 37.84 696.14 38.13 705.97 38.07 708.88 37.77		
793.74 37.5 830.31 37.5 833.41 37.57 863.14 37.52 875.93 37.45		
1053.96 37.61 1068.02 36.54 1087.56 36.55 1090.38 36.62 1123.49 36.85		
1547.31 37.08 1745.02 38.65 2024.47 40.38 2211.46 38.72 2378.03 31.83		
2563.7 30.93 2627.29 30.77 2707.23 30.85 2845.03 31.3 2915.01 30.47		
3264.81 30.47 3523.66 30.47 3827.18 31 4062.8 30.93 4381.93 30.7		
4580.3 31.68 4787.13 34.97 5000.27 33.92 5203.44 30.62 5294.39 18.55		
5643.13 18.21 5923.33 18.22 6224.02 18.78 6515.95 18.19 6553.96 17.78		
6734.22 17.58 7002.2 17.29 7077.48 17.42 7241.57 17.74 7434.18 17.93		
7486.59 18.05 7526.97 18.16 7564.23 19.54 7584.98 19.79 7655.43 20.36		
7720.56 21.17 7782.37 21.95 7792.38 21.91 7819.51 21.84 7898.6 20.82		
7965.91 20.83 8073.56 20.95 8203.6 21.89 8232.36 22.02 8256.67 22.4		
8318.11 22.42 8331.07 22.01 8461.41 22.19 8574.13 22.01 8668.9 21.99		
8680.98 22 8710.47 21.36 8872.72 21.35 8947.69 21.48 8965.37 23.25		
9014.99 22.65 9029.42 22.74 9048.24 21.02 9059.53 21.25 9125.29 21.29		
9149.48 20.71 9214.25 21.4 9280.88 21.47 9294.33 22.87 9307.53 22.79		
9336.28 21.56 9369.47 21.88 9397.36 22.93 9431.53 21.57 9457.45 22.17		
9476.57 20.97 9527.4 20.63 9587.99 21.85 9598.76 21.55 9623.52 21.36		
9690.27 23.3 9713.84 25.58 9763.55 26.95 9763.93 27.06 9800.58 35.35		
9805.31 36.73 9810.86 34.54 9825.53 36.82 9831.17 38.15 9843.03 38.09		
9847.07 37.86 9855.61 37.05 9867.1 36.49 9875.95 35.62 9890.4 37.69		
9902.64 31.69 9903.95 31.27 9914.12 29.59 9916.7 28.67 9926.37 25.04		
9940.07 20.04 9942.53 19.56 9967.01 15.65 9973.77 14.62 9982.47 11.31		
9995.84 10.09 9998.08 10.0310009.22 9.6710022.59 8.9310027.56 9.02		
10035.97 9.1510049.34 9.8810057.15 9.8310062.72 9.810076.09 9.73		

10089.47	9.4310090.33	9.4210102.85	9.1110116.22	8.8510120.55	8.72
10129.6	8.4410133.87	8.3610139.56	8.1210142.97	7.9210145.25	7.73
10150.95	7.3410156.35	6.9910156.64	6.9710162.33	6.5910168.02	6.21
10169.72	6.1510173.71	6.14 10179.4	5.67 10183.1	5.5110185.09	5.4
10190.78	4.3410196.47	3.4810203.97	3.4810211.88	4.4710219.77	6.97
10227.67	7.8110235.57	8.2810243.47	9.1310251.38	10.4210253.36	10.56
10302.74	13.2110325.63	14.5810343.25	14.9410350.36	16.3210359.53	19.83
10380.44	18.29 10389.2	18.9110398.15	19.2710429.38	17.9710569.28	17.3
10643.5	17.4110733.39	17.9210828.64	18.1410878.02	18.1911108.82	17.83
11199.32	17.8611494.31	18.2211768.35	17.6912410.28	17.8312698.83	18.51
12714.88	19.2812731.13	19.2612746.63	18.7312918.96	18.2812950.28	18.58
13035.62	18.4213072.62	16.8613094.12	16.6813137.01	16.6313295.69	16.68
13479.37	16.5813507.52	17.4513657.15	17.8113765.73	17.79 13901.4	17.72
13933.51	19.3613970.28	29.2413998.69	30.8814081.13	31.9914227.92	33.41
14346.97	35.0614591.74	35.2214878.54	36.4315199.49	36.5215394.54	36.53
15439.78	36.7615532.59	36.8415625.11	36.69 15760.5	37.0215846.61	38.68
15907.92	39.1115917.11	39.1616097.84	39.616137.51	39.6516368.27	39.97
16387.26	40.3716454.47	41.74 16700.7	43.28		

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val Sta n Val
.25 .062 9890.4 .08 9940.07 .01610359.53 .066

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9890.410359.53 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2
Sta L Sta R Elev Sta L Sta R Elev
.259890.402 17.682510359.53 16700.7 17.6825

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	22.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.062	0.017	0.066
W.S. Elev (ft)	21.75	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	9051.37	4762.69	13563.83
E.G. Slope (ft/ft)	0.000179	Area (sq ft)	9051.37	4762.69	13563.83
Q Total (cfs)	43600.00	Flow (cfs)	6292.09	27388.28	9919.63
Top Width (ft)	7560.22	Top Width (ft)	3553.22	424.13	3582.86
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)	0.70	5.75	0.73
Max Chl Dpth (ft)	18.27	Hydr. Depth (ft)	2.55	11.23	3.79
Conv. Total (cfs)	3259998.0	Conv. (cfs)	470463.2	2047838.0	741696.8
Length Wtd. (ft)	3611.15	Wetted Per. (ft)	3553.62	427.42	3583.38
Min Ch El (ft)	3.48	Shear (lb/sq ft)	0.03	0.12	0.04
Alpha	8.27	Stream Power (lb/ft s)	0.02	0.72	0.03
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	31346.61	61729.42	9918.47
C & E Loss (ft)	0.00	Cum SA (acres)	12215.28	13201.31	5323.42

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 22.5875*

INPUT

Description:

Station Elevation Data	num=	223
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
.38 47.94 59.64 47.84 164.91 42.28 166.06 42.27 289.76 38.53		
463.92 34.81 540.22 34.46 589.43 34.31 645.61 33.84 648 33.57		

653.85	33.55	654.81	33.85	674.28	34.33	683.8	34.26	686.62	34
768.8	33.63	804.22	33.64	807.22	33.71	836	33.67	848.39	33.62
1020.8	33.83	1034.42	32.22	1053.34	32.23	1056.07	32.29	1088.13	32.47
1498.57	32.66	1690.03	33.97	1960.65	35.41	2141.73	34.04	2303.05	28.29
2482.85	27.54	2544.43	27.41	2621.85	27.47	2755.29	27.85	2823.06	27.16
3161.81	27.16	3412.48	27.16	3706.42	27.6	3934.59	27.54	4243.65	27.35
4435.75	28.16	4636.05	30.91	4842.46	30.04	5039.2	27.29	5127.28	17.23
5465.01	16.94	5736.36	17.13	6027.55	18.16	6310.26	17.48	6347.06	16.89
6521.63	16.7	6781.15	16.43	6854.05	16.53	7012.96	16.8	7199.48	16.97
7250.24	17.12	7289.34	17.25	7325.42	19.29	7345.52	19.63	7413.74	20.59
7476.81	21.71	7536.68	22.79	7546.37	22.72	7572.64	22.55	7649.23	20.83
7714.42	20.69	7818.67	20.56	7944.6	21.59	7972.45	21.75	7995.99	22.3
8055.49	22.26	8068.04	21.64	8194.27	21.78	8303.43	21.63	8395.2	21.68
8406.9	21.7	8435.46	20.75	8592.59	20.75	8665.18	20.97	8682.31	22.47
8730.36	22.04	8744.34	22.31	8762.56	21.13	8773.49	21.47	8837.18	21.54
8860.6	20.68	8923.33	21.72	8987.85	21.82	9000.88	23.92	9013.66	23.81
9041.5	21.97	9073.64	22.45	9100.65	24.02	9133.75	21.99	9158.84	22.89
9177.36	21.09	9226.59	20.6	9285.25	22.43	9295.69	21.97	9319.67	21.35
9384.31	23.35	9407.13	26.45	9455.27	27.82	9455.64	27.92	9491.13	33.11
9495.71	34.25	9501.09	32.41	9515.3	34.28	9520.76	35.38	9532.24	35.3
9536.16	35.1	9544.42	34.4	9555.56	34.27	9564.12	33.81	9578.12	35.96
9591.9	29.31	9593.38	28.93	9604.83	27.31	9607.73	26.49	9618.62	23.13
9634.05	18.58	9636.83	18.11	9664.39	14.72	9672.01	13.86	9681.8	11.09
9696.86	10.07	9699.38	10.01	9711.93	9.68	9726.99	9.03	9732.58	9.09
9742.05	9.16	9757.12	9.71	9765.91	9.62	9772.18	9.58	9787.24	9.48
9802.31	9.18	9803.28	9.16	9817.37	8.84	9832.43	8.56	9837.31	8.43
9847.5	8.14	9852.31	8.05	9858.72	7.73	9862.56	7.45	9865.13	7.22
9871.54	6.76	9877.62	6.36	9877.95	6.34	9884.36	5.94	9890.77	5.54
9892.69	5.51	9897.17	5.53	9903.58	4.89	9907.75	4.69	9909.99	4.57
9916.4	3.08	9922.81	1.9	9929.06	1.9	9935.91	2.94	9942.76	5.23
9949.61	6.15	9956.46	6.76	9963.31	7.67	9970.16	8.97	9971.88	9.13
10014.7	12.17	10034.55	13.81	10049.83	14.48	10055.99	15.77	10063.94	18.89
10084.56	17.57	10093.2	18.07	10102.02	18.35	10132.81	17.21	10270.77	16.37
10343.95	16.61	10432.59	17.23	10526.5	17.62	10575.2	17.76	10802.78	17.54
10892.02	17.61	11182.89	18.17	11453.11	17.39	12086.08	17.65	12370.61	18.71
12386.43	19.87	12402.46	19.83	12417.74	19.04	12587.66	18.38	12618.55	18.83
12702.7	18.61	12739.18	16.27	12760.38	16.12	12802.67	15.92	12959.14	16.02
13140.25	15.88	13168.02	17.19	13315.55	17.74	13422.63	17.73	13556.41	17.63
13588.06	18.99	13624.32	27.22	13652.33	28.57	13733.63	29.47	13878.37	30.26
13995.76	31.63	14237.11	31.78	14519.91	32.81	14836.38	32.88	15028.71	32.9
15073.32	33.09	15164.84	33.16	15256.07	33.04	15389.57	33.32	15474.48	35.67
15534.93	36.21	15543.99	36.29	15722.2	36.78	15761.32	36.83	15988.86	37.11
16007.59	37.44	16073.85	38.56	16316.65	39.76				

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .38 .06 9578.12 .08 9634.05 .01610063.94 .064

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9578.1210063.94 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .3759578.11917.0637510063.9416316.6517.06375

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	21.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.060	0.018	0.064
W.S. Elev (ft)	21.08	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	8710.98	4924.29	11950.29

E.G. Slope (ft/ft)	0.000192	Area (sq ft)	8710.98	4924.29	11950.29
Q Total (cfs)	43600.00	Flow (cfs)	6956.52	27975.90	8667.58
Top Width (ft)	6901.56	Top Width (ft)	2929.89	438.36	3533.31
Vel Total (ft/s)	1.70	Avg. Vel. (ft/s)	0.80	5.68	0.73
Max Chl Dpth (ft)	19.18	Hydr. Depth (ft)	2.97	11.23	3.38
Conv. Total (cfs)	3144426.0	Conv. (cfs)	501703.3	2017618.0	625104.5
Length Wtd. (ft)	3692.70	Wetted Per. (ft)	2930.22	441.52	3533.79
Min Ch El (ft)	1.90	Shear (lb/sq ft)	0.04	0.13	0.04
Alpha	7.20	Stream Power (lb/ft s)	0.03	0.76	0.03
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	30932.98	61239.47	9224.28
C & E Loss (ft)	0.01	Cum SA (acres)	12064.31	13157.68	5129.81

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 21.75*

INPUT

Description:

Station	Elevation	Data	num=	223					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.5	45.15	57.83	45.27	159.67	38.31	160.78	38.29	280.44	34.84
448.92	31.21	522.73	30.65	570.34	30.38	624.69	29.83	627	29.48
632.66	29.46	633.59	29.86	652.43	30.52	661.63	30.45	664.36	30.23
743.86	29.77	778.12	29.79	781.03	29.85	808.87	29.83	820.86	29.79
987.64	30.04	1000.81	27.9	1019.12	27.9	1021.76	27.95	1052.78	28.1
1449.83	28.25	1635.05	29.3	1896.84	30.45	2072.01	29.35	2228.06	24.75
2402	24.15	2461.57	24.05	2536.47	24.1	2665.56	24.4	2731.12	23.85
3058.82	23.85	3301.31	23.85	3585.66	24.2	3806.39	24.15	4105.37	24
4291.2	24.65	4484.97	26.85	4684.64	26.15	4874.97	23.95	4960.18	15.9
5286.89	15.68	5549.39	16.04	5831.08	17.55	6104.57	16.76	6140.17	15.99
6309.05	15.82	6560.09	15.57	6630.62	15.64	6784.35	15.87	6964.79	16.02
7013.89	16.19	7051.71	16.34	7086.62	19.03	7106.06	19.47	7172.06	20.82
7233.07	22.25	7290.98	23.64	7300.35	23.53	7325.77	23.26	7399.87	20.84
7462.93	20.56	7563.77	20.17	7685.59	21.29	7712.54	21.48	7735.31	22.2
7792.87	22.11	7805.01	21.27	7927.12	21.37	8032.72	21.24	8121.5	21.37
8132.82	21.4	8160.45	20.14	8312.45	20.16	8382.68	20.47	8399.24	21.69
8445.72	21.44	8459.25	21.88	8476.87	21.24	8487.45	21.7	8549.06	21.79
8571.72	20.64	8632.4	22.03	8694.82	22.18	8707.42	24.98	8719.79	24.83
8746.72	22.37	8777.81	23.02	8803.94	25.12	8835.96	22.42	8860.23	23.61
8878.15	21.21	8925.77	20.56	8982.52	23	8992.62	22.39	9015.81	21.34
9078.35	23.4	9100.43	27.32	9146.99	28.69	9147.36	28.78	9181.69	30.87
9186.12	31.77	9191.32	30.28	9205.06	31.74	9210.35	32.61	9221.45	32.51
9225.24	32.34	9233.24	31.76	9244.01	32.06	9252.29	32	9265.83	34.22
9281.16	26.93	9282.8	26.59	9295.54	25.03	9298.76	24.3	9310.88	21.22
9328.03	17.12	9331.12	16.67	9361.77	13.79	9370.24	13.09	9381.13	10.88
9397.88	10.05	9400.69	10	9414.63	9.69	9431.39	9.12	9437.61	9.15
9448.14	9.16	9464.89	9.53	9474.67	9.42	9481.64	9.36	9498.39	9.22
9515.14	8.93	9516.22	8.91	9531.89	8.58	9548.64	8.27	9554.07	8.14
9565.39	7.84	9570.75	7.74	9577.88	7.35	9582.15	6.99	9585	6.72
9592.13	6.19	9598.9	5.74	9599.26	5.71	9606.38	5.29	9613.51	4.87
9615.65	4.86	9620.64	4.93	9627.77	4.11	9632.4	3.88	9634.89	3.73
9642.02	1.83	9649.15	.32	9654.15	.32	9659.95	1.41	9665.75	3.5
9671.55	4.49	9677.35	5.23	9683.15	6.22	9688.95	7.51	9690.4	7.71
9726.66	11.14	9743.47	13.02	9756.4	14.01	9761.62	15.22	9768.35	17.95
9788.68	16.85	9797.19	17.22	9805.89	17.42	9836.25	16.43	9972.26	15.44
10044.4	15.82	10131.79	16.54	10224.37	17.09	10272.38	17.33	10496.74	17.25
10584.71	17.34	10871.47	18.12	11137.87	17.09	11761.89	17.48	12042.39	18.91

12057.98	20.4612073.79	20.412088.86	19.3512256.37	18.4912286.82	19.09
12369.78	18.7812405.75	15.6712426.65	15.3212468.34	15.2212622.59	15.35
12801.14	15.1912828.51	16.9412973.96	17.6713079.52	17.6613211.41	17.54
13242.62	18.6213278.36	25.1913305.98	26.2713386.12	26.9613528.81	27.11
13644.54	28.2113882.48	28.3414161.28	29.1614473.27	29.2514662.89	29.26
14706.86	29.4214797.08	29.4814887.02	29.3915018.64	29.6215102.34	32.65
15161.94	33.3215170.88	33.4115346.56	33.9715385.13	34.0115609.45	34.25
15627.91	34.5115693.24	35.39 15932.6	36.25		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.5	.058	9265.83	.09	9310.88	.016	9768.35	.063

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

9265.83	9768.35	2028.75	4406.38	2370.38	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.59265.835	16.445	9768.35	15932.6	16.445	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	20.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.058	0.016	0.063
W.S. Elev (ft)	20.26	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	7924.22	4988.00	9858.39
E.G. Slope (ft/ft)	0.000184	Area (sq ft)	7924.22	4988.00	9858.39
Q Total (cfs)	43600.00	Flow (cfs)	6376.41	30895.05	6328.54
Top Width (ft)	6361.34	Top Width (ft)	2444.36	453.47	3463.51
Vel Total (ft/s)	1.91	Avg. Vel. (ft/s)	0.80	6.19	0.64
Max Chl Dpth (ft)	19.94	Hydr. Depth (ft)	3.24	11.00	2.85
Conv. Total (cfs)	3218092.0	Conv. (cfs)	470639.1	2280347.0	467106.2
Length Wtd. (ft)	3795.48	Wetted Per. (ft)	2444.66	456.70	3463.97
Min Ch El (ft)	0.32	Shear (lb/sq ft)	0.04	0.13	0.03
Alpha	7.46	Stream Power (lb/ft s)	0.03	0.78	0.02
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	30545.60	60738.12	8630.91
C & E Loss (ft)	0.01	Cum SA (acres)	11939.16	13112.58	4939.44

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 20.9125*

INPUT Description:

Station Elevation Data num= 223

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.62	42.36	56.02	42.71	154.43	34.33	155.5	34.31	271.13	31.14		
433.93	27.61	505.25	26.84	551.26	26.45	603.76	25.82	606	25.38		
611.47	25.37	612.36	25.87	630.57	26.72	639.46	26.64	642.1	26.47		
718.92	25.9	752.03	25.94	754.84	25.98	781.74	25.99	793.32	25.97		
954.48	26.26	967.21	23.57	984.9	23.58	987.45	23.61	1017.42	23.73		
1401.08	23.84	1580.06	24.63	1833.02	25.49	2002.29	24.66	2153.08	21.21		
2321.16	20.76	2378.71	20.69	2451.09	20.73	2575.82	20.95	2639.17	20.54		
2955.82	20.54	3190.14	20.54	3464.9	20.8	3678.19	20.76	3967.09	20.65		
4146.65	21.14	4333.89	22.79	4526.83	22.26	4710.74	20.61	4793.07	14.58		
5108.76	14.41	5362.42	14.96	5634.61	16.94	5898.88	16.05	5933.28	15.09		
6096.46	14.94	6339.04	14.71	6407.19	14.76	6555.74	14.94	6730.09	15.06		
6777.54	15.26	6814.08	15.43	6847.81	18.77	6866.6	19.32	6930.37	21.05		

6989.33	22.78	7045.29	24.48	7054.34	24.34	7078.91	23.97	7150.5	20.86
7211.43	20.42	7308.88	19.78	7426.59	20.98	7452.63	21.21	7474.63	22.1
7530.25	21.96	7541.98	20.91	7659.98	20.97	7762.02	20.86	7847.8	21.06
7858.74	21.1	7885.44	19.53	8032.31	19.57	8100.17	19.96	8116.18	20.91
8161.09	20.83	8174.16	21.45	8191.19	21.35	8201.41	21.92	8260.95	22.04
8282.84	20.61	8341.48	22.35	8401.79	22.53	8413.96	26.03	8425.92	25.84
8451.94	22.78	8481.99	23.59	8507.23	26.21	8538.17	22.84	8561.62	24.33
8578.93	21.33	8624.95	20.52	8679.79	23.58	8689.54	22.82	8711.96	21.33
8772.39	23.45	8793.72	28.19	8838.72	29.57	8839.07	29.63	8872.24	28.62
8876.52	29.29	8881.54	28.16	8894.83	29.2	8899.94	29.83	8910.66	29.72
8914.33	29.59	8922.05	29.12	8932.46	29.85	8940.46	30.19	8953.55	32.49
8970.42	24.55	8972.23	24.25	8986.24	22.75	8989.8	22.12	9003.13	19.31
9022.01	15.66	9025.42	15.22	9059.15	12.87	9068.48	12.33	9080.47	10.66
9098.91	10.02	9101.99	9.98	9117.34	9.7	9135.78	9.22	9142.63	9.22
9154.22	9.17	9172.66	9.35	9183.43	9.22	9191.1	9.14	9209.54	8.97
9227.98	8.68	9229.17	8.66	9246.42	8.31	9264.85	7.97	9270.83	7.84
9283.29	7.54	9289.19	7.43	9297.03	6.96	9301.73	6.53	9304.88	6.21
9312.72	5.62	9320.17	5.11	9320.57	5.08	9328.41	4.64	9336.26	4.2
9338.61	4.22	9344.11	4.32	9351.95	3.33	9357.05	3.06	9359.8	2.9
9367.64	.57	9375.49	-1.26	9379.24	-1.26	9383.99	-.12	9388.74	1.76
9393.49	2.83	9398.24	3.7	9402.99	4.76	9407.74	6.05	9408.93	6.28
9438.62	10.1	9452.39	12.24	9462.98	13.54	9467.25	14.68	9472.76	17.01
9492.8	16.12	9501.19	16.38	9509.77	16.5	9539.69	15.67	9673.74	14.5
9744.85	15.02	9830.98	15.85	9922.24	16.56	9969.56	16.9	10190.7	16.96
10277.41	17.08	10560.05	18.06	10822.62	16.79	11437.69	17.31	11714.17	19.11
11729.54	21.04	11745.12	20.98	11759.97	19.67	11925.08	18.59	11955.09	19.34
12036.86	18.96	12072.31	15.08	12092.91	14.64	12134	14.51	12286.05	14.69
12462.03	14.49	12489.01	16.68	12632.37	17.61	12736.42	17.61	12866.41	17.45
12897.17	18.25	12932.4	23.16	12959.62	23.96	13038.62	24.44	13179.26	23.95
13293.33	24.79	13527.85	24.89	13802.65	25.53	14110.16	25.61	14297.06	25.63
14340.4	25.75	14429.33	25.81	14517.97	25.73	14647.7	25.91	14730.21	29.64
14788.95	30.42	14797.76	30.53	14970.92	31.15	1515008.93	31.18	15230.04	31.38
15248.23	31.59	15312.62	32.21	15548.55	32.74				

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .62 .056 8953.55 .1 9003.13 .016 9472.76 .061

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 8953.55 9472.76 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .6258953.55215.826259472.76315548.5515.82625

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	19.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.056	0.016	0.061
W.S. Elev (ft)	19.45	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	7305.07	5017.86	7865.01
E.G. Slope (ft/ft)	0.000212	Area (sq ft)	7305.07	5017.86	7865.01
Q Total (cfs)	43600.00	Flow (cfs)	6391.87	32282.91	4925.22
Top Width (ft)	5972.09	Top Width (ft)	2144.97	470.31	3356.81
Vel Total (ft/s)	2.16	Avg. Vel. (ft/s)	0.87	6.43	0.63
Max Chl Dpth (ft)	20.71	Hydr. Depth (ft)	3.41	10.67	2.34
Conv. Total (cfs)	2992629.0	Conv. (cfs)	438726.7	2215843.0	338058.5
Length Wtd. (ft)	3834.73	Wetted Per. (ft)	2145.27	473.81	3357.20
Min Ch El (ft)	-1.26	Shear (lb/sq ft)	0.05	0.14	0.03
Alpha	6.60	Stream Power (lb/ft s)	0.04	0.90	0.02
Frctn Loss (ft)	0.98	Cum Volume (acre-ft)	30190.96	60232.04	8148.68

C & E Loss (ft) 0.00 Cum SA (acres) 11832.29 13065.85 4753.87

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 20.075*

INPUT

Description:

Station	Elevation	Data	num=	223	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.75	39.58	54.22	40.14	149.18	30.35	150.22	30.33	261.82	27.45			
418.93	24.02	487.77	23.03	532.17	22.51	582.84	21.82	585	21.29			
590.28	21.28	591.14	21.88	608.71	22.91	617.3	22.82	619.85	22.7			
693.98	22.03	725.93	22.09	728.64	22.12	754.61	22.15	765.79	22.14			
921.32	22.47	933.61	19.25	950.68	19.25	953.14	19.28	982.07	19.35			
1352.34	19.43	1525.07	19.95	1769.21	20.53	1932.57	19.98	2078.1	17.68			
2240.31	17.38	2295.86	17.33	2365.7	17.35	2486.09	17.5	2547.22	17.23			
2852.83	17.23	3078.97	17.23	3344.14	17.4	3549.99	17.38	3828.8	17.3			
4002.11	17.63	4182.81	18.73	4369.01	18.38	4546.51	17.28	4625.97	13.25			
4930.64	13.14	5175.45	13.87	5438.14	16.33	5693.18	15.33	5726.39	14.19			
5883.87	14.06	6117.99	13.86	6183.76	13.87	6327.12	14.01	6495.39	14.11			
6541.18	14.34	6576.46	14.52	6609.01	18.51	6627.14	19.16	6688.69	21.28			
6745.59	23.32	6799.59	25.32	6808.33	25.14	6832.04	24.68	6901.13	20.87			
6959.94	20.29	7053.99	19.38	7167.59	20.68	7192.72	20.94	7213.96	22			
7267.64	21.81	7278.96	20.54	7392.83	20.56	7491.31	20.47	7574.11	20.76			
7584.66	20.8	7610.42	18.92	7752.17	18.98	7817.67	19.45	7833.12	20.14			
7876.46	20.22	7889.08	21.03	7905.51	21.47	7915.38	22.15	7972.83	22.3			
7993.96	20.57	8050.55	22.67	8108.76	22.89	8120.51	27.09	8132.04	26.86			
8157.16	23.19	8186.16	24.16	8210.52	27.31	8240.38	23.26	8263.01	25.06			
8279.72	21.46	8324.13	20.48	8377.06	24.15	8386.47	23.24	8408.11	21.32			
8466.42	23.5	8487.01	29.06	8530.44	30.44	8530.78	30.49	8562.79	26.38			
8566.93	26.8	8571.77	26.03	8584.59	26.66	8589.52	27.06	8599.88	26.94			
8603.41	26.83	8610.87	26.48	8620.91	27.64	8628.64	28.38	8641.27	30.76			
8659.68	22.16	8661.66	21.91	8676.95	20.46	8680.83	19.93	8695.39	17.4			
8716	14.21	8719.71	13.77	8756.54	11.94	8766.72	11.57	8779.8	10.44			
8799.93	10	8803.29	9.97	8820.05	9.72	8840.18	9.32	8847.65	9.29			
8860.31	9.18	8880.43	9.17	8892.19	9.01	8900.56	8.92	8920.69	8.71			
8940.81	8.42	8942.11	8.41	8960.94	8.04	8981.07	7.68	8987.58	7.55			
9001.19	7.25	9007.62	7.12	9016.19	6.57	9021.32	6.07	9024.75	5.71			
9033.32	5.05	9041.45	4.49	9041.88	4.46	9050.44	4	9059.01	3.54			
9061.57	3.58	9067.57	3.71	9076.13	2.56	9081.7	2.24	9084.7	2.07			
9093.26	-.69	9101.83	-2.84	9104.33	-2.84	9108.02	-1.66	9111.72	.03			
9115.42	1.16	9119.12	2.17	9122.82	3.31	9126.52	4.59	9127.45	4.85			
9150.58	9.07	9161.3	11.46	9169.55	13.07	9172.88	14.13	9177.17	16.08			
9196.92	15.4	9205.19	15.53	9213.64	15.58	9243.13	14.9	9375.23	13.57			
9445.31	14.23	9530.18	15.15	9620.11	16.03	9666.74	16.46	9884.66	16.68			
9970.11	16.82	10248.64	18.82	10507.38	16.51	11113.49	17.14	11385.94	19.3			
11401.09	21.63	11416.45	21.55	11431.08	19.98	11593.79	18.69	11623.36	19.59			
11703.94	19.14	11738.87	14.49	11759.17	13.96	11799.67	13.81	11949.5	14.03			
12122.92	13.79	12149.51	16.42	12290.78	17.54	12393.31	17.53	12521.41	17.36			
12551.72	17.88	12586.44	21.13	12613.27	21.65	12691.11	21.93	12829.71	20.8			
12942.11	21.37	13173.23	21.45	13444.02	21.91	13747.06	21.97	13931.23	22			
13973.94	22.08	14061.57	22.12	14148.93	22.08	14276.77	22.21	14358.07	26.63			
14415.96	27.52	14424.64	27.65	14595.28	28.33	14632.74	28.36	14850.62	28.52			
14868.55	28.66	14932.01	29.03	15164.5	29.23							

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.75	.054	8641.27	.1	8695.39	.016	9177.17	.059

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
8641.27 9177.17 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2
Sta L Sta R Elev Sta L Sta R Elev
.74999998641.268 15.20759177.175 15164.5 15.2075

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	18.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.	0.054	0.018	0.059
W.S. Elev (ft)	18.44	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	8630.77	4915.62	5535.92
E.G. Slope (ft/ft)	0.000298	Area (sq ft)	8630.77	4915.62	5535.92
Q Total (cfs)	43600.00	Flow (cfs)	7206.93	32715.65	3677.42
Top Width (ft)	7810.82	Top Width (ft)	4374.62	487.75	2948.44
Vel Total (ft/s)	2.28	Avg. Vel. (ft/s)	0.84	6.66	0.66
Max Chl Dpth (ft)	21.28	Hydr. Depth (ft)	1.97	10.08	1.88
Conv. Total (cfs)	2527677.0	Conv. (cfs)	417816.5	1896665.0	213195.7
Length Wtd. (ft)	3724.27	Wetted Per. (ft)	4374.90	491.83	2948.79
Min Ch El (ft)	-2.84	Shear (lb/sq ft)	0.04	0.19	0.03
Alpha	6.40	Stream Power (lb/ft s)	0.03	1.24	0.02
Froctn Loss (ft)	0.92	Cum Volume (acre-ft)	29819.86	59729.63	7784.07
C & E Loss (ft)	0.05	Cum SA (acres)	11680.47	13017.40	4582.31

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 19.2375*

INPUT

Description:

Station Elevation Data	num=	223
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
.87 36.79 52.41 37.57 143.94 26.38 144.94 26.36 252.5 23.76		
403.94 20.42 470.28 19.21 513.08 18.58 561.92 17.81 564 17.19		
569.09 17.19 569.92 17.89 586.86 19.11 595.13 19.01 597.59 18.94		
669.04 18.17 699.84 18.24 702.45 18.26 727.48 18.3 738.25 18.32		
888.16 18.69 900 14.92 916.45 14.93 918.83 14.94 946.71 14.98		
1303.6 15.01 1470.08 15.28 1705.39 15.56 1862.84 15.29 2003.11 14.14		
2159.46 13.99 2213 13.96 2280.32 13.98 2396.35 14.05 2455.28 13.91		
2749.83 13.91 2967.8 13.91 3223.38 14 3421.79 13.99 3690.52 13.95		
3857.56 14.11 4031.72 14.66 4211.2 14.49 4382.27 13.94 4458.86 11.93		
4752.52 11.87 4988.47 12.79 5241.67 15.71 5487.49 14.62 5519.49 13.3		
5671.29 13.18 5896.94 13 5960.33 12.99 6098.51 13.08 6260.7 13.15		
6304.83 13.41 6338.83 13.61 6370.21 18.26 6387.68 19.01 6447 21.5		
6501.84 23.86 6553.9 26.16 6562.32 25.95 6585.17 25.39 6651.77 20.89		
6708.45 20.15 6799.09 18.99 6908.59 20.38 6932.81 20.67 6953.28 21.9		
7005.02 21.65 7015.93 20.17 7125.69 20.15 7220.61 20.09 7300.41 20.45		
7310.58 20.5 7335.41 18.31 7472.04 18.39 7535.16 18.94 7550.05 19.36		
7591.83 19.61 7603.99 20.6 7619.83 21.58 7629.34 22.37 7684.72 22.55		
7705.08 20.54 7759.63 22.98 7815.73 23.24 7827.06 28.14 7838.17 27.88		
7862.38 23.59 7890.33 24.73 7913.81 28.4 7942.59 23.68 7964.41 25.78		
7980.51 21.58 8023.32 20.44 8074.33 24.73 8083.4 23.66 8104.25 21.31		
8160.46 23.55 8180.31 29.93 8222.16 31.32 8222.49 31.34 8253.35 24.14		
8257.33 24.32 8262 23.9 8274.36 24.12 8279.11 24.28 8289.09 24.15		

8292.5	24.07	8299.68	23.84	8309.37	25.43	8316.81	26.57	8328.98	29.03
8348.94	19.78	8351.08	19.57	8367.66	18.18	8371.87	17.75	8387.65	15.49
8409.98	12.75	8414.01	12.33	8453.92	11.01	8464.95	10.81	8479.13	10.23
8500.95	9.97	8504.6	9.95	8522.76	9.73	8544.58	9.41	8552.68	9.35
8566.39	9.18	8588.21	8.99	8600.94	8.81	8610.02	8.7	8631.83	8.46
8653.65	8.17	8655.06	8.15	8675.46	7.78	8697.28	7.39	8704.34	7.25
8719.09	6.95	8726.06	6.81	8735.34	6.19	8740.91	5.6	8744.63	5.2
8753.91	4.47	8762.72	3.86	8763.19	3.83	8772.47	3.35	8781.75	2.87
8784.53	2.93	8791.04	3.11	8800.32	1.78	8806.35	1.43	8809.6	1.23
8818.88	-1.94	8828.16	-4.42	8829.41	-4.42	8832.06	-3.19	8834.71	-1.71
8837.36	-.5	8840.01	.65	8842.66	1.85	8845.31	3.14	8845.98	3.43
8862.54	8.03	8870.22	10.68	8876.13	12.6	8878.51	13.58	8881.59	15.14
8901.05	14.67	8909.19	14.69	8917.52	14.66	8946.57	14.13	9076.71	12.63
9145.76	13.43	9229.38	14.46	9317.98	15.5	9363.92	16.03	9578.62	16.39
9662.8	16.56	9937.22	17.95	10192.14	16.2	10789.3	16.97	11057.72	19.5
11072.65	22.21	11087.77	22.13	11102.19	20.29	11262.49	18.81	11291.63	19.85
11371.02	19.32	11405.44	13.89	11425.44	13.28	11465.33	13.11	11612.95	13.36
11783.81	13.1	11810	16.16	11949.19	17.47	12050.21	17.47	12176.41	17.27
12206.28	17.51	12240.49	19.11	12266.91	19.34	12343.61	19.41	12480.15	17.65
12590.9	17.95	12818.6	18.01	13085.39	18.26	13383.95	18.33	13565.4	18.36
13607.48	18.41	13693.82	18.44	13779.88	18.43	13905.83	18.51	13985.94	23.61
14042.97	24.63	14051.52	24.78	14219.64	25.52	14256.55	25.54	14471.21	25.66
14488.88	25.73	14551.39	25.85	14780.45	25.71				

Manning's n Values	num=	4
Sta n Val Sta	n Val Sta	n Val Sta
.87 .052 8328.98	.1 8367.66	.016 8881.59 .057

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
8328.98 8881.59	2028.75 4406.38 2370.38	.1	.3

Blocked Obstructions	num=	2
Sta L Sta R Elev	Sta L Sta R Elev	
.87499998328.98414.588758881.58814780.4514.58875		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	17.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.052	0.016	0.057
W.S. Elev (ft)	17.63	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	15791.02	4883.38	4111.40
E.G. Slope (ft/ft)	0.000198	Area (sq ft)	15791.02	4883.38	4111.40
Q Total (cfs)	43600.00	Flow (cfs)	12869.49	28638.88	2091.63
Top Width (ft)	8685.34	Top Width (ft)	5481.55	508.88	2694.91
Vel Total (ft/s)	1.76	Avg. Vel. (ft/s)	0.81	5.86	0.51
Max Chl Dpth (ft)	22.05	Hydr. Depth (ft)	2.88	9.60	1.53
Conv. Total (cfs)	3096712.0	Conv. (cfs)	914062.3	2034091.0	148558.9
Length Wtd. (ft)	3559.37	Wetted Per. (ft)	5482.43	514.11	2695.28
Min Ch El (ft)	-4.42	Shear (lb/sq ft)	0.04	0.12	0.02
Alpha	7.37	Stream Power (lb/ft s)	0.03	0.69	0.01
Frothn Loss (ft)	0.61	Cum Volume (acre-ft)	29251.15	59234.01	7521.58
C & E Loss (ft)	0.02	Cum SA (acres)	11450.95	12966.99	4428.77

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 18.4

INPUT

Description: Cross Section at River Mile 18.4

Station Elevation Data num= 112									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1	34	50.6	35	138.7	22.4	452.8	15.4	541	13.8
543	13.1	547.9	13.1	548.7	13.9	565	15.3	644.1	14.3
855	14.9	866.4	10.6	4574.4	10.6	4801.5	11.7	5045.2	15.1
5281.8	13.9	5312.6	12.4	5458.7	12.3	5736.9	12.1	6026	12.2
6101.2	12.7	6131.4	18	6258.1	24.4	6308.2	27	6338.3	26.1
6402.4	20.9	6544.2	18.6	6672.9	20.4	6692.6	21.8	6742.4	21.5
6752.9	19.8	6949.9	19.7	7036.5	20.2	7060.4	17.7	7191.9	17.8
7307.2	19	7343.3	22.6	7396.6	22.8	7416.2	20.5	7468.7	23.3
7522.7	23.6	7533.6	29.2	7544.3	28.9	7567.6	24	7594.5	25.3
7617.1	29.5	7644.8	24.1	7665.8	26.5	7681.3	21.7	7722.5	20.4
7771.6	25.3	7800.4	21.3	7854.5	23.6	7873.6	30.8	7914.2	32.2
7943.9	21.9	7988.5	21.2	8016.7	27.3	8038.2	17.4	8062.9	15.56
8079.9	13.58	8108.3	10.88	8151.3	10.08	8205.9	9.94	8257.7	9.42
8309.7	8.6	8368	7.9	8421.1	6.96	8444.5	6.5	8454.5	5.8
8464.5	4.7	8474.5	3.9	8484.5	3.2	8494.5	2.7	8504.5	2.2
8514.5	2.5	8524.5	1	8534.5	.4	8544.5	-3.2	8554.5	-6
8564.5	2	8574.5	7	8586	14.2	8778.2	11.7	9061.1	15.6
9355.5	16.3	9625.8	17.9	9876.9	15.9	10465.1	16.8	10729.5	19.7
10744.2	22.8	10759.1	22.7	10773.3	20.6	10931.2	18.9	10959.9	20.1
11038.1	19.5	11072	13.3	11091.7	12.6	11131	12.4	11276.4	12.7
11444.7	12.4	11470.5	15.9	11607.6	17.4	11707.1	17.4	11996.1	16.9
12130.6	14.5	13534.9	14.8	13613.8	20.6	13678.4	21.9	13844	22.7
14109.2	22.8	14396.4	22.2						

Manning's n Values num= 10									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1	.05	6026	.07	6402.4	.016	7307.2	.05	7873.6	.11
8038.2	.014	8778.2	.07	10465.1	.06	11444.7	.07	11707.1	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	8016.7	8586	3217.29	4349	2885.43	.1	.3
Blocked Obstructions num= 2							
Sta L	Sta R	Elev	Sta L	Sta R	Elev		
1	8016.7	13.97	8586	14396.4	13.97		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	17.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.050	0.014	0.042
W.S. Elev (ft)	17.06	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	17129.57	4962.89	7178.12
E.G. Slope (ft/ft)	0.000143	Area (sq ft)	17129.57	4962.89	7178.12
Q Total (cfs)	44800.00	Flow (cfs)	12539.57	27248.92	5011.51
Top Width (ft)	10134.02	Top Width (ft)	5747.75	543.24	3843.03
Vel Total (ft/s)	1.53	Avg. Vel. (ft/s)	0.73	5.49	0.70
Max Chl Dpth (ft)	23.06	Hydr. Depth (ft)	2.98	9.14	1.87
Conv. Total (cfs)	3749296.0	Conv. (cfs)	1049433.0	2280453.0	419411.2
Length Wtd. (ft)	3864.38	Wetted Per. (ft)	5748.30	550.94	3843.57
Min Ch El (ft)	-6.00	Shear (lb/sq ft)	0.03	0.08	0.02
Alpha	7.91	Stream Power (lb/ft s)	0.02	0.44	0.01
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	28484.54	58736.00	7214.42
C & E Loss (ft)	0.01	Cum SA (acres)	11189.46	12913.77	4250.88

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 17.5714*

INPUT
 Description: Interpolated Cross Section at River Mile 17.57

Station Elevation Data		num= 188									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.86	32.49	55.66	33.03	99.58	27.91	153.01	21.92	205.31	20.95		
334.61	18.4	460.08	16.12	500.09	15.45	597.55	14.12	599.76	13.53		
605.17	13.53	605.94	14.13	606.05	14.21	624.06	15.32	711.47	14.01		
735.88	13.94	854.35	14.17	944.51	15.01	955.62	11.84	957.11	11.38		
999.57	10.74	1080.46	10.9	1249.24	10.89	1433.32	10.39	1539.05	10.41		
1663.25	10.39	1779.17	10.37	1911.65	10.44	2057.51	10.39	2058.15	10.41		
3010.36	10.4	3961.94	10.37	4175.31	10.59	4386.13	10.73	4454.92	10.37		
4938.99	10.43	4961.92	10.56	4979.11	10.43	5054.36	10.44	5059.37	10.46		
5155.54	10.84	5170.19	11.34	5190.58	11.07	5305.3	11.46	5321.15	11.63		
5435.79	12.74	5545.35	13.95	5574.59	14.28	5707.13	13.81	5836.02	13.29		
5870.06	12.01	6031.5	11.91	6338.9	11.73	6658.35	11.8	6741.44	12.23		
6774.81	16.77	6914.81	22.25	6970.17	24.47	7003.43	23.7	7074.26	19.24		
7230.95	17.26	7373.16	18.8	7394.93	20	7449.96	19.74	7461.56	18.28		
7679.24	18.18	7774.93	18.61	7801.34	16.46	7946.64	16.54	8074.05	17.57		
8113.94	20.65	8172.83	20.82	8194.49	18.85	8252.5	21.24	8284.15	21.38		
8312.17	21.52	8324.21	26.33	8336.04	26.08	8361.78	21.9	8391.51	23.04		
8416.48	26.66	8434.47	23.95	8447.09	22.05	8470.29	24.12	8487.42	20.01		
8532.94	18.92	8587.2	23.14	8587.97	23.06	8619.02	19.89	8678.8	22.21		
8699.91	28.51	8708.35	28.78	8737.65	29.05	8744.77	29.25	8763.76	24.18		
8777.59	20.5	8824.27	20.06	8826.87	20.1	8840.83	22.86	8845.29	23.42		
8849.75	23.78	8858.03	25.24	8872.42	19.13	8879.19	16.24	8886.82	15.55		
8894.57	14.88	8903.49	14.29	8920.22	12.55	8948.17	10.18	8990.49	9.4		
9044.22	9.16	9095.2	8.61	9146.37	7.79	9203.75	7.07	9256	6.15		
9279.03	5.71	9288.87	5.08	9298.72	4.12	9308.56	3.41	9318.4	2.79		
9328.24	2.34	9338.08	1.89	9347.92	2.13	9357.76	.82	9360.71	.66		
9367.6	.1	9377.44	-3.28	9387.29	-5.97	9399.89	.99	9405.13	2.81		
9409.6	5.04	9412.5	6.64	9414.51	7.91	9421.2	10.92	9427	14.07		
9442.82	13.58	9617.55	11.3	9673.79	11.87	9786.64	13	9832	14.38		
9895.28	14.55	9898.03	14.59	10061.91	14.92	10189.91	14.92	10197.97	14.94		
10371.99	16.87	10398.35	16.54	10457.89	16.79	10706.84	14.85	10841.32	14.91		
11162.99	15.22	11208.34	15.51	11271.62	16.38	11290	16.22	11296.94	16.22		
11325.41	16.48	11552.14	18.62	11566.71	21.27	11581.49	21.19	11595.56	19.39		
11600.68	19.34	11752.11	17.93	11780.57	18.96	11858.09	18.45	11891.71	13.14		
11911.24	12.54	11950.2	12.37	11954	12.38	12094.35	12.64	12149.11	12.56		
12261.21	12.61	12286.79	15.66	12307.31	15.89	12422.72	17.39	12491.88	17.63		
12521.36	17.61	12662.74	17.31	12688.05	16.96	12807.89	16.47	12812.5	16.39		
12884.22	14.94	12941.24	14.06	14333.51	14.31	14411.73	19.29	14475.78	20.4		
14639.96	21.09	14902.89	21.17	15187.63	20.66						

Manning's n Values		num= 4			
Sta	n Val	Sta	n Val	Sta	n Val
.86	.054	8858.03	.11	8879.19	.016
				9427	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	8858.03	9427	3217.29	4349	2885.43	.1	.3

Blocked Obstructions		num= 2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev
.86	8858.03	13.42	9427	15187.63	13.42

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	16.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.054	0.016	0.055

W.S. Elev (ft)	16.47	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	18514.65	5063.22	7495.21
E.G. Slope (ft/ft)	0.000173	Area (sq ft)	18514.65	5063.22	7495.21
Q Total (cfs)	44800.00	Flow (cfs)	13718.15	26728.47	4353.38
Top Width (ft)	10669.14	Top Width (ft)	6346.56	548.34	3774.24
Vel Total (ft/s)	1.44	Avg. Vel. (ft/s)	0.74	5.28	0.58
Max Chl Dpth (ft)	22.44	Hydr. Depth (ft)	2.92	9.23	1.99
Conv. Total (cfs)	3401924.0	Conv. (cfs)	1041699.0	2029648.0	330577.3
Length Wtd. (ft)	3861.76	Wetted Per. (ft)	6347.37	554.72	3774.76
Min Ch El (ft)	-5.97	Shear (lb/sq ft)	0.03	0.10	0.02
Alpha	8.10	Stream Power (lb/ft s)	0.02	0.52	0.01
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	27168.21	58235.50	6728.43
C & E Loss (ft)	0.00	Cum SA (acres)	10742.82	12859.28	3998.59

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 16.7428*

INPUT

Description: Interpolated Cross Section at River Mile 16.74

Station Elevation Data		num= 188									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.71	30.97	60.73	31.07	108.82	26.51	167.33	21.44	224.59	20.56		
366.17	18.07	503.57	16.03	547.37	15.5	654.09	14.45	656.51	13.95		
662.44	13.96	663.29	14.46	663.41	14.53	683.13	15.34	778.84	13.72		
805.56	13.52	935.29	13.68	1034.02	15.11	1046.18	12.56	1047.81	12.16		
1094.3	10.89	1182.88	11.2	1367.7	11.17	1569.26	10.17	1685.04	10.23		
1821.04	10.17	1947.98	10.14	2093.04	10.29	2252.76	10.17	2253.46	10.23		
3296.13	10.2	4338.11	10.14	4571.76	10.57	4802.61	10.86	4877.93	10.14		
5407.99	10.26	5433.1	10.51	5451.93	10.26	5534.33	10.28	5539.81	10.3		
5645.12	10.63	5661.16	11.56	5683.48	10.94	5809.11	11.22	5826.46	11.36		
5952	12.13	6071.96	13.18	6103.97	13.46	6249.11	13.12	6390.25	12.69		
6427.52	11.61	6604.29	11.53	6940.9	11.36	7290.7	11.4	7381.69	11.75		
7418.23	15.53	7571.53	20.09	7632.15	21.95	7668.57	21.3	7746.12	17.58		
7917.7	15.92	8073.42	17.2	8097.25	18.19	8157.51	17.97	8170.21	16.76		
8408.58	16.67	8513.36	17.02	8542.28	15.23	8701.38	15.29	8840.89	16.13		
8884.57	18.7	8949.06	18.84	8972.78	17.19	9036.3	19.19	9070.96	19.3		
9101.64	19.44	9114.83	23.46	9127.77	23.26	9155.97	19.8	9188.51	20.78		
9215.86	23.82	9235.56	21.58	9249.37	20	9274.78	21.73	9293.54	18.32		
9343.39	17.43	9402.8	20.98	9403.64	20.92	9437.64	18.49	9503.1	20.83		
9526.21	26.22	9535.46	26.5	9567.54	26.13	9575.34	26.31	9596.14	22.11		
9611.27	19.09	9662.39	18.88	9665.24	19.01	9680.53	21.78	9685.41	22.03		
9690.29	21.89	9699.36	23.19	9713.52	17.69	9720.17	15.08	9727.68	14.27		
9735.31	13.53	9744.09	13.01	9760.55	11.53	9788.05	9.48	9829.68	8.72		
9882.55	8.39	9932.7	7.8	9983.05	6.99	10039.5	6.24	10090.91	5.34		
10113.57	4.91	10123.25	4.37	10132.93	3.54	10142.61	2.93	10152.29	2.38		
10161.98	1.98	10171.66	1.58	10181.34	1.76	10191.02	.64	10193.93	.5		
10200.71	-.21	10210.39	-3.36	10220.07	-5.94	10235.29	-.03	10241.61	1.54		
10247	4.23	10250.5	6.27	10252.92	7.83	10261	10.51	10268	13.94		
10283.68	13.17	10456.91	10.91	10512.66	11.26	10624.54	11.95	10669.5	14.09		
10732.23	13.54	10734.96	13.57	10897.43	13.85	11024.32	13.53	11032.31	13.53		
11204.82	16.36	11230.96	15.53	11289.99	15.68	11536.79	13.8	11670.1	13.71		
11988.99	13.83	12033.95	14.34	12096.69	15.98	12114.91	15.65	12121.78	15.57		
12150.01	15.77	12374.78	17.53	12389.23	19.75	12403.87	19.67	12417.83	18.17		
12422.9	18.13	12573.02	16.97	12601.23	17.83	12678.09	17.41	12711.41	12.98		
12730.77	12.48	12769.4	12.34	12773.17	12.35	12912.31	12.58	12966.59	12.52		
13077.73	12.82	13103.08	15.42	13123.43	15.66	13237.83	17.38	13306.4	17.86		

13335.63	17.8213475.78	17.4513500.88	16.8213619.68	16.0413624.25	15.95
13695.35	14.3513751.87	13.6115132.12	13.8315209.66	17.9715273.16	18.9
15435.92	19.4715696.58	19.5415978.86	19.11		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.71	.053	9699.36	.11	9720.17	.016	10268	.064

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9699.36 10268 3217.29 4349 2885.43 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.71	9699.36	12.87	10268	15978.86	12.87

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	16.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.053	0.017	0.064
W.S. Elev (ft)	15.80	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	19441.60	5121.91	7603.20
E.G. Slope (ft/ft)	0.000176	Area (sq ft)	19441.60	5121.91	7603.20
Q Total (cfs)	44800.00	Flow (cfs)	14306.54	26688.09	3805.37
Top Width (ft)	11508.73	Top Width (ft)	7159.10	549.68	3799.95
Vel Total (ft/s)	1.39	Avg. Vel. (ft/s)	0.74	5.21	0.50
Max Chl Dpth (ft)	21.74	Hydr. Depth (ft)	2.72	9.32	2.00
Conv. Total (cfs)	3376292.0	Conv. (cfs)	1078193.0	2011312.0	286786.7
Length Wtd. (ft)	3859.08	Wetted Per. (ft)	7159.76	555.30	3800.45
Min Ch El (ft)	-5.94	Shear (lb/sq ft)	0.03	0.10	0.02
Alpha	8.44	Stream Power (lb/ft s)	0.02	0.53	0.01
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	25766.51	57727.06	6228.37
C & E Loss (ft)	0.00	Cum SA (acres)	10244.06	12804.47	3747.74

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 15.9142*

INPUT
 Description: Interpolated Cross Section at River Mile 15.91
 Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.57	29.46	65.79	29.1	118.05	25.11	181.64	20.96	243.87	20.17
397.74	17.74	547.06	15.95	594.66	15.54	710.64	14.77	713.27	14.38
719.71	14.38	720.63	14.79	720.76	14.84	742.19	15.36	846.21	13.44
875.25	13.09	1016.23	13.18	1123.52	15.22	1136.75	13.29	1138.52	12.93
1189.04	11.03	1285.3	11.5	1486.16	11.46	1705.21	9.96	1831.03	10.04
1978.83	9.96	2116.78	9.91	2274.43	10.13	2448.01	9.96	2448.76	10.04
3581.91	10	4714.29	9.91	4968.2	10.56	5219.09	10.99	5300.95	9.91
5876.99	10.09	5904.28	10.47	5924.74	10.09	6014.29	10.13	6020.25	10.14
6134.7	10.42	6152.13	11.79	6176.38	10.81	6312.91	10.99	6331.76	11.09
6468.2	11.53	6598.56	12.4	6633.36	12.65	6791.08	12.44	6944.47	12.08
6984.97	11.22	7177.09	11.14	7542.9	10.99	7923.05	11	8021.93	11.28
8061.64	14.3	8228.24	17.94	8294.12	19.42	8333.7	18.9	8417.99	15.92
8604.45	14.58	8773.68	15.59	8799.58	16.39	8865.07	16.21	8878.87	15.24
9137.91	15.15	9251.79	15.42	9283.21	13.99	9456.13	14.03	9607.74	14.7
9655.21	16.75	9725.3	16.86	9751.07	15.54	9820.1	17.13	9857.77	17.22
9891.11	17.36	9905.44	20.59	9919.51	20.45	9950.15	17.71	9985.52	18.52
10015.24	20.97	10036.65	19.21	10051.66	17.95	10079.28	19.35	10099.66	16.63

10153.83	15.95	10218.4	18.8310219.31	18.7710256.27	17.08	10327.4	19.44
10352.52	23.9210362.57	24.2210397.43	23.210405.91	23.3610428.51	20.05		
10444.96	17.6910500.51	17.71	10503.6	17.9110520.22	20.710525.53	20.65	
10530.83	19.9910540.69	21.1310554.62	16.2510561.16	13.9210568.54	13		
10576.04	12.1810584.68	11.7410600.87	10.510627.92	8.7710668.87	8.04		
10720.87	7.61	10770.2	6.9810819.72	6.1810875.24	5.4110925.81	4.53	
10948.1	4.1210957.62	3.6510967.15	2.9610976.67	2.4410986.19	1.98		
10995.72	1.6311005.24	1.2811014.76	1.3811024.29	.4611027.14	.34		
11033.81	-.5111043.33	-3.4411052.86	-5.9111070.68	-1.0411078.09	.27		
11084.4	3.43	11088.5	5.9111091.34	7.74	11100.8	10.11	11109
11124.55	12.7511296.26	10.511351.53	10.6511462.43	10.9	11507	13.81	13.79
11569.18	12.5411571.89	12.5611732.94	12.7811858.73	12.1511866.64	12.13		
12037.66	15.8512063.57	14.5312122.08	14.5712366.73	12.7512498.88	12.5		
12815	12.4512859.56	13.1712921.75	15.5812939.81	15.0712946.62	14.92		
12974.61	15.0513197.42	16.4513211.74	18.2213226.26	18.1613240.09	16.96		
13245.12	16.9313393.93	16	13421.9	16.6913498.09	16.3613531.12	12.82	
13550.31	12.42	13588.6	12.3113592.33	12.3213730.26	12.5213784.08	12.47	
13894.24	13.0313919.38	15.1813939.54	15.4314052.95	17.3614120.92	18.09		
14149.89	18.0314288.83	17.6	14313.7	16.6814431.47	15.61	14436	15.52
14506.48	13.7614562.51	13.1715930.72	13.34	16007.6	16.6616070.54	17.4	
16231.88	17.8616490.27	17.9116770.09	17.57				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.57	.05210540.69	.1110561.16	.016	11109	.069		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	10540.69	11109		3217.29	4349	2885.43	.1	.3
Blocked Obstructions	num= 2							
Sta L	Sta R	Elev	Sta L	Sta R	Elev			
.5710540.69	12.33	1110916770.09	12.33					

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	15.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.052	0.017	0.069
W.S. Elev (ft)	15.14	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	20332.73	5180.07	7655.15
E.G. Slope (ft/ft)	0.000176	Area (sq ft)	20332.73	5180.07	7655.15
Q Total (cfs)	44800.00	Flow (cfs)	14924.02	26290.77	3585.21
Top Width (ft)	12240.56	Top Width (ft)	7951.88	551.27	3737.42
Vel Total (ft/s)	1.35	Avg. Vel. (ft/s)	0.73	5.08	0.47
Max Chl Dpth (ft)	21.05	Hydr. Depth (ft)	2.56	9.40	2.05
Conv. Total (cfs)	3381017.0	Conv. (cfs)	1126303.0	1984142.0	270572.5
Length Wtd. (ft)	3851.56	Wetted Per. (ft)	7952.35	556.49	3737.90
Min Ch El (ft)	-5.91	Shear (lb/sq ft)	0.03	0.10	0.02
Alpha	8.39	Stream Power (lb/ft s)	0.02	0.52	0.01
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	24297.67	57212.79	5723.01
C & E Loss (ft)	0.00	Cum SA (acres)	9686.02	12749.51	3498.10

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 15.0857*

INPUT
Description: Interpolated Cross Section at River Mile 15.09
Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.43	27.94	70.86	27.13	127.29	23.71	195.95	20.48	263.16	19.78
429.3	17.4	590.54	15.86	641.94	15.59	767.18	15.1	770.02	14.8
776.98	14.81	777.97	15.11	778.11	15.15	801.26	15.38	913.57	13.15
944.94	12.67	1097.17	12.69	1213.03	15.33	1227.31	14.02	1229.22	13.71
1283.78	11.17	1387.73	11.8	1604.62	11.74	1841.16	9.74	1977.02	9.86
2136.62	9.74	2285.59	9.69	2455.83	9.97	2643.25	9.74	2644.07	9.86
3867.68	9.8	5090.47	9.69	5364.65	10.54	5635.57	11.11	5723.96	9.69
6345.99	9.91	6375.46	10.43	6397.56	9.91	6494.25	9.97	6500.68	9.98
6624.27	10.22	6643.1	12.02	6669.29	10.68	6816.71	10.75	6837.07	10.81
6984.4	10.92	7125.17	11.63	7162.75	11.83	7333.06	11.75	7498.7	11.48
7542.43	10.83	7749.88	10.76	8144.9	10.62	8555.4	10.6	8662.17	10.8
8705.05	13.07	8884.96	15.79	8956.1	16.89	8998.83	16.5	9089.85	14.26
9291.19	13.24	9473.94	13.99	9501.91	14.59	9572.62	14.45	9587.53	13.72
9867.25	13.64	9990.22	13.83	10024.15	12.76	10210.87	12.77	10374.59	13.27
10425.85	14.81	10501.53	14.88	10529.36	13.89	10603.9	15.08	10644.58	15.14
10680.58	15.29	10696.05	17.72	10711.25	17.63	10744.33	15.61	10782.53	16.26
10814.62	18.13	10837.73	16.83	10853.95	15.89	10883.77	16.97	10905.78	14.94
10964.28	14.47	11033.99	16.67	11034.98	16.63	11074.89	15.68	11151.7	18.06
11178.82	21.63	11189.67	21.94	11227.32	20.28	11236.47	20.42	11260.88	17.99
11278.64	16.29	11338.64	16.53	11341.97	16.82	11359.92	19.63	11365.65	19.26
11371.37	18.09	11382.01	19.07	11395.71	14.81	11402.15	12.76	11409.41	11.72
11416.78	10.83	11425.28	10.47	11441.2	9.47	11467.79	8.07	11508.06	7.36
11559.19	6.84	11607.7	6.17	11656.4	5.37	11710.99	4.58	11760.72	3.72
11782.63	3.32	11792	2.94	11801.36	2.38	11810.73	1.95	11820.09	1.57
11829.46	1.27	11838.82	.97	11848.18	1.01	11857.55	.28	11860.36	.18
11866.91	-.82	11876.28	-3.52	11885.64	-5.89	11906.07	-2.05	11914.57	-.99
11921.8	2.62	11926.5	5.55	11929.75	7.66	11940.6	9.71	11950	13.69
11965.41	12.34	12135.62	10.1	12190.4	10.04	12300.32	9.85	12344.5	13.49
12406.14	11.53	12408.82	11.54	12568.46	11.71	12693.13	10.77	12700.98	10.72
12870.49	15.34	12896.18	13.52	12954.17	13.46	13196.67	11.71	13327.66	11.3
13641	11.06	13685.17	12.13	13746.81	15.19	13764.71	14.49	13771.47	14.26
13799.21	14.34	14020.06	15.37	14034.25	16.69	14048.64	16.65	14062.36	15.74
14067.34	15.72	14214.84	15.04	14242.56	15.56	14318.08	15.31	14350.82	12.66
14369.85	12.36	14407.8	12.29	14411.5	12.29	14548.22	12.46	14601.56	12.43
14710.75	13.23	14735.67	14.94	14755.66	15.21	14868.07	17.35	14935.44	18.31
14964.16	18.24	15101.87	17.75	15126.53	16.53	15243.26	15.18	15247.75	15.09
15317.61	13.17	15373.15	12.73	156729.33	12.86	16805.53	15.34	16867.92	15.9
17027.84	16.24	17283.96	16.29	17561.31	16.03				

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
.43	.051	11382.01	.111
		11402.15	.016
		11950	.073

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	11382.01	11950		3217.29	4349	2885.43	.1	.3	

Blocked Obstructions		num=	2
Sta L	Sta R	Elev	Sta L
.43	11382.01	11.78	11950
			17561.31
			11.78

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	14.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.051	0.018	0.073
W.S. Elev (ft)	14.48	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	21879.91	5235.33	7248.85
E.G. Slope (ft/ft)	0.000178	Area (sq ft)	21879.91	5235.33	7248.85
Q Total (cfs)	44800.00	Flow (cfs)	15741.64	25902.79	3155.58
Top Width (ft)	13496.72	Top Width (ft)	9231.11	553.25	3712.37
Vel Total (ft/s)	1.30	Avg. Vel. (ft/s)	0.72	4.95	0.44

Max Chl Dpth (ft)	20.37	Hydr. Depth (ft)	2.37	9.46	1.95
Conv. Total (cfs)	3362571.0	Conv. (cfs)	1181526.0	1944195.0	236849.3
Length Wtd. (ft)	3841.57	Wetted Per. (ft)	9231.38	558.32	3712.84
Min Ch El (ft)	-5.89	Shear (lb/sq ft)	0.03	0.10	0.02
Alpha	8.44	Stream Power (lb/ft s)	0.02	0.51	0.01
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	22738.79	56692.86	5229.39
C & E Loss (ft)	0.01	Cum SA (acres)	9051.47	12694.38	3251.36

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 14.2571*

INPUT
Description: Interpolated Cross Section at River Mile 14.26
Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.29	26.43	75.92	25.17	136.53	22.3	210.26	20	282.44	19.38
460.87	17.07	634.03	15.77	689.23	15.64	823.73	15.42	826.78	15.23
834.25	15.24	835.31	15.44	835.47	15.47	860.32	15.4	980.94	12.86
1014.63	12.25	1178.12	12.19	1302.54	15.44	1317.87	14.75	1319.93	14.49
1378.52	11.31	1490.15	12.1	1723.08	12.03	1977.11	9.53	2123.02	9.67
2294.42	9.53	2454.39	9.46	2637.22	9.81	2838.5	9.53	2839.38	9.67
4153.45	9.6	5466.65	9.46	5761.1	10.53	6052.04	11.24	6146.97	9.46
6815	9.74	6846.64	10.39	6870.37	9.74	6974.22	9.81	6981.12	9.82
7113.85	10.01	7134.06	12.25	7162.19	10.56	7320.52	10.51	7342.38	10.54
7500.6	10.31	7651.78	10.85	7692.13	11.01	7875.04	11.07	8052.92	10.87
8099.89	10.44	8322.68	10.37	8746.9	10.25	9187.75	10.2	9302.42	10.33
9348.47	11.83	9541.67	13.63	9618.07	14.36	9663.97	14.1	9761.71	12.6
9977.94	11.9	10174.2	12.3910204.24		12.7810280.18		12.6810296.19		12.2
10596.59	12.1210728.65		12.2410765.09		11.5210965.61		11.5211141.43		11.83
11196.48	12.8511277.76		12.911307.65		12.23	11387.7	13.0211431.38		13.06
11470.05	13.2111486.67		14.8511502.98		14.8111538.51		13.5111579.53		13.99
11614	15.2911638.82		14.4511656.24		13.8411688.26		14.5811711.89		13.25
11774.72	12.9911849.59		14.5111850.66		14.4911893.51		14.27	11976	16.67
12005.13	19.3412016.78		19.6612057.22		17.3512067.04		17.4712093.25		15.93
12112.33	14.8812176.76		15.3512180.34		15.7212199.61		18.5512205.76		17.87
12211.92	16.1912223.34		17.0112236.81		13.3812243.14		11.612250.27		10.45
12257.52	9.4812265.87		9.1912281.52		8.4412307.67		7.3712347.25		6.68
12397.52	6.06	12445.2	5.3612493.07		4.5712546.74		3.7512595.62		2.91
12617.17	2.5312626.37		2.2212635.58		1.812644.78		1.4712653.99		1.16
12663.19	.91	12672.4	.6612681.61		.6412690.81		.112693.57		.02
12700.02	-1.1212709.22		-3.612718.43		-5.8612741.47		-3.0712751.04		-2.26
12759.2	1.8112764.51		5.1912768.17		7.57	12780.4	9.31	12791	13.56
12806.27	11.9312974.97		9.713029.26		9.4213138.21		8.8	13182	13.19
13243.09	10.5213245.75		10.5313403.97		10.6413527.54		9.3813535.32		9.31
13703.33	14.8213728.79		12.5113786.27		12.3514026.61		10.6514156.44		10.1
14467	9.6714510.78		10.8414571.88		14.7914589.62		13.9214596.31		13.61
14623.8	13.6314842.69		14.2814856.76		15.1714871.03		15.1314884.62		14.53
14889.56	14.5115035.76		14.0715063.23		14.4215138.08		14.2715170.53		12.5
15189.38	12.31	15227	12.2615230.67		12.2615366.17		12.3915419.04		12.39
15527.26	13.4415551.96		14.715571.77		14.9615683.19		17.3415749.96		18.54
15778.42	18.4415914.91		17.915939.35		16.3916055.05		14.75	16059.5	14.66
16128.74	12.5816183.79		12.2917527.94		12.3717603.46		14.0317665.29		14.4
17823.8	14.6318077.64		14.6618352.54		14.49				

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val Sta n Val

.29 .04912223.34 .1112243.14 .016 12791 .078

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 12223.34 12791 3217.29 4349 2885.43 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .2912223.34 11.24 1279118352.54 11.24

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	14.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.049	0.019	0.078
W.S. Elev (ft)	13.81	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	23757.50	5289.32	6634.49
E.G. Slope (ft/ft)	0.000178	Area (sq ft)	23757.50	5289.32	6634.49
Q Total (cfs)	44800.00	Flow (cfs)	16973.26	25214.32	2612.42
Top Width (ft)	14742.15	Top Width (ft)	10474.42	555.80	3711.93
Vel Total (ft/s)	1.26	Avg. Vel. (ft/s)	0.71	4.77	0.39
Max Chl Dpth (ft)	19.67	Hydr. Depth (ft)	2.27	9.52	1.79
Conv. Total (cfs)	3356801.0	Conv. (cfs)	1271782.0	1889274.0	195744.9
Length Wtd. (ft)	3820.26	Wetted Per. (ft)	10474.75	560.89	3712.44
Min Ch El (ft)	-5.86	Shear (lb/sq ft)	0.03	0.10	0.02
Alpha	8.24	Stream Power (lb/ft s)	0.02	0.50	0.01
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	21053.42	56167.47	4769.57
C & E Loss (ft)	0.01	Cum SA (acres)	8323.75	12639.01	3005.47

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 13.4285*

INPUT
 Description: Interpolated Cross Section at River Mile 13.43
 Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.14	24.91	80.98	23.2	145.76	20.9	224.58	19.52	301.72	18.99
492.43	16.73	677.51	15.69	736.52	15.69	880.27	15.75	883.53	15.65
891.52	15.67	892.66	15.77	892.82	15.78	919.39	15.42	1048.31	12.57
1084.31	11.82	1259.06	11.7	1392.05	15.54	1408.44	15.47	1410.63	15.27
1473.26	11.46	1592.58	12.4	1841.54	12.31	2113.05	9.31	2269.01	9.49
2452.21	9.31	2623.2	9.23	2818.61	9.66	3033.75	9.31	3034.69	9.49
4439.23	9.4	5842.82	9.23	6157.55	10.51	6468.52	11.37	6569.99	9.23
7284	9.57	7317.82	10.34	7343.19	9.57	7454.18	9.65	7461.56	9.66
7603.42	9.81	7625.03	12.47	7655.1	10.43	7824.32	10.27	7847.69	10.27
8016.8	9.71	8178.39	10.08	8221.52	10.19	8417.02	10.38	8607.15	10.27
8657.35	10.04	8895.47	9.99	9348.9	9.87	9820.09	9.8	9942.66	9.85
9991.88	10.610198.39		11.4810280.04		11.84	10329.1	11.710433.58		10.94
10664.69	10.5710874.46		10.7910906.56		10.9810987.73		10.9211004.84		10.68
11325.93	10.611467.08		10.6511506.03		10.2911720.36		10.2611908.28		10.4
11967.12	10.912053.99		10.9212085.94		10.58	12171.5	10.9712218.19		10.98
12259.52	11.1312277.28		11.9812294.72		11.99	12332.7	11.4112376.54		11.73
12413.38	12.4512439.91		12.0812458.52		11.7912492.75		12.212518.01		11.56
12585.16	11.512665.19		12.3512666.33		12.3412712.13		12.8712800.31		15.28
12831.44	17.0512843.89		17.3812887.11		14.4312897.61		14.5312925.63		13.86
12946.02	13.4813014.88		14.1813018.71		14.6313039.31		17.4813045.88		16.49
13052.46	14.313064.67		14.96	13077.9	11.9413084.12		10.4413091.14		9.17
13098.26	8.1313106.47		7.9213121.85		7.4213147.54		6.6713186.44		6
13235.84	5.28	13282.7	4.5513329.75		3.7613382.49		2.9113430.53		2.1

13451.7	1.7313460.75	1.5113469.79	1.2213478.84	.9813487.89	.75
13496.93	.5513505.98	.3513515.03	.2713524.07	-.0813526.79	-.14
13533.12	-1.4213542.17	-3.6813551.21	-5.8313576.86	-4.0813587.52	-3.53
13596.6	1.0113602.51	4.8213606.58	7.49 13620.2	8.9 13632	13.43
13647.14	11.5113814.32	9.3113868.13	8.8113976.11	7.75 14019.5	12.9
14080.05	9.5114082.68	9.5114239.49	9.5714361.95	814369.66	7.91
14536.17	14.3114561.39	11.5114618.36	11.2314856.55	9.614985.22	8.9
15293	8.2915336.39	9.6715396.94	14.415414.52	13.3415421.16	12.95
15448.4	12.9115665.33	13.215679.28	13.6415693.41	13.6215706.88	13.32
15711.78	13.3115856.67	13.1115883.89	13.2915958.07	13.2215990.23	12.34
16008.92	12.25 16046.2	12.2316049.83	12.2316184.13	12.3316236.52	12.34
16343.78	13.6516368.25	14.4616387.88	14.73 16498.3	17.3316564.48	18.77
16592.69	18.6516727.96	18.0516752.18	16.2416866.84	14.3216871.25	14.23
16939.87	11.9916994.42	11.8418326.55	11.8918401.39	12.7118462.67	12.9
18619.76	13.0118871.33	13.0319143.77	12.94		

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .14 .04813064.67 .1113084.12 .016 13632 .082

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 13064.67 13632 3217.29 4349 2885.43 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .1413064.67 10.69 1363219143.77 10.69

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	13.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.048	0.020	0.082
W.S. Elev (ft)	13.17	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	26422.92	5352.20	6227.36
E.G. Slope (ft/ft)	0.000173	Area (sq ft)	26422.92	5352.20	6227.36
Q Total (cfs)	44800.00	Flow (cfs)	18759.24	23913.67	2127.09
Top Width (ft)	16686.29	Top Width (ft)	11566.15	558.78	4561.36
Vel Total (ft/s)	1.18	Avg. Vel. (ft/s)	0.71	4.47	0.34
Max Chl Dpth (ft)	19.00	Hydr. Depth (ft)	2.28	9.58	1.37
Conv. Total (cfs)	3401452.0	Conv. (cfs)	1424301.0	1815652.0	161499.6
Length Wtd. (ft)	3809.69	Wetted Per. (ft)	11566.50	563.96	4562.18
Min Ch El (ft)	-5.83	Shear (lb/sq ft)	0.02	0.10	0.01
Alpha	7.82	Stream Power (lb/ft s)	0.02	0.46	0.01
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	19200.29	55636.25	4343.58
C & E Loss (ft)	0.00	Cum SA (acres)	7509.81	12583.37	2731.45

Warning: Divided flow computed for this cross-section.
 Warning: The cross-section end points had to be extended vertically for the computed water surface.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 12.6

INPUT
 Description: Interpolated Cross Section at River Mile 12.6

Station Elevation Data num= 81									
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
0 23.4 155 19.5 321 18.6 524 16.4 721 15.6									
950 16.1 1154 11.4 1340 11.2 1499 16.2 1568 11.6									
1695 12.7 1960 12.6 2249 9.1 2415 9.3 2610 9.1									
2792 9 3000 9.5 3229 9.1 3230 9.3 4725 9.2									

6219	9	6554	10.5	6885	11.5	6993	9	7753	9.4
7789	10.3	7816	9.4	7942	9.5	8093	9.6	8116	12.7
8148	10.3	8353	10	8533	9.1	8705	9.3	8959	9.7
13005	8.9	13241	9.7	13482	10.2	13671	15.1	13717	11.5
13758	11.8	13853	13	13879	16.4	13886	15.1	13893	12.4
13906	12.9	13919	10.5	13932	7.9	13939	6.78	14360	-.3
14384	-5.8	14424	-4.8	14434	.2	14445	7.4	14460	8.5
14473	13.3	14488	11.1	14707	8.2	14814	6.7	14857	12.6
14917	8.5	15075	8.5	15204	6.5	15369	13.8	15394	10.5
15814	7.7	16119	6.9	16162	8.5	16222	14	16246	12.3
16273	12.2	16534	12.1	16869	12.2	17054	12.3	17204	14.5
17379	19	17541	18.2	17565	16.1	17683	13.8	17751	11.4
19935	11.4								

Manning's n Values		num=		12	
Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1154	.04	4725	.06
13758	.11	13932	.016	14473	.11
16869	.04	17751	.11	14707	.07
				16222	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	13906	14473		1090	5078		.1	.3
Blocked Obstructions		num=		2				
Sta L	Sta R	Elev	Sta L	Sta R	Elev			
0	13932	10.14	14445	19935	10.14			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	12.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.043	0.016	0.081
W.S. Elev (ft)	12.61	Reach Len. (ft)	1090.00	5078.00	2467.00
Crit W.S. (ft)		Flow Area (sq ft)	28345.45	5417.73	6944.28
E.G. Slope (ft/ft)	0.000116	Area (sq ft)	28345.45	5417.73	6944.28
Q Total (cfs)	45600.00	Flow (cfs)	18982.83	24616.93	2000.24
Top Width (ft)	17486.95	Top Width (ft)	12178.46	563.56	4744.94
Vel Total (ft/s)	1.12	Avg. Vel. (ft/s)	0.67	4.54	0.29
Max Chl Dpth (ft)	18.41	Hydr. Depth (ft)	2.33	9.61	1.46
Conv. Total (cfs)	4236199.0	Conv. (cfs)	1763488.0	2286891.0	185820.3
Length Wtd. (ft)	3127.28	Wetted Per. (ft)	12178.94	573.29	4746.85
Min Ch El (ft)	-5.80	Shear (lb/sq ft)	0.02	0.07	0.01
Alpha	9.03	Stream Power (lb/ft s)	0.01	0.31	0.00
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	17177.73	55098.62	3907.33
C & E Loss (ft)	0.04	Cum SA (acres)	6632.93	12527.35	2423.23

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: Fish Creek
REACH: Lower Fish Creek RS: 11.7

INPUT

Description: Cross Section at River Mile 11.7

Station Elevation Data		num=		109	
Sta	Elev	Sta	Elev	Sta	Elev
0	23.1	154.5	19.2	321.4	18.3
950.1	15.8	1153.5	11.1	1340.4	10.9
1694.6	12.4	1960.3	12.3	2248.9	8.8
2792.3	8.7	2999.5	9.2	3228.5	8.8
6219.3	8.7	6554	10.2	6884.5	11.2
				6993.1	8.7
				7752.9	9.1

7789	10	7816.4	9.1	7941.7	9.2	8092.5	9.3	8116.1	12.4
8147.5	10	8353.4	9.7	8533	8.8	8705	9	8958.5	9.4
13005.1	8.6	13240.6	9.4	13481.8	9.9	13670.5	14.8	13716.7	11.2
13758.2	11.5	13853.4	12.7	13878.5	16.1	13885.5	14.8	13892.6	12.1
13905.9	12.6	13919.1	10.2	13932.2	7.6	13951.4	5.8	14045.3	7.2
14136.4	2.8	14142.7	2.7	14152.6	2.4	14162.7	1.4	14172.6	-1
14182.7	-.6	14192.6	-1.3	14202.7	-1.9	14207.6	-3.1	14212.7	3
14220	10	14345.6	8.9	14384.6	16.7	14490.7	23.9	14771.9	20.9
15535.7	8.4	15555.8	7.7	15564.2	7.9	15576.9	4.9	15631.2	6.5
15691.2	6.1	15728.1	2.7	15759	1.3	15783.9	-3.9	15809	-5
15833.9	-5	15859	-4.3	15883.9	-4.7	15909	-4.1	15933.9	-3.5
15959	2.9	15978.2	7.7	15992.5	8.2	16005.8	13	16020.8	10.8
16240.1	7.9	16347.2	6.4	16390.3	12.3	16449.7	8.2	16608.1	8.2
16736.9	6.2	16902	13.5	16927.3	10.2	17347.2	7.4	17652.3	6.6
17695.4	8.2	17755.3	13.7	17779.3	12	17805.9	11.9	18066.6	11.8
18401.6	11.9	18587.3	12	18736.5	14.2	18912.2	18.7	19073.5	17.9
19097.8	15.8	19216	13.5	19284.3	11.1	21468.3	11.1		

Manning's n Values num= 15

Sta	n	Val	Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.11	1153.5	.045	4725	.05	6884.5	.045	13481.8	.09		
13758.2	.11	13932.2	.03	14220	.09	14490.7	.05	15535.7	.03		
16005.8	.11	16240.1	.09	17755.3	.06	18401.6	.04	19284.3	.11		

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

13905.9	16005.8	2559	4481.46	2515.69	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	13905.9	9.62	16005.8	21468.3	9.62

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	12.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.046	0.031	0.095
W.S. Elev (ft)	12.27	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	30132.39	8057.16	7044.80
E.G. Slope (ft/ft)	0.000160	Area (sq ft)	30132.39	8057.16	7044.80
Q Total (cfs)	45600.00	Flow (cfs)	22948.67	20560.16	2091.17
Top Width (ft)	18031.69	Top Width (ft)	12134.77	1159.04	4737.88
Vel Total (ft/s)	1.01	Avg. Vel. (ft/s)	0.76	2.55	0.30
Max Chl Dpth (ft)	17.27	Hydr. Depth (ft)	2.48	6.95	1.49
Conv. Total (cfs)	3609247.0	Conv. (cfs)	1816391.0	1627340.0	165516.3
Length Wtd. (ft)	3614.16	Wetted Per. (ft)	12135.26	1169.37	4739.78
Min Ch El (ft)	-5.00	Shear (lb/sq ft)	0.02	0.07	0.01
Alpha	3.18	Stream Power (lb/ft s)	0.02	0.18	0.00
Frcn Loss (ft)	0.55	Cum Volume (acre-ft)	16446.08	54313.20	3511.20
C & E Loss (ft)	0.00	Cum SA (acres)	6328.74	12426.94	2154.70

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: Fish Creek
REACH: Lower Fish Creek RS: 10.8538*

INPUT

Description: Interpolated Cross Section at River Mile 10.85

Station Elevation Data num= 271

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	21.53	145.83	17.92	303.37	17.09	494.51	15.05	680.84	14.3

789.5	14.52	896.81	14.76	1088.8	10.43	1265.21	10.25	1415.3	14.87
1479.76	10.63	1599.55	11.65	1839.03	11.57	1850.34	11.56	2122.75	8.33
2279.91	8.51	2463.98	8.33	2635.67	8.23	2817.1	8.66	2831.25	8.69
3047.41	8.31	3048.82	8.49	3871.16	8.38	4459.96	8.36	4850.97	8.32
5851.35	8.13	5870.44	8.13	6186.37	9.54	6498.33	10.49	6600.84	8.19
6840.92	8.33	7318.02	8.54	7352.1	9.37	7377.96	8.54	7496.23	8.62
7638.57	8.7	7660.85	11.56	7690.49	9.34	7773.33	9.22	7884.84	9.07
8054.36	8.24	8216.72	8.43	8456	8.81	8632.19	8.78	9555.54	8.54
10472.96	8.39	11325.9	8.2512275.61	8.1412323.49	8.3	12497.9	8.88		
12725.57	9.3312903.69	13.86	12947.3	10.5312986.47	10.8113076.33	11.92			
13100.02	15.0513106.63	13.8513113.33	11.3613125.88	11.8213147.48	9.58				
13160.7	8.0813168.91	7.1613180.17	6.5513197.96	5.613200.32	5.46				
13217.04	5.4913230.29	5.6913236.11	5.6413240.68	5.4113244.97	5.56				
13249.99	5.7813255.14	5.8213272.97	6.113289.67	6.2413308.47	6.41				
13326.23	6.5613339.82	6.6813353.93	6.7913355.07	6.7513380.51	6.07				
13416.17	5.0913431.07	4.6713441.06	4.3913452.66	4.0213465.87	3.64				
13485.18	3.1513499.33	2.8113502.97	2.7113513.27	2.6313526.93	2.4				
13529.47	2.3513545.02	1.4913545.99	1.4313562.11	.0713562.19	.06				
13578.71	-.3913582.71	-.5513594.91	-1.0413607.88	-1.4813611.43	-1.6				
13619.45	-2.7213627.79	2.9113639.73	9.3613641.55	9.3513677.07	9.18				
13718.64	8.9913756.01	8.7913789.27	8.64	13816.3	8.5	13845.2	8.35		
13860.8	10.1113893.53	13.8113909.01	15.5613926.77	16.2413950.71	17.16				
13982.96	18.3914014.06	19.5714048.86	20.9414074.19	21.8614082.58	22.19				
14104.36	22.0814137.55	21.8114166.11	21.714192.55	21.51	14227.7	21.3			
14272.64	21.0714307.63	20.8514334.41	20.6214387.41	20.3	14456.7	19.94			
14498.07	19.68	14541.8	19.47	14542.6	19.4614575.18	19.1214605.09	18.83		
14626.06	18.6914673.26	18.2814706.26	17.9414741.79	17.6114779.06	17.27				
14788.47	17.1814793.15	17.0614799.38	16.8114804.69	16.9514809.03	16.97				
14813.76	16.9314826.56	16.8114848.68	16.6114865.26	16.4714888.75	16.26				
14930.29	15.87	14958.5	15.6114982.83	15.3815020.04	15.0315051.27	14.74			
15086.1	14.4215111.11	14.215138.02	13.96	15157.2	13.7815180.79	13.55			
15211.19	13.315231.05	13.115251.75	12.9115271.23	12.7315286.72	12.59				
15295.3	12.5115305.65	12.4215331.09	12.215365.69	11.8615407.24	11.52				
15449.29	11.1315489.98	10.7415514.34	10.5115532.95	10.32	15541.3	10.21			
15548.25	1015558.28	9.8415561.39	10.0415562.11	10.0915564.99	10.04				
15594.74	9.7715623.76	9.5415660.16	9.115694.76	8.8815792.13	7.97				
15825.01	7.3215838.75	7.5115859.53	4.7415948.36	6.2116046.52	5.83				
16106.88	2.6916157.43	1.3916169.64	-.0516178.24	-1.0416198.17	-3.43				
16204.4	-3.5916213.93	-3.9316239.23	-5.8516262.22	-5.8516284.98	-4.45				
16308.15	-4.0716312.09	-3.9916326.46	-3.9616343.87	-4.0516344.68	-4.04				
16350.43	-4.0816360.86	-4.1316361.58	-4.1416381.43	-3.9316409.43	-3.61				
16411.45	-3.5816438.19	-3.2416458.21	-316460.94	-2.9816466.18	-2.38				
16485.16	-.1716506.31	2.3316510.81	2.8516519.55	3.8416529.53	4.91				
16548.97	7.1	16549	7.116569.05	7.416576.94	7.5316577.39	7.51			
16584.82	8.3416591.59	9.2916594.97	10.0916598.36	11.0516603.81	12.2				
16618.34	10.1716830.66	7.5516834.73	7.516934.35	6.1716976.08	11.62				
17033.58	7.8417155.16	7.8517186.94	7.917311.64	6.2617329.58	7.04				
17471.49	13.117495.98	10.0617670.98	9.0417902.51	7.618008.26	7.35				
18197.9	6.5918239.63	8.0118261.47	9.8918297.62	13.0318320.86	11.44				
18346.61	11.3318598.58	11.0618599.01	11.0618914.56	11.118923.35	11.11				
19103.14	11.3519189.73	12.6419247.59	13.4519417.69	17.5819573.86	16.82				
19589.12	15.5719597.39	14.8819711.82	12.7619777.95	10.5419850.25	10.54				
20242.03	10.6720567.26	10.8420890.33	10.9521233.23	11.0921553.49	11.21				
21892.42	11.24								

Manning's n	Values	num=	6						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06213125.88		.10713168.91		.03113639.73		.06115948.36		.031
16603.81	.079								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 13125.8816603.81 2559 4481.46 2515.69 .1 .3
 Blocked Obstructions num= 3
 Sta L Sta R Elev Sta L Sta R Elev Sta L Sta R Elev
 013125.88 9.19 016603.81 -4.6116618.3421892.42 9.19

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	11.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.062	0.032	0.079
W.S. Elev (ft)	11.72	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	27566.82	13102.97	5978.56
E.G. Slope (ft/ft)	0.000144	Area (sq ft)	27566.82	13102.97	5978.56
Q Total (cfs)	45600.00	Flow (cfs)	14096.75	29585.92	1917.33
Top Width (ft)	18339.00	Top Width (ft)	11778.04	1967.56	4593.39
Vel Total (ft/s)	0.98	Avg. Vel. (ft/s)	0.51	2.26	0.32
Max Chl Dpth (ft)	16.33	Hydr. Depth (ft)	2.34	6.66	1.30
Conv. Total (cfs)	3797903.0	Conv. (cfs)	1174081.0	2464133.0	159689.0
Length Wtd. (ft)	3864.80	Wetted Per. (ft)	11778.54	1973.33	4594.53
Min Ch El (ft)	-4.61	Shear (lb/sq ft)	0.02	0.06	0.01
Alpha	3.55	Stream Power (lb/ft s)	0.01	0.13	0.00
Frothn Loss (ft)	0.51	Cum Volume (acre-ft)	14751.27	53224.72	3135.14
C & E Loss (ft)	0.00	Cum SA (acres)	5626.34	12266.11	1885.25

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: Fish Creek
 REACH: Lower Fish Creek RS: 10.0076*

INPUT

Description: Interpolated Cross Section at River Mile 10.01

Station Elevation Data		num= 272	
Sta	Elev	Sta	Elev
0	19.96	137.17	16.65
742.58	13.5	843.51	13.72
1391.83	9.95	1504.49	10.89
2144.43	8.02	2317.55	7.85
2866.31	7.81	2867.64	7.98
5503.63	7.56	5521.59	7.56
6434.4	7.83	6883.14	7.98
7184.64	8.1	7205.6	10.72
7575.73	7.68	7728.43	7.86
9850.6	7.8110652	85	7.7111546
11969.35	8.7712136	88	12.9112177
12321.54	14.0112327	76	12.9112334
12394.21	7.5712405	62	6.7112421
12472.47	5.0412490	85	5.3112498
12518.21	5.3112525	37	5.3312550
12624.09	6.1712642	97	6.2912662
12749	4.8112769	69	4.4312783
12844.83	2.9712864	49	2.7112869
12902.81	2.3512906	34	2.3112927
12951.78	.2212974	72	-.1912980
13020.16	-1.313031	29	-2.3313042
13111.31	8.5713169	04	8.413220
13344.81	7.813366	47	9.4113411
13491.32	15.8913536	11	1713579
13674.46	20.48	13704.7	20.413750

13875.99	19.6513938.41	19.48	13987	19.2614024.19	18.9914097.78	18.69
14194	18.4214251.47	18.1614312.19		18.0314313.31	18.0214358.55	17.67
14400.08	17.39 14429.2	17.3214494.76		16.9614540.58	16.6214589.93	16.31
14641.68	16.0114654.75	15.9314661.24		15.73 14669.9	15.314677.27	15.62
14683.31	15.7114689.88	15.6814707.65		15.5614738.37	15.3914761.39	15.26
14794.02	15.08 14851.7	14.7114890.88		14.4714924.66	14.2714976.34	13.94
15019.7	13.6715068.07	13.3815102.81		13.215140.17	12.9715166.82	12.81
15199.57	12.5915241.79	12.3815269.37		12.215298.12	12.0215325.17	11.86
15346.69	11.72 15358.6	11.6515372.97		11.58 15408.3	11.3815456.35	11.06
15514.05	10.7815572.45	10.4315628.96		10.0515662.79	9.8415688.63	9.66
15700.22	9.5115709.88	9.1615723.81		8.9515728.12	9.3715729.13	9.47
15733.12	9.4115774.43	9.1615814.74		8.9915865.29	8.4915913.34	8.38
16048.56	7.5416094.22	6.9416113.31		7.1116142.16	4.5716265.52	5.91
16401.84	5.5616485.67	2.6816555.87		1.4916572.82	.1716584.76	-.73
16612.44	-2.9516621.09	-3.1216634.33		-3.5316669.46	-6.6916690.53	-6.69
16724.61	-4.2216759.29	-3.7916765.19		-3.6716786.69	-3.5116812.74	-3.55
16813.97	-3.5116822.57	-3.5516838.18		-3.5716839.25	-3.5816868.97	-3.41
16910.88	-3.0916913.91	-3.0616953.92		-2.716983.89	-2.4716987.97	-2.46
16995.83	-1.9317024.23	.0517055.88		2.3317062.63	2.817075.71	3.68
17090.65	4.5717119.74	6.517119.78		6.5 17149.8	6.75 17161.6	6.87
17162.27	6.8317173.41	7.1317183.53		7.817188.59	8.7817193.66	10.08
17201.83	11.417215.88	9.5517421.21		7.2117425.15	7.1617521.49	5.95
17561.85	10.9417617.47	7.4817735.04		7.4917765.78	7.617886.38	6.31
17903.73	7.0618040.97	12.6918064.66		9.9318233.91	9.0918457.83	7.8
18560.1	7.59 18743.5	6.5918783.86		7.8218804.98	9.5118839.95	12.36
18862.42	10.8918887.32	10.7619131.01		10.3219131.42	10.3219436.59	10.3
19445.1	10.3119618.97	10.719702.72		11.9619758.67	12.6919923.19	16.46
20074.22	15.7520088.97	14.5920096.97		13.9720207.64	12.02 20271.6	9.98
20341.52	9.9820720.42	10.2421034.95		10.58 21347.4	10.7921679.03	11.08
21988.76	11.3222316.55	11.38				

Manning's n Values	num=	6
Sta	n Val	Sta
0	.06312345.87	.10512405.62
17201.83	.079	.03413111.31
		.06216113.31
		.034

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
12345.87	17201.83		2559	4481.46	2515.69		.1	.3
Blocked Obstructions	num=	3						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
012345.87	8.77		017201.83	-4.23	17561.85	22316.55		8.77

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	11.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.063	0.035	0.079
W.S. Elev (ft)	11.23	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	25511.96	17832.54	5536.32
E.G. Slope (ft/ft)	0.000118	Area (sq ft)	25511.96	17832.54	5536.32
Q Total (cfs)	45600.00	Flow (cfs)	11448.65	32441.81	1709.54
Top Width (ft)	17962.32	Top Width (ft)	11138.32	2814.58	4009.42
Vel Total (ft/s)	0.93	Avg. Vel. (ft/s)	0.45	1.82	0.31
Max Chl Dpth (ft)	15.46	Hydr. Depth (ft)	2.29	6.34	1.38
Conv. Total (cfs)	4195433.0	Conv. (cfs)	1053335.0	2984812.0	157286.6
Length Wtd. (ft)	3953.71	Wetted Per. (ft)	11138.83	2818.35	4010.20
Min Ch El (ft)	-4.23	Shear (lb/sq ft)	0.02	0.05	0.01
Alpha	2.77	Stream Power (lb/ft s)	0.01	0.08	0.00
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	13192.17	51633.39	2802.63
C & E Loss (ft)	0.00	Cum SA (acres)	4953.21	12020.11	1636.83

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 9.16153*

INPUT

Description: Interpolated Cross Section at River Mile 9.16

Station	Elevation	Data	num=	272						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
0	18.39	128.5	15.37	267.32	14.66	435.74	12.94	599.92	12.29	
695.67	12.47	790.22	12.67	959.39	9.08	1114.84	8.94	1247.09	12.81	
1303.89	9.28	1409.44	10.14	1620.45	10.09	1630.43	10.08	1870.46	7.39	
2008.94	7.54	2171.13	7.38	2322.42	7.3	2482.28	7.65	2494.75	7.67	
2685.22	7.32	2686.46	7.47	3411.06	7.25	3929.89	7.27	4274.42	7.27	
5155.91	6.99	5172.73	7	5451.11	8.22	5726	9.07	5816.32	7.17	
6027.87	7.33	6448.26	7.42	6478.29	8.11	6501.08	7.41	6605.29	7.46	
6730.72	7.51	6750.35	9.89	6776.46	8.03	6849.46	7.92	6947.71	7.8	
7097.09	7.12	7240.15	7.29	7450.99	7.63	7606.25	7.62	8419.85	7.28	
9228.24	7.23	9979.8	7.1610816	6.4	7.2110858	8.3	7.3511012	5.1	7.83	
11213.12	8.211370	0.07	11.9711408	4.9	9.211443	0.01	9.4311522	1.19	10.35	
11543.06	12.9611548	8.89	11.9611554	7.9	9.8811565	8.5	10.2711604	2.23	8.34	
11627.73	7.0511642	3.33	6.2711662	3.4	5.7411693	9.7	4.9311698	1.6	4.79	
11727.89	4.5811751	4.2	4.9311761	7.8	4.67	11769.9	3.8911777	5.3	4.27	
11786.44	4.83	11795.6	4.8511827	2.9	5.3611856	9.7	5.511890	3.9	5.66	
11921.96	5.7811946	1.2	5.9	11971.2	5.9611973	2.3	5.9312018	4.4	5.37	
12081.83	4.5412108	3.1	4.1812126	0.7	3.9312146	6.8	3.4812170	1.5	3.13	
12204.48	2.7912229	6.5	2.61	12236.1	2.5412254	4.2	2.4912254	4.3	2.49	
12278.69	2.312283	2.1	2.2612310	8.5	1.5412312	5.8	1.4912341	2.2	.39	
12341.36	.3812370	7.3	.0212377	8.4	-.1112399	5.2	-.5312422	5.9	-.9	
12428.89	-1.0112443	1.4	-1.9512457	9.7	2.7312479	1.9	8.0912482	4.2	8.08	
12545.56	7.9512619	4.5	7.8112685	8.8	7.6312744	9.9	7.5112793	0.3	7.38	
12844.41	7.2512872	1.3	8.7112930	3.1	11.8112957	8.2	13.2712989	3.9	13.85	
13031.94	14.6213089	2.6	15.6213144	5.5	16.59	13206.4	17.8213251	4.2	18.49	
13266.34	18.7713305	0.5	18.7113364	0.4	18.3413414	8.1	18.3813461	8.1	18.18	
13524.28	1813604	1.7	17.8913666	3.6	17.6713713	9.6	17.3513808	1.6	17.09	
13931.31	16.914004	8.6	16.6514082	5.8	16.5914084	0.1	16.5814141	9.2	16.22	
14195.07	15.9414232	3.5	15.9414316	2.5	15.65	14374.9	15.314438	0.6	15.01	
14504.3	14.7414521	0.2	14.6714529	3.4	14.414540	4.1	13.7814549	8.6	14.29	
14557.58	14.4414565	9.9	14.4314588	7.4	14.3114628	0.5	14.1614657	5.2	14.06	
14699.28	13.914773	1.1	13.5614823	2.5	13.3414866	4.9	13.1514932	6.3	12.84	
14988.14	12.615050	0.5	12.3315094	5.1	12.1915142	3.3	11.9815176	4.4	11.83	
15218.36	11.6315272	3.9	11.4615307	6.9	11.29	15344.5	11.13	15379.1	10.98	
15406.65	10.86	15421.9	10.7915440	2.9	10.7415485	5.1	10.5615547	0.1	10.25	
15620.87	10.0515695	6.1	9.7215767	9.4	9.3615811	2.4	9.1815844	3.1	8.99	
15859.15	8.8115871	5.1	8.3215889	3.3	8.0515894	8.6	8.715896	1.4	8.85	
15901.26	8.7915954	1.3	8.5616005	7.1	8.4516070	4.2	7.8716131	9.1	7.88	
16304.99	7.1116363	4.4	6.5716387	8.6	6.7216424	7.9	4.4116582	6.9	5.62	
16757.15	5.2916864	4.5	2.67	16954.3	1.58	16976	.3816991	2.8	-.42	
17026.71	-2.4817037	7.9	-2.6417054	7.3	-3.1417099	6.9	-7.5417118	8.5	-7.54	
17164.24	-3.9917210	4.3	-3.5117218	2.8	-3.3617246	9.1	-3.0517281	6.2	-3.04	
17283.25	-2.9817294	7.1	-3.02	17315.5	-3.0117316	9.3	-3.0217356	5.1	-2.88	
17412.32	-2.5717416	3.6	-2.5417469	6.6	-2.1717509	5.8	-1.9317515	0.1	-1.94	
17525.47	-1.48	17563.3	.2817605	4.6	2.3417614	4.4	2.7517631	8.6	3.51	
17651.76	4.2317690	5.1	5.917690	5.6	5.917730	5.4	6.117746	2.7	6.21	
17747.16	6.1417761	9.9	5.9217775	4.8	6.3117782	2.1	7.4717788	9.6	9.12	
17799.85	10.617813	4.1	8.9218011	7.7	6.8618015	5.7	6.8218108	6.4	5.72	
18147.63	10.2718201	3.5	7.1218314	9.3	7.1418344	6.2	7.2918461	1.2	6.37	
18477.88	7.0818610	4.6	12.2918633	3.4	9.7918796	8.4	9.1319013	1.4	8	
19111.94	7.83	19289.1	6.5819328	0.9	7.6319348	4.9	9.1219382	2.7	11.68	

19403.97	10.3319428.03	10.219663.44	9.5819663.84	9.5819958.63	9.5
19966.84	9.5220134.81	10.0520215.71	11.2820269.76	11.9420428.68	15.34
20574.58	14.6720588.83	13.6220596.56	13.0520703.47	11.2720765.25	9.42
20832.79	9.4221198.81	9.8121502.65	10.3221804.47	10.6422124.82	11.08
22424.03	11.4222740.67	11.52			

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06511565.85	.10211642.33	.03812545.56	.06316131.91	.038		
17799.85	.08						

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

11565.85	17799.85	2559	4481.46	2515.69	.1	.3
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Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
011565.85	8.34	8.34	017799.85	-3.84	18147.63	22740.67	8.34	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	10.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.065	0.039	0.080
W.S. Elev (ft)	10.79	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	24148.16	22405.14	5248.25
E.G. Slope (ft/ft)	0.000112	Area (sq ft)	24148.16	22405.14	5248.25
Q Total (cfs)	45600.00	Flow (cfs)	10246.57	33795.69	1557.74
Top Width (ft)	17710.68	Top Width (ft)	10492.84	3721.67	3496.18
Vel Total (ft/s)	0.88	Avg. Vel. (ft/s)	0.42	1.51	0.30
Max Chl Dpth (ft)	14.63	Hydr. Depth (ft)	2.30	6.02	1.50
Conv. Total (cfs)	4308057.0	Conv. (cfs)	968044.3	3192845.0	147167.3
Length Wtd. (ft)	4001.96	Wetted Per. (ft)	10493.38	3724.39	3496.86
Min Ch El (ft)	-3.84	Shear (lb/sq ft)	0.02	0.04	0.01
Alpha	2.23	Stream Power (lb/ft s)	0.01	0.06	0.00
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	11733.49	49563.57	2491.22
C & E Loss (ft)	0.00	Cum SA (acres)	4317.83	11683.89	1420.10

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 8.31538*

INPUT

Description: Interpolated Cross Section at River Mile 8.32

Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	16.82	119.83	14.09	249.29	13.44	406.35	11.88	559.46	11.29
648.75	11.44	736.93	11.63	894.69	8.41	1039.66	8.29	1162.98	11.78
1215.96	8.6	1314.38	9.38	1511.17	9.35	1520.47	9.35	1744.32	6.91
1873.46	7.05	2024.71	6.9	2165.79	6.83	2314.87	7.14	2326.5	7.17
2504.12	6.83	2505.29	6.96	3181.02	6.68	3664.85	6.73	3986.15	6.74
4808.19	6.42	4823.88	6.43	5083.48	7.57	5339.83	8.36	5424.06	6.66
5621.34	6.82	6013.38	6.87	6041.39	7.48	6062.64	6.85	6159.82	6.88
6276.79	6.91	6295.09	9.05	6319.45	7.38	6387.52	7.27	6479.15	7.16
6618.45	6.56	6751.86	6.73	6948.48	7.04	7093.27	7.04	7852.01	6.66
8605.87	6.65	9306.75	6.61	10087.15	6.74	10126.49	6.87	10269.81	7.3
10456.89	7.64	10603.25	11.02	10639.09	8.53	10671.28	8.74	10745.12	9.56
10764.59	11.92	10770.02	11.02	10775.52	9.15	10785.84	9.49	10832.61	7.72
10861.25	6.54	10879.04	5.82	10903.43	5.34	10941.97	4.61	10947.08	4.45
10983.31	4.12	11011.99	4.54	11024.61	4.18	11034.51	3.13	11043.8	3.62
11054.67	4.36	11065.83	4.36	11104.45		11140.63	5.13	11181.35	5.28

11219.82	5.3911249.27	5.5111279.83	5.5411282.31	5.5211337.41	5.03
11414.65	4.2711446.93	3.9311468.57	3.7 11493.7	3.21 11522.3	2.88
11564.13	2.61 11594.8	2.5111602.67	2.45 11625	2.4211625.01	2.42
11654.57	2.2511660.08	2.2211693.77	1.5611695.87	1.5311730.78	.55
11730.95	.5511766.74	.2211775.41	.1111801.83	-.2711829.94	-.61
11837.62	-.7111854.98	-1.5611873.06	2.6411898.92	7.4511902.86	7.44
11979.8	7.3412069.85	7.2212150.81	7.0512222.85	6.95 12281.4	6.82
12344.02	6.7 12377.8	8 12448.7	10.8112482.22	12.13 12520.7	12.66
12572.55	13.3412642.42	14.24 12709.8	15.112785.17	16.2512840.04	16.8
12858.22	17.0612905.39	17.0312977.28	16.6113039.16	16.7213096.44	16.51
13172.58	16.3513269.93	16.313345.72	16.0813403.74	15.7213518.53	15.48
13668.62	15.3813758.26	15.1313852.98	15.1513854.71	15.1413925.29	14.77
13990.07	14.514035.49	14.5714137.75	14.3314209.22	13.98 14286.2	13.71
14366.92	13.48 14387.3	13.4114397.43	13.0714410.93	12.2614422.44	12.96
14431.85	13.18 14442.1	13.1814469.82	13.0614517.74	12.9314553.64	12.85
14604.54	12.7214694.52	12.414755.63	12.214808.32	12.0414888.93	11.75
14956.58	11.5315032.02	11.2915086.21	11.1815144.49	10.9915186.05	10.86
15237.14	10.6615302.99	10.5515346.01	10.3815390.87	10.2315433.04	10.1
15466.62	9.99 15485.2	9.9315507.61	9.8915562.72	9.7515637.67	9.45
15727.68	9.3115818.77	9.0215906.91	8.6815959.68	8.5115999.99	8.32
16018.08	8.1116033.14	7.4716054.86	7.1616061.59	8.0316063.16	8.24
16069.39	8.1616133.83	7.9516196.69	7.916275.54	7.2516350.49	7.38
16561.42	6.6816632.65	6.1916662.42	6.3216707.42	4.2416899.85	5.33
17112.47	5.0217243.23	2.6517352.74	1.6717379.18	.59 17397.8	-.11
17440.98	-2.0117454.48	-2.1717475.12	-2.7517529.92	-8.3817547.16	-8.38
17603.86	-3.7617661.57	-3.2317671.38	-3.0517707.14	-2.6 17750.5	-2.54
17752.54	-2.4517766.85	-2.4817792.82	-2.45 17794.6	-2.4617844.05	-2.35
17913.77	-2.0617918.82	-2.0317985.39	-1.6318035.26	-1.418042.04	-1.42
18055.11	-1.0318102.37	.518155.03	2.3518166.26	2.6918188.01	3.35
18212.88	3.8818261.28	5.318261.35	5.318311.29	5.4518330.93	5.55
18332.04	5.4518350.57	4.718367.42	4.8218375.82	6.1618384.27	8.16
18397.86	9.818410.95	8.2918602.33	6.5118605.99	6.4718695.79	5.5
18733.4	9.5918785.24	6.7618894.82	6.7818923.47	6.9919035.87	6.42
19052.03	7.1119179.94	11.8919202.02	9.6519359.76	9.1819568.45	8.2
19663.77	8.0619834.71	6.5819872.32	7.44 19892	8.7419924.59	11.01
19945.53	9.7719968.75	9.6320195.86	8.8520196.25	8.8520480.67	8.7
20488.59	8.7320650.65	9.4 20728.7	10.6120780.85	11.1920934.17	14.23
21074.94	13.621088.69	12.6521096.14	12.1421199.29	10.5321258.89	8.86
21324.06	8.85 21677.2	9.3821970.34	10.0522261.55	10.4822570.62	11.07
22859.29	11.5323164.79	11.65			

Manning's n Values		num= 6		Sta		n Val		Sta		n Val	
0	.06610785.84	.09910879.04	.041	11979.8	.06417112.47	.041					
18397.86	.08										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	10785.84	18397.86		2559	4481.46	2515.69	.1	.3	
Blocked Obstructions			num= 3			Sta			
	Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
	010785.84	7.92		018397.86	-3.4519179.94	23164.79	7.92		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	10.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.066	0.043	0.080
W.S. Elev (ft)	10.36	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	22860.06	26849.96	5381.42
E.G. Slope (ft/ft)	0.000104	Area (sq ft)	22860.06	26849.96	5381.42
Q Total (cfs)	45600.00	Flow (cfs)	9228.85	34729.26	1641.89

Top Width (ft)	17769.42	Top Width (ft)	9855.07	4698.39	3215.96
Vel Total (ft/s)	0.83	Avg. Vel. (ft/s)	0.40	1.29	0.31
Max Chl Dpth (ft)	13.81	Hydr. Depth (ft)	2.32	5.71	1.67
Conv. Total (cfs)	4477507.0	Conv. (cfs)	906189.3	3410099.0	161219.1
Length Wtd. (ft)	4042.75	Wetted Per. (ft)	9855.64	4700.52	3216.61
Min Ch El (ft)	-3.45	Shear (lb/sq ft)	0.02	0.04	0.01
Alpha	1.91	Stream Power (lb/ft s)	0.01	0.05	0.00
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	10352.71	47029.88	2184.27
C & E Loss (ft)	0.00	Cum SA (acres)	3720.15	11250.76	1226.28

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 7.46923*

INPUT

Description: Interpolated Cross Section at River Mile 7.47

Station Elevation Data		num= 272		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	15.25	111.17	12.82	231.26	12.23	376.97	10.83	519	10.29
601.83	10.42	683.63	10.59	829.99	7.73	964.47	7.64	1078.88	10.75
1128.02	7.93	1219.33	8.63	1401.88	8.61	1410.51	8.61	1618.17	6.44
1737.97	6.56	1878.28	6.43	2009.17	6.36	2147.46	6.64	2158.25	6.66
2323.03	6.33	2324.11	6.45	2950.97	6.12	3399.82	6.18	3697.88	6.21
4460.47	5.86	4475.02	5.86	4715.85	6.91	4953.66	7.64	5031.8	6.15
5214.81	6.32	5578.51	6.31	5604.48	6.85	5624.2	6.29	5714.35	6.3
5822.86	6.31	5839.84	8.21	5862.44	6.72	5925.59	6.61	6010.59	6.53
6139.82	6	6263.58	6.16	6445.98	6.45	6580.3	6.45	7284.16	6.03
7983.51	6.06	8633.7	6.07	9357.66	6.28	9394.16	6.4	9527.11	6.78
9700.67	7.07	9836.44	10.08	9869.69	7.86	9899.55	8.05	9968.05	8.78
9986.11	10.87	9991.14	10.07	9996.25	8.41	10005.82	8.72	10060.99	7.1
10094.76	6.02	10115.75	5.38	10144.51	4.93	10189.97	4.27	10196	4.11
10238.73	3.66	10272.56	4.16	10287.44	3.69	10299.12	2.37	10310.08	2.97
10322.89	3.89	10336.06	3.88	10381.61	4.63	10424.28	4.76	10472.31	4.91
10517.69	5.01	10552.42	5.12	10588.47	5.13	10591.38	5.11	10656.38	4.68
10747.48	3.99	10785.55	3.68	10811.08	3.46	10840.71	2.94	10874.44	2.63
10923.79	2.43	10959.96	2.41	10969.24	2.36	10995.57	2.35	10995.59	2.35
11030.45	2.21	11036.95	2.17	11076.68	1.59	11079.16	1.56	11120.34	.71
11120.54	.71	11162.76	.43	11172.97	.33	11204.13	-.01	11237.29	-.32
11246.35	-.41	11266.83	-1.18	11288.15	2.55	11318.66	6.81	11323.3	6.8
11414.04	6.72	11520.26	6.62	11615.74	6.46	11700.71	6.39	11769.76	6.26
11843.62	6.14	11883.47	7.31	11967.09	9.81	12006.63	10.99	12052.01	11.46
12113.17	12.07	12195.57	12.86	12275.04	13.61	12363.94	14.69	12428.66	15.11
12450.09	15.36	12505.74	15.35	12590.53	14.87	12663.51	15.06	12731.07	14.84
12820.87	14.7	12935.7	14.71	13025.09	14.51	13093.51	14.08	13228.91	13.87
13405.93	13.86	13511.65	13.62	13623.37	13.71	13625.42	13.71	13708.66	13.31
13785.06	13.05	13838.64	13.19	13959.24	13.02	14043.54	12.66	14134.33	12.4
14229.54	12.21	14253.58	12.16	14265.53	11.74	14281.45	10.74	14295.03	11.63
14306.12	11.91	14318.21	11.92	14350.91	11.81	14407.42	11.71	14449.77	11.64
14509.8	11.54	14615.93	11.24	14688	11.07	14750.15	10.92	14845.23	10.65
14925.01	10.46	15014	10.25	15077.91	10.17	15146.64	10.15	15195.67	9.89
15255.93	9.71	15333.59	9.63	15384.33	9.47	15437.24	9.34	15486.98	9.22
15526.58	9.13	15548.5	9.07	15574.93	9.05	15639.92	8.93	15728.32	8.64
15834.49	8.58	15941.93	8.32	16045.89	7.99	16108.13	7.84	16155.67	7.65
16177	7.41	16194.77	6.63	16220.39	6.26	16228.33	7.36	16230.17	7.62
16237.53	7.53	16313.52	7.35	16387.67	7.36	16480.67	6.64	16569.07	6.88
16817.85	6.25	16901.86	5.81	16936.97	5.93	16990.05	4.08	17217.01	5.03
17467.79	4.76	17622.02	2.64	17751.17	1.77	17782.36	.81	17804.33	.2
17855.25	-1.54	17871.17	-1.71	17895.52	-2.35	17960.15	-9.23	17975.48	-9.23

18043.49	-3.53	18112.7	-2.9518124.47	-2.7318167.37	-2.1418219.38	-2.03
18221.82	-1.9218238.99	-1.9518270.14	-1.8918272.28	-1.8918331.59	-1.82	
18415.22	-1.5418421.27	-1.5118501.12	-1.0918560.94	-0.8718569.08	-0.9	
18584.76	-0.5918641.44	0.72 18704.6	2.3518718.07	2.6418744.17	3.19	
18773.99	3.5418832.04	4.718832.13	4.718892.04	4.818915.59	4.89	
18916.93	4.7718939.15	3.4918959.36	3.3318969.44	4.8618979.57	7.2	
18995.88	919008.49	7.6719192.88	6.1619196.42	6.1319282.94	5.27	
19319.18	8.9119369.12	6.419474.71	6.4319502.31	6.6919610.61	6.48	
19626.19	7.1319749.43	11.48 19770.7	9.5219922.69	9.2320123.77	8.4	
20215.61	8.3 20380.3	6.5720416.54	7.2520435.51	8.3620466.91	10.34	
20487.09	9.2120509.46	9.0620728.29	8.1120728.66	8.1121002.71	7.9	
21010.34	7.9421166.48	8.7521241.69	9.9321291.93	10.4421439.67	13.11	
21575.29	12.5221588.54	11.6821595.73	11.2221695.11	9.7921752.54	8.3	
21815.33	8.2922155.59	8.9522438.04	9.7922718.62	10.3323016.42	11.06	
23294.56	11.6423588.92	11.79				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06810005.82	.09710115.75	.04411414.04	.06516936.97	.044				
18995.88	.081								

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

10005.82	18995.88	2559	4481.46	2515.69	.1	.3
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Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
010005.82	7.49	018995.88	-3.0719749.43	23588.92	7.49			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	9.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.068	0.045	0.081
W.S. Elev (ft)	9.96	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	21760.29	31263.16	5126.92
E.G. Slope (ft/ft)	0.000098	Area (sq ft)	21760.29	31263.16	5126.92
Q Total (cfs)	45600.00	Flow (cfs)	8388.13	35729.04	1482.83
Top Width (ft)	18039.57	Top Width (ft)	9226.11	5796.45	3017.01
Vel Total (ft/s)	0.78	Avg. Vel. (ft/s)	0.39	1.14	0.29
Max Chl Dpth (ft)	13.03	Hydr. Depth (ft)	2.36	5.39	1.70
Conv. Total (cfs)	4597998.0	Conv. (cfs)	845803.0	3602677.0	149518.1
Length Wtd. (ft)	4075.90	Wetted Per. (ft)	9226.71	5798.25	3017.56
Min Ch El (ft)	-3.07	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	1.71	Stream Power (lb/ft s)	0.01	0.04	0.00
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	9042.06	44040.54	1880.83
C & E Loss (ft)	0.00	Cum SA (acres)	3159.67	10710.90	1046.29

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 6.62307*

INPUT

Description: Interpolated Cross Section at River Mile 6.62

Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	13.68	102.5	11.54	213.23	11.01	347.58	9.77	478.54	9.29
554.92	9.39	630.34	9.55	765.28	7.06	889.28	6.99	994.77	9.71
1040.08	7.25	1124.27	7.87	1292.6	7.87	1300.55	7.87	1492.02	5.97
1602.49	6.07	1731.86	5.96	1852.54	5.89	1980.06	6.13	1990.01	6.15
2141.93	5.84	2142.93	5.94	2720.92	5.55	3134.78	5.64	3409.61	5.69

4112.75	5.29	4126.17	5.29	4348.22	6.25	4567.49	6.93	4639.54	5.63
4808.29	5.82	5143.63	5.75	5167.58	6.22	5185.76	5.72	5268.89	5.72
5368.93	5.71	5384.59	7.37	5405.42	6.07	5463.65	5.96	5542.03	5.89
5661.18	5.45	5775.29	5.59	5943.48	5.85	6067.32	5.87	6716.32	5.4
7361.15	5.48	7960.65	5.52	8628.18	5.81	8661.83	5.92	8784.42	6.25
8944.44	6.51	9069.63	9.14	9100.28	7.19	9127.82	7.35	9190.98	8
9207.63	9.82	9212.27	9.12	9216.98	7.67	9225.81	7.94	9289.37	6.47
9328.28	5.51	9352.46	4.93	9385.6	4.53	9437.98	3.93	9444.92	3.77
9494.15	3.21	9533.12	3.78	9550.27	3.21	9563.73	1.61	9576.36	2.33
9591.12	3.41	9606.29	3.39	9658.77	4.26	9707.93	4.39	9763.27	4.53
9815.55	4.62	9855.56	4.73	9897.1	4.71	9900.46	4.69	9975.34	4.33
10080.31	3.72	10124.17	3.44	10153.58	3.23	10187.72	2.68	10226.59	2.37
10283.44	2.25	10325.11	2.3	10335.8	2.27	10366.14	2.28	10366.17	2.28
10406.33	2.15	10413.81	2.12	10459.6	1.62	10462.46	1.59	10509.9	.87
10510.13	.87	10558.77	.64	10570.54	.55	10606.44	.25	10644.64	-.03
10655.08	-.11	10678.67	-.79	10703.24	2.46	10738.39	6.18	10743.74	6.16
10848.29	6.11	10970.67	6.03	11080.67	5.88	11178.57	5.83	11258.13	5.71
11343.23	5.59	11389.13	6.61	11485.47	8.81	11531.03	9.84	11583.32	10.27
11653.79	10.81	11748.73	11.47	11840.29	12.12	11942.71	13.13	12017.28	13.42
12041.97	13.65	12106.08	13.67	12203.78	13.14	12287.86	13.41	12365.7	13.18
12469.16	13.05	12601.46	13.12	12704.45	12.91	12783.28	12.45	12939.28	12.26
13143.24	12.34	13265.04	12.11	13393.76	12.27	13396.12	12.26	13492.02	11.86
13580.05	11.61	13641.78	11.82	13780.74	11.71	13877.86	11.34	13982.46	11.1
14092.16	10.95	14119.86	10.91	14133.63	10.41	14151.97	9.22	14167.61	10.3
14180.39	10.65	14194.32	10.67	14232	10.56	14297.11	10.48	14345.9	10.44
14415.07	10.36	14537.34	10.09	14620.38	9.94	14691.98	9.81	14801.52	9.56
14893.45	9.39	14995.97	9.21	15069.61	9.16	15148.8	9.02	15205.29	8.91
15274.71	8.74	15364.19	8.71	15422.65	8.56	15483.61	8.45	15540.92	8.34
15586.55	8.26	15611.8	8.21	15642.25	8.21	15717.13	8.11	15818.98	7.84
15941.31	7.84	16065.09	7.62	16184.86	7.31	16256.57	7.17	16311.35	6.98
16335.92	6.7	16356.4	5.79	16385.91	5.37	16395.06	6.69	16397.19	7.01
16405.66	6.91	16493.22	6.74	16578.65	6.81	16685.8	6.02	16787.65	6.39
17074.28	5.82	17171.07	5.43	17211.53	5.54	17272.68	3.91	17534.17	4.74
17823.11	4.49	18000.8	2.63	18149.6	1.86	18185.54	1.01	18210.85	.52
18269.52	-1.06	18287.86	-1.22	18315.92	-1.96	18390.38	-10.08	18403.79	-10.08
18483.12	-3.31	18563.84	-2.67	18577.56	-2.42	18627.6	-1.69	18688.26	-1.53
18691.11	-1.41	18711.13	-1.42	18747.46	-1.33	18749.95	-1.33	18819.13	-1.29
18916.67	-1.02	18923.72	-.99	19016.86	-.56	19086.62	-.33	19096.12	-.38
19114.4	-.14	19180.51	.94	19254.18	2.36	19269.88	2.59	19300.32	3.03
19335.1	3.21	19402.81	4.11	19402.92	4.11	19472.78	4.15	19500.26	4.23
19501.81	4.08	19527.73	2.28	19551.3	1.84	19563.06	3.55	19574.88	6.24
19593.89	8.21	19606.03	7.04	19783.44	5.82	19786.84	5.79	19870.08	5.04
19904.95	8.23	19953.01	6.04	20054.59	6.08	20081.15	6.39	20185.35	6.53
20200.34	7.15	20318.92	11.08	20339.38	9.38	20485.62	9.27	20679.08	8.61
20767.45	8.54	20925.91	6.57	20960.77	7.06	20979.02	7.98	21009.23	9.67
21028.65	8.66	21050.17	8.49	21260.71	7.37	21261.07	7.37	21524.74	7.1
21532.09	7.14	21682.32	8.12	21754.68	9.25	21803.02	9.68	21945.16	11.99
22075.65	11.45	22088.4	10.71	22095.31	10.31	22190.93	9.05	22246.19	7.74
22306.6	7.73	22633.98	8.52	22905.73	9.53	23175.69	10.18	23462.22	11.05
23729.83	11.75	24013.04	11.93						

Manning's n Values		num=	6		n Val		Sta		n Val		Sta	
0	.069	9225.81	.094	9352.46	.047	10848.29	.066	17823.11		.047		
19593.89	.081											

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9225.81	19593.89		2559	4481.46	2515.69	.1	.3
Blocked Obstructions	num=		3					
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev

0 9225.81 7.07 019593.99 -2.6820318.9224013.04 7.07

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	9.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.069	0.049	0.081
W.S. Elev (ft)	9.55	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	20537.76	35704.93	4882.91
E.G. Slope (ft/ft)	0.000100	Area (sq ft)	20537.76	35704.93	4882.91
Q Total (cfs)	45600.00	Flow (cfs)	7880.77	36296.92	1422.31
Top Width (ft)	18781.33	Top Width (ft)	8804.93	7089.59	2886.81
Vel Total (ft/s)	0.75	Avg. Vel. (ft/s)	0.38	1.02	0.29
Max Chl Dpth (ft)	12.23	Hydr. Depth (ft)	2.33	5.04	1.69
Conv. Total (cfs)	4555487.0	Conv. (cfs)	787296.9	3626100.0	142090.2
Length Wtd. (ft)	4100.14	Wetted Per. (ft)	8805.51	7091.24	2887.27
Min Ch El (ft)	-2.68	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	1.53	Stream Power (lb/ft s)	0.01	0.03	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	7799.63	40595.69	1591.79
C & E Loss (ft)	0.00	Cum SA (acres)	2630.04	10048.04	875.81

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 5.77692*

INPUT

Description: Interpolated Cross Section at River Mile 5.78

Station Elevation Data		num= 272							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	12.12	93.84	10.27	195.2	9.8	318.19	8.72	438.08	8.28
508	8.36	577.05	8.5	700.58	6.38	814.1	6.34	910.67	8.68
952.15	6.58	1029.22	7.12	1183.31	7.13	1190.59	7.13	1365.88	5.5
1467	5.58	1585.43	5.48	1695.91	5.43	1812.65	5.63	1821.76	5.64
1960.84	5.34	1961.75	5.44	2490.88	4.99	2869.74	5.1	3121.33	5.16
3765.02	4.72	3777.31	4.73	3980.59	5.59	4181.32	6.22	4247.28	5.12
4401.76	5.32	4708.75	5.19	4730.67	5.59	4747.32	5.16	4823.42	5.14
4915.01	5.12	4929.34	6.54	4948.41	5.41	5001.72	5.31	5073.46	5.26
5182.54	4.89	5287.01	5.02	5440.97	5.26	5554.35	5.29	6148.47	4.77
6738.78	4.9	7287.6	4.98	7898.69	5.35	7929.5	5.45	8041.72	5.73
8188.21	5.94	8302.82	8.19	8330.88	6.53	8356.09	6.66	8413.91	7.21
8429.15	8.78	8433.4	8.18	8437.71	6.93	8445.79	7.16	8517.75	5.85
8561.8	4.99	8589.17	4.49	8626.68	4.13	8685.98	3.6	8693.84	3.43
8749.57	2.75	8793.69	3.4	8813.11	2.72	8828.34	.85	8842.64	1.68
8859.34	2.94	8876.52	2.91	8935.94	3.9	8991.58	4.02	9054.24	4.15
9113.42	4.23	9158.71	4.34	9205.73	4.3	9209.54	4.28	9294.31	3.98
9413.14	3.44	9462.79	3.19	9496.08	3	9534.73	2.41	9578.73	2.12
9643.09	2.07	9690.27	2.2	9702.37	2.18	9736.72	2.22	9736.74	2.22
9782.21	2.1	9790.68	2.08	9842.51	1.64	9845.75	1.62	9899.46	1.03
9899.71	1.03	9954.78	.84	9968.11	.77	10008.75	.51	10051.99	.26
10063.81	.18	10090.52	-.41	10118.32	2.37	10158.12	5.54	10164.17	5.53
10282.53	5.49	10421.07	5.44	10545.61	5.31	10656.43	5.27	10746.5	5.15
10842.83	5.04	10894.8	5.91	11003.86	7.81	11055.44	8.71	11114.63	9.07
11194.4	9.53	11301.88	10.09	11405.53	10.63	11521.48	11.57	11605.89	11.73
11633.85	11.94	11706.43	11.99	11817.02	11.41	11912.21	11.75	12000.33	11.51
12117.45	11.41	12267.22	11.54	12383.82	11.32	12473.06	10.81	12649.65	10.65
12880.55	10.82	13018.44	10.59	13164.15	10.83	13166.83	10.82	13275.39	10.41
13375.04	10.17	13444.93	10.45	13602.23	10.39	13712.18	10.02	13830.6	9.8
13954.78	9.69	13986.13	9.64	14001.72	9.08	14022.49	7.71	14040.2	8.97
14054.67	9.39	14070.43	9.42	14113.08	9.31	14186.79	9.26	14242.03	9.23

14320.33	9.1814458.75	8.9314552.75	8.814633.81	8.6914757.82	8.46
14861.88	8.3214977.95	8.1615061.31	8.1515150.96	8.03 15214.9	7.94
15293.5	7.7815394.79	7.815460.97	7.6515529.98	7.5615594.86	7.47
15646.51	7.4 15675.1	7.3615709.57	7.3615794.34	7.315909.64	7.03
16048.12	7.1116188.25	6.9116323.84	6.6216405.02	6.5116467.03	6.31
16494.85	616518.03	4.9516551.44	4.4716561.79	6.0216564.21	6.39
16573.79	6.2716672.92	6.1316769.63	6.2716890.93	5.417006.23	5.89
17330.71	5.3917440.28	5.0617486.08	5.1417555.31	3.7517851.33	4.45
18178.43	4.2218379.58	2.6218548.04	1.9518588.72	1.2318617.37	.83
18683.78	-.5918704.55	-.7518736.32	-1.5618820.62	-10.9218832.11	-10.92
18922.74	-3.0819014.98	-2.3919030.66	-2.1119087.83	-1.2319157.13	-1.03
19160.39	-.8719183.27	-.8919224.78	-.7719227.63	-.7719306.67	-.77
19418.11	-.519426.18	-.4719532.59	-.0219612.31	.219623.15	.14
19644.04	.3119719.58	1.1719803.75	2.36 19821.7	2.5419856.47	2.87
19896.22	2.8619973.58	3.5 19973.7	3.520053.53	3.520084.92	3.57
20086.7	3.3920116.31	1.0720143.25	.3420156.68	2.2420170.18	5.27
20191.91	7.420203.56	6.41 20374	5.4720377.26	5.4520457.23	4.82
20490.73	7.5620536.89	5.6820634.48	5.7220659.99	6.0920760.09	6.59
20774.49	7.17 20888.4	10.6820908.06	9.2421048.54	9.3221234.39	8.81
21319.28	8.7821471.51	6.56 21505	6.8721522.54	7.5921551.55	9
21570.21	8.121590.88	7.9221793.14	6.6321793.48	6.6322046.78	6.3
22053.83	6.3522198.15	7.4522267.67	8.5722314.11	8.9322450.65	10.87
22576.01	10.3722588.26	9.73 22594.9	9.3922686.76	9.3122739.84	7.18
22797.88	7.1723112.37	8.0823373.43	9.2723632.76	10.0223908.01	11.05
24165.1	11.8524437.16	12.07			

Manning's n Values		num=	6
Sta	n Val	Sta	n Val
0	.071 8445.79	.091 8589.17	.05110118.32
20191.91	.082		.06817851.33
			.051

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.	
	8445.79	20191.91		2559	4481.46	2515.69	.1	.3	
Blocked Obstructions		num=	3	Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	8445.79	6.64		020191.91	-2.29	20888.424437.16	6.64		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	9.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.071	0.053	0.082
W.S. Elev (ft)	9.13	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	19318.40	40259.20	4596.52
E.G. Slope (ft/ft)	0.000105	Area (sq ft)	19318.40	40259.20	4596.52
Q Total (cfs)	45600.00	Flow (cfs)	7363.27	36876.32	1360.40
Top Width (ft)	19326.11	Top Width (ft)	8174.36	8569.00	2582.76
Vel Total (ft/s)	0.71	Avg. Vel. (ft/s)	0.38	0.92	0.30
Max Chl Dpth (ft)	11.42	Hydr. Depth (ft)	2.36	4.70	1.78
Conv. Total (cfs)	4442190.0	Conv. (cfs)	717303.9	3592360.0	132525.6
Length Wtd. (ft)	4112.77	Wetted Per. (ft)	8174.83	8570.65	2583.13
Min Ch El (ft)	-2.29	Shear (lb/sq ft)	0.02	0.03	0.01
Alpha	1.40	Stream Power (lb/ft s)	0.01	0.03	0.00
Frotn Loss (ft)	0.49	Cum Volume (acre-ft)	6628.92	36688.09	1318.06
C & E Loss (ft)	0.00	Cum SA (acres)	2131.31	9242.56	717.87

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 4.93076*

INPUT

Description: Interpolated Cross Section at River Mile 4.93

Station Elevation Data		num= 272		Elev Sta		Elev Sta		Elev Sta	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	10.55	85.17	8.99	177.18	8.58	288.81	7.66	397.62	7.28
461.08	7.34	523.75	7.46	635.88	5.71	738.91	5.69	826.56	7.65
864.21	5.9	934.17	6.36	1074.03	6.39	1080.64	6.39	1239.73	5.03
1331.52	5.1	1439.01	5.01	1539.29	4.96	1645.24	5.12	1653.51	5.13
1779.75	4.85	1780.57	4.93	2260.83	4.42	2604.71	4.56	2833.06	4.63
3417.3	4.15	3428.46	4.16	3612.96	4.93	3795.15	5.51	3855.02	4.61
3995.23	4.81	4273.87	4.63	4293.77	4.96	4308.87	4.6	4377.95	4.56
4461.08	4.52	4474.09	5.7	4491.4	4.76	4539.78	4.66	4604.9	4.62
4703.91	4.33	4798.73	4.45	4938.47	4.67	5041.37	4.71	5580.63	4.14
6116.42	4.31	6614.55	4.43	7169.2	4.88	7197.16	4.97	7299.02	5.2
7431.99	5.38	7536.01	7.25	7561.48	5.86	7584.36	5.97	7636.84	6.43
7650.67	7.73	7654.53	7.23	7658.44	6.19	7665.78	6.38	7746.13	5.23
7795.32	4.48	7825.88	4.04	7867.77	3.72	7933.98	3.27	7942.76	3.09
8004.99	2.29	8054.26	3.01	8075.94	2.23	8092.95	.1	8108.91	1.03
8127.57	2.47	8146.75	2.42	8213.1	3.53	8275.24	3.65	8345.2	3.78
8411.28	3.84	8461.86	3.95	8514.37	3.89	8518.61	3.86	8613.27	3.64
8745.96	3.17	8801.41	2.94	8838.58	2.76	8881.74	2.14	8930.88	1.87
9002.74	1.89	9055.42	2.1	9068.94	2.09	9107.29	2.15	9107.32	2.15
9158.09	2.05	9167.55	2.03	9225.43	1.67	9229.04	1.65	9289.01	1.2
9289.3	1.19	9350.79	1.05	9365.67	1	9411.05	.76	9459.34	.55
9472.54	.48	9502.36	-.02	9533.41	2.28	9577.85	4.9	9584.61	4.89
9716.78	4.88	9871.47	4.85	10010.54	4.71	10134.3	4.71	10234.87	4.59
10342.43	4.49	10400.47	5.21	10522.25	6.81	10579.85	7.56	10645.95	7.88
10735.02	8.26	10855.03	8.71	10970.78	9.15	11100.25	10.01	11194.51	10.04
11225.73	10.23	11306.77	10.31	11430.27	9.67	11536.55	10.09	11634.96	9.84
11765.74	9.75	11932.99	9.95	12063.18	9.74	12162.83	9.18	12360.03	9.04
12617.86	9.31	12771.83	9.07	12934.54	9.39	12937.53	9.38	13058.76	8.96
13170.04	8.72	13248.07	9.07	13423.73	9.07	13546.5	8.71	13678.73	8.5
13817.4	8.42	13852.41	8.38	13869.82	7.75	13893.01	6.19	13912.78	7.65
13928.94	8.12	13946.54	8.16	13994.17	8.05	14076.48	8.03	14138.16	8.03
14225.59		814380.16	7.78	14485.13	7.67	14575.64	7.58	14714.12	7.37
14830.32	7.25	14959.92	7.12	15053	7.14	15153.12	7.04	15224.52	6.97
15312.28	6.81	15425.4	6.88	15499.29	6.74	15576.35	6.66	15648.8	6.59
15706.48	6.53	15738.4	6.5	15776.9	6.52	15871.55	6.48	16000.3	6.23
16154.93	6.37	16311.4	6.21	16462.82	5.93	16553.47	5.84	16622.7	5.64
16653.78	5.31	16679.66	4.11	16716.97	3.58	16728.53	5.35	16731.22	5.78
16741.93	5.64	16852.62	5.53	16960.61	5.72	17096.06	4.78	17224.81	5.39
17587.14	4.96	17709.5	4.68	17760.63	4.75	17837.95	3.58	18168.49	4.15
18533.74	3.95	18758.37	2.61	18946.47	2.04	18991.9	1.44	19023.89	1.14
19098.05	-.12	19121.24	-.27	19156.71	-1.17	19250.85	-11.77	19260.42	-11.77
19362.37	-2.85	19466.12	-2.11	19483.75	-1.79	19548.06	-.78	19626.01	-.52
19629.68	-.34	19655.4	-.36	19702.1	-.21	19705.3	-.21	19794.21	-.24
19919.56	.01	19928.63	.05	20048.33	.52	20137.99	.73	20150.19	.66
20173.69	.76	20258.65	1.39	20353.33	2.37	20373.51	2.49	20412.63	2.71
20457.33	2.51	20544.35	2.92	20544.48	2.92	20634.27	2.85	20669.58	2.9
20671.59	2.71	20704.89	-.14	20735.19	-1.15	20750.3	.94	20765.48	4.31
20789.92	6.6	20801.1	5.78	20964.55	5.12	20967.69	5.11	21044.38	4.59
21076.5	6.88	21120.77	5.32	21214.37	5.37	21238.84	5.78	21334.83	6.64
21348.64	7.19	21457.89	10.27	21476.74	9.11	21611.47	9.37	21789.71	9.01
21871.12	9.01	22017.11	6.56	22049.23	6.68	22066.04	7.21	22093.88	8.33
22111.76	7.54	22131.59	7.36	22325.57	5.89	22325.9	5.89	22568.81	5.5
22575.58	5.56	22713.99	6.82	22780.65	7.89	22825.19	8.18	22956.15	9.75
23076.37	9.32	23088.12	8.76	23094.48	8.47	23182.58	7.56	23233.49	6.62
23289.14	6.61	23590.76	7.65	23841.12	9.01	24089.84	9.87	24353.81	11.04
24600.36	11.96	24861.29	12.21						

Manning's n Values num= 6
 Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val
 0 .072 7665.78 .088 7825.88 .054 8213.1 .06918946.47 .054
 20789.92 .082

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 7665.7820789.92 2559 4481.46 2515.69 .1 .3
 Blocked Obstructions num= 3
 Sta L Sta R Elev Sta L Sta R Elev Sta L Sta R Elev
 0 7665.78 6.22 20789.92 -1.921457.8924861.29 6.22

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	8.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.072	0.060	0.082
W.S. Elev (ft)	8.64	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	17453.87	44668.01	4244.27
E.G. Slope (ft/ft)	0.000132	Area (sq ft)	17453.87	44668.01	4244.27
Q Total (cfs)	45600.00	Flow (cfs)	7272.74	36896.37	1430.88
Top Width (ft)	20144.56	Top Width (ft)	7502.85	10377.57	2264.14
Vel Total (ft/s)	0.69	Avg. Vel. (ft/s)	0.42	0.83	0.34
Max Chl Dpth (ft)	10.54	Hydr. Depth (ft)	2.33	4.30	1.87
Conv. Total (cfs)	3965081.0	Conv. (cfs)	632390.7	3208270.0	124420.5
Length Wtd. (ft)	4136.19	Wetted Per. (ft)	7503.18	10379.25	2264.43
Min Ch El (ft)	-1.90	Shear (lb/sq ft)	0.02	0.04	0.02
Alpha	1.24	Stream Power (lb/ft s)	0.01	0.03	0.01
Frctn Loss (ft)	0.60	Cum Volume (acre-ft)	5548.80	32319.43	1062.77
C & E Loss (ft)	0.00	Cum SA (acres)	1670.81	8267.95	577.91

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 4.08461*

INPUT
 Description: Interpolated Cross Section at River Mile 4.08
 Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8.98	76.5	7.71	159.15	7.37	259.42	6.61	357.16	6.28
414.17	6.31	470.46	6.42	571.18	5.04	663.72	5.03	742.46	6.62
776.28	5.23	839.11	5.61	964.74	5.66	970.68	5.65	1113.58	4.56
1196.03	4.61	1292.59	4.53	1382.66	4.49	1477.83	4.62	1485.26	4.62
1598.65	4.36	1599.39	4.42	2030.79	3.86	2339.67	4.01	2544.79	4.11
3069.58	3.58	3079.6	3.59	3245.33	4.27	3408.99	4.8	3462.76	4.1
3588.71	4.31	3838.99	4.07	3856.87	4.33	3870.43	4.03	3932.48	3.99
4007.15	3.92	4018.84	4.86	4034.38	4.1	4077.84	4.01	4136.34	3.99
4225.27	3.77	4310.44	3.88	4435.97	4.08	4528.4	4.13	5012.78	3.51
5494.05	3.73	5941.5	3.88	6439.71	4.42	6464.83	4.5	6556.33	4.68
6675.76	4.81	6769.2	6.3	6792.08	5.19	6812.63	5.28	6859.77	5.64
6872.19	6.69	6875.66	6.29	6879.18	5.45	6885.76	5.61	6974.51	4.61
7028.83	3.96	7062.59	3.6	7108.86	3.32	7181.99	2.93	7191.68	2.76
7260.42	1.83	7314.83	2.63	7338.77	1.75	7357.56	-.66	7375.19	.39
7395.8	1.99	7416.98	1.94	7490.26	3.17	7558.89	3.28	7636.16	3.4
7709.14	3.45	7765.01	3.56	7823	3.47	7827.69	3.45	7932.24	3.29
8078.79	2.9	8140.02	2.69	8181.09	2.53	8228.75	1.87	8283.02	1.61
8362.39	1.72	8420.58	2	8435.51	2.01	8477.86	2.08	8477.89	2.08
8533.98	2	8544.42	1.98	8608.34	1.7	8612.33	1.68	8678.57	1.36
8678.89	1.35	8746.8	1.26	8763.24	1.22	8813.36	1.02	8866.69	.84

8881.27	.78	8914.21	.36	8948.5	2.18	8997.58	4.27	9005.05	4.25
9151.02	4.26	9321.88	4.26	9475.47	4.13	9612.16	4.15	9723.23	4.03
9842.04	3.94	9906.13	4.51	10040.64	5.81	10104.25	6.42	10177.26	6.68
10275.63	6.99	10408.19	7.33	10536.02	7.66	10679.02	8.45	10783.13	8.35
10817.61	8.52	10907.12	8.63	11043.52	7.94	11160.9	8.43	11269.58	8.17
11414.03	8.11	11598.75	8.36	11742.54	8.15	11852.6	7.54	12070.4	7.43
12355.17	7.78	12525.22	7.56	12704.93	7.96	12708.23	7.95	12842.13	7.51
12965.03	7.28	13051.22	7.71	13245.22	7.76	13380.82	7.38	13526.86	7.2
13680.02	7.16	13718.69	7.13	13737.92	6.42	13763.53	4.67	13785.36	6.32
13803.21	6.86	13822.65	6.91	13875.25	6.81	13966.16	6.81	14034.29	6.82
14130.85	6.82	14301.56	6.62	14417.5	6.54	14517.48	6.46	14670.41	6.28
14798.76	6.18	14941.9	6.07	15044.7	6.13	15155.27	6.05	15234.13	5.99
15331.06	5.85	15456	5.97	15537.62	5.83	15622.72	5.77	15702.74	5.71
15766.44	5.66	15801.7	5.64	15844.22	5.67	15948.76	5.67	16090.96	5.42
16261.75	5.64	16434.56	5.51	16601.79	5.25	16701.91	5.17	16778.38	4.97
16812.7	4.61	16841.29	3.27	16882.49	2.68	16895.26	4.68	16898.24	5.16
16910.06	5.01	17032.31	4.92	17151.59	5.18	17301.19	4.17	17443.38	4.89
17843.57	4.54	17978.71	4.31	18035.19	4.35	18120.58	3.42	18485.66	3.86
18889.06	3.68	19137.15	2.61	19344.91	2.14	19395.08	1.65	19430.41	1.45
19512.32	.35	19537.93	.21	19577.11	-.78	19681.08	-12.62	19688.74	-12.62
19801.99	-2.62	19917.25	-1.82	19936.85	-1.48	20008.29	-.32	20094.89	-.02
20098.96	.19	20127.54	.17	20179.42	.36	20182.98	.35	20281.74	.29
20421.01	.53	20431.09	.57	20564.06	1.05	20663.67	1.27	20677.22	1.18
20703.33	1.21	20797.72	1.61	20902.9	2.38	20925.33	2.44	20968.78	2.55
21018.45	2.17	21115.12	2.32	21115.27	2.32	21215.02	2.22	21254.25	2.24
21256.47	2.02	21293.47	-1.35	21327.13	-2.64	21343.92	-.37	21360.79	3.35
21387.94	5.82	21398.64	5.16	21555.11	4.77	21558.11	4.77	21631.53	4.37
21662.28	6.22	21704.66	4.96	21794.25	5.02	21817.68	5.48	21909.58	6.7
21922.79	7.21	22027.37	9.87	22045.42	8.97	22174.39	9.41	22345.02	9.21
22422.96	9.25	22562.71	6.55	22593.46	6.48	22609.56	6.83	22636.2	7.65
22653.32	6.98	22672.3	6.79	22857.99	5.15	22858.31	5.15	23090.85	4.7
23097.33	4.77	23229.83	6.15	23293.64	7.21	23336.28	7.42	23461.64	8.63
23576.73	8.22	23587.97	7.79	23594.07	7.56	23678.4	6.82	23727.13	6.07
23780.42	6.05	24069.14	7.22	24308.82	8.75	24546.91	9.72	24799.61	11.03
25035.63	12.07	25285.41	12.35						

Manning's n Values		num= 6		Sta		n Val		Sta		n Val	
0	.074	6885.76	.086	7108.86	.057	7490.26	.071	9344.91	.057		
21387.94	.083										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
6885.76	21387.94		2559	4481.46	2515.69	.1	.3	
Blocked Obstructions			num= 3			Sta		
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	6885.76	5.79	21837.94	25285.41	5.79	021387.94		-1.52

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	8.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.074	0.063	0.083
W.S. Elev (ft)	8.05	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	14926.06	48867.52	3751.06
E.G. Slope (ft/ft)	0.000156	Area (sq ft)	14926.06	48867.52	3751.06
Q Total (cfs)	45600.00	Flow (cfs)	6309.51	37985.89	1304.60
Top Width (ft)	22325.18	Top Width (ft)	6829.58	13394.24	2101.36
Vel Total (ft/s)	0.68	Avg. Vel. (ft/s)	0.42	0.78	0.35
Max Chl Dpth (ft)	9.57	Hydr. Depth (ft)	2.19	3.65	1.79
Conv. Total (cfs)	3647859.0	Conv. (cfs)	504741.1	3038753.0	104364.3
Length Wtd. (ft)	4062.10	Wetted Per. (ft)	6829.76	13396.08	2101.62

Min Ch El (ft)	-1.52	Shear (lb/sq ft)	0.02	0.04	0.02
Alpha	1.17	Stream Power (lb/ft s)	0.01	0.03	0.01
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	4597.69	27507.95	831.89
C & E Loss (ft)	0.00	Cum SA (acres)	1249.82	7045.13	451.86

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 3.23846*

INPUT

Description: Interpolated Cross Section at River Mile 3.24

Station Elevation Data		num= 272							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7.41	67.84	6.44	141.12	6.15	230.03	5.55	316.71	5.28
367.25	5.28	417.17	5.38	506.47	4.36	588.54	4.38	658.35	5.59
688.34	4.55	744.06	4.85	855.46	4.92	860.72	4.91	987.44	4.09
1060.54	4.12	1146.16	4.06	1226.03	4.02	1310.42	4.11	1317.01	4.11
1417.56	3.86	1418.22	3.91	1800.74	3.29	2074.63	3.47	2256.52	3.58
2721.86	3.01	2730.75	3.02	2877.7	3.61	3022.82	4.09	3070.5	3.59
3182.18	3.81	3404.11	3.51	3419.96	3.7	3431.99	3.47	3487.01	3.41
3553.22	3.32	3563.58	4.02	3577.37	3.45	3615.91	3.36	3667.78	3.36
3746.64	3.21	3822.16	3.31	3933.46	3.49	4015.42	3.55	4444.94	2.89
4871.69	3.15	5268.45	3.34	5710.23	3.95	5732.5	4.02	5813.63	4.15
5919.53	4.25	6002.39	5.36	6022.67	4.52	6040.9	4.59	6082.69	4.86
6093.72	5.64	6096.79	5.34	6099.91	4.72	6105.75	4.83	6202.88	3.99
6262.35	3.45	6299.3	3.15	6349.94	2.91	6429.99	2.6	6440.6	2.42
6515.84	1.37	6575.4	2.25	6601.6	1.26	6622.17	-1.42	6641.47	-.26
6664.02	1.52	6687.21	1.45	6767.42	2.8	6842.54	2.91	6927.12	3.03
7007.01	3.06	7068.16	3.17	7131.63	3.06	7136.77	3.04	7251.2	2.94
7411.62	2.62	7478.64	2.44	7523.59	2.3	7575.77	1.6	7635.17	1.36
7722.04	1.54	7785.73	1.9	7802.07	1.92	7848.44	2.01	7848.47	2.01
7909.86	1.95	7921.29	1.94	7991.26	1.72	7995.62	1.72	8068.13	1.52
8068.48	1.52	8142.81	1.46	8160.8	1.44	8215.66	1.28	8274.05	1.13
8290	1.08	8326.05	.74	8363.59	2.09	8417.31	3.63	8425.49	3.61
8585.27	3.65	8772.29	3.67	8940.4	3.55	9090.02	3.58	9211.6	3.47
9341.64	3.39	9411.8	3.8	9559.03	4.8	9628.66	5.27	9708.57	5.49
9816.25	5.71	9961.34	5.95	10101.27	6.17	10257.79	6.88	10371.75	6.67
10409.49	6.81	10507.46	6.94	10656.76	6.21	10785.25	6.77	10904.21	6.5
11062.33	6.45	11264.51	6.77	11421.91	6.56	11542.38	5.91	11780.78	5.83
12092.47	6.26	12278.62	6.04	12475.33	6.52	12478.94	6.51	12625.5	6.06
12760.02	5.83	12854.36	6.32	13066.72	6.44	13215.14	6.06	13375	5.9
13542.64	5.89	13584.97	5.87	13606.01	5.09	13634.04	3.15	13657.95	4.99
13677.48	5.59	13698.77	5.66	13756.34	5.55	13855.85	5.58	13930.41	5.62
14036.11	5.64	14222.97	5.47	14349.88	5.41	14459.31	5.35	14626.71	5.18
14767.19	5.11	14923.87	5.03	15036.4	5.13	15157.43	5.06	15243.75	5.02
15349.85	4.89	15486.6	5.05	15575.94	4.93	15669.09	4.88	15756.68	4.83
15826.41	4.8	15865	4.78	15911.54	4.83	16025.97	4.85	16181.62	4.62
16368.56	4.91	16557.72	4.81	16740.77	4.56	16850.36	4.51	16934.06	4.31
16971.62	3.91	17002.91	2.42	17048.02	1.79	17062	4.01	17065.25	4.55
17078.2	4.39	17212.01	4.32	17342.56	4.63	17506.31	3.55	17661.96	4.39
18100	4.11	18247.92	3.92	18309.74	3.96	18403.21	3.25	18802.82	3.57
19244.38	3.41	19515.93	2.59	19743.34	2.23	19798.26	1.86	19836.94	1.76
19926.59	.83	19954.62	.68	19997.51	-.38	20111.31	-13.46	20117.05	-13.46
20241.62	-2.39	20368.39	-1.54	20389.94	-1.17	20468.51	.13	20563.77	.49
20568.25	.72	20599.68	.71	20656.74	.92	20660.66	.91	20769.28	.82
20922.46	1.05	20933.54	1.09	21079.8	1.59	21189.35	1.82	21204.26	1.7
21232.97	1.66	21336.79	1.83	21452.48	2.38	21477.14	2.38	21524.94	2.38
21579.56	1.83	21685.89	1.72	21686.05	1.72	21795.76	1.55	21838.91	1.58

21841.36	1.3321882.06	-2.5721919.07	-4.1321937.54	-1.6821956.09	2.39
21985.95	521996.18	4.5322145.67	4.4322148.53	4.4222218.67	4.14
22248.05	5.5222288.54	4.622374.14	4.6622396.52	5.1822484.32	6.75
22496.95	7.2422596.86	9.4722614.11	8.8322737.32	9.4622900.33	9.41
22974.79	9.4923108.31	6.5523137.69	6.2923153.07	6.4523178.52	6.98
23194.88	6.4323213.01	6.2223390.42	4.4223390.72	4.4123612.89	3.9
23619.08	3.9723745.66	5.523806.63	6.5423847.37	6.6723967.13	7.51
24077.09	7.1524087.83	6.8224093.65	6.6424174.22	6.0824220.78	5.51
24271.69	5.4824547.53	6.7924776.51	8.4825003.98	9.5625245.41	11.02
25470.9	12.1825709.53	12.48			

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.075	6105.75	.083	6349.94	.06	6767.42	.071	118802.82	.06		
21985.95	.083										

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

6105.75	21985.95	2559	4481.46	2515.69	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
22974.79	25709.53	5.37	021985.95	-1.13	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	7.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.075	0.065	0.083
W.S. Elev (ft)	7.51	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	22572.05	55732.52	3463.27
E.G. Slope (ft/ft)	0.000111	Area (sq ft)	22572.05	55732.52	3463.27
Q Total (cfs)	45600.00	Flow (cfs)	11258.55	33371.40	970.04
Top Width (ft)	24087.56	Top Width (ft)	6105.75	15880.20	2101.62
Vel Total (ft/s)	0.56	Avg. Vel. (ft/s)	0.50	0.60	0.28
Max Chl Dpth (ft)	8.64	Hydr. Depth (ft)	3.70	3.51	1.65
Conv. Total (cfs)	4330386.0	Conv. (cfs)	1069164.0	3169102.0	92119.8
Length Wtd. (ft)	3996.31	Wetted Per. (ft)	6106.07	15881.73	2101.77
Min Ch El (ft)	-1.13	Shear (lb/sq ft)	0.03	0.02	0.01
Alpha	1.05	Stream Power (lb/ft s)	0.01	0.01	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	3496.25	22127.32	623.57
C & E Loss (ft)	0.00	Cum SA (acres)	869.87	5539.25	330.49

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: Fish Creek
REACH: Lower Fish Creek RS: 2.39230*

INPUT
Description: Interpolated Cross Section at River Mile 2.39

Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	5.84	59.17	5.16	123.09	4.94	200.65	4.5	276.25	4.27		
320.33	4.25	363.87	4.34	441.77	3.69	513.35	3.73	574.25	4.56		
600.4	3.88	649	4.1	746.17	4.18	750.76	4.18	861.29	3.61		
925.06	3.63	999.74	3.58	1069.41	3.55	1143.02	3.61	1148.76	3.6		
1236.46	3.37	1237.04	3.4	1570.69	2.73	1809.6	2.93	1968.24	3.05		
2374.14	2.44	2381.89	2.45	2510.07	2.96	2636.65	3.38	2678.24	3.08		
2775.65	3.31	2969.23	2.96	2983.06	3.07	2993.55	2.91	3041.54	2.83		
3099.29	2.73	3108.33	3.18	3120.36	2.79	3153.97	2.7	3199.22	2.72		
3268	2.65	3333.87	2.74	3430.96	2.9	3502.45	2.96	3877.09	2.26		

4249.33	2.57	4595.4	2.79	4980.74	3.49	5000.17	3.55	5070.93	3.63
5163.31	3.68	5235.58	4.42	5253.27	3.86	5269.16	3.9	5305.62	4.07
5315.24	4.6	5317.92	4.39	5320.64	3.98	5325.73	4.05	5431.26	3.37
5495.87	2.93	5536.01	2.71	5591.03	2.51	5677.99	2.27	5689.52	2.08
5771.26	.92	5835.96	1.87	5864.44	.77	5886.78	-2.18	5907.75	-.91
5932.25	1.05	5957.44	.97	6044.58	2.43	6126.2	2.54	6218.08	2.65
6304.87	2.68	6371.3	2.78	6440.27	2.64	6445.85	2.63	6570.17	2.59
6744.45	2.35	6817.26	2.2	6866.09	2.07	6922.78	1.34	6987.31	1.11
7081.7	1.36	7150.89	1.8	7168.64	1.83	7219.01	1.94	7219.05	1.94
7285.74	1.9	7298.16	1.89	7374.17	1.75	7378.92	1.75	7457.69	1.68
7458.06	1.68	7538.82	1.67	7558.37	1.66	7617.97	1.54	7681.4	1.42
7698.73	1.37	7737.9	1.13	7778.68	2	7837.04	2.99	7845.92	2.98
8019.51	3.03	8222.69	3.08	8405.34	2.97	8567.88	3.02	8699.97	2.92
8841.25	2.84	8917.47	3.1	9077.42	3.8	9153.06	4.13	9239.88	4.29
9356.87	4.44	9514.49	4.56	9666.51	4.68	9836.56	5.32	9960.37	4.98
10001.37	5.110107.81	5.2610270.01	4.47	10409.6	5.1210538.84	4.84	5.1210538.84	4.84	4.84
10710.62	4.810930.27	5.1811101.27	4.9711232.15	4.2711491.15	4.22				
11829.78	4.7412032.01	4.5312245.72	5.0812249.64	5.0712408.86	4.6				
12555.01	4.3912657.51	4.9512888.21	5.1313049.46	4.7413223.13	4.6				
13405.26	4.6313451.24	4.6113474.11	3.7613504.56	1.6413530.53	3.66				
13551.76	4.3313574.88	4.4113637.43	4.313745.53	4.3513826.54	4.41				
13941.38	4.4614144.38	4.3114282.25	4.2714401.14	4.2314583.01	4.09				
14735.63	4.0414905.85	3.99	15028.1	4.1215159.59	4.05				
15368.63	3.93	15517.2	4.1315614.26	4.0215715.46	3.96				
15886.37	3.93	15928.3	3.9215978.86	3.9916103.18	3.81				
16475.37	4.1716680.88	4.116879.75	3.8716998.81	3.8417089.74	3.64				
17130.55	3.217164.54	1.5817213.55	.8917228.73	3.3417232.27	3.93				
17246.33	3.7617391.71	3.7117533.54	4.0917711.44	2.9317880.54	3.9				
18356.43	3.6818517.13	3.5518584.29	3.5718685.84	3.0919119.98	3.27				
19599.7	3.1419894.72	2.5820141.77	2.3220201.44	2.0820243.46	2.08				
20340.86	1.320371.32	1.15	20417.9	.0120541.54	-14.31	3120545.37	-14.31		
20681.25	-2.1620819.53	-1.2620843.03	-1.2620843.03	.5921032.64	.99				
21037.53	1.2421071.82	1.2421134.06	1.4821138.33	1.4721256.82	1.34				
21423.9	1.5721435.99	1.621595.53	2.1321715.04	2.3321731.29	2.22				
21762.61	2.121875.86	2.0622002.05	2.3922028.96	2.3322081.09	2.22				
22140.67	1.4922256.66	1.122256.83	1.122376.51	.922423.57	.92				
22426.24	.6422470.64	-3.7822511.02	-5.6222531.16	-2.9922551.39	1.42				
22583.97	4.222593.72	3.922736.22	4.0822738.96	4.0822805.82	3.91				
22833.83	4.8422872.43	4.2422954.03	4.3122975.36	4.8823059.06	6.81				
23071.1	7.2623166.34	9.0623182.79	8.6923300.25	9.5123455.65	9.61				
23526.63	9.7323653.91	6.5423681.92	6.123696.58	6.0623720.84	6.31				
23736.44	5.8723753.72	5.6523922.85	3.6823923.13	3.6824134.93	3.1				
24140.83	3.18	24261.5	4.8624319.62	5.8624358.45	6.39				
24577.45	6.0724587.69	5.8424593.24	5.7324670.05	5.3424714.43	4.95				
24762.96	4.9225025.92	6.3625244.21	8.2225461.05	9.4125691.21	11.02				
25906.16	12.2826133.65	12.62							

Manning's n	Values	num=	6	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.077	5325.73	.08	5591.03	.064	6044.58	.072	20243.46	.064		
22583.97	.084										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	5325.73	22583.97	2559	4481.46	2515.69	.1	.3	
Blocked Obstructions	num=	2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev			
022583.97		-.7423526	6326133.65		4.94			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	7.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.077	0.069	0.084
W.S. Elev (ft)	7.09	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	20788.45	65371.17	3511.42
E.G. Slope (ft/ft)	0.000097	Area (sq ft)	20788.45	65371.17	3511.42
Q Total (cfs)	45600.00	Flow (cfs)	9808.60	34856.57	934.83
Top Width (ft)	24546.54	Top Width (ft)	5325.73	17258.24	1962.57
Vel Total (ft/s)	0.51	Avg. Vel. (ft/s)	0.47	0.53	0.27
Max Chl Dpth (ft)	7.83	Hydr. Depth (ft)	3.90	3.79	1.79
Conv. Total (cfs)	4622804.0	Conv. (cfs)	994368.6	3533664.0	94770.9
Length Wtd. (ft)	4061.93	Wetted Per. (ft)	5327.10	17259.51	1962.68
Min Ch El (ft)	-0.74	Shear (lb/sq ft)	0.02	0.02	0.01
Alpha	1.03	Stream Power (lb/ft s)	0.01	0.01	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	2222.61	15897.73	422.17
C & E Loss (ft)	0.00	Cum SA (acres)	534.09	3834.60	213.13

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: Fish Creek
REACH: Lower Fish Creek RS: 1.54615*

INPUT

Description: Interpolated Cross Section at River Mile 1.55

Station	Elevation	Data	num=	272						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	4.27	50.5	3.88	105.06	3.72	171.26	3.44	235.79	3.27	
273.42	3.23	310.58	3.29	377.07	3.02	438.16	3.08	490.14	3.53	
512.47	3.2	553.95	3.34	636.89	3.44	640.8	3.44	735.15	3.14	
789.57	3.14	853.32	3.11	912.78	3.09	975.61	3.1	980.51	3.1	
1055.37	2.88	1055.86	2.89	1340.65	2.16	1544.56	2.38	1679.97	2.53	
2026.42	1.87	2033.03	1.89	2142.44	2.3	2250.48	2.67	2285.98	2.57	
2369.13	2.8	2534.35	2.4	2546.16	2.44	2555.11	2.34	2596.07	2.25	
2645.37	2.13	2653.08	2.35	2663.35	2.14	2692.04	2.05	2730.65	2.09	
2789.36	2.09	2845.59	2.18	2928.45	2.31	2989.47	2.38	3309.25	1.63	
3626.96	1.98	3922.35	2.25	4251.25	3.02	4267.83	3.07	4328.23	3.1	
4407.08	3.12	4468.77	3.47	4483.87	3.19	4497.43	3.21	4528.55	3.29	
4536.76	3.55	4539.05	3.45	4541.37	3.24	4545.72	3.28	4659.64	2.75	
4729.38	2.42	4772.72	2.26	4832.11	2.1	4926	1.93	4938.44	1.74	
5026.68	.46	5096.53	1.48	5127.27	.29	5151.39	-2.94	5174.02	-1.55	
5200.47	.57	5227.67	.48	5321.74	2.07	5409.85	2.17	5509.04	2.28	
5602.74	2.29	5674.45	2.39	5748.9	2.23	5754.92	2.21	5889.13	2.25	
6077.27	2.07	6155.88	1.95	6208.6	1.83	6269.79	1.07	6339.46	.85	
6441.35	1.18	6516.05	1.7	6535.21	1.74	6589.58	1.87	6589.62	1.87	
6661.62	1.85	6675.03	1.85	6757.09	1.77	6762.21	1.78	6847.24	1.84	
6847.65	1.84	6934.83	1.87	6955.93	1.88	7020.28	1.79	7088.75	1.71	
7107.46	1.67	7149.75	1.51	7193.77	1.91	7256.78	2.35	7266.36	2.34	
7453.76	2.42	7673.1	2.49	7870.27	2.38	8045.74	2.46	8188.33	2.36	
8340.85	2.29	8423.13	2.4	8595.81	2.8	8677.47	2.99	8771.19	3.1	
8897.48	3.17	9067.65	3.18	9231.76	3.19	9415.33	3.76	9548.98	3.29	
9593.25	3.39	9708.16	3.58	9883.25	2.7310033.95		3.4610173.47		3.17	
10358.91	3.1510596.04		3.5910780.64		3.3910921.93		2.6411201.53		2.61	
11567.09	3.2211785.41		3.0112016.11		3.6412020.34		3.6312192.23		3.15	
12350.01	2.9412460.66		3.5712709.71		3.8112883.78		3.4213071.27		3.3	
13267.88	3.3613317.52		3.36 13342.2		2.4313375.08		.1213403.12		2.33	
13426.03	3.0613450.99		3.1513518.51		3.0513635.22		3.1313722.67		3.21	
13846.64	3.2814065.79		3.1614214.62		3.1314342.97		3.12 14539.3		2.99	
14704.06	2.9714887.82		2.94 15019.8		3.1115161.74		3.0915262.98		3.07	
15387.42	2.96 15547.8		3.2215652.58		3.1115761.83		3.0915864.56		3.08	

15946.33	3.07	15991.6	3.0616046.18	3.1416180.39	3.2216362.94	3.01		
16582.19	3.4316804.04		3.417018.72	3.1917147.25	3.1717245.42	2.97		
17289.47	2.517326.17		.7417379.07	017395.46	2.6717399.29	3.32		
17414.46	3.13	17571.4	3.1117724.52	3.5417916.57	2.3218099.12	3.4		
18612.86	3.2518786.34		3.1718858.85	3.1718968.47	2.9319437.14	2.98		
19955.01	2.87	20273.5	2.5620540.21	2.4220604.62	2.2920649.98	2.39		
20755.13	1.7720788.01		1.63	20838.3	.4120971.77	-15.1520973.68	-15.15	
21120.87	-1.9321270.66		- .9821296.13	- .5421388.97	1.0421501.52	1.5		
21506.81	1.7721543.96		1.7721611.38	2.0421616.01	2.0321744.36	1.87		
21925.35	2.0821938.45		2.1222111.27	2.6622240.72	2.8722258.33	2.74		
22292.26	2.5522414.93		2.2822551.62	2.3922580.77	2.2822637.25	2.06		
22701.79	1.1422827.43		.522827.62	.522957.25	.2523008.24	.26		
23011.13	-.0423059.22		-4.9923102.96	-7.1123124.78	-4.29	23146.7	.46	
23181.98	3.423191.25		3.2823326.78	3.7323329.38	3.7423392.97	3.69		
23419.6	4.1723456.31		3.8823533.91	3.95	23554.2	4.58	23633.8	6.86
23645.25	7.2823735.83		8.6623751.46	8.5623863.17	9.5524010.96	9.81		
24078.46	9.9624199.51		6.5424226.15	5.9124240.09	5.6824263.17	5.64		
24278	5.3124294.44		5.0824455.27	2.9424455.55	2.9424656.96	2.3		
24662.57	2.3924777.34		4.2124832.61	5.1824869.54	5.1724978.12	5.28		
25077.8	525087.54		4.8725092.82	4.8125165.87	4.625208.08	4.39		
25254.23	4.3625504.31		5.93	25711.9	7.9625918.13	9.25	26137	11.01
26341.43	12.3926557.78		12.76					

Manning's n Values	num=	6									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.078	4545.72	.078	4832.11	.067	5409.85	.073	20788.01	.067		
23181.98	.084										

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
4545.72	23181.98	2559	4481.46	2515.7	.1	.3	

Blocked Obstructions	num=	2									
Sta L	Sta R	Elev	Sta L	Sta R	Elev						
24078.46	26557.78	4.52	023181.98		- .36						

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	6.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.078	0.071	0.084
W.S. Elev (ft)	6.75	Reach Len. (ft)	2559.00	4481.46	2515.70
Crit W.S. (ft)		Flow Area (sq ft)	19002.28	77029.04	3658.08
E.G. Slope (ft/ft)	0.000076	Area (sq ft)	19002.28	77029.04	3658.08
Q Total (cfs)	45600.00	Flow (cfs)	8205.40	36482.85	911.74
Top Width (ft)	25025.39	Top Width (ft)	4545.72	18636.26	1843.41
Vel Total (ft/s)	0.46	Avg. Vel. (ft/s)	0.43	0.47	0.25
Max Chl Dpth (ft)	7.11	Hydr. Depth (ft)	4.18	4.13	1.98
Conv. Total (cfs)	5218507.0	Conv. (cfs)	939034.0	4175132.0	104340.9
Length Wtd. (ft)	4125.52	Wetted Per. (ft)	4548.24	18637.29	1843.49
Min Ch El (ft)	-0.36	Shear (lb/sq ft)	0.02	0.02	0.01
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.01	0.00
Frothn Loss (ft)	0.32	Cum Volume (acre-ft)	1053.83	8572.65	215.14
C & E Loss (ft)	0.00	Cum SA (acres)	244.13	1988.19	103.23

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: Fish Creek
REACH: Lower Fish Creek RS: 0.7

INPUT

Description: Cross Section at River Mile 0.7

Station Elevation Data num= 168									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2.7	226.5	2.2	527.6	2.7	808.2	2.6	1110.6	1.6
1391.7	2	1678.7	1.3	1962.6	2.3	2230.1	1.4	2476.5	1.8
2741.4	1	3004.6	1.4	3249.3	1.7	3535.5	2.6	3765.7	2.5
3962.9	1.9	4073.2	1.7	4174	1.6	4282.1	0	4357.1	1.1
4390.1	-.2	4416	-3.7	4440.3	-2.2	4468.7	.1	4497.9	0
4598.9	1.7	4693.5	1.8	4800	1.9	4900.6	1.9	4977.6	2
5064	1.8	5208.1	1.9	5410.1	1.8	5494.5	1.7	5551.1	1.6
5616.8	.8	5691.6	.6	5801	1	5881.2	1.6	5960.2	1.8
6037.5	1.8	6140	1.8	6236.8	2	6353.5	2.1	6496.1	2
6686.8	1.7	6888	1.8	7123.5	1.9	7335.2	1.8	7523.6	1.9
7676.7	1.8	7928.8	1.7	8114.2	1.8	8302.5	1.9	8438.1	1.9
8620.8	1.8	8797	1.7	8994.1	2.2	9137.6	1.6	9308.5	1.9
9496.5	1	9658.3	1.8	9808.1	1.5	10007.2	1.5	10261.8	2
10460	1.8	10611.7	1	10911.9	1	11304.4	1.7	11538.8	1.5
11786.5	2.2	11975.6	1.7	12145	1.5	12263.8	2.2	12531.2	2.5
12718.1	2.1	12919.4	2	13130.5	2.1	13183.8	2.1	13210.3	1.1
13245.6	-1.4	13275.7	1	13300.3	1.8	13327.1	1.9	13399.6	1.8
13524.9	1.9	13618.8	2	13751.9	2.1	13987.2	2	14147	2
14284.8	2	14495.6	1.9	14672.5	1.9	14869.8	1.9	15011.5	2.1
15163.9	2.1	15272.6	2.1	15406.2	2	15578.4	2.3	15690.9	2.2
15808.2	2.2	15918.5	2.2	16006.3	2.2	16054.9	2.2	16113.5	2.3
16257.6	2.4	16453.6	2.2	16689	2.7	16927.2	2.7	17157.7	2.5
17295.7	2.5	17401.1	2.3	17448.4	1.8	17487.8	-1	17544.6	-9
17562.2	2	17566.3	2.7	17582.6	2.5	17751.1	2.5	17915.5	3
18121.7	1.7	18317.7	2.9	21007.8	2.5	21056.5	2.7	21204.7	2.1
21258.7	.8	21402	-16	21560.5	-1.7	21721.8	-7	21849.2	1.5
21970.4	2	21976.1	2.3	22016.1	2.3	22088.7	2.6	22231.9	2.4
22426.8	2.6	22627	3.2	22766.4	3.4	22821.9	3	22954	2.5
23101.2	2.4	23193.4	1.9	23262.9	.8	23398.4	-1	23538	-4
23592.9	-.4	23647.8	-6.2	23694.9	-8.6	23718.4	-5.6	23742	-.5
23780	2.6	23919.8	3.4	24113.8	3.6	24219.4	7.3	24426.1	9.6
24630.3	10.2	24783.6	5.3	24987.7	2.2	25179	1.5	25345.6	4.5
25587.4	3.9	25745.5	3.8	25982.7	5.5	26179.6	7.7	26375.2	9.1
26582.8	11	26776.7	12.5	26981.9	12.9				

Manning's n Values num= 10									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.085	226.5	.075	4174	.07	4598.9	.075	5551.1	.07
5881.2	.075	21204.7	.07	21976.1	.075	23101.2	.07	23780	.085

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	3765.7	23780		0	0	0		.1	.3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	23780	.3	24630.3	26981.9	4.09

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	6.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.075	0.074	0.085
W.S. Elev (ft)	6.42	Reach Len. (ft)			
Crit W.S. (ft)	2.34	Flow Area (sq ft)	16874.73	89624.13	3792.40
E.G. Slope (ft/ft)	0.000080	Area (sq ft)	16874.73	89624.13	3792.40
Q Total (cfs)	53000.00	Flow (cfs)	8081.71	43904.88	1013.42
Top Width (ft)	25511.48	Top Width (ft)	3765.70	20014.30	1731.48
Vel Total (ft/s)	0.48	Avg. Vel. (ft/s)	0.48	0.49	0.27
Max Chl Dpth (ft)	6.12	Hydr. Depth (ft)	4.48	4.48	2.19

Conv. Total (cfs)	5924818.0	Conv. (cfs)	903445.8	4908083.0	113289.1
Length Wtd. (ft)		Wetted Per. (ft)	3769.44	20014.88	1731.58
Min Ch El (ft)	0.30	Shear (lb/sq ft)	0.02	0.02	0.01
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.01	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 RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 13.8

INPUT

Description: Cross Section at River Mile 13.8

Station Elevation Data num= 79									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.7	14.5	57.9	253.3	57.6	480.1	57	699	54.9
954.5	51.4	1189.4	47.4	1492.7	46.5	1772.2	46.1	2076.9	46.5
2360.2	47.7	2979	47.2	3218.8	47.7	3334.6	53.9	3574.2	52.4
3870.6	51.6	4116.8	51.3	4469.1	50.5	4805.3	54.2	4980.7	54.3
5242.5	54.5	5540	54.1	5881.1	52.3	6128.1	48.9	6423.3	45.2
6583.3	45.4	7011.5	42.8	7363	44.2	7478.5	47.1	7796.2	43.7
8010.7	49	8086.7	41.7	8314.6	40.9	8367.8	43.9	8427	40.6
8440.3	40.3	8446.6	37.9	8456.4	37	8463.4	37.7	8499.1	36.5
8502.7	35.5	8537	33.9	8581.8	32.1	8622	32.4	8635	30.4
8664.2	28.8	8674.2	27.5	8684.2	26.3	8694.2	25	8704.2	23.6
8714.2	23	8724.2	23.6	8734.2	24.7	8748.8	28.9	8754.4	31.6
8759.9	35.9	8773.7	35.9	8791.8	41.1	8807.1	41.6	8954.9	44.1
9246.1	44.8	9408.5	53	9561.1	55.1	9851.5	56.9	10144.3	57.9
10458.4	58.7	10756.9	60.6	11057.1	59.8	11356	57.3	11646.3	57.4
11961	58.5	12247.7	58.6	12554.3	58.3	12851.6	59	13163.2	59.3
13460.6	60.3	13760	59.7	14068	59.7	14358.1	64		

Manning's n Values num= 7									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	2360.2	.04	5881.1	.05	8446.6	.06	8502.7	.016
8773.7	.06	8954.9	.04						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	8502.7	8773.7		1530.69	2280.69	1205.25		.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	41.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.	0.060	0.016	0.060
W.S. Elev (ft)	40.45	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	195.97	2726.12	36.09
E.G. Slope (ft/ft)	0.000283	Area (sq ft)	195.97	2726.12	36.09
Q Total (cfs)	19900.00	Flow (cfs)	176.83	19697.81	25.36
Top Width (ft)	356.06	Top Width (ft)	69.21	271.00	15.85
Vel Total (ft/s)	6.73	Avg. Vel. (ft/s)	0.90	7.23	0.70
Max Chl Dpth (ft)	17.45	Hydr. Depth (ft)	2.83	10.06	2.28
Conv. Total (cfs)	1182045.0	Conv. (cfs)	10503.6	1170035.0	1506.3
Length Wtd. (ft)	2272.90	Wetted Per. (ft)	69.89	274.40	16.49
Min Ch El (ft)	23.00	Shear (lb/sq ft)	0.05	0.18	0.04
Alpha	1.14	Stream Power (lb/ft s)	0.04	1.27	0.03
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	2533.62	4498.31	3628.43
C & E Loss (ft)	0.01	Cum SA (acres)	1545.80	423.95	1224.41

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 13.375*

INPUT

Description: Interpolated Cross Section at River Mile 13.38

Station Elevation Data		num= 161	
Sta	Elev	Sta	Elev
1106.32	58.32	1120.99	57.55
1591.89	56.29	1746.05	54.88
2259.66	47.91	2309.26	47.13
2898.69	45.75	3206.86	46.09
4478.87	52.87	4721.2	51.43
5269.97	50.42	5317.72	50.34
5966.31	52.87	6108.45	52.94
6629.59	52.92	6709.37	52.8
7602.72	44.27	7656.9	44.33
8553.12	43.39	8669.93	46.16
9126.89	45.95	9208.19	47.7
9515.55	40.07	9534.33	41.04
9649.05	37.47	9658.96	36.64
9705.79	35.21	9738.53	33.43
9802.24	31.35	9819.68	31.44
9869.52	26.81	9872.32	26.48
9907.71	22.58	9910.53	22.73
9919.74	23.19	9921.71	23.35
9931.78	24.52	9933.33	25
9956.09	31.17	9961.89	34.71
9998.05	40.78	10011.74	41.19
10104.57	42.56	10128.59	42.64
10357.2	43.49	10468.38	43.88
10794.5	53.49	10852.6	53.81
11333.7	55.85	11384.19	56.41
11723.47	57.44	11791.52	57.84
12343.29	58.55	12371.67	58.35
12953.29	56.44	12974.66	56.51
13574.74	57.95	13575.91	57.95
14183.68	58.56	14201.12	58.61
14774.23	59.79	14831.61	59.93
15141.58	59.31	15286.23	59.31
15760.79	63.58		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
1106.32	.05	9705.79	.016
		9979.31	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9705.79	9979.31		1530.69	2280.69	1205.25	.1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	40.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.78	Wt. n-Val.	0.050	0.016	0.050
W.S. Elev (ft)	39.84	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	182.16	2768.72	29.69
E.G. Slope (ft/ft)	0.000272	Area (sq ft)	182.16	2768.72	29.69
Q Total (cfs)	19900.00	Flow (cfs)	167.93	19709.73	22.34
Top Width (ft)	358.66	Top Width (ft)	70.03	273.52	15.12
Vel Total (ft/s)	6.68	Avg. Vel. (ft/s)	0.92	7.12	0.75
Max Chl Dpth (ft)	17.26	Hydr. Depth (ft)	2.60	10.12	1.96

Conv. Total (cfs)	1206598.0	Conv. (cfs)	10182.0	1195062.0	1354.3
Length Wtd. (ft)	2269.89	Wetted Per. (ft)	70.62	276.33	15.62
Min Ch El (ft)	22.58	Shear (lb/sq ft)	0.04	0.17	0.03
Alpha	1.13	Stream Power (lb/ft s)	0.04	1.21	0.02
Frctn Loss (ft)	0.60	Cum Volume (acre-ft)	2526.97	4354.46	3627.52
C & E Loss (ft)	0.01	Cum SA (acres)	1543.36	409.69	1223.98

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.95*

INPUT

Description: Interpolated Cross Section at River Mile 12.95

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2212.65	57.94	2227.48	57.2	2394.26	56.63	2471.72	56.42	2620	55.83
2703.68	55.59	2859.57	54.22	2927.56	53.69	3143.19	51.24	3188.87	50.63
3378.96	47.59	3429.12	46.86	3635.24	46.33	3739.32	45.96	3917.82	45.56
4025.19	45.4	4336.82	45.67	4626.57	46.65	5259.45	46.06	5504.71	46.44
5623.15	51.83	5868.2	50.46	6169.64	49.69	6171.35	49.69	6226.66	49.64
6423.15	49.55	6471.43	49.48	6738.7	48.66	6783.47	48.54	7019.11	50.54
7127.32	51.55	7271.06	51.6	7306.71	51.61	7543.61	51.74	7574.47	51.78
7798.07	51.64	7878.74	51.51	8227.61	49.76	8480.23	46.65	8587.15	45.45
8782.15	43.34	8836.94	43.4	8945.79	43.52	9383.73	41.27	9683.38	42.31
9743.23	42.57	9861.36	45.22	9890.95	44.98	10139.09	42.41	10186.29	41.98
10323.47	44.89	10405.68	46.41	10422.62	44.97	10483.41	40.02	10607	39.75
10716.49	39.24	10735.49	40.13	10770.9	41.97	10831.45	39.32	10845.05	39.11
10851.5	37.04	10861.52	36.29	10868.68	36.93	10893.99	36.31	10905.19	35.83
10908.88	34.91	10940.07	32.95	10951.51	32.31	10974.64	30.78	10980.81	30.48
11000.75	30.43	11017.37	30.48	11029.19	28.68	11034.45	28.38	11055.74	27.25
11064.84	26.11	11067.5	25.81	11073.93	25.06	11083.02	23.91	11092.12	22.68
11101.21	22.15	11104.52	22.31	11107.89	22.46	11111.2	22.61	11114.24	22.74
11115.28	22.77	11117.58	22.92	11120.95	23.13	11124.26	23.39	11127.6	23.97
11129.35	24.34	11131.17	24.92	11142.97	27.11	11149.89	28.36	11153.45	29.44
11157.77	30.74	11164.56	34.05	11165.51	34.53	11173.09	34.66	11184.92	35.91
11204.3	40.46	11218.45	40.84	11220.68	40.87	11243.22	40.84	11278.05	41.23
11314.45	42.05	11339.29	41.81	11378.91	41.81	11399.98	41.57	11436.38	41.99
11575.69	42.44	11690.67	42.96	11711.03	43.85	11864.53	50.09	11900.7	50.47
12027.9	51.88	12087.98	52.18	12299.81	53.13	12338.8	53.41	12345.11	53.44
12585.48	54.01	12637.69	54.95	12652.26	55.04	12734.44	55.51	12902.96	55.98
12988.53	56.18	13058.9	56.57	13253.29	57.69	13308.1	57.94	13472.45	57.48
13629.49	57.31	13658.83	57.12	13881.42	56.07	13949.49	55.51	14078.41	55.35
14260.27	55.48	14282.38	55.55	14494.49	56.57	14597.19	57.01	14698.19	57.18
14902.91	57.31	14904.12	57.3	15109.2	57.29	15232.36	57.23	15311.6	57.41
15532.61	58.17	15550.65	58.21	15716.73	58.36	15884.24	58.62	15960.46	58.9
16143.29	59.46	16202.63	59.56	16232.99	59.48	16294.02	59.13	16451.26	59.02
16523.16	58.91	16672.74	58.92	16852.9	59.07	16863.85	59.21	17045.38	61.61
17163.47	63.16								

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
2212.65	.0510908.88	.01611184.92	.0049

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	10908.88	11184.92	1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	40.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.	0.050	0.016	0.005

W.S. Elev (ft)	39.27	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	170.99	2816.58	23.99
E.G. Slope (ft/ft)	0.000257	Area (sq ft)	170.99	2816.58	23.99
Q Total (cfs)	19900.00	Flow (cfs)	141.55	19596.78	161.67
Top Width (ft)	370.53	Top Width (ft)	80.19	276.04	14.30
Vel Total (ft/s)	6.61	Avg. Vel. (ft/s)	0.83	6.96	6.74
Max Chl Dpth (ft)	17.12	Hydr. Depth (ft)	2.13	10.20	1.68
Conv. Total (cfs)	1242279.0	Conv. (cfs)	8836.6	1223350.0	10092.4
Length Wtd. (ft)	2271.07	Wetted Per. (ft)	80.71	278.48	14.68
Min Ch El (ft)	22.15	Shear (lb/sq ft)	0.03	0.16	0.03
Alpha	1.10	Stream Power (lb/ft s)	0.03	1.13	0.18
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	2520.77	4208.24	3626.77
C & E Loss (ft)	0.00	Cum SA (acres)	1540.72	395.31	1223.57

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.525*

INPUT

Description: Interpolated Cross Section at River Mile 12.53

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3318.97	57.56	3333.97	56.85	3502.61	56.1	3580.92	55.83	3730.85	55.13
3815.47	54.88	3973.1	53.56	4041.84	53.08	4259.87	50.85	4306.06	50.25
4498.27	47.27	4548.98	46.59	4757.4	46.09	4862.64	45.68	5043.12	45.21
5151.68	45.05	5466.78	45.26	5759.75	46.13	6399.68	45.49	6647.67	45.81
6767.42	50.8	7015.2	49.49	7319.99	48.73	7321.72	48.73	7377.65	48.7
7576.32	48.67	7625.14	48.63	7895.38	47.69	7940.65	47.55	8178.92	49.3
8288.33	50.22	8433.67	50.25	8469.72	50.26	8709.25	50.38	8740.46	50.42
8966.54	50.36	9048.11	50.21	9400.86	48.49	9656.29	45.53	9764.4	44.39
9961.57	42.41	10016.97	42.46	10127.03	42.58	10569.85	40.51	10872.83	41.48
10933.35	41.76	11052.8	44.28	11082.71	44.07	11333.61	41.51	11381.34	41.12
11520.04	43.82	11603.17	45.11	11620.3	43.75	11681.76	39.19	11806.73	38.99
11917.44	38.42	11936.64	39.22	11972.46	41.01	12033.68	38.68	12047.43	38.52
12053.95	36.61	12064.08	35.93	12071.32	36.54	12096.92	36.01	12108.24	35.5
12111.96	34.62	12141.6	32.48	12152.47	31.76	12174.45	29.98	12180.31	29.67
12199.26	29.51	12215.05	29.52	12226.28	27.83	12231.29	27.54	12251.51	26.48
12260.16	25.42	12262.69	25.13	12268.8	24.44	12277.44	23.37	12286.08	22.22
12294.72	21.73	12298.5	21.91	12302.36	22.05	12306.15	22.18	12309.63	22.33
12310.82	22.36	12313.45	22.49	12317.31	22.67	12321.1	22.93	12324.92	23.67
12326.93	24.16	12329	24.85	12342.51	26.91	12350.44	28.09	12354.51	29.1
12359.46	30.31	12367.23	33.39	12368.31	33.84	12376.99	34.04	12390.54	35.92
12410.55	40.14	12425.17	40.49	12427.47	40.51	12450.76	40.28	12486.73	40.59
12524.33	41.53	12549.99	40.97	12590.92	40.67	12612.68	40.28	12650.28	40.87
12794.18	41.38	12912.95	42.04	12933.99	42.91	13092.54	48.63	13129.91	48.97
13261.3	50.27	13323.36	50.55	13542.18	51.35	13582.45	51.67	13588.97	51.7
13837.26	52.18	13891.19	53.49	13906.24	53.61	13991.13	54.22	14165.21	54.73
14253.6	54.92	14326.29	55.29	14527.08	56.4	14583.7	56.61	14753.47	56.12
14915.68	56.04	14946	55.91	15175.92	55.18	15246.23	54.6	15379.4	54.35
15567.26	54.52	15590.09	54.59	15809.2	55.77	15915.28	56.26	16019.61	56.5
16231.08	56.65	16232.33	56.65	16444.17	56.72	16571.39	56.71	16653.24	56.89
16881.54	57.77	16900.17	57.81	17071.73	57.96	17244.76	58.29	17323.49	58.58
17512.34	59.14	17573.64	59.19	17605	59.09	17668.05	58.62	17830.46	58.61
17904.74	58.51	18059.25	58.54	18245.35	58.75	18256.66	58.89	18444.17	61.23
18566.16	62.74								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

3318.97 .0512111.96 .01612390.54 .049

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 12111.9612390.54 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	39.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.74	Wt. n-Val.	0.050	0.016	0.049
W.S. Elev (ft)	38.69	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	168.04	2856.78	18.25
E.G. Slope (ft/ft)	0.000252	Area (sq ft)	168.04	2856.78	18.25
Q Total (cfs)	19900.00	Flow (cfs)	121.51	19767.73	10.76
Top Width (ft)	430.25	Top Width (ft)	138.51	278.58	13.15
Vel Total (ft/s)	6.54	Avg. Vel. (ft/s)	0.72	6.92	0.59
Max Chl Dpth (ft)	16.96	Hydr. Depth (ft)	1.21	10.25	1.39
Conv. Total (cfs)	1254025.0	Conv. (cfs)	7656.9	1245689.0	678.4
Length Wtd. (ft)	2275.85	Wetted Per. (ft)	138.96	280.79	13.44
Min Ch El (ft)	21.73	Shear (lb/sq ft)	0.02	0.16	0.02
Alpha	1.11	Stream Power (lb/ft s)	0.01	1.11	0.01
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)	2514.81	4059.72	3626.19
C & E Loss (ft)	0.01	Cum SA (acres)	1536.87	380.79	1223.19

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.1*

INPUT

Description: Interpolated Cross Section at River Mile 12.1

Station	Elevation	Data	num=	161					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4425.3	57.17	4440.46	56.51	4610.95	55.57	4690.13	55.23	4841.71	54.44
4927.25	54.18	5086.62	52.9	5156.12	52.47	5376.55	50.46	5423.25	49.87
5617.57	46.95	5668.84	46.32	5879.55	45.85	5985.95	45.41	6168.42	44.86
6278.17	44.7	6596.74	44.85	6892.94	45.6	7539.91	44.92	7790.62	45.17
7911.69	49.77	8162.2	48.52	8470.35	47.78	8472.09	47.78	8528.64	47.75
8729.5	47.8	8778.85	47.77	9052.07	46.72	9097.84	46.57	9338.73	48.05
9449.34	48.89	9596.28	48.91	9632.73	48.92	9874.89	49.01	9906.44	49.06
10135.02	49.08	10217.49	48.92	10574.11	47.21	10832.36	44.41	10941.66	43.32
11140.99	41.49	11197	41.53	11308.28	41.64	11755.97	39.74	12062.28	40.65
12123.47	40.94	12244.23	43.34	12274.47	43.17	12528.13	40.62	12576.39	40.26
12716.62	42.76	12800.65	43.81	12817.98	42.53	12880.11	38.35	13006.46	38.23
13118.39	37.59	13137.8	38.31	13174.01	40.05	13235.9	38.04	13249.81	37.92
13256.4	36.17	13266.64	35.57	13273.96	36.15	13299.84	35.73	13311.29	35.17
13315.05	34.33	13343.13	32.01	13353.43	31.22	13374.26	29.18	13379.82	28.86
13397.77	28.61	13412.73	28.56	13423.38	26.97	13428.12	26.69	13447.29	25.71
13455.47	24.73	13457.87	24.46	13463.66	23.82	13471.85	22.83	13480.04	21.76
13488.23	21.31	13492.49	21.48	13496.84	21.64	13501.1	21.77	13505.02	21.92
13506.36	21.94	13509.32	22.06	13513.67	22.21	13517.93	22.48	13522.24	23.37
13524.5	23.98	13526.84	24.78	13542.06	26.71	13550.98	27.82	13555.57	28.76
13561.14	29.88	13569.89	32.73	13571.12	33.16	13580.89	33.43	13596.15	35.93
13616.8	39.82	13631.89	40.15	13634.26	40.13	13658.29	39.72	13695.41	39.95
13734.21	41.01	13760.69	40.13	13802.93	39.52	13825.38	38.99	13864.18	39.75
14012.68	40.33	14135.23	41.12	14156.94	41.95	14320.56	47.17	14359.11	47.47
14494.7	48.67	14558.74	48.91	14784.54	49.58	14826.09	49.92	14832.82	49.97
15089.04	50.34	15144.69	52.04	15160.23	52.18	15247.82	52.92	15427.46	53.47
15518.66	53.67	15593.67	54.01	15800.88	55.11	15859.3	55.28	16034.49	54.77
16201.88	54.79	16233.16	54.68	16470.41	54.31	16542.97	53.71	16680.39	53.36

16874.25	53.5616897.81	53.63	17123.9	54.9717233.37	55.5117341.03	55.82
17559.25	5617560.54	5617779.15	56.1617910.42	56.1717994.89	56.36	
18230.46	57.3718249.69	57.418426.73	57.5618605.28	57.9518686.52	58.25	
18881.4	58.8118944.66	58.8218977.02	58.7119042.07	58.1219209.68	58.2	
19286.32	58.1219445.76	58.15	19637.8	58.4319649.47	58.5619842.96	60.85
19968.85	62.33					

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
4425.3	.0513315.05	.0313343.13	.01613596.15	.049			

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	13315.05	13596.15		1530.69	2280.69	1205.25	.1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	38.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.050	0.016	0.049
W.S. Elev (ft)	38.16	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	183.89	2899.57	13.17
E.G. Slope (ft/ft)	0.000241	Area (sq ft)	183.89	2899.57	13.17
Q Total (cfs)	19900.00	Flow (cfs)	110.69	19782.72	6.58
Top Width (ft)	490.16	Top Width (ft)	197.24	281.10	11.82
Vel Total (ft/s)	6.43	Avg. Vel. (ft/s)	0.60	6.82	0.50
Max Chl Dpth (ft)	16.86	Hydr. Depth (ft)	0.93	10.32	1.11
Conv. Total (cfs)	1281510.0	Conv. (cfs)	7128.2	1273957.0	424.0
Length Wtd. (ft)	2276.24	Wetted Per. (ft)	197.63	283.20	12.03
Min Ch El (ft)	21.30	Shear (lb/sq ft)	0.01	0.15	0.02
Alpha	1.12	Stream Power (lb/ft s)	0.01	1.05	0.01
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	2508.63	3909.03	3625.75
C & E Loss (ft)	0.01	Cum SA (acres)	1530.97	366.14	1222.85

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 11.675*

INPUT

Description: Interpolated Cross Section at River Mile 11.68

Station Elevation Data	num=	161									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5531.62	56.79	5546.95	56.16	5719.3	55.04	5799.34	54.64	5952.57	53.74		
6039.04	53.47	6200.14	52.24	6270.4	51.87	6493.23	50.07	6540.44	49.49		
6736.87	46.63	6788.7	46.05	7001.71	45.61	7109.26	45.14	7293.72	44.52		
7404.66	44.35	7726.7	44.43	8026.12	45.08	8680.13	44.35	8933.58	44.54		
9055.97	48.73	9309.2	47.55	9620.7	46.82	9622.47	46.82	9679.62	46.8		
9882.67	46.92	9932.57	46.91	10208.75	45.76	10255.02	45.59	10498.53	46.81		
10610.35	47.57	10758.89	47.57	10795.73	47.57	11040.53	47.64	11072.43	47.7		
11303.49	47.81	11386.86	47.62	11747.37	45.94	12008.42	43.29	12118.91	42.25		
12320.42	40.56	12377.04	40.59	12489.52	40.71	12942.09	38.97	13251.73	39.82		
13313.59	40.13	13435.66	42.41	13466.23	42.26	13722.66	39.73	13771.44	39.4		
13913.19	41.71	13998.14	42.52	14015.65	41.31	14078.47	37.51	14206.19	37.47		
14319.33	36.76	14338.96	37.41	14375.56	39.09	14438.13	37.41	14452.19	37.33		
14458.84	35.74	14469.2	35.22	14476.6	35.77	14502.76	35.44	14514.33	34.83		
14518.14	34.03	14544.67	31.54	14554.4	30.68	14574.07	28.38	14579.32	28.05		
14596.28	27.68	14610.42	27.61	14620.47	26.11	14624.95	25.84	14643.06	24.94		
14650.79	24.03	14653.06	23.79	14658.53	23.19	14666.26	22.28	14674	21.3		
14681.73	20.88	14686.47	21.07	14691.31	21.23	14696.05	21.36	14700.41	21.51		
14701.9	21.53	14705.2	21.63	14710.03	21.75	14714.77	22.02	14719.56	23.07		

14722.08	23.814724.68	24.71 14741.6	26.5214751.53	27.5614756.63	28.43
14762.83	29.4614772.56	32.0714773.92	32.4714784.79	32.8114801.76	35.93
14823.06	39.5114838.61	39.814841.05	39.7714865.82	39.16 14904.1	39.32
14944.1	40.4914971.39	39.2915014.94	38.3815038.08	37.715078.08	38.63
15231.17	39.2815357.52	40.2 15379.9	40.9915548.57	45.7215588.32	45.98
15728.1	47.0615794.12	47.28 16026.9	47.8116069.74	48.1816076.68	48.23
16340.82	48.516398.19	50.5916414.21	50.7516504.51	51.63 16689.7	52.22
16783.73	52.4116861.06	52.7417074.67	53.81 17134.9	53.95 17315.5	53.41
17488.07	53.5417520.32	53.4517764.91	53.4217839.71	52.817981.38	52.36
18181.24	52.618205.53	52.6718438.61	54.1818551.47	54.7718662.45	55.15
18887.42	55.3518888.75	55.3519114.12	55.619249.46	55.6319336.53	55.83
19579.39	56.9719599.21	57.0119781.72	57.17 19965.8	57.6120049.55	57.93
20250.46	58.4820315.67	58.4520349.03	58.32 20416.1	57.6220588.89	57.79
20667.9	57.7220832.28	57.7621030.25	58.1221042.28	58.2421241.76	60.47
21371.54	61.91				

Manning's n Values	num=	4
Sta n Val	Sta n Val	Sta n Val
5531.62	.0514518.14	.0314544.67 .01614801.76 .048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
14518.14	14801.76	1530.69	2280.69	1205.25	.1	.3	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	38.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.	0.050	0.016	0.048
W.S. Elev (ft)	37.64	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	236.16	2942.10	8.72
E.G. Slope (ft/ft)	0.000232	Area (sq ft)	236.16	2942.10	8.72
Q Total (cfs)	19900.00	Flow (cfs)	110.86	19785.47	3.67
Top Width (ft)	650.72	Top Width (ft)	356.92	283.62	10.19
Vel Total (ft/s)	6.24	Avg. Vel. (ft/s)	0.47	6.72	0.42
Max Chl Dpth (ft)	16.76	Hydr. Depth (ft)	0.66	10.37	0.86
Conv. Total (cfs)	1307051.0	Conv. (cfs)	7281.4	1299528.0	241.2
Length Wtd. (ft)	2275.73	Wetted Per. (ft)	357.26	285.68	10.33
Min Ch El (ft)	20.88	Shear (lb/sq ft)	0.01	0.15	0.01
Alpha	1.15	Stream Power (lb/ft s)	0.00	1.00	0.01
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	2501.25	3756.10	3625.45
C & E Loss (ft)	0.01	Cum SA (acres)	1521.24	351.35	1222.54

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 11.25*

INPUT

Description: Interpolated Cross Section at River Mile 11.25

Station Elevation Data	num=	161			
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	
6637.95	56.41 6653.44	55.81 6827.64	54.51 6908.54	54.05 7063.42	53.05
7150.83	52.77 7313.67	51.59 7384.68	51.26 7609.91	49.68 7657.62	49.1
7856.17	46.31 7908.56	45.78 8123.86	45.38 8232.57	44.87 8419.02	44.17
8531.16	44 8856.66	44.02 9159.31	44.56 9820.36	43.7810076.53	43.91
10200.24	47.7 10456.2	46.5810771.06	45.8710772.84	45.8610830.61	45.86
11035.85	46.0411086.28	46.0611365.44	44.7911412.21	44.6111658.34	45.56
11771.36	46.24 11921.5	46.2311958.74	46.2312206.18	46.2712238.41	46.34
12471.96	46.5212556.23	46.3312920.62	44.6713184.48	42.1613296.16	41.18
13499.84	39.6313557.07	39.6513670.77	39.76 14128.2	38.2114441.18	38.99

14503.7	39.3114627.09	41.4614657.99	41.3614917.18	38.8314966.48	38.53
15109.76	40.6315195.63	41.2215213.33	40.0915276.82	36.6715405.91	36.71
15520.28	35.9315540.12	36.4915577.11	38.1215640.36	36.7615654.56	36.73
15661.29	35.3115671.76	34.8615679.24	35.3815705.68	35.1615717.38	34.5
15721.22	33.74 15746.2	31.0615755.36	30.1315773.89	27.5815778.82	27.24
15794.79	26.76 15808.1	26.6515817.56	25.2515821.78	24.9915838.83	24.16
15846.11	23.3415848.24	23.1215853.39	22.5715860.67	21.7415867.96	20.85
15875.24	20.4515880.46	20.6515885.78	20.82 15891	20.94 15895.8	21.1
15897.45	21.1115901.07	21.215906.39	21.2915911.61	21.5615916.88	22.78
15919.65	23.6215922.52	24.6315941.15	26.3315952.08	27.2915957.69	28.09
15964.51	29.0315975.23	31.4115976.73	31.7915988.69	32.1916007.38	35.94
16029.31	39.1916045.32	39.4616047.85	39.416073.36	38.616112.78	38.68
16153.98	39.9816182.09	38.4616226.94	37.2316250.79	36.416291.99	37.51
16449.66	38.23 16579.8	39.2816602.85	40.0416776.59	44.2616817.53	44.48
16961.5	45.45 17029.5	45.6417269.27	46.0317313.39	46.4317320.54	46.49
17592.6	46.6717651.69	49.1317668.19	49.32 17761.2	50.3317951.95	50.96
18048.8	51.1518128.44	51.4618348.46	52.52 18410.5	52.6218596.52	52.06
18774.27	52.2918807.48	52.2319059.41	52.5319136.46	51.919282.38	51.36
19488.22	51.6319513.24	51.7119753.32	53.3819869.56	54.0219983.88	54.47
20215.59	54.720216.96	54.720449.09	55.0320588.49	55.120678.17	55.3
20928.32	56.5820948.74	56.6121136.72	56.7721326.31	57.2721412.58	57.61
21619.52	58.1621686.69	58.0821721.05	57.9421790.13	57.12 21968.1	57.38
22049.48	57.3222218.79	57.38 22422.7	57.822435.09	57.9222640.55	60.09
22774.22	61.49				

Manning's n Values	num=	4			
Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val
6637.95	.0515721.22	.04 15746.2	.01616007.38	.048	

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
15721.2216007.38		1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT	Profile #Calibration				
E.G. Elev (ft)	37.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.	0.050	0.016	0.048
W.S. Elev (ft)	37.15	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	321.67	2984.44	23.38
E.G. Slope (ft/ft)	0.000224	Area (sq ft)	321.67	2984.44	23.38
Q Total (cfs)	19900.00	Flow (cfs)	138.68	19755.26	6.06
Top Width (ft)	729.67	Top Width (ft)	386.06	286.16	57.45
Vel Total (ft/s)	5.98	Avg. Vel. (ft/s)	0.43	6.62	0.26
Max Chl Dpth (ft)	16.70	Hydr. Depth (ft)	0.83	10.43	0.41
Conv. Total (cfs)	1329762.0	Conv. (cfs)	9267.0	1320090.0	404.8
Length Wtd. (ft)	2273.68	Wetted Per. (ft)	386.37	288.26	57.56
Min Ch El (ft)	20.45	Shear (lb/sq ft)	0.01	0.14	0.01
Alpha	1.22	Stream Power (lb/ft s)	0.01	0.96	0.00
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	2491.45	3600.95	3625.01
C & E Loss (ft)	0.01	Cum SA (acres)	1508.18	336.44	1221.61

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 10.825*

INPUT
 Description: Interpolated Cross Section at River Mile 10.83

Station Elevation Data	num=	161			
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev

7744.27	56.03	7759.93	55.46	7935.99	53.98	8017.75	53.46	8174.28	52.35
8262.62	52.06	8427.19	50.93	8498.96	50.65	8726.59	49.29	8774.81	48.72
8975.48	45.99	9028.42	45.51	9246.01	45.14	9355.88	44.6	9544.31	43.82
9657.65	43.65	9986.62	43.61	10292.49	44.03	10960.58	43.21	11219.49	43.28
11344.51	46.67	11603.2	45.61	11921.41	44.91	11923.21	44.91	11981.6	44.91
12189.02	45.17	12239.99	45.21	12522.12	43.82	12569.39	43.62	12818.14	44.31
12932.37	44.91	13084.11	44.88	13121.74	44.88	13371.82	44.91	13404.4	44.98
13640.44	45.23	13725.6	45.03	14093.87	43.41	14360.55	41.04	14473.42	40.11
14679.26	38.7	14737.1	38.72	14852.01	38.82	15314.32	37.44	15630.64	38.16
15693.82	38.51	15818.52	40.53	15849.75	40.45	16111.7	37.94	16161.53	37.67
16306.34	39.57	16393.12	39.93	16411.01	38.87	16475.17	35.84	16605.64	35.95
16721.23	35.11	16741.28	35.58	16778.67	37.16	16842.58	36.12	16856.94	36.14
16863.74	34.88	16874.32	34.51	16881.88	35	16908.6	34.87	16920.42	34.17
16924.31	33.44	16947.73	30.59	16956.32	29.59	16973.7	26.78	16978.33	26.42
16993.3	25.85	17005.78	25.69	17014.66	24.39	17018.61	24.14	17034.6	23.39
17041.43	22.65	17043.43	22.45	17048.26	21.95	17055.09	21.21	17061.91	20.39
17068.74	20.03	17074.44	20.24	17080.25	20.41	17085.95	20.53	17091.19	20.69
17092.99	20.71	17096.94	20.77	17102.75	20.83	17108.45	21.11	17114.2	22.48
17117.23	23.44	17120.36	24.56	17140.69	26.14	17152.62	27.02	17158.75	27.75
17166.2	28.61	17177.89	30.75	17179.53	31.11	17192.59	31.57	17212.99	35.94
17235.56	38.87	17252.04	39.11	17254.64	39.03	17280.89	38.04	17321.46	38.04
17363.86	39.46	17392.79	37.62	17438.95	36.09	17463.49	35.11	17505.89	36.39
17668.16	37.17	17802.08	38.36	17825.8	39.08	18004.6	42.81	18046.73	42.98
18194.9	43.84	18264.88	44.01	18511.63	44.26	18557.04	44.69	18564.39	44.75
18844.38	44.83	18905.19	47.68	18922.17	47.89	19017.89	49.04	19214.19	49.7
19313.86	49.89	19395.83	50.19	19622.26	51.23	19686.1	51.29	19877.54	50.7
20060.46	51.03	20094.64	51.01	20353.91	51.65	20433.2	51.20	20583.37	50.37
20795.21	50.67	20820.96	50.75	21068.03	52.58	21187.65	53.28	21305.3	53.79
21543.76	54.05	21545.18	54.05	21784.06	54.47	21927.52	54.57	22019.81	54.77
22277.25	56.18	22298.26	56.21	22491.72	56.37	22686.83	56.94	22775.61	57.29
22988.58	57.83	23057.7	57.71	23093.06	57.56	23164.15	56.62	23347.31	56.98
23431.06	56.93	23605.3	56.99	23815.15	57.48	23827.9	57.62	24039.35	59.71
24176.91	61.07								

Manning's n Values	num=	4
Sta	n Val	Sta
7744.27	.0516924.31	.0516947.73
		.01617212.99
		.047

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	16924.31	17212.99	1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT	Profile #	Calibration			
E.G. Elev (ft)	37.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.050	0.016	0.047
W.S. Elev (ft)	36.67	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	426.66	3025.34	81.20
E.G. Slope (ft/ft)	0.000215	Area (sq ft)	426.66	3025.34	81.20
Q Total (cfs)	19900.00	Flow (cfs)	188.50	19686.35	25.15
Top Width (ft)	863.54	Top Width (ft)	425.47	288.68	149.39
Vel Total (ft/s)	5.63	Avg. Vel. (ft/s)	0.44	6.51	0.31
Max Chl Dpth (ft)	16.64	Hydr. Depth (ft)	1.00	10.48	0.54
Conv. Total (cfs)	1355862.0	Conv. (cfs)	12843.5	1341305.0	1713.3
Length Wtd. (ft)	2269.04	Wetted Per. (ft)	425.76	290.87	149.48
Min Ch El (ft)	20.03	Shear (lb/sq ft)	0.01	0.14	0.01
Alpha	1.32	Stream Power (lb/ft s)	0.01	0.91	0.00
Frctn Loss (ft)	0.48	Cum Volume (acre-ft)	2478.30	3443.62	3623.56
C & E Loss (ft)	0.01	Cum SA (acres)	1493.93	321.39	1218.75

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 10.4*

INPUT

Description: Interpolated Cross Section at River Mile 10.4

Station	Elevation	Data	num=	161						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
8850.6	55.65	8866.42	55.11	9044.33	53.45	9126.96	52.87	9285.14	51.66	
9374.41	51.36	9540.71	50.27	9613.24	50.05	9843.27	48.91	9892	48.34	
10094.78	45.67	10148.28	45.24	10368.17	44.9	10479.2	44.33	10669.61	43.48	
10784.14	43.31	1116.58	43.19	11425.67	43.51	12100.81	42.64	12362.44	42.65	
12488.79	45.63	12750.2	44.64	13071.76	43.95	13073.58	43.95	13132.59	43.97	
13342.2	44.29	13393.7	44.35	13678.81	42.85	13726.57	42.64	13977.95	43.07	
14093.38	43.59	14246.72	43.54	14284.75	43.54	14537.46	43.54	14570.38	43.62	
14808.91	43.95	14894.97	43.74	15267.12	42.13	15536.61	39.92	15650.67	39.04	
15858.69	37.77	15917.13	37.78	16033.25	37.88	16500.44	36.68	16820.09	37.33	
16883.94	37.68	17009.95	39.59	17041.51	39.55	17306.22	37.05	17356.58	36.81	
17502.91	38.51	17590.61	38.63	17608.68	37.65	17673.53	35.17	1805.37	35.19	
17922.17	34.28	17942.43	34.67	17980.22	36.21	18044.81	35.48	18059.32	35.54	
18066.19	34.44	18076.88	34.15	18084.52	34.61	18111.52	34.58	18123.47	33.84	
18127.4	33.15	18149.27	30.12	18157.29	29.05	18173.51	25.99	18177.83	25.61	
18191.81	24.93	18203.46	24.73	18211.75	23.54	18215.44	23.29	18230.37	22.62	
18236.75	21.95	18238.61	21.77	18243.12	21.33	18249.5	20.65	18255.87	19.93	
18262.25	19.61	18268.42	19.82	18274.72	19.99	18280.9	20.11	18286.58	20.28	
18288.53	20.28	18292.81	20.34	18299.11	20.37	18305.29	20.65	18311.53	22.18	
18314.8	23.26	18318.19	24.49	18340.24	25.94	18353.17	26.75	18359.81	27.41	
18367.88	28.17	18380.56	30.09	18382.34	30.42	18396.49	30.95	18418.6	35.95	
18441.81	38.55	18458.76	38.77	18461.43	38.66	18488.43	37.48	18530.14	37.4	
18573.74	38.94	18603.49	36.79	18650.96	34.95	18676.19	33.82	18719.79	35.26	
18886.65	36.12	19024.37	37.44	19048.76	38.13	19232.62	41.35	19275.94	41.48	
19428.3	42.23	19500.26	42.37	19753.99	42.49	19800.69	42.94	19808.25	43.01	
20096.16	42.99	20158.69	46.23	20176.15	46.46	20274.58	47.75	20476.44	48.45	
20578.93	48.63	20663.21	48.91	20896.05	49.94	20961.7	49.96	21158.56	49.35	
21346.65	49.78	21381.8	49.79	21648.41	50.77	21729.94	50.12	1884.36	49.37	
22102.2	49.71	22128.67	49.79	22382.73	51.78	22505.74	52.53	22626.72	53.12	
22871.93	53.42	22873.39	53.42	23119.03	53.91	23266.55	54.03	23361.46	54.24	
23626.18	55.78	23647.78	55.81	23846.72	55.97	24047.35	56.62	24138.64	56.97	
24357.63	57.51	24428.71	57.34	24465.08	57.17	24538.18	56.11	24726.52	56.57	
24812.64	56.53	24991.81	56.6	25207.6	57.17	25220.71	57.28	25438.14	59.33	
25579.6	60.65									

Manning's n Values	num=	4						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	
8850.6	.05	18127.4	.06	18149.27	.016	18418.6	.047	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	18127.4	18418.6		1530.69	2280.69	1205.25	.1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	36.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.050	0.016	0.047
W.S. Elev (ft)	36.22	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	560.31	3064.88	228.92
E.G. Slope (ft/ft)	0.000206	Area (sq ft)	560.31	3064.88	228.92
Q Total (cfs)	19900.00	Flow (cfs)	263.47	19545.61	90.93
Top Width (ft)	1055.81	Top Width (ft)	483.66	291.20	280.94
Vel Total (ft/s)	5.16	Avg. Vel. (ft/s)	0.47	6.38	0.40

Max Chl Dpth (ft)	16.62	Hydr. Depth (ft)	1.16	10.53	0.81
Conv. Total (cfs)	1386795.0	Conv. (cfs)	18360.7	1362098.0	6336.4
Length Wtd. (ft)	2259.67	Wetted Per. (ft)	483.92	293.54	281.03
Min Ch El (ft)	19.60	Shear (lb/sq ft)	0.01	0.13	0.01
Alpha	1.50	Stream Power (lb/ft s)	0.01	0.86	0.00
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)	2460.96	3284.19	3619.27
C & E Loss (ft)	0.01	Cum SA (acres)	1477.95	306.21	1212.79

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.975*

INPUT

Description: Interpolated Cross Section at River Mile 9.98

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9956.92	55.27	9972.91	54.76	10152.68	52.92	10236.17	52.28	10396	50.96
10486.2	50.65	10654.24	49.61	110727.52	49.44	10959.94	48.52	11009.19	47.96
11214.08	45.35	11268.14	44.97	11490.32	44.66	11602.51	44.05	11794.91	43.13
11910.64	42.94	12246.54	42.78	12558.86	42.98	13241.04	42.07	13505.4	42.02
13633.06	44.6	13897.2	43.68	14222.12	43.14	223.96	43.14	2283.58	43.02
14495.37	43.42	14547.41	43.49	14835.5	41.88	14883.76	41.66	15137.76	41.82
15254.39	42.26	15409.33	42.21	15447.76	42.19	15703.1	42.17	15736.37	42.26
15977.38	42.67	16064.34	42.44	16440.38	40.86	16712.68	38.79	16827.92	37.98
17038.11	36.84	17097.17	36.85	17214.5	36.94	17686.55	35.91	18009.54	36.5
18074.05	36.87	18201.38	38.65	18233.27	38.64	18500.74	36.15	18551.62	35.95
18699.48	37.44	18788.09	37.44	18806.36	36.44	18871.88	34.16	19005.1	34.43
19123.12	33.45	19143.59	33.76	19181.77	35.23	19247.03	34.84	19261.7	34.95
19268.64	34.01	19279.44	33.79	19287.16	34.22	19314.45	34.31	19326.52	33.5
19330.49	32.86	19350.8	29.65	19358.25	28.51	19373.32	25.19	19377.34	24.8
19390.32	24.02	19401.15	23.77	19408.85	22.68	19412.28	22.44	19426.14	21.85
19432.06	21.26	19433.8	21.11	19437.99	20.71	19443.91	20.11	19449.83	19.47
19455.76	19.18	19462.41	19.41	19469.2	19.58	19475.85	19.71	19481.97	19.87
19484.07	19.87	19488.69	19.91	19495.47	19.91	19502.13	20.19	19508.85	21.88
19512.38	23.08	19516.03	24.41	19539.78	25.75	19553.71	26.48	19560.88	27.07
19569.57	27.74	19583.23	29.43	19585.14	29.73	19600.39	30.33	19624.21	35.96
19648.06	38.23	19665.47	38.42	19668.22	38.31	19695.96	36.92	19738.82	36.77
19783.62	38.42	19814.19	35.95	19862.96	33.81	19888.89	32.53	19933.69	34.14
20105.14	35.07	20246.65	36.52	20271.71	37.18	20460.63	39.89	20505.15	39.98
20661.7	40.62	20735.64	40.74	20996.36	40.71	21044.33	41.2	21052.1	41.27
21347.94	41.16	21412.19	44.77	21430.13	45.03	21531.27	46.45	21738.68	47.19
21843.99	47.37	21930.6	47.63	22169.84	48.64	22237.3	48.63	22439.57	47.99
22632.85	48.53	22668.97	48.56	22942.91	49.88	23026.68	49.22	23185.35	48.37
23409.19	48.75	23436.39	48.83	23697.44	50.98	23823.84	51.78	23948.14	52.44
24200.1	52.75	24201.6	52.75	24454	53.34	24605.58	53.5	24703.1	53.71
24975.1	55.38	24997.3	55.41	25201.71	55.58	25407.87	56.26	25501.68	56.65
25726.69	57.18	25799.73	56.96	25837.09	56.79	25912.21	55.61	26105.73	56.16
26194.22	56.14	26378.32	56.21	26600.05	56.85	26613.52	56.95	26836.94	58.95
26982.29	60.23								

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9956.92	.05	19330.49	.06	19350.8	.06	19624.21	.047		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	19330.49	19624.21		1530.69	2280.69	1205.25	.1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	36.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.050	0.016	0.047
W.S. Elev (ft)	35.80	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	733.61	3108.40	453.66
E.G. Slope (ft/ft)	0.000193	Area (sq ft)	733.61	3108.40	453.66
Q Total (cfs)	19900.00	Flow (cfs)	387.70	19279.39	232.92
Top Width (ft)	1157.00	Top Width (ft)	505.63	293.03	358.34
Vel Total (ft/s)	4.63	Avg. Vel. (ft/s)	0.53	6.20	0.51
Max Chl Dpth (ft)	16.62	Hydr. Depth (ft)	1.45	10.61	1.27
Conv. Total (cfs)	1433767.0	Conv. (cfs)	27932.9	1389053.0	16781.3
Length Wtd. (ft)	2244.22	Wetted Per. (ft)	505.85	295.54	358.45
Min Ch El (ft)	19.18	Shear (lb/sq ft)	0.02	0.13	0.02
Alpha	1.74	Stream Power (lb/ft s)	0.01	0.78	0.01
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	2438.23	3122.58	3609.83
C & E Loss (ft)	0.02	Cum SA (acres)	1460.57	290.91	1203.95

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.55000*

INPUT

Description: Interpolated Cross Section at River Mile 9.55

Station Elevation Data		num= 161	
Sta	Elev	Sta	Elev
11063.25	54.89	11079.4	54.4111261.02
11597.98	49.9511767.76		52.3911345.37
12333.38	45.03	12388	48.9511841.79
13037.13	42.59	13376.5	48.8312076.62
14777.33	43.57	15044.2	44.4312725.82
15648.55	42.5415701.13		43.7812920.21
16415.4	40.9316571.94		42.3613692.04
17145.86	41.3917233.71		42.4614381.26
18217.53	35.91	18277.2	42.0415374.33
19264.17	36.0519392.82		42.0415434.57
19896.06	36.3819985.58		40.9116040.94
20324.07	32.6220344.75		40.6816297.56
20471.09	33.58	20482	40.8516868.74
20533.57	32.5620552.34		40.816902.36
20588.83	23.120598.83		40.8516868.74
20627.38	20.5720628.98		39.5917888.74
20649.26	18.7520656.39		37.6718005.18
20679.61	19.4620684.56		35.9918872.67
20709.96	22.920713.87		35.1519198.99
20771.26	27.3120785.89		37.7319695.27
20854.31	37.9120872.19		35.2619746.67
20993.51	37.9121024.89		33.3220070.23
21323.64	34.0221468.93		34.220464.07
21895.1	39.0221971.02		33.8420517.37
22599.72	39.3222665.69		24.3920576.84
23109.06	46.1223197.98		21.8220609.11
23919.04	47.2823956.13		21.5920621.91
24716.17	47.79	24744.1	21.5920621.91
25528.27	52.125529.81		19.5720643.79
26324.03	54.9926346.83		19.17
27095.75	56.8627170.74		19.2820677.36
27575.8	55.7427764.83		19.7420706.17
28384.97	59.81		19.4520698.96
			25.5620754.26
			26.2120761.94
			29.0520804.29
			29.7120829.82
			36.3620947.51
			31.2421147.59
			36.4321734.36
			39.4622295.96
			45.1623000.93
			47.323720.59
			48.324486.35
			51.0425269.56
			52.9726044.74
			55.9226864.71
			55.1127484.94
			56.6328235.73
			58.57

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 11063.25 .0520533.57 .0720552.34 .01620829.82 .046

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 20533.5720829.82 1530.69 2280.69 1205.25 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 020533.57 16.920829.8228384.97 30.39

CROSS SECTION OUTPUT Profile #Calibration

Element	Value	Left OB	Channel	Right OB
E.G. Elev (ft)	35.95			
Vel Head (ft)	0.53	0.050	0.016	0.046
W.S. Elev (ft)	35.42	1530.69	2280.69	1205.25
Crit W.S. (ft)		1010.08	3159.58	744.97
E.G. Slope (ft/ft)	0.000176	1010.08	3159.58	744.97
Q Total (cfs)	19900.00	554.24	18885.73	460.03
Top Width (ft)	1683.87	959.09	294.04	430.75
Vel Total (ft/s)	4.05	0.55	5.98	0.62
Max Chl Dpth (ft)	16.67	1.05	10.75	1.73
Conv. Total (cfs)	1499493.0	41762.7	1423066.0	34664.1
Length Wtd. (ft)	2213.04	959.28	296.75	430.90
Min Ch El (ft)	18.75	0.01	0.12	0.02
Alpha	2.07	0.01	0.70	0.01
Frctn Loss (ft)	0.52	2407.59	2958.49	3593.24
C & E Loss (ft)	0.02	1434.83	275.55	1193.03

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.12500*

INPUT

Description: Interpolated Cross Section at River Mile 9.13

Station	Elevation	Data	num=	161
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev
12169.57	54.5112185.89	54.0712369.37	51.8512454.58	51.0912617.71 49.57
12709.77	49.2412881.28	48.2912956.07	48.23 13193.3	47.7413243.56 47.19
13452.69	44.713507.87	44.4313734.63	44.1913849.13	43.5114045.51 42.43
14163.62	42.2414506.46	41.9514825.23	41.9415521.49	40.9315791.31 40.76
15921.61	42.53 16191.2	41.7416522.83	41.08 16524.7	41.0816585.55 41.13
16801.72	41.6616854.84	41.7817148.87	39.9417198.12	39.6917457.37 39.33
17576.41	39.6117734.55	39.5117773.77	39.518034.39	39.4418068.34 39.54
18314.33	40.1118403.08	39.8518786.88	38.31 19064.8	36.5519182.43 35.84
19396.96	34.9919457.23	34.9819576.99	35.0520058.79	34.3820388.44 34.85
20454.29	35.2420584.25	36.7720616.79	36.8320889.79	34.3720941.72 34.23
21092.63	35.3221183.07	34.7421201.71	3421268.59	32.4821404.55 32.9
21525.01	31.7921545.91	31.9521584.87	33.3121651.48	33.5621666.45 33.76
21673.54	33.1521684.56	33.0821692.44	33.4521720.29	33.7321732.61 32.84
21736.66	32.2721753.87	28.721760.18	27.4221772.94	23.5921776.34 23.18
21787.34	22.1821796.51	21.8521803.03	20.9621805.94	20.7421817.68 20.3
21822.7	19.8721824.17	19.7621827.72	19.4721832.73	19.0221837.75 18.55
21842.77	18.3321850.38	18.5821858.14	18.7621865.75	18.8721872.75 19.05
21875.15	19.0421880.43	19.05 21888.2	18.99 21895.8	19.2821903.49 21.29
21907.53	22.7221911.71	24.2721938.87	25.36 21954.8	25.94 21963 26.39
21972.94	26.8821988.56	28.121990.75	28.3622008.19	29.0922035.44 35.97
22060.56	37.5922078.91	37.73 22081.8	37.5622111.03	35.822156.19 35.49

22203.39	37.3922235.59	34.2822286.98	31.5122314.29	29.9522361.49	31.9
22542.13	32.9622691.22	34.6822717.62	35.2722916.66	36.9722963.56	36.99
23128.5	37.41 23206.4	37.4723481.08	37.1723531.63	37.7123539.82	37.79
23851.5	37.4823919.19	41.8723938.09	42.1724044.65	43.8724263.17	44.68
24374.12	44.8624465.37	45.0824717.43	46.06 24788.5	45.9725001.61	45.28
25205.24	46.0325243.29	46.12 25531.9	48.1225620.17	47.425787.34	46.38
26023.16	46.8326051.82	46.926326.86	49.3926460.02	50.2926590.99	51.09
26856.44	51.4526858.02	51.4527123.94	52.2227283.64	52.4327386.38	52.65
27672.96	54.5927696.35	54.6127911.71	54.7828128.91	55.5928227.74	56.01
28464.81	56.5328541.76	56.2228581.12	56.0228660.26	54.6128864.15	55.34
28957.38	55.3429151.34	55.4429384.95	56.2229399.14	56.3129634.53	58.2
29787.66	59.39				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
12169.57	.0521736.66		.0821753.87		.01622035.44		.046

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	21736.66	22035.44		1530.69	2280.69	1205.25	.1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
021736.66		18.62	22035.44	29787.66	29.85

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	35.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.	0.050	0.022	0.046
W.S. Elev (ft)	34.95	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	1459.86	3179.33	1040.48
E.G. Slope (ft/ft)	0.000294	Area (sq ft)	1459.86	3179.33	1040.48
Q Total (cfs)	19900.00	Flow (cfs)	981.97	17945.81	972.22
Top Width (ft)	2333.85	Top Width (ft)	1564.21	294.76	474.88
Vel Total (ft/s)	3.50	Avg. Vel. (ft/s)	0.67	5.64	0.93
Max Chl Dpth (ft)	16.62	Hydr. Depth (ft)	0.93	10.79	2.19
Conv. Total (cfs)	1160208.0	Conv. (cfs)	57250.6	1046275.0	56682.2
Length Wtd. (ft)	2178.35	Wetted Per. (ft)	1564.39	297.71	475.09
Min Ch El (ft)	18.33	Shear (lb/sq ft)	0.02	0.20	0.04
Alpha	2.35	Stream Power (lb/ft s)	0.01	1.11	0.04
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	2364.19	2792.55	3568.54
C & E Loss (ft)	0.01	Cum SA (acres)	1390.50	260.13	1180.50

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 8.70000*

INPUT
 Description: Interpolated Cross Section at River Mile 8.7

Station	Elevation	Data	num=	161			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
13275.9	54.1213292.38	53.7213477.71	51.3213563.79	50.513728.57	48.88		
13821.56	48.5413994.81	47.6314070.35	47.6214309.98	47.3514360.75	46.81		
14571.99	44.3814627.73	44.1614856.78	43.9514972.44	43.24 15170.8	42.09		
15290.11	41.8915636.42	41.5415958.41	41.4116661.72	40.3616934.27	40.12		
17065.88	41.5 17338.2	40.7717673.18	40.1317675.08	40.1317736.54	40.18		
17954.9	40.7918008.55	40.9218305.55	38.9718355.31	38.7118617.17	38.08		
18737.42	38.2818897.16	38.1718936.78	38.1619200.03	38.0719234.33	38.18		
19482.8	38.8319572.45	38.5519960.14	37.0420240.87	35.4320359.68	34.77		

20576.38	34.0620637.27	34.0420758.23	34.1121244.91	33.6221577.89	34.02
21644.41	34.4221775.68	35.8321808.55	35.9222084.31	33.4722136.77	33.37
22289.2	34.2522380.56	33.4422399.39	32.7822466.94	31.6522604.28	32.14
22725.96	30.9622747.06	31.0422786.43	32.3522853.71	32.9222868.83	33.17
22875.98	32.7122887.12	32.7222895.08	33.0622923.21	33.4422935.66	32.5
22939.75	31.98 22955.4	28.2322961.14	26.8722972.75	22.7922975.85	22.37
22985.86	21.27 22994.2	20.8923000.13	20.123002.77	19.923013.45	19.53
23018.02	19.1823019.36	19.0923022.58	18.8523027.15	18.4823031.71	18.09
23036.27	17.923044.36	18.1623052.61	18.35 23060.7	18.4623068.14	18.64
23070.69	18.6323076.31	18.6223084.55	18.5423092.64	18.8323100.81	20.99
23105.11	22.5423109.54	24.1923138.42	25.1723155.35	25.6723164.06	26.05
23174.63	26.4523191.23	27.4423193.55	27.6823212.09	28.4823241.05	35.97
23266.81	37.2823285.63	37.3823288.59	37.223318.56	35.2423364.87	34.85
23413.27	36.8723446.29	33.4423498.98	30.3723526.99	28.6623575.39	30.78
23760.62	31.91 23913.5	33.7623940.58	34.3224144.68	35.5224192.77	35.49
24361.9	35.824441.78	35.8424723.45	35.3924775.28	35.9724783.67	36.06
25103.28	35.6525172.69	40.4125192.07	40.7425301.34	42.5725525.42	43.42
25639.19	43.625732.76	43.825991.22	44.77 26064.1	44.6426282.63	43.92
26491.43	44.7726530.45	44.89 26826.4	47.2326916.91	46.527088.33	45.39
27330.15	45.8727359.54	45.9427641.56	48.5927778.12	49.5427912.41	50.41
28184.62	50.828186.23	50.8128458.91	51.6528622.67	51.928728.03	52.12
29021.89	54.1929045.87	54.2129266.71	54.3929489.43	55.2529590.77	55.68
29833.87	56.229912.77	55.8529953.14	55.6430034.29	54.1130243.36	54.93
30338.96	54.9530537.85	55.05 30777.4	55.930791.95	55.9931033.32	57.82
31190.35	58.97				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
13275.9	.0522939.75		.0822961.14		.01623241.05		.046

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

22939.75	23241.05	1530.69	2280.69	1205.25	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
022939.75	20.323241.05	31190.35	29.3		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	34.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.050	0.023	0.046
W.S. Elev (ft)	34.29	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	1842.41	3135.13	1252.76
E.G. Slope (ft/ft)	0.000328	Area (sq ft)	1842.41	3135.13	1252.76
Q Total (cfs)	19900.00	Flow (cfs)	1119.44	17430.73	1349.82
Top Width (ft)	2862.71	Top Width (ft)	2066.64	294.82	501.25
Vel Total (ft/s)	3.19	Avg. Vel. (ft/s)	0.61	5.56	1.08
Max Chl Dpth (ft)	16.39	Hydr. Depth (ft)	0.89	10.63	2.50
Conv. Total (cfs)	1098400.0	Conv. (cfs)	61788.8	962106.8	74504.8
Length Wtd. (ft)	2152.49	Wetted Per. (ft)	2066.80	298.05	501.47
Min Ch El (ft)	17.90	Shear (lb/sq ft)	0.02	0.22	0.05
Alpha	2.66	Stream Power (lb/ft s)	0.01	1.20	0.06
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	2306.17	2627.24	3536.82
C & E Loss (ft)	0.01	Cum SA (acres)	1326.71	244.70	1167.00

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: 8.27500*

INPUT

Description: Interpolated Cross Section at River Mile 8.28

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
14382.22	53.7414398.87	53.3714586.06	50.79	14673	49.9114839.43	48.18			
14933.35	47.8315108.33	46.9815184.63	47.0115426.66	46.9615477.93	46.42				
15691.29	44.0615747.59	43.8915978.94	43.7116095.76	42.97	16296.1	41.74			
16416.61	41.5416766.38	41.12	17091.6	40.8917801.94	39.7918077.22	39.49			
18210.15	40.47	18485.2	39.818823.54	39.1718825.45	39.1718887.53	39.24			
19108.07	39.9119162.26	40.0719462.24	38.0119512.49	37.7319776.98	36.84				
19898.43	36.9520059.77	36.8320099.78	36.8120365.67	36.720400.31	36.81				
20651.28	37.5420741.82	37.2621133.39	35.7721416.93	34.321536.94	33.7				
21755.8	33.13	21817.3	33.1121939.47	33.1722431.02	32.8522767.34	33.19			
22834.52	33.6122967.11	34.8923000.31	35.0223278.83	32.5823331.81	32.51				
23485.78	33.1923578.05	32.1523597.07	31.5623665.29	30.8123804.01	31.38				
23926.91	30.1423948.22	30.1323987.98	31.3824055.94	32.29	24071.2	32.57			
24078.43	32.2824089.69	32.3724097.72	32.6824126.13	33.16	24138.7	32.17			
24142.83	31.6824156.94	27.7524162.11	26.3324172.56	21.9924175.35	21.56				
24184.37	20.3524191.88	19.9324197.22	19.25	24199.6	19.0524209.22	18.75			
24213.34	18.4924214.54	18.4224217.45	18.2324221.56	17.9424225.67	17.63				
24229.78	17.4824238.35	17.7524247.08	17.9324255.65	18.0424263.53	18.23				
24266.23	18.2124272.18	18.1924280.92	18.0824289.48	18.3724298.13	20.69				
24302.68	22.3624307.38	24.1224337.96	24.98	24355.9	25.424365.12	25.72			
24376.31	26.03	24393.9	26.7824396.36	26.9924415.99	27.8624446.66	35.98			
24473.06	36.9624492.34	37.0424495.38	36.8324526.09	34.6824573.55	34.21				
24623.15	36.3524656.99	32.6124710.99	29.2224739.69	27.3724789.29	29.66				
24979.12	30.8625135.78	32.8425163.53	33.3625372.69	34.0625421.98	33.99				
25595.3	34.1925677.16	34.225965.81	33.6226018.93	34.2226027.53	34.32				
26355.06	33.8126426.19	38.9626446.05	39.3126558.03	41.2826787.66	42.17				
26904.26	42.3427000.14	42.5327265.02	43.48	27339.7	43.3127563.64	42.57			
27777.62	43.5227817.61	43.67	28120.9	46.3528213.65	45.628389.32	44.39			
28637.13	44.9128667.25	44.9828956.27	47.7929096.21	48.829233.83	49.73				
29512.79	50.1529514.44	50.1629793.88	51.09	29961.7	51.3730069.67	51.59			
30370.81	53.7930395.39	53.82	30621.7	53.9930849.95	54.91	30953.8	55.36		
31202.92	55.8831283.79	55.4831325.15	55.2531408.31	53.6131622.57	54.53				
31720.54	54.5531924.36	54.6632169.85	55.5832184.76	55.6732432.11	57.44				
32593.04	58.56								

Manning's n Values		num= 4			
Sta	n Val	Sta	n Val	Sta	n Val
14382.22	.0524142.83	.0924162.11	.01624446.66	.045	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	24142.83	24446.66	1530.69	2280.69	1205.25	.1	.3

Blocked Obstructions		num= 2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev
024142.83		2224446.66	32593.04		28.76

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	33.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.	0.050	0.024	0.045
W.S. Elev (ft)	33.58	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	2191.17	3070.06	1437.98
E.G. Slope (ft/ft)	0.000349	Area (sq ft)	2191.17	3070.06	1437.98
Q Total (cfs)	19900.00	Flow (cfs)	1423.20	16855.47	1621.33
Top Width (ft)	3102.36	Top Width (ft)	2226.00	294.77	581.59
Vel Total (ft/s)	2.97	Avg. Vel. (ft/s)	0.65	5.49	1.13
Max Chl Dpth (ft)	16.10	Hydr. Depth (ft)	0.98	10.42	2.47

Conv. Total (cfs)	1065365.0	Conv. (cfs)	76192.1	902373.0	86799.4
Length Wtd. (ft)	2140.29	Wetted Per. (ft)	2226.15	298.34	581.81
Min Ch El (ft)	17.48	Shear (lb/sq ft)	0.02	0.22	0.05
Alpha	2.91	Stream Power (lb/ft s)	0.01	1.23	0.06
Frctn Loss (ft)	0.81	Cum Volume (acre-ft)	2235.30	2464.80	3499.59
C & E Loss (ft)	0.00	Cum SA (acres)	1251.29	229.26	1152.02

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: 7.85000*

INPUT

Description: Interpolated Cross Section at River Mile 7.85

Station Elevation Data num= 161									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
15488.55	53.3615505.36	53.0215694.41	50.26	15782.2	49.3215950.28	47.49			
16045.14	47.1316221.85	46.3216298.91	46.4116543.34	46.5816595.12	46.04				
16810.59	43.7416867.45	43.6217101.09	43.4817219.07	42.7	17421.4	41.39			
17543.1	41.1917896.34	40.7118224.78	40.3618942.17	39.2219220.18	38.86				
19354.43	39.43	19632.2	38.8319973.89	38.2119975.82	38.2220038.52	38.29			
20261.25	39.0420315.97	39.2120618.93	37.0420669.68	36.7520936.79	35.59				
21059.44	35.6221222.38	35.4921262.79	35.4621531.31	35.33	21566.3	35.45			
21819.75	36.26	21911.2	35.9622306.64	34.522592.99	33.1822714.19	32.64			
22935.22	32.222997.33	32.1723120.72	32.2323617.14	32.0923956.79	32.36				
24024.64	32.7924158.54	33.9524192.07	34.1124473.35	31.6924526.86	31.65				
24682.35	32.1324775.54	30.8524794.74	30.3424863.64	29.9725003.74	30.62				
25127.85	29.3125149.38	29.2225189.53	30.4225258.16	31.6525273.58	31.98				
25280.88	31.8525292.25	32.0125300.36	32.2925329.05	32.8725341.75	31.84				
25345.92	31.3925358.47	27.2825363.07	25.7925372.38	21.225374.86	20.75				
25382.88	19.4325389.56	18.9825394.31	18.3925396.43	18.2	25405	17.98			
25408.65	17.7925409.73	17.7425412.31	17.625415.97	17.3925419.63	17.17				
25423.29	17.0525432.33	17.3325441.55	17.52	25450.6	17.6325458.92	17.82			
25461.77	17.825468.05	17.7625477.28	17.6225486.32	17.9125495.45	20.4				
25500.26	22.1825505.22	24.0525537.51	24.7925556.44	25.1425566.18	25.38				
25578	25.625596.56	26.1225599.16	26.325619.89	27.2425652.27	35.99				
25679.31	36.6425699.06	36.6925702.17	36.4625733.63	34.1225782.23	33.58				
25833.03	35.84	25867.7	31.77	25923	28.0825952.39	26.08	26003.2	28.54	
26197.61	29.8126358.07	31.9226386.49	32.4126600.71	32.626651.18	32.5				
26828.7	32.5826912.54	32.5727208.17	31.8527262.57	32.4827271.38	32.58				
27606.84	31.97	27679.7	37.5127700.04	37.8827814.72	39.9928049.91	40.91			
28169.32	41.0828267.53	41.2528538.81	42.18	28615.3	41.9828844.66	41.21			
29063.82	42.2729104.77	42.45	29415.4	45.4729510.39	44.729690.31	43.39			
29944.12	43.9529974.96	44.0230270.98	47	30414.3	48.0530555.25	49.05			
30840.96	49.530842.65	49.5131128.86	50.5331300.73	50.8331411.31	51.06				
31719.74	53.431744.92	53.42	31976.7	53.5932210.47	54.5732316.83	55.04			
32571.98	55.55	32654.8	55.1132697.17	54.8732782.34	53.133001.78	54.12			
33102.12	54.1633310.87	54.28	33562.3	55.2633577.57	55.3433830.91	57.06			
33995.72	58.14								

Manning's n Values num= 4									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
15488.55	.0525345.92		.125363.07		.01625652.27		.045		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
25345.9225652.27		1530.69	2280.69	1205.25	.1	.3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev

025345.92 23.725652.2733995.72 28.2

CROSS SECTION OUTPUT Profile #Calibration

Element	Left OB	Channel	Right OB
E.G. Elev (ft)	33.17		
Vel Head (ft)	0.43	0.050	0.045
W.S. Elev (ft)	32.74	1530.69	1205.25
Crit W.S. (ft)		2286.21	1995.35
E.G. Slope (ft/ft)	0.000409	2286.21	1995.35
Q Total (cfs)	19900.00	1624.38	1449.10
Top Width (ft)	4364.65	2312.74	1757.58
Vel Total (ft/s)	2.75	0.71	0.73
Max Chl Dpth (ft)	15.69	0.99	1.14
Conv. Total (cfs)	984584.8	80369.0	71696.4
Length Wtd. (ft)	2093.16	2312.88	1757.82
Min Ch El (ft)	17.05	0.03	0.03
Alpha	3.63	0.02	0.02
Frctn Loss (ft)	0.77	2156.63	3452.10
C & E Loss (ft)	0.03	1171.54	1119.66

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 7.42500*

INPUT
 Description: Interpolated Cross Section at River Mile 7.43
 Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
16594.87	52.9816611.85	52.6716802.75	49.7316891.41	48.7317061.14	46.79		
17156.93	46.4217335.38	45.6617413.19	45.817660.02	46.1917712.31	45.66		
17929.89	43.4217987.31	43.3518223.24	43.2418342.38	42.42 18546.7	41.05		
18669.59	40.84 19026.3	40.2919357.96	39.84 20082.4	38.6520363.13	38.23		
20498.7	38.4 20779.2	37.8621124.24	37.26 21126.2	37.2621189.51	37.35		
21414.42	38.1621469.69	38.3621775.61	36.0721826.86	35.7622096.59	34.35		
22220.45	34.322384.99	34.1422425.79	34.1222696.96	33.9722732.28	34.09		
22988.22	34.9823080.57	34.6723479.89	33.2323769.06	32.0623891.44	31.57		
24114.65	31.2724177.37	31.2424301.96	31.2924803.26	31.3225146.24	31.53		
25214.76	31.9825349.97	33.0125383.84	33.2125667.88	30.7925721.91	30.79		
25878.92	31.0625973.02	29.5625992.42	29.12 26062	29.1326203.47	29.86		
26328.8	28.4826350.54	28.3126391.08	29.4626460.39	31.0126475.96	31.38		
26483.33	31.4226494.81	31.65 26503	31.926531.98	32.5926544.79	31.5		
26549.01	31.09 26560	26.8126564.03	25.2426572.19	20.426574.36	19.94		
26581.39	18.5226587.24	18.0226591.41	17.5326593.27	17.3526600.77	17.21		
26603.97	17.126604.91	17.0726607.18	16.9826610.38	16.8526613.59	16.71		
26616.79	16.6326626.31	16.9226636.03	17.1126645.55	17.2126654.31	17.41		
26657.31	17.3826663.93	17.3326673.64	17.1626683.16	17.4626692.78	20.1		
26697.83	2226703.06	23.9726737.05	24.5926756.99	24.8726767.24	25.04		
26779.68	25.1726799.23	25.4626801.97	25.6226823.79	26.6226857.88	35.99		
26885.57	36.3226905.78	36.3526908.96	36.126941.16	33.5626990.91	32.94		
27042.92	35.32 27078.4	30.94 27135	26.94 27165.1	24.79 27217.1	27.42		
27416.1	28.7527580.35	3127609.44	31.4527828.72	31.1527880.39	31		
28062.1	30.9728147.92	30.9328450.53	30.0728506.22	30.7328515.24	30.84		
28858.62	30.14 28933.2	36.0528954.02	36.4529071.41	38.6929312.15	39.66		
29434.39	39.8229534.91	39.98 29812.6	40.89 29890.9	40.6530125.68	39.86		
30350.01	41.0230391.94	41.22 30709.9	44.5830807.14	43.8 30991.3	42.4		
31251.11	42.9931282.68	43.0631585.69	46.2 31732.4	47.3131876.68	48.38		
32169.13	48.8532170.86	48.8632463.83	49.9632639.76	50.332752.96	50.53		

33068.67	5333094.44	53.02	33331.7	53.233570.98	54.2433679.86	54.72
33941.04	55.2334025.81	54.7434069.18	54.4834156.37	52.634380.98	53.71	
34483.71	53.7634697.38	53.8934954.75	54.9534970.39	55.02	35229.7	56.68
35398.41	57.72					

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
16594.87	.0526549.01		.126564.03		.01626857.88		.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 26549.0126857.88 1530.69 2280.7 1205.25 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
026549.01	25.426857.8835398.41	27.66			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	32.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.050	0.024	0.044
W.S. Elev (ft)	32.05	Reach Len. (ft)	1530.69	2280.70	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	2762.03	2889.21	3331.03
E.G. Slope (ft/ft)	0.000329	Area (sq ft)	2762.03	2889.21	3331.03
Q Total (cfs)	19900.00	Flow (cfs)	1863.19	14977.94	3058.87
Top Width (ft)	4558.17	Top Width (ft)	2450.41	294.52	1813.24
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)	0.67	5.18	0.92
Max Chl Dpth (ft)	15.42	Hydr. Depth (ft)	1.13	9.81	1.84
Conv. Total (cfs)	1097615.0	Conv. (cfs)	102766.9	826131.3	168716.6
Length Wtd. (ft)	1945.15	Wetted Per. (ft)	2450.53	299.06	1813.53
Min Ch El (ft)	16.63	Shear (lb/sq ft)	0.02	0.20	0.04
Alpha	4.16	Stream Power (lb/ft s)	0.02	1.03	0.03
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	2067.94	2153.75	3378.41
C & E Loss (ft)	0.04	Cum SA (acres)	1087.85	198.42	1070.26

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 7.0

INPUT
 Description: Cross Section at River Mile 7.0

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17701.2	52.6	17911.1	49.2	18172	46.1	18448.9	45	18776.7	45.8
19049.2	43.1	19345.4	43	19672	40.7	22274.6	36.3	22340.5	36.4
22623.4	37.5	22932.3	35.1	23256.4	33.1	23547.6	32.8	23862.6	32.6
24156.7	33.7	25068.7	30.5	25357.4	30.3	26335.7	30.7	26575.6	32.3
26862.4	29.9	27075.5	30	27190.1	27.9	27403.2	29.1	27551.7	27.4
27734.9	32.3	27752.1	30.8	27765	24.7	27772	19.6	27779.9	17.6
27790.1	16.5	27800.1	16.4	27810.3	16.2	27820.3	16.5	27830.5	16.7
27840.5	16.8	27849.7	17	27859.8	16.9	27870	16.7	27880	17
27890.1	19.8	27900.9	23.9	27936.6	24.4	27968.3	24.7	28001.9	24.8
28027.7	26	28063.5	36	28112.5	36	28148.7	33	28199.6	32.3
28252.8	34.8	28289.1	30.1	28377.8	23.5	28431	26.3	28634.6	27.7
28832.4	30.5	29109.6	29.5	29383.3	29.3	29692.9	28.3	29759.1	29.1
30110.4	28.3	30186.7	34.6	30328.1	37.4	30574.4	38.4	30802.3	38.7
31086.4	39.6	31406.7	38.5	31679.1	40	32004.4	43.7	32292.3	41.4
32590.4	42.1	32900.4	45.4	33198.1	47.7	33497.3	48.2	33798.8	49.4
34094.6	50	34417.6	52.6	34686.7	52.8	35042.9	54.4	35310.1	54.9

35441.2 54.1 35530.4 52.1 35760.2 53.3 36083.9 53.5 36363.2 54.7
 36628.5 56.3 36801.1 57.3

Manning's n Values num= 9
 Sta n Val Sta n Val Sta n Val Sta n Val
 17701.2 .04 18448.9 .05 19672 .04 25068.7 .05 27752.1 .11
 27765 .016 28027.7 .11 28289.1 .05 28832.4 .04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 27752.1 28063.5 1574.27 2316.18 1729.73 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 17701.2 27734.9 27.11 28112.5 36801.1 27.11

CROSS SECTION OUTPUT Profile #Calibration

Element	Left OB	Channel	Right OB
E.G. Elev (ft)	31.56		
Vel Head (ft)	0.17	0.033	0.044
W.S. Elev (ft)	31.39	1574.27	1729.73
Crit W.S. (ft)		3410.59	4768.74
E.G. Slope (ft/ft)	0.000451	2822.98	4768.74
Q Total (cfs)	21500.00	2890.10	6543.49
Top Width (ft)	4812.08	2648.46	1868.72
Vel Total (ft/s)	1.95	0.85	1.37
Max Chl Dpth (ft)	15.19	1.29	2.55
Conv. Total (cfs)	1012731.0	136134.3	308222.8
Length Wtd. (ft)	2116.26	2648.58	1869.07
Min Ch El (ft)	16.20	0.04	0.07
Alpha	2.86	0.03	0.10
Frctn Loss (ft)	0.75	1959.49	3266.35
C & E Loss (ft)	0.04	998.27	1019.32

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 6.39818*

INPUT
 Description: Interpolated Cross Section at River Mile 6.40
 Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17637.45	49.9117832.37	46.8218074.65	4418331.79	42.9918636.19	43.72		
18889.24	41.26 19164.3	41.1719467.59	39.0721884.42	35.0521945.62	35.14		
22208.33	36.1322495.18	33.9522796.15	32.1323066.56	31.8523359.08	31.67		
23632.18	32.6624479.09	29.7524747.18	29.5625655.66	29.9225878.43	31.37		
26144.76	29.1826281.38	29.2426342.65	29.326449.07	27.4326646.96	28.61		
26784.86	27.1226954.99	31.6426970.96	30.2926976.04	2826979.83	26.26		
26981.96	25.3726985.41	23.9826985.52	23.9426985.62	23.88 26992.7	19.6		
26993.41	19.1826995.97	18.6426999.79	17.8627002.33	17.3127006.87	16.86		
27009.62	16.5327013.84	16.0427013.96	16.0327021.04	15.8527022.99	15.83		
27025.12	15.8127028.13	15.7727030.96	15.6327036.63	15.4727046.47	15.83		
27052.09	15.98 27056.5	16.0627066.33	16.1627067.55	16.1827075.38	16.38		
27083.01	16.3327085.31	16.3227095.34	16.1527098.46	16.2427105.18	16.5		
27113.92	18.9327115.11	19.2527125.73	23.2327129.38	23.327144.83	23.68		
27150.09	23.8727160.84	24.0227184.41	24.2527192.02	24.3227225.06	24.44		
27250.44	25.6 27253.8	26.5127267.71	30.3527285.64	35.4127314.13	35.32		
27326.05	35.3627334.08	35.3727338.25	35.0527369.86	32.4627380.78	32.3		
27420.17	31.7727472.76	34.1527508.64	29.67 27648.9	25.9127850.15	27.18		

28045.67	29.7328319.67	28.8228590.21	28.6428896.23	27.7328961.67	28.45
29308.91	27.7329384.33	33.45 29524.1	3629767.55	36.9129992.82	37.18
30273.64	3830590.24	37 30859.5	38.3631181.04	41.7331465.62	39.64
31760.27	40.27 32066.7	44.21 32109.7	44.5332153.43	44.9532203.52	45.93
32242.21	46.3232360.96	47.2832656.71	47.9332716.57	48.232954.73	49.12
33049.95	49.3133247.11	49.7333440.57	51.2733566.38	52.2533832.37	52.45
33877.7	52.6434143.36	53.834184.45	53.9834204.98	54.0334331.39	54.26
34448.57	54.4634457.39	54.4134578.16	53.7134666.33	51.8134842.59	52.72
34893.48	52.98 35155.3	53.1535213.44	53.1935469.59	54.2635489.52	54.37
35587	55.0235751.75	56.0335922.36	57.04		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 17637.45 .0526970.96 .01627285.64 .046

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 26970.9627285.64 1574.27 2316.18 1729.73 .1 .3

Blocked Obstructions num= 1
 Sta L Sta R Elev
 27285.6435922.36 26.51

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	30.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.050	0.016	0.046
W.S. Elev (ft)	30.25	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	2093.23	2682.44	3650.27
E.G. Slope (ft/ft)	0.000262	Area (sq ft)	2093.23	2682.44	3650.27
Q Total (cfs)	21500.00	Flow (cfs)	1140.00	17343.06	3016.94
Top Width (ft)	4394.91	Top Width (ft)	2260.49	296.29	1838.13
Vel Total (ft/s)	2.55	Avg. Vel. (ft/s)	0.54	6.47	0.83
Max Chl Dpth (ft)	14.78	Hydr. Depth (ft)	0.93	9.05	1.99
Conv. Total (cfs)	1327501.0	Conv. (cfs)	70388.1	1070834.0	186278.8
Length Wtd. (ft)	2191.61	Wetted Per. (ft)	2260.56	300.99	1838.33
Min Ch El (ft)	15.47	Shear (lb/sq ft)	0.02	0.15	0.03
Alpha	5.20	Stream Power (lb/ft s)	0.01	0.94	0.03
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)	1860.03	1857.85	3099.20
C & E Loss (ft)	0.01	Cum SA (acres)	909.56	167.28	945.72

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 5.79636*

INPUT

Description: Interpolated Cross Section at River Mile 5.80

Station Elevation Data num= 134									
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
17573.71 47.2217753.64 44.43 17977.3 41.8918214.67 40.9918495.68 41.63									
18729.28 39.42 18983.2 39.3319263.17 37.4421494.24 33.7921550.74 33.87									
21793.25 34.7722058.06 32.822335.89 31.1622585.52 30.922855.55 30.73									
23107.67 31.6323889.48 28.9924136.97 28.8224975.61 29.1325181.27 30.44									
25427.12 28.4725553.25 28.52 25609.8 28.625708.04 26.9725890.72 28.11									
26018.03 26.8426175.07 30.9926189.82 29.7726195.48 27.33 26199.7 25.44									
26202.07 24.5626205.91 23.2226206.03 23.1826206.14 23.1326214.03 19.15									
26214.83 18.7626217.68 18.2626221.93 17.5426224.76 17.0226229.81 16.55									
26232.87 16.1526237.58 15.5726237.71 15.56 26245.6 15.2626247.77 15.25									
26250.14 15.2326253.49 15.1826256.65 14.9626262.96 14.7426272.63 15.16									
26278.16 15.34 26282.5 15.4226292.16 15.5126293.36 15.5426301.06 15.75									

26308.56	15.7426310.83	15.7326320.69	15.5926323.75	15.6926330.36	16
26338.95	18.3926340.12	18.7126350.57	22.5626354.15	22.6526369.35	23.18
26374.51	23.4926385.09	23.6426408.26	23.8726415.74	23.9526448.22	24.07
26473.17	25.1926476.48	26.0626490.16	29.7926507.79	34.8126535.95	34.63
26547.73	34.7126555.66	34.7426559.78	34.4426591.02	31.9226601.81	31.75
26640.74	31.2426692.72	33.5126728.18	29.2326814.83	23.23 26866.8	25.52
27065.7	26.6627258.94	28.9527529.73	28.1427797.11	27.9728099.56	27.15
28164.23	27.8128507.42	27.1528581.96	32.31 28720.1	34.628960.71	35.42
29183.35	35.6629460.88	36.429773.79	35.5 30039.9	36.7330357.69	39.75
30638.94	37.8730930.15	38.4531232.99	43.01 31275.5	43.3231318.71	43.83
31368.22	45.3931406.46	45.8631523.82	46.8531816.11	47.6731875.28	47.96
32110.65	48.8532204.76	49.0332399.62	49.4732590.82	50.9732715.16	51.91
32978.04	52.0933022.84	52.28 33285.4	53.3833326.02	53.57 33346.3	53.61
33471.23	53.8433587.05	54.0233595.77	53.9733715.12	53.3233802.26	51.52
33976.46	52.4134026.75	52.6634285.52	52.8434342.98	52.8734596.14	53.92
34615.83	54.0334712.17	54.75 34875	55.7735043.62	56.78	

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 17573.71 .0526189.82 .01626507.79 .048

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 26189.8226507.79 1574.27 2316.18 1729.73 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 26507.7935043.62 25.93

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	30.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.050	0.016	0.048
W.S. Elev (ft)	29.72	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	2290.41	2724.39	3910.37
E.G. Slope (ft/ft)	0.000247	Area (sq ft)	2290.41	2724.39	3910.37
Q Total (cfs)	21500.00	Flow (cfs)	1192.08	17141.59	3166.33
Top Width (ft)	4373.80	Top Width (ft)	2253.29	299.99	1820.52
Vel Total (ft/s)	2.41	Avg. Vel. (ft/s)	0.52	6.29	0.81
Max Chl Dpth (ft)	14.98	Hydr. Depth (ft)	1.02	9.08	2.15
Conv. Total (cfs)	1368242.0	Conv. (cfs)	75862.8	1090876.0	201502.7
Length Wtd. (ft)	2186.66	Wetted Per. (ft)	2253.36	304.31	1820.77
Min Ch El (ft)	14.74	Shear (lb/sq ft)	0.02	0.14	0.03
Alpha	5.46	Stream Power (lb/ft s)	0.01	0.87	0.03
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	1780.82	1714.10	2949.08
C & E Loss (ft)	0.01	Cum SA (acres)	828.00	151.42	873.08

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 5.19454*

INPUT

Description: Interpolated Cross Section at River Mile 5.19

Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17509.96	44.5317674.92	42.0517879.95	39.7918097.56	38.9818355.17	39.55		
18569.32	37.5818802.09	37.519058.76	35.8121104.07	32.5421155.86	32.61		
21378.18	33.421620.94	31.6521875.64	30.1822104.48	29.9622352.03	29.8		
22583.15	30.5923299.87	28.2423526.75	28.0824295.57	28.35 24484.1	29.5		
24709.49	27.7524825.11	27.824876.96	27.8924967.02	26.525134.49	27.62		

25251.19	26.5525395.16	30.3325408.68	29.2625414.92	26.6625419.57	24.62
25422.18	23.7425426.41	22.4625426.55	22.4325426.67	22.3825435.37	18.69
25436.24	18.3425439.39	17.8725444.06	17.2325447.19	16.7225452.76	16.25
25456.13	15.7825461.31	15.1125461.46	15.125470.16	14.6825472.55	14.66
25475.17	14.6425478.86	14.625482.34	14.2925489.29	14.01 25498.8	14.49
25504.24	14.7125508.49	14.79 25518	14.8725519.17	14.8925526.74	15.13
25534.11	15.1625536.34	15.1525546.03	15.0425549.04	15.1425555.54	15.49
25563.98	17.8525565.14	18.16 25575.4	21.8925578.92	2225593.86	22.69
25598.94	23.1225609.33	23.26 25632.1	23.4925639.46	23.5725671.39	23.71
25695.91	24.7925699.16	25.62 25712.6	29.2425729.94	34.2225757.76	33.95
25769.4	34.0725777.24	34.1225781.31	33.8425812.18	31.3925822.85	31.2
25861.32	30.7225912.68	32.8625947.72	28.826033.35	23.0926084.71	25.13
26281.25	26.15 26472.2	28.18 26739.8	27.4527004.02	27.31 27302.9	26.58
27366.8	27.1627705.93	26.5827779.59	31.1627916.09	33.228153.86	33.93
28373.87	34.1528648.13	34.828957.33	34 29220.3	35.0929534.33	37.78
29812.26	36.1130100.03	36.6230399.29	41.8230441.29	42.11 30484	42.7
30532.92	44.84 30570.7	45.430686.68	46.4330975.52	47.431033.98	47.72
31266.57	48.5731359.58	48.7431552.13	49.231741.07	50.6731863.94	51.56
32123.72	51.7432167.99	51.9232427.44	52.9632467.57	53.1532487.62	53.2
32611.07	53.4232725.52	53.5932734.14	53.5432852.08	52.9332938.19	51.23
33110.34	52.0933160.03	52.3333415.74	52.5233472.52	52.5633722.69	53.57
33742.14	53.733837.35	54.4833998.25	55.534164.88	56.51	

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
17509.96 .0525408.68 .01625729.94 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
25408.6825729.94 1574.27 2316.18 1729.73 .1 .3
Blocked Obstructions num= 1
Sta L Sta R Elev
25729.9434164.88 25.34

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	29.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.	0.050	0.016	0.050
W.S. Elev (ft)	29.22	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	2522.53	2771.74	4075.03
E.G. Slope (ft/ft)	0.000233	Area (sq ft)	2522.53	2771.74	4075.03
Q Total (cfs)	21500.00	Flow (cfs)	1294.52	17021.05	3184.42
Top Width (ft)	4376.31	Top Width (ft)	2268.35	303.73	1804.23
Vel Total (ft/s)	2.29	Avg. Vel. (ft/s)	0.51	6.14	0.78
Max Chl Dpth (ft)	15.21	Hydr. Depth (ft)	1.11	9.13	2.26
Conv. Total (cfs)	1407402.0	Conv. (cfs)	84740.2	1114208.0	208454.1
Length Wtd. (ft)	2181.83	Wetted Per. (ft)	2268.41	307.78	1804.47
Min Ch El (ft)	14.01	Shear (lb/sq ft)	0.02	0.13	0.03
Alpha	5.69	Stream Power (lb/ft s)	0.01	0.81	0.03
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	1693.85	1567.98	2790.54
C & E Loss (ft)	0.01	Cum SA (acres)	746.29	135.37	801.11

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: 4.59272*

INPUT
Description: Interpolated Cross Section at River Mile 4.59
Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17446.22	41.8417596.19	39.66	17782.6	37.6817980.45	36.9718214.66	37.47			
18409.36	35.7418620.99	35.6618854.35	34.1920713.89	31.2820760.97	31.35				
20963.11	32.0321183.81	30.521415.38	29.2121623.44	29.0121848.51	28.87				
22058.64	29.5622710.26	27.4822916.54	27.3523615.53	27.5623786.93	28.57				
23991.85	27.0324096.97	27.0724144.11	27.1924225.99	26.0324378.25	27.13				
24484.35	26.2724615.25	29.6724627.54	28.7524634.36	25.9924639.44	23.79				
24642.29	22.9224646.92	21.724647.06	21.67 24647.2	21.63 24656.7	18.23				
24657.66	17.9224661.09	17.4924666.21	16.9224669.62	16.4324675.71	15.94				
24679.39	15.424685.05	14.6424685.21	14.6324694.71	14.0924697.33	14.07				
24700.19	14.0624704.22	14.0224708.02	13.6224715.63	13.2824724.97	13.82				
24730.31	14.0724734.49	14.1524743.83	14.2324744.99	14.2524752.42	14.51				
24759.67	14.5724761.85	14.5724771.38	14.4824774.34	14.5924780.71	14.99				
24789.01	17.3224790.15	17.6224800.23	21.2224803.69	21.3524818.37	22.19				
24823.36	22.7424833.57	22.8824855.95	23.1224863.18	23.1924894.55	23.35				
24918.65	24.3824921.84	25.1724935.05	28.6824952.08	33.6324979.57	33.27				
24991.07	33.4324998.82	33.4925002.84	33.2425033.35	30.8525043.88	30.65				
25081.89	30.1925132.64	32.2225167.26	28.3625251.87	22.9525302.61	24.74				
25496.8	25.6325685.47	27.4125949.87	26.7726210.93	26.6526506.23	26.01				
26569.37	26.5226904.45	26.0126977.22	30.0227112.09	31.827347.02	32.44				
27564.39	32.6327835.37	33.228140.88	32.5 28400.7	33.4528710.97	35.81				
28985.57	34.35 29269.9	34.7929565.59	40.6329607.09	40.929649.28	41.58				
29697.62	44.329734.95	44.9529849.54	4630134.92	47.1330192.69	47.48				
30422.5	48.2930514.39	48.4630704.64	48.9430891.32	50.3731012.72	51.21				
31269.39	51.3931313.13	51.5631569.48	52.5531609.13	52.7431628.94	52.78				
31750.92	53 31864	53.1531872.51	53.131989.04	52.5432074.12	50.94				
32244.21	51.7832293.31	52.0132545.96	52.2132602.06	52.2532849.24	53.22				
32868.46	53.3732962.53	54.2133121.51	55.2333286.14	56.25					

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 17446.22 .0524627.54 .01624952.08 .052

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 24627.5424952.08 1574.27 2316.18 1729.73 .1 .3

Blocked Obstructions num= 1
 Sta L Sta R Elev
 24952.0833286.14 25

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	29.18				
Vel Head (ft)	0.43	Wt. n-Val.	0.050	0.016	0.052
W.S. Elev (ft)	28.75	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	2840.94	2832.13	4268.64
E.G. Slope (ft/ft)	0.000216	Area (sq ft)	2840.94	2832.13	4268.64
Q Total (cfs)	21500.00	Flow (cfs)	1443.71	16853.70	3202.59
Top Width (ft)	4365.44	Top Width (ft)	2267.29	307.75	1790.40
Vel Total (ft/s)	2.16	Avg. Vel. (ft/s)	0.51	5.95	0.75
Max Chl Dpth (ft)	15.47	Hydr. Depth (ft)	1.25	9.20	2.38
Conv. Total (cfs)	1461313.0	Conv. (cfs)	98126.0	1145513.0	217673.8
Length Wtd. (ft)	2172.03	Wetted Per. (ft)	2267.34	311.60	1790.62
Min Ch El (ft)	13.28	Shear (lb/sq ft)	0.02	0.12	0.03
Alpha	5.96	Stream Power (lb/ft s)	0.01	0.73	0.02
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	1596.93	1419.00	2624.88
C & E Loss (ft)	0.02	Cum SA (acres)	664.33	119.12	729.74

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 3.99090*

INPUT

Description: Interpolated Cross Section at River Mile 3.99

Station Elevation Data		num= 134		Elev		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17382.47	39.1517517.46	37.2817685.25	35.5817863.33	34.9618074.15	35.38								
18249.4	33.918439.89	33.8318649.93	32.5620323.71	30.0320366.09	30.08								
20548.03	30.6720746.69	29.3420955.13	28.24 21142.4	28.0621344.98	27.94								
21534.12	28.5222120.65	26.7322306.32	26.6122935.48	26.7823089.77	27.64								
23274.21	26.3223368.83	26.3523411.26	26.4923484.96	25.5723622.01	26.63								
23717.51	25.9923835.33	29.02 23846.4	28.2323853.79	25.3223859.31	22.97								
23862.4	22.123867.42	20.9423867.58	20.9123867.72	20.8723878.03	17.77								
23879.07	17.5 23882.8	17.123888.34	16.623892.04	16.1423898.65	15.63								
23902.64	15.0323908.79	14.1823908.96	14.1623919.27	13.523922.11	13.49								
23925.21	13.4723929.58	13.4423933.71	12.9423941.96	12.5523951.13	13.15								
23956.38	13.4423960.49	13.5123969.66	13.58 23970.8	13.61 23978.1	13.89								
23985.22	13.9823987.37	13.9823996.72	13.9323999.63	14.0324005.89	14.49								
24014.04	16.7824015.16	17.0724025.07	20.5524028.46	20.724042.88	21.7								
24047.79	22.3624057.82	22.5 24079.8	22.7424086.89	22.8124117.72	22.98								
24141.39	23.9824144.53	24.72 24157.5	28.1224174.23	33.0424201.38	32.59								
24212.75	32.78 24220.4	32.8624224.38	32.6324254.51	30.3124264.91	30.1								
24302.47	29.66 24352.6	31.57 24386.8	27.9324470.38	22.8224520.51	24.35								
24712.36	25.1124898.74	26.6425159.94	26.0925417.83	25.9825709.56	25.44								
25771.94	25.8726102.96	25.4426174.85	28.8726308.09	30.426540.17	30.95								
26754.91	31.1127022.61	31.627324.42	3127581.09	31.8227887.62	33.84								
28158.89	32.5828439.78	32.9628731.89	39.4428772.88	39.6928814.56	40.46								
28862.32	43.76 28899.2	44.49 29012.4	45.5829294.33	46.8729351.39	47.24								
29578.42	48.01 29669.2	48.1729857.15	48.6730041.57	50.07 30161.5	50.87								
30415.06	51.0430458.27	51.230711.52	52.1330750.69	52.3230770.26	52.37								
30890.76	52.5831002.47	52.7131010.88	52.67 31126	52.1531210.05	50.65								
31378.08	51.4731426.59	51.6931676.18	51.89 31731.6	51.9431975.79	52.87								
31994.78	53.03 32087.7	53.9432244.76	54.97 32407.4	55.99									

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
17382.47	.05	23846.4	.01624174.23		.053		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	23846.424174.23		1574.27	2316.18	1729.73		.1		.3

Blocked Obstructions		num= 1		Sta		Elev	
Sta L	Sta R	Sta	Elev	Sta	Elev	Sta	Elev
24174.23	32407.4		24.6				

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.050	0.016	0.053
W.S. Elev (ft)	28.35	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	3393.15	2914.24	4587.24
E.G. Slope (ft/ft)	0.000190	Area (sq ft)	3393.15	2914.24	4587.24
Q Total (cfs)	21500.00	Flow (cfs)	1746.70	16422.26	3331.05
Top Width (ft)	4854.94	Top Width (ft)	2762.09	311.87	1780.98
Vel Total (ft/s)	1.97	Avg. Vel. (ft/s)	0.51	5.64	0.73
Max Chl Dpth (ft)	15.80	Hydr. Depth (ft)	1.23	9.34	2.58
Conv. Total (cfs)	1559640.0	Conv. (cfs)	126708.0	1191293.0	241638.7
Length Wtd. (ft)	2156.85	Wetted Per. (ft)	2762.15	315.57	1781.18
Min Ch El (ft)	12.55	Shear (lb/sq ft)	0.01	0.11	0.03
Alpha	6.25	Stream Power (lb/ft s)	0.01	0.62	0.02

Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	1484.28	1266.22	2449.05
C & E Loss (ft)	0.02	Cum SA (acres)	573.45	102.64	658.83

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 3.38909*

INPUT

Description: Interpolated Cross Section at River Mile 3.39

Station Elevation Data		num= 134		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17318.73	36.4517438.74	34.9	17587.9	33.4717746.22	32.9617933.64	33.3			
18089.44	32.0618258.79	31.9918445.52	30.9319933.54	28.7819971.21	28.82				
20132.96	29.320309.57	28.1920494.87	27.2720661.36	27.1120841.46	27				
21009.61	27.4921531.04	25.98 21696.1	25.8722255.44	25.99 22392.6	26.71				
22556.58	25.622640.69	25.6222678.41	25.7922743.94	25.122865.77	26.14				
22950.68	25.7123055.42	28.3623065.26	27.7223073.23	24.6423079.18	22.15				
23082.51	21.2923087.92	20.1823088.09	20.1523088.25	20.1223099.37	17.32				
23100.49	17.08 23104.5	16.7223110.48	16.2923114.47	15.85 23121.6	15.32				
23125.9	14.6523132.53	13.7223132.71	13.723143.83	12.9123146.88	12.9				
23150.23	12.8923154.95	12.85 23159.4	12.2723168.29	11.83 23177.3	12.47				
23182.45	12.823186.49	12.8723195.49	12.9423196.61	12.9623203.78	13.26				
23210.77	13.3923212.88	13.423222.07	13.3723224.92	13.4823231.07	13.99				
23239.08	16.2423240.17	16.53 23249.9	19.8923253.24	20.05 23267.4	21.2				
23272.21	21.9823282.06	22.1323303.64	22.3623310.61	22.4423340.88	22.62				
23364.12	23.5723367.21	24.2723379.95	27.5623396.37	32.44 23423.2	31.9				
23434.42	32.1423441.98	32.2323445.91	32.0323475.67	29.7723485.95	29.55				
23523.04	29.1323572.56	30.9323606.34	27.49 23688.9	22.6823738.41	23.95				
23927.91	24.5924112.01	25.86 24370	25.4124624.74	25.3224912.89	24.86				
24974.51	25.2325301.47	24.8625372.48	27.7325504.09	2925733.32	29.45				
25945.44	29.5926209.85	3026507.96	29.526761.49	30.1827064.26	31.86				
27332.21	30.8227609.66	31.1427898.18	38.2427938.68	38.4827979.85	39.33				
28027.02	43.2228063.44	44.0428175.26	45.1528453.73	46.6 28510.1	47				
28734.35	47.7428824.01	47.8929009.65	48.4129191.81	49.7729310.28	50.52				
29560.73	50.6829603.42	50.8429853.56	51.7129892.25	51.9129911.58	51.96				
30030.6	52.1630140.95	52.2730149.25	52.2330262.96	51.7730345.98	50.37				
30511.95	51.1530559.86	51.37 30806.4	51.5830861.14	51.6231102.33	52.52				
31121.09	52.731212.88	53.6731368.01	54.731528.65	55.73					

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
17318.73	.0523065.26	.01623396.37	.055		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	23065.26	23396.37		1574.27	2316.18	1729.73	.1	.3	

Blocked Obstructions		num= 1		Sta L Sta R Elev	
Sta L	Sta R	Elev			
23396.37	31528.65	24.2			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.050	0.016	0.055
W.S. Elev (ft)	28.01	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	4215.05	3016.96	5021.84
E.G. Slope (ft/ft)	0.000162	Area (sq ft)	4215.05	3016.96	5021.84
Q Total (cfs)	21500.00	Flow (cfs)	2148.71	15927.69	3423.61
Top Width (ft)	4815.06	Top Width (ft)	2699.10	316.19	1799.77

Vel Total (ft/s)	1.75	Avg. Vel. (ft/s)	0.51	5.28	0.68
Max Chl Dpth (ft)	16.18	Hydr. Depth (ft)	1.56	9.54	2.79
Conv. Total (cfs)	1688562.0	Conv. (cfs)	168754.5	1250925.0	268882.6
Length Wtd. (ft)	2138.46	Wetted Per. (ft)	2699.16	319.81	1799.95
Min Ch El (ft)	11.83	Shear (lb/sq ft)	0.02	0.10	0.03
Alpha	6.74	Stream Power (lb/ft s)	0.01	0.50	0.02
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	1346.80	1108.53	2258.26
C & E Loss (ft)	0.02	Cum SA (acres)	474.76	85.95	587.74

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 2.78727*

INPUT
 Description: Interpolated Cross Section at River Mile 2.79
 Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17254.98	33.7617360.01	32.5117490.55	31.3717629.11	30.9517793.13	31.22				
17929.47	30.2218077.69	30.16 18241.1	29.319543.36	27.5219576.33	27.56				
19717.89	27.9419872.45	27.0420034.62	26.2920180.32	26.1620337.94	26.07				
20485.1	26.4520941.43	25.2221085.89	25.1321575.39	25.2121695.43	25.78				
21838.94	24.8821912.55	24.921945.57	25.0922002.91	24.6322109.54	25.64				
22183.84	25.4322275.51	27.722284.12	27.222292.67	23.9722299.04	21.33				
22302.62	20.4722308.43	19.4222308.61	19.4222308.78	19.37 22320.7	16.86				
22321.9	16.6622326.21	16.3322332.62	15.97 22336.9	15.5522344.54	15.02				
22349.16	14.2822356.27	13.2522356.46	13.2322368.39	12.3322371.66	12.32				
22375.25	12.322380.31	12.2722385.08	11.622394.62	11.122403.47	11.8				
22408.52	12.1722412.48	12.2322421.33	12.2922422.42	12.3222429.46	12.64				
22436.32	12.822438.39	12.8122447.41	12.8222450.21	12.9322456.25	13.49				
22464.11	15.7122465.19	15.9822474.74	19.2222478.01	19.422491.91	20.71				
22496.63	21.61 22506.3	21.7522527.49	21.9822534.33	22.0622564.04	22.25				
22586.86	23.1722589.89	23.8322602.39	27.0122618.52	31.8522645.01	31.22				
22656.1	31.4922663.56	31.622667.44	31.4222696.83	29.2322706.98	29				
22743.62	28.622792.52	30.2822825.88	27.0622907.41	22.5522956.32	23.56				
23143.46	24.0723325.27	25.0923580.07	24.7323831.65	24.6524116.22	24.29				
24177.07	24.5824499.98	24.2924570.11	26.5824700.09	27.624926.48	27.96				
25135.96	28.07 25397.1	28.425691.51	2825941.89	28.55 26240.9	29.89				
26505.53	29.0526779.53	29.3127064.48	37.0527104.47	37.2727145.13	38.21				
27191.71	42.6827227.69	43.5827338.12	44.7327613.14	46.3427668.81	46.76				
27890.27	47.4627978.82	47.6128162.16	48.1428342.06	49.4728459.06	50.18				
28706.41	50.3328748.56	50.48 28995.6	51.329033.81	51.49 29052.9	51.54				
29170.45	51.7429279.42	51.8329287.62	51.7929399.92	51.3829481.91	50.08				
29645.82	50.8429693.14	51.0529936.62	51.2729990.68	51.3130228.88	52.17				
30247.4	52.3630338.05	53.430491.26	54.4430649.91	55.47					

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	
17254.98 .0522284.12	.01622618.52	.057

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
22284.1222618.52	1574.27	2316.18	1729.73		.1	.3
Blocked Obstructions	num=	1				
Sta L Sta R Elev						
22618.5230649.91	23.8					

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.00	Element	Left OB	Channel	Right OB
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Vel Head (ft)	0.26	Wt. n-Val.	0.050	0.016	0.057
W.S. Elev (ft)	27.73	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	5057.06	3144.30	5647.78
E.G. Slope (ft/ft)	0.000133	Area (sq ft)	5057.06	3144.30	5647.78
Q Total (cfs)	21500.00	Flow (cfs)	2729.41	15334.60	3435.98
Top Width (ft)	5072.59	Top Width (ft)	2786.03	320.69	1965.87
Vel Total (ft/s)	1.55	Avg. Vel. (ft/s)	0.54	4.88	0.61
Max Chl Dpth (ft)	16.63	Hydr. Depth (ft)	1.82	9.80	2.87
Conv. Total (cfs)	1861697.0	Conv. (cfs)	236341.5	1327832.0	297523.7
Length Wtd. (ft)	2044.43	Wetted Per. (ft)	2786.09	324.27	1966.04
Min Ch El (ft)	11.10	Shear (lb/sq ft)	0.02	0.08	0.02
Alpha	7.08	Stream Power (lb/ft s)	0.01	0.39	0.01
Frctn Loss (ft)	0.89	Cum Volume (acre-ft)	1179.25	944.73	2046.42
C & E Loss (ft)	0.05	Cum SA (acres)	375.65	69.01	512.98

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: Judy Creek
REACH: Lower Judy Creek RS: 2.18545*

INPUT

Description: Interpolated Cross Section at River Mile 2.19

Station Elevation Data		num= 134							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17191.24	31.0717281.28	30.1317393.21	29.2617511.99	28.9417652.62	29.13				
17769.51	28.3817896.58	28.3318036.69	27.6719153.18	26.2719181.45	26.29				
19302.81	26.5719435.33	25.8919574.36	25.3219699.29	25.2219834.42	25.14				
19960.58	25.4120351.82	24.4720475.67	24.3920895.35	24.4320998.27	24.84				
21121.3	24.1721184.42	24.1721212.72	24.3921261.88	24.17 21353.3	25.15				
21417	25.15 21495.6	27.0521502.97	26.6921512.11	23.321518.91	20.51				
21522.73	19.6521528.93	18.6521529.12	18.64 21529.3	18.6221542.03	16.4				
21543.31	16.2421547.91	15.9521554.76	15.6621559.33	15.2621567.48	14.71				
21572.42	13.9 21580	12.7921580.22	12.7621592.95	11.7421596.44	11.73				
21600.28	11.7121605.68	11.6921610.77	10.9321620.96	10.3721629.63	11.13				
21634.6	11.5321638.48	11.5921647.16	11.6521648.23	11.6721655.14	12.02				
21661.87	12.2121663.91	12.2321672.76	12.26 21675.5	12.3821681.43	12.99				
21689.14	15.17 21690.2	15.4421699.57	18.5521702.78	18.7521716.42	20.21				
21721.06	21.2321730.55	21.3721751.34	21.621758.05	21.6821787.21	21.89				
21809.6	22.7621812.57	23.3821824.84	26.4521840.66	31.2621866.82	30.54				
21877.77	30.8521885.14	30.9721888.97	30.8221917.99	28.6921928.02	28.45				
21964.19	28.0722012.48	29.6422045.43	26.6222125.93	22.4122174.22	23.17				
22359.01	23.5522538.54	24.3222790.13	24.0523038.55	23.9923319.56	23.72				
23379.64	23.9423698.49	23.7223767.74	25.4423896.08	26.224119.63	26.47				
24326.48	26.5524584.34	26.824875.05	26.525122.29	26.9125417.54	27.92				
25678.85	27.2925949.41	27.4826230.78	35.8626270.27	36.0726310.42	37.08				
26356.41	42.1426391.94	43.1326500.98	44.326772.54	46.0726827.51	46.52				
27046.2	47.1827133.63	47.3227314.67	47.8827492.31	49.1627607.84	49.83				
27852.08	49.98 27893.7	50.1128137.64	50.8828175.37	51.0828194.22	51.13				
28310.29	51.32 28417.9	51.39 28426	51.3628536.88	50.9928617.85	49.79				
28779.7	50.5328826.42	50.7329066.83	50.9529120.22	5129355.43	51.83				
29373.72	52.0329463.23	53.1329614.51	54.1729771.17	55.21					

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
17191.24	.0521502.97	.01621518.91	.059		

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

21502.9721840.66 1574.27 2316.18 1729.73 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 21840.6629771.17 22.9

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	27.06				
Vel Head (ft)	0.08	Wt. n-Val.	0.050	0.057	0.059
W.S. Elev (ft)	26.98	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	4780.43	3118.39	5924.35
E.G. Slope (ft/ft)	0.000738	Area (sq ft)	4780.43	3118.39	5924.35
Q Total (cfs)	21500.00	Flow (cfs)	5373.64	9888.18	6238.18
Top Width (ft)	6339.22	Top Width (ft)	2913.65	323.62	3101.95
Vel Total (ft/s)	1.56	Avg. Vel. (ft/s)	1.12	3.17	1.05
Max Chl Dpth (ft)	16.61	Hydr. Depth (ft)	1.64	9.64	1.91
Conv. Total (cfs)	791569.9	Conv. (cfs)	197842.5	364055.2	229672.2
Length Wtd. (ft)	2086.57	Wetted Per. (ft)	2913.70	327.14	3102.09
Min Ch El (ft)	10.37	Shear (lb/sq ft)	0.08	0.44	0.09
Alpha	2.18	Stream Power (lb/ft s)	0.08	1.39	0.09
Frctn Loss (ft)	1.04	Cum Volume (acre-ft)	1001.48	778.23	1816.66
C & E Loss (ft)	0.04	Cum SA (acres)	272.65	51.88	412.36

Warning: Divided flow computed for this cross-section.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 1.58363*

INPUT
 Description: Interpolated Cross Section at River Mile 1.58
 Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17127.49	28.3817202.55	27.7517295.86	27.1617394.88	26.9317512.11	27.05				
17609.55	26.5417715.48	26.4917832.28	26.04 18763	25.0218786.57	25.03				
18887.74	25.218998.21	24.7419114.11	24.3519218.24	24.2719330.89	24.2				
19436.07	24.3819762.21	23.7219865.46	23.6520215.31	23.64 20301.1	23.91				
20403.66	23.4520456.28	23.4520479.87	23.6820520.85	23.720597.06	24.66				
20650.17	24.8620715.68	26.3920721.83	26.1820731.54	22.6320738.78	19.68				
20742.84	18.8320749.43	17.8920749.64	17.8820749.83	17.8620763.36	15.94				
20764.73	15.8220769.62	15.56 20776.9	15.3520781.76	14.9720790.43	14.4				
20795.68	13.5320803.74	12.3320803.97	12.29 20817.5	11.1520821.22	11.14				
20825.3	11.1320831.04	11.1120836.46	10.2620847.29	9.64 20855.8	10.46				
20860.67	10.920864.48	10.9620872.99	11.0120874.05	11.0320880.82	11.4				
20887.43	11.6220889.42	11.65 20898.1	11.71 20900.8	11.8220906.61	12.48				
20914.18	14.6320915.21	14.89 20924.4	17.8820927.55	18.120940.94	19.72				
20945.48	20.8520954.79	20.9920975.19	21.2320981.77	21.321010.37	21.53				
21032.34	22.3621035.25	22.9321047.29	25.8921062.81	30.6721088.63	29.86				
21099.44	30.2121106.72	30.35 21110.5	30.2221139.16	28.1621149.05	27.9				
21184.76	27.5521232.44	28.9921264.97	26.1921344.45	22.2721392.12	22.78				
21574.56	23.0421751.81	23.55 22000.2	23.3622245.46	23.3322522.89	23.15				
22582.21	23.29 22897	23.1522965.38	24.2923092.08	24.823312.79	24.98				
23517	25.0423771.58	25.2 24058.6	25.24302.69	25.2724594.19	25.95				
24852.17	25.5325119.29	25.6525397.08	34.6725436.06	34.86 25475.7	35.96				
25521.11	41.5925556.19	42.6725663.84	43.8825931.95	45.825986.22	46.28				

26202.12	46.926288.45	47.0426467.18	47.6126642.56	48.8626756.62	49.48
26997.75	49.6327038.85	49.7527279.68	50.4627316.93	50.6627335.54	50.72
27450.13	50.927556.37	50.9627564.37	50.9227673.85	50.627753.78	49.5
27913.57	50.22 27959.7	50.428197.05	50.6428249.76	50.6928481.98	51.48
28500.04	51.728588.41	52.8628737.77	53.928892.43	54.94	

Manning's n Values num= 3
 Sta n Val Sta n Val
 17127.49 .0520721.83 .01621062.81 .061

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 20721.8321062.81 1574.27 2316.18 1729.73 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.050	0.016	0.061
W.S. Elev (ft)	25.45	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	2615.77	2837.46	4252.82
E.G. Slope (ft/ft)	0.000261	Area (sq ft)	2615.77	2837.46	4252.82
Q Total (cfs)	21500.00	Flow (cfs)	1368.21	18063.74	2068.05
Top Width (ft)	5722.51	Top Width (ft)	2302.20	321.65	3098.66
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)	0.52	6.37	0.49
Max Chl Dpth (ft)	15.81	Hydr. Depth (ft)	1.14	8.82	1.37
Conv. Total (cfs)	1330084.0	Conv. (cfs)	84643.5	1117501.0	127938.7
Length Wtd. (ft)	2184.96	Wetted Per. (ft)	2302.22	324.91	3098.75
Min Ch El (ft)	9.64	Shear (lb/sq ft)	0.02	0.14	0.02
Alpha	6.95	Stream Power (lb/ft s)	0.01	0.91	0.01
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	867.83	619.89	1614.60
C & E Loss (ft)	0.05	Cum SA (acres)	178.40	34.73	289.25

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: .981819*

INPUT

Description: Interpolated Cross Section at River Mile 0.98

Station Elevation Data		num= 134							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17063.75	25.6917123.83	25.3617198.51	25.0517277.77	24.9317371.59	24.97				
17449.59	24.717534.38	24.6617627.86	24.4218372.82	23.7618391.69	23.77				
18472.67	23.8418561.08	23.5918653.85	23.3818737.21	23.3218827.37	23.27				
18911.55	23.34 19172.6	22.9619255.24	22.9219535.27	22.8619603.93	22.98				
19686.03	22.7319728.14	22.7219747.02	22.9819779.83	23.2319840.82	24.16				
19883.33	24.5819935.77	25.7319940.69	25.6619950.98	21.9619958.65	18.86				
19962.95	18.0219969.94	17.1319970.15	17.1219970.36	17.11 19984.7	15.49				
19986.14	15.419991.32	15.1819999.04	15.0320004.19	14.6820013.38	14.1				
20018.93	13.1520027.48	11.8620027.72	11.8320042.06	10.57 20046	10.56				
20050.32	10.5420056.41	10.5220062.14	9.5920073.62	8.9120081.96	9.79				
20086.74	10.2620090.48	10.3220098.82	10.3620099.86	10.38 20106.5	10.77				
20112.98	11.0320114.93	11.0620123.45	11.1520126.09	11.2720131.79	11.98				
20139.21	14.120140.22	14.3420149.24	17.2120152.33	17.4520165.45	19.22				
20169.91	20.4820179.04	20.6120199.03	20.8520205.49	20.9320233.54	21.16				
20255.07	21.9520257.93	22.4920269.73	25.3420284.96	30.0720310.45	29.17				
20321.12	29.56 20328.3	29.7220332.03	29.6120360.32	27.6220370.09	27.35				
20405.34	27.02 20452.4	28.3520484.51	25.7520562.96	22.1420610.02	22.39				
20790.11	22.5220965.08	22.7721210.27	22.6821452.37	22.6621726.22	22.57				
21784.78	22.6522095.51	22.57 22163	23.1522288.08	23.422505.94	23.49				

22707.53	23.5222958.82	23.623242.14	23.523483.09	23.6423770.83	23.97
24025.49	23.7624289.16	23.8324563.37	33.4724601.86	33.6524640.99	34.83
24685.81	41.0524720.43	42.22 24826.7	43.4525091.36	45.5425144.93	46.04
25358.04	46.6325443.26	46.7525619.69	47.3525792.81	48.5625905.39	49.14
26143.42	49.2726183.99	49.3926421.72	50.0526458.49	50.2526476.86	50.3
26589.98	50.4826694.84	50.5226702.74	50.49 26810.8	50.2126889.71	49.21
27047.44	49.927092.97	50.0827327.27	50.32 27379.3	50.3727608.52	51.13
27626.35	51.3627713.58	52.5927861.02	53.6428013.69	54.68	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
17063.75	.0519940.69	.01620284.96	.063		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	19940.69	20284.96		1574.28	2316.18	1729.73	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.050	0.016	0.063
W.S. Elev (ft)	25.07	Reach Len. (ft)	1574.28	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	3647.29	2931.12	7116.89
E.G. Slope (ft/ft)	0.000191	Area (sq ft)	3647.29	2931.12	7116.89
Q Total (cfs)	21500.00	Flow (cfs)	1826.26	16161.45	3512.29
Top Width (ft)	6864.85	Top Width (ft)	2713.18	326.31	3825.35
Vel Total (ft/s)	1.57	Avg. Vel. (ft/s)	0.50	5.51	0.49
Max Chl Dpth (ft)	16.16	Hydr. Depth (ft)	1.34	8.98	1.86
Conv. Total (cfs)	1554287.0	Conv. (cfs)	132024.4	1168350.0	253912.2
Length Wtd. (ft)	2117.74	Wetted Per. (ft)	2713.20	329.64	3825.45
Min Ch El (ft)	8.91	Shear (lb/sq ft)	0.02	0.11	0.02
Alpha	9.30	Stream Power (lb/ft s)	0.01	0.59	0.01
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	754.66	466.52	1388.86
C & E Loss (ft)	0.05	Cum SA (acres)	87.77	17.50	151.77

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 0.38

INPUT
 Description: Interpolated Cross Section at River Mile 0.38
 Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17000	23	19000	2219159.55	25.1519170.42	21.2919178.52	18.04			
19183.06	17.219190.44	16.3719190.88	16.3619206.03	15.0319213.03	14.79				
19221.18	14.7219236.32	13.7919242.19	12.7819251.47	11.3619266.62	9.98				
19270.78	9.9719281.77	9.9419287.83	8.9219299.95	8.1819308.13	9.12				
19312.81	9.6319316.48	9.6819324.66	9.7219325.67	9.7419332.18	10.15				
19338.53	10.4419340.45	10.4819348.79	10.619351.38	10.7219356.97	11.48				
19364.24	13.5619365.24	13.819374.07	16.54 19377.1	16.819389.96	18.73				
19394.33	20.119403.28	20.2319422.88	20.4719429.21	20.55 19456.7	20.8				
19477.81	21.5519480.61	22.0419492.18	24.78 19507.1	29.4819532.26	28.49				
19542.79	28.9219549.88	29.0919553.56	29.0119581.48	27.0819591.12	26.8				
19625.91	26.4919672.36	27.719704.05	25.3219781.48	2223459.04	22				
23729.67	32.2823767.65	32.4423806.27	33.7123850.51	40.5123884.68	41.76				
23989.56	43.0324250.76	45.2724303.63	45.824513.97	46.3524598.07	46.47				
24772.2	47.0824943.06	48.2625054.18	48.79 25289.1	48.9225329.13	49.03				
25563.76	49.6325600.05	49.8325618.18	49.8925729.82	50.0625833.32	50.08				
25841.11	50.0525947.77	49.8226025.64	48.9226181.31	49.5926226.25	49.76				

26457.49 50.0126508.84 50.0626735.07 50.7826752.67 51.0326838.76 52.32
 26984.27 53.3727134.95 54.42

Manning's n Values num= 3
 Sta n Val Sta n Val
 17000 .0519159.55 .016 19507.1 .065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 19159.55 19507.1 0 0 0 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	25.05		0.050	0.016	0.065
Vel Head (ft)	0.20	Wt. n-Val.			
W.S. Elev (ft)	24.85	Reach Len. (ft)	3694.00	3694.00	3694.00
Crit W.S. (ft)		Flow Area (sq ft)	4896.38	3074.39	10666.07
E.G. Slope (ft/ft)	0.000124	Area (sq ft)	4896.38	3074.39	10666.07
Q Total (cfs)	22100.00	Flow (cfs)	2806.10	13913.27	5380.63
Top Width (ft)	6294.96	Top Width (ft)	2144.14	331.98	3818.84
Vel Total (ft/s)	1.19	Avg. Vel. (ft/s)	0.57	4.53	0.50
Max Chl Dpth (ft)	16.67	Hydr. Depth (ft)	2.28	9.26	2.79
Conv. Total (cfs)	1986180.0	Conv. (cfs)	252191.1	1250419.0	483570.1
Length Wtd. (ft)	3694.00	Wetted Per. (ft)	2146.01	335.45	3818.96
Min Ch El (ft)	8.18	Shear (lb/sq ft)	0.02	0.07	0.02
Alpha	9.24	Stream Power (lb/ft s)	0.01	0.32	0.01
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	600.27	306.86	1035.79
C & E Loss (ft)	0.02	Cum SA (acres)			

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.

SUMMARY OF MANNING'S N VALUES

River: Fish Creek

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9	n10	n11	n12	n13	n14	n15
Upper Fish Creek	43.3	.04	.016	.07	.04											
Upper Fish Creek	42.3916*	.04	.016	.07	.042											
Upper Fish Creek	41.4833*	.041	.016	.07	.043											
Upper Fish Creek	40.575*	.041	.016	.07	.043											
Upper Fish Creek	39.6666*	.042	.016	.07	.044											
Upper Fish Creek	38.7583*	.042	.016	.07	.045											
Upper Fish Creek	37.85*	.043	.016	.046												
Upper Fish Creek	36.9416*	.043	.016	.046												
Upper Fish Creek	36.0333*	.043	.016	.047												
Upper Fish Creek	35.125*	.044	.016	.048												
Upper Fish Creek	34.2166*	.044	.016	.048												
Upper Fish Creek	33.3083*	.045	.016	.049												
Upper Fish Creek	32.4	.04	.055	.07	.016	.05	.04	.05	.04							
Upper Fish Creek	31.6071*	.047	.07	.016	.055											
Upper Fish Creek	30.8142*	.05	.07	.016	.054											
Upper Fish Creek	30.0214*	.052	.07	.016	.057											
Upper Fish Creek	29.2285*	.054	.07	.016	.059											
Upper Fish Creek	28.4357*	.056	.07	.016	.061											
Upper Fish Creek	27.6428*	.059	.07	.016	.063											
Upper Fish Creek	26.85	.061	.016	.065												
Lower Fish Creek	26.09	.063	.07	.016	.067											
Lower Fish Creek	25.1	.05	.04	.05	.04	.05	.04	.07	.04	.05	.07	.016	.07	.04	.06	.04

Lower Fish Creek	24.2625*	.064	.08	.016	.068																
Lower Fish Creek	23.425*	.062	.08	.016	.066																
Lower Fish Creek	22.5875*	.06	.08	.016	.064																
Lower Fish Creek	21.75*	.058	.09	.016	.063																
Lower Fish Creek	20.9125*	.056	.1	.016	.061																
Lower Fish Creek	20.075*	.054	.1	.016	.059																
Lower Fish Creek	19.2375*	.052	.1	.016	.057																
Lower Fish Creek	18.4	.05	.07	.016	.05	.11	.014	.07	.06	.07	.05										
Lower Fish Creek	17.5714*	.054	.11	.016	.055																
Lower Fish Creek	16.7428*	.053	.11	.016	.064																
Lower Fish Creek	15.9142*	.052	.11	.016	.069																
Lower Fish Creek	15.0857*	.051	.11	.016	.073																
Lower Fish Creek	14.2571*	.049	.11	.016	.078																
Lower Fish Creek	13.4285*	.048	.11	.016	.082																
Lower Fish Creek	12.6	.06	.04	.06	.04	.05	.11	.016	.11	.07	.06	.04	.11								
Lower Fish Creek	11.7	.11	.045	.05	.045	.09	.11	.03	.09	.05	.03	.04	.11	.09	.06	.04	.11				
Lower Fish Creek	10.8538*	.062	.107	.031	.061	.031	.079														
Lower Fish Creek	10.0076*	.063	.105	.034	.062	.034	.079														
Lower Fish Creek	9.16153*	.065	.102	.038	.063	.038	.08														
Lower Fish Creek	8.31538*	.066	.099	.041	.064	.041	.08														
Lower Fish Creek	7.46923*	.068	.097	.044	.065	.044	.081														
Lower Fish Creek	6.62307*	.069	.094	.047	.066	.047	.081														
Lower Fish Creek	5.77692*	.071	.091	.051	.068	.051	.082														
Lower Fish Creek	4.93076*	.072	.088	.054	.069	.054	.082														
Lower Fish Creek	4.08461*	.074	.086	.057	.07	.057	.083														
Lower Fish Creek	3.23846*	.075	.083	.06	.071	.06	.083														
Lower Fish Creek	2.39230*	.077	.08	.064	.072	.064	.084														
Lower Fish Creek	1.54615*	.078	.078	.067	.073	.067	.084														
Lower Fish Creek	0.7	.085	.075	.07	.075	.07	.075	.07	.075	.07	.085										

River:Judy Creek

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9
Lower Judy Creek	13.8	.05	.04	.05	.06	.016	.06	.04		
Lower Judy Creek	13.375*	.05	.016	.05						
Lower Judy Creek	12.95*	.05	.016	.0049						
Lower Judy Creek	12.525*	.05	.016	.049						
Lower Judy Creek	12.1*	.05	.03	.016	.049					
Lower Judy Creek	11.675*	.05	.03	.016	.048					
Lower Judy Creek	11.25*	.05	.04	.016	.048					
Lower Judy Creek	10.825*	.05	.05	.016	.047					
Lower Judy Creek	10.4*	.05	.06	.016	.047					
Lower Judy Creek	9.975*	.05	.06	.016	.047					
Lower Judy Creek	9.55000*	.05	.07	.016	.046					
Lower Judy Creek	9.12500*	.05	.08	.016	.046					
Lower Judy Creek	8.70000*	.05	.08	.016	.046					
Lower Judy Creek	8.27500*	.05	.09	.016	.045					
Lower Judy Creek	7.85000*	.05	.1	.016	.045					
Lower Judy Creek	7.42500*	.05	.1	.016	.044					
Lower Judy Creek	7.0	.04	.05	.04	.05	.11	.016	.11	.05	.04
Lower Judy Creek	6.39818*	.05	.016	.046						
Lower Judy Creek	5.79636*	.05	.016	.048						
Lower Judy Creek	5.19454*	.05	.016	.05						
Lower Judy Creek	4.59272*	.05	.016	.052						
Lower Judy Creek	3.99090*	.05	.016	.053						
Lower Judy Creek	3.38909*	.05	.016	.055						
Lower Judy Creek	2.78727*	.05	.016	.057						
Lower Judy Creek	2.18545*	.05	.016	.059						
Lower Judy Creek	1.58363*	.05	.016	.061						
Lower Judy Creek	.981819*	.05	.016	.063						
Lower Judy Creek	0.38	.05	.016	.065						

SUMMARY OF REACH LENGTHS

River: Fish Creek

Reach	River Sta.	Left	Channel	Right
Upper Fish Creek	43.3	1903.5	4751.08	1745.42
Upper Fish Creek	42.3916*	1903.5	4751.08	1745.42
Upper Fish Creek	41.4833*	1903.5	4751.08	1745.42
Upper Fish Creek	40.575*	1903.5	4751.08	1745.42
Upper Fish Creek	39.6666*	1903.5	4751.08	1745.42
Upper Fish Creek	38.7583*	1903.5	4751.08	1745.42
Upper Fish Creek	37.85*	1903.5	4751.08	1745.42
Upper Fish Creek	36.9416*	1903.5	4751.08	1745.42
Upper Fish Creek	36.0333*	1903.5	4751.08	1745.42
Upper Fish Creek	35.125*	1903.5	4751.08	1745.42
Upper Fish Creek	34.2166*	1903.5	4751.08	1745.42
Upper Fish Creek	33.3083*	1903.5	4751.09	1745.42
Upper Fish Creek	32.4	2464.43	4273.14	2171
Upper Fish Creek	31.6071*	2464.43	4273.14	2171
Upper Fish Creek	30.8142*	2464.43	4273.14	2171
Upper Fish Creek	30.0214*	2464.43	4273.14	2171
Upper Fish Creek	29.2285*	2464.43	4273.14	2171
Upper Fish Creek	28.4357*	2464.43	4273.14	2171
Upper Fish Creek	27.6428*	2464.43	4273.14	2171
Upper Fish Creek	26.85	0	0	0
Lower Fish Creek	26.09	2826	4769	4679
Lower Fish Creek	25.1	2028.75	4406.38	2370.38
Lower Fish Creek	24.2625*	2028.75	4406.38	2370.38
Lower Fish Creek	23.425*	2028.75	4406.38	2370.38
Lower Fish Creek	22.5875*	2028.75	4406.38	2370.38
Lower Fish Creek	21.75*	2028.75	4406.38	2370.38
Lower Fish Creek	20.9125*	2028.75	4406.38	2370.38
Lower Fish Creek	20.075*	2028.75	4406.38	2370.38
Lower Fish Creek	19.2375*	2028.75	4406.38	2370.38
Lower Fish Creek	18.4	3217.29	4349	2885.43
Lower Fish Creek	17.5714*	3217.29	4349	2885.43
Lower Fish Creek	16.7428*	3217.29	4349	2885.43
Lower Fish Creek	15.9142*	3217.29	4349	2885.43
Lower Fish Creek	15.0857*	3217.29	4349	2885.43
Lower Fish Creek	14.2571*	3217.29	4349	2885.43
Lower Fish Creek	13.4285*	3217.29	4349	2885.43
Lower Fish Creek	12.6	1090	5078	2467
Lower Fish Creek	11.7	2559	4481.46	2515.69
Lower Fish Creek	10.8538*	2559	4481.46	2515.69
Lower Fish Creek	10.0076*	2559	4481.46	2515.69
Lower Fish Creek	9.16153*	2559	4481.46	2515.69
Lower Fish Creek	8.31538*	2559	4481.46	2515.69
Lower Fish Creek	7.46923*	2559	4481.46	2515.69
Lower Fish Creek	6.62307*	2559	4481.46	2515.69
Lower Fish Creek	5.77692*	2559	4481.46	2515.69
Lower Fish Creek	4.93076*	2559	4481.46	2515.69
Lower Fish Creek	4.08461*	2559	4481.46	2515.69
Lower Fish Creek	3.23846*	2559	4481.46	2515.69
Lower Fish Creek	2.39230*	2559	4481.46	2515.69
Lower Fish Creek	1.54615*	2559	4481.46	2515.7
Lower Fish Creek	0.7	0	0	0

River: Judy Creek

Reach	River Sta.	Left	Channel	Right
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Lower Judy Creek	13.8	1530.69	2280.69	1205.25
Lower Judy Creek	13.375*	1530.69	2280.69	1205.25
Lower Judy Creek	12.95*	1530.69	2280.69	1205.25
Lower Judy Creek	12.525*	1530.69	2280.69	1205.25
Lower Judy Creek	12.1*	1530.69	2280.69	1205.25
Lower Judy Creek	11.675*	1530.69	2280.69	1205.25
Lower Judy Creek	11.25*	1530.69	2280.69	1205.25
Lower Judy Creek	10.825*	1530.69	2280.69	1205.25
Lower Judy Creek	10.4*	1530.69	2280.69	1205.25
Lower Judy Creek	9.975*	1530.69	2280.69	1205.25
Lower Judy Creek	9.55000*	1530.69	2280.69	1205.25
Lower Judy Creek	9.12500*	1530.69	2280.69	1205.25
Lower Judy Creek	8.70000*	1530.69	2280.69	1205.25
Lower Judy Creek	8.27500*	1530.69	2280.69	1205.25
Lower Judy Creek	7.85000*	1530.69	2280.69	1205.25
Lower Judy Creek	7.42500*	1530.69	2280.7	1205.25
Lower Judy Creek	7.0	1574.27	2316.18	1729.73
Lower Judy Creek	6.39818*	1574.27	2316.18	1729.73
Lower Judy Creek	5.79636*	1574.27	2316.18	1729.73
Lower Judy Creek	5.19454*	1574.27	2316.18	1729.73
Lower Judy Creek	4.59272*	1574.27	2316.18	1729.73
Lower Judy Creek	3.99090*	1574.27	2316.18	1729.73
Lower Judy Creek	3.38909*	1574.27	2316.18	1729.73
Lower Judy Creek	2.78727*	1574.27	2316.18	1729.73
Lower Judy Creek	2.18545*	1574.27	2316.18	1729.73
Lower Judy Creek	1.58363*	1574.27	2316.18	1729.73
Lower Judy Creek	.981819*	1574.28	2316.18	1729.73
Lower Judy Creek	0.38	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Fish Creek

Reach	River Sta.	Contr.	Expan.
Upper Fish Creek	43.3	.1	.3
Upper Fish Creek	42.3916*	.1	.3
Upper Fish Creek	41.4833*	.1	.3
Upper Fish Creek	40.575*	.1	.3
Upper Fish Creek	39.6666*	.1	.3
Upper Fish Creek	38.7583*	.1	.3
Upper Fish Creek	37.85*	.1	.3
Upper Fish Creek	36.9416*	.1	.3
Upper Fish Creek	36.0333*	.1	.3
Upper Fish Creek	35.125*	.1	.3
Upper Fish Creek	34.2166*	.1	.3
Upper Fish Creek	33.3083*	.1	.3
Upper Fish Creek	32.4	.1	.3
Upper Fish Creek	31.6071*	.1	.3
Upper Fish Creek	30.8142*	.1	.3
Upper Fish Creek	30.0214*	.1	.3
Upper Fish Creek	29.2285*	.1	.3
Upper Fish Creek	28.4357*	.1	.3
Upper Fish Creek	27.6428*	.1	.3
Upper Fish Creek	26.85	.1	.3
Lower Fish Creek	26.09	.1	.3

Lower Fish Creek	25.1	.1	.3
Lower Fish Creek	24.2625*	.1	.3
Lower Fish Creek	23.425*	.1	.3
Lower Fish Creek	22.5875*	.1	.3
Lower Fish Creek	21.75*	.1	.3
Lower Fish Creek	20.9125*	.1	.3
Lower Fish Creek	20.075*	.1	.3
Lower Fish Creek	19.2375*	.1	.3
Lower Fish Creek	18.4	.1	.3
Lower Fish Creek	17.5714*	.1	.3
Lower Fish Creek	16.7428*	.1	.3
Lower Fish Creek	15.9142*	.1	.3
Lower Fish Creek	15.0857*	.1	.3
Lower Fish Creek	14.2571*	.1	.3
Lower Fish Creek	13.4285*	.1	.3
Lower Fish Creek	12.6	.1	.3
Lower Fish Creek	11.7	.1	.3
Lower Fish Creek	10.8538*	.1	.3
Lower Fish Creek	10.0076*	.1	.3
Lower Fish Creek	9.16153*	.1	.3
Lower Fish Creek	8.31538*	.1	.3
Lower Fish Creek	7.46923*	.1	.3
Lower Fish Creek	6.62307*	.1	.3
Lower Fish Creek	5.77692*	.1	.3
Lower Fish Creek	4.93076*	.1	.3
Lower Fish Creek	4.08461*	.1	.3
Lower Fish Creek	3.23846*	.1	.3
Lower Fish Creek	2.39230*	.1	.3
Lower Fish Creek	1.54615*	.1	.3
Lower Fish Creek	0.7	.1	.3

River: Judy Creek

Reach	River Sta.	Contr.	Expan.
Lower Judy Creek	13.8	.1	.3
Lower Judy Creek	13.375*	.1	.3
Lower Judy Creek	12.95*	.1	.3
Lower Judy Creek	12.525*	.1	.3
Lower Judy Creek	12.1*	.1	.3
Lower Judy Creek	11.675*	.1	.3
Lower Judy Creek	11.25*	.1	.3
Lower Judy Creek	10.825*	.1	.3
Lower Judy Creek	10.4*	.1	.3
Lower Judy Creek	9.975*	.1	.3
Lower Judy Creek	9.55000*	.1	.3
Lower Judy Creek	9.12500*	.1	.3
Lower Judy Creek	8.70000*	.1	.3
Lower Judy Creek	8.27500*	.1	.3
Lower Judy Creek	7.85000*	.1	.3
Lower Judy Creek	7.42500*	.1	.3
Lower Judy Creek	7.0	.1	.3
Lower Judy Creek	6.39818*	.1	.3
Lower Judy Creek	5.79636*	.1	.3
Lower Judy Creek	5.19454*	.1	.3
Lower Judy Creek	4.59272*	.1	.3
Lower Judy Creek	3.99090*	.1	.3
Lower Judy Creek	3.38909*	.1	.3
Lower Judy Creek	2.78727*	.1	.3

Lower Judy Creek	2.18545*	.1	.3
Lower Judy Creek	1.58363*	.1	.3
Lower Judy Creek	.981819*	.1	.3
Lower Judy Creek	0.38	.1	.3

Profile Output Table - Standard Table 1

River	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
Fish Creek	Lower Fish Creek	0.7	53000.00	0.30	6.42	2.34	6.43	0.000080	0.49	110291.30	25511.48	0.04	
Fish Creek	Lower Fish Creek	1.54615*	45600.00	-0.36	6.75		6.75	0.000076	0.47	99689.40	25025.39	0.04	
Fish Creek	Lower Fish Creek	2.39230*	45600.00	-0.74	7.09		7.10	0.000097	0.53	89671.05	24546.54	0.05	
Fish Creek	Lower Fish Creek	3.23846*	45600.00	-1.13	7.51		7.51	0.000111	0.60	81767.84	24087.56	0.06	
Fish Creek	Lower Fish Creek	4.08461*	45600.00	-1.52	8.05		8.06	0.000156	0.78	67544.65	22325.18	0.07	
Fish Creek	Lower Fish Creek	4.93076*	45600.00	-1.90	8.64		8.65	0.000132	0.83	66366.15	20144.56	0.07	
Fish Creek	Lower Fish Creek	5.77692*	45600.00	-2.29	9.13		9.14	0.000105	0.92	64174.13	19326.11	0.07	
Fish Creek	Lower Fish Creek	6.62307*	45600.00	-2.68	9.55		9.56	0.000100	1.02	61125.60	18781.33	0.08	
Fish Creek	Lower Fish Creek	7.46923*	45600.00	-3.07	9.96		9.97	0.000098	1.14	58150.38	18039.57	0.09	
Fish Creek	Lower Fish Creek	8.31538*	45600.00	-3.45	10.36		10.38	0.000104	1.29	55091.44	17769.42	0.10	
Fish Creek	Lower Fish Creek	9.16153*	45600.00	-3.84	10.79		10.81	0.000112	1.51	51801.55	17710.68	0.11	
Fish Creek	Lower Fish Creek	10.0076*	45600.00	-4.23	11.23		11.27	0.000118	1.82	48880.82	17962.32	0.13	
Fish Creek	Lower Fish Creek	10.8538*	45600.00	-4.61	11.72		11.78	0.000144	2.26	46648.34	18339.00	0.15	
Fish Creek	Lower Fish Creek	11.7	45600.00	-5.00	12.27		12.32	0.000160	2.55	45234.36	18031.69	0.17	
Fish Creek	Lower Fish Creek	12.6	45600.00	-5.80	12.61		12.79	0.000116	4.54	40707.45	17486.95	0.26	
Fish Creek	Lower Fish Creek	13.4285*	44800.00	-5.83	13.17		13.33	0.000173	4.47	38002.48	16686.29	0.25	
Fish Creek	Lower Fish Creek	14.2571*	44800.00	-5.86	13.81		14.02	0.000178	4.77	35681.31	14742.15	0.27	
Fish Creek	Lower Fish Creek	15.0857*	44800.00	-5.89	14.48		14.70	0.000178	4.95	34364.09	13496.72	0.28	
Fish Creek	Lower Fish Creek	15.9142*	44800.00	-5.91	15.14		15.38	0.000176	5.08	33167.94	12240.56	0.29	
Fish Creek	Lower Fish Creek	16.7428*	44800.00	-5.94	15.80		16.06	0.000176	5.21	32166.72	11508.73	0.30	
Fish Creek	Lower Fish Creek	17.5714*	44800.00	-5.97	16.47		16.73	0.000173	5.28	31073.08	10669.14	0.31	
Fish Creek	Lower Fish Creek	18.4	44800.00	-6.00	17.06		17.35	0.000143	5.49	29270.58	10134.02	0.32	
Fish Creek	Lower Fish Creek	19.2375*	43600.00	-4.42	17.63		17.98	0.000198	5.86	24785.80	8685.34	0.33	
Fish Creek	Lower Fish Creek	20.075*	43600.00	-2.84	18.44		18.96	0.000298	6.66	19082.32	7810.82	0.37	
Fish Creek	Lower Fish Creek	20.9125*	43600.00	-1.26	19.45		19.93	0.000212	6.43	20187.95	5972.09	0.35	
Fish Creek	Lower Fish Creek	21.75*	43600.00	0.32	20.26		20.69	0.000184	6.19	22770.60	6361.34	0.33	
Fish Creek	Lower Fish Creek	22.5875*	43600.00	1.90	21.08		21.40	0.000192	5.68	25585.56	6901.56	0.30	
Fish Creek	Lower Fish Creek	23.425*	43600.00	3.48	21.75		22.07	0.000179	5.75	27377.89	7560.22	0.30	
Fish Creek	Lower Fish Creek	24.2625*	43600.00	5.06	22.36		22.72	0.000174	6.04	28622.45	8092.08	0.32	
Fish Creek	Lower Fish Creek	25.1	43600.00	6.64	23.12		23.41	0.000212	5.65	30535.30	8678.31	0.30	
Fish Creek	Lower Fish Creek	26.09	43600.00	7.89	23.98		24.40	0.000215	6.52	27185.30	8356.35	0.35	
Fish Creek	Upper Fish Creek	26.85	25700.00	6.88	24.69		25.17	0.000169	5.97	12281.33	6549.31	0.31	
Fish Creek	Upper Fish Creek	27.6428*	25400.00	7.84	25.48		25.88	0.000180	5.56	12142.64	4845.91	0.29	
Fish Creek	Upper Fish Creek	28.4357*	25400.00	8.80	26.25		26.51	0.000137	4.78	16003.29	4773.76	0.24	
Fish Creek	Upper Fish Creek	29.2285*	25400.00	9.76	26.81		26.98	0.000115	4.16	19266.55	5069.05	0.21	
Fish Creek	Upper Fish Creek	30.0214*	25400.00	10.72	27.20		27.33	0.000086	3.90	21941.67	5320.85	0.20	
Fish Creek	Upper Fish Creek	30.8142*	25400.00	11.68	27.50		27.60	0.000073	3.56	24320.30	5581.21	0.18	
Fish Creek	Upper Fish Creek	31.6071*	25400.00	12.64	27.75		27.83	0.000064	3.35	26345.53	5846.42	0.17	
Fish Creek	Upper Fish Creek	32.4	25400.00	13.60	27.95		28.00	0.000048	2.92	27903.37	6116.67	0.15	
Fish Creek	Upper Fish Creek	33.3083*	25000.00	14.03	28.09		28.25	0.000089	4.29	20369.75	5615.67	0.23	
Fish Creek	Upper Fish Creek	34.2166*	25000.00	14.45	28.42		28.72	0.000149	5.40	14241.77	4900.03	0.29	
Fish Creek	Upper Fish Creek	35.125*	25000.00	14.88	29.00		29.48	0.000210	6.30	10205.91	4079.98	0.35	
Fish Creek	Upper Fish Creek	36.0333*	25000.00	15.30	29.86		30.45	0.000233	6.64	8116.23	3363.03	0.36	
Fish Creek	Upper Fish Creek	36.9416*	25000.00	15.73	30.85		31.47	0.000228	6.65	7110.88	2917.29	0.36	
Fish Creek	Upper Fish Creek	37.85*	25000.00	16.15	31.84		32.46	0.000216	6.54	6429.41	2570.94	0.35	
Fish Creek	Upper Fish Creek	38.7583*	25000.00	16.58	33.01		33.54	0.000259	6.11	6390.44	2404.77	0.33	
Fish Creek	Upper Fish Creek	39.6666*	25000.00	17.00	34.16		34.64	0.000222	5.77	6449.04	2084.86	0.30	
Fish Creek	Upper Fish Creek	40.575*	25000.00	17.43	35.15		35.59	0.000201	5.54	6308.64	1792.31	0.29	
Fish Creek	Upper Fish Creek	41.4833*	25000.00	17.85	36.06		36.48	0.000187	5.37	6213.23	1360.21	0.28	

Fish Creek	Upper	Fish Creek	42.3916*	25000.00	18.28	36.91	37.31	0.000176	5.21	6203.96	1077.32	0.27
Fish Creek	Upper	Fish Creek	43.3	25000.00	18.70	37.74	38.03	0.000140	4.65	9143.78	2331.78	0.24
Judy Creek	Lower	Judy Creek	0.38	22100.00	8.18	24.85	25.05	0.000124	4.53	18636.84	6294.96	0.26
Judy Creek	Lower	Judy Creek	.981819*	21500.00	8.91	25.07	25.43	0.000191	5.51	13695.30	6864.85	0.32
Judy Creek	Lower	Judy Creek	1.58363*	21500.00	9.64	25.45	25.98	0.000261	6.37	9706.05	5722.51	0.38
Judy Creek	Lower	Judy Creek	2.18545*	21500.00	10.37	26.98	27.06	0.000738	3.17	13823.17	6339.22	0.18
Judy Creek	Lower	Judy Creek	2.78727*	21500.00	11.10	27.73	28.00	0.000133	4.88	13849.15	5072.59	0.27
Judy Creek	Lower	Judy Creek	3.38909*	21500.00	11.83	28.01	28.33	0.000162	5.28	12253.85	4815.06	0.30
Judy Creek	Lower	Judy Creek	3.99090*	21500.00	12.55	28.35	28.72	0.000190	5.64	10894.63	4854.94	0.32
Judy Creek	Lower	Judy Creek	4.59272*	21500.00	13.28	28.75	29.18	0.000216	5.95	9941.72	4365.44	0.35
Judy Creek	Lower	Judy Creek	5.19454*	21500.00	14.01	29.22	29.68	0.000233	6.14	9369.29	4376.31	0.36
Judy Creek	Lower	Judy Creek	5.79636*	21500.00	14.74	29.72	30.22	0.000247	6.29	8925.17	4373.80	0.37
Judy Creek	Lower	Judy Creek	6.39818*	21500.00	15.47	30.25	30.77	0.000262	6.47	8425.95	4394.91	0.38
Judy Creek	Lower	Judy Creek	7.0	21500.00	16.20	31.39	31.56	0.000451	4.27	11002.32	4812.08	0.24
Judy Creek	Lower	Judy Creek	7.42500*	19900.00	16.63	32.05	32.36	0.000329	5.18	8982.27	4558.17	0.29
Judy Creek	Lower	Judy Creek	7.85000*	19900.00	17.05	32.74	33.17	0.000409	5.68	7242.71	4364.65	0.32
Judy Creek	Lower	Judy Creek	8.27500*	19900.00	17.48	33.58	33.98	0.000349	5.49	6699.21	3102.36	0.30
Judy Creek	Lower	Judy Creek	8.70000*	19900.00	17.90	34.29	34.72	0.000328	5.56	6230.30	2862.71	0.30
Judy Creek	Lower	Judy Creek	9.12500*	19900.00	18.33	34.95	35.40	0.000294	5.64	5679.68	2333.85	0.30
Judy Creek	Lower	Judy Creek	9.55000*	19900.00	18.75	35.42	35.95	0.000176	5.98	4914.63	1683.87	0.32
Judy Creek	Lower	Judy Creek	9.975*	19900.00	19.18	35.80	36.38	0.000193	6.20	4295.67	1157.00	0.34
Judy Creek	Lower	Judy Creek	10.4*	19900.00	19.60	36.22	36.84	0.000206	6.38	3854.11	1055.81	0.35
Judy Creek	Lower	Judy Creek	10.825*	19900.00	20.03	36.67	37.32	0.000215	6.51	3533.19	863.54	0.35
Judy Creek	Lower	Judy Creek	11.25*	19900.00	20.45	37.15	37.82	0.000224	6.62	3329.49	729.67	0.36
Judy Creek	Lower	Judy Creek	11.675*	19900.00	20.88	37.64	38.34	0.000232	6.72	3186.98	650.72	0.37
Judy Creek	Lower	Judy Creek	12.1*	19900.00	21.30	38.16	38.88	0.000241	6.82	3096.63	490.16	0.37
Judy Creek	Lower	Judy Creek	12.525*	19900.00	21.73	38.69	39.43	0.000252	6.92	3043.07	430.25	0.38
Judy Creek	Lower	Judy Creek	12.95*	19900.00	22.15	39.27	40.01	0.000257	6.96	3011.56	370.53	0.38
Judy Creek	Lower	Judy Creek	13.375*	19900.00	22.58	39.84	40.62	0.000272	7.12	2980.58	358.66	0.39
Judy Creek	Lower	Judy Creek	13.8	19900.00	23.00	40.45	41.26	0.000283	7.23	2958.18	356.06	0.40

Profile Output Table - Standard Table 2

River	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)
Fish Creek	Lower	Fish Creek	0.7	6.43	6.42	0.00		8081.71	43904.88	1013.42	25511.48
Fish Creek	Lower	Fish Creek	1.54615*	6.75	6.75	0.00	0.32	8205.40	36482.85	911.74	25025.39
Fish Creek	Lower	Fish Creek	2.39230*	7.10	7.09	0.00	0.35	9808.60	34856.57	934.83	24546.54
Fish Creek	Lower	Fish Creek	3.23846*	7.51	7.51	0.01	0.42	11258.55	33371.40	970.04	24087.56
Fish Creek	Lower	Fish Creek	4.08461*	8.06	8.05	0.01	0.54	6309.51	37985.89	1304.60	22325.18
Fish Creek	Lower	Fish Creek	4.93076*	8.65	8.64	0.01	0.60	7272.74	36896.37	1430.88	20144.56
Fish Creek	Lower	Fish Creek	5.77692*	9.14	9.13	0.01	0.49	7363.27	36876.32	1360.40	19326.11
Fish Creek	Lower	Fish Creek	6.62307*	9.56	9.55	0.01	0.42	7880.77	36296.92	1422.31	18781.33
Fish Creek	Lower	Fish Creek	7.46923*	9.97	9.96	0.02	0.40	8388.13	35729.04	1482.83	18039.57
Fish Creek	Lower	Fish Creek	8.31538*	10.38	10.36	0.02	0.41	9228.85	34729.26	1641.89	17769.42
Fish Creek	Lower	Fish Creek	9.16153*	10.81	10.79	0.03	0.43	10246.57	33795.69	1557.74	17710.68
Fish Creek	Lower	Fish Creek	10.0076*	11.27	11.23	0.04	0.46	11448.65	32441.81	1709.54	17962.32
Fish Creek	Lower	Fish Creek	10.8538*	11.78	11.72	0.05	0.51	14096.75	29585.92	1917.33	18339.00
Fish Creek	Lower	Fish Creek	11.7	12.32	12.27	0.05	0.55	22948.67	20560.16	2091.17	18031.69
Fish Creek	Lower	Fish Creek	12.6	12.79	12.61	0.18	0.43	18982.83	24616.93	2000.24	17486.95
Fish Creek	Lower	Fish Creek	13.4285*	13.33	13.17	0.17	0.55	18759.24	23913.67	2127.09	16686.29
Fish Creek	Lower	Fish Creek	14.2571*	14.02	13.81	0.20	0.67	16973.26	25214.32	2612.42	14742.15
Fish Creek	Lower	Fish Creek	15.0857*	14.70	14.48	0.22	0.68	15741.64	25902.79	3155.58	13496.72
Fish Creek	Lower	Fish Creek	15.9142*	15.38	15.14	0.24	0.68	14924.02	26290.77	3585.21	12240.56
Fish Creek	Lower	Fish Creek	16.7428*	16.06	15.80	0.25	0.68	14306.54	26688.09	3805.37	11508.73
Fish Creek	Lower	Fish Creek	17.5714*	16.73	16.47	0.26	0.67	13718.15	26728.47	4353.38	10669.14
Fish Creek	Lower	Fish Creek	18.4	17.35	17.06	0.29	0.61	12539.57	27248.92	5011.51	10134.02
Fish Creek	Lower	Fish Creek	19.2375*	17.98	17.63	0.35	0.61	12869.49	28638.88	2091.63	8685.34

Fish Creek	Lower	Fish Creek	20.075*	18.96	18.44	0.52	0.92	0.05	7206.93	32715.65	3677.42	7810.82
Fish Creek	Lower	Fish Creek	20.9125*	19.93	19.45	0.48	0.98	0.00	6391.87	32282.91	4925.22	5972.09
Fish Creek	Lower	Fish Creek	21.75*	20.69	20.26	0.42	0.75	0.01	6376.41	30895.05	6328.54	6361.34
Fish Creek	Lower	Fish Creek	22.5875*	21.40	21.08	0.32	0.69	0.01	6956.52	27975.90	8667.58	6901.56
Fish Creek	Lower	Fish Creek	23.425*	22.07	21.75	0.33	0.67	0.00	6292.09	27388.28	9919.63	7560.22
Fish Creek	Lower	Fish Creek	24.2625*	22.72	22.36	0.36	0.64	0.01	5671.32	27453.77	10474.91	8092.08
Fish Creek	Lower	Fish Creek	25.1	23.41	23.12	0.28	0.68	0.01	7017.88	24500.53	12081.59	8678.31
Fish Creek	Lower	Fish Creek	26.09	24.40	23.98	0.41	0.95	0.04	5667.11	27152.32	10780.58	8356.35
Fish Creek	Upper	Fish Creek	26.85	25.17	24.69	0.48	0.75	0.02	1957.34	22432.47	1310.19	6549.31
Fish Creek	Upper	Fish Creek	27.6428*	25.88	25.48	0.40	0.70	0.01	3002.96	21062.87	1334.18	4845.91
Fish Creek	Upper	Fish Creek	28.4357*	26.51	26.25	0.26	0.61	0.01	4764.56	18187.76	2447.68	4773.76
Fish Creek	Upper	Fish Creek	29.2285*	26.98	26.81	0.17	0.46	0.01	6154.94	15622.41	3622.65	5069.05
Fish Creek	Upper	Fish Creek	30.0214*	27.33	27.20	0.13	0.35	0.00	6709.89	14214.20	4475.91	5320.85
Fish Creek	Upper	Fish Creek	30.8142*	27.60	27.50	0.10	0.27	0.00	7329.87	12505.57	5564.56	5581.21
Fish Creek	Upper	Fish Creek	31.6071*	27.83	27.75	0.08	0.22	0.00	7906.04	11274.13	6219.83	5846.42
Fish Creek	Upper	Fish Creek	32.4	28.00	27.95	0.05	0.17	0.00	7384.12	9344.32	8671.56	6116.67
Fish Creek	Upper	Fish Creek	33.3083*	28.25	28.09	0.16	0.22	0.03	6389.33	13366.30	5244.37	5615.67
Fish Creek	Upper	Fish Creek	34.2166*	28.72	28.42	0.30	0.43	0.04	4931.63	16595.47	3472.90	4900.03
Fish Creek	Upper	Fish Creek	35.125*	29.48	29.00	0.48	0.71	0.05	3322.16	19561.52	2116.31	4079.98
Fish Creek	Upper	Fish Creek	36.0333*	30.45	29.86	0.59	0.94	0.03	2148.28	21387.71	1464.01	3363.03
Fish Creek	Upper	Fish Creek	36.9416*	31.47	30.85	0.62	1.01	0.01	1283.40	22470.14	1246.46	2917.29
Fish Creek	Upper	Fish Creek	37.85*	32.46	31.84	0.62	1.00	0.00	649.26	23174.46	1176.28	2570.94
Fish Creek	Upper	Fish Creek	38.7583*	33.54	33.01	0.54	1.08	0.01	482.71	23065.47	1451.82	2404.77
Fish Creek	Upper	Fish Creek	39.6666*	34.64	34.16	0.48	1.09	0.01	273.22	23112.54	1614.24	2084.86
Fish Creek	Upper	Fish Creek	40.575*	35.59	35.15	0.44	0.96	0.00	101.98	23241.12	1656.90	1792.31
Fish Creek	Upper	Fish Creek	41.4833*	36.48	36.06	0.42	0.88	0.00	22.68	23363.68	1613.64	1360.21
Fish Creek	Upper	Fish Creek	42.3916*	37.31	36.91	0.40	0.83	0.00	1.34	23426.83	1571.84	1077.32
Fish Creek	Upper	Fish Creek	43.3	38.03	37.74	0.29	0.70	0.01	2115.09	21480.97	1403.94	2331.78
Judy Creek	Lower	Judy Creek	0.38	25.05	24.85	0.20	0.63	0.02	2806.10	13913.27	5380.63	6294.96
Judy Creek	Lower	Judy Creek	.981819*	25.43	25.07	0.36	0.33	0.05	1826.26	16161.45	3512.29	6864.85
Judy Creek	Lower	Judy Creek	1.58363*	25.98	25.45	0.53	0.49	0.05	1368.21	18063.74	2068.05	5722.51
Judy Creek	Lower	Judy Creek	2.18545*	27.06	26.98	0.08	1.04	0.04	5373.64	9888.18	6238.18	6339.22
Judy Creek	Lower	Judy Creek	2.78727*	28.00	27.73	0.26	0.89	0.05	2729.41	15334.60	3435.98	5072.59
Judy Creek	Lower	Judy Creek	3.38909*	28.33	28.01	0.32	0.32	0.02	2148.71	15927.69	3423.61	4815.06
Judy Creek	Lower	Judy Creek	3.99090*	28.72	28.35	0.38	0.38	0.02	1746.70	16422.26	3331.05	4854.94
Judy Creek	Lower	Judy Creek	4.59272*	29.18	28.75	0.43	0.44	0.02	1443.71	16853.70	3202.59	4365.44
Judy Creek	Lower	Judy Creek	5.19454*	29.68	29.22	0.47	0.49	0.01	1294.52	17021.05	3184.42	4376.31
Judy Creek	Lower	Judy Creek	5.79636*	30.22	29.72	0.49	0.53	0.01	1192.08	17141.59	3166.33	4373.80
Judy Creek	Lower	Judy Creek	6.39818*	30.77	30.25	0.53	0.56	0.01	1140.00	17343.06	3016.94	4394.91
Judy Creek	Lower	Judy Creek	7.0	31.56	31.39	0.17	0.75	0.04	2890.10	12066.42	6543.49	4812.08
Judy Creek	Lower	Judy Creek	7.42500*	32.36	32.05	0.32	0.76	0.04	1863.19	14977.94	3058.87	4558.17
Judy Creek	Lower	Judy Creek	7.85000*	33.17	32.74	0.43	0.77	0.03	1624.38	16826.52	1449.10	4364.65
Judy Creek	Lower	Judy Creek	8.27500*	33.98	33.58	0.40	0.81	0.00	1423.20	16855.47	1621.33	3102.36
Judy Creek	Lower	Judy Creek	8.70000*	34.72	34.29	0.42	0.73	0.01	1119.44	17430.73	1349.82	2862.71
Judy Creek	Lower	Judy Creek	9.12500*	35.40	34.95	0.45	0.68	0.01	981.97	17945.81	972.22	2333.85
Judy Creek	Lower	Judy Creek	9.55000*	35.95	35.42	0.53	0.52	0.02	554.24	18885.73	460.03	1683.87
Judy Creek	Lower	Judy Creek	9.975*	36.38	35.80	0.58	0.41	0.02	387.70	19279.39	232.92	1157.00
Judy Creek	Lower	Judy Creek	10.4*	36.84	36.22	0.62	0.45	0.01	263.47	19545.61	90.93	1055.81
Judy Creek	Lower	Judy Creek	10.825*	37.32	36.67	0.65	0.48	0.01	188.50	19686.35	25.15	863.54
Judy Creek	Lower	Judy Creek	11.25*	37.82	37.15	0.68	0.50	0.01	138.68	19755.26	6.06	729.67
Judy Creek	Lower	Judy Creek	11.675*	38.34	37.64	0.70	0.52	0.01	110.86	19785.47	3.67	650.72
Judy Creek	Lower	Judy Creek	12.1*	38.88	38.16	0.72	0.54	0.01	110.69	19782.72	6.58	490.16
Judy Creek	Lower	Judy Creek	12.525*	39.43	38.69	0.74	0.56	0.01	121.51	19767.73	10.76	430.25
Judy Creek	Lower	Judy Creek	12.95*	40.01	39.27	0.75	0.58	0.00	141.55	19596.78	161.67	370.53
Judy Creek	Lower	Judy Creek	13.375*	40.62	39.84	0.78	0.60	0.01	167.93	19709.73	22.34	358.66
Judy Creek	Lower	Judy Creek	13.8	41.26	40.45	0.80	0.63	0.01	176.83	19697.81	25.36	356.06

Profile Output Table - Junctions

River	Reach	River Sta	W.S. Elev (ft)	E.G. Elev (ft)	Q Total (cfs)
Fish Creek	Upper Fish Creek	26.85	24.69	25.17	25700.00
Judy Creek	Lower Judy Creek	0.38	24.85	25.05	22100.00
Junction:	Fish Junct.				
Fish Creek	Lower Fish Creek	26.09	23.98	24.40	43600.00

Table E.4

HEC-RAS Run, Fish and Judy Creeks, 100-Year Flood Hydraulically Rough Report

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

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X   X XXXXXX   XXXX   XXXX   XX   XXXX
X   X X       X   X   X   X   X   X   X
X   X X       X       X   X   X   X   X
XXXXXXXX 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: 100-Year Design Max and Min n-Values
 Project File : 2002design.prj
 Run Date and Time: 11/15/2002 12:28:33 PM

Project in English units

PLAN DATA

Plan Title: 100-Year n-values at 0.031
 Plan File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\2002design.p02

Geometry Title: 100-Year Flood with n-Values at 0.031
 Geometry File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\2002design.g01

Flow Title : 100-Year Flood Calibrated
 Flow File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\2002design.f08

Plan Summary Information:

Number of:	Cross Sections =	79	Multiple Openings =	0
	Culverts =	0	Inline Weirs =	0
	Bridges =	0		

Computational Information

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

Computation Options

Critical depth computed only where necessary
 Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Friction Slope

Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 100-Year Flood Calibrated
Flow File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\2002design.f08

Flow Data (cfs)

River	Reach	RS	Calibration
Fish Creek	Upper Fish Creek	43.3	25000
Fish Creek	Upper Fish Creek	32.4	25400
Fish Creek	Upper Fish Creek	26.85	25700
Fish Creek	Lower Fish Creek	26.09	43600
Fish Creek	Lower Fish Creek	25.1	43600
Fish Creek	Lower Fish Creek	18.4	44800
Fish Creek	Lower Fish Creek	12.6	45600
Fish Creek	Lower Fish Creek	11.7	45600
Fish Creek	Lower Fish Creek	0.7	53000
Judy Creek	Lower Judy Creek	13.8	19900
Judy Creek	Lower Judy Creek	7.0	21500
Judy Creek	Lower Judy Creek	0.38	22100

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Fish Creek	Lower Fish Creek	Calibration		Normal S = .00008

GEOMETRY DATA

Geometry Title: 100-Year Flood with n-Values at 0.031
Geometry File : s:\Projects\2002\74-PAI20022.00 Phillips NPRA Hydrology Assessment\2002 HEC-RAS\Derek\2002design.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Fish Creek	Upper Fish Creek		Fish Junct.
Fish Creek	Lower Fish Creek	Fish Junct.	
Judy Creek	Lower Judy Creek		Fish Junct.

JUNCTION INFORMATION

Name: Fish Junct.
Description: Confluence of Fish and Judy Creek
Energy computation Method

Length across Junction		Tributary	Reach	Length	Angle
River	Reach	River			
Fish Creek	Upper Fish Creek to Fish Creek	Fish Creek	Lower Fish Creek	3915	
Judy Creek	Lower Judy Creek to Fish Creek	Judy Creek	Lower Fish Creek	3694	

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 43.3

INPUT

Description: Cross Section at River Mile 43.3

Station Elevation Data		num= 62	
Sta	Elev	Sta	Elev
3	95.5	63.1	87.2
1507	37.6	1802.5	39
2182.2	37.3	2197.8	27.1
2231.9	19.3	2242.5	18.7
2282.1	23.4	2292.8	23.5
2332.4	24.9	2342.3	25.3
2505.3	28.1	2551.4	28.1
2721.7	40.7	2906.1	42.2
3475.7	32.8	3562.3	42.5
4806.6	41.6	5103.9	39.6
5701.3	42.8	5925.6	43.2
6910.5	54.9	7207.6	52.8
8409.5	53.4	8705.2	56.6

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
3	.04	2182.2	.031
2721.7	.07	2562.1	.07
2721.7	.04		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	2182.2	2577.3		1903.5	4751.08	1745.42	.1
Blocked Obstructions		num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev		
3	2170.4	31.63	2562.1	8705.2	31.63		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	39.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.033	0.041
W.S. Elev (ft)	39.54	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	5816.95	5335.54	2769.29
E.G. Slope (ft/ft)	0.000143	Area (sq ft)	5816.95	5335.54	2769.29
Q Total (cfs)	25000.00	Flow (cfs)	5776.02	16142.95	3081.04
Top Width (ft)	2902.96	Top Width (ft)	1822.70	395.10	685.16
Vel Total (ft/s)	1.80	Avg. Vel. (ft/s)	0.99	3.03	1.11
Max Chl Dpth (ft)	20.84	Hydr. Depth (ft)	3.19	13.50	4.04
Conv. Total (cfs)	2089353.0	Conv. (cfs)	482725.3	1349133.0	257495.0
Length Wtd. (ft)	3883.09	Wetted Per. (ft)	1823.73	402.93	685.81
Min Ch El (ft)	18.70	Shear (lb/sq ft)	0.03	0.12	0.04
Alpha	1.95	Stream Power (lb/ft s)	0.03	0.36	0.04
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	8075.29	8498.66	6894.93
C & E Loss (ft)	0.01	Cum SA (acres)	1962.19	648.26	1804.35

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 42.3916*

INPUT

Description: Interpolated Cross Section at River Mile 42.39
 Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.75	93.31	77.59	85.42	102.3	78.16	198.07	50.39	242.58	37.5
266.58	37.52	305.9	37.1	386.03	37.04	479.14	37.12	574.75	37.11
676.79	37.21	760.81	37.27	862.64	37.72	956.16	37.67	1010.33	37.57
1044.37	37.28	1120.15	37.56	1228.92	37.63	1270.14	37.66	1334.67	37.61
1427.27	37.29	1461.38	37.05	1525.6	37.14	1613.87	37.11	1695.17	37.65
1713.79	37.71	1723.85	38.74	1726.74	38.96	1743.34	38.64	1782.6	37.5
1812.83	37.4	1875.54	37.76	1921.76	38.05	1953	37.38	1977.44	37.13
2016.89	37.08	2092.76	37.22	2186.47	37.53	2243.5	37.66	2281	38.08
2306.08	38.42	2383.46	39.33	2481.03	38.24	2559.2	37.46	2580.2	37.33
2593.78	36.94	2619.3	36.75	2701.61	37.17	2713.39	36.4	2716.3	36.17
2719.46	34.24	2721.85	32.55	2724.96	30.71	2730.06	27.89	2733.4	26.06
2735.2	25.69	2739.75	24.76	2740.3	24.54	2745.4	22.48	2749.07	21
2750.49	20.67	2755.59	19.49	2760.68	18.28	2769.12	18.82	2778.83	18.28
2788.36	18.66	2796.28	20.63	2797.22	20.87	2807.42	21.53	2813.73	22.28
2816.95	22.66	2827.25	22.78	2831.18	22.99	2836.11	23.29	2845.64	23.55
2849.15	23.84	2855.84	24.32	2865.37	24.23	2874.9	24.6	2884.15	24.98
2931.34	26.51	2935.74	26.65	2981.08	27.05	3013.18	27.18	3031.81	27.19
3045.98	27.15	3063.96	26.97	3072.86	26.94	3076.19	26.98	3080.36	27.52
3085.77	28.28	3086.49	28.39	3101.12	33.37	3111.49	34.08	3112.41	34.13
3250.85	39.22	3255.48	39.25	3442.04	40.58	3563.17	35.93	3616.65	33.89
3706.13	33.55	3731.22	34.84	3799.83	34.2	3898.18	33.35	3948.94	33.46
4032.64	32.43	4083.73	37.34	4122.43	41.14	4283.73	42.01	4480.35	43.11
4502.5	43.1	4691.43	43.03	4789.75	43	4896.61	42.44	5086.54	41.67
5099.14	41.61	5412.58	40.3	5720.84	38.62	5735.79	38.68	5747.28	38.78
5905.92	39.69	5976.7	40.41	6035.53	40.86	6121.7	41.68	6215.24	42.39
6340.26	43.27	6430.19	43.43	6572.83	43.62	6637.38	46.16	6769.52	51.33
6855.5	52.82	6971.29	54.91	7083.03	55.26	7276.44	55.79	7281.74	55.77
7509.13	54.51	7594.02	54.11	7743.71	53.17	7902.07	52.18	7999.93	52.27
8161.19	52.41	8215.51	52.46	8372.04	51.78	8524.91	50.96	8595.19	51.47
8756.8	52.82	8834.52	53.64	8907.06	53.6	9071.62	53.02	9148.27	52.61
9186.86	52.88	9318.42	54.17	9360.04	54.93	9454.87	56.27		

Manning's n Values		num=	4
Sta	n Val	Sta	n Val
2.75	.04	2716.3	.031
		3086.49	.07
		3101.12	.042

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	2716.3	3101.12	1903.5	4751.08	1745.42	.1	.3	

Blocked Obstructions		num=	2
Sta L	Sta R	Elev	Sta L
2.75	2716.3	30.85	3101.12
			9454.87
			30.85

CROSS SECTION OUTPUT		Profile #Calibration			
E.G. Elev (ft)	38.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.040	0.033	0.042
W.S. Elev (ft)	38.80	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	3213.95	5221.25	3006.33
E.G. Slope (ft/ft)	0.000205	Area (sq ft)	3213.95	5221.25	3006.33
Q Total (cfs)	25000.00	Flow (cfs)	2098.27	19003.71	3898.02
Top Width (ft)	3570.49	Top Width (ft)	2374.90	384.82	810.77
Vel Total (ft/s)	2.19	Avg. Vel. (ft/s)	0.65	3.64	1.30
Max Chl Dpth (ft)	20.52	Hydr. Depth (ft)	1.35	13.57	3.71
Conv. Total (cfs)	1746986.0	Conv. (cfs)	146625.8	1327968.0	272391.5
Length Wtd. (ft)	4091.93	Wetted Per. (ft)	2375.24	390.19	811.33
Min Ch El (ft)	18.28	Shear (lb/sq ft)	0.02	0.17	0.05
Alpha	2.17	Stream Power (lb/ft s)	0.01	0.62	0.06
Frcn Loss (ft)	0.92	Cum Volume (acre-ft)	7877.97	7922.95	6779.21
C & E Loss (ft)	0.00	Cum SA (acres)	1870.48	605.72	1774.38

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 41.4833*

INPUT
 Description: Interpolated Cross Section at River Mile 41.48

Station Elevation Data num= 154									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.5	91.12	92.07	83.64	121.66	76.93	236.28	51.7	289.55	40
318.28	40.03	365.34	39.18	461.25	39.01	572.7	39.13	687.13	39.07
809.28	39.21	909.84	39.29	1031.72	40.15	1143.65	40	1208.49	39.77
1249.24	39.18	1339.93	39.7	1470.13	39.79	1519.46	39.82	1596.7	39.7
1707.54	39.02	1748.37	38.52	1825.22	38.68	1930.89	38.56	2028.19	39.61
2050.47	39.72	2062.52	40.69	2065.97	40.82	2085.85	40.13	2132.84	37.71
2169.01	37.41	2244.08	37.93	2299.4	38.33	2336.79	36.86	2366.05	36.27
2413.27	36.03	2504.07	36.02	2616.24	36.27	2684.49	36.32	2729.38	36.66
2759.4	36.99	2852.01	37.76	2968.8	36.7	3062.36	36.02	3087.5	36.01
3103.76	35.39	3134.3	35.3	3232.81	35.95	3246.92	35.28	3250.4	35.03
3253.84	33.06	3256.44	31.12	3259.82	29.29	3265.36	26.69	3268.99	25.02
3270.96	24.68	3275.9	23.82	3276.5	23.62	3282.04	21.75	3286.03	20.4
3287.58	20.1	3293.12	19.01	3298.67	17.85	3306.33	18.35	3315.17	17.85
3324.33	18.21	3331.94	20.02	3332.84	20.24	3342.65	20.87	3348.71	21.56
3351.81	21.92	3361.71	22.06	3365.48	22.27	3370.22	22.58	3379.38	22.91
3382.76	23.2	3389.19	23.64	3398.35	23.57	3407.51	23.91	3416.39	24.25
3461.76	25.67	3465.99	25.81	3509.57	26.19	3540.42	26.34	3558.33	26.29
3571.95	26.2	3589.23	25.83	3597.78	25.78	3600.99	25.86	3604.99	26.4
3610.19	27.26	3610.89	27.37	3624.95	32.33	3635.69	33.07	3636.64	33.11
3779.99	37.73	3784.79	37.76	3977.99	38.96	4103.42	34.73	4158.8	32.89
4251.46	32.59	4277.44	33.77	4348.5	33.21	4450.34	32.52	4502.9	33.25
4589.57	32.06	4642.49	36.37	4682.55	39.79	4849.6	40.43	5053.2	41.32
5076.14	41.3	5271.78	41.15	5373.59	41.1	5484.25	40.56	5680.94	40.07
5693.99	40.03	6018.57	39	6337.78	37.64	6353.27	37.7	6365.16	37.85
6529.44	39.58	6602.74	40.64	6663.65	41.21	6752.9	42.21	6849.75	42.93
6979.22	43.75	7072.35	43.9	7220.05	44.03	7286.9	46.32	7423.73	50.96
7512.77	52.27	7632.68	54.23	7748.39	54.59	7948.67	55.08	7954.16	55.06
8189.64	53.69	8277.55	53.33	8432.56	52.47	8596.55	51.57	8697.89	51.64
8864.87	51.77	8921.13	51.83	9083.22	51.22	9241.52	50.31	9314.3	50.71
9481.66	51.95	9562.13	52.89	9637.25	53.02	9807.66	52.4	9887.04	51.81
9927	51.95	10063.23	53.16	10106.34	54.26	10204.53	55.93		

Manning's n Values num= 4									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2.5	.041	3250.4	.031	3610.89	.07	3624.95	.043		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	3250.4	3624.95		1903.5	4751.08	1745.42	.1
							.3

Blocked Obstructions num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
2.5	3250.4	30.06	3624.95	10204.53	30.06	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	38.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.041	0.033	0.043
W.S. Elev (ft)	37.84	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	1371.50	5019.87	3104.70

E.G. Slope (ft/ft)	0.000246	Area (sq ft)	1371.50	5019.87	3104.70
Q Total (cfs)	25000.00	Flow (cfs)	979.85	19869.20	4150.95
Top Width (ft)	2307.60	Top Width (ft)	1039.04	374.55	894.02
Vel Total (ft/s)	2.63	Avg. Vel. (ft/s)	0.71	3.96	1.34
Max Chl Dpth (ft)	19.99	Hydr. Depth (ft)	1.32	13.40	3.47
Conv. Total (cfs)	1594953.0	Conv. (cfs)	62512.6	1267618.0	264822.7
Length Wtd. (ft)	4109.15	Wetted Per. (ft)	1039.12	379.46	894.48
Min Ch El (ft)	17.85	Shear (lb/sq ft)	0.02	0.20	0.05
Alpha	1.84	Stream Power (lb/ft s)	0.01	0.80	0.07
Frctn Loss (ft)	1.04	Cum Volume (acre-ft)	7777.78	7364.45	6656.78
C & E Loss (ft)	0.00	Cum SA (acres)	1795.89	564.31	1740.23

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 40.575*

INPUT
Description: Interpolated Cross Section at River Mile 40.58
Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.25	88.93	106.56	81.85	141.01	75.71	274.49	53.01	336.53	42.5
369.98	42.53	424.79	41.25	536.48	40.98	666.26	41.13	799.52	41.02
941.76	41.2	1058.86	41.31	1200.79	42.57	1331.15	42.33	1406.65	41.97
1454.11	41.09	1559.72	41.84	1711.34	41.95	1768.79	41.99	1858.73	41.79
1987.81	40.75	2035.35	39.98	2124.85	40.21	2247.9	40.01	2361.21	41.57
2387.16	41.74	2401.19	42.64	2405.21	42.68	2428.35	41.62	2483.07	37.92
2525.2	37.42	2612.61	38.09	2677.04	38.61	2720.58	36.35	2754.65	35.42
2809.64	34.98	2915.38	34.82	3046	35.01	3125.49	34.98	3177.77	35.23
3212.72	35.56	3320.57	36.2	3456.57	35.16	3565.53	34.59	3594.8	34.69
3613.73	33.84	3649.3	33.85	3764.02	34.72	3780.45	34.16	3784.5	33.9
3788.21	31.89	3791.03	29.69	3794.68	27.87	3800.67	25.49	3804.59	23.98
3806.71	23.68	3812.06	22.88	3812.7	22.69	3818.69	21.01	3823	19.8
3824.68	19.53	3830.66	18.53	3836.65	17.43	3843.55	17.88	3851.5	17.43
3860.29	17.77	3867.59	19.41	3868.46	19.61	3877.87	20.2	3883.69	20.85
3886.66	21.18	3896.16	21.34	3899.79	21.54	3904.33	21.87	3913.12	22.26
3916.36	22.56	3922.53	22.96	3931.32	22.9	3940.11	23.21	3948.64	23.53
3992.17	24.83	3996.23	24.96	4038.05	25.34	4067.66	25.49	4084.84	25.38
4097.91	25.25	4114.49	24.7	4122.7	24.62	4125.78	24.75	4129.62	25.29
4134.61	26.23	4135.28	26.36	4148.77	31.3	4159.88	32.05	4160.86	32.1
4309.14	36.25	4314.1	36.28	4513.93	37.34	4643.67	33.53	4700.95	31.88
4796.79	31.64	4823.67	32.71	4897.16	32.22	5002.5	31.69	5056.86	33.05
5146.51	31.69	5201.24	35.39	5242.68	38.43	5415.46	38.86	5626.05	39.54
5649.77	39.5	5852.13	39.28	5957.44	39.2	6071.9	38.68	6275.34	38.48
6288.83	38.44	6624.56	37.7	6954.73	36.65	6970.74	36.72	6983.04	36.93
7152.96	39.47	7228.77	40.86	7291.78	41.57	7384.09	42.74	7484.27	43.47
7618.18	44.22	7714.5	44.37	7867.28	44.45	7936.42	46.49	8077.95	50.59
8170.04	51.72	8294.07	53.54	8413.75	53.92	8620.91	54.37	8626.59	54.35
8870.14	52.87	8961.07	52.54	9121.4	51.76	9291.02	50.95	9395.84	51.02
9568.55	51.14	9626.74	51.19	9794.4	50.66	9958.13	49.67	10033.41	49.95
10206.51	51.07	10289.75	52.13	10367.45	52.45	10543.7	51.78	10625.81	51.02
10667.14	51.03	10808.05	52.16	10852.64	53.58	10954.2	55.6		

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2.25	.041	3784.5	.031	4135.28	.07	4148.77	.043

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3784.5	4148.77	1903.5	4751.08	1745.42	.1	.3
Blocked Obstructions		num=	2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
2.25	3784.5	29.29	4148.77	10954.2	29.29	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	37.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.041	0.033	0.043
W.S. Elev (ft)	36.80	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	1866.27	4794.55	3168.05
E.G. Slope (ft/ft)	0.000260	Area (sq ft)	1866.27	4794.55	3168.05
Q Total (cfs)	25000.00	Flow (cfs)	1578.66	19317.55	4103.79
Top Width (ft)	2456.64	Top Width (ft)	1072.60	364.27	1019.77
Vel Total (ft/s)	2.54	Avg. Vel. (ft/s)	0.85	4.03	1.30
Max Chl Dpth (ft)	19.37	Hydr. Depth (ft)	1.74	13.16	3.11
Conv. Total (cfs)	1549430.0	Conv. (cfs)	97841.1	1197248.0	254341.2
Length Wtd. (ft)	4047.22	Wetted Per. (ft)	1072.68	368.84	1020.16
Min Ch El (ft)	17.43	Shear (lb/sq ft)	0.03	0.21	0.05
Alpha	1.99	Stream Power (lb/ft s)	0.02	0.85	0.07
Frctn Loss (ft)	1.09	Cum Volume (acre-ft)	7707.04	6829.22	6531.11
C & E Loss (ft)	0.00	Cum SA (acres)	1749.75	524.02	1701.89

Warning: Divided flow computed for this cross-section.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 39.6666*

INPUT
 Description: Interpolated Cross Section at River Mile 39.67
 Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2	86.73	121.05	80.07	160.37	74.49	312.7	54.32	383.51	45
421.68	45.04	484.23	43.32	611.7	42.95	759.82	43.14	911.91	42.97
1074.24	43.2	1207.89	43.33	1369.87	45	1518.64	44.66	1604.81	44.18
1658.97	42.99	1779.51	43.98	1952.54	44.11	2018.11	44.16	2120.76	43.88
2268.07	42.48	2322.33	41.45	2424.48	41.74	2564.91	41.47	2694.24	43.53
2723.84	43.75	2739.86	44.59	2744.44	44.54	2770.86	43.1	2833.31	38.13
2881.39	37.43	2981.15	38.26	3054.68	38.88	3104.37	35.83	3143.26	34.56
3206.01	33.93	3326.7	33.62	3475.77	33.76	3566.48	33.64	3626.15	33.81
3666.04	34.13	3789.13	34.63	3944.34	33.62	4068.69	33.16	4102.1	33.37
4123.71	32.29	4164.29	32.4	4295.23	33.5	4313.98	33.05	4318.6	32.77
4322.59	30.71	4325.61	28.26	4329.54	26.45	4335.97	24.29	4340.18	22.95
4342.47	22.67	4348.21	21.94	4348.9	21.77	4355.33	20.28	4359.97	19.2
4361.77	18.96	4368.2	18.05	4374.63	17	4380.77	17.4	4387.83	17
4396.25	17.32	4403.25	18.8	4404.08	18.98	4413.09	19.54	4418.67	20.13
4421.52	20.44	4430.62	20.62	4434.09	20.81	4438.44	21.16	4446.86	21.62
4449.97	21.92	4455.88	22.28	4464.3	22.23	4472.72	22.52	4480.88	22.8
4522.59	24	4526.47	24.11	4566.54	24.49	4594.89	24.65	4611.36	24.47
4623.88	24.3	4639.76	23.57	4647.62	23.47	4650.57	23.63	4654.25	24.18
4659.03	25.21	4659.67	25.35	4672.6	30.27	4684.07	31.04	4685.09	31.09
4838.29	34.77	4843.41	34.79	5049.87	35.73	5183.91	32.32	5243.1	30.88
5342.12	30.69	5369.89	31.64	5445.82	31.23	5554.65	30.86	5610.82	32.84
5703.44	31.31	5759.99	34.41	5802.81	37.08	5981.32	37.29	6198.9	37.75

6223.41	37.7	6432.48	37.4	6541.29	37.3	6659.54	36.81	6869.73	36.88
6883.68	36.86	7230.54	36.4	7571.67	35.67	7588.21	35.74	7600.93	36.01
7776.48	39.36	7854.81	41.09	7919.91	41.92	8015.28	43.27	8118.78	44
8257.14	44.69	8356.66	44.84	8514.5	44.86	8585.94	46.66	8732.17	50.22
8827.32	51.17	8955.45	52.85	9079.12	53.25	9293.14	53.67	9299.01	53.65
9550.65	52.05	9644.59	51.75	9810.25	51.05	9985.49	50.3310093.79		50.4
10272.24	50.510332.36		50.5510505.58		50.0910674.75		49.0310752.52		49.19
10931.37	50.211017.37		51.3711097.64		51.8811279.75		51.1611364.58		50.22
11407.28	50.111552.87		51.1511598.93		52.9111703.87		55.27		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2	.042	4318.6	.031	4659.67	.07	4672.6	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
4318.6 4672.6 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
2	4318.6	28.51	4672.6	11703.87	28.51

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	35.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.042	0.033	0.044
W.S. Elev (ft)	35.71	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	2412.96	4556.27	3227.87
E.G. Slope (ft/ft)	0.000280	Area (sq ft)	2412.96	4556.27	3227.87
Q Total (cfs)	25000.00	Flow (cfs)	2262.69	18771.52	3965.79
Top Width (ft)	2693.48	Top Width (ft)	1210.49	354.00	1129.00
Vel Total (ft/s)	2.45	Avg. Vel. (ft/s)	0.94	4.12	1.23
Max Chl Dpth (ft)	18.71	Hydr. Depth (ft)	1.99	12.87	2.86
Conv. Total (cfs)	1493889.0	Conv. (cfs)	135208.5	1121703.0	236977.8
Length Wtd. (ft)	3983.51	Wetted Per. (ft)	1210.56	358.32	1129.32
Min Ch El (ft)	17.00	Shear (lb/sq ft)	0.03	0.22	0.05
Alpha	2.17	Stream Power (lb/ft s)	0.03	0.92	0.06
Frctn Loss (ft)	1.17	Cum Volume (acre-ft)	7613.54	6319.27	6402.97
C & E Loss (ft)	0.00	Cum SA (acres)	1699.86	484.85	1658.84

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 38.7583*

INPUT
Description: Interpolated Cross Section at River Mile 38.76

Station Elevation Data	num=	154							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.75	84.54	135.53	78.29	179.72	73.26	350.92	55.63	430.48	47.5
473.38	47.55	543.68	45.39	686.93	44.91	853.38	45.15	1024.29	44.93
1206.72	45.2	1356.92	45.35	1538.95	47.42	1706.14	46.99	1802.97	46.38
1863.84	44.89	1999.29	46.12	2193.75	46.27	2267.44	46.33	2382.79	45.97
2548.34	44.2	2609.32	42.92	2724.11	43.27	2881.92	42.92	3027.26	45.49
3060.53	45.76	3078.52	46.54	3083.68	46.4	3113.36	44.59	3183.55	38.33
3237.58	37.44	3349.69	38.42	3432.32	39.16	3488.16	35.31	3531.86	33.7
3602.39	32.87	3738.01	32.42	3905.54	32.5	4007.48	32.3	4074.53	32.38
4119.36	32.7	4257.68	33.06	4432.11	32.08	4571.85	31.73	4609.4	32.04

4633.68	30.75	4679.29	30.95	4826.43	32.27	4847.51	31.93	4852.7	31.63
4856.96	29.53	4860.2	26.83	4864.39	25.04	4871.27	23.09	4875.78	21.91
4878.22	21.66	4884.36	21	4885.1	20.85	4891.98	19.54	4896.94	18.6
4898.86	18.39	4905.74	17.57	4912.62	16.58	4917.98	16.92	4924.17	16.58
4932.22	16.88	4938.91	18.19	4939.7	18.34	4948.32	18.87	4953.65	19.41
4956.37	19.7	4965.07	19.9	4968.39	20.09	4972.55	20.46	4980.6	20.97
4983.57	21.28	4989.22	21.6	4997.27	21.57	5005.32	21.82	5013.13	22.08
5053	23.16	5056.72	23.26	5095.02	23.64	5122.13	23.81	5137.88	23.57
5149.84	23.35	5165.03	22.43	5172.55	22.31	5175.36	22.51	5178.88	23.07
5183.45	24.18	5184.06	24.33	5196.43	29.23	5208.27	30.02	5209.32	30.08
5367.43	33.28	5372.72	33.3	5585.81	34.11	5724.16	31.12	5785.25	29.87
5887.45	29.73	5916.11	30.58	5994.48	30.24	6106.81	30.02	6164.78	32.64
6260.38	30.94	6318.74	33.44	6362.93	35.72	6547.18	35.71	6771.75	35.96
6797.05	35.9	7012.84	35.53	7125.13	35.41	7247.19	34.93	7464.13	35.28
7478.52	35.27	7836.53	35.1	8188.61	34.69	8205.69	34.76	8218.81	35.08
8400	39.26	8480.85	41.31	8548.04	42.28	8646.47	43.8	8753.3	44.54
8896.09	45.16	8998.81	45.31	9161.73	45.28	9235.46	46.83	9386.38	49.86
9484.59	50.63	9616.84	52.17	9744.48	52.58	9965.38	52.96	9971.44	52.94
10231.16	51.23	10328.12	50.97	10499.09	50.35	10679.97	49.72	10791.74	49.77
10975.92	49.86	11037.97	49.91	11216.75	49.53	11391.36	48.39	11471.63	48.43
11656.22	49.32	11744.98	50.62	11827.84	51.31	12015.79	50.54	12103.34	49.43
12147.42	49.18	12297.68	50.14	12345.23	52.23	12453.53	54.93		

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 1.75 .042 4852.7 .031 5184.06 .07 5196.43 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4852.7 5196.43 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 1.75 4852.7 27.72 5196.43 12453.53 27.72

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	34.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.042	0.033	0.045
W.S. Elev (ft)	34.54	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	2943.83	4300.63	3242.00
E.G. Slope (ft/ft)	0.000306	Area (sq ft)	2943.83	4300.63	3242.00
Q Total (cfs)	25000.00	Flow (cfs)	3071.96	18179.17	3748.88
Top Width (ft)	2831.08	Top Width (ft)	1343.69	343.73	1143.66
Vel Total (ft/s)	2.38	Avg. Vel. (ft/s)	1.04	4.23	1.16
Max Chl Dpth (ft)	17.96	Hydr. Depth (ft)	2.19	12.51	2.83
Conv. Total (cfs)	1429691.0	Conv. (cfs)	175678.0	1039624.0	214389.3
Length Wtd. (ft)	3928.34	Wetted Per. (ft)	1343.77	347.88	1143.94
Min Ch El (ft)	16.58	Shear (lb/sq ft)	0.04	0.24	0.05
Alpha	2.34	Stream Power (lb/ft s)	0.04	1.00	0.06
Frctn Loss (ft)	1.21	Cum Volume (acre-ft)	7496.50	5836.26	6273.35
C & E Loss (ft)	0.00	Cum SA (acres)	1644.06	446.80	1613.31

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

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 37.85*

INPUT

Description: Interpolated Cross Section at River Mile 37.85

Station Elevation Data		num= 154							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.5	82.35	150.02	76.51	199.08	72.04	389.13	56.94	477.46	50
525.09	50.06	603.13	47.47	762.15	46.88	946.94	47.16	1136.68	46.88
1339.21	47.2	1505.94	47.37	1708.03	49.85	1893.63	49.32	2001.13	48.58
2068.7	46.79	2219.08	48.26	2434.96	48.43	2516.76	48.49	2644.82	48.06
2828.6	45.93	2896.3	44.39	3023.73	44.81	3198.93	44.38	3360.28	47.45
3397.21	47.77	3417.19	48.49	3422.92	48.27	3455.87	46.08	3533.78	38.54
3593.77	37.44	3718.23	38.59	3809.96	39.44	3871.95	34.8	3920.47	32.84
3998.76	31.82	4149.32	31.21	4335.3	31.24	4448.48	30.96	4522.91	30.95
4572.68	31.27	4726.24	31.49	4919.88	30.54	5075.02	30.29	5116.7	30.72
5143.65	29.2	5194.29	29.5	5357.64	31.04	5381.03	30.81	5386.8	30.5
5391.34	28.36	5394.78	25.39	5399.25	23.62	5406.58	21.9	5411.38	20.87
5413.98	20.65	5420.51	20.06	5421.3	19.93	5428.63	18.81	5433.9	18
5435.95	17.82	5443.28	17.09	5450.6	16.15	5455.2	16.45	5460.5	16.15
5468.18	16.43	5474.56	17.57	5475.32	17.71	5483.54	18.21	5488.63	18.7
5491.22	18.96	5499.52	19.18	5502.69	19.36	5506.66	19.75	5514.34	20.32
5517.18	20.64	5522.57	20.92	5530.25	20.9	5537.93	21.13	5545.38	21.36
5583.41	22.32	5586.96	22.42	5623.5	22.78	5649.37	22.96	5664.39	22.66
5675.81	22.4	5690.3	21.3	5697.47	21.15	5700.16	21.39	5703.51	21.96
5707.88	23.15	5708.46	23.32	5720.25	28.2	5732.46	29.01	5733.54	29.07
5896.58	31.8	5902.03	31.82	6121.76	32.49	6264.41	29.92	6327.4	28.87
6432.78	28.78	6462.33	29.51	6543.14	29.25	6658.96	29.19	6718.74	32.43
6817.31	30.57	6877.49	32.46	6923.06	34.37	7113.04	34.14	7344.59	34.17
7370.68	34.1	7593.19	33.65	7708.98	33.51	7834.83	33.06	8058.52	33.68
8073.36	33.69	8442.51	33.8	8805.55	33.71	8823.16	33.78	8836.69	34.16
9023.52	39.15	9106.88	41.54	9176.16	42.63	9277.66	44.33	9387.81	45.08
9535.05	45.64	9640.97	45.78	9808.95	45.69	9884.98	46.99	10040.6	49.49
10141.86	50.08	10278.23	51.48	10409.84	51.91	10637.61	52.25	10643.86	52.24
10911.66	50.41	11011.64	50.18	11187.93	49.64	11374.44	49.11	11489.69	49.15
11679.6	49.22	11743.59	49.28	11927.93	48.97	12107.97	47.74	12190.74	47.67
12381.07	48.45	12472.6	49.86	12558.03	50.73	12751.84	49.92	12842.11	48.64
12887.56	48.25	13042.5	49.14	13091.52	51.56	13203.2	54.6		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
1.5	.043	5386.8	.031
		5720.25	.046

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	5386.8	5720.25	1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Elev
1.5	5386.8	26.94	13203.2
		26.94	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	33.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.043	0.031	0.046
W.S. Elev (ft)	33.33	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	3461.37	4037.81	3212.65
E.G. Slope (ft/ft)	0.000308	Area (sq ft)	3461.37	4037.81	3212.65
Q Total (cfs)	25000.00	Flow (cfs)	3703.48	17777.89	3518.63
Top Width (ft)	3160.08	Top Width (ft)	1478.36	333.45	1348.27
Vel Total (ft/s)	2.33	Avg. Vel. (ft/s)	1.07	4.40	1.10
Max Chl Dpth (ft)	17.18	Hydr. Depth (ft)	2.34	12.11	2.38
Conv. Total (cfs)	1423637.0	Conv. (cfs)	210896.3	1012371.0	200370.3
Length Wtd. (ft)	3843.85	Wetted Per. (ft)	1478.45	337.52	1348.51
Min Ch El (ft)	16.15	Shear (lb/sq ft)	0.05	0.23	0.05
Alpha	2.59	Stream Power (lb/ft s)	0.05	1.01	0.05

Frctn Loss (ft)	1.21	Cum Volume (acre-ft)	7356.55	5381.53	6144.03
C & E Loss (ft)	0.00	Cum SA (acres)	1582.40	409.87	1563.38

Warning: Divided flow computed for this cross-section.

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

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 36.9416*

INPUT

Description: Interpolated Cross Section at River Mile 36.94

Station Elevation Data		num= 154									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.25	80.16	164.51	74.73	218.43	70.82	427.34	58.25	524.43	52.5		
576.79	52.56	662.57	49.54	837.38	48.85	1040.5	49.16	1249.07	48.83		
1471.69	49.2	1654.97	49.39	1877.11	52.27	2081.13	51.65	2199.29	50.79		
2273.57	48.69	2438.87	50.4	2676.17	50.6	2766.08	50.66	2906.85	50.15		
3108.87	47.66	3183.28	45.86	3323.36	46.34	3515.94	45.83	3693.3	49.4		
3733.9	49.79	3755.86	50.45	3762.15	50.13	3798.37	47.56	3884.02	38.75		
3949.96	37.45	4086.77	38.75	4187.6	39.71	4255.74	34.28	4309.07	31.99		
4395.13	30.77	4560.64	30.01	4765.07	29.98	4889.47	29.62	4971.29	29.53		
5026	29.85	5194.8	29.92	5407.65	29	5578.18	28.86	5624	29.4		
5653.63	27.65	5709.29	28.05	5888.85	29.82	5914.56	29.69	5920.9	29.37		
5925.72	27.18	5929.37	23.96	5934.11	22.2	5941.88	20.7	5946.97	19.83		
5949.73	19.64	5956.66	19.12	5957.5	19.01	5965.27	18.07	5970.87	17.4		
5973.04	17.25	5980.81	16.61	5988.58	15.73	5992.42	15.97	5996.83	15.73		
6004.14	15.99	6010.22	16.96	6010.94	17.08	6018.77	17.54	6023.61	17.98		
6026.08	18.21	6033.98	18.46	6036.99	18.63	6040.77	19.04	6048.08	19.68		
6050.78	20	6055.91	20.24	6063.22	20.23	6070.53	20.43	6077.62	20.63		
6113.83	21.49	6117.21	21.57	6151.99	21.93	6176.61	22.12	6190.9	21.75		
6201.77	21.45	6215.56	20.17	6222.39	19.99	6224.95	20.28	6228.15	20.85		
6232.3	22.13	6232.85	22.3	6244.08	27.17	6256.66	27.99	6257.77	28.06		
6425.73	30.32	6431.34	30.33	6657.7	30.87	6804.66	28.71	6869.54	27.86		
6978.11	27.83	7008.55	28.45	7091.8	28.26	7211.12	28.36	7272.7	32.23		
7374.25	30.2	7436.24	31.48	7483.19	33.01	7678.9	32.57	7917.44	32.38		
7944.32	32.3	8173.54	31.77	8292.83	31.61	8422.48	31.18	8652.92	32.09		
8668.21	32.1	9048.5	32.5	9422.49	32.72	9440.63	32.8	9454.57	33.23		
9647.04	39.04	9732.92	41.77	9804.29	42.99	9908.85	44.85	10022.33	45.62		
10174.01	46.11	110283.12	46.25	10456.18	46.11	10534.5	47.16	10694.82	49.12		
10799.14	49.53	10939.62	50.79	11075.2	51.25	11309.84	51.54	11316.28	51.53		
11592.17	49.59	11695.17	49.41	11876.78	48.93	12068.91	48.48	12187.64	48.52		
12383.29	48.59	12449.2	48.64	12639.11	48.41	12824.58	47.11	12909.85	46.91		
13105.93	47.57	13200.21	49.11	13288.23	50.16	13487.88	49.31	13580.88	47.84		
13627.7	47.33	13787.32	48.13	13837.82	50.88	13952.87	54.27				

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
1.25	.043	5920.9	.031
		6244.08	.046

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
5920.9	6244.08	1903.5	4751.08	1745.42	.1	.3

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Sta L
0	5920.9	26.16	6244.08
			13952.87
			26.16

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	32.33	Element	Left OB	Channel	Right OB
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Vel Head (ft)	0.21	Wt. n-Val.	0.043	0.031	0.046
W.S. Elev (ft)	32.12	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	4038.24	3789.46	3433.97
E.G. Slope (ft/ft)	0.000322	Area (sq ft)	4038.24	3789.46	3433.97
Q Total (cfs)	25000.00	Flow (cfs)	4615.59	16692.54	3691.88
Top Width (ft)	3813.30	Top Width (ft)	1614.95	323.18	1875.17
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)	1.14	4.40	1.08
Max Chl Dpth (ft)	16.39	Hydr. Depth (ft)	2.50	11.73	1.83
Conv. Total (cfs)	1392428.0	Conv. (cfs)	257074.9	929726.4	205627.0
Length Wtd. (ft)	3702.46	Wetted Per. (ft)	1615.04	327.23	1875.41
Min Ch El (ft)	15.73	Shear (lb/sq ft)	0.05	0.23	0.04
Alpha	2.71	Stream Power (lb/ft s)	0.06	1.03	0.04
Frctn Loss (ft)	1.19	Cum Volume (acre-ft)	7192.69	4954.67	6010.87
C & E Loss (ft)	0.01	Cum SA (acres)	1514.81	374.06	1498.80

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

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 36.0333*

INPUT

Description: Interpolated Cross Section at River Mile 36.03

Station Elevation Data num= 154									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1	77.97	178.99	72.94	237.78	69.59	465.55	59.56	571.41	55
628.49	55.07	722.02	51.61	912.6	50.82	1134.06	51.17	1361.45	50.79
1604.17	51.2	1803.99	51.42	2046.19	54.7	2268.62	53.98	2397.46	52.99
2478.44	50.59	2658.65	52.54	2917.37	52.76	3015.41	52.83	3168.88	52.24
3389.14	49.39	3470.27	47.33	3622.99	47.87	3832.95	47.28	4026.32	51.36
4070.59	51.8	4094.53	52.4	4101.39	51.99	4140.88	49.05	4234.25	38.96
4306.15	37.46	4455.3	38.91	4565.24	39.99	4639.54	33.76	4697.68	31.13
4791.51	29.71	4971.95	28.81	5194.83	28.73	5330.47	28.28	5419.67	28.1
5479.32	28.42	5663.35	28.35	5895.42	27.46	6081.35	27.43	6131.3	28.08
6163.6	26.1	6224.29	26.6	6420.05	28.59	6448.09	28.57	6455	28.23
6460.09	26.01	6463.96	22.53	6468.97	20.78	6477.19	19.5	6482.57	18.79
6485.48	18.63	6492.82	18.18	6493.7	18.09	6501.92	17.34	6507.84	16.8
6510.13	16.68	6518.35	16.12	6526.57	15.3	6529.63	15.5	6533.17	15.3
6540.11	15.54	6545.88	16.35	6546.56	16.45	6553.99	16.88	6558.58	17.26
6560.93	17.47	6568.43	17.74	6571.29	17.91	6574.88	18.33	6581.82	19.03
6584.38	19.36	6589.26	19.56	6596.2	19.57	6603.14	19.74	6609.87	19.91
6644.24	20.65	6647.45	20.72	6680.47	21.08	6703.85	21.28	6717.42	20.85
6727.74	20.5	6740.83	19.03	6747.31	18.83	6749.74	19.16	6752.78	19.74
6756.72	21.1	6757.24	21.29	6767.9	26.13	6780.85	26.98	6782	27.05
6954.87	28.84	6960.66	28.85	7193.64	29.25	7344.91	27.51	7411.69	26.86
7523.44	26.87	7554.77	27.38	7640.46	27.26	7763.28	27.53	7826.66	32.02
7931.18	29.83	7994.99	30.51	8043.31	31.65	8244.76	30.99	8490.29	30.59
8517.95	30.5	8753.89	29.9	8876.67	29.71	9010.12	29.3	9247.32	30.49
9263.05	30.52	9654.48	31.21	10039.44	31.74	10058.11	31.82	10072.45	32.31
10270.56	38.93	10358.95	41.99	10432.42	43.34	10540.04	45.38	10656.84	46.15
10812.97	46.58	10925.28	46.72	11103.4	46.52	11184.02	47.33	11349.03	48.75
11456.41	48.99	11601.01	50.11	11740.56	50.58	11982.08	50.83	11988.71	50.82
12272.68	48.78	12378.69	48.61	12565.62	48.23	12763.38	47.87	12885.59	47.9
13086.97	47.95	13154.81	48.13	13350.29	47.85	13541.19	46.46	13628.96	46.15
13830.78	46.71	13927.83	48.35	14018.42	49.59	14223.92	48.68	14319.65	47.05
14367.84	46.41	14532.13	47.13	14584.12	50.21	14702.53	53.93		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val				
1	.043	6455	.031	6767.9	.047				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	6455	6767.9		1903.5	4751.08	1745.42	.1 .3

Blocked Obstructions	num=	2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev
1	6455	25.37	6767.9	14702.53	25.37

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	31.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.043	0.031	0.047
W.S. Elev (ft)	30.95	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	4715.25	3559.86	4038.30
E.G. Slope (ft/ft)	0.000321	Area (sq ft)	4715.25	3559.86	4038.30
Q Total (cfs)	25000.00	Flow (cfs)	5659.39	15322.95	4017.65
Top Width (ft)	4476.08	Top Width (ft)	1745.45	312.90	2417.73
Vel Total (ft/s)	2.03	Avg. Vel. (ft/s)	1.20	4.30	0.99
Max Chl Dpth (ft)	15.65	Hydr. Depth (ft)	2.70	11.38	1.67
Conv. Total (cfs)	1396098.0	Conv. (cfs)	316042.7	855693.8	224361.5
Length Wtd. (ft)	3509.53	Wetted Per. (ft)	1745.55	317.00	2417.94
Min Ch El (ft)	15.30	Shear (lb/sq ft)	0.05	0.22	0.03
Alpha	2.87	Stream Power (lb/ft s)	0.06	0.97	0.03
Froctn Loss (ft)	1.05	Cum Volume (acre-ft)	7001.44	4553.87	5861.16
C & E Loss (ft)	0.01	Cum SA (acres)	1441.39	339.37	1412.79

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

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 35.125*

INPUT
Description: Interpolated Cross Section at River Mile 35.13
Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.75	75.77	193.48	71.16	257.14	68.37	503.76	60.87	618.39	57.5
680.19	57.58	781.46	53.68	987.83	52.79	1227.62	53.18	1473.84	52.74
1736.65	53.2	1953.02	53.44	2215.26	57.12	2456.12	56.31	2595.62	55.19
2683.3	52.5	2878.44	54.68	3158.58	54.92	3264.73	55	3430.91	54.33
3669.4	51.12	3757.25	48.79	3922.62	49.4	4149.97	48.74	4359.34	53.32
4407.27	53.81	4433.2	54.35	4440.62	53.85	4483.38	50.54	4584.49	39.17
4662.33	37.47	4823.84	39.08	4942.88	40.27	5023.33	33.25	5086.28	30.27
5187.88	28.66	5383.26	27.61	5624.6	27.47	5771.46	26.94	5868.06	26.68
5932.64	26.99	6131.91	26.79	6383.19	25.92	6584.51	26	6638.6	26.76
6673.58	24.55	6739.29	25.15	6951.26	27.36	6981.62	27.45	6989.1	27.1
6994.47	24.83	6998.54	21.1	7003.83	19.36	7012.49	18.3	7018.16	17.75
7021.24	17.63	7028.97	17.24	7029.9	17.16	7038.56	16.6	7044.8	16.2
7047.23	16.11	7055.89	15.64	7064.55	14.88	7066.85	15.02	7069.5	14.88
7076.07	15.1	7081.53	15.74	7082.18	15.82	7089.21	16.21	7093.56	16.55
7095.79	16.73	7102.89	17.02	7105.6	17.18	7108.99	17.62	7115.56	18.39
7117.99	18.72	7122.6	18.88	7129.17	18.9	7135.74	19.04	7142.11	19.18
7174.66	19.81	7177.69	19.87	7208.95	20.22	7231.08	20.43	7243.93	19.94
7253.7	19.55	7266.1	17.9	7272.23	17.67	7274.53	18.04	7277.41	18.63
7281.14	20.08	7281.64	20.28	7291.73	25.1	7305.04	25.96	7306.22	26.03
7484.02	27.35	7489.97	27.36	7729.59	27.63	7885.16	26.31	7953.84	25.85
8068.77	25.92	8100.99	26.32	8189.12	26.27	8315.43	26.7	8380.62	31.82

8488.12	29.46	8553.75	29.53	8603.44	30.3	8810.62	29.42	9063.14	28.81
9091.59	28.7	9334.24	28.02	9460.52	27.81	9597.77	27.43	9841.71	28.89
9857.89	28.9310260.47		29.9110656.38		30.7610675.58		30.8410690.33		31.39
10894.08	38.8210984.99		42.2211060.55		43.7111171.23		45.9111291.36		46.69
11451.93	47.0611567.43		47.1911750.63		46.9411833.54		47.512003.25		48.38
12113.68	48.44	12262.4	49.4212405.92		49.9112654.31		50.1212661.13		50.12
12953.18	47.9613062.21		47.8213254.47		47.5213457.86		47.2513583.55		47.27
13790.65	47.3113860.43		47.3614061.47		47.29	14257.8	45.8214348.07		45.38
14555.64	45.8214655.45		47.5914748.62		49.0214959.97		48.0615058.42		46.25
15107.98	45.4815276.95		46.1215330.41		49.53	15452.2	53.6		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 .75 .044 6989.1 .031 7291.73 .048

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 6989.1 7291.73 1903.5 4751.08 1745.42 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .75 6989.1 24.6 7291.73 15452.2 24.6

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	30.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.044	0.031	0.048
W.S. Elev (ft)	29.94	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	5747.65	3388.86	5307.40
E.G. Slope (ft/ft)	0.000275	Area (sq ft)	5747.65	3388.86	5307.40
Q Total (cfs)	25000.00	Flow (cfs)	6780.67	13369.17	4850.16
Top Width (ft)	4947.37	Top Width (ft)	1881.82	302.63	2762.92
Vel Total (ft/s)	1.73	Avg. Vel. (ft/s)	1.18	3.95	0.91
Max Chl Dpth (ft)	15.06	Hydr. Depth (ft)	3.05	11.20	1.92
Conv. Total (cfs)	1506456.0	Conv. (cfs)	408591.2	805602.4	292262.1
Length Wtd. (ft)	3235.79	Wetted Per. (ft)	1881.94	306.83	2763.11
Min Ch El (ft)	14.88	Shear (lb/sq ft)	0.05	0.19	0.03
Alpha	2.96	Stream Power (lb/ft s)	0.06	0.75	0.03
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	6772.83	4174.93	5673.93
C & E Loss (ft)	0.02	Cum SA (acres)	1362.14	305.80	1309.00

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 34.2166*

INPUT

Description: Interpolated Cross Section at River Mile 34.22

Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.5	73.58	207.97	69.38	276.49	67.15	541.98	62.18	665.36	60
731.9	60.09	840.91	55.76	1063.05	54.76	1321.18	55.19	1586.23	54.69
1869.14	55.2	2102.05	55.46	2384.34	59.55	2643.61	58.64	2793.78	57.39
2888.17	54.4	3098.23	56.82	3399.79	57.08	3514.05	57.16	3692.94	56.42
3949.67	52.84	4044.23	50.26	4222.24	50.94	4466.98	50.19	4692.36	55.28
4743.96	55.82	4771.86	56.3	4779.86	55.71	4825.89	52.03	4934.73	39.38
5018.52	37.48	5192.38	39.24	5320.52	40.55	5407.12	32.73	5474.89	29.41
5584.25	27.61	5794.57	26.4	6054.37	26.21	6212.46	25.6	6316.44	25.25
6385.96	25.56	6600.47	25.22	6870.96	24.38	7087.67	24.56	7145.9	25.44
7183.55	23	7254.29	23.7	7482.47	26.14	7515.14	26.34	7523.2	25.97
7528.85	23.65	7533.13	19.66	7538.68	17.94	7547.79	17.1	7553.76	16.71

7556.99	16.62	7565.12	16.3	7566.1	16.24	7575.21	15.87	7581.77	15.6
7584.32	15.54	7593.42	15.16	7602.53	14.45	7604.07	14.55	7605.83	14.45
7612.03	14.65	7617.19	15.12	7617.8	15.19	7624.44	15.55	7628.54	15.83
7630.64	15.99	7637.34	16.3	7639.9	16.45	7643.1	16.91	7649.31	17.74
7651.59	18.08	7655.94	18.2	7662.15	18.23	7668.35	18.35	7674.36	18.46
7705.07	18.97	7707.94	19.03	7737.44	19.37	7758.32	19.59	7770.45	19.03
7779.67	18.6	7791.37	16.77	7797.16	16.52	7799.33	16.92	7802.04	17.52
7805.56	19.05	7806.03	19.26	7815.55	24.07	7829.24	24.95	7830.45	25.02
8013.17	25.87	8019.28	25.87	8265.53	26.02	8425.4	25.11	8495.99	24.85
8614.1	24.97	8647.22	25.26	8737.78	25.28	8867.59	25.86	8934.58	31.61
9045.05	29.09	9112.5	28.55	9163.57	28.94	9376.48	27.85	9635.99	27.02
9665.23	26.9	9914.6	26.1510044	36	25.9110185	41	25.5510436	11	27.29
10452.74	27.3410866	45	28.6111273	32	29.7811293	05	29.8611308	22	30.46
11517.6	38.7111611	03	42.4511688	67	44.0611802	42	46.4411925	87	47.23
12090.89	47.5312209	59	47.6612397	85	47.3612483	06	47.6612657	47	48.01
12770.95	47.8912923	79	48.7313071	28	49.2413326	55	49.4113333	55	49.41
13633.69	47.1413745	74	47.0413943	31	46.8114152	33	46.63	14281.5	46.65
14494.33	46.6714566	04	46.7314772	64	46.7214974	42	45.1715067	18	44.62
15280.49	44.9515383	06	46.8315478	81	48.4415696	01	47.4415797	19	45.46
15848.12	44.5516021	77	45.1116076	71	48.8516201	87	53.27		

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
.5	.044	7523.2	.031	7815.55	.048			

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

7523.2	7815.55	1903.5	4751.08	1745.42	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.5	7523.2	23.82	7815.5516201	87	23.82

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	29.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.044	0.031	0.048
W.S. Elev (ft)	29.25	Reach Len. (ft)	1903.50	4751.08	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	7497.73	3317.06	7740.57
E.G. Slope (ft/ft)	0.000179	Area (sq ft)	7497.73	3317.06	7740.57
Q Total (cfs)	25000.00	Flow (cfs)	8077.48	10642.16	6280.37
Top Width (ft)	5471.39	Top Width (ft)	2038.32	292.35	3140.72
Vel Total (ft/s)	1.35	Avg. Vel. (ft/s)	1.08	3.21	0.81
Max Chl Dpth (ft)	14.80	Hydr. Depth (ft)	3.68	11.35	2.46
Conv. Total (cfs)	1867358.0	Conv. (cfs)	603341.4	794908.8	469107.5
Length Wtd. (ft)	2925.00	Wetted Per. (ft)	2038.42	296.73	3140.92
Min Ch El (ft)	14.45	Shear (lb/sq ft)	0.04	0.13	0.03
Alpha	2.71	Stream Power (lb/ft s)	0.04	0.40	0.02
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	6483.43	3809.22	5412.52
C & E Loss (ft)	0.01	Cum SA (acres)	1276.49	273.36	1190.72

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 33.3083*

INPUT

Description: Interpolated Cross Section at River Mile 33.31

Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.25	71.39	222.45	67.6	295.85	65.92	580.19	63.49	712.34	62.5

783.6	62.59	900.35	57.83	1138.28	56.73	1414.74	57.19	1698.61	56.65
2001.62	57.2	2251.07	57.48	2553.42	61.97	2831.11	60.97	2991.94	59.6
3093.03	56.3	3318.01	58.96	3640.99	59.24	3763.38	59.33	3954.97	58.51
4229.93	54.57	4331.22	51.73	4521.87	52.47	4783.99	51.65	5025.38	57.24
5080.64	57.84	5110.53	58.25	5119.09	57.57	5168.39	53.51	5284.96	39.59
5374.71	37.49	5560.92	39.41	5698.16	40.82	5790.91	32.22	5863.49	28.56
5980.63	26.55	6205.89	25.2	6484.13	24.96	6653.45	24.26	6764.82	23.83
6839.28	24.13	7069.02	23.65	7358.73	22.84	7590.84	23.13	7653.2	24.12
7693.53	21.45	7769.28	22.25	8013.67	24.91	8048.67	25.22	8057.3	24.83
8063.22	22.48	8067.71	18.23	8073.54	16.52	8083.1	15.9	8089.35	15.67
8092.75	15.61	8101.27	15.36	8102.3	15.32	8111.85	15.13	8118.74	15
8121.41	14.97	8130.96	14.68	8140.52	14.03	8141.28	14.08	8142.17	14.03
8148	14.21	8152.84	14.51	8153.42	14.56	8159.66	14.88	8163.52	15.12
8165.49	15.25	8171.79	15.58	8174.2	15.73	8177.21	16.2	8183.05	17.09
8185.2	17.44	8189.29	17.52	8195.12	17.57	8200.95	17.65	8206.61	17.74
8235.49	18.14	8238.18	18.18	8265.92	18.52	8285.56	18.74	8296.96	18.13
8305.63	17.65	8316.63	15.63	8322.08	15.36	8324.12	15.81	8326.67	16.41
8329.98	18.03	8330.42	18.25	8339.38	23.03	8353.43	23.93	8354.67	24.01
8542.31	24.39	8548.59	24.39	8801.47	24.4	8965.65	23.9	9038.14	23.84
9159.43	24.02	9193.44	24.19	9286.44	24.29	9419.74	25.03	9488.54	31.41
9601.99	28.72	9671.25	27.58	9723.7	27.59	9942.34	26.27	10208.84	25.23
10238.86	25.110494.95	24.2810628.21	24.0110773.05	23.68	11030.5	25.7			
11047.58	25.7611472.44	27.3111890.26	28.7911910.53	28.88	11926.1	29.54			
12141.12	38.612237.06	42.67	12316.8	44.4112433.61	46.9712560.38	47.76			
12729.85	4812851.74	48.1313045.08	47.7713132.58	47.8313311.68	47.64				
13428.23	47.3513585.17	48.0513736.64	48.5713998.78	48.7114005.98	48.71				
14314.19	46.3214429.26	46.2514632.16	46.11	14846.8	46.0214979.45	46.02			
15198.02	46.0415271.66	46.0915483.82	46.1615691.03	44.5315786.29	43.86				
16005.34	44.0716110.68	46.08	16209	47.8716432.05	46.8216535.96	44.67			
16588.26	43.6316766.58	44.11	16823	48.1816951.53	52.93				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 .25 .045 8057.3 .031 8339.38 .049

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 8057.3 8339.38 1903.5 4751.09 1745.42 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .25 8057.3 23.03 8339.3816951.53 23.03

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.045	0.031	0.049
W.S. Elev (ft)	28.87	Reach Len. (ft)	1903.50	4751.09	1745.42
Crit W.S. (ft)		Flow Area (sq ft)	10053.20	3334.04	11465.79
E.G. Slope (ft/ft)	0.000097	Area (sq ft)	10053.20	3334.04	11465.79
Q Total (cfs)	25000.00	Flow (cfs)	9006.06	8082.06	7911.89
Top Width (ft)	5916.45	Top Width (ft)	2199.96	282.08	3434.41
Vel Total (ft/s)	1.01	Avg. Vel. (ft/s)	0.90	2.42	0.69
Max Chl Dpth (ft)	14.84	Hydr. Depth (ft)	4.57	11.82	3.34
Conv. Total (cfs)	2537499.0	Conv. (cfs)	914114.4	820328.4	803056.4
Length Wtd. (ft)	2612.41	Wetted Per. (ft)	2200.06	286.68	3434.66
Min Ch El (ft)	14.03	Shear (lb/sq ft)	0.03	0.07	0.02
Alpha	2.31	Stream Power (lb/ft s)	0.02	0.17	0.01
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	6099.96	3446.50	5027.72
C & E Loss (ft)	0.01	Cum SA (acres)	1183.88	242.03	1058.99

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: Fish Creek
 REACH: Upper Fish Creek RS: 32.4

INPUT
 Description: Cross Section at River Mile 32.4

Station Elevation Data num= 97									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.2	315.2	64.7	618.4	64.8	835.3	65.1	959.8	59.9
1213.5	58.7	1508.3	59.2	1811	58.6	2134.1	59.2	2400.1	59.5
2722.5	64.4	3018.6	63.3	3190.1	61.8	3297.9	58.2	3537.8	61.1
3882.2	61.4	4012.7	61.5	4217	60.6	4510.2	56.3	4618.2	53.2
4821.5	54	5101	53.1	5358.4	59.2	5449.2	60.2	5510.9	55
5635.2	39.8	5730.9	37.5	6075.8	41.1	6174.7	31.7	6252.1	27.7
6377	25.5	6617.2	24	6913.9	23.7	7213.2	22.4	7292.6	22.7
7846.5	21.3	8094	21.7	8160.5	22.8	8203.5	19.9	8582.2	24.1
8591.4	23.7	8597.6	21.3	8602.3	16.8	8608.4	15.1	8618.4	14.7
8628.5	14.6	8638.5	14.4	8648.5	14.4	8658.5	14.4	8668.5	14.2
8678.5	13.6	8688.5	13.9	8698.5	14.4	8708.5	15	8718.8	16.8
8765.9	17.3	8812.8	17.9	8831.6	16.7	8841.9	14.5	8847	14.2
8851.3	15.3	8854.4	17	8863.2	22	8878.9	23	9077.9	22.9
9505.9	22.7	9835.1	23.3	9971.9	24.2	10042.5	31.2	10230	26.6
10508.2	24.7	10812.5	23.3	11075.3	22.4	11360.7	22.8	11624.9	24.1
12528	27.9	12863.1	42.9	13064.8	47.5	13194.9	48.3	13493.9	48.6
13782.1	48	14085.5	46.8	14402	47.9	14678.4	48	14994.7	45.5
15321	45.4	15677.4	45.4	15901.7	45.4	16195	45.6	16505.4	43.1
16730.2	43.2	16939.2	47.3	17168.1	46.2	17328.4	42.7	17511.4	43.1
17569.3	47.5	17701.2	52.6						

Manning's n Values num= 8									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	7846.5	.055	8582.2	.07	8597.6	.031	8863.2	.05
8878.9	.04	15321	.05	15901.7	.04				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	8591.4	8863.2	2464.43	4273.14	2171		.1	.3

Blocked Obstructions num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
0	8582.2	22.25	8878.9	17701.2	22.25	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.045	0.032	0.040
W.S. Elev (ft)	28.71	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	13008.25	3401.38	16136.31
E.G. Slope (ft/ft)	0.000043	Area (sq ft)	13008.25	3401.38	16136.31
Q Total (cfs)	25400.00	Flow (cfs)	8930.86	5512.48	10956.66
Top Width (ft)	6186.51	Top Width (ft)	2358.76	271.80	3555.95
Vel Total (ft/s)	0.78	Avg. Vel. (ft/s)	0.69	1.62	0.68
Max Chl Dpth (ft)	15.11	Hydr. Depth (ft)	5.51	12.51	4.54
Conv. Total (cfs)	3855058.0	Conv. (cfs)	1355471.0	836650.9	1662936.0
Length Wtd. (ft)	2797.47	Wetted Per. (ft)	2358.85	276.69	3556.28
Min Ch El (ft)	13.60	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	1.53	Stream Power (lb/ft s)	0.01	0.05	0.01
Frcn Loss (ft)	0.15	Cum Volume (acre-ft)	5596.09	3079.19	4474.72
C & E Loss (ft)	0.00	Cum SA (acres)	1084.28	211.82	918.94

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 31.6071*

INPUT
 Description: Interpolated Cross Section at River Mile 31.61

Station Elevation Data num= 195									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67.73	168.71	65.39	259.62	63.85	294.66	63.27	320.24	62.89
472	62.5	509.35	62.53	599.81	62.6	628.29	62.59	688	62.63
695.9	62.63	698.78	62.58	790.55	62.6	818.52	62.63	821.57	62.64
848.66	62.66	850.88	62.58	863.5	62.12	975.15	58.19	999.5	58.09
1072.18	57.8	1074.97	57.8	1107.61	57.71	1232.91	57.23	1242.32	57.24
1491.65	57.61	1525.54	57.67	1532.42	57.69	1720.5	57.63	1757.76	57.61
1839.96	57.56	1976.86	57.92	1996.06	57.98	2168.23	58.04	2180.44	58.04
2242.4	57.68	2344.7	57.05	2438.48	57.06	2486.29	57.63	2527.79	58.12
2590.49	58.89	2627.55	59.36	2669.32	59.87	2716.33	60.47	2766.04	61.15
2805.2	61.06	2874.21	60.72	2913.93	60.6	3066.87	60.13	3197.6	59.17
3219.15	59.01	3241.12	58.84	3305.09	57.04	3350.64	55.76	3473.36	57
3474.39	57.01	3594.38	58.23	3714.85	58.32	3773.69	58.34	3803.81	58.34
3944.28	58.45	3971.26	58.47	4006.03	58.49	4076.87	58.52	4201.47	58.03
4284.44	57.76	4320.73	57.32	4413.48	56.3	4488.27	55.45	4516.34	55.08
4539.09	54.82	4582.33	54.29	4641.47	52.87	4692.05	51.76	4720.3	51.91
4898.61	52.37	4918.41	52.3	5107.25	51.26	5182.58	49.26	5191.8	49.22
5329.6	51.8	5437.46	53.9	5444.09	54.03	5536.34	54.89	5599.03	50.43
5725.32	37.41	5822.55	35.44	6172.96	38.54	6273.45	30.49	6352.08	27.06
6478.98	25.18	6723.02	23.9	7024.47	23.65	7328.55	22.55	7409.22	22.81
7833.21	21.92	7971.98	21.66	8075.9	21.82	8223.44	21.98	8271.21	22.63
8291	22.91	8334.69	20.42	8498.11	21.95	8541.91	22.37	8559.08	22.82
8617.12	23.18	8634.16	22.98	8642.72	23.05	8719.45	23.8	8727.74	23.5
8728.79	25.04	8732.5	23.51	8735.28	22.52	8735.95	22.23	8741.37	17.44
8742.38	17.1	8743.88	16.89	8744.5	16.6	8748.41	15.47	8755.96	14.74
8758.7	14.61	8759.94	14.58	8763.42	14.56	8771.6	14.41	8772.57	14.39
8781.72	14.26	8783.14	14.22	8790.87	14.15	8794.67	14.01	8800.01	13.82
8806.21	13.69	8809.16	13.58	8817.75	13.44	8818.31	13.41	8821.97	13.09
8829.29	12.64	8839.2	13.07	8840.65	13.16	8849.1	13.56	8852	13.72
8859.01	14.18	8863.37	14.92	8869.22	15.91	8874.73	15.99	8886.09	16.31
8897.45	16.57	8908.81	16.94	8912.67	17.17	8915.88	17.21	8937.89	17.49
8962.36	17.81	8980.99	16.72	8988.9	15.15	8991.2	14.71	8996.25	14.49
8999.12	15.21	9000.51	15.57	9003.58	17.22	9012.3	22.07	9026.37	22.95
9057.32	22.99	9095.9	23.04	9204.66	22.98	9588.11	22.81	9883.05	23.32
10005.61	24.09	10068.87	30.09	10236.85	26.15	10486.1	24.52	10758.73	23.31
10994.18	22.54	11249.87	22.02	11486.58	23.99	12295.69	27.24	12595.91	40.1
12776.62	44.04	12893.18	44.72	13161.06	44.98	13419.26	44.46	13691.09	43.43
13974.65	44.37	14222.28	44.45	14505.66	42.31	14798	42.22	15117.31	42.22
15318.27	42.21	15581.04	42.38	15859.14	40.24	16060.54	40.32	16247.79	43.83
16452.86	42.89	16596.48	39.89	16760.44	40.23	16812.31	44	16930.48	48.37

Manning's n Values num= 4											
Sta	n	Val	Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.047	8728.79	.07	8735.95	.031	9012.3	.055				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 8728.79 9012.3 2464.43 4273.14 2171 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev

0 8728.79 21.99 9012.316930.48 21.99

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.047	0.032	0.055
W.S. Elev (ft)	28.55	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	13112.37	3590.94	14383.40
E.G. Slope (ft/ft)	0.000062	Area (sq ft)	13112.37	3590.94	14383.40
Q Total (cfs)	25400.00	Flow (cfs)	10075.73	6973.56	8350.71
Top Width (ft)	5926.52	Top Width (ft)	2410.88	283.51	3232.13
Vel Total (ft/s)	0.82	Avg. Vel. (ft/s)	0.77	1.94	0.58
Max Chl Dpth (ft)	15.91	Hydr. Depth (ft)	5.44	12.67	4.45
Conv. Total (cfs)	3231188.0	Conv. (cfs)	1281754.0	887121.6	1062312.0
Length Wtd. (ft)	2901.18	Wetted Per. (ft)	2411.80	288.49	3232.45
Min Ch El (ft)	12.64	Shear (lb/sq ft)	0.02	0.05	0.02
Alpha	2.07	Stream Power (lb/ft s)	0.02	0.09	0.01
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	4857.19	2736.22	3714.18
C & E Loss (ft)	0.00	Cum SA (acres)	949.36	184.59	749.79

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 30.8142*

INPUT
 Description: Interpolated Cross Section at River Mile 30.81
 Station Elevation Data num= 195

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	66.27	171.36	63.95	263.71	62.15	299.3	61.47	325.28	61.07
479.43	60.25	517.36	60.3	609.25	60.41	638.18	60.39	698.83	60.39
706.85	60.37	709.78	60.27	802.99	60.18	831.4	60.2	834.5	60.23
862.02	60.22	864.27	60.15	877.09	59.76	990.5	56.47	1015.24	56.39
1089.06	56.16	1091.89	56.17	1125.05	56.14	1252.31	55.76	1261.88	55.77
1515.12	56.09	1549.56	56.14	1556.54	56.17	1747.58	56.43	1785.43	56.46
1868.92	56.52	2007.98	57	2027.48	57.07	2202.36	56.89	2214.77	56.87
2277.7	56.09	2381.61	54.71	2476.87	54.62	2525.42	55.04	2567.58	55.4
2631.26	56	2668.91	56.39	2711.34	56.79	2759.09	57.28	2809.58	57.89
2849.36	57.85	2919.45	57.43	2959.8	57.35	3115.15	56.95	3247.93	56.16
3269.82	56.02	3292.13	55.89	3357.11	54.39	3403.38	53.31	3528.03	54.33
3529.08	54.34	3650.95	55.36	3773.32	55.43	3833.09	55.43	3863.68	55.41
4006.37	55.5	4033.77	55.52	4069.09	55.53	4141.04	55.54	4267.61	55.11
4351.88	54.91	4388.74	54.57	4482.95	53.86	4558.92	53.24	4587.43	52.9
4610.54	52.71	4654.46	52.28	4714.53	51.11	4765.91	50.31	4794.59	50.52
4975.71	50.74	4995.82	50.66	5187.64	49.18	5264.15	45.42	5273.52	45.13
5413.49	47.06	5523.04	48.75	5529.78	48.86	5623.49	49.58	5687.16	45.87
5815.44	35.02	5914.2	33.38	6270.13	35.98	6372.19	29.27	6452.07	26.42
6580.96	24.86	6828.85	23.8	7135.04	23.61	7443.91	22.7	7525.85	22.92
7956.5	22.2	8097.46	22.01	8203.01	22.18	8352.88	22.25	8401.4	22.78
8421.51	23.01	8465.88	20.94	8631.87	22.21	8676.37	22.57	8693.81	23.3
8752.76	23.38	8770.07	22.79	8778.76	22.84	8856.69	23.5	8865.11	23.26
8866.19	26.37	8870.39	24.56	8873.54	23.51	8874.29	23.17	8880.44	18.09
8881.59	17.65	8883.29	17.58	8883.99	17.15	8888.42	15.84	8896.97	14.64
8900.08	14.48	8901.49	14.45	8905.43	14.45	8914.7	14.23	8915.8	14.19
8926.17	14.1	8927.77	14.05	8936.53	13.89	8940.85	13.62	8946.9	13.24
8953.93	12.97	8957.27	12.81	8967	12.68	8967.63	12.65	8971.78	12.21
8980.08	11.68	8989.89	12.25	8991.33	12.36	8999.71	12.72	9002.58	12.87
9009.53	13.35	9013.85	14.08	9019.64	15.02	9025.1	15.11	9036.35	15.65

9047.61	16.04	9058.87	16.66	9062.69	17.08	9065.88	17.11	9087.68	17.4
9111.93	17.73	9130.38	16.74	9138.22	15.3	9140.5	14.93	9145.5	14.77
9148.35	15.47	9149.72	15.85	9152.76	17.44	9161.41	22.13	9173.84	22.9
9201.19	22.99	9235.29	23.11	9331.42	23.07	9670.33	22.92	9931	23.34
10039.33	23.98	10095.23	28.98	10243.7	25.69	10464	24.33	10704.96	23.33
10913.05	22.68	11139.05	22.25	11348.25	23.88	12063.37	26.58	12328.72	37.29
12488.44	40.58	12591.46	41.15	12828.22	41.35	13056.43	40.92	13296.68	40.06
13547.3	40.84	13766.16	40.91	14016.62	39.12	14275	39.04	14557.22	39.03
14734.83	39.03	14967.08	39.17	15212.87	37.38	15390.88	37.44	15556.37	40.37
15737.63	39.58	15864.56	37.08	16009.47	37.36	16055.32	40.51	16159.76	44.14

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	8866.19	.07	8874.29	.031	9161.41	.054

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

8866.19	9161.41	2464.43	4273.14	2171	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	8866.19	21.73	9161.41	16159.76	21.73

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.050	0.032	0.054
W.S. Elev (ft)	28.35	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	12830.63	3766.36	12501.99
E.G. Slope (ft/ft)	0.000072	Area (sq ft)	12830.63	3766.36	12501.99
Q Total (cfs)	25400.00	Flow (cfs)	9708.29	7910.15	7781.56
Top Width (ft)	5673.87	Top Width (ft)	2468.24	295.22	2910.41
Vel Total (ft/s)	0.87	Avg. Vel. (ft/s)	0.76	2.10	0.62
Max Chl Dpth (ft)	16.67	Hydr. Depth (ft)	5.20	12.76	4.30
Conv. Total (cfs)	2991794.0	Conv. (cfs)	1143512.0	931714.2	916567.8
Length Wtd. (ft)	2989.16	Wetted Per. (ft)	2470.57	300.38	2910.71
Min Ch El (ft)	11.68	Shear (lb/sq ft)	0.02	0.06	0.02
Alpha	2.25	Stream Power (lb/ft s)	0.02	0.12	0.01
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	4123.32	2375.35	3044.21
C & E Loss (ft)	0.00	Cum SA (acres)	811.34	156.20	596.72

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 30.0214*

INPUT Description: Interpolated Cross Section at River Mile 30.02

Station Elevation Data num= 195

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	64.8	174.02	62.51	267.79	60.44	303.94	59.68	330.32	59.26
486.86	58	525.38	58.06	618.7	58.22	648.07	58.18	709.66	58.14
717.81	58.11	720.77	57.95	815.44	57.76	844.29	57.77	847.43	57.81
875.37	57.78	877.67	57.73	890.68	57.39	1005.85	54.76	1030.97	54.69
1105.93	54.51	1108.81	54.54	1142.48	54.57	1271.72	54.29	1281.43	54.3
1538.6	54.58	1573.57	54.62	1580.66	54.66	1774.66	55.23	1813.1	55.31
1897.88	55.48	2039.09	56.07	2058.9	56.17	2236.49	55.73	2249.09	55.7
2313	54.49	2418.51	52.37	2515.25	52.17	2564.56	52.45	2607.37	52.68
2672.04	53.11	2710.27	53.42	2753.36	53.71	2801.85	54.1	2853.12	54.64
2893.51	54.65	2964.7	54.15	3005.66	54.09	3163.42	53.78	3298.26	53.15

3320.49	53.04	3343.15	52.93	3409.14	51.74	3456.12	50.87	3582.7	51.67
3583.77	51.67	3707.53	52.49	3831.8	52.54	3892.49	52.52	3923.56	52.47
4068.45	52.55	4096.27	52.57	4132.15	52.57	4205.21	52.56	4333.74	52.18
4419.32	52.07	4456.75	51.81	4552.42	51.41	4629.56	51.04	4658.52	50.73
4681.98	50.61	4726.58	50.27	4787.59	49.35	4839.76	48.87	4868.89	49.12
5052.82	49.11	5073.24	49.03	5268.03	47.1	5345.73	41.58	5355.24	41.04
5497.38	42.33	5608.63	43.6	5615.48	43.69	5710.63	44.27	5775.29	41.3
5905.56	32.63	6005.85	31.32	6367.29	33.42	6470.94	28.06	6552.05	25.78
6682.94	24.53	6934.67	23.7	7245.6	23.56	7559.26	22.85	7642.47	23.03
8079.8	22.47	8222.95	22.37	8330.13	22.53	8482.32	22.53	8531.59	22.93
8552.01	23.12	8597.07	21.46	8765.64	22.47	8810.82	22.78	8828.53	23.77
8888.39	23.57	8905.97	22.6	8914.8	22.63	8993.94	23.21	9002.49	23.01
9003.58	27.71	9008.28	25.62	9011.8	24.5	9012.64	24.1	9019.51	18.73
9020.79	18.19	9022.69	18.27	9023.48	17.71	9028.43	16.21	9037.98	14.54
9041.46	14.35	9043.04	14.33	9047.44	14.34	9057.79	14.04	9059.03	14
9070.62	13.94	9072.41	13.87	9082.2	13.64	9087.02	13.23	9093.78	12.66
9101.64	12.26	9105.38	12.04	9116.25	11.92	9116.96	11.89	9121.6	11.32
9130.87	10.72	9140.59	11.42	9142.01	11.55	9150.32	11.88	9153.16	12.02
9160.04	12.53	9164.32	13.24	9170.06	14.13	9175.47	14.24	9186.62	14.98
9197.77	15.51	9208.93	16.38	9212.71	16.98	9215.87	17.02	9237.47	17.31
9261.49	17.64	9279.77	16.76	9287.54	15.45	9289.79	15.14	9294.75	15.06
9297.57	15.74	9298.93	16.12	9301.95	17.67	9310.51	22.2	9321.31	22.84
9345.07	22.99	9374.68	23.19	9458.17	23.15	9752.54	23.03	9978.96	23.36
10073.04	23.88	10121.6	27.87	10250.56	25.24	10441.89	24.15	10651.18	23.34
10831.93	22.82	11028.22	22.47	11209.93	23.78	11831.06	25.93	12061.53	34.49
12200.25	37.11	12289.73	37.57	12495.38	37.73	12693.59	37.38	12902.26	36.69
13119.94	37.31	13310.04	37.36	13527.59	35.92	13752.01	35.86	13997.13	35.85
14151.4	35.84	14353.12	35.95	14566.61	34.52	14721.22	34.57	14864.96	36.9
15022.39	36.27	15132.64	34.27	15258.5	34.49	15298.33	37.15	15389.04	39.91

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.052	9003.58	.07	9012.64	.031	9310.51	.057

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9003.58 9310.51 2464.43 4273.14 2171 .1 .3

Blocked Obstructions

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	9003.58	21.47	9310.51	15389.04	21.47

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.052	0.033	0.057
W.S. Elev (ft)	28.10	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	12296.54	3924.20	10578.72
E.G. Slope (ft/ft)	0.000090	Area (sq ft)	12296.54	3924.20	10578.72
Q Total (cfs)	25400.00	Flow (cfs)	9531.27	9175.82	6692.91
Top Width (ft)	5419.27	Top Width (ft)	2533.39	306.93	2578.95
Vel Total (ft/s)	0.95	Avg. Vel. (ft/s)	0.78	2.34	0.63
Max Chl Dpth (ft)	17.38	Hydr. Depth (ft)	4.85	12.79	4.10
Conv. Total (cfs)	2681654.0	Conv. (cfs)	1006282.0	968754.6	706617.1
Length Wtd. (ft)	3091.85	Wetted Per. (ft)	2537.27	312.37	2579.21
Min Ch El (ft)	10.72	Shear (lb/sq ft)	0.03	0.07	0.02
Alpha	2.57	Stream Power (lb/ft s)	0.02	0.16	0.01
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	3412.53	1998.14	2469.04
C & E Loss (ft)	0.00	Cum SA (acres)	669.85	126.66	459.92

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 29.2285*

INPUT

Description: Interpolated Cross Section at River Mile 29.23

Station Elevation Data		num= 194							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	63.34	176.67	61.07	271.88	58.74	308.58	57.89	335.36	57.44
494.29	55.75	533.4	55.83	628.14	56.03	657.96	55.98	720.49	55.89
728.76	55.85	731.77	55.64	827.88	55.34	857.17	55.33	860.36	55.39
888.73	55.34	891.06	55.3	904.27	55.02	1021.2	53.04	1046.7	52.99
1122.81	52.87	1125.73	52.91	1159.92	53	1291.13	52.82	1300.99	52.83
1562.08	53.06	1597.58	53.1	1604.78	53.14	1801.75	54.03	1840.77	54.16
1926.85	54.45	2070.21	55.14	2090.31	55.26	2270.61	54.58	2283.41	54.53
2348.29	52.89	2455.42	50.03	2553.63	49.73	2603.7	49.86	2647.16	49.96
2712.81	50.22	2751.62	50.45	2795.37	50.63	2844.6	50.91	2896.65	51.39
2937.67	51.45	3009.94	50.86	3051.53	50.84	3211.69	50.61	3348.6	50.14
3371.16	50.06	3394.17	49.98	3461.16	49.08	3508.86	48.42	3637.37	49
3638.46	49.01	3764.11	49.61	3890.27	49.65	3951.89	49.61	3983.43	49.54
4130.54	49.6	4158.78	49.61	4195.2	49.61	4269.39	49.58	4399.87	49.26
4486.75	49.23	4524.76	49.06	4621.89	48.97	4700.21	48.83	4729.6	48.55
4753.43	48.5	4798.71	48.26	4860.65	47.59	4913.62	47.42	4943.19	47.72
5129.92	47.48	5150.66	47.39	5348.42	45.02	5427.3	37.74	5436.96	36.95
5581.27	37.59	5694.22	38.45	5701.17	38.52	5797.78	38.96	5863.42	36.74
5995.67	30.24	6097.5	29.27	6464.46	30.86	6569.69	26.84	6652.04	25.14
6784.93	24.21	7040.49	23.6	7356.17	23.52	7674.62	23	7759.1	23.14
8203.1	22.75	8348.43	22.72	8457.25	22.89	8611.76	22.81	8661.79	23.08
8682.51	23.22	8728.26	21.98	8899.4	22.73	8945.27	22.98	8963.25	24.24
9024.03	23.77	9041.88	22.4	9050.84	22.42	9131.19	22.91	9139.87	22.77
9140.98	29.04	9146.17	26.67	9150.05	25.49	9150.99	25.03	9158.58	19.37
9160	18.74	9162.97	18.26	9168.43	16.58	9179	14.44	9182.84	14.22
9184.58	14.21	9189.45	14.24	9200.89	13.85	9202.25	13.8	9215.07	13.78
9217.05	13.7	9227.87	13.39	9233.2	12.84	9240.67	12.07	9249.35	11.55
9253.48	11.26	9265.5	11.16	9266.28	11.14	9271.41	10.43	9281.65	9.76
9291.29	10.6	9292.7	10.74	9300.92	11.05	9303.74	11.17	9310.56	11.7
9314.8	12.39	9320.48	13.23	9325.84	13.37	9336.88	14.32	9347.93	14.98
9358.98	16.1	9362.73	16.89	9365.86	16.93	9387.26	17.22	9411.05	17.56
9429.16	16.79	9436.85	15.6	9439.09	15.35	9444	15.35	9446.8	16
9448.15	16.39	9451.13	17.89	9459.61	22.27	9468.78	22.79	9488.94	22.99
9514.08	23.27	9584.93	23.24	9834.75	23.14	10026.91	23.39	10106.76	23.77
10147.97	26.76	10257.41	24.79	10419.79	23.96	10597.41	23.35	10750.81	22.96
10917.39	22.69	11071.61	23.67	11598.74	25.27	11794.34	31.69	11912.07	33.65
11988.01	33.99	12162.54	34.11	12330.76	33.84	12507.85	33.32	12692.59	33.78
12853.93	33.81	13038.55	32.73	13229.01	32.68	13437.04	32.67	13567.96	32.66
13739.16	32.73	13920.34	31.65	14051.55	31.69	14173.55	33.44	14307.16	32.96
14400.72	31.46	14507.54	31.62	14541.34	33.51	14618.33	35.69		

Manning's n Values		num= 4					
Sta	n Val	Sta	n Val	Sta	n Val		
0	.054	9140.98	.07	9158.58	.031	9459.61	.059

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9140.98	9459.61		2464.43	4273.14	2171	.1 .3

Blocked Obstructions		num= 2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	9140.98	21.21	10147.97	14618.33	21.21

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.054	0.034	0.059
W.S. Elev (ft)	27.77	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	11505.76	4056.55	8601.78
E.G. Slope (ft/ft)	0.000116	Area (sq ft)	11505.76	4056.55	8601.78
Q Total (cfs)	25400.00	Flow (cfs)	9178.78	10465.60	5755.62
Top Width (ft)	5126.46	Top Width (ft)	2595.37	315.85	2215.25
Vel Total (ft/s)	1.05	Avg. Vel. (ft/s)	0.80	2.58	0.67
Max Chl Dpth (ft)	18.01	Hydr. Depth (ft)	4.43	12.84	3.88
Conv. Total (cfs)	2361702.0	Conv. (cfs)	853446.1	973095.4	535160.0
Length Wtd. (ft)	3220.44	Wetted Per. (ft)	2599.72	321.14	2215.44
Min Ch El (ft)	9.76	Shear (lb/sq ft)	0.03	0.09	0.03
Alpha	2.78	Stream Power (lb/ft s)	0.03	0.24	0.02
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	2739.22	1606.69	1991.07
C & E Loss (ft)	0.00	Cum SA (acres)	524.77	96.12	340.45

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Upper Fish Creek RS: 28.4357*

INPUT

Description: Interpolated Cross Section at River Mile 28.44

Station Elevation Data		num= 195							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	61.87	179.33	59.63	275.97	57.04	313.21	56.1	340.4	55.63
501.72	53.5	541.42	53.6	637.58	53.84	667.85	53.77	731.32	53.64
739.71	53.59	742.77	53.33	840.32	52.92	870.05	52.9	873.3	52.97
902.09	52.91	904.45	52.87	917.87	52.65	1036.55	51.33	1062.43	51.29
1139.69	51.22	1142.65	51.28	1177.35	51.43	1310.53	51.34	1320.54	51.35
1585.56	51.54	1621.59	51.58	1628.9	51.63	1828.83	52.83	1868.43	53.01
1955.81	53.41	2101.33	54.21	2121.73	54.35	2304.74	53.42	2317.73	53.35
2383.59	51.29	2492.33	47.68	2592.01	47.29	2642.83	47.28	2686.94	47.25
2753.59	47.34	2792.98	47.49	2837.39	47.55	2887.36	47.72	2940.19	48.14
2981.82	48.25	3055.18	47.57	3097.4	47.58	3259.97	47.44	3398.93	47.13
3421.83	47.08	3445.18	47.02	3513.18	46.43	3561.6	45.98	3692.05	46.34
3693.14	46.34	3820.68	46.74	3948.74	46.77	4011.29	46.69	4043.3	46.6
4192.62	46.65	4221.29	46.66	4258.26	46.65	4333.56	46.6	4466	46.33
4554.19	46.38	4592.77	46.3	4691.36	46.53	4770.86	46.62	4800.69	46.38
4824.88	46.39	4870.84	46.25	4933.7	45.83	4987.47	45.98	5017.49	46.32
5207.03	45.85	5228.08	45.75	5428.81	42.94	5508.88	33.9	5518.68	32.86
5665.16	32.86	5779.81	33.3	5786.86	33.34	5884.92	33.65	5951.55	32.17
6085.79	27.85	6189.14	27.21	6561.62	28.3	6668.43	25.63	6752.02	24.5
6886.91	23.89	7146.31	23.5	7466.74	23.47	7789.97	23.15	7875.72	23.25
8326.4	23.02	8473.91	23.08	8584.37	23.24	8741.2	23.09	8791.98	23.24
8813.02	23.33	8859.46	22.5	9033.16	23	9079.72	23.19	9097.97	24.71
9159.67	23.97	9177.78	22.21	9186.88	22.21	9268.44	22.61	9277.25	22.53
9278.37	30.38	9284.05	27.72	9288.31	26.49	9289.34	25.96	9297.65	20.01
9299.2	19.29	9301.5	19.66	9302.45	18.82	9308.44	16.95	9320.01	14.34
9324.22	14.09	9326.13	14.09	9331.46	14.13	9343.99	13.66	9345.48	13.61
9359.51	13.61	9361.69	13.52	9373.54	13.14	9379.37	12.45	9387.56	11.49
9397.06	10.84	9401.59	10.49	9414.75	10.4	9415.61	10.38	9421.22	9.54
9432.44	8.8	9441.99	9.77	9443.38	9.93	9451.53	10.21	9454.32	10.31
9461.07	10.88	9465.27	11.55	9470.9	12.34	9476.21	12.5	9487.15	13.65
9498.09	14.44	9509.04	15.81	9512.75	16.8	9515.85	16.84	9537.04	17.13
9560.61	17.47	9578.56	16.81	9586.17	15.76	9588.39	15.56	9593.25	15.64
9596.02	16.27	9597.36	16.66	9600.31	18.11	9608.71	22.34	9616.24	22.74
9632.81	23	9653.47	23.35	9711.69	23.32	9916.97	23.25	10074.86	23.41

10140.47	23.6610174.33	25.6610264.26	24.3310397.69	23.7810543.64	23.37
10669.68	23.110806.57	22.9210933.28	23.5611366.43	24.6111527.15	28.88
11623.89	30.1911686.29	30.41 11829.7	30.4911967.92	30.312113.44	29.95
12265.24	30.2512397.81	30.2712549.51	29.5412706.01	29.512876.95	29.48
12984.53	29.47 13125.2	29.5213274.08	28.7913381.89	28.8113482.13	29.97
13591.92	29.65 13668.8	28.6413756.58	28.7513784.35	30.0113847.61	31.46

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.056	9278.37	.07	9297.65	.031	9608.71	.061

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

9278.37	9608.71	2464.43	4273.14	2171	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	9278.37	20.94	10174.33	13847.61	20.94

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.056	0.033	0.061
W.S. Elev (ft)	27.31	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	10389.94	4147.22	6556.66
E.G. Slope (ft/ft)	0.000152	Area (sq ft)	10389.94	4147.22	6556.66
Q Total (cfs)	25400.00	Flow (cfs)	8391.10	12442.53	4566.37
Top Width (ft)	4909.17	Top Width (ft)	2726.62	323.24	1859.32
Vel Total (ft/s)	1.20	Avg. Vel. (ft/s)	0.81	3.00	0.70
Max Chl Dpth (ft)	18.51	Hydr. Depth (ft)	3.81	12.83	3.53
Conv. Total (cfs)	2058152.0	Conv. (cfs)	679927.3	1008213.0	370011.2
Length Wtd. (ft)	3404.44	Wetted Per. (ft)	2730.95	328.79	1859.44
Min Ch El (ft)	8.80	Shear (lb/sq ft)	0.04	0.12	0.03
Alpha	3.25	Stream Power (lb/ft s)	0.03	0.36	0.02
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	2119.84	1204.31	1613.33
C & E Loss (ft)	0.01	Cum SA (acres)	374.22	64.77	238.92

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 27.6428*

INPUT
 Description: Interpolated Cross Section at River Mile 27.64
 Station Elevation Data num= 195

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	60.41	181.98	58.19	280.05	55.33	317.85	54.3	345.44	53.82
509.15	51.25	549.43	51.36	647.02	51.65	677.74	51.57	742.15	51.4
750.67	51.33	753.77	51.01	852.77	50.5	882.94	50.47	886.23	50.55
915.45	50.47	917.85	50.45	931.46	50.29	1051.9	49.61	1078.17	49.59
1156.56	49.58	1159.57	49.65	1194.79	49.86	1329.94	49.87	1340.1	49.88
1609.04	50.02	1645.61	50.05	1653.03	50.11	1855.91	51.63	1896.1	51.86
1984.77	52.37	2132.44	53.29	2153.15	53.45	2338.87	52.27	2352.05	52.18
2418.88	49.7	2529.23	45.34	2630.4	44.85	2681.97	44.69	2726.73	44.53
2794.36	44.45	2834.34	44.52	2879.4	44.47	2930.11	44.54	2983.73	44.88
3025.98	45.05	3100.42	44.29	3143.26	44.33	3308.24	44.26	3449.26	44.12
3472.5	44.09	3496.2	44.07	3565.21	43.77	3614.34	43.53	3746.72	43.67
3747.83	43.68	3877.26	43.87	4007.22	43.88	4070.69	43.78	4103.18	43.67
4254.71	43.7	4283.8	43.71	4321.31	43.69	4397.73	43.62	4532.14	43.41
4621.63	43.54	4660.78	43.55	4760.83	44.09	4841.5	44.42	4871.78	44.2

4896.32	44.29	4942.96	44.24	5006.76	44.07	5061.33	44.54	5091.79	44.93
5284.13	44.22	5305.49	44.12	5509.2	40.86	5590.45	30.06	5600.4	28.77
5749.05	28.12	5865.39	28.15	5872.55	28.17	5972.06	28.33	6039.68	27.6
6175.91	25.46	6280.79	25.15	6658.79	25.74	6767.18	24.41	6852	23.86
6988.89	23.57	7252.14	23.41	7577.31	23.42	7905.32	23.3	7992.34	23.36
8449.69	23.3	8599.39	23.43	8711.48	23.6	8870.64	23.36	8922.17	23.39
8943.52	23.43	8990.65	23.02	9166.93	23.26	9214.18	23.39	9232.7	25.19
9295.3	24.16	9313.69	22.02	9322.92	22	9405.68	22.31	9414.62	22.28
9415.77	31.71	9421.94	28.78	9426.57	27.48	9427.68	26.9	9436.72	20.66
9438.41	19.83	9440.9	20.35	9441.94	19.37	9448.45	17.32	9461.03	14.24
9465.6	13.96	9467.67	13.96	9473.47	14.02	9487.09	13.48	9488.71	13.41
9503.96	13.45	9506.32	13.35	9519.2	12.88	9525.54	12.06	9534.44	10.91
9544.78	10.12	9549.69	9.72	9564	9.64	9564.93	9.62	9571.04	8.66
9583.23	7.84	9592.68	8.95	9594.07	9.12	9602.13	9.37	9604.9	9.46
9611.58	10.05	9615.75	10.7	9621.32	11.45	9626.58	11.62	9637.41	12.99
9648.25	13.91	9659.09	15.53	9662.77	16.7	9665.84	16.74	9686.83	17.04
9710.18	17.39	9727.95	16.83	9735.49	15.91	9737.68	15.78	9742.5	15.92
9745.25	16.53	9746.57	16.94	9749.5	18.34	9757.82	22.4	9763.71	22.69
9776.69	23	9792.86	23.42	9838.45	23.41	9999.18	23.3610122.81		23.43
10174.18	23.55	10200.7	24.5510271.11		23.8810375.59		23.610489.87		23.38
10588.56	23.2410695.74		23.1410794.96		23.4511134.12		23.9511259.96		26.08
11335.71	26.7311384.57		26.8411496.86		26.8611605.09		26.7611719.03		26.58
11837.89	26.7211941.69		26.7212060.47		26.3512183.01		26.3212316.86		26.3
12401.09	26.2912511.24		26.312627.81		25.9312712.23		25.9312790.72		26.51
12876.68	26.3412936.88		25.8313005.61		25.8813027.35		26.5113076.89		27.23

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 0 .059 9415.77 .07 9436.72 .031 9757.82 .063

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9415.77 9757.82 2464.43 4273.14 2171 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 0 9415.77 20.68 9759.8213076.89 20.68

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	26.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.059	0.033	0.063
W.S. Elev (ft)	26.61	Reach Len. (ft)	2464.43	4273.14	2171.00
Crit W.S. (ft)		Flow Area (sq ft)	9273.90	4160.14	4867.23
E.G. Slope (ft/ft)	0.000223	Area (sq ft)	9273.90	4160.14	4867.23
Q Total (cfs)	25400.00	Flow (cfs)	6929.92	15226.00	3244.08
Top Width (ft)	6306.58	Top Width (ft)	3312.41	329.72	2664.45
Vel Total (ft/s)	1.39	Avg. Vel. (ft/s)	0.75	3.66	0.67
Max Chl Dpth (ft)	18.77	Hydr. Depth (ft)	2.80	12.62	1.83
Conv. Total (cfs)	1699158.0	Conv. (cfs)	463583.8	1018559.0	217015.6
Length Wtd. (ft)	3513.31	Wetted Per. (ft)	3316.48	335.30	2664.53
Min Ch El (ft)	7.84	Shear (lb/sq ft)	0.04	0.17	0.03
Alpha	4.28	Stream Power (lb/ft s)	0.03	0.63	0.02
Frctn Loss (ft)	0.79	Cum Volume (acre-ft)	1563.59	796.84	1328.65
C & E Loss (ft)	0.00	Cum SA (acres)	203.39	32.74	126.19

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Upper Fish Creek RS: 26.85

INPUT

Description: Interpolated Cross Section at River Mile 26.85

Station Elevation Data		num= 123							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.94	184.64	56.75	284.14	53.63	322.49	52.51	516.58	49
557.45	49.13	656.46	49.46	752.98	49.15	761.62	49.07	764.77	48.7
865.21	48.08	895.82	48.04	899.16	48.13	931.24	48.02	945.05	47.92
1093.9	47.89	1173.44	47.93	1176.49	48.02	1212.22	48.29	1359.65	48.41
1632.52	48.5	1669.62	48.53	1882.99	50.43	1923.77	50.71	2163.56	52.36
2184.57	52.54	2386.37	51.01	2454.18	48.1	2566.14	43	2721.1	42.1
2766.52	41.81	2835.14	41.56	2875.7	41.55	2921.42	41.39	2972.87	41.35
3070.13	41.85	3145.66	41	3189.13	41.07	3499.59	41.11	3523.17	41.11
3617.23	41.12	3801.39	41.01	3802.52	41.01	4065.69	40.99	4130.09	40.87
4163.05	40.73	4346.31	40.76	4384.37	40.73	4598.27	40.48	4728.79	40.79
4830.3	41.65	4912.15	42.21	4942.87	42.03	4967.77	42.18	5079.82	42.31
5166.09	43.53	5382.91	42.48	5589.59	38.78	5682.12	24.68	5832.94	23.39
5950.98	23	8572.99	23.57	8838.6	23.95	9052.36	23.54	9300.69	23.52
9348.63	23.6	9367.42	25.66	9430.94	24.36	9449.59	21.83	9458.96	21.79
9552	22.04	9553.16	33.05	9559.83	29.83	9564.83	28.47	9566.03	27.83
9575.79	21.3	9577.61	20.38	9580.31	21.04	9581.43	19.93	9588.46	17.69
9602.04	14.14	9606.98	13.83	9609.22	13.84	9615.48	13.91	9630.19	13.29
9631.94	13.22	9648.41	13.29	9650.96	13.17	9664.87	12.63	9671.72	11.67
9681.33	10.33	9692.49	9.41	9697.8	8.95	9713.25	8.88	9714.26	8.86
9720.85	7.77	9734.02	6.88	9743.38	8.12	9744.75	8.31	9752.74	8.53
9755.48	8.61	9762.1	9.23	9766.22	9.86	9771.74	10.56	9776.95	10.75
9787.68	12.32	9798.41	13.38	9809.15	15.25	9812.79	16.61	9815.83	16.65
9836.62	16.95	9859.74	17.3	9877.34	16.85	9884.81	16.06	9886.98	15.99
9891.75	16.21	9894.47	16.8	9895.78	17.21	9898.68	18.56	9906.92	22.47
9920.56	23	9932.25	23.51	2306.17	23				

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.061	9553.16	.031
		9906.92	.065

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9553.16	9906.92		0	0		.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	9553.16	20.42

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.061	0.031	0.065
W.S. Elev (ft)	25.82	Reach Len. (ft)	3915.00	3915.00	3915.00
Crit W.S. (ft)		Flow Area (sq ft)	9407.11	4136.26	6162.56
E.G. Slope (ft/ft)	0.000223	Area (sq ft)	9407.11	4136.26	6162.56
Q Total (cfs)	25700.00	Flow (cfs)	6180.04	15573.65	3946.31
Top Width (ft)	6614.86	Top Width (ft)	3877.73	337.88	2399.25
Vel Total (ft/s)	1.30	Avg. Vel. (ft/s)	0.66	3.77	0.64
Max Chl Dpth (ft)	18.94	Hydr. Depth (ft)	2.43	12.24	2.57
Conv. Total (cfs)	1719359.0	Conv. (cfs)	413451.7	1041895.0	264012.7
Length Wtd. (ft)	3915.00	Wetted Per. (ft)	3881.52	343.35	2402.09
Min Ch El (ft)	6.88	Shear (lb/sq ft)	0.03	0.17	0.04
Alpha	5.15	Stream Power (lb/ft s)	0.02	0.63	0.02
Frctn Loss (ft)	0.91	Cum Volume (acre-ft)	1035.15	389.91	1053.79
C & E Loss (ft)	0.01	Cum SA (acres)			

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: Fish Creek
 REACH: Lower Fish Creek RS: 26.09

INPUT

Description: Cross Section at River Mile 26.09

Station Elevation Data num= 117									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	57.55	181.9	55.45	317.7	50.85	508.9	46.85	646.7	47.35
750.3	46.95	753.4	46.55	882.5	46.45	885.8	46.55	917.4	46.45
931	46.35	1156	46.45	1159	46.55	1194.2	46.85	1644.8	47.15
1855	49.25	2152.1	51.55	2350.9	49.35	2528	40.15	2725.4	38.95
2793	38.75	2878	38.85	3024.5	39.45	3098.9	38.35	3470.8	38.35
3746	38.35	4068.7	39.05	4319.2	38.95	4658.5	38.65	4869.4	39.95
5089.3	44.35	5315.9	42.95	5531.9	38.55	5628.6	22.45	7444.3	20.25
7698.8	20.85	7959.3	21.15	8063.9	21.35	8138.8	21.15	8284.4	21.55
8468.9	22.35	8721.6	23.75	8995.7	24.25	9216.3	23.85	9512.7	23.75
9531.5	26.05	9599.6	24.85	9619.6	22.05	10204.9	21.95	10380.1	26.45
10424.5	42.95	10430.4	40.05	10446	43.15	10452	44.95	10464.6	44.91
10468.9	44.63	10490.2	42.16	10499.6	40.49	10514.97	42.4	10525.1	37.2
10532.7	35.41	10552.1	24.2	10556.2	25.89	10557.9	23.81	10577.3	17.39
10583.8	12.99	10593.8	11.39	10603.8	10.89	10613.8	9.99	10623.8	10.39
10633.8	11.49	10643.8	11.49	10653.8	11.49	10663.8	11.19	10673.8	10.89
10683.8	10.69	10693.8	10.29	10703.8	10.09	10713.8	9.49	10723.8	8.69
10733.8	8.39	10743.8	7.89	10753.8	7.89	10763.8	8.79	10773.8	11.69
10783.8	12.39	10793.8	12.59	10803.8	13.29	10813.8	14.59	10907.8	17.39
10939.1	18.66	10950.7	22.95	10972.2	20.99	10981.2	21.85	10990.4	22.36
11022.5	20.75	11242.6	20.25	11335	20.55	11432.9	20.45	11720.9	19.65
14591.4	19.15	14624.4	21.35	14662.2	34.55	14691.4	36.75	15049.4	43.15
15301	43.35	15595.8	44.95	15925.7	45.05	16126.2	45.05	16172.7	45.35
16268.1	45.45	16363.2	45.25	16653.9	46.15	16889.9	46.55	17127.1	46.95
17215.7	49.35	17468.8	51.55						

Manning's n Values num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.063	10464.6	.07	10556.2	.031	10950.7	.067

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	10514.97	10950.7		2826	4769	4679	.1 .3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
010514.97	20.17	10950.7	17468.8	20.17	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.063	0.031	0.067
W.S. Elev (ft)	24.94	Reach Len. (ft)	2826.00	4769.00	4679.00
Crit W.S. (ft)		Flow Area (sq ft)	13627.87	4540.33	17287.33
E.G. Slope (ft/ft)	0.000240	Area (sq ft)	13627.87	4540.33	17287.33
Q Total (cfs)	43600.00	Flow (cfs)	10222.79	16740.49	16636.72
Top Width (ft)	8716.65	Top Width (ft)	4635.85	396.81	3683.99
Vel Total (ft/s)	1.23	Avg. Vel. (ft/s)	0.75	3.69	0.96
Max Chl Dpth (ft)	17.05	Hydr. Depth (ft)	2.94	11.44	4.69
Conv. Total (cfs)	2815841.0	Conv. (cfs)	660223.8	1081159.0	1074458.0
Length Wtd. (ft)	4253.52	Wetted Per. (ft)	4636.37	401.84	3684.82

Min Ch El (ft)	7.89	Shear (lb/sq ft)	0.04	0.17	0.07
Alpha	3.77	Stream Power (lb/ft s)	0.03	0.62	0.07
Frctn Loss (ft)	0.95	Cum Volume (acre-ft)	36752.73	63691.57	15754.56
C & E Loss (ft)	0.01	Cum SA (acres)	13236.02	13332.82	6351.00

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 25.1

INPUT
 Description: Cross Section at River Mile 25.1

Station Elevation Data		num= 115									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	56.3	181.9	54.2	317.7	49.6	508.9	45.6	646.7	46.1		
750.3	45.7	753.4	45.3	882.5	45.2	885.8	45.3	917.4	45.2		
931	45.1	1156	45.2	1159	45.3	1194.2	45.6	1644.8	45.9		
1855	48	2152.1	50.3	2350.9	48.1	2528	38.9	2725.4	37.7		
2793	37.5	2878	37.6	3024.5	38.2	3098.9	37.1	3470.8	37.1		
3746	37.1	4068.7	37.8	4319.2	37.7	4658.5	37.4	4869.4	38.7		
5089.3	43.1	5315.9	41.7	5531.9	37.3	5628.6	21.2	7444.3	19		
7698.8	19.6	7959.3	19.9	8063.9	20.1	8138.8	19.9	8284.4	20.3		
8468.9	21.1	8721.6	22.5	8995.7	23	9216.3	22.6	9512.7	22.5		
9531.5	24.8	9599.6	23.6	9619.6	20.8	10204.9	20.7	10380.1	25.2		
10424.5	41.7	10430.4	38.8	10446	41.9	10452	43.7	10464.6	43.66		
10468.9	43.38	10490.2	40.91	10499.6	39.241	10514.97	41.15	10525.1	35.95		
10532.7	34.16	10552.1	22.95	10577.3	16.14	10583.8	11.74	10593.8	10.14		
10603.8	9.64	10613.8	8.74	10623.8	9.14	10633.8	10.24	10643.8	10.24		
10653.8	10.24	10663.8	9.94	10673.8	9.64	10683.8	9.44	10693.8	9.04		
10703.8	8.84	10713.8	8.24	10723.8	7.44	10733.8	7.14	10743.8	6.64		
10753.8	6.64	10763.8	7.54	10773.8	10.44	10783.8	11.14	10793.8	11.34		
10803.8	12.04	10813.8	13.34	10907.8	16.14	10939.1	17.41	10950.7	21.7		
10972.2	19.74	10981.2	20.6	10990.4	21.11	11022.5	19.5	11242.6	19		
11335	19.3	11432.9	19.2	11720.9	18.4	14591.4	17.9	14624.4	20.1		
14662.2	33.3	14691.4	35.5	15049.4	41.9	15301	42.1	15595.8	43.7		
15925.7	43.8	16126.2	43.8	16172.7	44.1	16268.1	44.2	16363.2	44		
16653.9	44.9	16889.9	45.3	17127.1	45.7	17215.7	48.1	17468.8	50.3		

Manning's n Values		num= 15									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	508.9	.04	1194.2	.05	2725.4	.04	3470.8	.05		
5089.3	.04	5628.6	.07	8721.6	.04	9216.3	.05	10464.6	.07		
10552.1	.031	10939.1	.07	15301	.04	16363.2	.06	17215.7	.04		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 10514.97 10950.7 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions		num= 2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev
010514.97	18.92	10950.7	17468.8	18.92	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	24.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.065	0.033	0.070
W.S. Elev (ft)	24.00	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	15072.77	4683.67	18431.48
E.G. Slope (ft/ft)	0.000209	Area (sq ft)	15072.77	4683.67	18431.48
Q Total (cfs)	43600.00	Flow (cfs)	11375.72	15702.70	16521.59

Top Width (ft)	8755.26	Top Width (ft)	4669.96	400.42	3684.88
Vel Total (ft/s)	1.14	Avg. Vel. (ft/s)	0.75	3.35	0.90
Max Chl Dpth (ft)	17.36	Hydr. Depth (ft)	3.23	11.70	5.00
Conv. Total (cfs)	3019354.0	Conv. (cfs)	787782.5	1087431.0	1144141.0
Length Wtd. (ft)	3060.28	Wetted Per. (ft)	4670.54	404.72	3685.76
Min Ch El (ft)	6.64	Shear (lb/sq ft)	0.04	0.15	0.07
Alpha	3.45	Stream Power (lb/ft s)	0.03	0.51	0.06
Frctn Loss (ft)	0.62	Cum Volume (acre-ft)	35821.73	63186.64	13836.19
C & E Loss (ft)	0.00	Cum SA (acres)	12934.15	13289.18	5955.24

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 24.2625*

INPUT

Description:

Station Elevation Data		num= 223							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.12	53.51	63.26	52.98	175.39	50.24	176.62	50.22	308.39	45.91
493.91	42	575.19	42.09	627.61	42.17	687.45	41.85	689.99	41.76
696.23	41.74	697.25	41.83	718	41.94	728.13	41.89	731.14	41.53
818.68	41.36	856.41	41.35	859.61	41.44	890.27	41.36	903.46	41.27
1087.12	41.4	1101.63	40.87	1121.78	40.88	1124.69	40.96	1158.84	41.22
1596.06	41.49	1800.01	43.33	2088.28	45.34	2281.18	43.41	2453.02	35.36
2644.55	34.31	2710.14	34.14	2792.62	34.22	2934.76	34.75	3006.95	33.79
3367.8	33.79	3634.83	33.79	3947.94	34.4	4191	34.31	4520.22	34.05
4724.85	35.19	4938.22	39.04	5158.08	37.81	5367.67	33.96	5461.49	19.88
5821.25	19.48	6110.31	19.3	6420.5	19.39	6721.64	18.91	6760.85	18.68
6946.81	18.46	7223.25	18.14	7300.91	18.3	7470.19	18.67	7668.88	18.88
7722.95	18.97	7764.6	19.07	7803.03	19.8	7824.44	19.94	7897.11	20.13
7964.3	20.63	8028.07	21.11	8038.39	21.11	8066.38	21.13	8147.97	20.8
8217.41	20.96	8328.46	21.34	8462.6	22.2	8492.27	22.29	8517.34	22.5
8580.73	22.57	8594.09	22.38	8728.56	22.59	8844.84	22.4	8942.6	22.29
8955.07	22.3	8985.49	21.97	9152.86	21.94	9230.19	21.99	9248.44	24.02
9299.62	23.26	9314.51	23.17	9333.92	20.91	9345.57	21.02	9413.41	21.04
9438.36	20.75	9505.18	21.09	9573.91	21.11	9587.79	21.81	9601.4	21.77
9631.06	21.15	9665.3	21.31	9694.07	21.83	9729.32	21.15	9756.05	21.45
9775.78	20.84	9828.22	20.67	9890.72	21.28	9901.83	21.12	9927.37	21.37
9996.23	23.25	10020.55	24.71	10071.82	26.07	10072.22	26.21	10110.02	37.59
10114.9	39.22	10120.63	36.67	10135.77	39.36	10141.59	40.93	10153.81	40.87
10157.99	40.62	10166.79	39.69	10178.65	38.71	10187.77	37.43	10202.69	39.42
10213.38	34.07	10214.53	33.61	10223.41	31.88	10225.66	30.86	10234.12	26.96
10246.08	21.49	10248.24	21.10	10269.62	16.58	10275.54	15.38	10283.13	11.52
10294.82	10.12	10296.78	10.04	10306.51	9.65	10318.2	8.84	10322.54	8.95
10329.88	9.15	10341.57	10.06	10348.4	10.03	10353.26	10.02	10364.95	9.99
10376.63	9.69	10377.39	9.67	10388.32	9.37	10400.01	9.15	10403.8	9.02
10411.7	8.74	10415.43	8.67	10420.41	8.51	10423.39	8.38	10425.38	8.23
10430.35	7.91	10435.07	7.61	10435.33	7.59	10440.3	7.23	10445.27	6.87
10446.76	6.81	10450.25	6.74	10455.22	6.45	10458.45	6.32	10460.19	6.23
10465.16	5.61	10470.14	5.06	10478.89	5.06	10487.84	6.01	10496.79	8.7
10505.74	9.48	10514.69	9.81	10523.64	10.58	10532.59	11.88	10534.83	11.99
10590.78	14.24	10616.72	15.36	10636.67	15.41	10644.73	16.86	10655.11	20.76
10676.32	19.02	10685.2	19.76	10694.27	20.19	10725.94	18.73	10867.8	18.24
10943.05	18.2	11034.2	18.61	11130.77	18.67	11180.85	18.63	11414.86	18.11
11506.62	18.12	11805.73	18.28	12083.59	17.98	12734.48	18.13	13027.05	18.31
13043.32	18.71	13059.81	18.68	13075.52	18.42	13250.25	18.18	13282.01	18.32
13368.54	18.24	13406.06	17.45	13427.86	17.36	13471.34	17.33	13632.24	17.34

13818.48	17.2813847.03	17.7113998.74	17.8814108.84	17.86	14246.4	17.81
14278.95	19.7314316.24	31.2714345.04	33.1914428.64	34.514577.47		36.56
14698.19	38.4814946.37	38.6615237.17	40.0715562.59	40.1615760.37		40.17
15806.24	40.4315900.35	40.5215994.16	40.3516131.44	40.7316218.75		41.69
16280.91	4216290.23	42.0416473.48	42.4116513.71	42.4816747.69		42.84
16766.94	43.316835.08	44.9217084.75	46.79			

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.12	.06410202.69	.0810225.66	.03110655.11	.068			

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

10202.6910655.11	2028.75	4406.38	2370.38	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.12510202.6918.3012510655.1117084.7518.30125					

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	23.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.064	0.031	0.068
W.S. Elev (ft)	23.36	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	14053.91	4958.07	18125.70
E.G. Slope (ft/ft)	0.000198	Area (sq ft)	14053.91	4958.07	18125.70
Q Total (cfs)	43600.00	Flow (cfs)	9921.93	17418.63	16259.44
Top Width (ft)	8558.52	Top Width (ft)	4509.81	413.13	3635.58
Vel Total (ft/s)	1.17	Avg. Vel. (ft/s)	0.71	3.51	0.90
Max Chl Dpth (ft)	18.30	Hydr. Depth (ft)	3.12	12.00	4.99
Conv. Total (cfs)	3099199.0	Conv. (cfs)	705276.1	1238160.0	1155762.0
Length Wtd. (ft)	3124.50	Wetted Per. (ft)	4510.39	416.93	3636.33
Min Ch El (ft)	5.06	Shear (lb/sq ft)	0.04	0.15	0.06
Alpha	3.88	Stream Power (lb/ft s)	0.03	0.52	0.06
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	35143.46	62698.98	12841.54
C & E Loss (ft)	0.00	Cum SA (acres)	12720.39	13248.03	5756.06

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 23.425*

INPUT

Description:

Station Elevation Data num= 223

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.25	50.72	61.45	50.41	170.15	46.26	171.34	46.24	299.07	42.22
478.91	38.41	557.7	38.28	608.52	38.24	666.53	37.85	669	37.66
675.04	37.65	676.03	37.84	696.14	38.13	705.97	38.07	708.88	37.77
793.74	37.5	830.31	37.5	833.41	37.57	863.14	37.52	875.93	37.45
1053.96	37.61	1068.02	36.54	1087.56	36.55	1090.38	36.62	1123.49	36.85
1547.31	37.08	1745.02	38.65	2024.47	40.38	2211.46	38.72	2378.03	31.83
2563.7	30.93	2627.29	30.77	2707.23	30.85	2845.03	31.3	2915.01	30.47
3264.81	30.47	3523.66	30.47	3827.18	31	4062.8	30.93	4381.93	30.7
4580.3	31.68	4787.13	34.97	5000.27	33.92	5203.44	30.62	5294.39	18.55
5643.13	18.21	5923.33	18.22	6224.02	18.78	6515.95	18.19	6553.96	17.78
6734.22	17.58	7002.2	17.29	7077.48	17.42	7241.57	17.74	7434.18	17.93
7486.59	18.05	7526.97	18.16	7564.23	19.54	7584.98	19.79	7655.43	20.36
7720.56	21.17	7782.37	21.95	7792.38	21.91	7819.51	21.84	7898.6	20.82
7965.91	20.83	8073.56	20.95	8203.6	21.89	8232.36	22.02	8256.67	22.4

8318.11	22.42	8331.07	22.01	8461.41	22.19	8574.13	22.01	8668.9	21.99
8680.98	22	8710.47	21.36	8872.72	21.35	8947.69	21.48	8965.37	23.25
9014.99	22.65	9029.42	22.74	9048.24	21.02	9059.53	21.25	9125.29	21.29
9149.48	20.71	9214.25	21.4	9280.88	21.47	9294.33	22.87	9307.53	22.79
9336.28	21.56	9369.47	21.88	9397.36	22.93	9431.53	21.57	9457.45	22.17
9476.57	20.97	9527.4	20.63	9587.99	21.85	9598.76	21.55	9623.52	21.36
9690.27	23.3	9713.84	25.58	9763.55	26.95	9763.93	27.06	9800.58	35.35
9805.31	36.73	9810.86	34.54	9825.53	36.82	9831.17	38.15	9843.03	38.09
9847.07	37.86	9855.61	37.05	9867.1	36.49	9875.95	35.62	9890.4	37.69
9902.64	31.69	9903.95	31.27	9914.12	29.59	9916.7	28.67	9926.37	25.04
9940.07	20.04	9942.53	19.56	9967.01	15.65	9973.77	14.62	9982.47	11.31
9995.84	10.09	9998.08	10.0310009	22	9.6710022	59	8.9310027	56	9.02
10035.97	9.1510049	34	9.8810057	15	9.8310062	72	9.810076	09	9.73
10089.47	9.4310090	33	9.4210102	85	9.1110116	22	8.8510120	55	8.72
10129.6	8.4410133	87	8.3610139	56	8.1210142	97	7.9210145	25	7.73
10150.95	7.3410156	35	6.9910156	64	6.9710162	33	6.5910168	02	6.21
10169.72	6.1510173	71	6.14	10179.4	5.67	10183.1	5.5110185	09	5.4
10190.78	4.3410196	47	3.4810203	97	3.4810211	88	4.4710219	77	6.97
10227.67	7.8110235	57	8.2810243	47	9.1310251	38	10.4210253	36	10.56
10302.74	13.2110325	63	14.5810343	25	14.9410350	36	16.3210359	53	19.83
10380.44	18.29	10389.2	18.9110398	15	19.2710429	38	17.9710569	28	17.3
10643.5	17.4110733	39	17.9210828	64	18.1410878	02	18.1911108	82	17.83
11199.32	17.8611494	31	18.2211768	35	17.6912410	28	17.8312698	83	18.51
12714.88	19.2812731	13	19.2612746	63	18.7312918	96	18.2812950	28	18.58
13035.62	18.4213072	62	16.8613094	12	16.6813137	01	16.6313295	69	16.68
13479.37	16.5813507	52	17.4513657	15	17.8113765	73	17.79	13901.4	17.72
13933.51	19.3613970	28	29.2413998	69	30.8814081	13	31.9914227	92	33.41
14346.97	35.0614591	74	35.2214878	54	36.4315199	49	36.5215394	54	36.53
15439.78	36.7615532	59	36.8415625	11	36.69	15760.5	37.0215846	61	38.68
15907.92	39.1115917	11	39.1616097	84	39.616137	51	39.6516368	27	39.97
16387.26	40.3716454	47	41.74	16700.7	43.28				

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .25 .062 9890.4 .08 9940.07 .03110359.53 .066

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9890.410359.53 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .259890.402 17.682510359.53 16700.7 17.6825

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	22.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.062	0.032	0.066
W.S. Elev (ft)	22.72	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	12975.49	5175.99	17045.97
E.G. Slope (ft/ft)	0.000210	Area (sq ft)	12975.49	5175.99	17045.97
Q Total (cfs)	43600.00	Flow (cfs)	9718.34	18175.29	15706.37
Top Width (ft)	8340.02	Top Width (ft)	4326.75	426.80	3586.48
Vel Total (ft/s)	1.24	Avg. Vel. (ft/s)	0.75	3.51	0.92
Max Chl Dpth (ft)	19.24	Hydr. Depth (ft)	3.00	12.13	4.75
Conv. Total (cfs)	3011161.0	Conv. (cfs)	671180.6	1255246.0	1084734.0
Length Wtd. (ft)	3148.24	Wetted Per. (ft)	4327.46	430.25	3587.12
Min Ch El (ft)	3.48	Shear (lb/sq ft)	0.04	0.16	0.06
Alpha	3.63	Stream Power (lb/ft s)	0.03	0.55	0.06
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	34514.04	62186.42	11884.58
C & E Loss (ft)	0.00	Cum SA (acres)	12514.61	13205.55	5559.56

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 22.5875*

INPUT

Description:

Station	Elevation	Data	num=	223	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.38	47.94	59.64	47.84	164.91	42.28	166.06	42.27	289.76	38.53				
463.92	34.81	540.22	34.46	589.43	34.31	645.61	33.84	648	33.57				
653.85	33.55	654.81	33.85	674.28	34.33	683.8	34.26	686.62	34				
768.8	33.63	804.22	33.64	807.22	33.71	836	33.67	848.39	33.62				
1020.8	33.83	1034.42	32.22	1053.34	32.23	1056.07	32.29	1088.13	32.47				
1498.57	32.66	1690.03	33.97	1960.65	35.41	2141.73	34.04	2303.05	28.29				
2482.85	27.54	2544.43	27.41	2621.85	27.47	2755.29	27.85	2823.06	27.16				
3161.81	27.16	3412.48	27.16	3706.42	27.6	3934.59	27.54	4243.65	27.35				
4435.75	28.16	4636.05	30.91	4842.46	30.04	5039.2	27.29	5127.28	17.23				
5465.01	16.94	5736.36	17.13	6027.55	18.16	6310.26	17.48	6347.06	16.89				
6521.63	16.7	6781.15	16.43	6854.05	16.53	7012.96	16.8	7199.48	16.97				
7250.24	17.12	7289.34	17.25	7325.42	19.29	7345.52	19.63	7413.74	20.59				
7476.81	21.71	7536.68	22.79	7546.37	22.72	7572.64	22.55	7649.23	20.83				
7714.42	20.69	7818.67	20.56	7944.6	21.59	7972.45	21.75	7995.99	22.3				
8055.49	22.26	8068.04	21.64	8194.27	21.78	8303.43	21.63	8395.2	21.68				
8406.9	21.7	8435.46	20.75	8592.59	20.75	8665.18	20.97	8682.31	22.47				
8730.36	22.04	8744.34	22.31	8762.56	21.13	8773.49	21.47	8837.18	21.54				
8860.6	20.68	8923.33	21.72	8987.85	21.82	9000.88	23.92	9013.66	23.81				
9041.5	21.97	9073.64	22.45	9100.65	24.02	9133.75	21.99	9158.84	22.89				
9177.36	21.09	9226.59	20.6	9285.25	22.43	9295.69	21.97	9319.67	21.35				
9384.31	23.35	9407.13	26.45	9455.27	27.82	9455.64	27.92	9491.13	33.11				
9495.71	34.25	9501.09	32.41	9515.3	34.28	9520.76	35.38	9532.24	35.3				
9536.16	35.1	9544.42	34.4	9555.56	34.27	9564.12	33.81	9578.12	35.96				
9591.9	29.31	9593.38	28.93	9604.83	27.31	9607.73	26.49	9618.62	23.13				
9634.05	18.58	9636.83	18.11	9664.39	14.72	9672.01	13.86	9681.8	11.09				
9696.86	10.07	9699.38	10.01	9711.93	9.68	9726.99	9.03	9732.58	9.09				
9742.05	9.16	9757.12	9.71	9765.91	9.62	9772.18	9.58	9787.24	9.48				
9802.31	9.18	9803.28	9.16	9817.37	8.84	9832.43	8.56	9837.31	8.43				
9847.5	8.14	9852.31	8.05	9858.72	7.73	9862.56	7.45	9865.13	7.22				
9871.54	6.76	9877.62	6.36	9877.95	6.34	9884.36	5.94	9890.77	5.54				
9892.69	5.51	9897.17	5.53	9903.58	4.89	9907.75	4.69	9909.99	4.57				
9916.4	3.08	9922.81	1.9	9929.06	1.9	9935.91	2.94	9942.76	5.23				
9949.61	6.15	9956.46	6.76	9963.31	7.67	9970.16	8.97	9971.88	9.13				
10014.7	12.17	10034.55	13.81	10049.83	14.48	10055.99	15.77	10063.94	18.89				
10084.56	17.57	10093.2	18.07	10102.02	18.35	10132.81	17.21	10270.77	16.37				
10343.95	16.61	10432.59	17.23	10526.5	17.62	10575.2	17.76	10802.78	17.54				
10892.02	17.61	1182.89	18.17	11453.11	17.39	12086.08	17.65	12370.61	18.71				
12386.43	19.87	12402.46	19.83	12417.74	19.04	12587.66	18.38	12618.55	18.83				
12702.7	18.61	12739.18	16.27	12760.38	16.27	12802.67	15.92	12959.14	16.02				
13140.25	15.88	13168.02	17.19	13315.55	17.74	13422.63	17.73	13556.41	17.63				
13588.06	18.99	13624.32	27.22	13652.33	28.57	13733.63	29.47	13878.37	30.26				
13995.76	31.63	14237.11	31.78	14519.91	32.81	14836.38	32.88	15028.71	32.9				
15073.32	33.09	15164.84	33.16	15256.07	33.04	15389.57	33.32	15474.48	35.67				
15534.93	36.21	15543.99	36.29	15722.2	36.78	15761.32	36.83	15988.86	37.11				
16007.59	37.44	16073.85	38.56	16316.65	39.76								

Manning's n Values	num=	4			
Sta	n Val	Sta	n Val	Sta	n Val
.38	.06	9578.12	.08	9634.05	.03110063.94
					.064

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9578.1210063.94 2028.75 4406.38 2370.38 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .3759578.11917.0637510063.9416316.6517.06375

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	22.14				
Vel Head (ft)	0.09	Wt. n-Val.	0.060	0.033	0.064
W.S. Elev (ft)	22.05	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	11953.37	5352.50	15390.94
E.G. Slope (ft/ft)	0.000214	Area (sq ft)	11953.37	5352.50	15390.94
Q Total (cfs)	43600.00	Flow (cfs)	11056.01	18625.66	13918.33
Top Width (ft)	7803.80	Top Width (ft)	3824.54	441.66	3537.60
Vel Total (ft/s)	1.33	Avg. Vel. (ft/s)	0.92	3.48	0.90
Max Chl Dpth (ft)	20.15	Hydr. Depth (ft)	3.13	12.12	4.35
Conv. Total (cfs)	2982883.0	Conv. (cfs)	756394.3	1274270.0	952218.8
Length Wtd. (ft)	3200.37	Wetted Per. (ft)	3825.17	444.97	3538.18
Min Ch El (ft)	1.90	Shear (lb/sq ft)	0.04	0.16	0.06
Alpha	3.18	Stream Power (lb/ft s)	0.04	0.56	0.05
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	33933.52	61653.91	11002.03
C & E Loss (ft)	0.00	Cum SA (acres)	12324.79	13161.62	5365.73

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 21.75*

INPUT

Description:

Station Elevation Data		num= 223									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.5	45.15	57.83	45.27	159.67	38.31	160.78	38.29	280.44	34.84		
448.92	31.21	522.73	30.65	570.34	30.38	624.69	29.83	627	29.48		
632.66	29.46	633.59	29.86	652.43	30.52	661.63	30.45	664.36	30.23		
743.86	29.77	778.12	29.79	781.03	29.85	808.87	29.83	820.86	29.79		
987.64	30.04	1000.81	27.9	1019.12	27.9	1021.76	27.95	1052.78	28.1		
1449.83	28.25	1635.05	29.3	1896.84	30.45	2072.01	29.35	2228.06	24.75		
2402	24.15	2461.57	24.05	2536.47	24.1	2665.56	24.4	2731.12	23.85		
3058.82	23.85	3301.31	23.85	3585.66	24.2	3806.39	24.15	4105.37	24		
4291.2	24.65	4484.97	26.85	4684.64	26.15	4874.97	23.95	4960.18	15.9		
5286.89	15.68	5549.39	16.04	5831.08	17.55	6104.57	16.76	6140.17	15.99		
6309.05	15.82	6560.09	15.57	6630.62	15.64	6784.35	15.87	6964.79	16.02		
7013.89	16.19	7051.71	16.34	7086.62	19.03	7106.06	19.47	7172.06	20.82		
7233.07	22.25	7290.98	23.64	7300.35	23.53	7325.77	23.26	7399.87	20.84		
7462.93	20.56	7563.77	20.17	7685.59	21.29	7712.54	21.48	7735.31	22.2		
7792.87	22.11	7805.01	21.27	7927.12	21.37	8032.72	21.24	8121.5	21.37		
8132.82	21.4	8160.45	20.14	8312.45	20.16	8382.68	20.47	8399.24	21.69		
8445.72	21.44	8459.25	21.88	8476.87	21.24	8487.45	21.7	8549.06	21.79		
8571.72	20.64	8632.4	22.03	8694.82	22.18	8707.42	24.98	8719.79	24.83		
8746.72	22.37	8777.81	23.02	8803.94	25.12	8835.96	22.42	8860.23	23.61		
8878.15	21.21	8925.77	20.56	8982.52	23	8992.62	22.39	9015.81	21.34		
9078.35	23.4	9100.43	27.32	9146.99	28.69	9147.36	28.78	9181.69	30.87		
9186.12	31.77	9191.32	30.28	9205.06	31.74	9210.35	32.61	9221.45	32.51		
9225.24	32.34	9233.24	31.76	9244.01	32.06	9252.29	32	9265.83	34.22		
9281.16	26.93	9282.8	26.59	9295.54	25.03	9298.76	24.3	9310.88	21.22		

9328.03	17.12	9331.12	16.67	9361.77	13.79	9370.24	13.09	9381.13	10.88
9397.88	10.05	9400.69	10	9414.63	9.69	9431.39	9.12	9437.61	9.15
9448.14	9.16	9464.89	9.53	9474.67	9.42	9481.64	9.36	9498.39	9.22
9515.14	8.93	9516.22	8.91	9531.89	8.58	9548.64	8.27	9554.07	8.14
9565.39	7.84	9570.75	7.74	9577.88	7.35	9582.15	6.99	9585	6.72
9592.13	6.19	9598.9	5.74	9599.26	5.71	9606.38	5.29	9613.51	4.87
9615.65	4.86	9620.64	4.93	9627.77	4.11	9632.4	3.88	9634.89	3.73
9642.02	1.83	9649.15	.32	9654.15	.32	9659.95	1.41	9665.75	3.5
9671.55	4.49	9677.35	5.23	9683.15	6.22	9688.95	7.51	9690.4	7.71
9726.66	11.14	9743.47	13.02	9756.4	14.01	9761.62	15.22	9768.35	17.95
9788.68	16.85	9797.19	17.22	9805.89	17.42	9836.25	16.43	9972.26	15.44
10044.4	15.82	10131.79	16.54	10224.37	17.09	10272.38	17.33	10496.74	17.25
10584.71	17.34	10871.47	18.12	11137.87	17.09	11761.89	17.48	12042.39	18.91
12057.98	20.46	12073.79	20.41	12088.86	19.35	12256.37	18.49	12286.82	19.09
12369.78	18.78	12405.75	15.67	12426.65	15.32	12468.34	15.22	12622.59	15.35
12801.14	15.19	12828.51	16.94	12973.96	17.67	13079.52	17.66	13211.41	17.54
13242.62	18.62	13278.36	25.19	13305.98	26.27	13386.12	26.96	13528.81	27.11
13644.54	28.21	13882.48	28.34	14161.28	29.16	14473.27	29.25	14662.89	29.26
14706.86	29.42	14797.08	29.48	14887.02	29.39	15018.64	29.62	15102.34	32.65
15161.94	33.32	15170.88	33.41	15346.56	33.97	15385.13	34.01	15609.45	34.25
15627.91	34.51	15693.24	35.39	15932.6	36.25				

Manning's n Values num= 4
Sta n Val Sta n Val Sta n Val Sta n Val
.5 .058 9265.83 .09 9310.88 .031 9768.35 .063

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9265.83 9768.35 2028.75 4406.38 2370.38 .1 .3
Blocked Obstructions num= 2
Sta L Sta R Elev Sta L Sta R Elev
.59265.835 16.445 9768.35 15932.6 16.445

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	21.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.058	0.031	0.063
W.S. Elev (ft)	21.31	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	10794.73	5465.39	13507.76
E.G. Slope (ft/ft)	0.000231	Area (sq ft)	10794.73	5465.39	13507.76
Q Total (cfs)	43600.00	Flow (cfs)	11044.51	20630.30	11925.19
Top Width (ft)	7073.26	Top Width (ft)	3126.51	457.83	3488.92
Vel Total (ft/s)	1.46	Avg. Vel. (ft/s)	1.02	3.77	0.88
Max Chl Dpth (ft)	20.99	Hydr. Depth (ft)	3.45	11.94	3.87
Conv. Total (cfs)	2871707.0	Conv. (cfs)	727444.7	1358812.0	785450.8
Length Wtd. (ft)	3276.67	Wetted Per. (ft)	3127.00	461.18	3489.49
Min Ch El (ft)	0.32	Shear (lb/sq ft)	0.05	0.17	0.06
Alpha	3.37	Stream Power (lb/ft s)	0.05	0.64	0.05
Frctn Loss (ft)	0.85	Cum Volume (acre-ft)	33403.79	61106.76	10215.75
C & E Loss (ft)	0.00	Cum SA (acres)	12162.92	13116.13	5174.55

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 20.9125*

INPUT
Description:
Station Elevation Data num= 223

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.62	42.36	56.02	42.71	154.43	34.33	155.5	34.31	271.13	31.14
433.93	27.61	505.25	26.84	551.26	26.45	603.76	25.82	606	25.38
611.47	25.37	612.36	25.87	630.57	26.72	639.46	26.64	642.1	26.47
718.92	25.9	752.03	25.94	754.84	25.98	781.74	25.99	793.32	25.97
954.48	26.26	967.21	23.57	984.9	23.58	987.45	23.61	1017.42	23.73
1401.08	23.84	1580.06	24.63	1833.02	25.49	2002.29	24.66	2153.08	21.21
2321.16	20.76	2378.71	20.69	2451.09	20.73	2575.82	20.95	2639.17	20.54
2955.82	20.54	3190.14	20.54	3464.9	20.8	3678.19	20.76	3967.09	20.65
4146.65	21.14	4333.89	22.79	4526.83	22.26	4710.74	20.61	4793.07	14.58
5108.76	14.41	5362.42	14.96	5634.61	16.94	5898.88	16.05	5933.28	15.09
6096.46	14.94	6339.04	14.71	6407.19	14.76	6555.74	14.94	6730.09	15.06
6777.54	15.26	6814.08	15.43	6847.81	18.77	6866.6	19.32	6930.37	21.05
6989.33	22.78	7045.29	24.48	7054.34	24.34	7078.91	23.97	7150.5	20.86
7211.43	20.42	7308.88	19.78	7426.59	20.98	7452.63	21.21	7474.63	22.1
7530.25	21.96	7541.98	20.91	7659.98	20.97	7762.02	20.86	7847.8	21.06
7858.74	21.1	7885.44	19.53	8032.31	19.57	8100.17	19.96	8116.18	20.91
8161.09	20.83	8174.16	21.45	8191.19	21.35	8201.41	21.92	8260.95	22.04
8282.84	20.61	8341.48	22.35	8401.79	22.53	8413.96	26.03	8425.92	25.84
8451.94	22.78	8481.99	23.59	8507.23	26.21	8538.17	22.84	8561.62	24.33
8578.93	21.33	8624.95	20.52	8679.79	23.58	8689.54	22.82	8711.96	21.33
8772.39	23.45	8793.72	28.19	8838.72	29.57	8839.07	29.63	8872.24	28.62
8876.52	29.29	8881.54	28.16	8894.83	29.2	8899.94	29.83	8910.66	29.72
8914.33	29.59	8922.05	29.12	8932.46	29.85	8940.46	30.19	8953.55	32.49
8970.42	24.55	8972.23	24.25	8986.24	22.75	8989.8	22.12	9003.13	19.31
9022.01	15.66	9025.42	15.22	9059.15	12.87	9068.48	12.33	9080.47	10.66
9098.91	10.02	9101.99	9.98	9117.34	9.7	9135.78	9.22	9142.63	9.22
9154.22	9.17	9172.66	9.35	9183.43	9.22	9191.1	9.14	9209.54	8.97
9227.98	8.68	9229.17	8.66	9246.42	8.31	9264.85	7.97	9270.83	7.84
9283.29	7.54	9289.19	7.43	9297.03	6.96	9301.73	6.53	9304.88	6.21
9312.72	5.62	9320.17	5.11	9320.57	5.08	9328.41	4.64	9336.26	4.2
9338.61	4.22	9344.11	4.32	9351.95	3.33	9357.05	3.06	9359.8	2.9
9367.64	.57	9375.49	-1.26	9379.24	-1.26	9383.99	-1.12	9388.74	1.76
9393.49	2.83	9398.24	3.7	9402.99	4.76	9407.74	6.05	9408.93	6.28
9438.62	10.1	9452.39	12.24	9462.98	13.54	9467.25	14.68	9472.76	17.01
9492.8	16.12	9501.19	16.38	9509.77	16.5	9539.69	15.67	9673.74	14.5
9744.85	15.02	9830.98	15.85	9922.24	16.56	9969.56	16.9	10190.7	16.96
10277.41	17.08	10560.05	18.06	10822.62	16.79	11437.69	17.31	11714.17	19.11
11729.54	21.04	11745.12	20.98	11759.97	19.67	11925.08	18.59	11955.09	19.34
12036.86	18.96	12072.31	15.08	12092.91	14.64	12134	14.51	12286.05	14.69
12462.03	14.49	12489.01	16.68	12632.37	17.61	12736.42	17.61	12866.41	17.45
12897.17	18.25	12932.4	23.16	12959.62	23.96	13038.62	24.44	13179.26	23.95
13293.33	24.79	13527.85	24.89	13802.65	25.53	14110.16	25.61	14297.06	25.63
14340.4	25.75	14429.33	25.81	14517.97	25.73	14647.7	25.91	14730.21	29.64
14788.95	30.42	14797.76	30.53	14970.92	31.15	15008.93	31.18	15230.04	31.38
15248.23	31.59	15312.62	32.21	15548.55	32.74				

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .62 .056 8953.55 .1 9003.13 .031 9472.76 .061

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 8953.55 9472.76 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .6258953.55215.826259472.76315548.5515.82625

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft) 20.57 Element Left OB Channel Right OB

Vel Head (ft)	0.13	Wt. n-Val.	0.056	0.032	0.061
W.S. Elev (ft)	20.44	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	9686.42	5484.29	11217.52
E.G. Slope (ft/ft)	0.000290	Area (sq ft)	9686.42	5484.29	11217.52
Q Total (cfs)	43600.00	Flow (cfs)	11369.53	21946.17	10284.30
Top Width (ft)	6486.69	Top Width (ft)	2598.06	474.99	3413.64
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)	1.17	4.00	0.92
Max Chl Dpth (ft)	21.70	Hydr. Depth (ft)	3.73	11.55	3.29
Conv. Total (cfs)	2561651.0	Conv. (cfs)	667999.3	1289414.0	604238.4
Length Wtd. (ft)	3318.71	Wetted Per. (ft)	2598.45	478.59	3414.19
Min Ch El (ft)	-1.26	Shear (lb/sq ft)	0.07	0.21	0.06
Alpha	3.16	Stream Power (lb/ft s)	0.08	0.83	0.05
Frctn Loss (ft)	1.12	Cum Volume (acre-ft)	32926.85	60552.94	9543.02
C & E Loss (ft)	0.00	Cum SA (acres)	12029.62	13068.95	4986.74

Warning: Divided flow computed for this cross-section.

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

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 20.075*

INPUT

Description:

Station	Elevation	Data	num=	223										
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
.75	39.58	54.22	40.14	149.18	30.35	150.22	30.33	261.82	27.45					
418.93	24.02	487.77	23.03	532.17	22.51	582.84	21.82	585	21.29					
590.28	21.28	591.14	21.88	608.71	22.91	617.3	22.82	619.85	22.7					
693.98	22.03	725.93	22.09	728.64	22.12	754.61	22.15	765.79	22.14					
921.32	22.47	933.61	19.25	950.68	19.25	953.14	19.28	982.07	19.35					
1352.34	19.43	1525.07	19.95	1769.21	20.53	1932.57	19.98	2078.1	17.68					
2240.31	17.38	2295.86	17.33	2365.7	17.35	2486.09	17.5	2547.22	17.23					
2852.83	17.23	3078.97	17.23	3344.14	17.4	3549.99	17.38	3828.8	17.3					
4002.11	17.63	4182.81	18.73	4369.01	18.38	4546.51	17.28	4625.97	13.25					
4930.64	13.14	5175.45	13.87	5438.14	16.33	5693.18	15.33	5726.39	14.19					
5883.87	14.06	6117.99	13.86	6183.76	13.87	6327.12	14.01	6495.39	14.11					
6541.18	14.34	6576.46	14.52	6609.01	18.51	6627.14	19.16	6688.69	21.28					
6745.59	23.32	6799.59	25.32	6808.33	25.14	6832.04	24.68	6901.13	20.87					
6959.94	20.29	7053.99	19.38	7167.59	20.68	7192.72	20.94	7213.96	22					
7267.64	21.81	7278.96	20.54	7392.83	20.56	7491.31	20.47	7574.11	20.76					
7584.66	20.8	7610.42	18.92	7752.17	18.98	7817.67	19.45	7833.12	20.14					
7876.46	20.22	7889.08	21.03	7905.51	21.47	7915.38	22.15	7972.83	22.3					
7993.96	20.57	8050.55	22.67	8108.76	22.89	8120.51	27.09	8132.04	26.86					
8157.16	23.19	8186.16	24.16	8210.52	27.31	8240.38	23.26	8263.01	25.06					
8279.72	21.46	8324.13	20.48	8377.06	24.15	8386.47	23.24	8408.11	21.32					
8466.42	23.5	8487.01	29.06	8530.44	30.44	8530.78	30.49	8562.79	26.38					
8566.93	26.8	8571.77	26.03	8584.59	26.66	8589.52	27.06	8599.88	26.94					
8603.41	26.83	8610.87	26.48	8620.91	27.64	8628.64	28.38	8641.27	30.76					
8659.68	22.16	8661.66	21.91	8676.95	20.46	8680.83	19.93	8695.39	17.4					
8716	14.21	8719.71	13.77	8756.54	11.94	8766.72	11.57	8779.8	10.44					
8799.93	10	8803.29	9.97	8820.05	9.72	8840.18	9.32	8847.65	9.29					
8860.31	9.18	8880.43	9.17	8892.19	9.01	8900.56	8.92	8920.69	8.71					
8940.81	8.42	8942.11	8.41	8960.94	8.04	8981.07	7.68	8987.58	7.55					
9001.19	7.25	9007.62	7.12	9016.19	6.57	9021.32	6.07	9024.75	5.71					
9033.32	5.05	9041.45	4.49	9041.88	4.46	9050.44	4	9059.01	3.54					
9061.57	3.58	9067.57	3.71	9076.13	2.56	9081.7	2.24	9084.7	2.07					
9093.26	-.69	9101.83	-2.84	9104.33	-2.84	9108.02	-1.66	9111.72	.03					

9115.42	1.16	9119.12	2.17	9122.82	3.31	9126.52	4.59	9127.45	4.85
9150.58	9.07	9161.3	11.46	9169.55	13.07	9172.88	14.13	9177.17	16.08
9196.92	15.4	9205.19	15.53	9213.64	15.58	9243.13	14.9	9375.23	13.57
9445.31	14.23	9530.18	15.15	9620.11	16.03	9666.74	16.46	9884.66	16.68
9970.11	16.82	10248.64	18.01	10507.38	16.51	11113.49	17.14	11385.94	19.3
11401.09	21.63	11416.45	21.55	11431.08	19.98	11593.79	18.69	11623.36	19.59
11703.94	19.14	11738.87	14.49	11759.17	13.96	11799.67	13.81	11949.5	14.03
12122.92	13.79	12149.51	16.42	12290.78	17.54	12393.31	17.53	12521.41	17.36
12551.72	17.88	12586.44	21.13	12613.27	21.65	12691.11	21.93	12829.71	20.8
12942.11	21.37	13173.23	21.45	13444.02	21.91	13747.06	21.97	13931.23	22
13973.94	22.08	14061.57	22.12	14148.93	22.08	14276.77	22.21	14358.07	26.63
14415.96	27.52	14424.64	27.65	14595.28	28.33	14632.74	28.36	14850.62	28.52
14868.55	28.66	14932.01	29.03	15164.5	29.23				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.75	.054	8641.27	.1	8695.39	.031	9177.17	.059

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

8641.27	9177.17	2028.75	4406.38	2370.38	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.74999998641.268	15.20759177.175	15164.5	15.2075		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	19.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.054	0.033	0.059
W.S. Elev (ft)	19.30	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	12642.31	5338.55	8165.11
E.G. Slope (ft/ft)	0.000383	Area (sq ft)	12642.31	5338.55	8165.11
Q Total (cfs)	43600.00	Flow (cfs)	13162.78	22786.37	7650.84
Top Width (ft)	8565.48	Top Width (ft)	4875.32	492.72	3197.45
Vel Total (ft/s)	1.67	Avg. Vel. (ft/s)	1.04	4.27	0.94
Max Chl Dpth (ft)	22.14	Hydr. Depth (ft)	2.59	10.83	2.55
Conv. Total (cfs)	2227759.0	Conv. (cfs)	672557.4	1164278.0	390922.8
Length Wtd. (ft)	3200.54	Wetted Per. (ft)	4875.64	496.87	3197.89
Min Ch El (ft)	-2.84	Shear (lb/sq ft)	0.06	0.26	0.06
Alpha	3.60	Stream Power (lb/ft s)	0.06	1.10	0.06
Frctn Loss (ft)	1.02	Cum Volume (acre-ft)	32406.88	60005.54	9015.65
C & E Loss (ft)	0.02	Cum SA (acres)	11855.59	13020.00	4806.87

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 19.2375*

INPUT Description:

Station Elevation Data	num=	223							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
.87	36.79	52.41	37.57	143.94	26.38	144.94	26.36	252.5	23.76
403.94	20.42	470.28	19.21	513.08	18.58	561.92	17.81	564	17.19
569.09	17.19	569.92	17.89	586.86	19.11	595.13	19.01	597.59	18.94
669.04	18.17	699.84	18.24	702.45	18.26	727.48	18.3	738.25	18.32
888.16	18.69	900	14.92	916.45	14.93	918.83	14.94	946.71	14.98

1303.6	15.01	1470.08	15.28	1705.39	15.56	1862.84	15.29	2003.11	14.14
2159.46	13.99	2213	13.96	2280.32	13.98	2396.35	14.05	2455.28	13.91
2749.83	13.91	2967.8	13.91	3223.38	14	3421.79	13.99	3690.52	13.95
3857.56	14.11	4031.72	14.66	4211.2	14.49	4382.27	13.94	4458.86	11.93
4752.52	11.87	4988.47	12.79	5241.67	15.71	5487.49	14.62	5519.49	13.3
5671.29	13.18	5896.94	13	5960.33	12.99	6098.51	13.08	6260.7	13.15
6304.83	13.41	6338.83	13.61	6370.21	18.26	6387.68	19.01	6447	21.5
6501.84	23.86	6553.9	26.16	6562.32	25.95	6585.17	25.39	6651.77	20.89
6708.45	20.15	6799.09	18.99	6908.59	20.38	6932.81	20.67	6953.28	21.9
7005.02	21.65	7015.93	20.17	7125.69	20.15	7220.61	20.09	7300.41	20.45
7310.58	20.5	7335.41	18.31	7472.04	18.39	7535.16	18.94	7550.05	19.36
7591.83	19.61	7603.99	20.6	7619.83	21.58	7629.34	22.37	7684.72	22.55
7705.08	20.54	7759.63	22.98	7815.73	23.24	7827.06	28.14	7838.17	27.88
7862.38	23.59	7890.33	24.73	7913.81	28.4	7942.59	23.68	7964.41	25.78
7980.51	21.58	8023.32	20.44	8074.33	24.73	8083.4	23.66	8104.25	21.31
8160.46	23.55	8180.31	29.93	8222.16	31.32	8222.49	31.34	8253.35	24.14
8257.33	24.32	8262	23.9	8274.36	24.12	8279.11	24.28	8289.09	24.15
8292.5	24.07	8299.68	23.84	8309.37	25.43	8316.81	26.57	8328.98	29.03
8348.94	19.78	8351.08	19.57	8367.66	18.18	8371.87	17.75	8387.65	15.49
8409.98	12.75	8414.01	12.33	8453.92	11.01	8464.95	10.81	8479.13	10.23
8500.95	9.97	8504.6	9.95	8522.76	9.73	8544.58	9.41	8552.68	9.35
8566.39	9.18	8588.21	8.99	8600.94	8.81	8610.02	8.7	8631.83	8.46
8653.65	8.17	8655.06	8.15	8675.46	7.78	8697.28	7.39	8704.34	7.25
8719.09	6.95	8726.06	6.81	8735.34	6.19	8740.91	5.6	8744.63	5.2
8753.91	4.47	8762.72	3.86	8763.19	3.83	8772.47	3.35	8781.75	2.87
8784.53	2.93	8791.04	3.11	8800.32	1.78	8806.35	1.43	8809.6	1.23
8818.88	-1.94	8828.16	-4.42	8829.41	-4.42	8832.06	-3.19	8834.71	-1.71
8837.36	-.5	8840.01	.65	8842.66	1.85	8845.31	3.14	8845.98	3.43
8862.54	8.03	8870.22	10.68	8876.13	12.6	8878.51	13.58	8881.59	15.14
8901.05	14.67	8909.19	14.69	8917.52	14.66	8946.57	14.13	9076.71	12.63
9145.76	13.43	9229.38	14.46	9317.98	15.5	9363.92	16.03	9578.62	16.39
9662.8	16.56	9937.22	17.95	10192.14	16.2	10789.3	16.97	11057.72	19.5
11072.65	22.21	11087.77	22.13	11102.19	20.29	11262.49	18.81	11291.63	19.85
11371.02	19.32	11405.44	13.89	11425.44	13.28	11465.33	13.11	11612.95	13.36
11783.81	13.1	11810	16.16	11949.19	17.47	12050.21	17.47	12176.41	17.27
12206.28	17.51	12240.49	19.11	12266.91	19.34	12343.61	19.41	12480.15	17.65
12590.9	17.95	12818.6	18.01	13085.39	18.26	13383.95	18.33	13565.4	18.36
13607.48	18.41	13693.82	18.44	13779.88	18.43	13905.83	18.51	13985.94	23.61
14042.97	24.63	14051.52	24.78	14219.64	25.52	14256.55	25.54	14471.21	25.66
14488.88	25.73	14551.39	25.85	14780.45	25.71				

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .87 .052 8328.98 .1 8367.66 .031 8881.59 .057

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 8328.98 8881.59 2028.75 4406.38 2370.38 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .87499998328.98414.588758881.58814780.4514.58875

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	18.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.052	0.031	0.057
W.S. Elev (ft)	18.33	Reach Len. (ft)	2028.75	4406.38	2370.38
Crit W.S. (ft)		Flow Area (sq ft)	19629.56	5240.11	6295.54
E.G. Slope (ft/ft)	0.000255	Area (sq ft)	19629.56	5240.11	6295.54
Q Total (cfs)	43600.00	Flow (cfs)	20916.18	18486.72	4197.10
Top Width (ft)	9995.80	Top Width (ft)	5642.82	515.67	3837.31

Vel Total (ft/s)	1.40	Avg. Vel. (ft/s)	1.07	3.53	0.67
Max Chl Dpth (ft)	22.75	Hydr. Depth (ft)	3.48	10.16	1.64
Conv. Total (cfs)	2731174.0	Conv. (cfs)	1310223.0	1158038.0	262913.2
Length Wtd. (ft)	3231.14	Wetted Per. (ft)	5644.00	520.94	3837.76
Min Ch El (ft)	-4.42	Shear (lb/sq ft)	0.06	0.16	0.03
Alpha	3.00	Stream Power (lb/ft s)	0.06	0.56	0.02
Frctn Loss (ft)	0.57	Cum Volume (acre-ft)	31655.37	59470.49	8622.20
C & E Loss (ft)	0.01	Cum SA (acres)	11610.65	12969.00	4615.46

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.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 18.4

INPUT

Description: Cross Section at River Mile 18.4

Station Elevation Data		num= 112									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1	34	50.6	35	138.7	22.4	452.8	15.4	541	13.8		
543	13.1	547.9	13.1	548.7	13.9	565	15.3	644.1	14.3		
855	14.9	866.4	10.6	4574.4	10.6	4801.5	11.7	5045.2	15.1		
5281.8	13.9	5312.6	12.4	5458.7	12.3	5736.9	12.1	6026	12.2		
6101.2	12.7	6131.4	18	6258.1	24.4	6308.2	27	6338.3	26.1		
6402.4	20.9	6544.2	18.6	6672.9	20.4	6692.6	21.8	6742.4	21.5		
6752.9	19.8	6949.9	19.7	7036.5	20.2	7060.4	17.7	7191.9	17.8		
7307.2	19	7343.3	22.6	7396.6	22.8	7416.2	20.5	7468.7	23.3		
7522.7	23.6	7533.6	29.2	7544.3	28.9	7567.6	24	7594.5	25.3		
7617.1	29.5	7644.8	24.1	7665.8	26.5	7681.3	21.7	7722.5	20.4		
7771.6	25.3	7800.4	21.3	7854.5	23.6	7873.6	30.8	7914.2	32.2		
7943.9	21.9	7988.5	21.2	8016.7	27.3	8038.2	17.4	8062.9	15.56		
8079.9	13.58	8108.3	10.88	8151.3	10.08	8205.9	9.94	8257.7	9.42		
8309.7	8.6	8368	7.9	8421.1	6.96	8444.5	6.5	8454.5	5.8		
8464.5	4.7	8474.5	3.9	8484.5	3.2	8494.5	2.7	8504.5	2.2		
8514.5	2.5	8524.5	1	8534.5	.4	8544.5	-3.2	8554.5	-6		
8564.5	2	8574.5	7	8586	14.2	8778.2	11.7	9061.1	15.6		
9355.5	16.3	9625.8	17.9	9876.9	15.9	10465.1	16.8	10729.5	19.7		
10744.2	22.8	10759.1	22.7	10773.3	20.6	10931.2	18.9	10959.9	20.1		
11038.1	19.5	11072	13.3	11091.7	12.6	11131	12.4	11276.4	12.7		
11444.7	12.4	11470.5	15.9	11607.6	17.4	11707.1	17.4	11996.1	16.9		
12130.6	14.5	13534.9	14.8	13613.8	20.6	13678.4	21.9	13844	22.7		
14109.2	22.8	14396.4	22.2								

Manning's n Values		num= 10									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1	.05	6026	.07	6402.4	.031	7307.2	.05	7873.6	.11		
8038.2	.014	8778.2	.07	10465.1	.06	11444.7	.07	11707.1	.05		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.			
8016.7	8586	3217.29	4349	2885.43	.1	.3				
Blocked Obstructions		num= 2								
Sta L	Sta R	Elev	Sta L	Sta R	Elev					
1	8016.7	13.97	8586	14396.4	13.97					

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	17.84	Element	Left OB	Channel	Right OB
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Vel Head (ft)	0.19	Wt. n-Val.	0.050	0.014	0.043
W.S. Elev (ft)	17.64	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	20488.48	5281.49	9605.06
E.G. Slope (ft/ft)	0.000100	Area (sq ft)	20488.48	5281.49	9605.06
Q Total (cfs)	44800.00	Flow (cfs)	14084.86	24759.03	5956.12
Top Width (ft)	10731.29	Top Width (ft)	5777.23	548.33	4405.73
Vel Total (ft/s)	1.27	Avg. Vel. (ft/s)	0.69	4.69	0.62
Max Chl Dpth (ft)	23.64	Hydr. Depth (ft)	3.55	9.63	2.18
Conv. Total (cfs)	4483416.0	Conv. (cfs)	1409560.0	2477790.0	596065.9
Length Wtd. (ft)	3689.76	Wetted Per. (ft)	5777.83	556.09	4406.36
Min Ch El (ft)	-6.00	Shear (lb/sq ft)	0.02	0.06	0.01
Alpha	7.70	Stream Power (lb/ft s)	0.02	0.28	0.01
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	30721.15	58938.32	8189.57
C & E Loss (ft)	0.04	Cum SA (acres)	11344.72	12915.18	4391.19

Warning: Divided flow computed for this cross-section.

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

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 17.5714*

INPUT

Description: Interpolated Cross Section at River Mile 17.57

Station Elevation Data		num= 188									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.86	32.49	55.66	33.03	99.58	27.91	153.01	21.92	205.31	20.95		
334.61	18.4	460.08	16.12	500.09	15.45	597.55	14.12	599.76	13.53		
605.17	13.53	605.94	14.13	606.05	14.21	624.06	15.32	711.47	14.01		
735.88	13.94	854.35	14.17	944.51	15.01	955.62	11.84	957.11	11.38		
999.57	10.74	1080.46	10.9	1249.24	10.89	1433.32	10.39	1539.05	10.41		
1663.25	10.39	1779.17	10.37	1911.65	10.44	2057.51	10.39	2058.15	10.41		
3010.36	10.4	3961.94	10.37	4175.31	10.59	4386.13	10.73	4454.92	10.37		
4938.99	10.43	4961.92	10.56	4979.11	10.43	5054.36	10.44	5059.37	10.46		
5155.54	10.84	5170.19	11.34	5190.58	11.07	5305.3	11.46	5321.15	11.63		
5435.79	12.74	5545.35	13.95	5574.59	14.28	5707.13	13.81	5836.02	13.29		
5870.06	12.01	6031.5	11.91	6338.9	11.73	6658.35	11.8	6741.44	12.23		
6774.81	16.77	6914.81	22.25	6970.17	24.47	7003.43	23.7	7074.26	19.24		
7230.95	17.26	7373.16	18.8	7394.93	20	7449.96	19.74	7461.56	18.28		
7679.24	18.18	7774.93	18.61	7801.34	16.46	7946.64	16.54	8074.05	17.57		
8113.94	20.65	8172.83	20.82	8194.49	18.85	8252.5	21.24	8284.15	21.38		
8312.17	21.52	8324.21	26.33	8336.04	26.08	8361.78	21.9	8391.51	23.04		
8416.48	26.66	8434.47	23.95	8447.09	22.05	8470.29	24.12	8487.42	20.01		
8532.94	18.92	8587.2	23.14	8587.97	23.06	8619.02	19.89	8678.8	22.21		
8699.91	28.51	8708.35	28.78	8737.65	29.05	8744.77	29.25	8763.76	24.18		
8777.59	20.5	8824.27	20.06	8826.87	20.1	8840.83	22.86	8845.29	23.42		
8849.75	23.78	8858.03	25.24	8872.42	19.13	8879.19	16.24	8886.82	15.55		
8894.57	14.88	8903.49	14.29	8920.22	12.55	8948.17	10.18	8990.49	9.4		
9044.22	9.16	9095.2	8.61	9146.37	7.79	9203.75	7.07	9256	6.15		
9279.03	5.71	9288.87	5.08	9298.72	4.12	9308.56	3.41	9318.4	2.79		
9328.24	2.34	9338.08	1.89	9347.92	2.13	9357.76	.82	9360.71	.66		
9367.6	.1	9377.44	-3.28	9387.29	-5.97	9399.89	.99	9405.13	2.81		
9409.6	5.04	9412.5	6.64	9414.51	7.91	9421.2	10.92	9427	14.07		
9442.82	13.58	9617.55	11.3	9673.79	11.87	9786.64	13	9832	14.38		
9895.28	14.55	9898.03	14.59	10061.91	14.92	10189.91	14.92	10197.97	14.94		
10371.99	16.87	10398.35	16.54	10457.89	16.79	10706.84	14.85	10841.32	14.91		
11162.99	15.22	11208.34	15.51	11271.62	16.38	11290	16.22	11296.94	16.22		
11325.41	16.48	11552.14	18.62	11566.71	21.27	11581.49	21.19	11595.56	19.39		

11600.68	19.3411752.11	17.9311780.57	18.9611858.09	18.4511891.71	13.14
11911.24	12.54 11950.2	12.37 11954	12.3812094.35	12.6412149.11	12.56
12261.21	12.6112286.79	15.6612307.31	15.8912422.72	17.3912491.88	17.63
12521.36	17.6112662.74	17.312688.05	16.9612807.89	16.47 12812.5	16.39
12884.22	14.9412941.24	14.0614333.51	14.3114411.73	19.2914475.78	20.4
14639.96	21.0914902.89	21.1715187.63	20.66		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.86	.054	8858.03	.11	8879.19	.031	9427	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
8858.03 9427 3217.29 4349 2885.43 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.86	8858.03	13.42	9427	15187.63	13.42

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	17.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.054	0.032	0.055
W.S. Elev (ft)	17.19	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	23230.61	5459.49	10416.83
E.G. Slope (ft/ft)	0.000196	Area (sq ft)	23230.61	5459.49	10416.83
Q Total (cfs)	44800.00	Flow (cfs)	21014.86	16523.64	7261.49
Top Width (ft)	11391.61	Top Width (ft)	6618.95	550.03	4222.63
Vel Total (ft/s)	1.15	Avg. Vel. (ft/s)	0.90	3.03	0.70
Max Chl Dpth (ft)	23.16	Hydr. Depth (ft)	3.51	9.93	2.47
Conv. Total (cfs)	3198789.0	Conv. (cfs)	1500493.0	1179814.0	518481.8
Length Wtd. (ft)	3587.36	Wetted Per. (ft)	6619.83	556.56	4223.24
Min Ch El (ft)	-5.97	Shear (lb/sq ft)	0.04	0.12	0.03
Alpha	2.93	Stream Power (lb/ft s)	0.04	0.36	0.02
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	29106.63	58402.14	7526.45
C & E Loss (ft)	0.00	Cum SA (acres)	10886.93	12860.35	4105.41

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 16.7428*

INPUT
Description: Interpolated Cross Section at River Mile 16.74

Station	Elevation	Data	num=	188					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.71	30.97	60.73	31.07	108.82	26.51	167.33	21.44	224.59	20.56
366.17	18.07	503.57	16.03	547.37	15.5	654.09	14.45	656.51	13.95
662.44	13.96	663.29	14.46	663.41	14.53	683.13	15.34	778.84	13.72
805.56	13.52	935.29	13.68	1034.02	15.11	1046.18	12.56	1047.81	12.16
1094.3	10.89	1182.88	11.2	1367.7	11.17	1569.26	10.17	1685.04	10.23
1821.04	10.17	1947.98	10.14	2093.04	10.29	2252.76	10.17	2253.46	10.23
3296.13	10.2	4338.11	10.14	4571.76	10.57	4802.61	10.86	4877.93	10.14
5407.99	10.26	5433.1	10.51	5451.93	10.26	5534.33	10.28	5539.81	10.3
5645.12	10.63	5661.16	11.56	5683.48	10.94	5809.11	11.22	5826.46	11.36
5952	12.13	6071.96	13.18	6103.97	13.46	6249.11	13.12	6390.25	12.69
6427.52	11.61	6604.29	11.53	6940.9	11.36	7290.7	11.4	7381.69	11.75
7418.23	15.53	7571.53	20.09	7632.15	21.95	7668.57	21.3	7746.12	17.58
7917.7	15.92	8073.42	17.2	8097.25	18.19	8157.51	17.97	8170.21	16.76
8408.58	16.67	8513.36	17.02	8542.28	15.23	8701.38	15.29	8840.89	16.13

8884.57	18.7	8949.06	18.84	8972.78	17.19	9036.3	19.19	9070.96	19.3
9101.64	19.44	9114.83	23.46	9127.77	23.26	9155.97	19.8	9188.51	20.78
9215.86	23.82	9235.56	21.58	9249.37	20	9274.78	21.73	9293.54	18.32
9343.39	17.43	9402.8	20.98	9403.64	20.92	9437.64	18.49	9503.1	20.83
9526.21	26.22	9535.46	26.5	9567.54	26.13	9575.34	26.31	9596.14	22.11
9611.27	19.09	9662.39	18.88	9665.24	19.01	9680.53	21.78	9685.41	22.03
9690.29	21.89	9699.36	23.19	9713.52	17.69	9720.17	15.08	9727.68	14.27
9735.31	13.53	9744.09	13.01	9760.55	11.53	9788.05	9.48	9829.68	8.72
9882.55	8.39	9932.7	7.8	9983.05	6.99	10039.5	6.2410090.91	5.34	
10113.57	4.9110123.25		4.3710132.93		3.5410142.61		2.9310152.29	2.38	
10161.98	1.9810171.66		1.5810181.34		1.7610191.02		.6410193.93	.5	
10200.71	-.2110210.39		-3.3610220.07		-5.9410235.29		-.0310241.61	1.54	
10247	4.23	10250.5	6.2710252.92		7.83	10261	10.51	10268	13.94
10283.68	13.1710456.91		10.910512.66		11.2610624.54		11.95	10669.5	14.09
10732.23	13.5410734.96		13.5710897.43		13.8511024.32		13.5311032.31	13.53	
11204.82	16.3611230.96		15.5311289.99		15.6811536.79		13.8	11670.1	13.71
11988.99	13.8312033.95		14.3412096.69		15.9812114.91		15.6512121.78	15.57	
12150.01	15.7712374.78		17.5312389.23		19.7512403.87		19.6712417.83	18.17	
12422.9	18.1312573.02		16.9712601.23		17.8312678.09		17.4112711.41	12.98	
12730.77	12.48	12769.4	12.3412773.17		12.3512912.31		12.5812966.59	12.52	
13077.73	12.8213103.08		15.4213123.43		15.6613237.83		17.38	13306.4	17.86
13335.63	17.8213475.78		17.4513500.88		16.8213619.68		16.0413624.25	15.95	
13695.35	14.3513751.87		13.6115132.12		13.8315209.66		17.9715273.16	18.9	
15435.92	19.4715696.58		19.5415978.86		19.11				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.71	.053	9699.36	.11	9720.17	.031	10268	.064

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9699.36	10268		3217.29	4349 2885.43	.1	.3

Blocked Obstructions

Sta L	Sta R	Elev	Sta L	Sta R	Elev
.71	9699.36	12.87	10268	15978.86	12.87

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	16.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.053	0.032	0.064
W.S. Elev (ft)	16.47	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	24305.49	5488.99	10235.58
E.G. Slope (ft/ft)	0.000201	Area (sq ft)	24305.49	5488.99	10235.58
Q Total (cfs)	44800.00	Flow (cfs)	21830.66	16733.36	6235.98
Top Width (ft)	12067.37	Top Width (ft)	7424.56	551.38	4091.43
Vel Total (ft/s)	1.12	Avg. Vel. (ft/s)	0.90	3.05	0.61
Max Chl Dpth (ft)	22.41	Hydr. Depth (ft)	3.27	9.96	2.50
Conv. Total (cfs)	3156043.0	Conv. (cfs)	1537913.0	1178822.0	439308.4
Length Wtd. (ft)	3597.08	Wetted Per. (ft)	7425.26	557.13	4092.03
Min Ch El (ft)	-5.94	Shear (lb/sq ft)	0.04	0.12	0.03
Alpha	3.13	Stream Power (lb/ft s)	0.04	0.38	0.02
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	27351.15	57855.59	6842.43
C & E Loss (ft)	0.00	Cum SA (acres)	10368.31	12805.37	3830.05

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 15.9142*

INPUT

Description: Interpolated Cross Section at River Mile 15.91

Station Elevation Data		num= 188									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.57	29.46	65.79	29.1	118.05	25.11	181.64	20.96	243.87	20.17		
397.74	17.74	547.06	15.95	594.66	15.54	710.64	14.77	713.27	14.38		
719.71	14.38	720.63	14.79	720.76	14.84	742.19	15.36	846.21	13.44		
875.25	13.09	1016.23	13.18	1123.52	15.22	1136.75	13.29	1138.52	12.93		
1189.04	11.03	1285.3	11.5	1486.16	11.46	1705.21	9.96	1831.03	10.04		
1978.83	9.96	2116.78	9.91	2274.43	10.13	2448.01	9.96	2448.76	10.04		
3581.91	10	4714.29	9.91	4968.2	10.56	5219.09	10.99	5300.95	9.91		
5876.99	10.09	5904.28	10.47	5924.74	10.09	6014.29	10.13	6020.25	10.14		
6134.7	10.42	6152.13	11.79	6176.38	10.81	6312.91	10.99	6331.76	11.09		
6468.2	11.53	6598.56	12.4	6633.36	12.65	6791.08	12.44	6944.47	12.08		
6984.97	11.22	7177.09	11.14	7542.9	10.99	7923.05	11	8021.93	11.28		
8061.64	14.3	8228.24	17.94	8294.12	19.42	8333.7	18.9	8417.99	15.92		
8604.45	14.58	8773.68	15.59	8799.58	16.39	8865.07	16.21	8878.87	15.24		
9137.91	15.15	9251.79	15.42	9283.21	13.99	9456.13	14.03	9607.74	14.7		
9655.21	16.75	9725.3	16.86	9751.07	15.54	9820.1	17.13	9857.77	17.22		
9891.11	17.36	9905.44	20.59	9919.51	20.45	9950.15	17.71	9985.52	18.52		
10015.24	20.97	10036.65	19.21	10051.66	17.95	10079.28	19.35	10099.66	16.63		
10153.83	15.95	10218.4	18.83	10219.31	18.77	10256.27	17.08	10327.4	19.44		
10352.52	23.92	10362.57	24.22	10397.43	23.21	10405.91	23.36	10428.51	20.05		
10444.96	17.69	10500.51	17.71	10503.6	17.91	10520.22	20.71	10525.53	20.65		
10530.83	19.99	10540.69	21.13	10554.62	16.25	10561.16	13.92	10568.54	13		
10576.04	12.18	10584.68	11.74	10600.87	10.51	10627.92	8.77	10668.87	8.04		
10720.87	7.61	10770.2	6.98	10819.72	6.18	10875.24	5.41	10925.81	4.53		
10948.1	4.12	10957.62	3.65	10967.15	2.96	10976.67	2.44	10986.19	1.98		
10995.72	1.63	11005.24	1.28	11014.76	1.38	11024.29	.46	11027.14	.34		
11033.81	-.51	11043.33	-3.44	11052.86	-5.91	11070.68	-1.04	11078.09	.27		
11084.4	3.43	11088.5	5.91	11091.34	7.74	11100.8	10.11	11109	13.81		
11124.55	12.75	11296.26	10.51	11351.53	10.65	11462.43	10.9	11507	13.79		
11569.18	12.54	11571.89	12.56	11732.94	12.78	11858.73	12.15	11866.64	12.13		
12037.66	15.85	12063.57	14.53	12122.08	14.57	12366.73	12.75	12498.88	12.5		
12815	12.45	12859.56	13.17	12921.75	15.58	12939.81	15.07	12946.62	14.92		
12974.61	15.05	13197.42	16.45	13211.74	18.22	13226.26	18.16	13240.09	16.96		
13245.12	16.93	13393.93	16	13421.9	16.69	13498.09	16.36	13531.12	12.82		
13550.31	12.42	13588.6	12.31	13592.33	12.32	13730.26	12.52	13784.08	12.47		
13894.24	13.03	13919.38	15.18	13939.54	15.43	14052.95	17.36	14120.92	18.09		
14149.89	18.03	14288.83	17.6	14313.7	16.68	14431.47	15.61	14436	15.52		
14506.48	13.76	14562.51	13.17	15930.72	13.34	16007.6	16.66	16070.54	17.4		
16231.88	17.86	16490.27	17.91	16770.09	17.57						

Manning's n Values		num= 4									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
.57	.052	10540.69	.111	10561.16	.031	11109	.069				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	10540.69	11109	3217.29	4349	2885.43	.1	.3	

Blocked Obstructions		num= 2									
Sta L	Sta R	Elev	Sta L	Sta R	Elev						
.57	10540.69	12.33	11109	16770.09	12.33						

CROSS SECTION OUTPUT		Profile #Calibration									
E.G. Elev (ft)	15.80	Element	Left OB	Channel	Right OB						
Vel Head (ft)	0.06	Wt. n-Val.	0.052	0.032	0.069						
W.S. Elev (ft)	15.74	Reach Len. (ft)	3217.29	4349.00	2885.43						
Crit W.S. (ft)		Flow Area (sq ft)	25356.64	5508.02	9950.12						
E.G. Slope (ft/ft)	0.000206	Area (sq ft)	25356.64	5508.02	9950.12						

Q Total (cfs)	44800.00	Flow (cfs)	22259.92	16836.80	5703.28
Top Width (ft)	13204.13	Top Width (ft)	8662.10	552.93	3989.10
Vel Total (ft/s)	1.10	Avg. Vel. (ft/s)	0.88	3.06	0.57
Max Chl Dpth (ft)	21.65	Hydr. Depth (ft)	2.93	9.96	2.49
Conv. Total (cfs)	3118155.0	Conv. (cfs)	1549328.0	1171870.0	396957.7
Length Wtd. (ft)	3601.87	Wetted Per. (ft)	8662.64	558.27	3989.68
Min Ch El (ft)	-5.91	Shear (lb/sq ft)	0.04	0.13	0.03
Alpha	3.27	Stream Power (lb/ft s)	0.03	0.39	0.02
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	25517.16	57306.63	6173.88
C & E Loss (ft)	0.00	Cum SA (acres)	9774.24	12750.24	3562.42

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 15.0857*

INPUT
Description: Interpolated Cross Section at River Mile 15.09

Station Elevation Data		num= 188									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.43	27.94	70.86	27.13	127.29	23.71	195.95	20.48	263.16	19.78		
429.3	17.4	590.54	15.86	641.94	15.59	767.18	15.1	770.02	14.8		
776.98	14.81	777.97	15.11	778.11	15.15	801.26	15.38	913.57	13.15		
944.94	12.67	1097.17	12.69	1213.03	15.33	1227.31	14.02	1229.22	13.71		
1283.78	11.17	1387.73	11.8	1604.62	11.74	1841.16	9.74	1977.02	9.86		
2136.62	9.74	2285.59	9.69	2455.83	9.97	2643.25	9.74	2644.07	9.86		
3867.68	9.8	5090.47	9.69	5364.65	10.54	5635.57	11.11	5723.96	9.69		
6345.99	9.91	6375.46	10.43	6397.56	9.91	6494.25	9.97	6500.68	9.98		
6624.27	10.22	6643.1	12.02	6669.29	10.68	6816.71	10.75	6837.07	10.81		
6984.4	10.92	7125.17	11.63	7162.75	11.83	7333.06	11.75	7498.7	11.48		
7542.43	10.83	7749.88	10.76	8144.9	10.62	8555.4	10.6	8662.17	10.8		
8705.05	13.07	8884.96	15.79	8956.1	16.89	8998.83	16.5	9089.85	14.26		
9291.19	13.24	9473.94	13.99	9501.91	14.59	9572.62	14.45	9587.53	13.72		
9867.25	13.64	9990.22	13.83	10024.15	12.76	10210.87	12.77	10374.59	13.27		
10425.85	14.81	10501.53	14.88	10529.36	13.89	10603.9	15.08	10644.58	15.14		
10680.58	15.29	10696.05	17.72	10711.25	17.63	10744.33	15.61	10782.53	16.26		
10814.62	18.13	10837.73	16.83	10853.95	15.89	10883.77	16.97	10905.78	14.94		
10964.28	14.47	11033.99	16.67	11034.98	16.63	11074.89	15.68	11151.7	18.06		
11178.82	21.63	11189.67	21.94	11227.32	20.28	11236.47	20.42	11260.88	17.99		
11278.64	16.29	11338.64	16.53	11341.97	16.82	11359.92	19.63	11365.65	19.26		
11371.37	18.09	11382.01	19.07	11395.71	14.81	11402.15	12.76	11409.41	11.72		
11416.78	10.83	11425.28	10.47	11441.2	9.47	11467.79	8.07	11508.06	7.36		
11559.19	6.84	11607.7	6.17	11656.4	5.37	11710.99	4.58	11760.72	3.72		
11782.63	3.32	11792	2.94	11801.36	2.38	11810.73	1.95	11820.09	1.57		
11829.46	1.27	11838.82	.97	11848.18	1.01	11857.55	.28	11860.36	.18		
11866.91	-.82	11876.28	-3.52	11885.64	-5.89	11906.07	-2.05	11914.57	-.99		
11921.8	2.62	11926.5	5.55	11929.75	7.66	11940.6	9.71	11950	13.69		
11965.41	12.34	12135.62	10.1	12190.4	10.04	12300.32	9.85	12344.5	13.49		
12406.14	11.53	12408.82	11.54	12568.46	11.71	12693.13	10.77	12700.98	10.72		
12870.49	15.34	12896.18	13.52	12954.17	13.46	13196.67	11.71	13327.66	11.3		
13641	11.06	13685.17	12.13	13746.81	15.19	13764.71	14.49	13771.47	14.26		
13799.21	14.34	14020.06	15.37	14034.25	16.69	14048.64	16.65	14062.36	15.74		
14067.34	15.72	14214.84	15.04	14242.56	15.56	14318.08	15.31	14350.82	12.66		
14369.85	12.36	14407.8	12.29	14411.5	12.29	14548.22	12.46	14601.56	12.43		
14710.75	13.23	14735.67	14.94	14755.66	15.21	14868.07	17.35	14935.44	18.31		
14964.16	18.24	15101.87	17.75	15126.53	16.53	15243.26	15.18	15247.75	15.09		
15317.61	13.17	15373.15	12.73	15679.33	12.86	16805.53	15.34	16867.92	15.9		
17027.84	16.24	17283.96	16.29	17561.31	16.03						

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .43 .05111382.01 .1111402.15 .031 11950 .073

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 11382.01 11950 3217.29 4349 2885.43 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .4311382.01 11.78 1195017561.31 11.78

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	15.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.051	0.033	0.073
W.S. Elev (ft)	14.99	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	26690.15	5517.80	9194.16
E.G. Slope (ft/ft)	0.000208	Area (sq ft)	26690.15	5517.80	9194.16
Q Total (cfs)	44800.00	Flow (cfs)	23143.18	16728.79	4928.03
Top Width (ft)	14090.83	Top Width (ft)	9614.56	554.86	3921.41
Vel Total (ft/s)	1.08	Avg. Vel. (ft/s)	0.87	3.03	0.54
Max Chl Dpth (ft)	20.88	Hydr. Depth (ft)	2.78	9.94	2.34
Conv. Total (cfs)	3102708.0	Conv. (cfs)	1602824.0	1158584.0	341299.6
Length Wtd. (ft)	3605.41	Wetted Per. (ft)	9614.94	560.02	3921.99
Min Ch El (ft)	-5.89	Shear (lb/sq ft)	0.04	0.13	0.03
Alpha	3.29	Stream Power (lb/ft s)	0.03	0.39	0.02
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	23595.10	56756.22	5539.82
C & E Loss (ft)	0.00	Cum SA (acres)	9099.30	12694.94	3300.42

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 14.2571*

INPUT
 Description: Interpolated Cross Section at River Mile 14.26
 Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.29	26.43	75.92	25.17	136.53	22.3	210.26	20	282.44	19.38
460.87	17.07	634.03	15.77	689.23	15.64	823.73	15.42	826.78	15.23
834.25	15.24	835.31	15.44	835.47	15.47	860.32	15.4	980.94	12.86
1014.63	12.25	1178.12	12.19	1302.54	15.44	1317.87	14.75	1319.93	14.49
1378.52	11.31	1490.15	12.1	1723.08	12.03	1977.11	9.53	2123.02	9.67
2294.42	9.53	2454.39	9.46	2637.22	9.81	2838.5	9.53	2839.38	9.67
4153.45	9.6	5466.65	9.46	5761.1	10.53	6052.04	11.24	6146.97	9.46
6815	9.74	6846.64	10.39	6870.37	9.74	6974.22	9.81	6981.12	9.82
7113.85	10.01	7134.06	12.25	7162.19	10.56	7320.52	10.51	7342.38	10.54
7500.6	10.31	7651.78	10.85	7692.13	11.01	7875.04	11.07	8052.92	10.87
8099.89	10.44	8322.68	10.37	8746.9	10.25	9187.75	10.2	9302.42	10.33
9348.47	11.83	9541.67	13.63	9618.07	14.36	9663.97	14.1	9761.71	12.6
9977.94	11.9	10174.2	12.39	10204.24	12.78	10280.18	12.68	10296.19	12.2
10596.59	12.12	10728.65	12.24	10765.09	11.52	10965.61	11.52	11141.43	11.83
11196.48	12.85	11277.76	12.91	11307.65	12.23	11387.7	13.02	11431.38	13.06
11470.05	13.21	11486.67	14.85	11502.98	14.81	11538.51	13.51	11579.53	13.99
11614	15.29	11638.82	14.45	11656.24	13.84	11688.26	14.58	11711.89	13.25
11774.72	12.99	11849.59	14.51	11850.66	14.49	11893.51	14.27	11976	16.67
12005.13	19.34	12016.78	19.66	12057.22	17.35	12067.04	17.47	12093.25	15.93
12112.33	14.88	12176.76	15.35	12180.34	15.72	12199.61	18.55	12205.76	17.87

12211.92	16.1912223.34	17.0112236.81	13.3812243.14	11.612250.27	10.45
12257.52	9.4812265.87	9.1912281.52	8.4412307.67	7.3712347.25	6.68
12397.52	6.06 12445.2	5.3612493.07	4.5712546.74	3.7512595.62	2.91
12617.17	2.5312626.37	2.2212635.58	1.812644.78	1.4712653.99	1.16
12663.19	.91 12672.4	.6612681.61	.6412690.81	.112693.57	.02
12700.02	-1.1212709.22	-3.612718.43	-5.8612741.47	-3.0712751.04	-2.26
12759.2	1.8112764.51	5.1912768.17	7.57 12780.4	9.31 12791	13.56
12806.27	11.9312974.97	9.713029.26	9.4213138.21	8.8 13182	13.19
13243.09	10.5213245.75	10.5313403.97	10.6413527.54	9.3813535.32	9.31
13703.33	14.8213728.79	12.5113786.27	12.3514026.61	10.6514156.44	10.1
14467	9.6714510.78	10.8414571.88	14.7914589.62	13.9214596.31	13.61
14623.8	13.6314842.69	14.2814856.76	15.1714871.03	15.1314884.62	14.53
14889.56	14.5115035.76	14.0715063.23	14.4215138.08	14.2715170.53	12.5
15189.38	12.31 15227	12.2615230.67	12.2615366.17	12.3915419.04	12.39
15527.26	13.4415551.96	14.715571.77	14.9615683.19	17.3415749.96	18.54
15778.42	18.4415914.91	17.915939.35	16.3916055.05	14.75 16059.5	14.66
16128.74	12.5816183.79	12.2917527.94	12.3717603.46	14.0317665.29	14.4
17823.8	14.6318077.64	14.6618352.54	14.49		

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 .29 .04912223.34 .1112243.14 .031 12791 .078

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 12223.34 12791 3217.29 4349 2885.43 .1 .3
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 .2912223.34 11.24 1279118352.54 11.24

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	14.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.049	0.033	0.078
W.S. Elev (ft)	14.23	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	28169.43	5521.36	8235.97
E.G. Slope (ft/ft)	0.000212	Area (sq ft)	28169.43	5521.36	8235.97
Q Total (cfs)	44800.00	Flow (cfs)	24269.98	16597.51	3932.51
Top Width (ft)	15277.46	Top Width (ft)	10696.29	557.35	4023.82
Vel Total (ft/s)	1.07	Avg. Vel. (ft/s)	0.86	3.01	0.48
Max Chl Dpth (ft)	20.09	Hydr. Depth (ft)	2.63	9.91	2.05
Conv. Total (cfs)	3074254.0	Conv. (cfs)	1665448.0	1138950.0	269855.5
Length Wtd. (ft)	3605.05	Wetted Per. (ft)	10696.71	562.49	4024.41
Min Ch El (ft)	-5.86	Shear (lb/sq ft)	0.03	0.13	0.03
Alpha	3.30	Stream Power (lb/ft s)	0.03	0.39	0.01
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	21569.17	56205.15	4962.53
C & E Loss (ft)	0.00	Cum SA (acres)	8349.23	12639.42	3037.28

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 13.4285*

INPUT
 Description: Interpolated Cross Section at River Mile 13.43
 Station Elevation Data num= 188

Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
.14 24.91 80.98 23.2 145.76 20.9 224.58 19.52 301.72 18.99
492.43 16.73 677.51 15.69 736.52 15.69 880.27 15.75 883.53 15.65

891.52	15.67	892.66	15.77	892.82	15.78	919.39	15.42	1048.31	12.57
1084.31	11.82	1259.06	11.7	1392.05	15.54	1408.44	15.47	1410.63	15.27
1473.26	11.46	1592.58	12.4	1841.54	12.31	2113.05	9.31	2269.01	9.49
2452.21	9.31	2623.2	9.23	2818.61	9.66	3033.75	9.31	3034.69	9.49
4439.23	9.4	5842.82	9.23	6157.55	10.51	6468.52	11.37	6569.99	9.23
7284	9.57	7317.82	10.34	7343.19	9.57	7454.18	9.65	7461.56	9.66
7603.42	9.81	7625.03	12.47	7655.1	10.43	7824.32	10.27	7847.69	10.27
8016.8	9.71	8178.39	10.08	8221.52	10.19	8417.02	10.38	8607.15	10.27
8657.35	10.04	8895.47	9.99	9348.9	9.87	9820.09	9.8	9942.66	9.85
9991.88	10.610198.39		11.4810280.04		11.84	10329.1	11.710433.58		10.94
10664.69	10.5710874.46		10.7910906.56		10.9810987.73		10.9211004.84		10.68
11325.93	10.611467.08		10.6511506.03		10.2911720.36		10.2611908.28		10.4
11967.12	10.912053.99		10.9212085.94		10.58	12171.5	10.9712218.19		10.98
12259.52	11.1312277.28		11.9812294.72		11.99	12332.7	11.4112376.54		11.73
12413.38	12.4512439.91		12.0812458.52		11.7912492.75		12.212518.01		11.56
12585.16	11.512665.19		12.3512666.33		12.3412712.13		12.8712800.31		15.28
12831.44	17.0512843.89		17.3812887.11		14.4312897.61		14.5312925.63		13.86
12946.02	13.4813014.88		14.1813018.71		14.6313039.31		17.4813045.88		16.49
13052.46	14.313064.67		14.96	13077.9	11.9413084.12		10.4413091.14		9.17
13098.26	8.1313106.47		7.9213121.85		7.4213147.54		6.6713186.44		6
13235.84	5.28	13282.7	4.5513329.75		3.7613382.49		2.9113430.53		2.1
13451.7	1.7313460.75		1.5113469.79		1.2213478.84		.9813487.89		.75
13496.93	.5513505.98		.3513515.03		.2713524.07		-.0813526.79		-.14
13533.12	-1.4213542.17		-3.6813551.21		-5.8313576.86		-4.0813587.52		-3.53
13596.6	1.0113602.51		4.8213606.58		7.49	13620.2	8.9	13632	13.43
13647.14	11.5113814.32		9.3113868.13		8.8113976.11		7.75	14019.5	12.9
14080.05	9.5114082.68		9.5114239.49		9.5714361.95		814369.66		7.91
14536.17	14.3114561.39		11.5114618.36		11.2314856.55		9.614985.22		8.9
15293	8.2915336.39		9.6715396.94		14.415414.52		13.3415421.16		12.95
15448.4	12.9115665.33		13.215679.28		13.6415693.41		13.6215706.88		13.32
15711.78	13.3115856.67		13.1115883.89		13.2915958.07		13.2215990.23		12.34
16008.92	12.25	16046.2	12.2316049.83		12.2316184.13		12.3316236.52		12.34
16343.78	13.6516368.25		14.4616387.88		14.73	16498.3	17.3316564.48		18.77
16592.69	18.6516727.96		18.0516752.18		16.2416866.84		14.3216871.25		14.23
16939.87	11.9916994.42		11.8418326.55		11.8918401.39		12.7118462.67		12.9
18619.76	13.0118871.33		13.0319143.77		12.94				

Manning's n Values		num=	4	
Sta	n Val	Sta	n Val	Sta
.14	.04813064.67	.1113084.12	.031	13632
				.082

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	13064.67	13632	3217.29	4349	2885.43	.1	.3

Blocked Obstructions		num=	2	
Sta L	Sta R	Elev	Sta L	Sta R
.1413064.67	10.69	1363219143.77	10.69	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	13.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.048	0.034	0.082
W.S. Elev (ft)	13.47	Reach Len. (ft)	3217.29	4349.00	2885.43
Crit W.S. (ft)		Flow Area (sq ft)	30001.81	5525.13	7701.42
E.G. Slope (ft/ft)	0.000211	Area (sq ft)	30001.81	5525.13	7701.42
Q Total (cfs)	44800.00	Flow (cfs)	25516.76	16168.65	3114.58
Top Width (ft)	17032.38	Top Width (ft)	11607.19	560.82	4864.36
Vel Total (ft/s)	1.04	Avg. Vel. (ft/s)	0.85	2.93	0.40
Max Chl Dpth (ft)	19.30	Hydr. Depth (ft)	2.58	9.85	1.58
Conv. Total (cfs)	3082804.0	Conv. (cfs)	1755875.0	1112607.0	214322.4
Length Wtd. (ft)	3604.47	Wetted Per. (ft)	11607.57	566.09	4865.56

Min Ch El (ft)	-5.83	Shear (lb/sq ft)	0.03	0.13	0.02
Alpha	3.27	Stream Power (lb/ft s)	0.03	0.38	0.01
Frctn Loss (ft)	0.72	Cum Volume (acre-ft)	19420.94	55653.71	4434.68
C & E Loss (ft)	0.00	Cum SA (acres)	7525.57	12583.60	2742.90

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 12.6

INPUT
Description: Interpolated Cross Section at River Mile 12.6

Station Elevation Data num= 81									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	23.4	155	19.5	321	18.6	524	16.4	721	15.6
950	16.1	1154	11.4	1340	11.2	1499	16.2	1568	11.6
1695	12.7	1960	12.6	2249	9.1	2415	9.3	2610	9.1
2792	9	3000	9.5	3229	9.1	3230	9.3	4725	9.2
6219	9	6554	10.5	6885	11.5	6993	9	7753	9.4
7789	10.3	7816	9.4	7942	9.5	8093	9.6	8116	12.7
8148	10.3	8353	10	8533	9.1	8705	9.3	8959	9.7
13005	8.9	13241	9.7	13482	10.2	13671	15.1	13717	11.5
13758	11.8	13853	13	13879	16.4	13886	15.1	13893	12.4
13906	12.9	13919	10.5	13932	7.9	13939	6.78	14360	-.3
14384	-5.8	14424	-4.8	14434	.2	14445	7.4	14460	8.5
14473	13.3	14488	11.1	14707	8.2	14814	6.7	14857	12.6
14917	8.5	15075	8.5	15204	6.5	15369	13.8	15394	10.5
15814	7.7	16119	6.9	16162	8.5	16222	14	16246	12.3
16273	12.2	16534	12.1	16869	12.2	17054	12.3	17204	14.5
17379	19	17541	18.2	17565	16.1	17683	13.8	17751	11.4
19935	11.4								

Manning's n Values num= 12									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1154	.04	4725	.06	6885	.04	13482	.05
13758	.11	13932	.031	14473	.11	14707	.07	16222	.06
16869	.04	17751	.11						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	13906	14473		1090	5078	2467	.1	.3

Blocked Obstructions num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	13932	10.14	14445	19935	10.14

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	12.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.043	0.031	0.081
W.S. Elev (ft)	12.75	Reach Len. (ft)	1090.00	5078.00	2467.00
Crit W.S. (ft)		Flow Area (sq ft)	30135.07	5499.35	7632.42
E.G. Slope (ft/ft)	0.000187	Area (sq ft)	30135.07	5499.35	7632.42
Q Total (cfs)	45600.00	Flow (cfs)	26177.65	16522.51	2899.84
Top Width (ft)	17799.32	Top Width (ft)	12466.72	564.73	4767.87
Vel Total (ft/s)	1.05	Avg. Vel. (ft/s)	0.87	3.00	0.38
Max Chl Dpth (ft)	18.55	Hydr. Depth (ft)	2.42	9.74	1.60
Conv. Total (cfs)	3336372.0	Conv. (cfs)	1915315.0	1208887.0	212170.1
Length Wtd. (ft)	2786.91	Wetted Per. (ft)	12467.26	574.50	4769.97

Min Ch El (ft)	-5.80	Shear (lb/sq ft)	0.03	0.11	0.02
Alpha	3.34	Stream Power (lb/ft s)	0.02	0.34	0.01
Frctn Loss (ft)	0.48	Cum Volume (acre-ft)	17200.12	55103.38	3926.82
C & E Loss (ft)	0.00	Cum SA (acres)	6636.54	12527.41	2423.88

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: Fish Creek
REACH: Lower Fish Creek RS: 11.7

INPUT
Description: Cross Section at River Mile 11.7

Station Elevation Data		num= 109									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	23.1	154.5	19.2	321.4	18.3	523.9	16.1	721.3	15.3		
950.1	15.8	1153.5	11.1	1340.4	10.9	1499.4	15.9	1567.7	11.3		
1694.6	12.4	1960.3	12.3	2248.9	8.8	2415.4	9	2610.4	8.8		
2792.3	8.7	2999.5	9.2	3228.5	8.8	3230	9	4725	8.9		
6219.3	8.7	6554	10.2	6884.5	11.2	6993.1	8.7	7752.9	9.1		
7789	10	7816.4	9.1	7941.7	9.2	8092.5	9.3	8116.1	12.4		
8147.5	10	8353.4	9.7	8533	8.8	8705	9	8958.5	9.4		
13005.1	8.6	13240.6	9.4	13481.8	9.9	13670.5	14.8	13716.7	11.2		
13758.2	11.5	13853.4	12.7	13878.5	16.1	13885.5	14.8	13892.6	12.1		
13905.9	12.6	13919.1	10.2	13932.2	7.6	13951.4	5.8	14045.3	7.2		
14136.4	2.8	14142.7	2.7	14152.6	2.4	14162.7	1.4	14172.6	-1		
14182.7	-6	14192.6	-1.3	14202.7	-1.9	14207.6	-3.1	14212.7	3		
14220	10	14345.6	8.9	14384.6	16.7	14490.7	23.9	14771.9	20.9		
15535.7	8.4	15555.8	7.7	15564.2	7.9	15576.9	4.9	15631.2	6.5		
15691.2	6.1	15728.1	2.7	15759	1.3	15783.9	-3.9	15809	-5		
15833.9	-5	15859	-4.3	15883.9	-4.7	15909	-4.1	15933.9	-3.5		
15959	2.9	15978.2	7.7	15992.5	8.2	16005.8	13	16020.8	10.8		
16240.1	7.9	16347.2	6.4	16390.3	12.3	16449.7	8.2	16608.1	8.2		
16736.9	6.2	16902	13.5	16927.3	10.2	17347.2	7.4	17652.3	6.6		
17695.4	8.2	17755.3	13.7	17779.3	12	17805.9	11.9	18066.6	11.8		
18401.6	11.9	18587.3	12	18736.5	14.2	18912.2	18.7	19073.5	17.9		
19097.8	15.8	19216	13.5	19284.3	11.1	21468.3	11.1				

Manning's n Values		num= 15									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.11	1153.5	.045	4725	.05	6884.5	.045	13481.8	.09		
13758.2	.11	13932.2	.03	14220	.09	14490.7	.05	15535.7	.03		
16005.8	.11	16240.1	.09	17755.3	.06	18401.6	.04	19284.3	.11		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
13905.9 16005.8 2559 4481.46 2515.69 .1 .3

Blocked Obstructions		num= 2					
Sta L	Sta R	Elev	Sta L	Sta R	Elev		
0	13905.9	9.62	16005.8	21468.3	9.62		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	12.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.046	0.031	0.095
W.S. Elev (ft)	12.27	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	30132.39	8057.16	7044.80
E.G. Slope (ft/ft)	0.000160	Area (sq ft)	30132.39	8057.16	7044.80
Q Total (cfs)	45600.00	Flow (cfs)	22948.67	20560.16	2091.17
Top Width (ft)	18031.69	Top Width (ft)	12134.77	1159.04	4737.88

Vel Total (ft/s)	1.01	Avg. Vel. (ft/s)	0.76	2.55	0.30
Max Chl Dpth (ft)	17.27	Hydr. Depth (ft)	2.48	6.95	1.49
Conv. Total (cfs)	3609247.0	Conv. (cfs)	1816391.0	1627340.0	165516.3
Length Wtd. (ft)	3614.16	Wetted Per. (ft)	12135.26	1169.37	4739.78
Min Ch El (ft)	-5.00	Shear (lb/sq ft)	0.02	0.07	0.01
Alpha	3.18	Stream Power (lb/ft s)	0.02	0.18	0.00
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	16446.08	54313.20	3511.20
C & E Loss (ft)	0.00	Cum SA (acres)	6328.74	12426.94	2154.70

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: Fish Creek
REACH: Lower Fish Creek RS: 10.8538*

INPUT
Description: Interpolated Cross Section at River Mile 10.85
Station Elevation Data num= 271

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	21.53	145.83	17.92	303.37	17.09	494.51	15.05	680.84	14.3
789.5	14.52	896.81	14.76	1088.8	10.43	1265.21	10.25	1415.3	14.87
1479.76	10.63	1599.55	11.65	1839.03	11.57	1850.34	11.56	2122.75	8.33
2279.91	8.51	2463.98	8.33	2635.67	8.23	2817.1	8.66	2831.25	8.69
3047.41	8.31	3048.82	8.49	3871.16	8.38	4459.96	8.36	4850.97	8.32
5851.35	8.13	5870.44	8.13	6186.37	9.54	6498.33	10.49	6600.84	8.19
6840.92	8.33	7318.02	8.54	7352.1	9.37	7377.96	8.54	7496.23	8.62
7638.57	8.7	7660.85	11.56	7690.49	9.34	7773.33	9.22	7884.84	9.07
8054.36	8.24	8216.72	8.43	8456	8.81	8632.19	8.78	9555.54	8.54
10472.96	8.39	11325.9	8.25	12275.61	8.14	12323.49	8.3	12497.9	8.88
12725.57	9.33	12903.69	13.86	12947.3	10.53	12986.47	10.81	13076.33	11.92
13100.02	15.05	13106.63	13.85	13113.33	11.36	13125.88	11.82	13147.48	9.58
13160.7	8.08	13168.91	7.16	13180.17	6.55	13197.96	5.61	13200.32	5.46
13217.04	5.49	13230.29	5.69	13236.11	5.64	13240.68	5.41	13244.97	5.56
13249.99	5.78	13255.14	5.82	13272.97	6.11	13289.67	6.24	13308.47	6.41
13326.23	6.56	13339.82	6.68	13353.93	6.79	13355.07	6.75	13380.51	6.07
13416.17	5.09	13431.07	4.67	13441.06	4.39	13452.66	4.02	13465.87	3.64
13485.18	3.15	13499.33	2.81	13502.97	2.71	13513.27	2.63	13526.93	2.4
13529.47	2.35	13545.02	1.49	13545.99	1.43	13562.11	.07	13562.19	.06
13578.71	-.39	13582.71	-.55	13594.91	-1.04	13607.88	-1.48	13611.43	-1.6
13619.45	-2.72	13627.79	-2.91	13639.73	-2.91	13641.55	-2.91	13677.07	9.18
13718.64	8.99	13756.01	8.79	13789.27	8.64	13816.3	8.5	13845.2	8.35
13860.8	10.11	13893.53	13.81	13909.01	15.56	13926.77	16.24	13950.71	17.16
13982.96	18.39	14014.06	19.57	14048.86	20.94	14074.19	21.86	14082.58	22.19
14104.36	22.08	14137.55	21.81	14166.11	21.71	14192.55	21.51	14227.7	21.3
14272.64	21.07	14307.63	20.85	14334.41	20.62	14387.41	20.3	14456.7	19.94
14498.07	19.68	14541.8	19.47	14542.6	19.46	14575.18	19.12	14605.09	18.83
14626.06	18.69	14673.26	18.28	14706.26	17.94	14741.79	17.61	14779.06	17.27
14788.47	17.18	14793.15	17.06	14799.38	16.81	14804.69	16.95	14809.03	16.97
14813.76	16.93	14826.56	16.81	14848.68	16.61	14865.26	16.47	14888.75	16.26
14930.29	15.87	14958.5	15.61	14982.83	15.38	15020.04	15.03	15051.27	14.74
15086.1	14.42	15111.11	14.21	15138.02	13.96	15157.2	13.78	15180.79	13.55
15211.19	13.31	15231.05	13.11	15251.75	12.91	15271.23	12.73	15286.72	12.59
15295.3	12.51	15305.65	12.42	15331.09	12.21	15365.69	11.86	15407.24	11.52
15449.29	11.13	15489.98	10.74	15514.34	10.51	15532.95	10.32	15541.3	10.21
15548.25	10.15	15558.28	9.84	15561.39	10.04	15562.11	10.09	15564.99	10.04
15594.74	9.77	15623.76	9.54	15660.16	9.11	15694.76	8.88	15792.13	7.97
15825.01	7.32	15838.75	7.51	15859.53	4.74	15948.36	6.21	16046.52	5.83
16106.88	2.69	16157.43	1.39	16169.64	-.05	16178.24	-1.04	16198.17	-3.43
16204.4	-3.59	16213.93	-3.93	16239.23	-5.85	16262.22	-5.85	16284.98	-4.45

16308.15	-4.0716312.09	-3.9916326.46	-3.9616343.87	-4.0516344.68	-4.04
16350.43	-4.0816360.86	-4.1316361.58	-4.1416381.43	-3.9316409.43	-3.61
16411.45	-3.5816438.19	-3.2416458.21	-316460.94	-2.9816466.18	-2.38
16485.16	-.1716506.31	2.3316510.81	2.8516519.55	3.8416529.53	4.91
16548.97	7.1 16549	7.116569.05	7.416576.94	7.5316577.39	7.51
16584.82	8.3416591.59	9.2916594.97	10.0916598.36	11.0516603.81	12.2
16618.34	10.1716830.66	7.5516834.73	7.516934.35	6.1716976.08	11.62
17033.58	7.8417155.16	7.8517186.94	7.917311.64	6.2617329.58	7.04
17471.49	13.117495.98	10.0617670.98	9.0417902.51	7.618008.26	7.35
18197.9	6.5918239.63	8.0118261.47	9.8918297.62	13.0318320.86	11.44
18346.61	11.3318598.58	11.0618599.01	11.0618914.56	11.118923.35	11.11
19103.14	11.3519189.73	12.6419247.59	13.4519417.69	17.5819573.86	16.82
19589.12	15.5719597.39	14.8819711.82	12.7619777.95	10.5419850.25	10.54
20242.03	10.6720567.26	10.8420890.33	10.9521233.23	11.0921553.49	11.21
21892.42	11.24				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06213125.88	.10713168.91	.03113639.73	.06115948.36	.031				
16603.81	.079								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
13125.8816603.81 2559 4481.46 2515.69 .1 .3

Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
013125.88	9.19		016603.81	-4.6116618.3421892.42	9.19			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	11.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.062	0.032	0.079
W.S. Elev (ft)	11.72	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	27566.82	13102.97	5978.56
E.G. Slope (ft/ft)	0.000144	Area (sq ft)	27566.82	13102.97	5978.56
Q Total (cfs)	45600.00	Flow (cfs)	14096.75	29585.92	1917.33
Top Width (ft)	18339.00	Top Width (ft)	11778.04	1967.56	4593.39
Vel Total (ft/s)	0.98	Avg. Vel. (ft/s)	0.51	2.26	0.32
Max Chl Dpth (ft)	16.33	Hydr. Depth (ft)	2.34	6.66	1.30
Conv. Total (cfs)	3797903.0	Conv. (cfs)	1174081.0	2464133.0	159689.0
Length Wtd. (ft)	3864.80	Wetted Per. (ft)	11778.54	1973.33	4594.53
Min Ch El (ft)	-4.61	Shear (lb/sq ft)	0.02	0.06	0.01
Alpha	3.55	Stream Power (lb/ft s)	0.01	0.13	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	14751.27	53224.72	3135.14
C & E Loss (ft)	0.00	Cum SA (acres)	5626.34	12266.11	1885.25

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: Fish Creek
REACH: Lower Fish Creek RS: 10.0076*

INPUT

Description: Interpolated Cross Section at River Mile 10.01

Station Elevation Data	num=	272							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	19.96	137.17	16.65	285.34	15.87	465.13	13.99	640.38	13.3
742.58	13.5	843.51	13.72	1024.09	9.75	1190.03	9.6	1331.19	13.84
1391.83	9.95	1504.49	10.89	1729.74	10.83	1740.38	10.82	1996.61	7.86
2144.43	8.02	2317.55	7.85	2479.05	7.76	2649.69	8.15	2663	8.18

2866.31	7.81	2867.64	7.98	3641.11	7.81	4194.93	7.81	4562.7	7.79
5503.63	7.56	5521.59	7.56	5818.74	8.88	6112.16	9.78	6208.58	7.68
6434.4	7.83	6883.14	7.98	6915.19	8.74	6939.52	7.97	7050.76	8.04
7184.64	8.1	7205.6	10.72	7233.47	8.69	7311.4	8.57	7416.28	8.43
7575.73	7.68	7728.43	7.86	7953.49	8.22	8119.22	8.2	8987.7	7.91
9850.6	7.8110652.85	7.7111546.12	7.6711591.16	7.8211755.21	8.35				
11969.35	8.7712136.88	12.9112177.89	9.8612214.74	10.1212299.26	11.13				
12321.54	14.0112327.76	12.9112334.06	10.6212345.87	11.0512375.86	8.96				
12394.21	7.5712405.62	6.7112421.25	6.1512445.97	5.2712449.24	5.12				
12472.47	5.0412490.85	5.3112498.94	5.1512505.29	4.6512511.25	4.91				
12518.21	5.3112525.37	5.3312550.13	5.7312573.32	5.8712599.43	6.03				
12624.09	6.1712642.97	6.2912662.57	6.3712664.15	6.3412699.48	5.72				
12749	4.8112769.69	4.4312783.57	4.1612799.67	3.7512818.01	3.39				
12844.83	2.9712864.49	2.7112869.54	2.6212883.85	2.5612883.86	2.56				
12902.81	2.3512906.34	2.3112927.94	1.5112929.29	1.4612951.67	.23				
12951.78	.2212974.72	-.1912980.28	-.3312997.21	-.7813015.24	-1.19				
13020.16	-1.313031.29	-2.3313042.88	2.8213059.46	8.7313061.99	8.71				
13111.31	8.5713169.04	8.413220.94	8.2113267.13	8.0813304.66	7.94				
13344.81	7.813366.47	9.4113411.92	12.8113433.41	14.4113458.08	15.05				
13491.32	15.8913536.11	1713579.31	18.0813627.63	19.3813662.81	20.17				
13674.46	20.48	13704.7	20.413750.79	20.0713790.46	20.0413827.18	19.85			
13875.99	19.6513938.41	19.48	13987	19.2614024.19	18.9914097.78	18.69			
14194	18.4214251.47	18.1614312.19	18.0314313.31	18.0214358.55	17.67				
14400.08	17.39	14429.2	17.3214494.76	16.9614540.58	16.6214589.93	16.31			
14641.68	16.0114654.75	15.9314661.24	15.73	14669.9	15.314677.27	15.62			
14683.31	15.7114689.88	15.6814707.65	15.5614738.37	15.3914761.39	15.26				
14794.02	15.08	14851.7	14.7114890.88	14.4714924.66	14.2714976.34	13.94			
15019.7	13.6715068.07	13.3815102.81	13.215140.17	12.9715166.82	12.81				
15199.57	12.5915241.79	12.3815269.37	12.215298.12	12.0215325.17	11.86				
15346.69	11.72	15358.6	11.6515372.97	11.58	15408.3	11.3815456.35	11.06		
15514.05	10.7815572.45	10.4315628.96	10.0515662.79	9.8415688.63	9.66				
15700.22	9.5115709.88	9.1615723.81	8.9515728.12	9.3715729.13	9.47				
15733.12	9.4115774.43	9.1615814.74	8.9915865.29	8.4915913.34	8.38				
16048.56	7.5416094.22	6.9416113.31	7.1116142.16	4.5716265.52	5.91				
16401.84	5.5616485.67	2.6816555.87	1.4916572.82	.1716584.76	-.73				
16612.44	-2.9516621.09	-3.1216634.33	-3.5316669.46	-6.6916690.53	-6.69				
16724.61	-4.2216759.29	-3.7916765.19	-3.6716786.69	-3.5116812.74	-3.55				
16813.97	-3.5116822.57	-3.5516838.18	-3.5716839.25	-3.5816868.97	-3.41				
16910.88	-3.0916913.91	-3.0616953.92	-2.716983.89	-2.4716987.97	-2.46				
16995.83	-1.9317024.23	.0517055.88	2.3317062.63	2.817075.71	3.68				
17090.65	4.5717119.74	6.517119.78	6.5	17149.8	6.75	17161.6	6.87		
17162.27	6.8317173.41	7.1317183.53	7.817188.59	8.7817193.66	10.08				
17201.83	11.417215.88	9.5517421.21	7.2117425.15	7.1617521.49	5.95				
17561.85	10.9417617.47	7.4817735.04	7.4917765.78	7.617886.38	6.31				
17903.73	7.0618040.97	12.6918064.66	9.9318233.91	9.0918457.83	7.8				
18560.1	7.59	18743.5	6.5918783.86	7.8218804.98	9.5118839.95	12.36			
18862.42	10.8918887.32	10.7619131.01	10.3219131.42	10.3219436.59	10.3				
19445.1	10.3119618.97	10.719702.72	11.9619758.67	12.6919923.19	16.46				
20074.22	15.7520088.97	14.5920096.97	13.9720207.64	12.02	20271.6	9.98			
20341.52	9.9820720.42	10.2421034.95	10.58	21347.4	10.7921679.03	11.08			
21988.76	11.3222316.55	11.38							

Manning's n	Values	num=	6
Sta	n Val	Sta	n Val
0	.06312345.87	.10512405.62	.03413111.31
17201.83	.079		.06216113.31
			.034

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	12345.87	17201.83		2559	4481.46	2515.69	.1
Blocked Obstructions			num=	3			.3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
012345.87	8.77		017201.83	-4.2317561.8522316.55				8.77

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	11.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.063	0.035	0.079
W.S. Elev (ft)	11.23	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	25511.96	17832.54	5536.32
E.G. Slope (ft/ft)	0.000118	Area (sq ft)	25511.96	17832.54	5536.32
Q Total (cfs)	45600.00	Flow (cfs)	11448.65	32441.81	1709.54
Top Width (ft)	17962.32	Top Width (ft)	11138.32	2814.58	4009.42
Vel Total (ft/s)	0.93	Avg. Vel. (ft/s)	0.45	1.82	0.31
Max Chl Dpth (ft)	15.46	Hydr. Depth (ft)	2.29	6.34	1.38
Conv. Total (cfs)	4195433.0	Conv. (cfs)	1053335.0	2984812.0	157286.6
Length Wtd. (ft)	3953.71	Wetted Per. (ft)	11138.83	2818.35	4010.20
Min Ch El (ft)	-4.23	Shear (lb/sq ft)	0.02	0.05	0.01
Alpha	2.77	Stream Power (lb/ft s)	0.01	0.08	0.00
Frothn Loss (ft)	0.46	Cum Volume (acre-ft)	13192.17	51633.39	2802.63
C & E Loss (ft)	0.00	Cum SA (acres)	4953.21	12020.11	1636.83

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 9.16153*

INPUT
 Description: Interpolated Cross Section at River Mile 9.16
 Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	18.39	128.5	15.37	267.32	14.66	435.74	12.94	599.92	12.29
695.67	12.47	790.22	12.67	959.39	9.08	1114.84	8.94	1247.09	12.81
1303.89	9.28	1409.44	10.14	1620.45	10.09	1630.43	10.08	1870.46	7.39
2008.94	7.54	2171.13	7.38	2322.42	7.3	2482.28	7.65	2494.75	7.67
2685.22	7.32	2686.46	7.47	3411.06	7.25	3929.89	7.27	4274.42	7.27
5155.91	6.99	5172.73	7	5451.11	8.22	5726	9.07	5816.32	7.17
6027.87	7.33	6448.26	7.42	6478.29	8.11	6501.08	7.41	6605.29	7.46
6730.72	7.51	6750.35	9.89	6776.46	8.03	6849.46	7.92	6947.71	7.8
7097.09	7.12	7240.15	7.29	7450.99	7.63	7606.25	7.62	8419.85	7.28
9228.24	7.23	9979.8	7.16	10816.64	7.21	10858.83	7.35	11012.51	7.83
11213.12	8.21	11370.07	11.97	11408.49	9.21	11443.01	9.43	11522.19	10.35
11543.06	12.96	11548.89	11.96	11554.79	9.88	11565.85	10.27	11604.23	8.34
11627.73	7.05	11642.33	6.27	11662.34	5.74	11693.97	4.93	11698.16	4.79
11727.89	4.58	11751.42	4.93	11761.78	4.67	11769.9	3.89	11777.53	4.27
11786.44	4.83	11795.6	4.85	11827.29	5.36	11856.97	5.51	11890.39	5.66
11921.96	5.78	11946.12	5.9	11971.2	5.96	11973.23	5.93	12018.44	5.37
12081.83	4.54	12108.31	4.18	12126.07	3.93	12146.68	3.48	12170.15	3.13
12204.48	2.79	12229.65	2.61	12236.1	2.54	12254.42	2.49	12254.43	2.49
12278.69	2.31	12283.21	2.26	12310.85	1.54	12312.58	1.49	12341.22	.39
12341.36	.38	12370.73	.02	12377.84	-.11	12399.52	-.53	12422.59	-.9
12428.89	-1.01	12443.14	-1.95	12457.97	2.73	12479.19	8.09	12482.42	8.08
12545.56	7.95	12619.45	7.81	12685.88	7.63	12744.99	7.51	12793.03	7.38
12844.41	7.25	12872.13	8.71	12930.31	11.81	12957.82	13.27	12989.39	13.85
13031.94	14.62	13089.26	15.62	13144.55	16.59	13206.4	17.82	13251.42	18.49
13266.34	18.77	13305.05	18.71	13364.04	18.34	13414.81	18.38	13461.81	18.18
13524.28	1813	13604.17	17.89	13666.36	17.67	13713.96	17.35	13808.16	17.09
13931.31	16.91	14004.86	16.65	14082.58	16.59	14084.01	16.58	14141.92	16.22
14195.07	15.94	14232.35	15.94	14316.25	15.65	14374.9	15.31	14438.06	15.01
14504.3	14.74	14521.02	14.67	14529.34	14.41	14540.41	13.78	14549.86	14.29

14557.58	14.4414565.99	14.4314588.74	14.3114628.05	14.1614657.52	14.06
14699.28	13.914773.11	13.5614823.25	13.3414866.49	13.1514932.63	12.84
14988.14	12.615050.05	12.3315094.51	12.1915142.33	11.9815176.44	11.83
15218.36	11.6315272.39	11.4615307.69	11.29 15344.5	11.13 15379.1	10.98
15406.65	10.86 15421.9	10.7915440.29	10.7415485.51	10.5615547.01	10.25
15620.87	10.0515695.61	9.7215767.94	9.3615811.24	9.1815844.31	8.99
15859.15	8.8115871.51	8.3215889.33	8.0515894.86	8.715896.14	8.85
15901.26	8.7915954.13	8.5616005.71	8.4516070.42	7.8716131.91	7.88
16304.99	7.1116363.44	6.5716387.86	6.7216424.79	4.4116582.69	5.62
16757.15	5.2916864.45	2.67 16954.3	1.58 16976	.3816991.28	-.42
17026.71	-2.4817037.79	-2.6417054.73	-3.1417099.69	-7.5417118.85	-7.54
17164.24	-3.9917210.43	-3.5117218.28	-3.3617246.91	-3.0517281.62	-3.04
17283.25	-2.9817294.71	-3.02 17315.5	-3.0117316.93	-3.0217356.51	-2.88
17412.32	-2.5717416.36	-2.5417469.66	-2.1717509.58	-1.9317515.01	-1.94
17525.47	-1.48 17563.3	.2817605.46	2.3417614.44	2.7517631.86	3.51
17651.76	4.2317690.51	5.917690.56	5.917730.54	6.117746.27	6.21
17747.16	6.1417761.99	5.9217775.48	6.3117782.21	7.4717788.96	9.12
17799.85	10.617813.41	8.9218011.77	6.8618015.57	6.8218108.64	5.72
18147.63	10.2718201.35	7.1218314.93	7.1418344.62	7.2918461.12	6.37
18477.88	7.0818610.46	12.2918633.34	9.7918796.84	9.1319013.14	8
19111.94	7.83 19289.1	6.5819328.09	7.6319348.49	9.1219382.27	11.68
19403.97	10.3319428.03	10.219663.44	9.5819663.84	9.5819958.63	9.5
19966.84	9.5220134.81	10.0520215.71	11.2820269.76	11.9420428.68	15.34
20574.58	14.6720588.83	13.6220596.56	13.0520703.47	11.2720765.25	9.42
20832.79	9.4221198.81	9.8121502.65	10.3221804.47	10.6422124.82	11.08
22424.03	11.4222740.67	11.52			

Manning's n Values	num=	6							
Sta n Val Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06511565.85	.10211642.33	.03812545.56	.06316131.91	.038				
17799.85	.08								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
11565.8517799.85		2559	4481.46	2515.69	.1		.3
Blocked Obstructions		num=	3				
Sta L Sta R Elev	Sta L Sta R Elev	Sta L Sta R Elev	Sta L Sta R Elev	Sta L Sta R Elev			
011565.85 8.34	017799.85	-3.8418147.6322740.67	8.34				

CROSS SECTION OUTPUT	Profile #Calibration				
E.G. Elev (ft)	10.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.065	0.039	0.080
W.S. Elev (ft)	10.79	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	24148.16	22405.14	5248.25
E.G. Slope (ft/ft)	0.000112	Area (sq ft)	24148.16	22405.14	5248.25
Q Total (cfs)	45600.00	Flow (cfs)	10246.57	33795.69	1557.74
Top Width (ft)	17710.68	Top Width (ft)	10492.84	3721.67	3496.18
Vel Total (ft/s)	0.88	Avg. Vel. (ft/s)	0.42	1.51	0.30
Max Chl Dpth (ft)	14.63	Hydr. Depth (ft)	2.30	6.02	1.50
Conv. Total (cfs)	4308057.0	Conv. (cfs)	968044.3	3192845.0	147167.3
Length Wtd. (ft)	4001.96	Wetted Per. (ft)	10493.38	3724.39	3496.86
Min Ch El (ft)	-3.84	Shear (lb/sq ft)	0.02	0.04	0.01
Alpha	2.23	Stream Power (lb/ft s)	0.01	0.06	0.00
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	11733.49	49563.57	2491.22
C & E Loss (ft)	0.00	Cum SA (acres)	4317.83	11683.89	1420.10

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek

REACH: Lower Fish Creek RS: 8.31538*

INPUT

Description: Interpolated Cross Section at River Mile 8.32

Station Elevation Data		num= 272									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	16.82	119.83	14.09	249.29	13.44	406.35	11.88	559.46	11.29		
648.75	11.44	736.93	11.63	894.69	8.41	1039.66	8.29	1162.98	11.78		
1215.96	8.6	1314.38	9.38	1511.17	9.35	1520.47	9.35	1744.32	6.91		
1873.46	7.05	2024.71	6.9	2165.79	6.83	2314.87	7.14	2326.5	7.17		
2504.12	6.83	2505.29	6.96	3181.02	6.68	3664.85	6.73	3986.15	6.74		
4808.19	6.42	4823.88	6.43	5083.48	7.57	5339.83	8.36	5424.06	6.66		
5621.34	6.82	6013.38	6.87	6041.39	7.48	6062.64	6.85	6159.82	6.88		
6276.79	6.91	6295.09	9.05	6319.45	7.38	6387.52	7.27	6479.15	7.16		
6618.45	6.56	6751.86	6.73	6948.48	7.04	7093.27	7.04	7852.01	6.66		
8605.87	6.65	9306.75	6.6110087.15		6.7410126.49		6.8710269.81		7.3		
10456.89	7.6410603.25		11.0210639.09		8.5310671.28		8.7410745.12		9.56		
10764.59	11.9210770.02		11.0210775.52		9.1510785.84		9.4910832.61		7.72		
10861.25	6.5410879.04		5.8210903.43		5.3410941.97		4.610947.08		4.45		
10983.31	4.1211011.99		4.5411024.61		4.1811034.51		3.13 11043.8		3.62		
11054.67	4.3611065.83		4.3611104.45		511140.63		5.1311181.35		5.28		
11219.82	5.3911249.27		5.5111279.83		5.5411282.31		5.5211337.41		5.03		
11414.65	4.2711446.93		3.9311468.57		3.7 11493.7		3.21 11522.3		2.88		
11564.13	2.61 11594.8		2.5111602.67		2.45 11625		2.4211625.01		2.42		
11654.57	2.2511660.08		2.2211693.77		1.5611695.87		1.5311730.78		.55		
11730.95	.5511766.74		.2211775.41		.1111801.83		-.2711829.94		-.61		
11837.62	-.7111854.98		-1.5611873.06		2.6411898.92		7.4511902.86		7.44		
11979.8	7.3412069.85		7.2212150.81		7.0512222.85		6.95 12281.4		6.82		
12344.02	6.7 12377.8		8 12448.7		10.8112482.22		12.13 12520.7		12.66		
12572.55	13.3412642.42		14.24 12709.8		15.112785.17		16.2512840.04		16.8		
12858.22	17.0612905.39		17.0312977.28		16.6113039.16		16.7213096.44		16.51		
13172.58	16.3513269.93		16.313345.72		16.0813403.74		15.7213518.53		15.48		
13668.62	15.3813758.26		15.1313852.98		15.1513854.71		15.1413925.29		14.77		
13990.07	14.514035.49		14.5714137.75		14.3314209.22		13.98 14286.2		13.71		
14366.92	13.48 14387.3		13.4114397.43		13.0714410.93		12.2614422.44		12.96		
14431.85	13.18 14442.1		13.1814469.82		13.0614517.74		12.9314553.64		12.85		
14604.54	12.7214694.52		12.414755.63		12.214808.32		12.0414888.93		11.75		
14956.58	11.5315032.02		11.2915086.21		11.1815144.49		10.9915186.05		10.86		
15237.14	10.6615302.99		10.5515346.01		10.3815390.87		10.2315433.04		10.1		
15466.62	9.99 15485.2		9.9315507.61		9.8915562.72		9.7515637.67		9.45		
15727.68	9.3115818.77		9.0215906.91		8.6815959.68		8.5115999.99		8.32		
16018.08	8.1116033.14		7.4716054.86		7.1616061.59		8.0316063.16		8.24		
16069.39	8.1616133.83		7.9516196.69		7.916275.54		7.2516350.49		7.38		
16561.42	6.6816632.65		6.1916662.42		6.3216707.42		4.2416899.85		5.33		
17112.47	5.0217243.23		2.6517352.74		1.6717379.18		.59 17397.8		-.11		
17440.98	-2.0117454.48		-2.1717475.12		-2.7517529.92		-8.3817547.16		-8.38		
17603.86	-3.7617661.57		-3.2317671.38		-3.0517707.14		-2.6 17750.5		-2.54		
17752.54	-2.4517766.85		-2.4817792.82		-2.45 17794.6		-2.4617844.05		-2.35		
17913.77	-2.0617918.82		-2.0317985.39		-1.6318035.26		-1.418042.04		-1.42		
18055.11	-1.0318102.37		.518155.03		2.3518166.26		2.6918188.01		3.35		
18212.88	3.8818261.28		5.318261.35		5.318311.29		5.4518330.93		5.55		
18332.04	5.4518350.57		4.718367.42		4.8218375.82		6.1618384.27		8.16		
18397.86	9.818410.95		8.2918602.33		6.5118605.99		6.4718695.79		5.5		
18733.4	9.5918785.24		6.7618894.82		6.7818923.47		6.9919035.87		6.42		
19052.03	7.1119179.94		11.8919202.02		9.6519359.76		9.1819568.45		8.2		
19663.77	8.0619834.71		6.5819872.32		7.44 19892		8.7419924.59		11.01		
19945.53	9.7719968.75		9.6320195.86		8.8520196.25		8.8520480.67		8.7		
20488.59	8.7320650.65		9.4 20728.7		10.6120780.85		11.1920934.17		14.23		
21074.94	13.621088.69		12.6521096.14		12.1421199.29		10.5321258.89		8.86		
21324.06	8.85 21677.2		9.3821970.34		10.0522261.55		10.4822570.62		11.07		

22859.29 11.5323164.79 11.65

Manning's n Values	num=	6
Sta n Val Sta n Val Sta n Val Sta n Val		
0 .06610785.84 .09910879.04 .041 11979.8 .06417112.47 .041		
18397.86 .08		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
10785.8418397.86	2559 4481.46 2515.69	.1	.3
Blocked Obstructions	num=	3	
Sta L Sta R Elev Sta L Sta R Elev Sta L Sta R Elev			
010785.84 7.92 018397.86 -3.4519179.9423164.79 7.92			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	10.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.066	0.043	0.080
W.S. Elev (ft)	10.36	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	22860.06	26849.96	5381.42
E.G. Slope (ft/ft)	0.000104	Area (sq ft)	22860.06	26849.96	5381.42
Q Total (cfs)	45600.00	Flow (cfs)	9228.85	34729.26	1641.89
Top Width (ft)	17769.42	Top Width (ft)	9855.07	4698.39	3215.96
Vel Total (ft/s)	0.83	Avg. Vel. (ft/s)	0.40	1.29	0.31
Max Chl Dpth (ft)	13.81	Hydr. Depth (ft)	2.32	5.71	1.67
Conv. Total (cfs)	4477507.0	Conv. (cfs)	906189.3	3410099.0	161219.1
Length Wtd. (ft)	4042.75	Wetted Per. (ft)	9855.64	4700.52	3216.61
Min Ch El (ft)	-3.45	Shear (lb/sq ft)	0.02	0.04	0.01
Alpha	1.91	Stream Power (lb/ft s)	0.01	0.05	0.00
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	10352.71	47029.88	2184.27
C & E Loss (ft)	0.00	Cum SA (acres)	3720.15	11250.76	1226.28

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 7.46923*

INPUT

Description: Interpolated Cross Section at River Mile 7.47

Station Elevation Data	num=	272
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 15.25 111.17 12.82 231.26 12.23 376.97 10.83 519 10.29		
601.83 10.42 683.63 10.59 829.99 7.73 964.47 7.64 1078.88 10.75		
1128.02 7.93 1219.33 8.63 1401.88 8.61 1410.51 8.61 1618.17 6.44		
1737.97 6.56 1878.28 6.43 2009.17 6.36 2147.46 6.64 2158.25 6.66		
2323.03 6.33 2324.11 6.45 2950.97 6.12 3399.82 6.18 3697.88 6.21		
4460.47 5.86 4475.02 5.86 4715.85 6.91 4953.66 7.64 5031.8 6.15		
5214.81 6.32 5578.51 6.31 5604.48 6.85 5624.2 6.29 5714.35 6.3		
5822.86 6.31 5839.84 8.21 5862.44 6.72 5925.59 6.61 6010.59 6.53		
6139.82 6 6263.58 6.16 6445.98 6.45 6580.3 6.45 7284.16 6.03		
7983.51 6.06 8633.7 6.07 9357.66 6.28 9394.16 6.4 9527.11 6.78		
9700.67 7.07 9836.44 10.08 9869.69 7.86 9899.55 8.05 9968.05 8.78		
9986.11 10.87 9991.14 10.07 9996.25 8.4110005.82 8.7210060.99 7.1		
10094.76 6.0210115.75 5.3810144.51 4.9310189.97 4.27 10196 4.11		
10238.73 3.6610272.56 4.1610287.44 3.6910299.12 2.3710310.08 2.97		
10322.89 3.8910336.06 3.8810381.61 4.6310424.28 4.7610472.31 4.91		
10517.69 5.0110552.42 5.1210588.47 5.1310591.38 5.110656.38 4.68		
10747.48 3.9910785.55 3.6810811.08 3.4610840.71 2.9410874.44 2.63		
10923.79 2.4310959.96 2.410969.24 2.3610995.57 2.3510995.59 2.35		
11030.45 2.211036.95 2.1711076.68 1.5911079.16 1.5611120.34 .71		

11120.54	.7111162.76	.4311172.97	.3311204.13	-.0111237.29	-.32
11246.35	-.4111266.83	-1.1811288.15	2.5511318.66	6.81 11323.3	6.8
11414.04	6.7211520.26	6.6211615.74	6.4611700.71	6.3911769.76	6.26
11843.62	6.1411883.47	7.311967.09	9.812006.63	10.9912052.01	11.46
12113.17	12.0712195.57	12.8612275.04	13.6112363.94	14.6912428.66	15.11
12450.09	15.3612505.74	15.3512590.53	14.8712663.51	15.0612731.07	14.84
12820.87	14.7 12935.7	14.7113025.09	14.513093.51	14.0813228.91	13.87
13405.93	13.8613511.65	13.6213623.37	13.7113625.42	13.713708.66	13.31
13785.06	13.0513838.64	13.1913959.24	13.0214043.54	12.6614134.33	12.4
14229.54	12.2114253.58	12.1614265.53	11.7414281.45	10.7414295.03	11.63
14306.12	11.9114318.21	11.9214350.91	11.8114407.42	11.7114449.77	11.64
14509.8	11.5414615.93	11.24 14688	11.0714750.15	10.9214845.23	10.65
14925.01	10.46 15014	10.2515077.91	10.1715146.64	10.15195.67	9.89
15255.93	9.715333.59	9.6315384.33	9.4715437.24	9.3415486.98	9.22
15526.58	9.13 15548.5	9.0715574.93	9.0515639.92	8.9315728.32	8.64
15834.49	8.5815941.93	8.3216045.89	7.9916108.13	7.8416155.67	7.65
16177	7.4116194.77	6.6316220.39	6.2616228.33	7.3616230.17	7.62
16237.53	7.5316313.52	7.3516387.67	7.3616480.67	6.6416569.07	6.88
16817.85	6.2516901.86	5.8116936.97	5.9316990.05	4.0817217.01	5.03
17467.79	4.7617622.02	2.6417751.17	1.7717782.36	.817804.33	.2
17855.25	-1.5417871.17	-1.717895.52	-2.3517960.15	-9.2317975.48	-9.23
18043.49	-3.53 18112.7	-2.9518124.47	-2.7318167.37	-2.1418219.38	-2.03
18221.82	-1.9218238.99	-1.9518270.14	-1.8918272.28	-1.8918331.59	-1.82
18415.22	-1.5418421.27	-1.5118501.12	-1.0918560.94	-.8718569.08	-.9
18584.76	-.5918641.44	.72 18704.6	2.3518718.07	2.6418744.17	3.19
18773.99	3.5418832.04	4.718832.13	4.718892.04	4.818915.59	4.89
18916.93	4.7718939.15	3.4918959.36	3.3318969.44	4.8618979.57	7.2
18995.88	919008.49	7.6719192.88	6.1619196.42	6.1319282.94	5.27
19319.18	8.9119369.12	6.419474.71	6.4319502.31	6.6919610.61	6.48
19626.19	7.1319749.43	11.48 19770.7	9.5219922.69	9.2320123.77	8.4
20215.61	8.3 20380.3	6.5720416.54	7.2520435.51	8.3620466.91	10.34
20487.09	9.2120509.46	9.0620728.29	8.1120728.66	8.1121002.71	7.9
21010.34	7.9421166.48	8.7521241.69	9.9321291.93	10.4421439.67	13.11
21575.29	12.5221588.54	11.6821595.73	11.2221695.11	9.7921752.54	8.3
21815.33	8.2922155.59	8.9522438.04	9.7922718.62	10.3323016.42	11.06
23294.56	11.6423588.92	11.79			

Manning's n Values		num= 6	
Sta	n Val	Sta	n Val
0	.06810005.82	.09710115.75	.04411414.04
18995.88	.081		.06516936.97

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
10005.82	18995.88		2559	4481.46	2515.69	.1	.3	
Blocked Obstructions		num= 3						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
010005.82	7.49		018995.88	-3.07	19749.43	23588.92		7.49

CROSS SECTION OUTPUT	Profile #Calibration	
E.G. Elev (ft)	9.97	Element
Vel Head (ft)	0.02	Wt. n-Val.
W.S. Elev (ft)	9.96	Reach Len. (ft)
Crit W.S. (ft)		Flow Area (sq ft)
E.G. Slope (ft/ft)	0.000098	Area (sq ft)
Q Total (cfs)	45600.00	Flow (cfs)
Top Width (ft)	18039.57	Top Width (ft)
Vel Total (ft/s)	0.78	Avg. Vel. (ft/s)
Max Chl Dpth (ft)	13.03	Hydr. Depth (ft)
Conv. Total (cfs)	4597998.0	Conv. (cfs)
		Left OB
		Channel
		Right OB
		0.068
		0.045
		0.081
		2559.00
		4481.46
		2515.69
		21760.29
		31263.16
		5126.92
		21760.29
		31263.16
		5126.92
		8388.13
		35729.04
		1482.83
		9226.11
		5796.45
		3017.01
		0.39
		1.14
		0.29
		2.36
		5.39
		1.70
		845803.0
		3602677.0
		149518.1

Length Wtd. (ft)	4075.90	Wetted Per. (ft)	9226.71	5798.25	3017.56
Min Ch El (ft)	-3.07	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	1.71	Stream Power (lb/ft s)	0.01	0.04	0.00
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	9042.06	44040.54	1880.83
C & E Loss (ft)	0.00	Cum SA (acres)	3159.67	10710.90	1046.29

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 6.62307*

INPUT

Description: Interpolated Cross Section at River Mile 6.62

Station	Elevation	Data	num=	272	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
0	13.68	102.5	11.54	213.23	11.01	347.58	9.77	478.54	9.29			
554.92	9.39	630.34	9.55	765.28	7.06	889.28	6.99	994.77	9.71			
1040.08	7.25	1124.27	7.87	1292.6	7.87	1300.55	7.87	1492.02	5.97			
1602.49	6.07	1731.86	5.96	1852.54	5.89	1980.06	6.13	1990.01	6.15			
2141.93	5.84	2142.93	5.94	2720.92	5.55	3134.78	5.64	3409.61	5.69			
4112.75	5.29	4126.17	5.29	4348.22	6.25	4567.49	6.93	4639.54	5.63			
4808.29	5.82	5143.63	5.75	5167.58	6.22	5185.76	5.72	5268.89	5.72			
5368.93	5.71	5384.59	7.37	5405.42	6.07	5463.65	5.96	5542.03	5.89			
5661.18	5.45	5775.29	5.59	5943.48	5.85	6067.32	5.87	6716.32	5.4			
7361.15	5.48	7960.65	5.52	8628.18	5.81	8661.83	5.92	8784.42	6.25			
8944.44	6.51	9069.63	9.14	9100.28	7.19	9127.82	7.35	9190.98	8			
9207.63	9.82	9212.27	9.12	9216.98	7.67	9225.81	7.94	9289.37	6.47			
9328.28	5.51	9352.46	4.93	9385.6	4.53	9437.98	3.93	9444.92	3.77			
9494.15	3.21	9533.12	3.78	9550.27	3.21	9563.73	1.61	9576.36	2.33			
9591.12	3.41	9606.29	3.39	9658.77	4.26	9707.93	4.39	9763.27	4.53			
9815.55	4.62	9855.56	4.73	9897.1	4.71	9900.46	4.69	9975.34	4.33			
10080.31	3.72	10124.17	3.44	10153.58	3.23	10187.72	2.68	10226.59	2.37			
10283.44	2.25	10325.11	2.3	10335.8	2.27	10366.14	2.28	10366.17	2.28			
10406.33	2.15	10413.81	2.12	10459.6	1.62	10462.46	1.59	10509.9	.87			
10510.13	.87	10558.77	.64	10570.54	.55	10606.44	.25	10644.64	-.03			
10655.08	-.11	10678.67	-.79	10703.24	2.46	10738.39	6.18	10743.74	6.16			
10848.29	6.11	10970.67	6.03	11080.67	5.88	11178.57	5.83	11258.13	5.71			
11343.23	5.59	11389.13	6.61	11485.47	8.81	11531.03	9.84	11583.32	10.27			
11653.79	10.81	11748.73	11.47	11840.29	12.12	11942.71	13.13	12017.28	13.42			
12041.97	13.65	12106.08	13.67	12203.78	13.14	12287.86	13.41	12365.7	13.18			
12469.16	13.05	12601.46	13.12	12704.45	12.91	12783.28	12.45	12939.28	12.26			
13143.24	12.34	13265.04	12.11	13393.76	12.27	13396.12	12.26	13492.02	11.86			
13580.05	11.61	13641.78	11.82	13780.74	11.71	13877.86	11.34	13982.46	11.1			
14092.16	10.95	14119.86	10.91	14133.63	10.41	14151.97	9.22	14167.61	10.3			
14180.39	10.65	14194.32	10.67	14232	10.56	14297.11	10.48	14345.9	10.44			
14415.07	10.36	14537.34	10.09	14620.38	9.94	14691.98	9.81	14801.52	9.56			
14893.45	9.39	14995.97	9.21	15069.61	9.16	15148.8	9.02	15205.29	8.91			
15274.71	8.74	15364.19	8.71	15422.65	8.56	15483.61	8.45	15540.92	8.34			
15586.55	8.26	15611.8	8.21	15642.25	8.21	15717.13	8.11	15818.98	7.84			
15941.31	7.84	16065.09	7.62	16184.86	7.31	16256.57	7.17	16311.35	6.98			
16335.92	6.7	16356.4	5.79	16385.91	5.37	16395.06	6.69	16397.19	7.01			
16405.66	6.91	16493.22	6.74	16578.65	6.81	16685.8	6.02	16787.65	6.39			
17074.28	5.82	17171.07	5.43	17211.53	5.54	17272.68	3.91	17534.17	4.74			
17823.11	4.49	18000.8	2.63	18149.6	1.86	18185.54	1.01	18210.85	.52			
18269.52	-1.06	18287.86	-1.22	18315.92	-1.96	18390.38	-10.08	18403.79	-10.08			
18483.12	-3.31	18563.84	-2.67	18577.56	-2.42	18627.6	-1.69	18688.26	-1.53			
18691.11	-1.41	18711.13	-1.42	18747.46	-1.33	18749.95	-1.33	18819.13	-1.29			
18916.67	-1.02	18923.72	-.99	19016.86	-.56	19086.62	-.33	19096.12	-.38			
19114.4	-.14	19180.51	.94	19254.18	2.36	19269.88	2.59	19300.32	3.03			

19335.1	3.219402.81	4.119402.92	4.119472.78	4.1519500.26	4.23
19501.81	4.0819527.73	2.28 19551.3	1.8419563.06	3.5519574.88	6.24
19593.89	8.219606.03	7.0419783.44	5.8219786.84	5.7919870.08	5.04
19904.95	8.2319953.01	6.0420054.59	6.0820081.15	6.3920185.35	6.53
20200.34	7.1520318.92	11.0820339.38	9.3820485.62	9.2720679.08	8.61
20767.45	8.5420925.91	6.5720960.77	7.0620979.02	7.9821009.23	9.67
21028.65	8.6621050.17	8.4921260.71	7.3721261.07	7.3721524.74	7.1
21532.09	7.1421682.32	8.121754.68	9.2521803.02	9.6821945.16	11.99
22075.65	11.45 22088.4	10.7122095.31	10.3122190.93	9.0522246.19	7.74
22306.6	7.7322633.98	8.5222905.73	9.5323175.69	10.1823462.22	11.05
23729.83	11.7524013.04	11.93			

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val		
0	.069	9225.81	.094	9352.46	.047	10848.29	.066	17823.11	.047
19593.89	.081								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9225.8119593.89 2559 4481.46 2515.69 .1 .3

Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	9225.81	7.07	019593.99	-2.68	20318.92	24013.04		7.07

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	9.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.069	0.049	0.081
W.S. Elev (ft)	9.55	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	20537.76	35704.93	4882.91
E.G. Slope (ft/ft)	0.000100	Area (sq ft)	20537.76	35704.93	4882.91
Q Total (cfs)	45600.00	Flow (cfs)	7880.77	36296.92	1422.31
Top Width (ft)	18781.33	Top Width (ft)	8804.93	7089.59	2886.81
Vel Total (ft/s)	0.75	Avg. Vel. (ft/s)	0.38	1.02	0.29
Max Chl Dpth (ft)	12.23	Hydr. Depth (ft)	2.33	5.04	1.69
Conv. Total (cfs)	4555487.0	Conv. (cfs)	787296.9	3626100.0	142090.2
Length Wtd. (ft)	4100.14	Wetted Per. (ft)	8805.51	7091.24	2887.27
Min Ch El (ft)	-2.68	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	1.53	Stream Power (lb/ft s)	0.01	0.03	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	7799.63	40595.69	1591.79
C & E Loss (ft)	0.00	Cum SA (acres)	2630.04	10048.04	875.81

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 5.77692*

INPUT

Description: Interpolated Cross Section at River Mile 5.78

Station	Elevation	Data	num=	272						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Elev
0	12.12	93.84	10.27	195.2	9.8	318.19	8.72	438.08	8.28	
508	8.36	577.05	8.5	700.58	6.38	814.1	6.34	910.67	8.68	
952.15	6.58	1029.22	7.12	1183.31	7.13	1190.59	7.13	1365.88	5.5	
1467	5.58	1585.43	5.48	1695.91	5.43	1812.65	5.63	1821.76	5.64	
1960.84	5.34	1961.75	5.44	2490.88	4.99	2869.74	5.1	3121.33	5.16	
3765.02	4.72	3777.31	4.73	3980.59	5.59	4181.32	6.22	4247.28	5.12	
4401.76	5.32	4708.75	5.19	4730.67	5.59	4747.32	5.16	4823.42	5.14	
4915.01	5.12	4929.34	6.54	4948.41	5.41	5001.72	5.31	5073.46	5.26	
5182.54	4.89	5287.01	5.02	5440.97	5.26	5554.35	5.29	6148.47	4.77	

6738.78	4.9	7287.6	4.98	7898.69	5.35	7929.5	5.45	8041.72	5.73
8188.21	5.94	8302.82	8.19	8330.88	6.53	8356.09	6.66	8413.91	7.21
8429.15	8.78	8433.4	8.18	8437.71	6.93	8445.79	7.16	8517.75	5.85
8561.8	4.99	8589.17	4.49	8626.68	4.13	8685.98	3.6	8693.84	3.43
8749.57	2.75	8793.69	3.4	8813.11	2.72	8828.34	.85	8842.64	1.68
8859.34	2.94	8876.52	2.91	8935.94	3.9	8991.58	4.02	9054.24	4.15
9113.42	4.23	9158.71	4.34	9205.73	4.3	9209.54	4.28	9294.31	3.98
9413.14	3.44	9462.79	3.19	9496.08	3	9534.73	2.41	9578.73	2.12
9643.09	2.07	9690.27	2.2	9702.37	2.18	9736.72	2.22	9736.74	2.22
9782.21	2.1	9790.68	2.08	9842.51	1.64	9845.75	1.62	9899.46	1.03
9899.71	1.03	9954.78	.84	9968.11	.77	10008.75	.51	10051.99	.26
10063.81	.18	10090.52	-.41	10118.32	2.37	10158.12	5.54	10164.17	5.53
10282.53	5.49	10421.07	5.44	10545.61	5.31	10656.43	5.27	10746.5	5.15
10842.83	5.04	10894.8	5.91	11003.86	7.81	11055.44	8.71	11114.63	9.07
11194.4	9.53	11301.88	10.09	11405.53	10.63	11521.48	11.57	11605.89	11.73
11633.85	11.94	11706.43	11.99	11817.02	11.41	11912.21	11.75	12000.33	11.51
12117.45	11.41	12267.22	11.54	12383.82	11.32	12473.06	10.81	12649.65	10.65
12880.55	10.82	13018.44	10.59	13164.15	10.83	13166.83	10.82	13275.39	10.41
13375.04	10.17	13444.93	10.45	13602.23	10.39	13712.18	10.02	13830.6	9.8
13954.78	9.69	13986.13	9.64	14001.72	9.08	14022.49	7.71	14040.2	8.97
14054.67	9.39	14070.43	9.42	14113.08	9.31	14186.79	9.26	14242.03	9.23
14320.33	9.18	14458.75	8.93	14552.75	8.81	14633.81	8.69	14757.82	8.46
14861.88	8.32	14977.95	8.16	15061.31	8.15	15150.96	8.03	15214.9	7.94
15293.5	7.78	15394.79	7.81	15460.97	7.65	15529.98	7.56	15594.86	7.47
15646.51	7.4	15675.1	7.36	15709.57	7.36	15794.34	7.31	15909.64	7.03
16048.12	7.11	16188.25	6.91	16323.84	6.62	16405.02	6.51	16467.03	6.31
16494.85	6.16	16518.03	4.95	16551.44	4.47	16561.79	6.02	16564.21	6.39
16573.79	6.27	16672.92	6.13	16769.63	6.27	16890.93	5.41	17006.23	5.89
17330.71	5.39	17440.28	5.06	17486.08	5.14	17555.31	3.75	17851.33	4.45
18178.43	4.22	18379.58	2.62	18548.04	1.95	18588.72	1.23	18617.37	.83
18683.78	-.59	18704.55	-.75	18736.32	-1.56	18820.62	-10.92	18832.11	-10.92
18922.74	-3.08	19014.98	-2.39	19030.66	-2.11	19087.83	-1.23	19157.13	-1.03
19160.39	-.87	19183.27	-.89	19224.78	-.77	19227.63	-.77	19306.67	-.77
19418.11	-.51	19426.18	-.47	19532.59	-.02	19612.31	.21	19623.15	.14
19644.04	.31	19719.58	1.17	19803.75	2.36	19821.7	2.54	19856.47	2.87
19896.22	2.86	19973.58	3.5	19973.7	3.52	20053.53	3.52	20084.92	3.57
20086.7	3.39	20116.31	1.07	20143.25	.34	20156.68	2.24	20170.18	5.27
20191.91	7.42	20203.56	6.41	20374	5.47	20377.26	5.45	20457.23	4.82
20490.73	7.56	20536.89	5.68	20634.48	5.72	20659.99	6.09	20760.09	6.59
20774.49	7.17	20888.4	10.68	20908.06	9.24	21048.54	9.32	21234.39	8.81
21319.28	8.78	21471.51	6.56	21505	6.87	21522.54	7.59	21551.55	9
21570.21	8.12	21590.88	7.92	21793.14	6.63	21793.48	6.63	22046.78	6.3
22053.83	6.35	22198.15	7.45	22267.67	8.57	22314.11	8.93	22450.65	10.87
22576.01	10.37	22588.26	9.73	22594.9	9.39	22686.76	8.31	22739.84	7.18
22797.88	7.17	23112.37	8.08	23373.43	9.27	23632.76	10.02	23908.01	11.05
24165.1	11.85	24437.16	12.07						

Manning's n Values		num= 6		n Val		Sta		n Val		Sta	
0	.071	8445.79	.091	8589.17	.051	10118.32	.068	17851.33	.051		
20191.91	.082										

Bank Sta:	Left	Right	Lengths:		Left Channel	Right	Coeff	Contr.	Expan.
	8445.79	20191.91	2559	4481.46	2515.69		.1	.3	
Blocked Obstructions			num= 3						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev	
0	8445.79	6.64	020191.91	-2.29	20888.42	4437.16	6.64		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	9.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.071	0.053	0.082
W.S. Elev (ft)	9.13	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	19318.40	40259.20	4596.52
E.G. Slope (ft/ft)	0.000105	Area (sq ft)	19318.40	40259.20	4596.52
Q Total (cfs)	45600.00	Flow (cfs)	7363.27	36876.32	1360.40
Top Width (ft)	19326.11	Top Width (ft)	8174.36	8569.00	2582.76
Vel Total (ft/s)	0.71	Avg. Vel. (ft/s)	0.38	0.92	0.30
Max Chl Dpth (ft)	11.42	Hydr. Depth (ft)	2.36	4.70	1.78
Conv. Total (cfs)	4442190.0	Conv. (cfs)	717303.9	3592360.0	132525.6
Length Wtd. (ft)	4112.77	Wetted Per. (ft)	8174.83	8570.65	2583.13
Min Ch El (ft)	-2.29	Shear (lb/sq ft)	0.02	0.03	0.01
Alpha	1.40	Stream Power (lb/ft s)	0.01	0.03	0.00
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	6628.92	36688.09	1318.06
C & E Loss (ft)	0.00	Cum SA (acres)	2131.31	9242.56	717.87

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 4.93076*

INPUT

Description: Interpolated Cross Section at River Mile 4.93

Station Elevation Data			num= 272								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	10.55	85.17	8.99	177.18	8.58	288.81	7.66	397.62	7.28		
461.08	7.34	523.75	7.46	635.88	5.71	738.91	5.69	826.56	7.65		
864.21	5.9	934.17	6.36	1074.03	6.39	1080.64	6.39	1239.73	5.03		
1331.52	5.1	1439.01	5.01	1539.29	4.96	1645.24	5.12	1653.51	5.13		
1779.75	4.85	1780.57	4.93	2260.83	4.42	2604.71	4.56	2833.06	4.63		
3417.3	4.15	3428.46	4.16	3612.96	4.93	3795.15	5.51	3855.02	4.61		
3995.23	4.81	4273.87	4.63	4293.77	4.96	4308.87	4.6	4377.95	4.56		
4461.08	4.52	4474.09	5.7	4491.4	4.76	4539.78	4.66	4604.9	4.62		
4703.91	4.33	4798.73	4.45	4938.47	4.67	5041.37	4.71	5580.63	4.14		
6116.42	4.31	6614.55	4.43	7169.2	4.88	7197.16	4.97	7299.02	5.2		
7431.99	5.38	7536.01	7.25	7561.48	5.86	7584.36	5.97	7636.84	6.43		
7650.67	7.73	7654.53	7.23	7658.44	6.19	7665.78	6.38	7746.13	5.23		
7795.32	4.48	7825.88	4.04	7867.77	3.72	7933.98	3.27	7942.76	3.09		
8004.99	2.29	8054.26	3.01	8075.94	2.23	8092.95	.1	8108.91	1.03		
8127.57	2.47	8146.75	2.42	8213.1	3.53	8275.24	3.65	8345.2	3.78		
8411.28	3.84	8461.86	3.95	8514.37	3.89	8518.61	3.86	8613.27	3.64		
8745.96	3.17	8801.41	2.94	8838.58	2.76	8881.74	2.14	8930.88	1.87		
9002.74	1.89	9055.42	2.1	9068.94	2.09	9107.29	2.15	9107.32	2.15		
9158.09	2.05	9167.55	2.03	9225.43	1.67	9229.04	1.65	9289.01	1.2		
9289.3	1.19	9350.79	1.05	9365.67	1	9411.05	.76	9459.34	.55		
9472.54	.48	9502.36	-.02	9533.41	2.28	9577.85	4.9	9584.61	4.89		
9716.78	4.88	9871.47	4.85	10010.54	4.71	10134.3	4.71	10234.87	4.59		
10342.43	4.49	10400.47	5.2	10522.25	6.8	10579.85	7.56	10645.95	7.88		
10735.02	8.26	10855.03	8.7	110970.78	9.15	11100.25	10.0	111194.51	10.04		
11225.73	10.23	11306.77	10.3	11430.27	9.67	11536.55	10.09	11634.96	9.84		
11765.74	9.75	11932.99	9.95	12063.18	9.74	12162.83	9.18	12360.03	9.04		
12617.86	9.3	12771.83	9.07	12934.54	9.39	12937.53	9.38	13058.76	8.96		
13170.04	8.72	13248.07	9.07	13423.73	9.07	13546.5	8.7	13678.73	8.5		
13817.4	8.42	13852.41	8.38	13869.82	7.75	13893.01	6.19	13912.78	7.65		
13928.94	8.12	13946.54	8.16	13994.17	8.05	14076.48	8.03	14138.16	8.03		
14225.59		814380.16	7.78	14485.13	7.67	14575.64	7.58	14714.12	7.37		
14830.32	7.25	14959.92	7.12	15053	7.14	15153.12	7.04	15224.52	6.97		
15312.28	6.81	15425.4	6.88	15499.29	6.74	15576.35	6.66	15648.8	6.59		
15706.48	6.53	15738.4	6.5	15776.9	6.52	15871.55	6.48	16000.3	6.23		

16154.93	6.37	16311.4	6.2116462.82	5.9316553.47	5.84	16622.7	5.64
16653.78	5.316679.66	4.1116716.97	3.5816728.53	5.3516731.22	5.78		
16741.93	5.6416852.62	5.5316960.61	5.7217096.06	4.7817224.81	5.39		
17587.14	4.96	17709.5	4.6817760.63	4.7517837.95	3.5818168.49	4.15	
18533.74	3.9518758.37	2.6118946.47	2.04	18991.9	1.4419023.89	1.14	
19098.05	-.1219121.24	-.2719156.71	-1.1719250.85	-11.7719260.42	-11.77		
19362.37	-2.8519466.12	-2.1119483.75	-1.7919548.06	-.7819626.01	-.52		
19629.68	-.34	19655.4	-.36	19702.1	-.21	19705.3	-.24
19919.56	.0119928.63	.0520048.33	.5220137.99	.7320150.19	.66		
20173.69	.7620258.65	1.3920353.33	2.3720373.51	2.4920412.63	2.71		
20457.33	2.5120544.35	2.920544.48	2.920634.27	2.8520669.58	2.9		
20671.59	2.7120704.89	-.1420735.19	-1.15	20750.3	.9420765.48	4.31	
20789.92	6.6	20801.1	5.7820964.55	5.1220967.69	5.1121044.38	4.59	
21076.5	6.8821120.77	5.3221214.37	5.3721238.84	5.7821334.83	6.64		
21348.64	7.1921457.89	10.2721476.74	9.1121611.47	9.3721789.71	9.01		
21871.12	9.0122017.11	6.5622049.23	6.6822066.04	7.2122093.88	8.33		
22111.76	7.5422131.59	7.3622325.57	5.89	22325.9	5.8922568.81	5.5	
22575.58	5.5622713.99	6.822780.65	7.8922825.19	8.1822956.15	9.75		
23076.37	9.323088.12	8.7623094.48	8.4723182.58	7.5623233.49	6.62		
23289.14	6.6123590.76	7.6523841.12	9.0124089.84	9.8724353.81	11.04		
24600.36	11.9624861.29	12.21					

Manning's n Values	num=	6							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.072	7665.78	.088	7825.88	.054	8213.1	.069	18946.47	.054
20789.92	.082								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
7665.78	20789.92	2559	4481.46	2515.69	.1	.3	

Blocked Obstructions	num=	3							
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev	
0	7665.78	6.22	20789.92	-1.92	1457.89	24861.29		6.22	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	8.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.072	0.060	0.082
W.S. Elev (ft)	8.64	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	17453.87	44668.01	4244.27
E.G. Slope (ft/ft)	0.000132	Area (sq ft)	17453.87	44668.01	4244.27
Q Total (cfs)	45600.00	Flow (cfs)	7272.74	36896.37	1430.88
Top Width (ft)	20144.56	Top Width (ft)	7502.85	10377.57	2264.14
Vel Total (ft/s)	0.69	Avg. Vel. (ft/s)	0.42	0.83	0.34
Max Chl Dpth (ft)	10.54	Hydr. Depth (ft)	2.33	4.30	1.87
Conv. Total (cfs)	3965081.0	Conv. (cfs)	632390.7	3208270.0	124420.5
Length Wtd. (ft)	4136.19	Wetted Per. (ft)	7503.18	10379.25	2264.43
Min Ch El (ft)	-1.90	Shear (lb/sq ft)	0.02	0.04	0.02
Alpha	1.24	Stream Power (lb/ft s)	0.01	0.03	0.01
Frctn Loss (ft)	0.60	Cum Volume (acre-ft)	5548.80	32319.43	1062.77
C & E Loss (ft)	0.00	Cum SA (acres)	1670.81	8267.95	577.91

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
 REACH: Lower Fish Creek RS: 4.08461*

INPUT
 Description: Interpolated Cross Section at River Mile 4.08
 Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8.98	76.5	7.71	159.15	7.37	259.42	6.61	357.16	6.28
414.17	6.31	470.46	6.42	571.18	5.04	663.72	5.03	742.46	6.62
776.28	5.23	839.11	5.61	964.74	5.66	970.68	5.65	1113.58	4.56
1196.03	4.61	1292.59	4.53	1382.66	4.49	1477.83	4.62	1485.26	4.62
1598.65	4.36	1599.39	4.42	2030.79	3.86	2339.67	4.01	2544.79	4.11
3069.58	3.58	3079.6	3.59	3245.33	4.27	3408.99	4.8	3462.76	4.1
3588.71	4.31	3838.99	4.07	3856.87	4.33	3870.43	4.03	3932.48	3.99
4007.15	3.92	4018.84	4.86	4034.38	4.1	4077.84	4.01	4136.34	3.99
4225.27	3.77	4310.44	3.88	4435.97	4.08	4528.4	4.13	5012.78	3.51
5494.05	3.73	5941.5	3.88	6439.71	4.42	6464.83	4.5	6556.33	4.68
6675.76	4.81	6769.2	6.3	6792.08	5.19	6812.63	5.28	6859.77	5.64
6872.19	6.69	6875.66	6.29	6879.18	5.45	6885.76	5.61	6974.51	4.61
7028.83	3.96	7062.59	3.6	7108.86	3.32	7181.99	2.93	7191.68	2.76
7260.42	1.83	7314.83	2.63	7338.77	1.75	7357.56	-.66	7375.19	.39
7395.8	1.99	7416.98	1.94	7490.26	3.17	7558.89	3.28	7636.16	3.4
7709.14	3.45	7765.01	3.56	7823	3.47	7827.69	3.45	7932.24	3.29
8078.79	2.9	8140.02	2.69	8181.09	2.53	8228.75	1.87	8283.02	1.61
8362.39	1.72	8420.58	2	8435.51	2.01	8477.86	2.08	8477.89	2.08
8533.98	2	8544.42	1.98	8608.34	1.7	8612.33	1.68	8678.57	1.36
8678.89	1.35	8746.8	1.26	8763.24	1.22	8813.36	1.02	8866.69	.84
8881.27	.78	8914.21	.36	8948.5	2.18	8997.58	4.27	9005.05	4.25
9151.02	4.26	9321.88	4.26	9475.47	4.13	9612.16	4.15	9723.23	4.03
9842.04	3.94	9906.13	4.51	10040.64	5.81	10104.25	6.42	10177.26	6.68
10275.63	6.99	10408.19	7.33	10536.02	7.66	10679.02	8.45	10783.13	8.35
10817.61	8.52	10907.12	8.63	11043.52	7.94	11160.9	8.43	11269.58	8.17
11414.03	8.11	11598.75	8.36	11742.54	8.15	11852.6	7.54	12070.4	7.43
12355.17	7.78	12525.22	7.56	12704.93	7.96	12708.23	7.95	12842.13	7.51
12965.03	7.28	13051.22	7.71	13245.22	7.76	13380.82	7.38	13526.86	7.2
13680.02	7.16	13718.69	7.13	13737.92	6.42	13763.53	4.67	13785.36	6.32
13803.21	6.86	13822.65	6.91	13875.25	6.81	13966.16	6.81	14034.29	6.82
14130.85	6.82	14301.56	6.62	14417.5	6.54	14517.48	6.46	14670.41	6.28
14798.76	6.18	14941.9	6.07	15044.7	6.13	15155.27	6.05	15234.13	5.99
15331.06	5.85	15456	5.97	15537.62	5.83	15622.72	5.77	15702.74	5.71
15766.44	5.66	15801.7	5.64	15844.22	5.67	15948.76	5.67	16090.96	5.42
16261.75	5.64	16434.56	5.51	16601.79	5.25	16701.91	5.17	16778.38	4.97
16812.7	4.61	16841.29	3.27	16882.49	2.68	16895.26	4.68	16898.24	5.16
16910.06	5.01	17032.31	4.92	17151.59	5.18	17301.19	4.17	17443.38	4.89
17843.57	4.54	17978.71	4.31	18035.19	4.35	18120.58	3.42	18485.66	3.86
18889.06	3.68	19137.15	2.61	19344.91	2.14	19395.08	1.65	19430.41	1.45
19512.32	.35	19537.93	.21	19577.11	-.78	19681.08	-12.62	19688.74	-12.62
19801.99	-2.62	19917.25	-1.82	19936.85	-1.48	20008.29	-.32	20094.89	-.02
20098.96	.19	20127.54	.17	20179.42	.36	20182.98	.35	20281.74	.29
20421.01	.53	20431.09	.57	20564.06	1.05	20663.67	1.27	20677.22	1.18
20703.33	1.21	20797.72	1.61	20902.9	2.38	20925.33	2.44	20968.78	2.55
21018.45	2.17	21115.12	2.32	21115.27	2.32	21215.02	2.22	21254.25	2.24
21256.47	2.02	21293.47	-1.35	21327.13	-2.64	21343.92	-.37	21360.79	3.35
21387.94	5.82	21398.64	5.16	21555.11	4.77	21558.11	4.77	21631.53	4.37
21662.28	6.22	21704.66	4.96	21794.25	5.02	21817.68	5.48	21909.58	6.7
21922.79	7.21	22027.37	9.87	22045.42	8.97	22174.39	9.41	22345.02	9.21
22422.96	9.25	22562.71	6.55	22593.46	6.48	22609.56	6.83	22636.2	7.65
22653.32	6.98	22672.3	6.79	22857.99	5.15	22858.31	5.15	23090.85	4.7
23097.33	4.77	23229.83	6.15	23293.64	7.21	23336.28	7.42	23461.64	8.63
23576.73	8.22	23587.97	7.79	23594.07	7.56	23678.4	6.82	23727.13	6.07
23780.42	6.05	24069.14	7.22	24308.82	8.75	24546.91	9.72	24799.61	11.03
25035.63	12.07	25285.41	12.35						

Manning's n Values		num= 6	
Sta	n Val	Sta	n Val
0	.074	6885.76	.086
		7108.86	.057
		7490.26	.071
		9344.91	.057

21387.94 .083

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
6885.76	21387.94	2559	4481.46	2515.69	.1	.3	
Blocked Obstructions		num=					
Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R
0	6885.76	5.79	21387.94	2515.69	5.79	21387.94	-1.52

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	8.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.074	0.063	0.083
W.S. Elev (ft)	8.05	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	14926.06	48867.52	3751.06
E.G. Slope (ft/ft)	0.000156	Area (sq ft)	14926.06	48867.52	3751.06
Q Total (cfs)	45600.00	Flow (cfs)	6309.51	37985.89	1304.60
Top Width (ft)	22325.18	Top Width (ft)	6829.58	13394.24	2101.36
Vel Total (ft/s)	0.68	Avg. Vel. (ft/s)	0.42	0.78	0.35
Max Chl Dpth (ft)	9.57	Hydr. Depth (ft)	2.19	3.65	1.79
Conv. Total (cfs)	3647859.0	Conv. (cfs)	504741.1	3038753.0	104364.3
Length Wtd. (ft)	4062.10	Wetted Per. (ft)	6829.76	13396.08	2101.62
Min Ch El (ft)	-1.52	Shear (lb/sq ft)	0.02	0.04	0.02
Alpha	1.17	Stream Power (lb/ft s)	0.01	0.03	0.01
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	4597.69	27507.95	831.89
C & E Loss (ft)	0.00	Cum SA (acres)	1249.82	7045.13	451.86

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Fish Creek
REACH: Lower Fish Creek RS: 3.23846*

INPUT
Description: Interpolated Cross Section at River Mile 3.24

Station	Elevation	Data	num=	272
Sta	Elev	Sta	Elev	Sta
0	7.41	67.84	6.44	141.12
367.25	5.28	417.17	5.38	506.47
688.34	4.55	744.06	4.85	855.46
1060.54	4.12	1146.16	4.06	1226.03
1417.56	3.86	1418.22	3.91	1800.74
2721.86	3.01	2730.75	3.02	2877.7
3182.18	3.81	3404.11	3.51	3419.96
3553.22	3.32	3563.58	4.02	3577.37
3746.64	3.21	3822.16	3.31	3933.46
4871.69	3.15	5268.45	3.34	5710.23
5919.53	4.25	6002.39	5.36	6022.67
6093.72	5.64	6096.79	5.34	6099.91
6262.35	3.45	6299.3	3.15	6349.94
6515.84	1.37	6575.4	2.25	6601.6
6664.02	1.52	6687.21	1.45	6767.42
7007.01	3.06	7068.16	3.17	7131.63
7411.62	2.62	7478.64	2.44	7523.59
7722.04	1.54	7785.73	1.9	7802.07
7909.86	1.95	7921.29	1.94	7991.26
8068.48	1.52	8142.81	1.46	8160.8
8290	1.08	8326.05	.74	8363.59
8585.27	3.65	8772.29	3.67	8940.4
9341.64	3.39	9411.8	3.8	9559.03
9816.25	5.71	9961.34	5.95	10101.27
			6.17	10257.79
			6.88	10371.75
			5.55	316.71
			4.38	658.35
			4.91	987.44
			4.11	1317.01
			3.47	2256.52
			4.09	3070.5
			3.47	3487.01
			3.36	3667.78
			3.55	4444.94
			4.02	5813.63
			4.59	6082.69
			4.83	6202.88
			2.6	6440.6
			-1.42	6641.47
			2.91	6927.12
			3.04	7251.2
			1.6	7635.17
			2.01	7848.47
			1.72	8068.13
			1.28	8274.05
			3.63	8425.49
			3.58	9211.6
			5.27	9708.57
			6.88	10371.75

10409.49	6.8110507.46	6.9410656.76	6.210785.25	6.7710904.21	6.5
11062.33	6.4511264.51	6.7711421.91	6.5611542.38	5.9111780.78	5.83
12092.47	6.2612278.62	6.0412475.33	6.5212478.94	6.51 12625.5	6.06
12760.02	5.8312854.36	6.3213066.72	6.4413215.14	6.06 13375	5.9
13542.64	5.8913584.97	5.8713606.01	5.0913634.04	3.1513657.95	4.99
13677.48	5.5913698.77	5.6613756.34	5.5513855.85	5.5813930.41	5.62
14036.11	5.6414222.97	5.4714349.88	5.414459.31	5.3514626.71	5.18
14767.19	5.1114923.87	5.03 15036.4	5.1315157.43	5.0615243.75	5.02
15349.85	4.89 15486.6	5.0515575.94	4.9315669.09	4.8815756.68	4.83
15826.41	4.8 15865	4.7815911.54	4.8316025.97	4.8516181.62	4.62
16368.56	4.916557.72	4.8116740.77	4.5616850.36	4.516934.06	4.31
16971.62	3.917002.91	2.4217048.02	1.79 17062	4.0117065.25	4.55
17078.2	4.3917212.01	4.3217342.56	4.6317506.31	3.5517661.96	4.39
18100	4.1118247.92	3.9218309.74	3.9618403.21	3.2518802.82	3.57
19244.38	3.4119515.93	2.5919743.34	2.2319798.26	1.8619836.94	1.76
19926.59	.8319954.62	.6819997.51	-.3820111.31	-13.4620117.05	-13.46
20241.62	-2.3920368.39	-1.5420389.94	-1.1720468.51	.1320563.77	.49
20568.25	.7220599.68	.7120656.74	.9220660.66	.9120769.28	.82
20922.46	1.0520933.54	1.09 21079.8	1.5921189.35	1.821204.26	1.7
21232.97	1.6621336.79	1.8321452.48	2.3821477.14	2.3821524.94	2.38
21579.56	1.8321685.89	1.721686.05	1.721795.76	1.5521838.91	1.58
21841.36	1.3321882.06	-2.5721919.07	-4.1321937.54	-1.6821956.09	2.39
21985.95	521996.18	4.5322145.67	4.4322148.53	4.422218.67	4.14
22248.05	5.5222288.54	4.622374.14	4.6622396.52	5.1822484.32	6.75
22496.95	7.2422596.86	9.4722614.11	8.8322737.32	9.4622900.33	9.41
22974.79	9.4923108.31	6.5523137.69	6.2923153.07	6.4523178.52	6.98
23194.88	6.4323213.01	6.2223390.42	4.4223390.72	4.4123612.89	3.9
23619.08	3.9723745.66	5.523806.63	6.5423847.37	6.6723967.13	7.51
24077.09	7.1524087.83	6.8224093.65	6.6424174.22	6.0824220.78	5.51
24271.69	5.4824547.53	6.7924776.51	8.4825003.98	9.5625245.41	11.02
25470.9	12.1825709.53	12.48			

Manning's n	Values	num=	6
Sta	n Val	Sta	n Val
0	.075 6105.75	.083 6349.94	.06 6767.42
21985.95	.083		.07118802.82

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	6105.75	21985.95	2559	4481.46	2515.69	.1	.3

Blocked Obstructions	num=	2
Sta L	Sta R	Elev
22974.79	25709.53	5.37
	021985.95	-1.13

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	7.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.075	0.065	0.083
W.S. Elev (ft)	7.51	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	22572.05	55732.52	3463.27
E.G. Slope (ft/ft)	0.000111	Area (sq ft)	22572.05	55732.52	3463.27
Q Total (cfs)	45600.00	Flow (cfs)	11258.55	33371.40	970.04
Top Width (ft)	24087.56	Top Width (ft)	6105.75	15880.20	2101.62
Vel Total (ft/s)	0.56	Avg. Vel. (ft/s)	0.50	0.60	0.28
Max Chl Dpth (ft)	8.64	Hydr. Depth (ft)	3.70	3.51	1.65
Conv. Total (cfs)	4330386.0	Conv. (cfs)	1069164.0	3169102.0	92119.8
Length Wtd. (ft)	3996.31	Wetted Per. (ft)	6106.07	15881.73	2101.77
Min Ch El (ft)	-1.13	Shear (lb/sq ft)	0.03	0.02	0.01
Alpha	1.05	Stream Power (lb/ft s)	0.01	0.01	0.00
Frcn Loss (ft)	0.42	Cum Volume (acre-ft)	3496.25	22127.32	623.57
C & E Loss (ft)	0.00	Cum SA (acres)	869.87	5539.25	330.49

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: Fish Creek
 REACH: Lower Fish Creek RS: 2.39230*

INPUT

Description: Interpolated Cross Section at River Mile 2.39

Station	Elevation	Data	num=	272						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	5.84	59.17	5.16	123.09	4.94	200.65	4.5	276.25	4.27	
320.33	4.25	363.87	4.34	441.77	3.69	513.35	3.73	574.25	4.56	
600.4	3.88	649	4.1	746.17	4.18	750.76	4.18	861.29	3.61	
925.06	3.63	999.74	3.58	1069.41	3.55	1143.02	3.61	1148.76	3.6	
1236.46	3.37	1237.04	3.4	1570.69	2.73	1809.6	2.93	1968.24	3.05	
2374.14	2.44	2381.89	2.45	2510.07	2.96	2636.65	3.38	2678.24	3.08	
2775.65	3.31	2969.23	2.96	2983.06	3.07	2993.55	2.91	3041.54	2.83	
3099.29	2.73	3108.33	3.18	3120.36	2.79	3153.97	2.7	3199.22	2.72	
3268	2.65	3333.87	2.74	3430.96	2.9	3502.45	2.96	3877.09	2.26	
4249.33	2.57	4595.4	2.79	4980.74	3.49	5000.17	3.55	5070.93	3.63	
5163.31	3.68	5235.58	4.42	5253.27	3.86	5269.16	3.9	5305.62	4.07	
5315.24	4.6	5317.92	4.39	5320.64	3.98	5325.73	4.05	5431.26	3.37	
5495.87	2.93	5536.01	2.71	5591.03	2.51	5677.99	2.27	5689.52	2.08	
5771.26	.92	5835.96	1.87	5864.44	.77	5886.78	-2.18	5907.75	-.91	
5932.25	1.05	5957.44	.97	6044.58	2.43	6126.2	2.54	6218.08	2.65	
6304.87	2.68	6371.3	2.78	6440.27	2.64	6445.85	2.63	6570.17	2.59	
6744.45	2.35	6817.26	2.2	6866.09	2.07	6922.78	1.34	6987.31	1.11	
7081.7	1.36	7150.89	1.8	7168.64	1.83	7219.01	1.94	7219.05	1.94	
7285.74	1.9	7298.16	1.89	7374.17	1.75	7378.92	1.75	7457.69	1.68	
7458.06	1.68	7538.82	1.67	7558.37	1.66	7617.97	1.54	7681.4	1.42	
7698.73	1.37	7737.9	1.13	7778.68	2	7837.04	2.99	7845.92	2.98	
8019.51	3.03	8222.69	3.08	8405.34	2.97	8567.88	3.02	8699.97	2.92	
8841.25	2.84	8917.47	3.1	9077.42	3.8	9153.06	4.13	9239.88	4.29	
9356.87	4.44	9514.49	4.56	9666.51	4.68	9836.56	5.32	9960.37	4.98	
10001.37	5.110107.81		5.2610270.01		4.47	10409.6	5.1210538.84		4.84	
10710.62	4.810930.27		5.1811101.27		4.9711232.15		4.2711491.15		4.22	
11829.78	4.7412032.01		4.5312245.72		5.0812249.64		5.0712408.86		4.6	
12555.01	4.3912657.51		4.9512888.21		5.1313049.46		4.7413223.13		4.6	
13405.26	4.6313451.24		4.6113474.11		3.7613504.56		1.6413530.53		3.66	
13551.76	4.3313574.88		4.4113637.43		4.313745.53		4.3513826.54		4.41	
13941.38	4.4614144.38		4.3114282.25		4.2714401.14		4.2314583.01		4.09	
14735.63	4.0414905.85		3.99 15028.1		4.1215159.59		4.0815253.37		4.05	
15368.63	3.93 15517.2		4.1315614.26		4.0215715.46		3.9915810.62		3.96	
15886.37	3.93 15928.3		3.9215978.86		3.9916103.18		4.0316272.28		3.81	
16475.37	4.1716680.88		4.116879.75		3.8716998.81		3.8417089.74		3.64	
17130.55	3.217164.54		1.5817213.55		.8917228.73		3.3417232.27		3.93	
17246.33	3.7617391.71		3.7117533.54		4.0917711.44		2.9317880.54		3.9	
18356.43	3.6818517.13		3.5518584.29		3.5718685.84		3.0919119.98		3.27	
19599.7	3.1419894.72		2.5820141.77		2.3220201.44		2.0820243.46		2.08	
20340.86	1.320371.32		1.15 20417.9		.0120541.54		-14.3120545.37		-14.31	
20681.25	-2.1620819.53		-1.2620843.03		-.8520928.74		.5921032.64		.99	
21037.53	1.2421071.82		1.2421134.06		1.4821138.33		1.4721256.82		1.34	
21423.9	1.5721435.99		1.621595.53		2.1321715.04		2.3321731.29		2.22	
21762.61	2.121875.86		2.0622002.05		2.3922028.96		2.3322081.09		2.22	
22140.67	1.4922256.66		1.122256.83		1.122376.51		.922423.57		.92	
22426.24	.6422470.64		-3.7822511.02		-5.6222531.16		-2.9922551.39		1.42	
22583.97	4.222593.72		3.922736.22		4.0822738.96		4.0822805.82		3.91	
22833.83	4.8422872.43		4.2422954.03		4.3122975.36		4.8823059.06		6.81	

23071.1	7.2623166.34	9.0623182.79	8.6923300.25	9.5123455.65	9.61
23526.63	9.7323653.91	6.5423681.92	6.123696.58	6.0623720.84	6.31
23736.44	5.8723753.72	5.6523922.85	3.6823923.13	3.6824134.93	3.1
24140.83	3.18 24261.5	4.8624319.62	5.8624358.45	5.9224472.63	6.39
24577.45	6.0724587.69	5.8424593.24	5.7324670.05	5.3424714.43	4.95
24762.96	4.9225025.92	6.3625244.21	8.2225461.05	9.4125691.21	11.02
25906.16	12.2826133.65	12.62			

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.077	5325.73	.08	5591.03	.064	6044.58	.072	20243.46	.064
22583.97	.084								

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

5325.73	22583.97	2559	4481.46	2515.69	.1	.3
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Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
022583.97	-.742	3526.63	26133.65	4.94	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	7.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.077	0.069	0.084
W.S. Elev (ft)	7.09	Reach Len. (ft)	2559.00	4481.46	2515.69
Crit W.S. (ft)		Flow Area (sq ft)	20788.45	65371.17	3511.42
E.G. Slope (ft/ft)	0.000097	Area (sq ft)	20788.45	65371.17	3511.42
Q Total (cfs)	45600.00	Flow (cfs)	9808.60	34856.57	934.83
Top Width (ft)	24546.54	Top Width (ft)	5325.73	17258.24	1962.57
Vel Total (ft/s)	0.51	Avg. Vel. (ft/s)	0.47	0.53	0.27
Max Chl Dpth (ft)	7.83	Hydr. Depth (ft)	3.90	3.79	1.79
Conv. Total (cfs)	4622804.0	Conv. (cfs)	994368.6	3533664.0	94770.9
Length Wtd. (ft)	4061.93	Wetted Per. (ft)	5327.10	17259.51	1962.68
Min Ch El (ft)	-0.74	Shear (lb/sq ft)	0.02	0.02	0.01
Alpha	1.03	Stream Power (lb/ft s)	0.01	0.01	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	2222.61	15897.73	422.17
C & E Loss (ft)	0.00	Cum SA (acres)	534.09	3834.60	213.13

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: Fish Creek
REACH: Lower Fish Creek RS: 1.54615*

INPUT
Description: Interpolated Cross Section at River Mile 1.55

Station Elevation Data num= 272

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4.27	50.5	3.88	105.06	3.72	171.26	3.44	235.79	3.27
273.42	3.23	310.58	3.29	377.07	3.02	438.16	3.08	490.14	3.53
512.47	3.2	553.95	3.34	636.89	3.44	640.8	3.44	735.15	3.14
789.57	3.14	853.32	3.11	912.78	3.09	975.61	3.1	980.51	3.1
1055.37	2.88	1055.86	2.89	1340.65	2.16	1544.56	2.38	1679.97	2.53
2026.42	1.87	2033.03	1.89	2142.44	2.3	2250.48	2.67	2285.98	2.57
2369.13	2.8	2534.35	2.4	2546.16	2.44	2555.11	2.34	2596.07	2.25
2645.37	2.13	2653.08	2.35	2663.35	2.14	2692.04	2.05	2730.65	2.09
2789.36	2.09	2845.59	2.18	2928.45	2.31	2989.47	2.38	3309.25	1.63
3626.96	1.98	3922.35	2.25	4251.25	3.02	4267.83	3.07	4328.23	3.1
4407.08	3.12	4468.77	3.47	4483.87	3.19	4497.43	3.21	4528.55	3.29
4536.76	3.55	4539.05	3.45	4541.37	3.24	4545.72	3.28	4659.64	2.75

4729.38	2.42	4772.72	2.26	4832.11	2.1	4926	1.93	4938.44	1.74
5026.68	.46	5096.53	1.48	5127.27	.29	5151.39	-2.94	5174.02	-1.55
5200.47	.57	5227.67	.48	5321.74	2.07	5409.85	2.17	5509.04	2.28
5602.74	2.29	5674.45	2.39	5748.9	2.23	5754.92	2.21	5889.13	2.25
6077.27	2.07	6155.88	1.95	6208.6	1.83	6269.79	1.07	6339.46	.85
6441.35	1.18	6516.05	1.7	6535.21	1.74	6589.58	1.87	6589.62	1.87
6661.62	1.85	6675.03	1.85	6757.09	1.77	6762.21	1.78	6847.24	1.84
6847.65	1.84	6934.83	1.87	6955.93	1.88	7020.28	1.79	7088.75	1.71
7107.46	1.67	7149.75	1.51	7193.77	1.91	7256.78	2.35	7266.36	2.34
7453.76	2.42	7673.1	2.49	7870.27	2.38	8045.74	2.46	8188.33	2.36
8340.85	2.29	8423.13	2.4	8595.81	2.8	8677.47	2.99	8771.19	3.1
8897.48	3.17	9067.65	3.18	9231.76	3.19	9415.33	3.76	9548.98	3.29
9593.25	3.39	9708.16	3.58	9883.25	2.7310033	.95	3.4610173	.47	3.17
10358.91	3.1510596	.04	3.5910780	.64	3.3910921	.93	2.6411201	.53	2.61
11567.09	3.2211785	.41	3.0112016	.11	3.6412020	.34	3.6312192	.23	3.15
12350.01	2.9412460	.66	3.5712709	.71	3.8112883	.78	3.4213071	.27	3.3
13267.88	3.3613317	.52	3.36	13342.2	2.4313375	.08	.1213403	.12	2.33
13426.03	3.0613450	.99	3.1513518	.51	3.0513635	.22	3.1313722	.67	3.21
13846.64	3.2814065	.79	3.1614214	.62	3.1314342	.97	3.12	14539.3	2.99
14704.06	2.9714887	.82	2.94	15019.8	3.1115161	.74	3.0915262	.98	3.07
15387.42	2.96	15547.8	3.2215652	.58	3.1115761	.83	3.0915864	.56	3.08
15946.33	3.07	15991.6	3.0616046	.18	3.1416180	.39	3.2216362	.94	3.01
16582.19	3.4316804	.04	3.417018	.72	3.1917147	.25	3.1717245	.42	2.97
17289.47	2.517326	.17	.7417379	.07	017395	.46	2.6717399	.29	3.32
17414.46	3.13	17571.4	3.1117724	.52	3.5417916	.57	2.3218099	.12	3.4
18612.86	3.2518786	.34	3.1718858	.85	3.1718968	.47	2.9319437	.14	2.98
19955.01	2.87	20273.5	2.5620540	.21	2.4220604	.62	2.2920649	.98	2.39
20755.13	1.7720788	.01	1.63	20838.3	.4120971	.77	-15.1520973	.68	-15.15
21120.87	-1.9321270	.66	-.9821296	.13	-.5421388	.97	1.0421501	.52	1.5
21506.81	1.7721543	.96	1.7721611	.38	2.0421616	.01	2.0321744	.36	1.87
21925.35	2.0821938	.45	2.1222111	.27	2.6622240	.72	2.8722258	.33	2.74
22292.26	2.5522414	.93	2.2822551	.62	2.3922580	.77	2.2822637	.25	2.06
22701.79	1.1422827	.43	.522827	.62	.522957	.25	.2523008	.24	.26
23011.13	-.0423059	.22	-4.9923102	.96	-7.1123124	.78	-4.29	23146.7	.46
23181.98	3.423191	.25	3.2823326	.78	3.7323329	.38	3.7423392	.97	3.69
23419.6	4.1723456	.31	3.8823533	.91	3.95	23554.2	4.58	23633.8	6.86
23645.25	7.2823735	.83	8.6623751	.46	8.5623863	.17	9.5524010	.96	9.81
24078.46	9.9624199	.51	6.5424226	.15	5.9124240	.09	5.6824263	.17	5.64
24278	5.3124294	.44	5.0824455	.27	2.9424455	.55	2.9424656	.96	2.3
24662.57	2.3924777	.34	4.2124832	.61	5.1824869	.54	5.1724978	.12	5.28
25077.8	525087	.54	4.8725092	.82	4.8125165	.87	4.625208	.08	4.39
25254.23	4.3625504	.31	5.93	25711.9	7.9625918	.13	9.25	26137	11.01
26341.43	12.3926557	.78	12.76						

Manning's n Values		num= 6	
Sta	n Val	Sta	n Val
0	.078	4545.72	.078
23181.98	.084	4832.11	.067
		5409.85	.07320788
			.01

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4545.72	23181.98		2559	4481.46	2515.7	.1	.3
Blocked Obstructions		num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev			
24078.46	26557.78	4.52	023181.98		-.36			

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	6.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.078	0.071	0.084
W.S. Elev (ft)	6.75	Reach Len. (ft)	2559.00	4481.46	2515.70

Crit W.S. (ft)		Flow Area (sq ft)	19002.28	77029.04	3658.08
E.G. Slope (ft/ft)	0.000076	Area (sq ft)	19002.28	77029.04	3658.08
Q Total (cfs)	45600.00	Flow (cfs)	8205.40	36482.85	911.74
Top Width (ft)	25025.39	Top Width (ft)	4545.72	18636.26	1843.41
Vel Total (ft/s)	0.46	Avg. Vel. (ft/s)	0.43	0.47	0.25
Max Chl Dpth (ft)	7.11	Hydr. Depth (ft)	4.18	4.13	1.98
Conv. Total (cfs)	5218507.0	Conv. (cfs)	939034.0	4175132.0	104340.9
Length Wtd. (ft)	4125.52	Wetted Per. (ft)	4548.24	18637.29	1843.49
Min Ch El (ft)	-0.36	Shear (lb/sq ft)	0.02	0.02	0.01
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.01	0.00
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	1053.83	8572.65	215.14
C & E Loss (ft)	0.00	Cum SA (acres)	244.13	1988.19	103.23

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: Fish Creek
REACH: Lower Fish Creek RS: 0.7

INPUT
Description: Cross Section at River Mile 0.7

Station	Elevation	Data	num=	168	Sta	Elev	Sta	Elev	Sta	Elev
0	2.7	226.5	2.2	527.6	2.7	808.2	2.6	1110.6	1.6	
1391.7	2	1678.7	1.3	1962.6	2.3	2230.1	1.4	2476.5	1.8	
2741.4	1	3004.6	1.4	3249.3	1.7	3535.5	2.6	3765.7	2.5	
3962.9	1.9	4073.2	1.7	4174	1.6	4282.1	0	4357.1	1.1	
4390.1	-.2	4416	-3.7	4440.3	-2.2	4468.7	.1	4497.9	0	
4598.9	1.7	4693.5	1.8	4800	1.9	4900.6	1.9	4977.6	2	
5064	1.8	5208.1	1.9	5410.1	1.8	5494.5	1.7	5551.1	1.6	
5616.8	.8	5691.6	.6	5801	1	5881.2	1.6	5960.2	1.8	
6037.5	1.8	6140	1.8	6236.8	2	6353.5	2.1	6496.1	2	
6686.8	1.7	6888	1.8	7123.5	1.9	7335.2	1.8	7523.6	1.9	
7676.7	1.8	7928.8	1.7	8114.2	1.8	8302.5	1.9	8438.1	1.9	
8620.8	1.8	8797	1.7	8994.1	2.2	9137.6	1.6	9308.5	1.9	
9496.5	1	9658.3	1.8	9808.1	1.5	10007.2	1.5	10261.8	2	
10460	1.8	10611.7	1	10911.9	1	11304.4	1.7	11538.8	1.5	
11786.5	2.2	11975.6	1.7	12145	1.5	12263.8	2.2	12531.2	2.5	
12718.1	2.1	12919.4	2	13130.5	2.1	13183.8	2.1	13210.3	1.1	
13245.6	-1.4	13275.7	1	13300.3	1.8	13327.1	1.9	13399.6	1.8	
13524.9	1.9	13618.8	2	13751.9	2.1	13987.2	2	14147	2	
14284.8	2	14495.6	1.9	14672.5	1.9	14869.8	1.9	15011.5	2.1	
15163.9	2.1	15272.6	2.1	15406.2	2	15578.4	2.3	15690.9	2.2	
15808.2	2.2	15918.5	2.2	16006.3	2.2	16054.9	2.2	16113.5	2.3	
16257.6	2.4	16453.6	2.2	16689	2.7	16927.2	2.7	17157.7	2.5	
17295.7	2.5	17401.1	2.3	17448.4	1.8	17487.8	-1.1	17544.6	-9	
17562.2	2	17566.3	2.7	17582.6	2.5	17751.1	2.5	17915.5	3	
18121.7	1.7	18317.7	2.9	21007.8	2.5	21056.5	2.7	21204.7	2.1	
21258.7	.8	21402	-16	21560.5	-1.7	21721.8	-1.7	21849.2	1.5	
21970.4	2	21976.1	2.3	22016.1	2.3	22088.7	2.6	22231.9	2.4	
22426.8	2.6	22627	3.2	22766.4	3.4	22821.9	3	22954	2.5	
23101.2	2.4	23193.4	1.9	23262.9	.8	23398.4	-1.1	23538	-4	
23592.9	-.4	23647.8	-6.2	23694.9	-8.6	23718.4	-5.6	23742	-5	
23780	2.6	23919.8	3.4	24113.8	3.6	24219.4	7.3	24426.1	9.6	
24630.3	10.2	24783.6	5.3	24987.7	2.2	25179	1.5	25345.6	4.5	
25587.4	3.9	25745.5	3.8	25982.7	5.5	26179.6	7.7	26375.2	9.1	
26582.8	11	26776.7	12.5	26981.9	12.9					

Manning's n Values num= 10

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.085	226.5	.075	4174	.07	4598.9	.075	5551.1	.07		
5881.2	.075	21204.7	.07	21976.1	.075	23101.2	.07	23780	.085		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.			
	3765.7	23780		0	0		.1	.3			
Blocked Obstructions	num=		2								
Sta L	Sta R	Elev	Sta L	Sta R	Elev						
0	23780	.3	24630.3	26981.9	4.09						

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	6.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.075	0.074	0.085
W.S. Elev (ft)	6.42	Reach Len. (ft)			
Crit W.S. (ft)	2.34	Flow Area (sq ft)	16874.73	89624.13	3792.40
E.G. Slope (ft/ft)	0.000080	Area (sq ft)	16874.73	89624.13	3792.40
Q Total (cfs)	53000.00	Flow (cfs)	8081.71	43904.88	1013.42
Top Width (ft)	25511.48	Top Width (ft)	3765.70	20014.30	1731.48
Vel Total (ft/s)	0.48	Avg. Vel. (ft/s)	0.48	0.49	0.27
Max Chl Dpth (ft)	6.12	Hydr. Depth (ft)	4.48	4.48	2.19
Conv. Total (cfs)	5924818.0	Conv. (cfs)	903445.8	4908083.0	113289.1
Length Wtd. (ft)		Wetted Per. (ft)	3769.44	20014.88	1731.58
Min Ch El (ft)	0.30	Shear (lb/sq ft)	0.02	0.02	0.01
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.01	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 RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 13.8

INPUT

Description: Cross Section at River Mile 13.8

Station	Elevation	Data	num=	79							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.7	14.5	57.9	253.3	57.6	480.1	57	699	54.9		
954.5	51.4	1189.4	47.4	1492.7	46.5	1772.2	46.1	2076.9	46.5		
2360.2	47.7	2979	47.2	3218.8	47.7	3334.6	53.9	3574.2	52.4		
3870.6	51.6	4116.8	51.3	4469.1	50.5	4805.3	54.2	4980.7	54.3		
5242.5	54.5	5540	54.1	5881.1	52.3	6128.1	48.9	6423.3	45.2		
6583.3	45.4	7011.5	42.8	7363	44.2	7478.5	47.1	7796.2	43.7		
8010.7	49	8086.7	41.7	8314.6	40.9	8367.8	43.9	8427	40.6		
8440.3	40.3	8446.6	37.9	8456.4	37	8463.4	37.7	8499.1	36.5		
8502.7	35.5	8537	33.9	8581.8	32.1	8622	32.4	8635	30.4		
8664.2	28.8	8674.2	27.5	8684.2	26.3	8694.2	25	8704.2	23.6		
8714.2	23	8724.2	23.6	8734.2	24.7	8748.8	28.9	8754.4	31.6		
8759.9	35.9	8773.7	35.9	8791.8	41.1	8807.1	41.6	8954.9	44.1		
9246.1	44.8	9408.5	53	9561.1	55.1	9851.5	56.9	10144.3	57.9		
10458.4	58.7	10756.9	60.6	11057.1	59.8	11356	57.3	11646.3	57.4		
11961	58.5	12247.7	58.6	12554.3	58.3	12851.6	59	13163.2	59.3		
13460.6	60.3	13760	59.7	14068	59.7	14358.1	64				

Manning's n Values	num=		7								
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.05	2360.2	.04	5881.1	.05	8446.6	.06	8502.7	.031		
8773.7	.06	8954.9	.04								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 8502.7 8773.7 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	44.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.054	0.031	0.060
W.S. Elev (ft)	43.85	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	1462.43	3647.16	285.11
E.G. Slope (ft/ft)	0.000345	Area (sq ft)	1462.43	3647.16	285.11
Q Total (cfs)	19900.00	Flow (cfs)	1505.06	18207.96	186.98
Top Width (ft)	1332.14	Top Width (ft)	894.58	271.00	166.55
Vel Total (ft/s)	3.69	Avg. Vel. (ft/s)	1.03	4.99	0.66
Max Chl Dpth (ft)	20.85	Hydr. Depth (ft)	1.63	13.46	1.71
Conv. Total (cfs)	1072090.0	Conv. (cfs)	81083.2	980933.4	10073.3
Length Wtd. (ft)	2215.76	Wetted Per. (ft)	895.55	274.40	167.31
Min Ch El (ft)	23.00	Shear (lb/sq ft)	0.04	0.29	0.04
Alpha	1.68	Stream Power (lb/ft s)	0.04	1.43	0.02
Frothn Loss (ft)	0.77	Cum Volume (acre-ft)	4651.90	5117.76	5042.05
C & E Loss (ft)	0.00	Cum SA (acres)	2253.01	426.78	1438.01

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 13.375*

INPUT

Description: Interpolated Cross Section at River Mile 13.38

Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1106.32	58.32	1120.99	57.55	1285.91	57.16	1362.51	57.01	1509.14	56.52
1591.89	56.29	1746.05	54.88	1813.28	54.29	2026.51	51.62	2071.69	51.02
2259.66	47.91	2309.26	47.13	2513.09	46.56	2616.01	46.23	2792.52	45.9
2898.69	45.75	3206.86	46.09	3493.38	47.18	4119.23	46.63	4361.76	47.07
4478.87	52.87	4721.2	51.43	5019.29	50.65	5020.97	50.64	5075.67	50.59
5269.97	50.42	5317.72	50.34	5582.01	49.63	5626.28	49.52	5859.31	51.79
5966.31	52.87	6108.45	52.94	6143.71	52.95	6377.97	53.11	6408.49	53.14
6629.59	52.92	6709.37	52.8	7054.35	51.03	7304.16	47.78	7409.89	46.52
7602.72	44.27	7656.9	44.33	7764.54	44.46	8197.62	42.03	8493.93	43.14
8553.12	43.39	8669.93	46.16	8699.18	45.88	8944.57	43.3	8991.25	42.84
9126.89	45.95	9208.19	47.7	9224.95	46.19	9285.05	40.86	9407.27	40.51
9515.55	40.07	9534.33	41.04	9569.35	42.94	9629.23	39.96	9642.68	39.71
9649.05	37.47	9658.96	36.64	9666.04	37.31	9691.07	36.58	9702.15	36.17
9705.79	35.21	9738.53	33.43	9750.54	32.85	9774.83	31.57	9781.3	31.29
9802.24	31.35	9819.68	31.44	9832.09	29.54	9837.62	29.23	9859.97	28.03
9869.52	26.81	9872.32	26.48	9879.07	25.68	9888.61	24.46	9898.16	23.14
9907.71	22.58	9910.53	22.73	9913.42	22.87	9916.25	23.01	9918.85	23.15
9919.74	23.19	9921.71	23.35	9924.59	23.58	9927.42	23.85	9930.27	24.27
9931.78	24.52	9933.33	25	9943.42	27.29	9949.35	28.63	9952.39	29.78
9956.09	31.17	9961.89	34.71	9962.71	35.21	9969.19	35.28	9979.31	35.91
9998.05	40.78	10011.74	41.19	10013.89	41.23	10035.69	41.41	10069.37	41.87
10104.57	42.56	10128.59	42.64	10166.91	42.96	10187.28	42.86	10222.48	43.11
10357.2	43.49	10468.38	43.88	10488.08	44.81	10636.51	51.54	10671.49	51.97
10794.5	53.49	10852.6	53.81	11057.45	54.91	11095.15	55.16	11101.25	55.18
11333.7	55.85	11384.19	56.41	11398.28	56.47	11477.75	56.81	11640.72	57.24
11723.47	57.44	11791.52	57.84	11979.5	58.98	12032.5	59.27	12191.43	58.84
12343.29	58.55	12371.67	58.35	12586.92	56.95	12652.74	56.41	12777.42	56.35
12953.29	56.44	12974.66	56.51	13179.78	57.37	13279.09	57.75	13376.76	57.86
13574.74	57.95	13575.91	57.95	13774.23	57.85	13893.33	57.77	13969.96	57.94

14183.68	58.5614201.12	58.614361.74	58.7514523.72	58.9614597.42	59.22
14774.23	59.7914831.61	59.9314860.97	59.8614919.99	59.6315072.04	59.43
15141.58	59.315286.23	59.3115460.45	59.3815471.04	59.5315646.58	61.99
15760.79	63.58				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1106.32	.05	9705.79	.031	9979.31	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9705.79	9979.31		1530.69	2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	43.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.050	0.031	0.050
W.S. Elev (ft)	43.08	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	1487.09	3655.84	268.61
E.G. Slope (ft/ft)	0.000348	Area (sq ft)	1487.09	3655.84	268.61
Q Total (cfs)	19900.00	Flow (cfs)	1442.10	18297.21	160.69
Top Width (ft)	1461.88	Top Width (ft)	949.15	273.52	239.21
Vel Total (ft/s)	3.68	Avg. Vel. (ft/s)	0.97	5.00	0.60
Max Chl Dpth (ft)	20.50	Hydr. Depth (ft)	1.57	13.37	1.12
Conv. Total (cfs)	1066094.0	Conv. (cfs)	77256.9	980228.6	8608.4
Length Wtd. (ft)	2181.21	Wetted Per. (ft)	950.00	276.33	239.85
Min Ch El (ft)	22.58	Shear (lb/sq ft)	0.03	0.29	0.02
Alpha	1.71	Stream Power (lb/ft s)	0.03	1.44	0.01
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)	4600.08	4926.58	5034.39
C & E Loss (ft)	0.02	Cum SA (acres)	2220.62	412.52	1432.40

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.95*

INPUT
 Description: Interpolated Cross Section at River Mile 12.95
 Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2212.65	57.94	2227.48	57.2	2394.26	56.63	2471.72	56.42	2620	55.83
2703.68	55.59	2859.57	54.22	2927.56	53.69	3143.19	51.24	3188.87	50.63
3378.96	47.59	3429.12	46.86	3635.24	46.33	3739.32	45.96	3917.82	45.56
4025.19	45.4	4336.82	45.67	4626.57	46.65	5259.45	46.06	5504.71	46.44
5623.15	51.83	5868.2	50.46	6169.64	49.69	6171.35	49.69	6226.66	49.64
6423.15	49.55	6471.43	49.48	6738.7	48.66	6783.47	48.54	7019.11	50.54
7127.32	51.55	7271.06	51.6	7306.71	51.61	7543.61	51.74	7574.47	51.78
7798.07	51.64	7878.74	51.51	8227.61	49.76	8480.23	46.65	8587.15	45.45
8782.15	43.34	8836.94	43.4	8945.79	43.52	9383.73	41.27	9683.38	42.31
9743.23	42.57	9861.36	45.22	9890.95	44.98	10139.09	42.41	10186.29	41.98
10323.47	44.89	10405.68	46.41	10422.62	44.97	10483.41	40.02	10607	39.75
10716.49	39.24	10735.49	40.13	10770.9	41.97	10831.45	39.32	10845.05	39.11
10851.5	37.04	10861.52	36.29	10868.68	36.93	10893.99	36.31	10905.19	35.83
10908.88	34.91	10940.07	32.95	10951.51	32.31	10974.64	30.78	10980.81	30.48
11000.75	30.43	11017.37	30.48	11029.19	28.68	11034.45	28.38	11055.74	27.25
11064.84	26.11	11067.5	25.81	11073.93	25.06	11083.02	23.91	11092.12	22.68
11101.21	22.15	11104.52	22.31	11107.89	22.46	11111.2	22.61	11114.24	22.74
11115.28	22.77	11117.58	22.92	11120.95	23.13	11124.26	23.39	11127.6	23.97
11129.35	24.34	11131.17	24.92	11142.97	27.11	11149.89	28.36	11153.45	29.44
11157.77	30.74	11164.56	34.05	11165.51	34.53	11173.09	34.66	11184.92	35.91

11204.3	40.4611218.45	40.8411220.68	40.8711243.22	40.8411278.05	41.23
11314.45	42.0511339.29	41.811378.91	41.8111399.98	41.5711436.38	41.99
11575.69	42.4411690.67	42.9611711.03	43.8511864.53	50.09 11900.7	50.47
12027.9	51.8812087.98	52.1812299.81	53.13 12338.8	53.4112345.11	53.44
12585.48	54.0112637.69	54.9512652.26	55.0412734.44	55.5112902.96	55.98
12988.53	56.18 13058.9	56.5713253.29	57.69 13308.1	57.9413472.45	57.48
13629.49	57.313658.83	57.1213881.42	56.0713949.49	55.514078.41	55.35
14260.27	55.4814282.38	55.5514494.49	56.5714597.19	57.0114698.19	57.18
14902.91	57.314904.12	57.3 15109.2	57.2915232.36	57.23 15311.6	57.41
15532.61	58.1715550.65	58.215716.73	58.3615884.24	58.6215960.46	58.9
16143.29	59.4616202.63	59.5616232.99	59.4816294.02	59.1316451.26	59.02
16523.16	58.9116672.74	58.92 16852.9	59.0716863.85	59.2117045.38	61.61
17163.47	63.16				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 2212.65 .0510908.88 .03111184.92 .0049

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 10908.881184.92 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	42.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.050	0.031	0.005
W.S. Elev (ft)	42.42	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	1624.07	3686.61	325.81
E.G. Slope (ft/ft)	0.000294	Area (sq ft)	1624.07	3686.61	325.81
Q Total (cfs)	19900.00	Flow (cfs)	1432.39	16951.31	1516.30
Top Width (ft)	1731.72	Top Width (ft)	1071.65	276.04	384.04
Vel Total (ft/s)	3.53	Avg. Vel. (ft/s)	0.88	4.60	4.65
Max Chl Dpth (ft)	20.27	Hydr. Depth (ft)	1.52	13.36	0.85
Conv. Total (cfs)	1160916.0	Conv. (cfs)	83562.2	988897.1	88456.9
Length Wtd. (ft)	2177.30	Wetted Per. (ft)	1072.40	278.48	384.59
Min Ch El (ft)	22.15	Shear (lb/sq ft)	0.03	0.24	0.02
Alpha	1.58	Stream Power (lb/ft s)	0.02	1.12	0.07
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	4545.41	4734.36	5026.17
C & E Loss (ft)	0.00	Cum SA (acres)	2185.11	398.14	1423.77

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.525*

INPUT

Description: Interpolated Cross Section at River Mile 12.53

Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3318.97	57.56	3333.97	56.85	3502.61	56.1	3580.92	55.83	3730.85	55.13
3815.47	54.88	3973.1	53.56	4041.84	53.08	4259.87	50.85	4306.06	50.25
4498.27	47.27	4548.98	46.59	4757.4	46.09	4862.64	45.68	5043.12	45.21
5151.68	45.05	5466.78	45.26	5759.75	46.13	6399.68	45.49	6647.67	45.81
6767.42	50.8	7015.2	49.49	7319.99	48.73	7321.72	48.73	7377.65	48.7
7576.32	48.67	7625.14	48.63	7895.38	47.69	7940.65	47.55	8178.92	49.3
8288.33	50.22	8433.67	50.25	8469.72	50.26	8709.25	50.38	8740.46	50.42
8966.54	50.36	9048.11	50.21	9400.86	48.49	9656.29	45.53	9764.4	44.39
9961.57	42.4110016.97	42.4610127.03	42.5810569.85	40.510872.83	41.48				
10933.35	41.76	11052.8	44.2811082.71	44.0711333.61	41.5111381.34	41.12			
11520.04	43.8211603.17	45.11 11620.3	43.7511681.76	39.1911806.73	38.99				

11917.44	38.4211936.64	39.2211972.46	41.0112033.68	38.6812047.43	38.52
12053.95	36.612064.08	35.9312071.32	36.5412096.92	36.0112108.24	35.5
12111.96	34.62 12141.6	32.4812152.47	31.7612174.45	29.9812180.31	29.67
12199.26	29.5112215.05	29.5212226.28	27.8312231.29	27.5412251.51	26.48
12260.16	25.4212262.69	25.13 12268.8	24.4412277.44	23.3712286.08	22.22
12294.72	21.73 12298.5	21.912302.36	22.0512306.15	22.1812309.63	22.33
12310.82	22.3612313.45	22.4912317.31	22.67 12321.1	22.9312324.92	23.67
12326.93	24.16 12329	24.8512342.51	26.9112350.44	28.0912354.51	29.1
12359.46	30.3112367.23	33.3912368.31	33.8412376.99	34.0412390.54	35.92
12410.55	40.1412425.17	40.4912427.47	40.512450.76	40.2812486.73	40.59
12524.33	41.5312549.99	40.9712590.92	40.6712612.68	40.2812650.28	40.87
12794.18	41.3812912.95	42.0412933.99	42.913092.54	48.6313129.91	48.97
13261.3	50.2713323.36	50.5513542.18	51.3513582.45	51.6713588.97	51.7
13837.26	52.1813891.19	53.4913906.24	53.6113991.13	54.2214165.21	54.73
14253.6	54.9214326.29	55.2914527.08	56.4 14583.7	56.6114753.47	56.12
14915.68	56.04 14946	55.915175.92	55.1815246.23	54.6 15379.4	54.35
15567.26	54.5215590.09	54.59 15809.2	55.7715915.28	56.2616019.61	56.5
16231.08	56.6516232.33	56.6516444.17	56.7216571.39	56.716653.24	56.89
16881.54	57.7716900.17	57.817071.73	57.9617244.76	58.2917323.49	58.58
17512.34	59.1417573.64	59.19 17605	59.0917668.05	58.6217830.46	58.61
17904.74	58.5118059.25	58.5418245.35	58.7518256.66	58.8918444.17	61.23
18566.16	62.74				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 3318.97 .0512111.96 .03112390.54 .049

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 12111.9612390.54 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	42.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.	0.050	0.031	0.049
W.S. Elev (ft)	41.69	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	1709.99	3690.90	399.71
E.G. Slope (ft/ft)	0.000338	Area (sq ft)	1709.99	3690.90	399.71
Q Total (cfs)	19900.00	Flow (cfs)	1589.01	18108.04	202.95
Top Width (ft)	1897.10	Top Width (ft)	1159.37	278.58	459.15
Vel Total (ft/s)	3.43	Avg. Vel. (ft/s)	0.93	4.91	0.51
Max Chl Dpth (ft)	19.96	Hydr. Depth (ft)	1.47	13.25	0.87
Conv. Total (cfs)	1082870.0	Conv. (cfs)	86467.2	985359.7	11043.5
Length Wtd. (ft)	2207.27	Wetted Per. (ft)	1160.02	280.79	459.63
Min Ch El (ft)	21.73	Shear (lb/sq ft)	0.03	0.28	0.02
Alpha	1.87	Stream Power (lb/ft s)	0.03	1.36	0.01
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	4486.83	4541.23	5016.13
C & E Loss (ft)	0.00	Cum SA (acres)	2145.91	383.62	1412.11

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 12.1*

INPUT
 Description: Interpolated Cross Section at River Mile 12.1
 Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4425.3	57.17	4440.46	56.51	4610.95	55.57	4690.13	55.23	4841.71	54.44
4927.25	54.18	5086.62	52.9	5156.12	52.47	5376.55	50.46	5423.25	49.87

5617.57	46.95	5668.84	46.32	5879.55	45.85	5985.95	45.41	6168.42	44.86
6278.17	44.7	6596.74	44.85	6892.94	45.6	7539.91	44.92	7790.62	45.17
7911.69	49.77	8162.2	48.52	8470.35	47.78	8472.09	47.78	8528.64	47.75
8729.5	47.8	8778.85	47.77	9052.07	46.72	9097.84	46.57	9338.73	48.05
9449.34	48.89	9596.28	48.91	9632.73	48.92	9874.89	49.01	9906.44	49.06
10135.02	49.0810217	49	48.9210574	11	47.2110832	36	44.4110941	66	43.32
11140.99	41.49	11197	41.5311308	28	41.6411755	97	39.7412062	28	40.65
12123.47	40.9412244	23	43.3412274	47	43.1712528	13	40.6212576	39	40.26
12716.62	42.7612800	65	43.8112817	98	42.5312880	11	38.3513006	46	38.23
13118.39	37.59	13137.8	38.3113174	01	40.05	13235.9	38.0413249	81	37.92
13256.4	36.1713266	64	35.5713273	96	36.1513299	84	35.7313311	29	35.17
13315.05	34.3313343	13	32.0113353	43	31.2213374	26	29.1813379	82	28.86
13397.77	28.613412	73	28.5613423	38	26.9713428	12	26.6913447	29	25.71
13455.47	24.7313457	87	24.4613463	66	23.8213471	85	22.8313480	04	21.76
13488.23	21.313492	49	21.4813496	84	21.64	13501.1	21.7713505	02	21.92
13506.36	21.9413509	32	22.0613513	67	22.2113517	93	22.4813522	24	23.37
13524.5	23.9813526	84	24.7813542	06	26.7113550	98	27.8213555	57	28.76
13561.14	29.8813569	89	32.7313571	12	33.1613580	89	33.4313596	15	35.93
13616.8	39.8213631	89	40.1513634	26	40.1313658	29	39.7213695	41	39.95
13734.21	41.0113760	69	40.1313802	93	39.5213825	38	38.9913864	18	39.75
14012.68	40.3314135	23	41.1214156	94	41.9514320	56	47.1714359	11	47.47
14494.7	48.6714558	74	48.9114784	54	49.5814826	09	49.9214832	82	49.97
15089.04	50.3415144	69	52.0415160	23	52.1815247	82	52.9215427	46	53.47
15518.66	53.6715593	67	54.0115800	88	55.11	15859.3	55.2816034	49	54.77
16201.88	54.7916233	16	54.6816470	41	54.316542	97	53.716680	39	53.36
16874.25	53.5616897	81	53.63	17123.9	54.9717233	37	55.5117341	03	55.82
17559.25	5617560	54	5617779	15	56.1617910	42	56.1717994	89	56.36
18230.46	57.3718249	69	57.418426	73	57.5618605	28	57.9518686	52	58.25
18881.4	58.8118944	66	58.8218977	02	58.7119042	07	58.1219209	68	58.2
19286.32	58.1219445	76	58.15	19637.8	58.4319649	47	58.5619842	96	60.85
19968.85	62.33								

Manning's n Values	num=	4
Sta	n Val	Sta
4425.3	.0513315.05	.0313343.13
		.03113596.15
		.049

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	13315.05	13596.15		1530.69	2280.69	1205.25		.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	41.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.	0.050	0.031	0.049
W.S. Elev (ft)	40.96	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	1806.60	3687.09	490.69
E.G. Slope (ft/ft)	0.000331	Area (sq ft)	1806.60	3687.09	490.69
Q Total (cfs)	19900.00	Flow (cfs)	1633.54	17999.47	266.98
Top Width (ft)	2042.21	Top Width (ft)	1250.47	281.10	510.64
Vel Total (ft/s)	3.33	Avg. Vel. (ft/s)	0.90	4.88	0.54
Max Chl Dpth (ft)	19.66	Hydr. Depth (ft)	1.44	13.12	0.96
Conv. Total (cfs)	1094203.0	Conv. (cfs)	89820.5	989702.1	14680.1
Length Wtd. (ft)	2200.46	Wetted Per. (ft)	1251.04	283.20	511.06
Min Ch El (ft)	21.30	Shear (lb/sq ft)	0.03	0.27	0.02
Alpha	1.96	Stream Power (lb/ft s)	0.03	1.31	0.01
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	4425.05	4348.08	5003.81
C & E Loss (ft)	0.00	Cum SA (acres)	2103.57	368.97	1398.69

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 11.675*

INPUT
 Description: Interpolated Cross Section at River Mile 11.68

Station Elevation Data		num= 161		Elev		Sta		Elev		Sta	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5531.62	56.79	5546.95	56.16	5719.3	55.04	5799.34	54.64	5952.57	53.74		
6039.04	53.47	6200.14	52.24	6270.4	51.87	6493.23	50.07	6540.44	49.49		
6736.87	46.63	6788.7	46.05	7001.71	45.61	7109.26	45.14	7293.72	44.52		
7404.66	44.35	7726.7	44.43	8026.12	45.08	8680.13	44.35	8933.58	44.54		
9055.97	48.73	9309.2	47.55	9620.7	46.82	9622.47	46.82	9679.62	46.8		
9882.67	46.92	9932.57	46.91	10208.75	45.76	10255.02	45.59	10498.53	46.81		
10610.35	47.57	10758.89	47.57	10795.73	47.57	11040.53	47.64	11072.43	47.7		
11303.49	47.81	11386.86	47.62	11747.37	45.94	12008.42	43.29	12118.91	42.25		
12320.42	40.56	12377.04	40.59	12489.52	40.71	12942.09	38.97	13251.73	39.82		
13313.59	40.13	13435.66	42.41	13466.23	42.26	13722.66	39.73	13771.44	39.4		
13913.19	41.71	13998.14	42.52	14015.65	41.31	14078.47	37.51	14206.19	37.47		
14319.33	36.76	14338.96	37.41	14375.56	39.09	14438.13	37.41	14452.19	37.33		
14458.84	35.74	14469.2	35.22	14476.6	35.77	14502.76	35.44	14514.33	34.83		
14518.14	34.03	14544.67	31.54	14554.4	30.68	14574.07	28.38	14579.32	28.05		
14596.28	27.68	14610.42	27.61	14620.47	26.11	14624.95	25.84	14643.06	24.94		
14650.79	24.03	14653.06	23.79	14658.53	23.19	14666.26	22.28	14674	21.3		
14681.73	20.88	14686.47	21.07	14691.31	21.23	14696.05	21.36	14700.41	21.51		
14701.9	21.53	14705.2	21.63	14710.03	21.75	14714.77	22.02	14719.56	23.07		
14722.08	23.81	14724.68	24.71	14741.6	26.52	14751.53	27.56	14756.63	28.43		
14762.83	29.46	14772.56	32.07	14773.92	32.47	14784.79	32.81	14801.76	35.93		
14823.06	39.51	14838.61	39.81	14841.05	39.77	14865.82	39.16	14904.1	39.32		
14944.1	40.49	14971.39	39.29	15014.94	38.38	15038.08	37.71	15078.08	38.63		
15231.17	39.28	15357.52	40.2	15379.9	40.99	15548.57	45.72	15588.32	45.98		
15728.1	47.06	15794.12	47.28	16026.9	47.81	16069.74	48.18	16076.68	48.23		
16340.82	48.51	16398.19	50.59	16414.21	50.75	16504.51	51.63	16689.7	52.22		
16783.73	52.41	16861.06	52.74	17074.67	53.81	17134.9	53.95	17315.5	53.41		
17488.07	53.54	17520.32	53.45	17764.91	53.42	17839.71	52.81	17981.38	52.36		
18181.24	52.61	18205.53	52.67	18438.61	54.18	18551.47	54.77	18662.45	55.15		
18887.42	55.35	18888.75	55.35	19114.12	55.61	19249.46	55.63	19336.53	55.83		
19579.39	56.97	19599.21	57.01	19781.72	57.17	19965.8	57.61	20049.55	57.93		
20250.46	58.48	20315.67	58.45	20349.03	58.32	20416.1	57.62	20588.89	57.79		
20667.9	57.72	20832.28	57.76	21030.25	58.12	21042.28	58.24	21241.76	60.47		
21371.54	61.91										

Manning's n Values		num= 4		n Val		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
5531.62	.05	14518.14	.03	14544.67	.03	114801.76	.048		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	14518.14	1414801.76		1530.69	2280.69	1205.25		.1	.3

CROSS SECTION OUTPUT	Profile #Calibration				
E.G. Elev (ft)	40.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.050	0.031	0.048
W.S. Elev (ft)	40.24	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	1936.24	3679.00	601.45
E.G. Slope (ft/ft)	0.000330	Area (sq ft)	1936.24	3679.00	601.45
Q Total (cfs)	19900.00	Flow (cfs)	1721.03	17816.35	362.62
Top Width (ft)	2173.34	Top Width (ft)	1347.00	283.62	542.71
Vel Total (ft/s)	3.20	Avg. Vel. (ft/s)	0.89	4.84	0.60
Max Chl Dpth (ft)	19.36	Hydr. Depth (ft)	1.44	12.97	1.11
Conv. Total (cfs)	1095157.0	Conv. (cfs)	94713.4	980487.6	19956.0

Length Wtd. (ft)	2190.37	Wetted Per. (ft)	1347.50	285.68	543.09
Min Ch El (ft)	20.88	Shear (lb/sq ft)	0.03	0.27	0.02
Alpha	2.06	Stream Power (lb/ft s)	0.03	1.29	0.01
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	4359.29	4155.25	4988.71
C & E Loss (ft)	0.00	Cum SA (acres)	2057.94	354.18	1384.12

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 11.25*

INPUT

Description: Interpolated Cross Section at River Mile 11.25

Station Elevation Data		num= 161									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6637.95	56.41	6653.44	55.81	6827.64	54.51	6908.54	54.05	7063.42	53.05		
7150.83	52.77	7313.67	51.59	7384.68	51.26	7609.91	49.68	7657.62	49.1		
7856.17	46.31	7908.56	45.78	8123.86	45.38	8232.57	44.87	8419.02	44.17		
8531.16	44	8856.66	44.02	9159.31	44.56	9820.36	43.78	10076.53	43.91		
10200.24	47.7	10456.2	46.58	10771.06	45.87	10772.84	45.86	10830.61	45.86		
11035.85	46.04	11086.28	46.06	11365.44	44.79	11412.21	44.61	11658.34	45.56		
11771.36	46.24	11921.5	46.23	11958.74	46.23	12206.18	46.27	12238.41	46.34		
12471.96	46.52	12556.23	46.33	12920.62	44.67	13184.48	42.16	13296.16	41.18		
13499.84	39.63	13557.07	39.65	13670.77	39.76	14128.2	38.21	14441.18	38.99		
14503.7	39.31	14627.09	41.46	14657.99	41.36	14917.18	38.83	14966.48	38.53		
15109.76	40.63	15195.63	41.22	15213.33	40.09	15276.82	36.67	15405.91	36.71		
15520.28	35.93	15540.12	36.49	15577.11	38.12	15640.36	36.76	15654.56	36.73		
15661.29	35.31	15671.76	34.86	15679.24	35.38	15705.68	35.16	15717.38	34.5		
15721.22	33.74	15746.2	31.06	15755.36	30.13	15773.89	27.58	15778.82	27.24		
15794.79	26.76	15808.1	26.65	15817.56	25.25	15821.78	24.99	15838.83	24.16		
15846.11	23.34	15848.24	23.12	15853.39	22.57	15860.67	21.74	15867.96	20.85		
15875.24	20.45	15880.46	20.65	15885.78	20.82	15891	20.94	15895.8	21.1		
15897.45	21.11	15901.07	21.21	15906.39	21.29	15911.61	21.56	15916.88	22.78		
15919.65	23.62	15922.52	24.63	15941.15	26.33	15952.08	27.29	15957.69	28.09		
15964.51	29.03	15975.23	31.41	15976.73	31.79	15988.69	32.19	16007.38	35.94		
16029.31	39.19	16045.32	39.46	16047.85	39.41	16073.36	38.61	16112.78	38.68		
16153.98	39.98	16168.02	38.46	16226.94	37.23	16250.79	36.41	16291.99	37.51		
16449.66	38.23	16579.8	39.28	16602.85	40.04	16776.59	44.26	16817.53	44.48		
16961.5	45.45	17029.5	45.64	17269.27	46.03	17313.39	46.43	17320.54	46.49		
17592.6	46.67	17651.69	49.13	17668.19	49.32	17761.2	50.33	17951.95	50.96		
18048.8	51.15	18128.44	51.46	18348.46	52.52	18410.5	52.62	18596.52	52.06		
18774.27	52.29	18807.48	52.23	19059.41	52.53	19136.46	51.91	19282.38	51.36		
19488.22	51.63	19513.24	51.71	19753.32	53.38	19869.56	54.02	19983.88	54.47		
20215.59	54.72	20216.96	54.72	20449.09	55.03	20588.49	55.12	20678.17	55.3		
20928.32	56.58	20948.74	56.61	21136.72	56.77	21326.31	57.27	21412.58	57.61		
21619.52	58.16	21686.69	58.08	21721.05	57.94	21790.13	57.12	21968.1	57.38		
22049.48	57.32	22218.79	57.38	22422.7	57.82	22435.09	57.92	22640.55	60.09		
22774.22	61.49										

Manning's n Values		num= 4			
Sta	n Val	Sta	n Val	Sta	n Val
6637.95	.05	15721.22	.04	15746.2	.03
				16007.38	.048

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	15721.22	16007.38		1530.69	2280.69	1205.25		.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	39.84	Element	Left OB	Channel	Right OB
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Vel Head (ft)	0.32	Wt. n-Val.	0.050	0.031	0.048
W.S. Elev (ft)	39.52	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	2084.66	3663.78	723.07
E.G. Slope (ft/ft)	0.000335	Area (sq ft)	2084.66	3663.78	723.07
Q Total (cfs)	19900.00	Flow (cfs)	1834.91	17564.83	500.26
Top Width (ft)	2303.35	Top Width (ft)	1460.38	286.16	556.82
Vel Total (ft/s)	3.08	Avg. Vel. (ft/s)	0.88	4.79	0.69
Max Chl Dpth (ft)	19.07	Hydr. Depth (ft)	1.43	12.80	1.30
Conv. Total (cfs)	1087451.0	Conv. (cfs)	100270.1	959843.9	27337.3
Length Wtd. (ft)	2176.77	Wetted Per. (ft)	1460.80	288.26	557.17
Min Ch El (ft)	20.45	Shear (lb/sq ft)	0.03	0.27	0.03
Alpha	2.15	Stream Power (lb/ft s)	0.03	1.27	0.02
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	4288.64	3963.02	4970.38
C & E Loss (ft)	0.00	Cum SA (acres)	2008.61	339.27	1368.91

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 10.825*

INPUT
 Description: Interpolated Cross Section at River Mile 10.83

Station Elevation Data		num= 161	
Sta	Elev	Sta	Elev
7744.27	56.03	7759.93	55.46
8262.62	52.06	8427.19	50.93
8975.48	45.99	9028.42	45.51
9657.65	43.65	9986.62	43.61
11344.51	46.67	11603.2	45.61
12189.02	45.17	12239.99	45.21
12932.37	44.91	113084.11	44.88
13640.44	45.23	13725.6	45.03
14679.26	38.7	14737.1	38.72
15693.82	38.51	5818.52	40.53
16306.34	39.57	16393.12	39.93
16721.23	35.11	6741.28	35.58
16863.74	34.88	16874.32	34.51
16924.31	33.44	16947.73	30.59
16993.3	25.85	17005.78	25.69
17041.43	22.65	17043.43	22.45
17068.74	20.03	17074.44	20.24
17092.99	20.71	17096.94	20.77
17117.23	23.44	17120.36	24.56
17166.2	28.61	17177.89	30.75
17235.56	38.87	17252.04	39.11
17363.86	39.46	17392.79	37.62
17668.16	37.17	17802.08	38.36
18194.9	43.84	18264.88	44.01
18844.38	44.83	18905.19	47.68
19313.86	49.89	19395.83	50.19
20060.46	51.03	20094.64	51.01
20795.21	50.67	20820.96	50.75
21543.76	54.05	21545.18	54.05
22277.25	56.18	22298.26	56.21
22988.58	57.83	23057.7	57.71
23431.06	56.93	23605.3	56.99
24176.91	61.07		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
7744.27	.0516924.31	.0516947.73	.03117212.99	.047			

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	16924.3117212.99			1530.69 2280.69	1205.25	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	39.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.050	0.031	0.047
W.S. Elev (ft)	38.80	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	2269.60	3640.25	859.22
E.G. Slope (ft/ft)	0.000336	Area (sq ft)	2269.60	3640.25	859.22
Q Total (cfs)	19900.00	Flow (cfs)	1956.13	17242.23	701.64
Top Width (ft)	2600.82	Top Width (ft)	1763.86	288.68	548.29
Vel Total (ft/s)	2.94	Avg. Vel. (ft/s)	0.86	4.74	0.82
Max Chl Dpth (ft)	18.77	Hydr. Depth (ft)	1.29	12.61	1.57
Conv. Total (cfs)	1085594.0	Conv. (cfs)	106711.6	940606.3	38276.4
Length Wtd. (ft)	2160.11	Wetted Per. (ft)	1764.22	290.87	548.61
Min Ch El (ft)	20.03	Shear (lb/sq ft)	0.03	0.26	0.03
Alpha	2.26	Stream Power (lb/ft s)	0.02	1.24	0.03
Frothn Loss (ft)	0.72	Cum Volume (acre-ft)	4212.14	3771.81	4948.49
C & E Loss (ft)	0.00	Cum SA (acres)	1951.96	324.22	1353.62

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 10.4*

INPUT

Description: Interpolated Cross Section at River Mile 10.4

Station Elevation Data	num=	161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8850.6	55.65	8866.42	55.11	9044.33	53.45	9126.96	52.87	9285.14	51.66
9374.41	51.36	9540.71	50.27	9613.24	50.05	9843.27	48.91	9892	48.34
10094.78	45.67	10148.28	45.24	10368.17	44.9	10479.2	44.33	10669.61	43.48
10784.14	43.31	11116.58	43.19	11425.67	43.51	12100.81	42.64	12362.44	42.65
12488.79	45.63	12750.2	44.64	13071.76	43.95	13073.58	43.95	13132.59	43.97
13342.2	44.29	13393.7	44.35	13678.81	42.85	13726.57	42.64	13977.95	43.07
14093.38	43.59	14246.72	43.54	14284.75	43.54	14537.46	43.54	14570.38	43.62
14808.91	43.95	14894.97	43.74	15267.12	42.13	15536.61	39.92	15650.67	39.04
15858.69	37.77	15917.13	37.78	16033.25	37.88	16500.44	36.68	16820.09	37.33
16883.94	37.68	17009.95	39.59	17041.51	39.55	17306.22	37.05	17356.58	36.81
17502.91	38.51	17590.61	38.63	17608.68	37.65	17673.53	35.17	17805.37	35.19
17922.17	34.28	17942.43	34.67	17980.22	36.21	18044.81	35.48	18059.32	35.54
18066.19	34.44	18076.88	34.15	18084.52	34.61	18111.52	34.58	18123.47	33.84
18127.4	33.15	18149.27	30.12	18157.29	29.05	18173.51	25.99	18177.83	25.61
18191.81	24.93	18203.46	24.73	18211.75	23.54	18215.44	23.29	18230.37	22.62
18236.75	21.95	18238.61	21.77	18243.12	21.33	18249.5	20.65	18255.87	19.93
18262.25	19.61	18268.42	19.82	18274.72	19.99	18280.9	20.11	18286.58	20.28
18288.53	20.28	18292.81	20.34	18299.11	20.37	18305.29	20.65	18311.53	22.18
18314.8	23.26	18318.19	24.49	18340.24	25.94	18353.17	26.75	18359.81	27.41
18367.88	28.17	18380.56	30.09	18382.34	30.42	18396.49	30.95	18418.6	35.95
18441.81	38.55	18458.76	38.77	18461.43	38.66	18488.43	37.48	18530.14	37.4
18573.74	38.94	18603.49	36.79	18650.96	34.95	18676.19	33.82	18719.79	35.26
18886.65	36.12	19024.37	37.44	19048.76	38.13	19232.62	41.35	19275.94	41.48
19428.3	42.23	19500.26	42.37	19753.99	42.49	19800.69	42.94	19808.25	43.01
20096.16	42.99	20158.69	46.23	20176.15	46.46	20274.58	47.75	20476.44	48.45
20578.93	48.63	20663.21	48.91	20896.05	49.94	20961.7	49.96	21158.56	49.35

21346.65	49.78	21381.8	49.7921648.41	50.7721729.94	50.121884.36	49.37
22102.2	49.7122128.67	49.7922382.73	51.7822505.74	52.5322626.72	53.12	
22871.93	53.422873.39	53.423119.03	53.9123266.55	54.0323361.46	54.24	
23626.18	55.7823647.78	55.8123846.72	55.9724047.35	56.624138.64	56.97	
24357.63	57.5124428.71	57.3424465.08	57.1724538.18	56.1124726.52	56.57	
24812.64	56.5324991.81	56.6 25207.6	57.1725220.71	57.2825438.14	59.33	
25579.6	60.65					

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8850.6	.05	18127.4	.0618149.27	.031	18418.6	.047	

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

18127.4	18418.6	1530.69	2280.69	1205.25	.1	.3
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CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	38.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.050	0.031	0.047
W.S. Elev (ft)	38.09	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	2529.04	3611.60	1014.98
E.G. Slope (ft/ft)	0.000335	Area (sq ft)	2529.04	3611.60	1014.98
Q Total (cfs)	19900.00	Flow (cfs)	2110.88	16864.69	924.43
Top Width (ft)	2752.27	Top Width (ft)	1904.38	291.20	556.69
Vel Total (ft/s)	2.78	Avg. Vel. (ft/s)	0.83	4.67	0.91
Max Chl Dpth (ft)	18.49	Hydr. Depth (ft)	1.33	12.40	1.82
Conv. Total (cfs)	1087374.0	Conv. (cfs)	115342.3	921518.4	50512.8
Length Wtd. (ft)	2141.47	Wetted Per. (ft)	1904.70	293.54	556.99
Min Ch El (ft)	19.60	Shear (lb/sq ft)	0.03	0.26	0.04
Alpha	2.40	Stream Power (lb/ft s)	0.02	1.20	0.03
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	4127.82	3581.97	4922.56
C & E Loss (ft)	0.00	Cum SA (acres)	1887.51	309.04	1338.33

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.975*

INPUT
 Description: Interpolated Cross Section at River Mile 9.98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9956.92	55.27	9972.91	54.7610152.68	52.9210236.17	52.28	10396	50.96
10486.2	50.6510654.24	49.6110727.52	49.4410959.94	48.5211009.19	47.96		
11214.08	45.3511268.14	44.9711490.32	44.6611602.51	44.0511794.91	43.13		
11910.64	42.9412246.54	42.7812558.86	42.9813241.04	42.07 13505.4	42.02		
13633.06	44.6 13897.2	43.6814222.12	4314223.96	4314283.58	43.02		
14495.37	43.4214547.41	43.49 14835.5	41.8814883.76	41.6615137.76	41.82		
15254.39	42.2615409.33	42.215447.76	42.19 15703.1	42.1715736.37	42.26		
15977.38	42.6716064.34	42.4416440.38	40.8616712.68	38.7916827.92	37.98		
17038.11	36.8417097.17	36.85 17214.5	36.9417686.55	35.9118009.54	36.5		
18074.05	36.8718201.38	38.6518233.27	38.6418500.74	36.1518551.62	35.95		
18699.48	37.4418788.09	37.3318806.36	36.4418871.88	34.16 19005.1	34.43		
19123.12	33.4519143.59	33.7619181.77	35.2319247.03	34.84 19261.7	34.95		
19268.64	34.0119279.44	33.7919287.16	34.2219314.45	34.319326.52	33.5		
19330.49	32.86 19350.8	29.6519358.25	28.519373.32	25.1919377.34	24.8		
19390.32	24.0219401.15	23.7719408.85	22.6819412.28	22.4419426.14	21.85		
19432.06	21.26 19433.8	21.119437.99	20.7119443.91	20.1119449.83	19.47		
19455.76	19.1819462.41	19.41 19469.2	19.5819475.85	19.719481.97	19.87		

19484.07	19.8719488.69	19.9119495.47	19.9119502.13	20.1919508.85	21.88
19512.38	23.0819516.03	24.4119539.78	25.7519553.71	26.4819560.88	27.07
19569.57	27.7419583.23	29.4319585.14	29.7319600.39	30.3319624.21	35.96
19648.06	38.2319665.47	38.4219668.22	38.319695.96	36.9219738.82	36.77
19783.62	38.4219814.19	35.9519862.96	33.819888.89	32.5319933.69	34.14
20105.14	35.0720246.65	36.5220271.71	37.1820460.63	39.8920505.15	39.98
20661.7	40.6220735.64	40.7420996.36	40.7121044.33	41.2 21052.1	41.27
21347.94	41.1621412.19	44.7721430.13	45.0321531.27	46.4521738.68	47.19
21843.99	47.37 21930.6	47.6322169.84	48.64 22237.3	48.6322439.57	47.99
22632.85	48.5322668.97	48.5622942.91	49.8823026.68	49.223185.35	48.37
23409.19	48.7523436.39	48.8323697.44	50.9823823.84	51.7823948.14	52.44
24200.1	52.75 24201.6	52.75 24454	53.3424605.58	53.5 24703.1	53.71
24975.1	55.38 24997.3	55.4125201.71	55.5825407.87	56.2625501.68	56.65
25726.69	57.1825799.73	56.9625837.09	56.7925912.21	55.6126105.73	56.16
26194.22	56.1426378.32	56.2126600.05	56.8526613.52	56.9526836.94	58.95
26982.29	60.23				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9956.92	.0519330.49	.06	19350.8	.03119624.21	.047		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
19330.4919624.21 1530.69 2280.69 1205.25 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	37.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.050	0.031	0.047
W.S. Elev (ft)	37.40	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	2858.92	3579.27	1192.00
E.G. Slope (ft/ft)	0.000332	Area (sq ft)	2858.92	3579.27	1192.00
Q Total (cfs)	19900.00	Flow (cfs)	2254.74	16461.87	1183.39
Top Width (ft)	2973.56	Top Width (ft)	2104.36	293.72	575.48
Vel Total (ft/s)	2.61	Avg. Vel. (ft/s)	0.79	4.60	0.99
Max Chl Dpth (ft)	18.22	Hydr. Depth (ft)	1.36	12.19	2.07
Conv. Total (cfs)	1092287.0	Conv. (cfs)	123759.9	903572.3	64955.1
Length Wtd. (ft)	2120.23	Wetted Per. (ft)	2104.63	296.25	575.76
Min Ch El (ft)	19.18	Shear (lb/sq ft)	0.03	0.25	0.04
Alpha	2.59	Stream Power (lb/ft s)	0.02	1.15	0.04
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)	4033.16	3393.72	4892.03
C & E Loss (ft)	0.01	Cum SA (acres)	1817.08	293.73	1322.67

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: 9.55000*

INPUT

Description: Interpolated Cross Section at River Mile 9.55

Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11063.25	54.89	11079.4	54.4111261.02	52.3911345.37	51.6911506.85	50.27			
11597.98	49.9511767.76	48.9511841.79	48.8312076.62	48.1312126.37	47.57				
12333.38	45.03	12388	44.712612.47	44.4312725.82	43.7812920.21	42.78			
13037.13	42.59	13376.5	42.3613692.04	42.4614381.26	41.514648.35	41.39			
14777.33	43.57	15044.2	42.7115372.47	42.0415374.33	42.0415434.57	42.08			
15648.55	42.5415701.13	42.6315992.18	40.9116040.94	40.6816297.56	40.58				
16415.4	40.9316571.94	40.8616610.76	40.8516868.74	40.816902.36	40.9				
17145.86	41.3917233.71	41.1517613.63	39.5917888.74	37.6718005.18	36.91				

18217.53	35.91	18277.2	35.9118395.74	35.9918872.67	35.1519198.99	35.68
19264.17	36.0519392.82	37.7119425.03	37.7319695.27	35.2619746.67	35.09	
19896.06	36.3819985.58	36.0420004.04	35.2220070.23	33.3220204.83	33.67	
20324.07	32.6220344.75	32.8620383.32	34.2720449.26	34.220464.07	34.35	
20471.09	33.58	20482	33.44	20489.8	33.8420517.37	34.0120529.56
20533.57	32.5620552.34	29.1720559.21	27.9620573.13	24.3920576.84	23.99	
20588.83	23.120598.83	22.8120605.94	21.8220609.11	21.5920621.91	21.07	
20627.38	20.5720628.98	20.4320632.85	20.0920638.32	19.5720643.79	19.01	
20649.26	18.7520656.39	18.9920663.67	19.17	20670.8	19.2820677.36	19.46
20679.61	19.4620684.56	19.4820691.83	19.4520698.96	19.7420706.17	21.59	
20709.96	22.920713.87	24.3420739.33	25.5620754.26	26.2120761.94	26.73	
20771.26	27.3120785.89	28.7620787.95	29.0520804.29	29.7120829.82	35.96	
20854.31	37.9120872.19	38.0720875.01	37.9320903.49	36.3620947.51	36.13	
20993.51	37.9121024.89	35.1221074.97	32.6621101.59	31.2421147.59	33.02	
21323.64	34.0221468.93	35.621494.67	36.2221688.65	38.4321734.36	38.49	
21895.1	39.0221971.02	39.1122238.72	38.9422287.98	39.4622295.96	39.53	
22599.72	39.3222665.69	43.3222684.11	43.622787.96	45.1623000.93	45.94	
23109.06	46.1223197.98	46.3623443.64	47.35	23512.9	47.323720.59	46.63
23919.04	47.2823956.13	47.3424237.41	4924323.43	48.324486.35	47.38	
24716.17	47.79	24744.1	47.8625012.15	50.1925141.93	51.0425269.56	51.76
25528.27	52.125529.81	52.125788.97	52.7825944.61	52.9726044.74	53.18	
26324.03	54.9926346.83	55.0126556.71	55.1826768.39	55.9226864.71	56.33	
27095.75	56.8627170.74	56.5927209.11	56.427286.23	55.1127484.94	55.75	
27575.8	55.7427764.83	55.83	27992.5	56.5328006.33	56.6328235.73	58.57
28384.97	59.81					

Manning's n Values	num=	4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
11063.25	.0520533.57	.0720552.34	.03120829.82	.046			

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
20533.57	20829.82	1530.69	2280.69	1205.25	.1	.3	

Blocked Obstructions	num=	2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev
020533.57	16.920829.82	28384.97	30.39		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	36.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.050	0.031	0.046
W.S. Elev (ft)	36.70	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	3265.40	3539.75	1387.53
E.G. Slope (ft/ft)	0.000329	Area (sq ft)	3265.40	3539.75	1387.53
Q Total (cfs)	19900.00	Flow (cfs)	2413.20	15987.35	1499.46
Top Width (ft)	3163.06	Top Width (ft)	2262.28	296.25	604.54
Vel Total (ft/s)	2.43	Avg. Vel. (ft/s)	0.74	4.52	1.08
Max Chl Dpth (ft)	17.95	Hydr. Depth (ft)	1.44	11.95	2.30
Conv. Total (cfs)	1096995.0	Conv. (cfs)	133028.3	881308.3	82658.1
Length Wtd. (ft)	2085.05	Wetted Per. (ft)	2262.51	299.02	604.81
Min Ch El (ft)	18.75	Shear (lb/sq ft)	0.03	0.24	0.05
Alpha	2.80	Stream Power (lb/ft s)	0.02	1.10	0.05
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	3925.56	3207.36	4856.35
C & E Loss (ft)	0.01	Cum SA (acres)	1740.36	278.28	1306.35

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 9.12500*

INPUT

Description: Interpolated Cross Section at River Mile 9.13

Station Elevation Data		num= 161	
Sta	Elev	Sta	Elev
12169.57	54.5112185.89	54.0712369.37	51.8512454.58
12709.77	49.2412881.28	48.2912956.07	48.23 13193.3
13452.69	44.713507.87	44.4313734.63	44.1913849.13
14163.62	42.2414506.46	41.9514825.23	41.9415521.49
15921.61	42.53 16191.2	41.7416522.83	41.08 16524.7
16801.72	41.6616854.84	41.7817148.87	39.9417198.12
17576.41	39.6117734.55	39.5117773.77	39.518034.39
18314.33	40.1118403.08	39.8518786.88	38.31 19064.8
19396.96	34.9919457.23	34.9819576.99	35.0520058.79
20454.29	35.2420584.25	36.7720616.79	36.8320889.79
21092.63	35.3221183.07	34.7421201.71	3421268.59
21525.01	31.7921545.91	31.9521584.87	33.3121651.48
21673.54	33.1521684.56	33.0821692.44	33.4521720.29
21736.66	32.2721753.87	28.721760.18	27.4221772.94
21787.34	22.1821796.51	21.8521803.03	20.9621805.94
21822.7	19.8721824.17	19.7621827.72	19.4721832.73
21842.77	18.3321850.38	18.5821858.14	18.7621865.75
21875.15	19.0421880.43	19.05 21888.2	18.99 21895.8
21907.53	22.7221911.71	24.2721938.87	25.36 21954.8
21972.94	26.8821988.56	28.121990.75	28.3622008.19
22060.56	37.5922078.91	37.73 22081.8	37.5622111.03
22203.39	37.3922235.59	34.2822286.98	31.5122314.29
22542.13	32.9622691.22	34.6822717.62	35.2722916.66
23128.5	37.41 23206.4	37.4723481.08	37.1723531.63
23851.5	37.4823919.19	41.8723938.09	42.1724044.65
24374.12	44.8624465.37	45.0824717.43	46.06 24788.5
25205.24	46.0325243.29	46.12 25531.9	48.1225620.17
26023.16	46.8326051.82	46.926326.86	49.3926460.02
26856.44	51.4526858.02	51.4527123.94	52.2227283.64
27672.96	54.5927696.35	54.6127911.71	54.7828128.91
28464.81	56.5328541.76	56.2228581.12	56.0228660.26
28957.38	55.3429151.34	55.4429384.95	56.2229399.14
29787.66	59.39		

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
12169.57	.0521736.66	.0821753.87	.03122035.44

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
21736.66	22035.44	1530.69	2280.69	1205.25	.1	.3

Blocked Obstructions		num= 2	
Sta L	Sta R	Elev	Elev
021736.66	18.622035.44	29787.66	29.85

CROSS SECTION OUTPUT		Profile #Calibration	
E.G. Elev (ft)	36.21	Element	Left OB Channel Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.050 0.035 0.046
W.S. Elev (ft)	35.99	Reach Len. (ft)	1530.69 2280.69 1205.25
Crit W.S. (ft)		Flow Area (sq ft)	3670.08 3486.90 1599.95
E.G. Slope (ft/ft)	0.000382	Area (sq ft)	3670.08 3486.90 1599.95
Q Total (cfs)	19900.00	Flow (cfs)	3031.17 14925.00 1943.83
Top Width (ft)	3331.19	Top Width (ft)	2387.24 298.78 645.17
Vel Total (ft/s)	2.27	Avg. Vel. (ft/s)	0.83 4.28 1.21
Max Chl Dpth (ft)	17.66	Hydr. Depth (ft)	1.54 11.67 2.48
Conv. Total (cfs)	1017985.0	Conv. (cfs)	155059.7 763488.9 99436.4

Length Wtd. (ft)	2047.50	Wetted Per. (ft)	2387.43	301.86	645.45
Min Ch El (ft)	18.33	Shear (lb/sq ft)	0.04	0.28	0.06
Alpha	2.71	Stream Power (lb/ft s)	0.03	1.18	0.07
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	3803.70	3023.41	4815.02
C & E Loss (ft)	0.00	Cum SA (acres)	1658.66	262.70	1289.06

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: 8.70000*

INPUT
Description: Interpolated Cross Section at River Mile 8.7

Station Elevation Data		num= 161							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
13275.9	54.1213292.38	53.7213477.71	51.3213563.79	50.513728.57	48.88				
13821.56	48.5413994.81	47.6314070.35	47.6214309.98	47.3514360.75	46.81				
14571.99	44.3814627.73	44.1614856.78	43.9514972.44	43.24 15170.8	42.09				
15290.11	41.8915636.42	41.5415958.41	41.4116661.72	40.3616934.27	40.12				
17065.88	41.5 17338.2	40.7717673.18	40.1317675.08	40.1317736.54	40.18				
17954.9	40.7918008.55	40.9218305.55	38.9718355.31	38.7118617.17	38.08				
18737.42	38.2818897.16	38.1718936.78	38.1619200.03	38.0719234.33	38.18				
19482.8	38.8319572.45	38.5519960.14	37.0420240.87	35.4320359.68	34.77				
20576.38	34.0620637.27	34.0420758.23	34.1121244.91	33.6221577.89	34.02				
21644.41	34.4221775.68	35.8321808.55	35.9222084.31	33.4722136.77	33.37				
22289.2	34.2522380.56	33.4422399.39	32.7822466.94	31.6522604.28	32.14				
22725.96	30.9622747.06	31.0422786.43	32.3522853.71	32.9222868.83	33.17				
22875.98	32.7122887.12	32.7222895.08	33.0622923.21	33.4422935.66	32.5				
22939.75	31.98 22955.4	28.2322961.14	26.8722972.75	22.7922975.85	22.37				
22985.86	21.27 22994.2	20.8923000.13	20.123002.77	19.923013.45	19.53				
23018.02	19.1823019.36	19.0923022.58	18.8523027.15	18.4823031.71	18.09				
23036.27	17.923044.36	18.1623052.61	18.35 23060.7	18.4623068.14	18.64				
23070.69	18.6323076.31	18.6223084.55	18.5423092.64	18.8323100.81	20.99				
23105.11	22.5423109.54	24.1923138.42	25.1723155.35	25.6723164.06	26.05				
23174.63	26.4523191.23	27.4423193.55	27.6823212.09	28.4823241.05	35.97				
23266.81	37.2823285.63	37.3823288.59	37.223318.56	35.2423364.87	34.85				
23413.27	36.8723446.29	33.4423498.98	30.3723526.99	28.6623575.39	30.78				
23760.62	31.91 23913.5	33.7623940.58	34.3224144.68	35.5224192.77	35.49				
24361.9	35.824441.78	35.8424723.45	35.3924775.28	35.9724783.67	36.06				
25103.28	35.6525172.69	40.4125192.07	40.7425301.34	42.5725525.42	43.42				
25639.19	43.625732.76	43.825991.22	44.77 26064.1	44.6426282.63	43.92				
26491.43	44.7726530.45	44.89 26826.4	47.2326916.91	46.527088.33	45.39				
27330.15	45.8727359.54	45.9427641.56	48.5927778.12	49.5427912.41	50.41				
28184.62	50.828186.23	50.8128458.91	51.6528622.67	51.928728.03	52.12				
29021.89	54.1929045.87	54.2129266.71	54.3929489.43	55.2529590.77	55.68				
29833.87	56.229912.77	55.8529953.14	55.6430034.29	54.1130243.36	54.93				
30338.96	54.9530537.85	55.05 30777.4	55.930791.95	55.9931033.32	57.82				
31190.35	58.97								

Manning's n Values		num= 4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
13275.9	.0522939.75	.0822961.14	.03123241.05	.046			

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	22939.75	23241.05	1530.69	2280.69	1205.25	.1	.3

Blocked Obstructions		num= 2			
Sta L	Sta R	Elev	Sta L	Sta R	Elev
022939.75	20.323241.05	31190.35	29.3		

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	35.40		0.050	0.036	0.046
Vel Head (ft)	0.20	Wt. n-Val.			
W.S. Elev (ft)	35.20	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	3921.80	3403.96	1786.87
E.G. Slope (ft/ft)	0.000400	Area (sq ft)	3921.80	3403.96	1786.87
Q Total (cfs)	19900.00	Flow (cfs)	3367.46	14308.89	2223.65
Top Width (ft)	3494.37	Top Width (ft)	2485.06	298.32	710.98
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)	0.86	4.20	1.24
Max Chl Dpth (ft)	17.30	Hydr. Depth (ft)	1.58	11.41	2.51
Conv. Total (cfs)	994779.8	Conv. (cfs)	168335.9	715285.9	111157.9
Length Wtd. (ft)	2034.99	Wetted Per. (ft)	2485.23	301.66	711.26
Min Ch El (ft)	17.90	Shear (lb/sq ft)	0.04	0.28	0.06
Alpha	2.73	Stream Power (lb/ft s)	0.03	1.19	0.08
Frctn Loss (ft)	0.88	Cum Volume (acre-ft)	3670.31	2843.01	4768.16
C & E Loss (ft)	0.00	Cum SA (acres)	1573.06	247.07	1270.30

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 8.27500*

INPUT
 Description: Interpolated Cross Section at River Mile 8.28
 Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
14382.22	53.7414398.87	53.3714586.06	50.79	14673	49.9114839.43	48.18			
14933.35	47.8315108.33	46.9815184.63	47.0115426.66	46.9615477.93	46.42				
15691.29	44.0615747.59	43.8915978.94	43.7116095.76	42.97	16296.1	41.74			
16416.61	41.5416766.38	41.12	17091.6	40.8917801.94	39.7918077.22	39.49			
18210.15	40.47	18485.2	39.818823.54	39.1718887.53	39.24				
19108.07	39.9119162.26	40.0719462.24	38.0119512.49	37.7319776.98	36.84				
19898.43	36.9520059.77	36.8320099.78	36.8120365.67	36.720400.31	36.81				
20651.28	37.5420741.82	37.2621133.39	35.7721416.93	34.321536.94	33.7				
21755.8	33.13	21817.3	33.1121939.47	33.1722431.02	32.8522767.34	33.19			
22834.52	33.6122967.11	34.8923000.31	35.0223278.83	32.5823331.81	32.51				
23485.78	33.1923578.05	32.1523597.07	31.5623665.29	30.8123804.01	31.38				
23926.91	30.1423948.22	30.1323987.98	31.3824055.94	32.29	24071.2	32.57			
24078.43	32.2824089.69	32.3724097.72	32.6824126.13	33.16	24138.7	32.17			
24142.83	31.6824156.94	27.7524162.11	26.3324172.56	21.9924175.35	21.56				
24184.37	20.3524191.88	19.9324197.22	19.25	24199.6	19.0524209.22	18.75			
24213.34	18.4924214.54	18.4224217.45	18.2324221.56	17.9424225.67	17.63				
24229.78	17.4824238.35	17.7524247.08	17.9324255.65	18.0424263.53	18.23				
24266.23	18.2124272.18	18.1924280.92	18.0824289.48	18.3724298.13	20.69				
24302.68	22.3624307.38	24.1224337.96	24.98	24355.9	25.424365.12	25.72			
24376.31	26.03	24393.9	26.7824396.36	26.9924415.99	27.8624446.66	35.98			
24473.06	36.9624492.34	37.0424495.38	36.8324526.09	34.6824573.55	34.21				
24623.15	36.3524656.99	32.6124710.99	29.2224739.69	27.3724789.29	29.66				
24979.12	30.8625135.78	32.8425163.53	33.3625372.69	34.0625421.98	33.99				
25595.3	34.1925677.16	34.225965.81	33.6226018.93	34.2226027.53	34.32				
26355.06	33.8126426.19	38.9626446.05	39.3126558.03	41.2826787.66	42.17				
26904.26	42.3427000.14	42.5327265.02	43.48	27339.7	43.3127563.64	42.57			
27777.62	43.5227817.61	43.67	28120.9	46.3528213.65	45.628389.32	44.39			
28637.13	44.9128667.25	44.9828956.27	47.7929096.21	48.829233.83	49.73				
29512.79	50.1529514.44	50.1629793.88	51.09	29961.7	51.3730069.67	51.59			
30370.81	53.7930395.39	53.82	30621.7	53.9930849.95	54.91	30953.8	55.36		

31202.92 55.8831283.79 55.4831325.15 55.2531408.31 53.6131622.57 54.53
 31720.54 54.5531924.36 54.6632169.85 55.5832184.76 55.6732432.11 57.44
 32593.04 58.56

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 14382.22 .0524142.83 .0924162.11 .03124446.66 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 24142.8324446.66 1530.69 2280.69 1205.25 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 024142.83 2224446.6632593.04 28.76

CROSS SECTION OUTPUT Profile #Calibration

			Left OB	Channel	Right OB
E.G. Elev (ft)	34.52	Element	0.050	0.036	0.045
Vel Head (ft)	0.22	Wt. n-Val.	0.050	0.036	0.045
W.S. Elev (ft)	34.30	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	3913.19	3282.75	2197.32
E.G. Slope (ft/ft)	0.000466	Area (sq ft)	3913.19	3282.75	2197.32
Q Total (cfs)	19900.00	Flow (cfs)	3576.72	14296.80	2026.49
Top Width (ft)	4563.60	Top Width (ft)	2549.39	297.48	1716.73
Vel Total (ft/s)	2.12	Avg. Vel. (ft/s)	0.91	4.36	0.92
Max Chl Dpth (ft)	16.82	Hydr. Depth (ft)	1.53	11.04	1.28
Conv. Total (cfs)	921938.1	Conv. (cfs)	165704.2	662349.8	93884.2
Length Wtd. (ft)	2005.11	Wetted Per. (ft)	2549.55	301.15	1717.01
Min Ch El (ft)	17.48	Shear (lb/sq ft)	0.04	0.32	0.04
Alpha	3.09	Stream Power (lb/ft s)	0.04	1.38	0.03
Frctn Loss (ft)	0.93	Cum Volume (acre-ft)	3532.65	2667.96	4713.04
C & E Loss (ft)	0.01	Cum SA (acres)	1484.60	231.47	1236.71

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 7.85000*

INPUT
 Description: Interpolated Cross Section at River Mile 7.85
 Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
15488.55	53.3615505.36	53.0215694.41	50.26 15782.2	49.3215950.28	47.49				
16045.14	47.1316221.85	46.3216298.91	46.4116543.34	46.5816595.12	46.04				
16810.59	43.7416867.45	43.6217101.09	43.4817219.07	42.7 17421.4	41.39				
17543.1	41.1917896.34	40.7118224.78	40.3618942.17	39.2219220.18	38.86				
19354.43	39.43 19632.2	38.8319973.89	38.2119975.82	38.2220038.52	38.29				
20261.25	39.0420315.97	39.2120618.93	37.0420669.68	36.7520936.79	35.59				
21059.44	35.6221222.38	35.4921262.79	35.4621531.31	35.33 21566.3	35.45				
21819.75	36.26 21911.2	35.9622306.64	34.522592.99	33.1822714.19	32.64				
22935.22	32.222997.33	32.1723120.72	32.2323617.14	32.0923956.79	32.36				
24024.64	32.7924158.54	32.9524192.07	34.1124473.35	31.6924526.86	31.65				
24682.35	32.1324775.54	30.8524794.74	30.3424863.64	29.9725003.74	30.62				
25127.85	29.3125149.58	29.2225189.53	30.4225258.16	31.6525273.58	31.98				
25280.88	31.8525292.25	32.0125300.36	32.2925329.05	32.8725341.75	31.84				
25345.92	31.3925358.47	27.2825363.07	25.7925372.38	21.225374.86	20.75				
25382.88	19.4325389.56	18.9825394.31	18.3925396.43	18.2 25405	17.98				
25408.65	17.7925409.73	17.7425412.31	17.625415.97	17.3925419.63	17.17				
25423.29	17.0525432.33	17.3325441.55	17.52 25450.6	17.6325458.92	17.82				

25461.77	17.825468.05	17.7625477.28	17.6225486.32	17.9125495.45	20.4
25500.26	22.1825505.22	24.0525537.51	24.7925556.44	25.1425566.18	25.38
25578	25.625596.56	26.1225599.16	26.325619.89	27.2425652.27	35.99
25679.31	36.6425699.06	36.6925702.17	36.4625733.63	34.1225782.23	33.58
25833.03	35.84 25867.7	31.77 25923	28.0825952.39	26.08 26003.2	28.54
26197.61	29.8126358.07	31.9226386.49	32.4126600.71	32.626651.18	32.5
26828.7	32.5826912.54	32.5727208.17	31.8527262.57	32.4827271.38	32.58
27606.84	31.97 27679.7	37.5127700.04	37.8827814.72	39.9928049.91	40.91
28169.32	41.0828267.53	41.2528538.81	42.18 28615.3	41.9828844.66	41.21
29063.82	42.2729104.77	42.45 29415.4	45.4729510.39	44.729690.31	43.39
29944.12	43.9529974.96	44.0230270.98	47 30414.3	48.0530555.25	49.05
30840.96	49.530842.65	49.5131128.86	50.5331300.73	50.8331411.31	51.06
31719.74	53.431744.92	53.42 31976.7	53.5932210.47	54.5732316.83	55.04
32571.98	55.55 32654.8	55.1132697.17	54.8732782.34	53.133001.78	54.12
33102.12	54.1633310.87	54.28 33562.3	55.2633577.57	55.3433830.91	57.06
33995.72	58.14				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
15488.55	.0525345.92		.125363.07		.03125652.27		.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
25345.9225652.27 1530.69 2280.69 1205.25 .1 .3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
025345.92	23.725652.27	33995.72	28.2		

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	33.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.050	0.037	0.045
W.S. Elev (ft)	33.39	Reach Len. (ft)	1530.69	2280.69	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	3873.21	3151.16	3129.91
E.G. Slope (ft/ft)	0.000465	Area (sq ft)	3873.21	3151.16	3129.91
Q Total (cfs)	19900.00	Flow (cfs)	3473.96	13170.73	3255.30
Top Width (ft)	4682.62	Top Width (ft)	2614.40	296.71	1771.51
Vel Total (ft/s)	1.96	Avg. Vel. (ft/s)	0.90	4.18	1.04
Max Chl Dpth (ft)	16.34	Hydr. Depth (ft)	1.48	10.62	1.77
Conv. Total (cfs)	923248.3	Conv. (cfs)	161172.3	611048.1	151027.8
Length Wtd. (ft)	1924.19	Wetted Per. (ft)	2614.55	300.78	1771.81
Min Ch El (ft)	17.05	Shear (lb/sq ft)	0.04	0.30	0.05
Alpha	3.09	Stream Power (lb/ft s)	0.04	1.27	0.05
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	3395.84	2499.53	4639.34
C & E Loss (ft)	0.02	Cum SA (acres)	1393.88	215.92	1188.45

Warning: Divided flow computed for this cross-section.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: 7.42500*

INPUT

Description: Interpolated Cross Section at River Mile 7.43

Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
16594.87	52.9816611.85	52.6716802.75	49.7316891.41	48.7317061.14	46.79				
17156.93	46.4217335.38	45.6617413.19	45.817660.02	46.1917712.31	45.66				
17929.89	43.4217987.31	43.3518223.24	43.2418342.38	42.42 18546.7	41.05				
18669.59	40.84 19026.3	40.2919357.96	39.84 20082.4	38.6520363.13	38.23				

20498.7	38.4	20779.2	37.8621124.24	37.26	21126.2	37.2621189.51	37.35		
21414.42	38.1621469.69	38.3621775.61	36.0721826.86	35.7622096.59	34.35				
22220.45	34.322384.99	34.1422425.79	34.1222696.96	33.9722732.28	34.09				
22988.22	34.9823080.57	34.6723479.89	33.2323769.06	32.0623891.44	31.57				
24114.65	31.2724177.37	31.2424301.96	31.2924803.26	31.3225146.24	31.53				
25214.76	31.9825349.97	33.0125383.84	33.2125667.88	30.7925721.91	30.79				
25878.92	31.0625973.02	29.5625992.42	29.12	26062	29.1326203.47	29.86			
26328.8	28.4826350.54	28.3126391.08	29.4626460.39	31.0126475.96	31.38				
26483.33	31.4226494.81	31.65	26503	31.926531.98	32.5926544.79	31.5			
26549.01	31.09	26560	26.8126564.03	25.2426572.19	20.426574.36	19.94			
26581.39	18.5226587.24	18.0226591.41	17.5326593.27	17.3526600.77	17.21				
26603.97	17.126604.91	17.0726607.18	16.9826610.38	16.8526613.59	16.71				
26616.79	16.6326626.31	16.9226636.03	17.1126645.55	17.2126654.31	17.41				
26657.31	17.3826663.93	17.3326673.64	17.1626683.16	17.4626692.78	20.1				
26697.83	2226703.06	23.9726737.05	24.5926756.99	24.8726767.24	25.04				
26779.68	25.1726799.23	25.4626801.97	25.6226823.79	26.6226857.88	35.99				
26885.57	36.3226905.78	36.3526908.96	36.126941.16	33.5626990.91	32.94				
27042.92	35.32	27078.4	30.94	27135	26.94	27165.1	24.79	27217.1	27.42
27416.1	28.7527580.35	3127609.44	31.4527828.72	31.1527880.39	31				
28062.1	30.9728147.92	30.9328450.53	30.0728506.22	30.7328515.24	30.84				
28858.62	30.14	28933.2	36.0528954.02	36.4529071.41	38.6929312.15	39.66			
29434.39	39.8229534.91	39.98	29812.6	40.89	29890.9	40.6530125.68	39.86		
30350.01	41.0230391.94	41.22	30709.9	44.5830807.14	43.8	30991.3	42.4		
31251.11	42.9931282.68	43.0631585.69	46.2	31732.4	47.3131876.68	48.38			
32169.13	48.8532170.86	48.8632463.83	49.9632639.76	50.332752.96	50.53				
33068.67	5333094.44	53.02	33331.7	53.233570.98	54.2433679.86	54.72			
33941.04	55.2334025.81	54.7434069.18	54.4834156.37	52.634380.98	53.71				
34483.71	53.7634697.38	53.8934954.75	54.9534970.39	55.02	35229.7	56.68			
35398.41	57.72								

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val
 16594.87 .0526549.01 .126564.03 .03126857.88 .044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 26549.0126857.88 1530.69 2280.7 1205.25 .1 .3

Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 026549.01 25.426857.8835398.41 27.66

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	32.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.050	0.036	0.044
W.S. Elev (ft)	32.62	Reach Len. (ft)	1530.69	2280.70	1205.25
Crit W.S. (ft)		Flow Area (sq ft)	4268.07	3059.82	4381.17
E.G. Slope (ft/ft)	0.000368	Area (sq ft)	4268.07	3059.82	4381.17
Q Total (cfs)	19900.00	Flow (cfs)	3481.99	11331.09	5086.92
Top Width (ft)	4887.68	Top Width (ft)	2765.86	296.62	1825.20
Vel Total (ft/s)	1.70	Avg. Vel. (ft/s)	0.82	3.70	1.16
Max Chl Dpth (ft)	15.99	Hydr. Depth (ft)	1.54	10.32	2.40
Conv. Total (cfs)	1037519.0	Conv. (cfs)	181539.3	590764.4	265214.9
Length Wtd. (ft)	1789.47	Wetted Per. (ft)	2766.02	301.24	1825.55
Min Ch El (ft)	16.63	Shear (lb/sq ft)	0.04	0.23	0.06
Alpha	2.86	Stream Power (lb/ft s)	0.03	0.86	0.06
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	3252.80	2336.94	4535.43
C & E Loss (ft)	0.02	Cum SA (acres)	1299.35	200.39	1138.69

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 7.0

INPUT

Description: Cross Section at River Mile 7.0

Station Elevation Data num= 87									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17701.2	52.6	17911.1	49.2	18172	46.1	18448.9	45	18776.7	45.8
19049.2	43.1	19345.4	43	19672	40.7	22274.6	36.3	22340.5	36.4
22623.4	37.5	22932.3	35.1	23256.4	33.1	23547.6	32.8	23862.6	32.6
24156.7	33.7	25068.7	30.5	25357.4	30.3	26335.7	30.7	26575.6	32.3
26862.4	29.9	27075.5	30	27190.1	27.9	27403.2	29.1	27551.7	27.4
27734.9	32.3	27752.1	30.8	27765	24.7	27772	19.6	27779.9	17.6
27790.1	16.5	27800.1	16.4	27810.3	16.2	27820.3	16.5	27830.5	16.7
27840.5	16.8	27849.7	17	27859.8	16.9	27870	16.7	27880	17
27890.1	19.8	27900.9	23.9	27936.6	24.4	27968.3	24.7	28001.9	24.8
28027.7	26	28063.5	36	28112.5	36	28148.7	33	28199.6	32.3
28252.8	34.8	28289.1	30.1	28377.8	23.5	28431	26.3	28634.6	27.7
28832.4	30.5	29109.6	29.5	29383.3	29.3	29692.9	28.3	29759.1	29.1
30110.4	28.3	30186.7	34.6	30328.1	37.4	30574.4	38.4	30802.3	38.7
31086.4	39.6	31406.7	38.5	31679.1	40	32004.4	43.7	32292.3	41.4
32590.4	42.1	32900.4	45.4	33198.1	47.7	33497.3	48.2	33798.8	49.4
34094.6	50	34417.6	52.6	34686.7	52.8	35042.9	54.4	35310.1	54.9
35441.2	54.1	35530.4	52.1	35760.2	53.3	36083.9	53.5	36363.2	54.7
36628.5	56.3	36801.1	57.3						

Manning's n Values num= 9									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
17701.2	.04	18448.9	.05	19672	.04	25068.7	.05	27752.1	.11
27765	.031	28027.7	.11	28289.1	.05	28832.4	.04		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	27752.1	28063.5		1574.27	2316.18	1729.73		.1	.3

Blocked Obstructions num= 2						
Sta L	Sta R	Elev	Sta L	Sta R	Elev	
17701.2	27734.9	27.11	28112.5	36801.1	27.11	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	32.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.050	0.044	0.044
W.S. Elev (ft)	32.03	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	5220.23	3011.58	5963.24
E.G. Slope (ft/ft)	0.000345	Area (sq ft)	5220.23	3011.58	5963.24
Q Total (cfs)	21500.00	Flow (cfs)	4485.29	8747.87	8266.84
Top Width (ft)	5211.33	Top Width (ft)	3032.79	297.18	1881.36
Vel Total (ft/s)	1.51	Avg. Vel. (ft/s)	0.86	2.90	1.39
Max Chl Dpth (ft)	15.83	Hydr. Depth (ft)	1.72	10.13	3.17
Conv. Total (cfs)	1157522.0	Conv. (cfs)	241479.9	470970.1	445072.0
Length Wtd. (ft)	1973.02	Wetted Per. (ft)	3032.96	302.53	1881.78
Min Ch El (ft)	16.20	Shear (lb/sq ft)	0.04	0.21	0.07
Alpha	1.89	Stream Power (lb/ft s)	0.03	0.62	0.09
Frctn Loss (ft)	0.62	Cum Volume (acre-ft)	3086.09	2178.00	4392.32
C & E Loss (ft)	0.01	Cum SA (acres)	1197.46	184.84	1087.42

Warning: Divided flow computed for this cross-section.

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 6.39818*

INPUT

Description: Interpolated Cross Section at River Mile 6.40

Station Elevation Data		num= 133							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17637.45	49.9117832.37	46.8218074.65		4418331.79	42.9918636.19		43.72		
18889.24	41.26 19164.3	41.1719467.59		39.0721884.42	35.0521945.62		35.14		
22208.33	36.1322495.18	33.9522796.15		32.1323066.56	31.8523359.08		31.67		
23632.18	32.6624479.09	29.7524747.18		29.5625655.66	29.9225878.43		31.37		
26144.76	29.1826281.38	29.2426342.65		29.326449.07	27.4326646.96		28.61		
26784.86	27.1226954.99	31.6426970.96		30.2926976.04	2826979.83		26.26		
26981.96	25.3726985.41	23.9826985.52		23.9426985.62	23.88 26992.7		19.6		
26993.41	19.1826995.97	18.6426999.79		17.8627002.33	17.3127006.87		16.86		
27009.62	16.5327013.84	16.0427013.96		16.0327021.04	15.8527022.99		15.83		
27025.12	15.8127028.13	15.7727030.96		15.6327036.63	15.4727046.47		15.83		
27052.09	15.98 27056.5	16.0627066.33		16.1627067.55	16.1827075.38		16.38		
27083.01	16.3327085.31	16.3227095.34		16.1527098.46	16.2427105.18		16.5		
27113.92	18.9327115.11	19.2527125.73		23.2327129.38	23.327144.83		23.68		
27150.09	23.8727160.84	24.0227184.41		24.2527192.02	24.3227225.06		24.44		
27250.44	25.6 27253.8	26.5127267.71		30.3527285.64	35.4127314.13		35.32		
27326.05	35.3627334.08	35.3727338.25		35.0527369.86	32.4627380.78		32.3		
27420.17	31.7727472.76	34.1527508.64		29.67 27648.9	25.9127850.15		27.18		
28045.67	29.7328319.84	28.8228590.21		28.6428896.23	27.7328961.67		28.45		
29308.91	27.7329384.33	33.45 29524.1		3629767.55	36.9129992.82		37.18		
30273.64	3830590.24	37 30859.5		38.3631181.04	41.7331465.62		39.64		
31760.27	40.27 32066.7	44.21 32109.7		44.5332153.43	44.9532203.52		45.93		
32242.21	46.3232360.96	47.2832656.71		47.9332716.57	48.232954.73		49.12		
33049.95	49.3133247.11	49.7333440.57		51.2733566.38	52.2533832.37		52.45		
33877.7	52.6434143.36	52.834184.45		53.9834204.98	54.0334331.39		54.26		
34448.57	54.4634457.39	54.4134578.16		53.7134666.33	51.8134842.59		52.72		
34893.48	52.98 35155.3	53.1535213.44		53.1935469.59	54.2635489.52		54.37		
35587	55.0235751.75	56.0335922.36		57.04					

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
17637.45	.0526970.96	.03127285.64	.046

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	26970.96	27285.64	1574.27	2316.18	1729.73	.1	.3

Blocked Obstructions		num= 1	
Sta L	Sta R	Elev	
27285.64	35922.36	26.51	

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	31.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.050	0.031	0.046
W.S. Elev (ft)	31.34	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	4937.18	3009.13	5675.78
E.G. Slope (ft/ft)	0.000288	Area (sq ft)	4937.18	3009.13	5675.78
Q Total (cfs)	21500.00	Flow (cfs)	3696.51	11259.67	6543.82
Top Width (ft)	5095.88	Top Width (ft)	2934.27	300.27	1861.34
Vel Total (ft/s)	1.58	Avg. Vel. (ft/s)	0.75	3.74	1.15
Max Chl Dpth (ft)	15.87	Hydr. Depth (ft)	1.68	10.02	3.05
Conv. Total (cfs)	1266549.0	Conv. (cfs)	217758.6	663299.0	385491.7
Length Wtd. (ft)	2010.74	Wetted Per. (ft)	2934.42	305.13	1861.65
Min Ch El (ft)	15.47	Shear (lb/sq ft)	0.03	0.18	0.05

Alpha	3.14	Stream Power (lb/ft s)	0.02	0.66	0.06
Frctn Loss (ft)	0.57	Cum Volume (acre-ft)	2902.55	2017.93	4161.24
C & E Loss (ft)	0.00	Cum SA (acres)	1089.64	168.96	1013.11

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 5.79636*

INPUT
 Description: Interpolated Cross Section at River Mile 5.80

Station Elevation Data num= 134									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17573.71	47.2217753.64	44.43	17977.3	41.8918214.67	40.9918495.68	41.63			
18729.28	39.42 18983.2	39.3319263.17	37.4421494.24	33.7921550.74	33.87				
21793.25	34.7722058.06	32.822335.89	31.1622585.52	30.922855.55	30.73				
23107.67	31.6323889.48	28.9924136.97	28.8224975.61	29.1325181.27	30.44				
25427.12	28.4725553.25	28.52 25609.8	28.625708.04	26.9725890.72	28.11				
26018.03	26.8426175.07	30.9926189.82	29.7726195.48	27.33 26199.7	25.44				
26202.07	24.5626205.91	23.2226206.03	23.1826206.14	23.1326214.03	19.15				
26214.83	18.7626217.68	18.2626221.93	17.5426224.76	17.0226229.81	16.55				
26232.87	16.1526237.58	15.5726237.71	15.56 26245.6	15.2626247.77	15.25				
26250.14	15.2326253.49	15.1826256.65	14.9626262.96	14.7426272.63	15.16				
26278.16	15.34 26282.5	15.4226292.16	15.5126293.36	15.5426301.06	15.75				
26308.56	15.7426310.83	15.7326320.69	15.5926323.75	15.6926330.36	16				
26338.95	18.3926340.12	18.7126350.57	22.5626354.15	22.6526369.35	23.18				
26374.51	23.4926385.09	23.6426408.26	23.8726415.74	23.9526448.22	24.07				
26473.17	25.1926476.48	26.0626490.16	29.7926507.79	34.8126535.95	34.63				
26547.73	34.7126555.66	34.7426559.78	34.4426591.02	31.9226601.81	31.75				
26640.74	31.2426692.72	33.5126728.18	29.2326814.83	23.23 26866.8	25.52				
27065.7	26.6627258.94	28.9527529.73	28.1427797.11	27.9728099.56	27.15				
28164.23	27.8128507.42	27.1528581.96	32.31 28720.1	34.628960.71	35.42				
29183.35	35.6629460.88	36.429773.79	35.5 30039.9	36.7330357.69	39.75				
30638.94	37.8730930.15	38.4531232.99	43.01 31275.5	43.3231318.71	43.83				
31368.22	45.3931406.46	45.8631523.82	46.8531816.11	47.6731875.28	47.96				
32110.65	48.8532204.76	49.0332399.62	49.4732590.82	50.9732715.16	51.91				
32978.04	52.0933022.84	52.28 33285.4	53.3833326.02	53.57 33346.3	53.61				
33471.23	53.8433587.05	54.0233595.77	53.9733715.12	53.3233802.26	51.52				
33976.46	52.4134026.75	52.6634285.52	52.8434342.98	52.8734596.14	53.92				
34615.83	54.0334712.17	54.75 34875	55.7735043.62	56.78					

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
17573.71	.0526189.82		.03126507.79		.048

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	26189.82	26507.79		1574.27	2316.18	1729.73	.1	.3

Blocked Obstructions num= 1		
Sta L	Sta R	Elev
26507.79	35043.62	25.93

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	30.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.050	0.031	0.048
W.S. Elev (ft)	30.77	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	4986.67	3041.29	5833.61
E.G. Slope (ft/ft)	0.000284	Area (sq ft)	4986.67	3041.29	5833.61
Q Total (cfs)	21500.00	Flow (cfs)	3654.43	11293.15	6552.41

Top Width (ft)	5047.23	Top Width (ft)	2899.07	303.79	1844.37
Vel Total (ft/s)	1.55	Avg. Vel. (ft/s)	0.73	3.71	1.12
Max Chl Dpth (ft)	16.03	Hydr. Depth (ft)	1.72	10.01	3.16
Conv. Total (cfs)	1276629.0	Conv. (cfs)	216993.3	670566.0	389069.8
Length Wtd. (ft)	2011.37	Wetted Per. (ft)	2899.20	308.27	1844.73
Min Ch El (ft)	14.74	Shear (lb/sq ft)	0.03	0.17	0.06
Alpha	3.21	Stream Power (lb/ft s)	0.02	0.65	0.06
Frctn Loss (ft)	0.57	Cum Volume (acre-ft)	2723.22	1857.07	3932.72
C & E Loss (ft)	0.00	Cum SA (acres)	984.23	152.90	939.53

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 5.19454*

INPUT

Description: Interpolated Cross Section at River Mile 5.19

Station Elevation Data		num= 134							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17509.96	44.5317674.92	42.0517879.95	39.7918097.56	38.9818355.17	39.55				
18569.32	37.5818802.09	37.519058.76	35.8121104.07	32.5421155.86	32.61				
21378.18	33.421620.94	31.6521875.64	30.1822104.48	29.9622352.03	29.8				
22583.15	30.5923299.87	28.2423526.75	28.0824295.57	28.35 24484.1	29.5				
24709.49	27.7524825.11	27.824876.96	27.8924967.02	26.525134.49	27.62				
25251.19	26.5525395.16	30.3325408.68	29.2625414.92	26.6625419.57	24.62				
25422.18	23.7425426.41	22.4625426.55	22.4325426.67	22.3825435.37	18.69				
25436.24	18.3425439.39	17.8725444.06	17.2325447.19	16.7225452.76	16.25				
25456.13	15.7825461.31	15.1125461.46	15.125470.16	14.6825472.55	14.66				
25475.17	14.6425478.86	14.625482.34	14.2925489.29	14.01 25498.8	14.49				
25504.24	14.7125508.49	14.79 25518	14.8725519.17	14.8925526.74	15.13				
25534.11	15.1625536.34	15.1525546.03	15.0425549.04	15.1425555.54	15.49				
25563.98	17.8525565.14	18.16 25575.4	21.8925578.92	2225593.86	22.69				
25598.94	23.1225609.33	23.26 25632.1	23.4925639.46	23.5725671.39	23.71				
25695.91	24.7925699.16	25.62 25712.6	29.2425729.94	34.2225757.76	33.95				
25769.4	34.0725777.24	34.1225781.31	33.8425812.18	31.3925822.85	31.2				
25861.32	30.7225912.68	32.8625947.72	28.826033.35	23.0926084.71	25.13				
26281.25	26.15 26472.2	28.18 26739.8	27.4527004.02	27.31 27302.9	26.58				
27366.8	27.1627705.93	26.5827779.59	31.1627916.09	33.228153.86	33.93				
28373.87	34.1528648.13	34.828957.33	34 29220.3	35.0929534.33	37.78				
29812.26	36.1130100.03	36.6230399.29	41.8230441.29	42.11 30484	42.7				
30532.92	44.84 30570.7	45.430686.68	46.4330975.52	47.431033.98	47.72				
31266.57	48.5731359.58	48.7431552.13	49.231741.07	50.6731863.94	51.56				
32123.72	51.7432167.99	51.9232427.44	52.9632467.57	53.1532487.62	53.2				
32611.07	53.4232725.52	53.5932734.14	53.5432852.08	52.9332938.19	51.23				
33110.34	52.0933160.03	52.3333415.74	52.5233472.52	52.5633722.69	53.57				
33742.14	53.7333837.35	54.4833998.25	55.534164.88	56.51					

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
17509.96	.0525408.68	.03125729.94	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	25408.6825729.94		1574.27	2316.18	1729.73	.1	.3
Blocked Obstructions		num= 1					
Sta L	Sta R	Elev					
25729.9434164.88	25.34						

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	30.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.050	0.031	0.050
W.S. Elev (ft)	30.21	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	5166.42	3075.86	5882.93
E.G. Slope (ft/ft)	0.000279	Area (sq ft)	5166.42	3075.86	5882.93
Q Total (cfs)	21500.00	Flow (cfs)	3803.39	11334.07	6362.55
Top Width (ft)	5443.48	Top Width (ft)	3307.34	307.31	1828.83
Vel Total (ft/s)	1.52	Avg. Vel. (ft/s)	0.74	3.68	1.08
Max Chl Dpth (ft)	16.20	Hydr. Depth (ft)	1.56	10.01	3.22
Conv. Total (cfs)	1287227.0	Conv. (cfs)	227712.5	678582.0	380932.2
Length Wtd. (ft)	2014.14	Wetted Per. (ft)	3307.46	311.50	1829.16
Min Ch El (ft)	14.01	Shear (lb/sq ft)	0.03	0.17	0.06
Alpha	3.28	Stream Power (lb/ft s)	0.02	0.63	0.06
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)	2539.76	1694.44	3700.10
C & E Loss (ft)	0.00	Cum SA (acres)	872.08	136.65	866.60

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 4.59272*

INPUT

Description: Interpolated Cross Section at River Mile 4.59

Station Elevation Data		num= 134							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17446.22	41.8417596.19	39.66	17782.6	37.6817980.45	36.9718214.66		37.47		
18409.36	35.7418620.99	35.6618854.35	34.1920713.89	31.2820760.97	31.35				
20963.11	32.0321183.81	30.521415.38	29.2121623.44	29.0121848.51	28.87				
22058.64	29.5622710.26	27.4822916.54	27.3523615.53	27.5623786.93	28.57				
23991.85	27.0324096.97	27.0724144.11	27.1924225.99	26.0324378.25	27.13				
24484.35	26.2724615.25	29.6724627.54	28.7524634.36	25.9924639.44	23.79				
24642.29	22.9224646.92	21.724647.06	21.67 24647.2	21.63 24656.7	18.23				
24657.66	17.9224661.09	17.4924666.21	16.9224669.62	16.4324675.71	15.94				
24679.39	15.424685.05	14.6424685.21	14.6324694.71	14.0924697.33	14.07				
24700.19	14.0624704.22	14.0224708.02	13.6224715.63	13.2824724.97	13.82				
24730.31	14.0724734.49	14.1524743.83	14.2324744.99	14.2524752.42	14.51				
24759.67	14.5724761.85	14.5724771.38	14.4824774.34	14.5924780.71	14.99				
24789.01	17.3224790.15	17.6224800.23	21.2224803.69	21.3524818.37	22.19				
24823.36	22.7424833.57	22.8824855.95	23.1224863.18	23.1924894.55	23.35				
24918.65	24.3824921.84	25.1724935.05	28.6824952.08	33.6324979.57	33.27				
24991.07	33.4324998.82	33.4925002.84	33.2425033.35	30.8525043.88	30.65				
25081.89	30.1925132.64	32.2225167.26	28.3625251.87	22.9525302.61	24.74				
25496.8	25.6325585.47	27.4125949.87	26.7726210.93	26.6526506.23	26.01				
26569.37	26.5226904.45	26.0126977.22	30.0227112.09	31.827347.02	32.44				
27564.39	32.6327835.37	33.228140.88	32.5 28400.7	33.4528710.97	35.81				
28985.57	34.35 29269.9	34.7929565.59	40.6329607.09	40.929649.28	41.58				
29697.62	44.329734.95	44.9529849.54	4630134.92	47.1330192.69	47.48				
30422.5	48.2930514.39	48.4630704.64	48.9430891.32	50.3731012.72	51.21				
31269.39	51.3931313.13	51.5631569.48	52.5531609.13	52.7431628.94	52.78				
31750.92	53 31864	53.1531872.51	53.131989.04	52.5432074.12	50.94				
32244.21	51.7832293.31	52.0132545.96	52.2132602.06	52.2532849.24	53.22				
32868.46	53.3732962.53	54.2133121.51	55.2333286.14	56.25					

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
17446.22	.0524627.54	.03124952.08	.052

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	24627.54	24952.08		1574.27	2316.18	1729.73	.1	.3	

Blocked Obstructions num= 1
 Sta L Sta R Elev
 24952.0833286.14 25

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	29.77				
Vel Head (ft)	0.12	Wt. n-Val.	0.050	0.031	0.052
W.S. Elev (ft)	29.65	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	5416.58	3111.24	5895.31
E.G. Slope (ft/ft)	0.000282	Area (sq ft)	5416.58	3111.24	5895.31
Q Total (cfs)	21500.00	Flow (cfs)	3771.32	11527.34	6201.34
Top Width (ft)	5416.28	Top Width (ft)	3290.56	310.86	1814.87
Vel Total (ft/s)	1.49	Avg. Vel. (ft/s)	0.70	3.71	1.05
Max Chl Dpth (ft)	16.37	Hydr. Depth (ft)	1.65	10.01	3.25
Conv. Total (cfs)	1280890.0	Conv. (cfs)	224681.1	686756.3	369452.9
Length Wtd. (ft)	2013.35	Wetted Per. (ft)	3290.67	314.83	1815.16
Min Ch El (ft)	13.28	Shear (lb/sq ft)	0.03	0.17	0.06
Alpha	3.49	Stream Power (lb/ft s)	0.02	0.64	0.06
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	2348.52	1529.95	3466.24
C & E Loss (ft)	0.00	Cum SA (acres)	752.85	120.22	794.26

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 3.99090*

INPUT

Description: Interpolated Cross Section at River Mile 3.99

Station Elevation Data		num= 134							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17382.47	39.1517517.46	37.2817685.25	35.5817863.33	34.9618074.15	35.38				
18249.4	33.918439.89	33.8318649.93	32.5620323.71	30.0320366.09	30.08				
20548.03	30.6720746.69	29.3420955.13	28.24 21142.4	28.0621344.98	27.94				
21534.12	28.5222120.65	26.7322306.32	26.6122935.48	26.7823089.77	27.64				
23274.21	26.3223368.83	26.3523411.26	26.4923484.96	25.5723622.01	26.63				
23717.51	25.9923835.33	29.02 23846.4	28.2323853.79	25.3223859.31	22.97				
23862.4	22.123867.42	20.9423867.58	20.9123867.72	20.8723878.03	17.77				
23879.07	17.5 23882.8	17.123888.34	16.623892.04	16.1423898.65	15.63				
23902.64	15.0323908.79	14.1823908.96	14.1623919.27	13.523922.11	13.49				
23925.21	13.4723929.58	13.4423933.71	12.9423941.96	12.5523951.13	13.15				
23956.38	13.4423960.49	13.5123969.66	13.58 23970.8	13.61 23978.1	13.89				
23985.22	13.9823987.37	13.9823996.72	13.9323999.63	14.0324005.89	14.49				
24014.04	16.7824015.16	17.0724025.07	20.5524028.46	20.724042.88	21.7				
24047.79	22.3624057.82	22.5 24079.8	22.7424086.89	22.8124117.72	22.98				
24141.39	23.9824144.53	24.72 24157.5	28.1224174.23	33.0424201.38	32.59				
24212.75	32.78 24220.4	32.8624224.38	32.6324254.51	30.3124264.91	30.1				
24302.47	29.66 24352.6	31.57 24386.8	27.9324470.38	22.8224520.51	24.35				
24712.36	25.1124898.74	26.6425159.94	26.0925417.83	25.9825709.56	25.44				
25771.94	25.8726102.96	25.4426174.85	28.8726308.09	30.426540.17	30.95				
26754.91	31.1127022.61	31.627324.42	3127581.09	31.8227887.62	33.84				
28158.89	32.5828439.78	32.9628731.89	39.4428772.88	39.6928814.56	40.46				
28862.32	43.76 28899.2	44.49 29012.4	45.5829294.33	46.8729351.39	47.24				
29578.42	48.01 29669.2	48.1729857.15	48.6730041.57	50.07 30161.5	50.87				
30415.06	51.0430458.27	51.230711.52	52.1330750.69	52.3230770.26	52.37				
30890.76	52.5831002.47	52.7131010.88	52.67 31126	52.1531210.05	50.65				
31378.08	51.4731426.59	51.6931676.18	51.89 31731.6	51.9431975.79	52.87				
31994.78	53.03 32087.7	53.9432244.76	54.97 32407.4	55.99					

Manning's n Values num= 3
 Sta n Val Sta n Val
 17382.47 .05 23846.4 .03124174.23 .053

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 23846.424174.23 1574.27 2316.18 1729.73 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 24174.23 32407.4 24.6

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	29.23				
Vel Head (ft)	0.11	Wt. n-Val.	0.050	0.031	0.053
W.S. Elev (ft)	29.11	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	5659.16	3154.36	5963.62
E.G. Slope (ft/ft)	0.000265	Area (sq ft)	5659.16	3154.36	5963.62
Q Total (cfs)	21500.00	Flow (cfs)	4130.35	11362.80	6006.85
Top Width (ft)	5191.47	Top Width (ft)	3056.67	314.48	1820.32
Vel Total (ft/s)	1.45	Avg. Vel. (ft/s)	0.73	3.60	1.01
Max Chl Dpth (ft)	16.56	Hydr. Depth (ft)	1.85	10.03	3.28
Conv. Total (cfs)	1319945.0	Conv. (cfs)	253573.6	697593.8	368777.1
Length Wtd. (ft)	2007.17	Wetted Per. (ft)	3056.77	318.29	1820.57
Min Ch El (ft)	12.55	Shear (lb/sq ft)	0.03	0.16	0.05
Alpha	3.42	Stream Power (lb/ft s)	0.02	0.59	0.05
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	2148.38	1363.37	3230.79
C & E Loss (ft)	0.00	Cum SA (acres)	638.16	103.59	722.08

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 3.38909*

INPUT

Description: Interpolated Cross Section at River Mile 3.39

Station	Elevation	Data	num=	134					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17318.73	36.4517438.74	34.9	17587.9	33.4717746.22	32.9617933.64	33.3			
18089.44	32.0618258.79	31.9918445.52	30.9319933.54	28.7819971.21	28.82				
20132.96	29.320309.57	28.1920494.87	27.2720661.36	27.1120841.46	27				
21009.61	27.4921531.04	25.98 21696.1	25.8722255.44	25.99 22392.6	26.71				
22556.58	25.622640.69	25.6222678.41	25.7922743.94	25.122865.77	26.14				
22950.68	25.7123055.42	28.3623065.26	27.7223073.23	24.6423079.18	22.15				
23082.51	21.2923087.92	20.1823088.09	20.1523088.25	20.1223099.37	17.32				
23100.49	17.08 23104.5	16.7223110.48	16.2923114.47	15.85 23121.6	15.32				
23125.9	14.6523132.53	13.7223132.71	13.723143.83	12.9123146.88	12.9				
23150.23	12.8923154.95	12.85 23159.4	12.2723168.29	11.83 23177.3	12.47				
23182.45	12.823186.49	12.8723195.49	12.9423196.61	12.9623203.78	13.26				
23210.77	13.3923212.88	13.423222.07	13.3723224.92	13.4823231.07	13.99				
23239.08	16.2423240.17	16.53 23249.9	19.8923253.24	20.05 23267.4	21.2				
23272.21	21.9823282.06	22.1323303.64	22.3623310.61	22.4423340.88	22.62				
23364.12	23.5723367.21	24.2723379.95	27.5623396.37	32.44 23423.2	31.9				
23434.42	32.1423441.98	32.2323445.91	32.0323475.67	29.7723485.95	29.55				
23523.04	29.1323572.56	30.9323606.34	27.49 23688.9	22.6823738.41	23.95				
23927.91	24.5924112.01	25.86 24370	25.4124624.74	25.3224912.89	24.86				
24974.51	25.2325301.47	24.8625372.48	27.7325504.09	2925733.32	29.45				
25945.44	29.5926209.85	3026507.96	29.526761.49	30.1827064.26	31.86				
27332.21	30.8227609.66	31.1427898.18	38.2427938.68	38.4827979.85	39.33				
28027.02	43.2228063.44	44.0428175.26	45.1528453.73	46.6 28510.1	47				

28734.35	47.7428824.01	47.8929009.65	48.4129191.81	49.7729310.28	50.52
29560.73	50.6829603.42	50.8429853.56	51.7129892.25	51.9129911.58	51.96
30030.6	52.1630140.95	52.2730149.25	52.2330262.96	51.7730345.98	50.37
30511.95	51.1530559.86	51.37 30806.4	51.5830861.14	51.6231102.33	52.52
31121.09	52.731212.88	53.6731368.01	54.731528.65	55.73	

Manning's n Values num= 3
 Sta n Val Sta n Val
 17318.73 .05233065.26 .03123396.37 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 23065.2623396.37 1574.27 2316.18 1729.73 .1 .3

Blocked Obstructions num= 1
 Sta L Sta R Elev
 23396.3731528.65 24.2

CROSS SECTION OUTPUT Profile #Calibration

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	28.70				
Vel Head (ft)	0.11	Wt. n-Val.	0.050	0.031	0.055
W.S. Elev (ft)	28.60	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	5849.92	3204.41	6105.30
E.G. Slope (ft/ft)	0.000251	Area (sq ft)	5849.92	3204.41	6105.30
Q Total (cfs)	21500.00	Flow (cfs)	4479.95	11262.30	5757.76
Top Width (ft)	5005.38	Top Width (ft)	2820.39	318.18	1866.81
Vel Total (ft/s)	1.42	Avg. Vel. (ft/s)	0.77	3.51	0.94
Max Chl Dpth (ft)	16.77	Hydr. Depth (ft)	2.07	10.07	3.27
Conv. Total (cfs)	1356941.0	Conv. (cfs)	282745.3	710803.3	363392.2
Length Wtd. (ft)	2010.67	Wetted Per. (ft)	2820.46	321.88	1867.04
Min Ch El (ft)	11.83	Shear (lb/sq ft)	0.03	0.16	0.05
Alpha	3.40	Stream Power (lb/ft s)	0.02	0.55	0.05
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	1940.41	1194.32	2991.17
C & E Loss (ft)	0.00	Cum SA (acres)	531.96	86.77	648.88

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 2.78727*

INPUT

Description: Interpolated Cross Section at River Mile 2.79

Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17254.98	33.7617360.01	32.5117490.55	31.3717629.11	30.9517793.13	31.22				
17929.47	30.2218077.69	30.16 18241.1	29.319543.36	27.5219576.33	27.56				
19717.89	27.9419872.45	27.0420034.62	26.2920180.32	26.1620337.94	26.07				
20485.1	26.4520941.43	25.2221085.89	25.1321575.39	25.2121695.43	25.78				
21838.94	24.8821912.55	24.921945.57	25.0922002.91	24.6322109.54	25.64				
22183.84	25.4322275.51	27.722284.12	27.222292.67	23.9722299.04	21.33				
22302.62	20.4722308.43	19.4222308.61	19.422308.78	19.37 22320.7	16.86				
22321.9	16.6622326.21	16.3322332.62	15.97 22336.9	15.5522344.54	15.02				
22349.16	14.2822356.27	13.2522356.46	13.2322368.39	12.3322371.66	12.32				
22375.25	12.322380.31	12.2722385.08	11.622394.62	11.122403.47	11.8				
22408.52	12.1722412.48	12.2322421.33	12.2922422.42	12.3222429.46	12.64				
22436.32	12.822438.39	12.8122447.41	12.8222450.21	12.9322456.25	13.49				
22464.11	15.7122465.19	15.9822474.74	19.2222478.01	19.422491.91	20.71				
22496.63	21.61 22506.3	21.7522527.49	21.9822534.33	22.0622564.04	22.25				
22586.86	23.1722589.89	23.8322602.39	27.0122618.52	31.8522645.01	31.22				
22656.1	31.4922663.56	31.6222667.44	31.4222696.83	29.2322706.98	29				

22743.62	28.622792.52	30.2822825.88	27.0622907.41	22.5522956.32	23.56
23143.46	24.0723325.27	25.0923580.07	24.7323831.65	24.6524116.22	24.29
24177.07	24.5824499.98	24.2924570.11	26.5824700.09	27.624926.48	27.96
25135.96	28.07 25397.1	28.425691.51	2825941.89	28.55 26240.9	29.89
26505.53	29.0526779.53	29.3127064.48	37.0527104.47	37.2727145.13	38.21
27191.71	42.6827227.69	43.5827338.12	44.7327613.14	46.3427668.81	46.76
27890.27	47.4627978.82	47.6128162.16	48.1428342.06	49.4728459.06	50.18
28706.41	50.3328748.56	50.48 28995.6	51.329033.81	51.49 29052.9	51.54
29170.45	51.7429279.42	51.8329287.62	51.7929399.92	51.3829481.91	50.08
29645.82	50.8429693.14	51.0529936.62	51.2729990.68	51.3130228.88	52.17
30247.4	52.3630338.05	53.430491.26	54.4430649.91	55.47	

Manning's n Values num= 3
 Sta n Val Sta n Val
 17254.98 .0522284.12 .03122618.52 .057

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 22284.1222618.52 1574.27 2316.18 1729.73 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev
 22618.5230649.91 23.8

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	28.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.050	0.031	0.057
W.S. Elev (ft)	28.07	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	6062.63	3252.46	6356.77
E.G. Slope (ft/ft)	0.000263	Area (sq ft)	6062.63	3252.46	6356.77
Q Total (cfs)	21500.00	Flow (cfs)	4523.94	11723.62	5252.44
Top Width (ft)	5872.45	Top Width (ft)	3144.10	321.81	2406.54
Vel Total (ft/s)	1.37	Avg. Vel. (ft/s)	0.75	3.60	0.83
Max Chl Dpth (ft)	16.97	Hydr. Depth (ft)	1.93	10.11	2.64
Conv. Total (cfs)	1326513.0	Conv. (cfs)	279119.4	723326.9	324066.2
Length Wtd. (ft)	1970.13	Wetted Per. (ft)	3144.16	325.44	2406.73
Min Ch El (ft)	11.10	Shear (lb/sq ft)	0.03	0.16	0.04
Alpha	3.92	Stream Power (lb/ft s)	0.02	0.59	0.04
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	1725.15	1022.65	2743.74
C & E Loss (ft)	0.02	Cum SA (acres)	424.18	69.76	564.03

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 2.18545*

INPUT

Description: Interpolated Cross Section at River Mile 2.19

Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17191.24	31.0717281.28	30.1317393.21	29.2617511.99	28.9417652.62	29.13				
17769.51	28.3817896.58	28.3318036.69	27.6719153.18	26.2719181.45	26.29				
19302.81	26.5719435.33	25.8919574.36	25.3219699.29	25.2219834.42	25.14				
19960.58	25.4120351.82	24.4720475.67	24.3920895.35	24.4320998.27	24.84				
21121.3	24.1721184.42	24.1721212.72	24.3921261.88	24.17 21353.3	25.15				
21417	25.15 21495.6	27.0521502.97	26.6921512.11	23.321518.91	20.51				
21522.73	19.6521528.93	18.6521529.12	18.64 21529.3	18.6221542.03	16.4				
21543.31	16.2421547.91	15.9521554.76	15.6621559.33	15.2621567.48	14.71				
21572.42	13.9 21580	12.7921580.22	12.7621592.95	11.7421596.44	11.73				
21600.28	11.7121605.68	11.6921610.77	10.9321620.96	10.3721629.63	11.13				

21634.6	11.5321638.48	11.5921647.16	11.6521648.23	11.6721655.14	12.02
21661.87	12.2121663.91	12.2321672.76	12.26 21675.5	12.3821681.43	12.99
21689.14	15.17 21690.2	15.4421699.57	18.5521702.78	18.7521716.42	20.21
21721.06	21.2321730.55	21.3721751.34	21.621758.05	21.6821787.21	21.89
21809.6	22.7621812.57	23.3821824.84	26.4521840.66	31.2621866.82	30.54
21877.77	30.8521885.14	30.9721888.97	30.8221917.99	28.6921928.02	28.45
21964.19	28.0722012.48	29.6422045.43	26.6222125.93	22.4122174.22	23.17
22359.01	23.5522538.54	24.3222790.13	24.0523038.55	23.9923319.56	23.72
23379.64	23.9423698.49	23.7223767.74	25.4423896.08	26.224119.63	26.47
24326.48	26.5524584.34	26.824875.05	26.525122.29	26.9125417.54	27.92
25678.85	27.2925949.41	27.4826230.78	35.8626270.27	36.0726310.42	37.08
26356.41	42.1426391.94	43.1326500.98	44.326772.54	46.0726827.51	46.52
27046.2	47.1827133.63	47.3227314.67	47.8827492.31	49.1627607.84	49.83
27852.08	49.98 27893.7	50.1128137.64	50.8828175.37	51.0828194.22	51.13
28310.29	51.32 28417.9	51.39 28426	51.3628536.88	50.9928617.85	49.79
28779.7	50.5328826.42	50.7329066.83	50.9529120.22	51.29355.43	51.83
29373.72	52.0329463.23	53.1329614.51	54.1729771.17	55.21	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
17191.24	.0521502.97	.03121518.91	.059		

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

21502.9721840.66	1574.27	2316.18	1729.73	.1	.3
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Blocked Obstructions num= 1

Sta L	Sta R	Elev
21840.6629771.17		22.9

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	27.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.050	0.058	0.059
W.S. Elev (ft)	27.35	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	5903.11	3237.21	7084.63
E.G. Slope (ft/ft)	0.000514	Area (sq ft)	5903.11	3237.21	7084.63
Q Total (cfs)	21500.00	Flow (cfs)	5968.97	8684.27	6846.77
Top Width (ft)	6856.02	Top Width (ft)	3210.09	324.82	3321.11
Vel Total (ft/s)	1.33	Avg. Vel. (ft/s)	1.01	2.68	0.97
Max Chl Dpth (ft)	16.98	Hydr. Depth (ft)	1.84	9.97	2.13
Conv. Total (cfs)	948454.9	Conv. (cfs)	263316.1	383099.4	302039.5
Length Wtd. (ft)	1974.21	Wetted Per. (ft)	3210.14	328.40	3321.27
Min Ch El (ft)	10.37	Shear (lb/sq ft)	0.06	0.32	0.07
Alpha	1.99	Stream Power (lb/ft s)	0.06	0.85	0.07
Frctn Loss (ft)	0.81	Cum Volume (acre-ft)	1508.93	850.12	2476.86
C & E Loss (ft)	0.01	Cum SA (acres)	309.36	52.57	450.31

Warning: Divided flow computed for this cross-section.
 Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: Judy Creek
 REACH: Lower Judy Creek RS: 1.58363*

INPUT
 Description: Interpolated Cross Section at River Mile 1.58

Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17127.49	28.3817202.55	27.7517295.86	27.1617394.88	26.9317512.11	27.05				
17609.55	26.5417715.48	26.4917832.28	26.04 18763	25.0218786.57	25.03				
18887.74	25.218998.21	24.7419114.11	24.3519218.24	24.2719330.89	24.2				

19436.07	24.3819762.21	23.7219865.46	23.6520215.31	23.64	20301.1	23.91
20403.66	23.4520456.28	23.4520479.87	23.6820520.85	23.720597.06		24.66
20650.17	24.8620715.68	26.3920721.83	26.1820731.54	22.6320738.78		19.68
20742.84	18.8320749.43	17.8920749.64	17.8820749.83	17.8620763.36		15.94
20764.73	15.8220769.62	15.56 20776.9	15.3520781.76	14.9720790.43		14.4
20795.68	13.5320803.74	12.3320803.97	12.29 20817.5	11.1520821.22		11.14
20825.3	11.1320831.04	11.1120836.46	10.2620847.29	9.64 20855.8		10.46
20860.67	10.920864.48	10.9620872.99	11.0120874.05	11.0320880.82		11.4
20887.43	11.6220889.42	11.65 20898.1	11.71 20900.8	11.8220906.61		12.48
20914.18	14.6320915.21	14.89 20924.4	17.8820927.55	18.120940.94		19.72
20945.48	20.8520954.79	20.9920975.19	21.2320981.77	21.321010.37		21.53
21032.34	22.3621035.25	22.9321047.29	25.8921062.81	30.6721088.63		29.86
21099.44	30.2121106.72	30.35 21110.5	30.2221139.16	28.1621149.05		27.9
21184.76	27.5521232.44	28.9921264.97	26.1921344.45	22.2721392.12		22.78
21574.56	23.0421751.81	23.55 22000.2	23.3622245.46	23.3322522.89		23.15
22582.21	23.29 22897	23.1522965.38	24.2923092.08	24.823312.79		24.98
23517	25.0423771.58	25.2 24058.6	2524302.69	25.2724594.19		25.95
24852.17	25.5325119.29	25.6525397.08	34.6725436.06	34.86 25475.7		35.96
25521.11	41.5925556.19	42.6725663.84	43.8825931.95	45.825986.22		46.28
26202.12	46.926288.45	47.0426467.18	47.6126642.56	48.8626756.62		49.48
26997.75	49.6327038.85	49.7527279.68	50.4627316.93	50.6627335.54		50.72
27450.13	50.927556.37	50.9627564.37	50.9227673.85	50.627753.78		49.5
27913.57	50.22 27959.7	50.428197.05	50.6428249.76	50.6928481.98		51.48
28500.04	51.728588.41	52.8628737.77	53.928892.43	54.94		

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
17127.49 .0520721.83 .03121062.81 .061

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
20721.8321062.81 1574.27 2316.18 1729.73 .1 .3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	26.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.050	0.031	0.061
W.S. Elev (ft)	26.46	Reach Len. (ft)	1574.27	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	5375.83	3165.94	7987.23
E.G. Slope (ft/ft)	0.000303	Area (sq ft)	5375.83	3165.94	7987.23
Q Total (cfs)	21500.00	Flow (cfs)	4106.44	11912.58	5480.97
Top Width (ft)	7207.80	Top Width (ft)	2998.16	327.30	3882.34
Vel Total (ft/s)	1.30	Avg. Vel. (ft/s)	0.76	3.76	0.69
Max Chl Dpth (ft)	16.82	Hydr. Depth (ft)	1.79	9.67	2.06
Conv. Total (cfs)	1234527.0	Conv. (cfs)	235791.2	684018.7	314716.6
Length Wtd. (ft)	1998.31	Wetted Per. (ft)	2998.19	330.83	3882.47
Min Ch El (ft)	9.64	Shear (lb/sq ft)	0.03	0.18	0.04
Alpha	4.77	Stream Power (lb/ft s)	0.03	0.68	0.03
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	1305.11	679.88	2177.62
C & E Loss (ft)	0.02	Cum SA (acres)	197.17	35.23	307.29

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: Judy Creek
REACH: Lower Judy Creek RS: .981819*

INPUT

Description: Interpolated Cross Section at River Mile 0.98

Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17063.75	25.6917123.83	25.3617198.51	25.0517277.77	24.9317371.59					24.97

17449.59	24.717534.38	24.6617627.86	24.4218372.82	23.7618391.69	23.77
18472.67	23.8418561.08	23.5918653.85	23.3818737.21	23.3218827.37	23.27
18911.55	23.34 19172.6	22.9619255.24	22.9219535.27	22.8619603.93	22.98
19686.03	22.7319728.14	22.7219747.02	22.9819779.83	23.2319840.82	24.16
19883.33	24.5819935.77	25.7319940.69	25.6619950.98	21.9619958.65	18.86
19962.95	18.0219969.94	17.1319970.15	17.1219970.36	17.11 19984.7	15.49
19986.14	15.419991.32	15.1819999.04	15.0320004.19	14.6820013.38	14.1
20018.93	13.1520027.48	11.8620027.72	11.8320042.06	10.57 20046	10.56
20050.32	10.5420056.41	10.5220062.14	9.5920073.62	8.9120081.96	9.79
20086.74	10.2620090.48	10.3220098.82	10.3620099.86	10.38 20106.5	10.77
20112.98	11.0320114.93	11.0620123.45	11.1520126.09	11.2720131.79	11.98
20139.21	14.120140.22	14.3420149.24	17.2120152.33	17.4520165.45	19.22
20169.91	20.4820179.04	20.6120199.03	20.8520205.49	20.9320233.54	21.16
20255.07	21.9520257.93	22.4920269.73	25.3420284.96	30.0720310.45	29.17
20321.12	29.56 20328.3	29.7220332.03	29.6120360.32	27.6220370.09	27.35
20405.34	27.02 20452.4	28.3520484.51	25.7520562.96	22.1420610.02	22.39
20790.11	22.5220965.08	22.7721210.27	22.6821452.37	22.6621726.22	22.57
21784.78	22.6522095.51	22.57 22163	23.1522288.08	23.422505.94	23.49
22707.53	23.5222958.82	23.623242.14	23.523483.09	23.6423770.83	23.97
24025.49	23.7624289.16	23.8324563.37	33.4724601.86	33.6524640.99	34.83
24685.81	41.0524720.43	42.22 24826.7	43.4525091.36	45.5425144.93	46.04
25358.04	46.6325443.26	46.7525619.69	47.3525792.81	48.5625905.39	49.14
26143.42	49.2726183.99	49.3926421.72	50.0526458.49	50.2526476.86	50.3
26589.98	50.4826694.84	50.5226702.74	50.49 26810.8	50.2126889.71	49.21
27047.44	49.927092.97	50.0827327.27	50.32 27379.3	50.3727608.52	51.13
27626.35	51.3627713.58	52.5927861.02	53.6428013.69	54.68	

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	Sta n Val
17063.75 .0519940.69	.03120284.96	.063

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
19940.6920284.96	1574.28 2316.18 1729.73	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	26.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.050	0.031	0.063
W.S. Elev (ft)	25.99	Reach Len. (ft)	1574.28	2316.18	1729.73
Crit W.S. (ft)		Flow Area (sq ft)	6225.60	3231.75	10632.04
E.G. Slope (ft/ft)	0.000204	Area (sq ft)	6225.60	3231.75	10632.04
Q Total (cfs)	21500.00	Flow (cfs)	4424.75	10041.98	7033.27
Top Width (ft)	7077.03	Top Width (ft)	2876.94	331.13	3868.96
Vel Total (ft/s)	1.07	Avg. Vel. (ft/s)	0.71	3.11	0.66
Max Chl Dpth (ft)	17.08	Hydr. Depth (ft)	2.16	9.76	2.75
Conv. Total (cfs)	1503916.0	Conv. (cfs)	309509.3	702432.4	491974.4
Length Wtd. (ft)	1946.91	Wetted Per. (ft)	2877.27	334.69	3869.10
Min Ch El (ft)	8.91	Shear (lb/sq ft)	0.03	0.12	0.04
Alpha	4.15	Stream Power (lb/ft s)	0.02	0.38	0.02
Frotn Loss (ft)	0.33	Cum Volume (acre-ft)	1095.47	509.79	1807.94
C & E Loss (ft)	0.01	Cum SA (acres)	91.01	17.72	153.39

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: Judy Creek
REACH: Lower Judy Creek RS: 0.38

INPUT

Description: Interpolated Cross Section at River Mile 0.38

Station Elevation Data		num= 87	
Sta	Elev	Sta	Elev
17000	23	19000	2219159.55
19183.06	17.219190.44	16.3719190.88	25.1519170.42
19221.18	14.7219236.32	13.7919242.19	16.3619206.03
19270.78	9.9719281.77	9.9419287.83	15.0319213.03
19312.81	9.6319316.48	9.6819324.66	11.3619266.62
19338.53	10.4419340.45	10.4819348.79	8.1819308.13
19364.24	13.5619365.24	13.819374.07	9.7219325.67
19394.33	20.119403.28	20.2319422.88	9.7419332.18
19477.81	21.5519480.61	22.0419492.18	10.619351.38
19542.79	28.9219549.88	29.0919553.56	10.7219356.97
19625.91	26.4919672.36	27.719704.05	16.819389.96
23729.67	32.2823767.65	32.4423806.27	20.4719429.21
23989.56	43.0324250.76	45.2724303.63	20.55 19456.7
24772.2	47.0824943.06	48.2625054.18	24.78 19507.1
25563.76	49.6325600.05	49.8325618.18	29.4819532.26
25841.11	50.0525947.77	49.8226025.64	27.0819591.12
26457.49	50.0126508.84	50.0626735.07	2223459.04
26984.27	53.3727134.95	54.42	25.3219781.48
			40.5123884.68
			41.76
			46.47
			49.03
			50.08
			49.76
			52.32

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
17000	.0519159.55	19507.1	.065

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	19159.55	19507.1		0	0	.1	.3

CROSS SECTION OUTPUT Profile #Calibration

E.G. Elev (ft)	25.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.050	0.031	0.065
W.S. Elev (ft)	25.68	Reach Len. (ft)	3694.00	3694.00	3694.00
Crit W.S. (ft)		Flow Area (sq ft)	6699.62	3353.65	13875.68
E.G. Slope (ft/ft)	0.000134	Area (sq ft)	6699.62	3353.65	13875.68
Q Total (cfs)	22100.00	Flow (cfs)	4900.08	8575.82	8624.10
Top Width (ft)	6351.77	Top Width (ft)	2159.55	335.49	3856.73
Vel Total (ft/s)	0.92	Avg. Vel. (ft/s)	0.73	2.56	0.62
Max Chl Dpth (ft)	17.50	Hydr. Depth (ft)	3.10	10.00	3.60
Conv. Total (cfs)	1908502.0	Conv. (cfs)	423158.8	740586.7	744756.5
Length Wtd. (ft)	3694.00	Wetted Per. (ft)	2162.26	339.14	3856.89
Min Ch El (ft)	8.18	Shear (lb/sq ft)	0.03	0.08	0.03
Alpha	3.29	Stream Power (lb/ft s)	0.02	0.21	0.02
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	861.91	334.71	1321.35
C & E Loss (ft)	0.00	Cum SA (acres)			

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.

SUMMARY OF MANNING'S N VALUES

River: Fish Creek

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9	n10	n11	n12	n13	n14	n15
Upper Fish Creek	43.3	.04	.031	.07	.04											
Upper Fish Creek	42.3916*	.04	.031	.07	.042											

Upper Fish Creek	41.4833*	.041	.031	.07	.043														
Upper Fish Creek	40.575*	.041	.031	.07	.043														
Upper Fish Creek	39.6666*	.042	.031	.07	.044														
Upper Fish Creek	38.7583*	.042	.031	.07	.045														
Upper Fish Creek	37.85*	.043	.031	.046															
Upper Fish Creek	36.9416*	.043	.031	.046															
Upper Fish Creek	36.0333*	.043	.031	.047															
Upper Fish Creek	35.125*	.044	.031	.048															
Upper Fish Creek	34.2166*	.044	.031	.048															
Upper Fish Creek	33.3083*	.045	.031	.049															
Upper Fish Creek	32.4	.04	.055	.07	.031	.05	.04	.05	.04										
Upper Fish Creek	31.6071*	.047	.07	.031	.055														
Upper Fish Creek	30.8142*	.05	.07	.031	.054														
Upper Fish Creek	30.0214*	.052	.07	.031	.057														
Upper Fish Creek	29.2285*	.054	.07	.031	.059														
Upper Fish Creek	28.4357*	.056	.07	.031	.061														
Upper Fish Creek	27.6428*	.059	.07	.031	.063														
Upper Fish Creek	26.85	.061	.031	.065															
Lower Fish Creek	26.09	.063	.07	.031	.067														
Lower Fish Creek	25.1	.05	.04	.05	.04	.05	.04	.07	.04	.05	.07	.031	.07	.04	.06	.04			
Lower Fish Creek	24.2625*	.064	.08	.031	.068														
Lower Fish Creek	23.425*	.062	.08	.031	.066														
Lower Fish Creek	22.5875*	.06	.08	.031	.064														
Lower Fish Creek	21.75*	.058	.09	.031	.063														
Lower Fish Creek	20.9125*	.056	.1	.031	.061														
Lower Fish Creek	20.075*	.054	.1	.031	.059														
Lower Fish Creek	19.2375*	.052	.1	.031	.057														
Lower Fish Creek	18.4	.05	.07	.031	.05	.11	.014	.07	.06	.07	.05								
Lower Fish Creek	17.5714*	.054	.11	.031	.055														
Lower Fish Creek	16.7428*	.053	.11	.031	.064														
Lower Fish Creek	15.9142*	.052	.11	.031	.069														
Lower Fish Creek	15.0857*	.051	.11	.031	.073														
Lower Fish Creek	14.2571*	.049	.11	.031	.078														
Lower Fish Creek	13.4285*	.048	.11	.031	.082														
Lower Fish Creek	12.6	.06	.04	.06	.04	.05	.11	.031	.11	.07	.06	.04	.11	.06	.04	.11			
Lower Fish Creek	11.7	.11	.045	.05	.045	.09	.11	.03	.09	.05	.03	.11	.09	.06	.04	.11			
Lower Fish Creek	10.8538*	.062	.107	.031	.061	.031	.079												
Lower Fish Creek	10.0076*	.063	.105	.034	.062	.034	.079												
Lower Fish Creek	9.16153*	.065	.102	.038	.063	.038	.08												
Lower Fish Creek	8.31538*	.066	.099	.041	.064	.041	.08												
Lower Fish Creek	7.46923*	.068	.097	.044	.065	.044	.081												
Lower Fish Creek	6.62307*	.069	.094	.047	.066	.047	.081												
Lower Fish Creek	5.77692*	.071	.091	.051	.068	.051	.082												
Lower Fish Creek	4.93076*	.072	.088	.054	.069	.054	.082												
Lower Fish Creek	4.08461*	.074	.086	.057	.07	.057	.083												
Lower Fish Creek	3.23846*	.075	.083	.06	.071	.06	.083												
Lower Fish Creek	2.39230*	.077	.08	.064	.072	.064	.084												
Lower Fish Creek	1.54615*	.078	.078	.067	.073	.067	.084												
Lower Fish Creek	0.7	.085	.075	.07	.075	.07	.075	.07	.075	.07	.085								

River:Judy Creek

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9
Lower Judy Creek	13.8	.05	.04	.05	.06	.031	.06	.04		
Lower Judy Creek	13.375*	.05	.031	.05						
Lower Judy Creek	12.95*	.05	.031	.0049						
Lower Judy Creek	12.525*	.05	.031	.049						
Lower Judy Creek	12.1*	.05	.03	.031	.049					
Lower Judy Creek	11.675*	.05	.03	.031	.048					
Lower Judy Creek	11.25*	.05	.04	.031	.048					
Lower Judy Creek	10.825*	.05	.05	.031	.047					
Lower Judy Creek	10.4*	.05	.06	.031	.047					
Lower Judy Creek	9.975*	.05	.06	.031	.047					
Lower Judy Creek	9.55000*	.05	.07	.031	.046					
Lower Judy Creek	9.12500*	.05	.08	.031	.046					
Lower Judy Creek	8.70000*	.05	.08	.031	.046					
Lower Judy Creek	8.27500*	.05	.09	.031	.045					
Lower Judy Creek	7.85000*	.05	.1	.031	.045					
Lower Judy Creek	7.42500*	.05	.1	.031	.044					

Lower Judy Creek	7.0	.04	.05	.04	.05	.11	.031	.11	.05	.04
Lower Judy Creek	6.39818*	.05	.031	.046						
Lower Judy Creek	5.79636*	.05	.031	.048						
Lower Judy Creek	5.19454*	.05	.031	.05						
Lower Judy Creek	4.59272*	.05	.031	.052						
Lower Judy Creek	3.99090*	.05	.031	.053						
Lower Judy Creek	3.38909*	.05	.031	.055						
Lower Judy Creek	2.78727*	.05	.031	.057						
Lower Judy Creek	2.18545*	.05	.031	.059						
Lower Judy Creek	1.58363*	.05	.031	.061						
Lower Judy Creek	.981819*	.05	.031	.063						
Lower Judy Creek	0.38	.05	.031	.065						

SUMMARY OF REACH LENGTHS

River: Fish Creek

Reach	River Sta.	Left	Channel	Right
Upper Fish Creek	43.3	1903.5	4751.08	1745.42
Upper Fish Creek	42.3916*	1903.5	4751.08	1745.42
Upper Fish Creek	41.4833*	1903.5	4751.08	1745.42
Upper Fish Creek	40.575*	1903.5	4751.08	1745.42
Upper Fish Creek	39.6666*	1903.5	4751.08	1745.42
Upper Fish Creek	38.7583*	1903.5	4751.08	1745.42
Upper Fish Creek	37.85*	1903.5	4751.08	1745.42
Upper Fish Creek	36.9416*	1903.5	4751.08	1745.42
Upper Fish Creek	36.0333*	1903.5	4751.08	1745.42
Upper Fish Creek	35.125*	1903.5	4751.08	1745.42
Upper Fish Creek	34.2166*	1903.5	4751.08	1745.42
Upper Fish Creek	33.3083*	1903.5	4751.09	1745.42
Upper Fish Creek	32.4	2464.43	4273.14	2171
Upper Fish Creek	31.6071*	2464.43	4273.14	2171
Upper Fish Creek	30.8142*	2464.43	4273.14	2171
Upper Fish Creek	30.0214*	2464.43	4273.14	2171
Upper Fish Creek	29.2285*	2464.43	4273.14	2171
Upper Fish Creek	28.4357*	2464.43	4273.14	2171
Upper Fish Creek	27.6428*	2464.43	4273.14	2171
Upper Fish Creek	26.85	0	0	0
Lower Fish Creek	26.09	2826	4769	4679
Lower Fish Creek	25.1	2028.75	4406.38	2370.38
Lower Fish Creek	24.2625*	2028.75	4406.38	2370.38
Lower Fish Creek	23.425*	2028.75	4406.38	2370.38
Lower Fish Creek	22.5875*	2028.75	4406.38	2370.38
Lower Fish Creek	21.75*	2028.75	4406.38	2370.38
Lower Fish Creek	20.9125*	2028.75	4406.38	2370.38
Lower Fish Creek	20.075*	2028.75	4406.38	2370.38
Lower Fish Creek	19.2375*	2028.75	4406.38	2370.38
Lower Fish Creek	18.4	3217.29	4349	2885.43
Lower Fish Creek	17.5714*	3217.29	4349	2885.43
Lower Fish Creek	16.7428*	3217.29	4349	2885.43
Lower Fish Creek	15.9142*	3217.29	4349	2885.43
Lower Fish Creek	15.0857*	3217.29	4349	2885.43
Lower Fish Creek	14.2571*	3217.29	4349	2885.43
Lower Fish Creek	13.4285*	3217.29	4349	2885.43
Lower Fish Creek	12.6	1090	5078	2467
Lower Fish Creek	11.7	2559	4481.46	2515.69
Lower Fish Creek	10.8538*	2559	4481.46	2515.69
Lower Fish Creek	10.0076*	2559	4481.46	2515.69
Lower Fish Creek	9.16153*	2559	4481.46	2515.69
Lower Fish Creek	8.31538*	2559	4481.46	2515.69
Lower Fish Creek	7.46923*	2559	4481.46	2515.69

Lower Fish Creek	6.62307*	2559	4481.46	2515.69
Lower Fish Creek	5.77692*	2559	4481.46	2515.69
Lower Fish Creek	4.93076*	2559	4481.46	2515.69
Lower Fish Creek	4.08461*	2559	4481.46	2515.69
Lower Fish Creek	3.23846*	2559	4481.46	2515.69
Lower Fish Creek	2.39230*	2559	4481.46	2515.69
Lower Fish Creek	1.54615*	2559	4481.46	2515.7
Lower Fish Creek	0.7	0	0	0

River: Judy Creek

Reach	River Sta.	Left	Channel	Right
Lower Judy Creek	13.8	1530.69	2280.69	1205.25
Lower Judy Creek	13.375*	1530.69	2280.69	1205.25
Lower Judy Creek	12.95*	1530.69	2280.69	1205.25
Lower Judy Creek	12.525*	1530.69	2280.69	1205.25
Lower Judy Creek	12.1*	1530.69	2280.69	1205.25
Lower Judy Creek	11.675*	1530.69	2280.69	1205.25
Lower Judy Creek	11.25*	1530.69	2280.69	1205.25
Lower Judy Creek	10.825*	1530.69	2280.69	1205.25
Lower Judy Creek	10.4*	1530.69	2280.69	1205.25
Lower Judy Creek	9.975*	1530.69	2280.69	1205.25
Lower Judy Creek	9.55000*	1530.69	2280.69	1205.25
Lower Judy Creek	9.12500*	1530.69	2280.69	1205.25
Lower Judy Creek	8.70000*	1530.69	2280.69	1205.25
Lower Judy Creek	8.27500*	1530.69	2280.69	1205.25
Lower Judy Creek	7.85000*	1530.69	2280.69	1205.25
Lower Judy Creek	7.42500*	1530.69	2280.7	1205.25
Lower Judy Creek	7.0	1574.27	2316.18	1729.73
Lower Judy Creek	6.39818*	1574.27	2316.18	1729.73
Lower Judy Creek	5.79636*	1574.27	2316.18	1729.73
Lower Judy Creek	5.19454*	1574.27	2316.18	1729.73
Lower Judy Creek	4.59272*	1574.27	2316.18	1729.73
Lower Judy Creek	3.99090*	1574.27	2316.18	1729.73
Lower Judy Creek	3.38909*	1574.27	2316.18	1729.73
Lower Judy Creek	2.78727*	1574.27	2316.18	1729.73
Lower Judy Creek	2.18545*	1574.27	2316.18	1729.73
Lower Judy Creek	1.58363*	1574.27	2316.18	1729.73
Lower Judy Creek	.981819*	1574.28	2316.18	1729.73
Lower Judy Creek	0.38	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Fish Creek

Reach	River Sta.	Contr.	Expan.
Upper Fish Creek	43.3	.1	.3
Upper Fish Creek	42.3916*	.1	.3
Upper Fish Creek	41.4833*	.1	.3
Upper Fish Creek	40.575*	.1	.3
Upper Fish Creek	39.6666*	.1	.3
Upper Fish Creek	38.7583*	.1	.3
Upper Fish Creek	37.85*	.1	.3
Upper Fish Creek	36.9416*	.1	.3

Upper Fish Creek	36.0333*	.1	.3
Upper Fish Creek	35.125*	.1	.3
Upper Fish Creek	34.2166*	.1	.3
Upper Fish Creek	33.3083*	.1	.3
Upper Fish Creek	32.4	.1	.3
Upper Fish Creek	31.6071*	.1	.3
Upper Fish Creek	30.8142*	.1	.3
Upper Fish Creek	30.0214*	.1	.3
Upper Fish Creek	29.2285*	.1	.3
Upper Fish Creek	28.4357*	.1	.3
Upper Fish Creek	27.6428*	.1	.3
Upper Fish Creek	26.85	.1	.3
Lower Fish Creek	26.09	.1	.3
Lower Fish Creek	25.1	.1	.3
Lower Fish Creek	24.2625*	.1	.3
Lower Fish Creek	23.425*	.1	.3
Lower Fish Creek	22.5875*	.1	.3
Lower Fish Creek	21.75*	.1	.3
Lower Fish Creek	20.9125*	.1	.3
Lower Fish Creek	20.075*	.1	.3
Lower Fish Creek	19.2375*	.1	.3
Lower Fish Creek	18.4	.1	.3
Lower Fish Creek	17.5714*	.1	.3
Lower Fish Creek	16.7428*	.1	.3
Lower Fish Creek	15.9142*	.1	.3
Lower Fish Creek	15.0857*	.1	.3
Lower Fish Creek	14.2571*	.1	.3
Lower Fish Creek	13.4285*	.1	.3
Lower Fish Creek	12.6	.1	.3
Lower Fish Creek	11.7	.1	.3
Lower Fish Creek	10.8538*	.1	.3
Lower Fish Creek	10.0076*	.1	.3
Lower Fish Creek	9.16153*	.1	.3
Lower Fish Creek	8.31538*	.1	.3
Lower Fish Creek	7.46923*	.1	.3
Lower Fish Creek	6.62307*	.1	.3
Lower Fish Creek	5.77692*	.1	.3
Lower Fish Creek	4.93076*	.1	.3
Lower Fish Creek	4.08461*	.1	.3
Lower Fish Creek	3.23846*	.1	.3
Lower Fish Creek	2.39230*	.1	.3
Lower Fish Creek	1.54615*	.1	.3
Lower Fish Creek	0.7	.1	.3

River: Judy Creek

Reach	River Sta.	Contr.	Expan.
Lower Judy Creek	13.8	.1	.3
Lower Judy Creek	13.375*	.1	.3
Lower Judy Creek	12.95*	.1	.3
Lower Judy Creek	12.525*	.1	.3
Lower Judy Creek	12.1*	.1	.3
Lower Judy Creek	11.675*	.1	.3
Lower Judy Creek	11.25*	.1	.3
Lower Judy Creek	10.825*	.1	.3
Lower Judy Creek	10.4*	.1	.3
Lower Judy Creek	9.975*	.1	.3
Lower Judy Creek	9.55000*	.1	.3

Lower Judy Creek	9.12500*	.1	.3
Lower Judy Creek	8.70000*	.1	.3
Lower Judy Creek	8.27500*	.1	.3
Lower Judy Creek	7.85000*	.1	.3
Lower Judy Creek	7.42500*	.1	.3
Lower Judy Creek	7.0	.1	.3
Lower Judy Creek	6.39818*	.1	.3
Lower Judy Creek	5.79636*	.1	.3
Lower Judy Creek	5.19454*	.1	.3
Lower Judy Creek	4.59272*	.1	.3
Lower Judy Creek	3.99090*	.1	.3
Lower Judy Creek	3.38909*	.1	.3
Lower Judy Creek	2.78727*	.1	.3
Lower Judy Creek	2.18545*	.1	.3
Lower Judy Creek	1.58363*	.1	.3
Lower Judy Creek	.981819*	.1	.3
Lower Judy Creek	0.38	.1	.3

Profile Output Table - Standard Table 1

River	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
Fish Creek	Lower Fish Creek	0.7	53000.00		0.30	6.42	2.34	6.43	0.000080	0.49	110291.30	25511.48	0.04
Fish Creek	Lower Fish Creek	1.54615*	45600.00	-0.36	6.75	6.75		6.75	0.000076	0.47	99689.40	25025.39	0.04
Fish Creek	Lower Fish Creek	2.39230*	45600.00	-0.74	7.09	7.10		7.10	0.000097	0.53	89671.05	24546.54	0.05
Fish Creek	Lower Fish Creek	3.23846*	45600.00	-1.13	7.51	7.51		7.51	0.000111	0.60	81767.84	24087.56	0.06
Fish Creek	Lower Fish Creek	4.08461*	45600.00	-1.52	8.05	8.06		8.06	0.000156	0.78	67544.65	22325.18	0.07
Fish Creek	Lower Fish Creek	4.93076*	45600.00	-1.90	8.64	8.65		8.65	0.000132	0.83	66366.15	20144.56	0.07
Fish Creek	Lower Fish Creek	5.77692*	45600.00	-2.29	9.13	9.14		9.14	0.000105	0.92	64174.13	19326.11	0.07
Fish Creek	Lower Fish Creek	6.62307*	45600.00	-2.68	9.55	9.56		9.56	0.000100	1.02	61125.60	18781.33	0.08
Fish Creek	Lower Fish Creek	7.46923*	45600.00	-3.07	9.96	9.97		9.97	0.000098	1.14	58150.38	18039.57	0.09
Fish Creek	Lower Fish Creek	8.31538*	45600.00	-3.45	10.36	10.38		10.38	0.000104	1.29	55091.44	17769.42	0.10
Fish Creek	Lower Fish Creek	9.16153*	45600.00	-3.84	10.79	10.81		10.81	0.000112	1.51	51801.55	17710.68	0.11
Fish Creek	Lower Fish Creek	10.0076*	45600.00	-4.23	11.23	11.27		11.27	0.000118	1.82	48880.82	17962.32	0.13
Fish Creek	Lower Fish Creek	10.8538*	45600.00	-4.61	11.72	11.78		11.78	0.000144	2.26	46648.34	18339.00	0.15
Fish Creek	Lower Fish Creek	11.7	45600.00	-5.00	12.27	12.32		12.32	0.000160	2.55	45234.36	18031.69	0.17
Fish Creek	Lower Fish Creek	12.6	45600.00	-5.80	12.75	12.81		12.81	0.000187	3.00	43266.84	17799.32	0.17
Fish Creek	Lower Fish Creek	13.4285*	44800.00	-5.83	13.47	13.53		13.53	0.000211	2.93	43228.35	17032.38	0.16
Fish Creek	Lower Fish Creek	14.2571*	44800.00	-5.86	14.23	14.29		14.29	0.000212	3.01	41926.76	15277.46	0.17
Fish Creek	Lower Fish Creek	15.0857*	44800.00	-5.89	14.99	15.05		15.05	0.000208	3.03	41402.11	14090.83	0.17
Fish Creek	Lower Fish Creek	15.9142*	44800.00	-5.91	15.74	15.80		15.80	0.000206	3.06	40814.78	13204.13	0.17
Fish Creek	Lower Fish Creek	16.7428*	44800.00	-5.94	16.47	16.53		16.53	0.000201	3.05	40030.06	12067.37	0.17
Fish Creek	Lower Fish Creek	17.5714*	44800.00	-5.97	17.19	17.25		17.25	0.000196	3.03	39106.93	11391.61	0.17
Fish Creek	Lower Fish Creek	18.4	44800.00	-6.00	17.64	17.84		17.84	0.000100	4.69	35375.02	10731.29	0.27
Fish Creek	Lower Fish Creek	19.2375*	43600.00	-4.42	18.33	18.42		18.42	0.000255	3.53	31165.21	9995.80	0.20
Fish Creek	Lower Fish Creek	20.075*	43600.00	-2.84	19.30	19.46		19.46	0.000383	4.27	26145.97	8565.48	0.23
Fish Creek	Lower Fish Creek	20.9125*	43600.00	-1.26	20.44	20.57		20.57	0.000290	4.00	26388.23	6486.69	0.21
Fish Creek	Lower Fish Creek	21.75*	43600.00	0.32	21.31	21.42		21.42	0.000231	3.77	29767.88	7073.26	0.19
Fish Creek	Lower Fish Creek	22.5875*	43600.00	1.90	22.05	22.14		22.14	0.000214	3.48	32696.81	7803.80	0.18
Fish Creek	Lower Fish Creek	23.425*	43600.00	3.48	22.72	22.80		22.80	0.000210	3.51	35197.45	8340.02	0.18
Fish Creek	Lower Fish Creek	24.2625*	43600.00	5.06	23.36	23.45		23.45	0.000198	3.51	37137.67	8558.52	0.18
Fish Creek	Lower Fish Creek	25.1	43600.00	6.64	24.00	24.07		24.07	0.000209	3.35	38187.93	8755.26	0.17
Fish Creek	Lower Fish Creek	26.09	43600.00	7.89	24.94	25.03		25.03	0.000240	3.69	35455.53	8716.65	0.19
Fish Creek	Upper Fish Creek	26.85	25700.00	6.88	25.82	25.95		25.95	0.000223	3.77	19705.93	6614.86	0.19
Fish Creek	Upper Fish Creek	27.6428*	25400.00	7.84	26.61	26.74		26.74	0.000223	3.66	18301.26	6306.58	0.18
Fish Creek	Upper Fish Creek	28.4357*	25400.00	8.80	27.31	27.38		27.38	0.000152	3.00	21093.82	4909.17	0.15
Fish Creek	Upper Fish Creek	29.2285*	25400.00	9.76	27.77	27.82		27.82	0.000116	2.58	24164.09	5126.46	0.13
Fish Creek	Upper Fish Creek	30.0214*	25400.00	10.72	28.10	28.13		28.13	0.000090	2.34	26799.46	5419.27	0.12

Fish Creek	Upper	Fish Creek	30.8142*	25400.00	11.68	28.35	28.38	0.000072	2.10	29098.99	5673.87	0.10
Fish Creek	Upper	Fish Creek	31.6071*	25400.00	12.64	28.55	28.57	0.000062	1.94	31086.71	5926.52	0.10
Fish Creek	Upper	Fish Creek	32.4	25400.00	13.60	28.71	28.72	0.000043	1.62	32545.94	6186.51	0.08
Fish Creek	Upper	Fish Creek	33.3083*	25000.00	14.03	28.87	28.91	0.000097	2.42	24853.03	5916.45	0.12
Fish Creek	Upper	Fish Creek	34.2166*	25000.00	14.45	29.25	29.32	0.000179	3.21	18555.37	5471.39	0.17
Fish Creek	Upper	Fish Creek	35.125*	25000.00	14.88	29.94	30.07	0.000275	3.95	14443.91	4947.37	0.21
Fish Creek	Upper	Fish Creek	36.0333*	25000.00	15.30	30.95	31.13	0.000321	4.30	12313.41	4476.08	0.22
Fish Creek	Upper	Fish Creek	36.9416*	25000.00	15.73	32.12	32.33	0.000322	4.40	11261.67	3813.30	0.23
Fish Creek	Upper	Fish Creek	37.85*	25000.00	16.15	33.33	33.55	0.000308	4.40	10711.83	3160.08	0.22
Fish Creek	Upper	Fish Creek	38.7583*	25000.00	16.58	34.54	34.75	0.000306	4.23	10486.46	2831.08	0.21
Fish Creek	Upper	Fish Creek	39.6666*	25000.00	17.00	35.71	35.91	0.000280	4.12	10197.09	2693.48	0.20
Fish Creek	Upper	Fish Creek	40.575*	25000.00	17.43	36.80	37.00	0.000260	4.03	9828.86	2456.64	0.20
Fish Creek	Upper	Fish Creek	41.4833*	25000.00	17.85	37.84	38.04	0.000246	3.96	9496.07	2307.60	0.19
Fish Creek	Upper	Fish Creek	42.3916*	25000.00	18.28	38.80	38.96	0.000205	3.64	11441.53	3570.49	0.17
Fish Creek	Upper	Fish Creek	43.3	25000.00	18.70	39.54	39.64	0.000143	3.03	13921.78	2902.96	0.15
Judy Creek	Lower	Judy Creek	0.38	22100.00	8.18	25.68	25.73	0.000134	2.56	23928.95	6351.77	0.14
Judy Creek	Lower	Judy Creek	.981819*	21500.00	8.91	25.99	26.06	0.000204	3.11	20089.39	7077.03	0.18
Judy Creek	Lower	Judy Creek	1.58363*	21500.00	9.64	26.46	26.58	0.000303	3.76	16528.99	7207.80	0.21
Judy Creek	Lower	Judy Creek	2.18545*	21500.00	10.37	27.35	27.40	0.000514	2.68	16224.94	6856.02	0.15
Judy Creek	Lower	Judy Creek	2.78727*	21500.00	11.10	28.07	28.19	0.000263	3.60	15671.85	5872.45	0.20
Judy Creek	Lower	Judy Creek	3.38909*	21500.00	11.83	28.60	28.70	0.000251	3.51	15159.63	5005.38	0.20
Judy Creek	Lower	Judy Creek	3.99090*	21500.00	12.55	29.11	29.23	0.000265	3.60	14777.14	5191.47	0.20
Judy Creek	Lower	Judy Creek	4.59272*	21500.00	13.28	29.65	29.77	0.000282	3.71	14423.13	5416.28	0.21
Judy Creek	Lower	Judy Creek	5.19454*	21500.00	14.01	30.21	30.33	0.000279	3.68	14125.20	5443.48	0.21
Judy Creek	Lower	Judy Creek	5.79636*	21500.00	14.74	30.77	30.89	0.000284	3.71	13861.56	5047.23	0.21
Judy Creek	Lower	Judy Creek	6.39818*	21500.00	15.47	31.34	31.47	0.000288	3.74	13622.09	5095.88	0.21
Judy Creek	Lower	Judy Creek	7.0	21500.00	16.20	32.03	32.10	0.000345	2.90	14195.05	5211.33	0.16
Judy Creek	Lower	Judy Creek	7.42500*	19900.00	16.63	32.62	32.75	0.000368	3.70	11709.07	4887.68	0.20
Judy Creek	Lower	Judy Creek	7.85000*	19900.00	17.05	33.39	33.57	0.000465	4.18	10154.28	4682.62	0.23
Judy Creek	Lower	Judy Creek	8.27500*	19900.00	17.48	34.30	34.52	0.000466	4.36	9393.25	4563.60	0.23
Judy Creek	Lower	Judy Creek	8.70000*	19900.00	17.90	35.20	35.40	0.000400	4.20	9112.64	3494.37	0.22
Judy Creek	Lower	Judy Creek	9.12500*	19900.00	18.33	35.99	36.21	0.000382	4.28	8756.93	3331.19	0.22
Judy Creek	Lower	Judy Creek	9.55000*	19900.00	18.75	36.70	36.96	0.000329	4.52	8192.67	3163.06	0.23
Judy Creek	Lower	Judy Creek	9.975*	19900.00	19.18	37.40	37.67	0.000332	4.60	7630.20	2973.56	0.23
Judy Creek	Lower	Judy Creek	10.4*	19900.00	19.60	38.09	38.38	0.000335	4.67	7155.61	2752.27	0.23
Judy Creek	Lower	Judy Creek	10.825*	19900.00	20.03	38.80	39.11	0.000336	4.74	6769.07	2600.82	0.24
Judy Creek	Lower	Judy Creek	11.25*	19900.00	20.45	39.52	39.84	0.000335	4.79	6471.50	2303.35	0.24
Judy Creek	Lower	Judy Creek	11.675*	19900.00	20.88	40.24	40.57	0.000330	4.84	6216.69	2173.34	0.24
Judy Creek	Lower	Judy Creek	12.1*	19900.00	21.30	40.96	41.29	0.000331	4.88	5984.37	2042.21	0.24
Judy Creek	Lower	Judy Creek	12.525*	19900.00	21.73	41.69	42.03	0.000338	4.91	5800.60	1897.10	0.24
Judy Creek	Lower	Judy Creek	12.95*	19900.00	22.15	42.42	42.72	0.000294	4.60	5636.48	1731.72	0.22
Judy Creek	Lower	Judy Creek	13.375*	19900.00	22.58	43.08	43.44	0.000348	5.00	5411.53	1461.88	0.24
Judy Creek	Lower	Judy Creek	13.8	19900.00	23.00	43.85	44.21	0.000345	4.99	5394.69	1332.14	0.24

Profile Output Table - Standard Table 2

River	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)
Fish Creek	Lower	Fish Creek	0.7	6.43	6.42	0.00		8081.71	43904.88	1013.42	25511.48
Fish Creek	Lower	Fish Creek	1.54615*	6.75	6.75	0.00		8205.40	36482.85	911.74	25025.39
Fish Creek	Lower	Fish Creek	2.39230*	7.10	7.09	0.00	0.32	9808.60	34856.57	934.83	24546.54
Fish Creek	Lower	Fish Creek	3.23846*	7.51	7.51	0.01	0.42	11258.55	33371.40	970.04	24087.56
Fish Creek	Lower	Fish Creek	4.08461*	8.06	8.05	0.01	0.54	6309.51	37985.89	1304.60	22325.18
Fish Creek	Lower	Fish Creek	4.93076*	8.65	8.64	0.01	0.60	7272.74	36896.37	1430.88	20144.56
Fish Creek	Lower	Fish Creek	5.77692*	9.14	9.13	0.01	0.49	7363.27	36876.32	1360.40	19326.11
Fish Creek	Lower	Fish Creek	6.62307*	9.56	9.55	0.01	0.42	7880.77	36296.92	1422.31	18781.33
Fish Creek	Lower	Fish Creek	7.46923*	9.97	9.96	0.02	0.40	8388.13	35729.04	1482.83	18039.57
Fish Creek	Lower	Fish Creek	8.31538*	10.38	10.36	0.02	0.41	9228.85	34729.26	1641.89	17769.42

Fish Creek	Lower	Fish Creek	9.16153*	10.81	10.79	0.03	0.43	0.00	10246.57	33795.69	1557.74	17710.68
Fish Creek	Lower	Fish Creek	10.0076*	11.27	11.23	0.04	0.46	0.00	11448.65	32441.81	1709.54	17962.32
Fish Creek	Lower	Fish Creek	10.8538*	11.78	11.72	0.05	0.51	0.00	14096.75	29585.92	1917.33	18339.00
Fish Creek	Lower	Fish Creek	11.7	12.32	12.27	0.05	0.55	0.00	22948.67	20560.16	2091.17	18031.69
Fish Creek	Lower	Fish Creek	12.6	12.81	12.75	0.06	0.48	0.00	26177.65	16522.51	2899.84	17799.32
Fish Creek	Lower	Fish Creek	13.4285*	13.53	13.47	0.05	0.72	0.00	25516.76	16168.65	3114.58	17032.38
Fish Creek	Lower	Fish Creek	14.2571*	14.29	14.23	0.06	0.76	0.00	24269.98	16597.51	3932.51	15277.46
Fish Creek	Lower	Fish Creek	15.0857*	15.05	14.99	0.06	0.76	0.00	23143.18	16728.79	4928.03	14090.83
Fish Creek	Lower	Fish Creek	15.9142*	15.80	15.74	0.06	0.75	0.00	22259.92	16836.80	5703.28	13204.13
Fish Creek	Lower	Fish Creek	16.7428*	16.53	16.47	0.06	0.73	0.00	21830.66	16733.36	6235.98	12067.37
Fish Creek	Lower	Fish Creek	17.5714*	17.25	17.19	0.06	0.71	0.00	21014.86	16523.64	7261.49	11391.61
Fish Creek	Lower	Fish Creek	18.4	17.84	17.64	0.19	0.55	0.04	14084.86	24759.03	5956.12	10731.29
Fish Creek	Lower	Fish Creek	19.2375*	18.42	18.33	0.09	0.57	0.01	20916.18	18486.72	4197.10	9995.80
Fish Creek	Lower	Fish Creek	20.075*	19.46	19.30	0.16	1.02	0.02	13162.78	22786.37	7650.84	8565.48
Fish Creek	Lower	Fish Creek	20.9125*	20.57	20.44	0.13	1.12	0.00	11369.53	21946.17	10284.30	6486.69
Fish Creek	Lower	Fish Creek	21.75*	21.42	21.31	0.11	0.85	0.00	11044.51	20630.30	11925.19	7073.26
Fish Creek	Lower	Fish Creek	22.5875*	22.14	22.05	0.09	0.71	0.00	11056.01	18625.66	13918.33	7803.80
Fish Creek	Lower	Fish Creek	23.425*	22.80	22.72	0.09	0.67	0.00	9718.34	18175.29	15706.37	8340.02
Fish Creek	Lower	Fish Creek	24.2625*	23.45	23.36	0.08	0.64	0.00	9921.93	17418.63	16259.44	8558.52
Fish Creek	Lower	Fish Creek	25.1	24.07	24.00	0.07	0.62	0.00	11375.72	15702.70	16521.59	8755.26
Fish Creek	Lower	Fish Creek	26.09	25.03	24.94	0.09	0.95	0.01	10222.79	16740.49	16636.72	8716.65
Fish Creek	Upper	Fish Creek	26.85	25.95	25.82	0.14	0.91	0.01	6180.04	15573.65	3946.31	6614.86
Fish Creek	Upper	Fish Creek	27.6428*	26.74	26.61	0.13	0.79	0.00	6929.92	15226.00	3244.08	6306.58
Fish Creek	Upper	Fish Creek	28.4357*	27.38	27.31	0.07	0.64	0.01	8391.10	12442.53	4566.37	4909.17
Fish Creek	Upper	Fish Creek	29.2285*	27.82	27.77	0.05	0.43	0.00	9178.78	10465.60	5755.62	5126.46
Fish Creek	Upper	Fish Creek	30.0214*	28.13	28.10	0.04	0.32	0.00	9531.27	9175.82	6692.91	5419.27
Fish Creek	Upper	Fish Creek	30.8142*	28.38	28.35	0.03	0.24	0.00	9708.29	7910.15	7781.56	5673.87
Fish Creek	Upper	Fish Creek	31.6071*	28.57	28.55	0.02	0.19	0.00	10075.73	6973.56	8350.71	5926.52
Fish Creek	Upper	Fish Creek	32.4	28.72	28.71	0.01	0.15	0.00	8930.86	5512.48	10956.66	6186.51
Fish Creek	Upper	Fish Creek	33.3083*	28.91	28.87	0.04	0.18	0.01	9006.06	8082.06	7911.89	5916.45
Fish Creek	Upper	Fish Creek	34.2166*	29.32	29.25	0.08	0.40	0.01	8077.48	10642.16	6280.37	5471.39
Fish Creek	Upper	Fish Creek	35.125*	30.07	29.94	0.14	0.74	0.02	6780.67	13369.17	4850.16	4947.37
Fish Creek	Upper	Fish Creek	36.0333*	31.13	30.95	0.18	1.05	0.01	5659.39	15322.95	4017.65	4476.08
Fish Creek	Upper	Fish Creek	36.9416*	32.33	32.12	0.21	1.19	0.01	4615.59	16692.54	3691.88	3813.30
Fish Creek	Upper	Fish Creek	37.85*	33.55	33.33	0.22	1.21	0.00	3703.48	17777.89	3518.63	3160.08
Fish Creek	Upper	Fish Creek	38.7583*	34.75	34.54	0.21	1.21	0.00	3071.96	18179.17	3748.88	2831.08
Fish Creek	Upper	Fish Creek	39.6666*	35.91	35.71	0.20	1.17	0.00	2262.69	18771.52	3965.79	2693.48
Fish Creek	Upper	Fish Creek	40.575*	37.00	36.80	0.20	1.09	0.00	1578.66	19317.55	4103.79	2456.64
Fish Creek	Upper	Fish Creek	41.4833*	38.04	37.84	0.20	1.04	0.00	979.85	19869.20	4150.95	2307.60
Fish Creek	Upper	Fish Creek	42.3916*	38.96	38.80	0.16	0.92	0.00	2098.27	19003.71	3898.02	3570.49
Fish Creek	Upper	Fish Creek	43.3	39.64	39.54	0.10	0.68	0.01	5776.02	16142.95	3081.04	2902.96
Judy Creek	Lower	Judy Creek	0.38	25.73	25.68	0.04	0.69	0.00	4900.08	8575.82	8624.10	6351.77
Judy Creek	Lower	Judy Creek	.981819*	26.06	25.99	0.07	0.33	0.01	4424.75	10041.98	7033.27	7077.03
Judy Creek	Lower	Judy Creek	1.58363*	26.58	26.46	0.13	0.51	0.02	4106.44	11912.58	5480.97	7207.80
Judy Creek	Lower	Judy Creek	2.18545*	27.40	27.35	0.05	0.81	0.01	5968.97	8684.27	6846.77	6856.02
Judy Creek	Lower	Judy Creek	2.78727*	28.19	28.07	0.11	0.76	0.02	4523.94	11723.62	5252.44	5872.45
Judy Creek	Lower	Judy Creek	3.38909*	28.70	28.60	0.11	0.52	0.00	4479.95	11262.30	5757.76	5005.38
Judy Creek	Lower	Judy Creek	3.99090*	29.23	29.11	0.11	0.52	0.00	4130.35	11362.80	6006.85	5191.47
Judy Creek	Lower	Judy Creek	4.59272*	29.77	29.65	0.12	0.55	0.00	3771.32	11527.34	6201.34	5416.28
Judy Creek	Lower	Judy Creek	5.19454*	30.33	30.21	0.12	0.56	0.00	3803.39	11334.07	6362.55	5443.48
Judy Creek	Lower	Judy Creek	5.79636*	30.89	30.77	0.12	0.57	0.00	3654.43	11293.15	6552.41	5047.23
Judy Creek	Lower	Judy Creek	6.39818*	31.47	31.34	0.12	0.57	0.00	3696.51	11259.67	6543.82	5095.88
Judy Creek	Lower	Judy Creek	7.0	32.10	32.03	0.07	0.62	0.01	4485.29	8747.87	8266.84	5211.33
Judy Creek	Lower	Judy Creek	7.42500*	32.75	32.62	0.13	0.64	0.02	3481.99	11331.09	5086.92	4887.68
Judy Creek	Lower	Judy Creek	7.85000*	33.57	33.39	0.18	0.80	0.02	3473.96	13170.73	3255.30	4682.62
Judy Creek	Lower	Judy Creek	8.27500*	34.52	34.30	0.22	0.93	0.01	3576.72	14296.80	2026.49	4563.60
Judy Creek	Lower	Judy Creek	8.70000*	35.40	35.20	0.20	0.88	0.00	3367.46	14308.89	2223.65	3494.37
Judy Creek	Lower	Judy Creek	9.12500*	36.21	35.99	0.22	0.80	0.00	3031.17	14925.00	1943.83	3331.19
Judy Creek	Lower	Judy Creek	9.55000*	36.96	36.70	0.26	0.74	0.01	2413.20	15987.35	1499.46	3163.06
Judy Creek	Lower	Judy Creek	9.975*	37.67	37.40	0.27	0.70	0.01	2254.74	16461.87	1183.39	2973.56

Judy Creek	Lower Judy Creek	10.4*	38.38	38.09	0.29	0.71	0.00	2110.88	16864.69	924.43	2752.27
Judy Creek	Lower Judy Creek	10.825*	39.11	38.80	0.30	0.72	0.00	1956.13	17242.23	701.64	2600.82
Judy Creek	Lower Judy Creek	11.25*	39.84	39.52	0.32	0.73	0.00	1834.91	17564.83	500.26	2303.35
Judy Creek	Lower Judy Creek	11.675*	40.57	40.24	0.33	0.73	0.00	1721.03	17816.35	362.62	2173.34
Judy Creek	Lower Judy Creek	12.1*	41.29	40.96	0.34	0.73	0.00	1633.54	17999.47	266.98	2042.21
Judy Creek	Lower Judy Creek	12.525*	42.03	41.69	0.34	0.74	0.00	1589.01	18108.04	202.95	1897.10
Judy Creek	Lower Judy Creek	12.95*	42.72	42.42	0.31	0.69	0.00	1432.39	16951.31	1516.30	1731.72
Judy Creek	Lower Judy Creek	13.375*	43.44	43.08	0.36	0.70	0.02	1442.10	18297.21	160.69	1461.88
Judy Creek	Lower Judy Creek	13.8	44.21	43.85	0.36	0.77	0.00	1505.06	18207.96	186.98	1332.14

Profile Output Table - Junctions

River	Reach	River Sta	W.S. Elev (ft)	E.G. Elev (ft)	Q Total (cfs)
Fish Creek	Upper Fish Creek	26.85	25.82	25.95	25700.00
Judy Creek	Lower Judy Creek	0.38	25.68	25.73	22100.00
Junction:	Fish Junct.				
Fish Creek	Lower Fish Creek	26.09	24.94	25.03	43600.00

Table E.5

HEC-RAS Run, Ublutuoch River, Calibration Report

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

```
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   X
XXXXXXXX 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
```

Ublutuoch River Calibration Run, May 24th 2002 Discharge and Cross-Sections

PROJECT DATA

Project Title: Ublutuoch River calibration model
Project File : Ub5.prj
Run Date and Time: 9/30/2002 8:33:51 AM

Project in English units

Project Description:
Ublutuoch River Backwater analysis

PLAN DATA

Plan Title: Plan 06
Plan File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub5.p06

Geometry Title: Calibration X-sections new bank sta--1
Geometry File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub5.g04

Flow Title : Calibration Run new bank sta--1
Flow File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub5.f04

Computational Information

Water surface calculation tolerance = 0.003
Critical depth calculation tolerance = 0.003
Maximum number of iterations = 20
Maximum difference tolerance = 0.1
Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Friction Slope
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Calibration Run new bank sta--1
Flow File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub5.f04

Flow Data (cfs)

River	Reach	RS	PF 1
Ublutuoch River	13.7-8	13.7	1363
Ublutuoch River	13.7-8	12.56	1392
Ublutuoch River	13.7-8	11.42	1422
Ublutuoch River	13.7-8	10.28	1451
Ublutuoch River	13.7-8	9.14	1481
Ublutuoch River	13.7-8	8	1510

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Ublutuoch River	13.7-8	PF 1		Normal S = .000041

GEOMETRY DATA

Geometry Title: Calibration X-sections new bank sta--1

Geometry File : s:\Projects\2002\NPR Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub5.g04

Cross-Section Data

CROSS SECTION RIVER: Ublutuoch River
REACH: 13.7-8 RS: 13.7

INPUT

Description: Calibration X-section at 13.7

Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	30.8	99	27.2	286	23.3	336	20.8	430	17.2
473	17.2	500	17.2	517	17.2	556	17.2	583	16.9
610	14.87	613	13.7	634.5	11.87	642	10.47	647	8.37
649.5	8.07	652	7.47	654.5	7.07	657	6.97	659.5	6.97
662	7.07	664.5	6.97	667	7.17	669.5	7.27	672	7.87
674.5	8.37	677	8.67	679.5	9.27	682	9.37	684.5	9.57
687	10.07	689.5	10.17	692	11.07	699	14.87	705	18.1
713	18.6	721	18.7	810	15.9	985	16.1	1011	17.1
1104	16.9	1189	18.5	1288	19.2	1381	19.2	1471	19.7
1568	20.3	1649	19.9	1755	23	1807	25.3	1875	26.2

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.11	613	.0205	705	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	613	705		3000	3010	3000	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	14.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.110	0.021	
W.S. Elev (ft)	14.68	Reach Len. (ft)	3000.00	3010.00	3000.00
Crit W.S. (ft)		Flow Area (sq ft)	1.23	395.55	
E.G. Slope (ft/ft)	0.000303	Area (sq ft)	1.23	395.55	
Q Total (cfs)	1363.00	Flow (cfs)	0.17	1362.83	
Top Width (ft)	88.16	Top Width (ft)	2.51	85.65	
Vel Total (ft/s)	3.44	Avg. Vel. (ft/s)	0.14	3.45	
Max Chl Dpth (ft)	7.71	Hydr. Depth (ft)	0.49	4.62	
Conv. Total (cfs)	78242.3	Conv. (cfs)	9.8	78232.5	
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	2.69	87.76	

Min Ch El (ft)	6.97	Shear (lb/sq ft)	0.01	0.09	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.29	
Frctn Loss (ft)	0.90	Cum Volume (acre-ft)	0.60	300.94	0.12
C & E Loss (ft)	0.00	Cum SA (acres)	1.69	61.14	0.27

CROSS SECTION RIVER: Ublutuoch River
 REACH: 13.7-8 RS: 13.13*

INPUT

Description:

Station Elevation Data		num= 128							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	30.16	40.73	28.66	84.18	26.87	104.49	25.78	112.02	25.48
140.53	24.78	195.53	23.79	205.03	23.68	219.29	23.38	249.16	23.01
282.43	22.27	300.08	21.96	301.86	21.96	306.19	21.85	339.45	20.33
351.67	19.96	354.64	19.77	359.82	19.5	381.55	18.75	420.92	17.51
453.85	16.44	461.66	16.44	471.16	16.57	475.24	16.44	488.81	16.45
491.53	16.52	493.57	16.45	499.23	16.45	527.73	16.42	528.87	16.42
541.77	16.45	545.68	16.46	568.93	16.51	573	16.6	575.71	16.53
586.84	16.42	597.44	16.21	615.34	16.06	619.16	15.82	629.35	15.14
634.1	15.02	640.21	14.54	642.93	14.28	643.83	14.18	647	12.99
650.63	12.54	655.17	12.09	659.71	11.69	664.26	11.28	668.74	10.83
668.8	10.82	673.34	10	676.33	9.48	677.88	8.89	681.39	7.56
682.42	7.45	683.91	7.3	684.69	7.13	686.44	6.75	686.96	6.68
688.97	6.38	689.23	6.37	691.5	6.27	693.75	6.27	696	6.36
698.25	6.27	700.67	6.46	700.76	6.47	703.09	6.55	703.27	6.56
705.51	7.06	705.78	7.12	707.93	7.5	708.29	7.57	710.35	7.78
710.8	7.83	712.77	8.24	713.31	8.36	715.19	8.44	715.81	8.46
717.61	8.59	718.32	8.64	720.03	8.94	720.83	9.09	722.45	9.15
723.34	9.17	724.87	9.65	725.85	9.97	729.71	11.85	732.88	13.58
734.54	14.48	738.9	17.02	745.33	17.49	746.84	17.63	747.47	17.66
754.78	17.77	775.33	17.26	781.76	16.97	791.4	16.88	843.13	15.54
850.33	15.57	859.97	15.45	867.47	15.55	921.04	15.78	922.11	15.86
992.82	15.94	1016.84	16	1042.65	16.94	1077.46	16.92	1134.97	16.86
1173.89	17.56	1219.34	18.34	1242.46	18.49	1317.61	19.06	1324.96	19.07
1408.53	19.03	1409.93	19.03	1448.17	19.28	1499.27	19.61	1545.67	19.93
1595.56	20.21	1614.24	20.13	1675.96	19.88	1704.23	20.64	1781.18	22.75
1810.3	23.94	1832.8	24.86	1900.3	25.73				

Manning's n Values		num= 3					
Sta	n Val	Sta	n Val				
0	.11	647	.0198	738.9	.11		
Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	647	738.9		3000	3010	3000	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	13.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.110	0.020	
W.S. Elev (ft)	13.77	Reach Len. (ft)	3000.00	3010.00	3000.00
Crit W.S. (ft)		Flow Area (sq ft)	0.81	391.16	
E.G. Slope (ft/ft)	0.000296	Area (sq ft)	0.81	391.16	
Q Total (cfs)	1363.00	Flow (cfs)	0.10	1362.90	
Top Width (ft)	88.31	Top Width (ft)	2.08	86.23	
Vel Total (ft/s)	3.48	Avg. Vel. (ft/s)	0.12	3.48	
Max Chl Dpth (ft)	7.50	Hydr. Depth (ft)	0.39	4.54	
Conv. Total (cfs)	79248.6	Conv. (cfs)	5.6	79243.0	

Length Wtd. (ft)	3010.00	Wetted Per. (ft)	2.22	88.19	
Min Ch El (ft)	6.27	Shear (lb/sq ft)	0.01	0.08	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.29	
Frctn Loss (ft)	0.90	Cum Volume (acre-ft)	0.53	273.76	0.12
C & E Loss (ft)	0.00	Cum SA (acres)	1.53	55.20	0.27

CROSS SECTION RIVER: Ublutuoch River
 REACH: 13.7-8 RS: 12.56

INPUT

Description:

Station Elevation Data	num=	128
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 29.52 42.88 27.92 88.61 25.84 109.98 24.36 117.91 23.9		
147.92 23.07 205.8 22.18 215.8 22.15 230.81 21.83 262.25 21.67		
297.27 20.85 315.85 20.59 317.73 20.62 322.28 20.6 357.29 19.14		
370.16 18.97 373.27 18.74 378.73 18.39 401.6 17.68 443.04 16.62		
477.7 15.68 485.92 15.68 495.92 15.94 500.21 15.68 514.5 15.7		
517.36 15.84 519.5 15.7 525.47 15.69 555.46 15.64 556.66 15.64		
570.24 15.7 574.35 15.72 598.82 15.82 603.11 15.99 605.97 15.86		
617.68 15.63 628.84 15.33 647.67 15.23 651.7 15.02 662.42 14.38		
667.42 14.47 673.85 13.94 676.71 13.62 677.67 13.49 681 12.28		
684.67 11.69 689.27 11.16 693.86 10.76 698.45 10.31 702.99 9.79		
703.04 9.78 707.63 8.97 710.66 8.49 712.22 7.95 715.77 6.76		
716.82 6.65 718.33 6.52 719.11 6.38 720.89 6.03 721.41 5.96		
723.44 5.69 723.7 5.68 726 5.57 728 5.57 730 5.65		
732 5.57 734.43 5.76 734.52 5.77 736.86 5.84 737.04 5.85		
739.29 6.32 739.56 6.37 741.71 6.71 742.07 6.77 744.14 6.95		
744.59 6.98 746.57 7.35 747.11 7.45 749 7.53 749.63 7.55		
751.43 7.66 752.15 7.71 753.86 7.98 754.67 8.11 756.29 8.16		
757.19 8.17 758.71 8.59 759.7 8.87 763.57 10.56 766.76 12.3		
768.43 13.2 772.8 15.94 779.18 16.48 780.68 16.66 781.31 16.71		
788.56 16.84 808.96 16.48 815.34 16.1 824.91 16.21 876.26 15.18		
883.4 15.23 892.97 14.98 900.42 15.16 953.59 15.57 954.65 15.72		
1024.84 15.8 1048.68 15.89 1074.3 16.77 1108.86 16.82 1165.93 16.83		
1204.57 17.49 1249.68 18.18 1272.63 18.31 1347.23 18.92 1354.52 18.94		
1437.47 18.86 1438.86 18.86 1476.82 19.15 1527.54 19.52 1573.59 19.87		
1623.11 20.12 1641.65 20.05 1702.92 19.85 1730.99 20.55 1807.36 22.49		
1836.27 23.58 1858.6 24.42 1925.6 25.26		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .11 681 .0192 772.8 .11		

Bank Sta: Left Right Lengths: Left Channel Right	Coeff Contr.	Expan.
681 772.8 3000 3010 3000	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	13.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.110	0.019	
W.S. Elev (ft)	12.85	Reach Len. (ft)	3000.00	3010.00	3000.00
Crit W.S. (ft)		Flow Area (sq ft)	0.45	386.48	
E.G. Slope (ft/ft)	0.000304	Area (sq ft)	0.45	386.48	

Q Total (cfs)	1392.00	Flow (cfs)	0.04	1391.96	
Top Width (ft)	88.36	Top Width (ft)	1.58	86.79	
Vel Total (ft/s)	3.60	Avg. Vel. (ft/s)	0.10	3.60	
Max Chl Dpth (ft)	7.28	Hydr. Depth (ft)	0.29	4.45	
Conv. Total (cfs)	79834.1	Conv. (cfs)	2.5	79831.6	
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	1.68	88.63	
Min Ch El (ft)	5.57	Shear (lb/sq ft)	0.01	0.08	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.30	
Frctn Loss (ft)	0.89	Cum Volume (acre-ft)	0.48	246.89	0.12
C & E Loss (ft)	0.00	Cum SA (acres)	1.40	49.22	0.27

CROSS SECTION RIVER: Ublutuoch River
 REACH: 13.7-8 RS: 11.99*

INPUT

Description:

Station Elevation Data	num=	128
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 28.88 45.02 27.18 93.03 24.81 115.47 22.94 123.79 22.33		
155.3 21.36 216.08 20.57 226.58 20.62 242.33 20.27 275.35 20.34		
312.11 19.43 331.62 19.21 333.59 19.28 338.37 19.35 375.13 17.94		
388.64 17.99 391.91 17.72 397.64 17.28 421.65 16.61 465.16 15.73		
501.55 14.91 510.18 14.92 520.68 15.31 525.18 14.92 540.19 14.95		
543.19 15.16 545.44 14.95 551.7 14.94 583.2 14.86 584.45 14.86		
598.71 14.95 603.03 14.98 628.72 15.13 633.22 15.39 636.22 15.19		
648.52 14.85 660.23 14.45 680.01 14.39 684.24 14.22 695.49 13.62		
700.74 13.92 707.5 13.35 710.5 12.96 711.5 12.8 715 11.57		
718.71 10.83 723.36 10.24 728 9.82 732.64 9.34 737.23 8.75		
737.29 8.74 741.93 7.94 744.99 7.5 746.57 7.02 750.16 5.95		
751.21 5.85 752.74 5.75 753.54 5.63 755.33 5.31 755.86 5.25		
757.91 5 758.18 4.99 760.5 4.87 762.25 4.87 764 4.94		
765.75 4.87 768.19 5.06 768.28 5.07 770.62 5.13 770.81 5.14		
773.06 5.57 773.33 5.62 775.5 5.92 775.86 5.96 777.94 6.11		
778.39 6.14 780.38 6.45 780.92 6.54 782.81 6.62 783.44 6.64		
785.25 6.74 785.97 6.78 787.69 7.01 788.5 7.13 790.12 7.17		
791.03 7.17 792.56 7.52 793.56 7.77 797.44 9.26 800.63 11.01		
802.31 11.92 806.7 14.86 813.03 15.46 814.52 15.68 815.14 15.76		
822.35 15.91 842.59 15.69 848.92 15.22 858.42 15.55 909.38 14.82		
916.48 14.89 925.98 14.5 933.36 14.78 986.14 15.35 987.2 15.59		
1056.86 15.66 1080.53 15.79 1105.95 16.61 1140.25 16.72 1196.9 16.79		
1235.25 17.42 1280.03 18.02 1302.8 18.14 1376.84 18.78 1384.08 18.81		
1466.41 18.69 1467.79 18.7 1505.46 19.02 1555.81 19.42 1601.52 19.81		
1650.67 20.03 1669.07 19.96 1729.88 19.83 1757.74 20.45 1833.55 22.24		
1862.24 23.22 1884.4 23.98 1950.9 24.79		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .11 715 .0185 806.7 .11		

Bank Sta: Left Right Lengths: Left Channel Right	Coeff Contr.	Expan.
715 806.7 3000 3010 3000	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	12.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.110	0.019	

W.S. Elev (ft)	11.96	Reach Len. (ft)	3000.00	3010.00	3000.00
Crit W.S. (ft)		Flow Area (sq ft)	0.21	384.26	
E.G. Slope (ft/ft)	0.000290	Area (sq ft)	0.21	384.26	
Q Total (cfs)	1392.00	Flow (cfs)	0.02	1391.98	
Top Width (ft)	88.46	Top Width (ft)	1.10	87.36	
Vel Total (ft/s)	3.62	Avg. Vel. (ft/s)	0.07	3.62	
Max Chl Dpth (ft)	7.09	Hydr. Depth (ft)	0.19	4.40	
Conv. Total (cfs)	81752.0	Conv. (cfs)	0.9	81751.1	
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	1.17	89.14	
Min Ch El (ft)	4.87	Shear (lb/sq ft)	0.00	0.08	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.28	
Frctn Loss (ft)	0.86	Cum Volume (acre-ft)	0.46	220.27	0.12
C & E Loss (ft)	0.00	Cum SA (acres)	1.31	43.21	0.27

CROSS SECTION RIVER: Ublutuoch River
 REACH: 13.7-8 RS: 11.42

INPUT

Description:

Station	Elevation	Data	num=	128
Sta	Elev	Sta	Elev	Sta
0	28.24	47.16	26.44	97.46
162.69	19.65	226.35	18.96	237.35
326.95	18.01	347.39	17.84	349.45
407.12	17	410.54	16.69	416.55
525.4	14.15	534.44	14.16	545.44
569.02	14.48	571.38	14.2	577.94
627.18	14.2	631.7	14.23	658.62
679.35	14.07	691.63	13.57	712.34
734.07	13.38	741.14	12.76	744.28
752.76	9.98	757.45	9.31	762.14
771.53	7.7	776.22	6.92	779.32
785.61	5.05	787.16	4.97	787.96
792.39	4.31	792.65	4.3	795
799.5	4.17	801.95	4.36	802.04
806.84	4.83	807.11	4.87	809.29
812.19	5.3	814.18	5.55	814.72
819.07	5.81	819.8	5.85	821.52
824.87	6.18	826.41	6.45	827.41
836.2	10.64	840.6	13.78	846.89
856.13	14.98	876.22	14.91	882.5
949.55	14.54	958.98	14.03	966.31
1088.88	15.52	1112.37	15.69	1137.6
1265.93	17.34	1310.37	17.86	1332.97
1495.35	18.52	1496.72	18.53	1534.11
1678.23	19.94	1696.49	19.88	1756.84
1888.2	22.86	1910.2	23.54	1976.2

Manning's n Values

num=	3
Sta	n Val
0	.11
749	.0179
840.6	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 749 840.6 3000 3010 3000 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	11.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.110	0.018	
W.S. Elev (ft)	11.08	Reach Len. (ft)	3000.00	3010.00	3000.00
Crit W.S. (ft)		Flow Area (sq ft)	0.07	384.51	
E.G. Slope (ft/ft)	0.000285	Area (sq ft)	0.07	384.51	
Q Total (cfs)	1422.00	Flow (cfs)	0.00	1422.00	
Top Width (ft)	88.47	Top Width (ft)	0.65	87.82	
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)	0.05	3.70	
Max Chl Dpth (ft)	6.91	Hydr. Depth (ft)	0.11	4.38	
Conv. Total (cfs)	84305.0	Conv. (cfs)	0.2	84304.8	
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	0.69	89.58	
Min Ch El (ft)	4.17	Shear (lb/sq ft)	0.00	0.08	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.28	
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	0.45	193.70	0.12
C & E Loss (ft)	0.00	Cum SA (acres)	1.25	37.15	0.27

CROSS SECTION RIVER: Ublutuoch River
 REACH: 13.7-8 RS: 10.85*

INPUT

Description:

Station Elevation Data		num= 128							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	27.6	49.3	25.7	101.88	22.75	126.46	20.1	135.57	19.18
170.07	17.94	236.63	17.35	248.13	17.56	265.38	17.17	301.53	17.67
341.79	16.59	363.15	16.47	365.31	16.6	370.55	16.85	410.81	15.56
425.6	16.02	429.18	15.66	435.46	15.06	461.75	14.46	509.4	13.95
549.25	13.39	558.7	13.4	570.2	14.05	575.13	13.4	591.56	13.45
594.85	13.8	597.31	13.45	604.17	13.43	638.66	13.3	640.04	13.3
655.65	13.45	660.38	13.49	688.51	13.75	693.44	14.19	696.73	13.85
710.19	13.29	723.02	12.69	744.68	12.72	749.31	12.61	761.64	12.1
767.39	12.83	774.78	12.16	778.07	11.65	779.17	11.42	783	10.15
786.8	9.13	791.54	8.39	796.29	7.94	801.03	7.4	805.72	6.67
805.78	6.66	810.52	5.89	813.65	5.52	815.27	5.14	818.93	4.34
820.01	4.25	821.57	4.2	822.38	4.12	824.22	3.88	824.76	3.82
826.86	3.62	827.13	3.61	829.5	3.46	830.75	3.46	832	3.52
833.25	3.46	835.71	3.66	835.8	3.66	838.16	3.71	838.34	3.72
840.62	4.08	840.89	4.11	843.07	4.33	843.44	4.36	845.53	4.44
845.98	4.46	847.98	4.65	848.53	4.73	850.44	4.8	851.07	4.82
852.89	4.89	853.62	4.91	855.35	5.08	856.17	5.16	857.8	5.2
858.71	5.18	860.26	5.39	861.26	5.58	865.17	6.66	868.39	8.43
870.08	9.36	874.5	12.7	880.74	13.43	882.21	13.74	882.82	13.85
889.91	14.04	909.85	14.12	916.09	13.47	925.44	14.22	975.64	14.1
982.63	14.2	991.98	13.56	999.26	14.01	1051.24	14.93	1052.28	15.32
1120.9	15.39	1144.21	15.58	1169.25	16.28	1203.04	16.51	1258.84	16.72
1296.61	17.27	1340.71	17.7	1363.14	17.78	1436.07	18.51	1443.2	18.55
1524.29	18.35	1525.66	18.36	1562.76	18.76	1612.35	19.24	1657.37	19.69
1705.78	19.85	1723.91	19.8	1783.81	19.79	1811.24	20.27	1885.91	21.73
1914.17	22.5	1936	23.1	2001.5	23.85				
Manning's n Values		num= 3							
Sta	n Val	Sta	n Val	Sta	n Val				
0	.11	783	.0172	874.5	.11				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 783 874.5 3000 3010 3000 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	10.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.110	0.017	
W.S. Elev (ft)	10.29	Reach Len. (ft)	3000.00	3010.00	3000.00
Crit W.S. (ft)		Flow Area (sq ft)	0.03	392.26	
E.G. Slope (ft/ft)	0.000248	Area (sq ft)	0.03	392.26	
Q Total (cfs)	1422.00	Flow (cfs)	0.00	1422.00	
Top Width (ft)	88.72	Top Width (ft)	0.42	88.31	
Vel Total (ft/s)	3.62	Avg. Vel. (ft/s)	0.03	3.63	
Max Chl Dpth (ft)	6.83	Hydr. Depth (ft)	0.07	4.44	
Conv. Total (cfs)	90331.0	Conv. (cfs)	0.1	90330.9	
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	0.44	90.13	
Min Ch El (ft)	3.46	Shear (lb/sq ft)	0.00	0.07	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.24	
Frothn Loss (ft)	0.68	Cum Volume (acre-ft)	0.45	166.87	0.12
C & E Loss (ft)	0.00	Cum SA (acres)	1.21	31.07	0.27

CROSS SECTION RIVER: Ublutuoch River
 REACH: 13.7-8 RS: 10.28

INPUT

Description:

Station Elevation Data		num=		128					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	26.96	51.44	24.96	106.3	21.72	131.95	18.68	141.45	17.6
177.46	16.24	246.9	15.74	258.9	16.03	276.91	15.61	314.63	16.34
356.63	15.17	378.92	15.09	381.18	15.26	386.64	15.6	428.65	14.37
444.08	15.04	447.82	14.63	454.37	13.94	481.8	13.39	531.52	13.06
573.1	12.63	582.96	12.64	594.96	13.42	600.1	12.64	617.25	12.7
620.68	13.12	623.25	12.7	630.41	12.67	666.39	12.53	667.83	12.52
684.12	12.7	689.05	12.75	718.41	13.06	723.56	13.58	726.98	13.18
741.03	12.5	754.42	11.82	777.02	11.89	781.85	11.81	794.71	11.34
800.71	12.29	808.43	11.57	811.86	10.99	813	10.73	817	9.44
820.84	8.27	825.63	7.46	830.43	7.01	835.22	6.44	839.97	5.63
840.02	5.62	844.82	4.86	847.98	4.53	849.61	4.21	853.32	3.53
854.41	3.46	855.99	3.42	856.81	3.37	858.66	3.16	859.2	3.11
861.33	2.93	861.6	2.92	864	2.76	865	2.76	866	2.8
867	2.76	869.46	2.96	869.56	2.96	871.93	3	872.11	3.01
874.39	3.34	874.67	3.36	876.86	3.54	877.22	3.56	879.32	3.6
879.78	3.61	881.79	3.75	882.33	3.82	884.25	3.89	884.89	3.9
886.71	3.96	887.44	3.98	889.18	4.12	890	4.18	891.64	4.21
892.56	4.18	894.11	4.32	895.11	4.48	899.04	5.36	902.27	7.15
903.96	8.08	908.4	11.62	914.59	12.42	916.05	12.77	916.65	12.9
923.69	13.11	943.48	13.34	949.67	12.6	958.95	13.56	1008.77	13.74
1015.7	13.86	1024.99	13.09	1032.21	13.63	1083.79	14.72	1084.83	15.18
1152.92	15.25	1176.05	15.48	1200.9	16.12	1234.43	16.41	1289.8	16.68
1327.28	17.2	1371.05	17.54	1393.32	17.61	1465.69	18.37	1472.76	18.42
1553.23	18.18	1554.59	18.19	1591.41	18.63	1640.62	19.15	1685.3	19.64
1733.34	19.76	1751.33	19.72	1810.77	19.76	1837.99	20.17	1912.09	21.47

1940.13 22.14 1961.8 22.66 2026.8 23.38
Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .11 817 .0165 908.4 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
817 908.4 3000 3010 3000 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	9.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.110	0.017	
W.S. Elev (ft)	9.61	Reach Len. (ft)	3000.00	3010.00	3000.00
Crit W.S. (ft)		Flow Area (sq ft)	0.05	411.26	
E.G. Slope (ft/ft)	0.000205	Area (sq ft)	0.05	411.26	
Q Total (cfs)	1451.00	Flow (cfs)	0.00	1451.00	
Top Width (ft)	89.42	Top Width (ft)	0.54	88.88	
Vel Total (ft/s)	3.53	Avg. Vel. (ft/s)	0.04	3.53	
Max Chl Dpth (ft)	6.85	Hydr. Depth (ft)	0.09	4.63	
Conv. Total (cfs)	101335.3	Conv. (cfs)	0.1	101335.2	
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	0.57	90.87	
Min Ch El (ft)	2.76	Shear (lb/sq ft)	0.00	0.06	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.20	
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	0.44	139.10	0.12
C & E Loss (ft)	0.01	Cum SA (acres)	1.18	24.95	0.27

CROSS SECTION RIVER: Ublutuoch River
REACH: 13.7-8 RS: 9.71*

INPUT

Description:

Station Elevation Data		num=	128							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	26.32	53.58	24.22	110.73	20.69	137.44	17.26	147.34	16.03	
184.84	14.53	257.18	14.13	269.68	14.49	288.43	14.06	327.72	15	
371.48	13.76	394.69	13.72	397.04	13.91	402.73	14.35	446.48	13.18	
462.56	14.05	466.45	13.6	473.27	12.83	501.85	12.32	553.64	12.17	
596.95	11.87	607.22	11.88	619.72	12.79	625.08	11.88	642.94	11.95	
646.51	12.44	649.19	11.95	656.64	11.92	694.13	11.75	695.62	11.74	
712.59	11.95	717.73	12.01	748.31	12.37	753.67	12.98	757.24	12.51	
771.87	11.72	785.81	10.94	809.35	11.05	814.39	11.01	827.78	10.58	
834.03	11.74	842.07	10.98	845.64	10.33	846.84	10.04	851	8.73	
854.88	7.42	859.72	6.54	864.57	6.07	869.42	5.47	874.21	4.59	
874.27	4.58	879.11	3.84	882.31	3.53	883.96	3.27	887.7	2.72	
888.81	2.66	890.4	2.65	891.23	2.62	893.1	2.44	893.65	2.4	
895.8	2.24	896.08	2.23	898.5	2.06	899.25	2.06	900	2.09	
900.75	2.06	903.22	2.26	903.31	2.26	905.7	2.29	905.88	2.3	
908.17	2.59	908.44	2.61	910.64	2.74	911.01	2.75	913.12	2.77	
913.57	2.77	915.59	2.85	916.14	2.91	918.06	2.99	918.7	2.99	
920.54	3.04	921.27	3.05	923.01	3.15	923.83	3.2	925.48	3.22	
926.4	3.18	927.96	3.26	928.96	3.38	932.9	4.06	936.14	5.86	
937.85	6.8	942.3	10.54	948.44	11.4	949.89	11.8	950.49	11.95	
957.48	12.18	977.11	12.55	983.25	11.72	992.47	12.89	1041.9	13.38	
1048.78	13.52	1057.99	12.62	1065.16	13.25	1116.35	14.51	1117.37	15.05	

1184.94	15.11	1207.89	15.38	1232.56	15.96	1265.82	16.31	1320.77	16.65
1357.96	17.12	1401.4	17.38	1423.49	17.43	1495.3	18.23	1502.32	18.29
1582.18	18.01	1583.52	18.02	1620.06	18.49	1668.89	19.06	1713.22	19.58
1760.9	19.67	1778.75	19.64	1837.73	19.74	1864.74	20.08	1938.27	21.22
1966.1	21.78	1987.6	22.22	2052.1	22.91				
Manning's n Values			num=			3			
Sta	n Val	Sta	n Val	Sta	n Val				
0	.11	851	.0159	942.3	.11				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
851 942.3 3000 3010 3000 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	9.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.110	0.016	
W.S. Elev (ft)	9.10	Reach Len. (ft)	3000.00	3010.00	3000.00
Crit W.S. (ft)		Flow Area (sq ft)	0.22	445.40	
E.G. Slope (ft/ft)	0.000148	Area (sq ft)	0.22	445.40	
Q Total (cfs)	1451.00	Flow (cfs)	0.01	1450.99	
Top Width (ft)	90.77	Top Width (ft)	1.18	89.59	
Vel Total (ft/s)	3.26	Avg. Vel. (ft/s)	0.05	3.26	
Max Chl Dpth (ft)	7.04	Hydr. Depth (ft)	0.19	4.97	
Conv. Total (cfs)	119259.7	Conv. (cfs)	0.9	119258.7	
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	1.24	91.84	
Min Ch El (ft)	2.06	Shear (lb/sq ft)	0.00	0.04	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.15	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	0.43	109.51	0.12
C & E Loss (ft)	0.01	Cum SA (acres)	1.12	18.78	0.27

CROSS SECTION RIVER: Ublutuoch River
REACH: 13.7-8 RS: 9.14

INPUT

Description:

Station Elevation Data		num=		128							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
0	25.68	55.72	23.48	115.15	19.66	142.93	15.84	153.23	14.45		
192.23	12.82	267.45	12.52	280.45	12.96	299.95	12.51	340.81	13.67		
386.32	12.34	410.46	12.35	412.9	12.57	418.82	13.1	464.32	11.98		
481.04	13.07	485.09	12.57	492.18	11.72	521.9	11.24	575.76	11.28		
620.8	11.1	631.48	11.12	644.48	12.16	650.05	11.12	668.63	11.2		
672.34	11.76	675.13	11.2	682.88	11.16	721.86	10.97	723.42	10.96		
741.06	11.2	746.4	11.27	778.21	11.68	783.78	12.38	787.49	11.84		
802.71	10.94	817.21	10.06	841.69	10.22	846.93	10.21	860.86	9.82		
867.36	11.19	875.71	10.39	879.43	9.67	880.67	9.35	885	8.02		
888.92	6.57	893.82	5.61	898.71	5.13	903.61	4.5	908.45	3.55		
908.51	3.54	913.41	2.81	916.64	2.54	918.31	2.33	922.09	1.92		
923.2	1.86	924.82	1.87	925.65	1.87	927.55	1.72	928.1	1.69		
930.27	1.55	930.55	1.54	933	1.36	933.5	1.36	934	1.38		
934.5	1.36	936.98	1.56	937.07	1.56	939.46	1.58	939.65	1.59		
941.95	1.85	942.22	1.86	944.43	1.95	944.8	1.95	946.91	1.93		
947.37	1.93	949.39	1.96	949.94	2	951.88	2.08	952.52	2.08		
954.36	2.11	955.09	2.12	956.84	2.19	957.67	2.22	959.32	2.23		

960.24	2.18	961.8	2.19	962.81	2.28	966.77	2.76	970.02	4.57
971.73	5.52	976.2	9.46	982.3	10.39	983.73	10.83	984.33	11
991.26	11.25	1010.74	11.77	1016.83	10.85	1025.98	12.23	1075.03	13.02
1081.85	13.18	1090.99	12.14	1098.1	12.87	1148.9	14.29	1149.91	14.91
1216.96	14.97	1239.74	15.28	1264.21	15.79	1297.21	16.2	1351.74	16.61
1388.64	17.05	1431.74	17.22	1453.66	17.25	1524.92	18.09	1531.88	18.16
1611.12	17.84	1612.45	17.86	1648.7	18.36	1697.16	18.97	1741.15	19.52
1788.45	19.58	1806.16	19.56	1864.69	19.72	1891.5	19.99	1964.46	20.96
1992.07	21.42	2013.4	21.78	2077.4	22.44				
Manning's n Values			num=	3					
Sta	n Val	Sta	n Val	Sta	n Val				
0	.11	885	.0152	976.2	.11				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	885	976.2		3000	3010	3000	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	8.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.110	0.015	
W.S. Elev (ft)	8.75	Reach Len. (ft)	3000.00	3010.00	3000.00
Crit W.S. (ft)		Flow Area (sq ft)	0.86	494.18	
E.G. Slope (ft/ft)	0.000101	Area (sq ft)	0.86	494.18	
Q Total (cfs)	1481.00	Flow (cfs)	0.06	1480.94	
Top Width (ft)	92.75	Top Width (ft)	2.36	90.39	
Vel Total (ft/s)	2.99	Avg. Vel. (ft/s)	0.07	3.00	
Max Chl Dpth (ft)	7.39	Hydr. Depth (ft)	0.36	5.47	
Conv. Total (cfs)	147091.6	Conv. (cfs)	5.7	147085.9	
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	2.47	93.02	
Min Ch El (ft)	1.36	Shear (lb/sq ft)	0.00	0.03	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.10	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.40	77.04	0.12
C & E Loss (ft)	0.01	Cum SA (acres)	1.00	12.56	0.27

CROSS SECTION RIVER: Ublutuoch River
 REACH: 13.7-8 RS: 8.57*

INPUT

Description:

Station Elevation Data	num=	128								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	25.04	57.86	22.74	119.58	18.63	148.42	14.42	159.11	12.88	
199.61	11.11	277.73	10.91	291.23	11.43	311.48	10.95	353.91	12.33	
401.16	10.92	426.23	10.97	428.77	11.23	434.91	11.85	482.16	10.79	
499.52	12.08	503.73	11.55	511.09	10.61	541.95	10.17	597.88	10.39	
644.65	10.34	655.74	10.36	669.24	11.53	675.03	10.36	694.31	10.45	
698.17	11.08	701.06	10.45	709.11	10.41	749.59	10.19	751.21	10.18	
769.53	10.45	775.08	10.53	808.1	10.99	813.89	11.77	817.75	11.17	
833.55	10.16	848.6	9.18	874.02	9.38	879.46	9.4	893.93	9.06	
900.68	10.65	909.36	9.79	913.21	9.02	914.5	8.66	919	7.31	
922.96	5.71	927.91	4.69	932.86	4.2	937.81	3.53	942.7	2.51	
942.76	2.5	947.7	1.79	950.97	1.55	952.65	1.4	956.48	1.11	
957.6	1.06	959.23	1.1	960.08	1.11	961.99	1	962.55	.97	
964.74	.86	965.03	.85	967.5	.66	967.75	.66	968	.67	

968.25	.66	970.74	.86	970.83	.86	973.23	.87	973.42	.88
975.72	1.1	976	1.11	978.21	1.15	978.58	1.15	980.71	1.1
981.17	1.08	983.2	1.06	983.75	1.09	985.69	1.17	986.33	1.17
988.18	1.19	988.92	1.19	990.67	1.22	991.5	1.24	993.16	1.25
994.08	1.18	995.65	1.13	996.67	1.18	1000.63	1.46	1003.9	3.28
1005.62	4.24	1010.1	8.38	1016.15	9.37	1017.57	9.85	1018.16	10.05
1025.04	10.32	1044.37	10.98	1050.42	9.97	1059.49	11.56	1108.15	12.66
1114.93	12.84	1124	11.67	1131.05	12.48	1181.45	14.08	1182.46	14.78
1248.98	14.84	1271.58	15.17	1295.86	15.63	1328.61	16.1	1382.7	16.57
1419.32	16.97	1462.08	17.06	1483.83	17.08	1554.53	17.95	1561.44	18.03
1640.06	17.67	1641.38	17.69	1677.35	18.23	1725.43	18.87	1769.07	19.46
1816.01	19.49	1833.58	19.48	1891.65	19.7	1918.25	19.89	1990.64	20.71
2018.03	21.06	2039.2	21.34	2102.7	21.97				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .11 919 .0146 1010.1 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 919 1010.1 3000 3010 3000 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	8.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.110	0.015	0.110
W.S. Elev (ft)	8.52	Reach Len. (ft)	3000.00	3010.00	3000.00
Crit W.S. (ft)		Flow Area (sq ft)	2.43	555.44	0.06
E.G. Slope (ft/ft)	0.000064	Area (sq ft)	2.43	555.44	0.06
Q Total (cfs)	1481.00	Flow (cfs)	0.18	1480.82	0.00
Top Width (ft)	95.96	Top Width (ft)	4.02	91.10	0.83
Vel Total (ft/s)	2.65	Avg. Vel. (ft/s)	0.08	2.67	0.02
Max Chl Dpth (ft)	7.86	Hydr. Depth (ft)	0.60	6.10	0.07
Conv. Total (cfs)	184570.4	Conv. (cfs)	22.7	184547.6	0.1
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	4.20	94.16	0.85
Min Ch El (ft)	0.66	Shear (lb/sq ft)	0.00	0.02	0.00
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.06	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.28	40.78	0.11
C & E Loss (ft)	0.01	Cum SA (acres)	0.78	6.29	0.24

CROSS SECTION RIVER: Ublutuoch River
 REACH: 13.7-8 RS: 8

INPUT

Description: Calibration X-section at 8.0

Station Elevation Data		num= 83							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	24.4	60	22	124	17.6	165	11.3	207	9.4
288	9.3	302	9.9	323	9.4	367	11	416	9.5
442	9.6	451	10.6	500	9.6	518	11.1	530	9.5
562	9.1	620	9.5	680	9.6	694	10.9	700	9.6
720	9.7	724	10.4	727	9.7	779	9.4	798	9.7
838	10.3	844	11.17	848	10.5	880	8.3	912	8.6
927	8.3	934	10.1	943	9.2	947	8.36	953	6.6
957	4.86	962	3.76	967	3.26	972	2.56	977	1.46
982	.76	987	.46	992	.26	994.5	.36	997	.26
999.5	.16	1002	-.04	1004.5	.16	1007	.16	1009.5	.36
1012	.36	1014.5	.26	1017	.16	1019.5	.26	1022	.26
1024.5	.26	1027	.26	1029.5	.06	1034.5	.16	1039.5	2.96
1044	7.3	1050	8.36	1052	9.1	1078	10.2	1084	9.1
1093	10.9	1148	12.5	1157	11.2	1164	12.1	1214	13.87
1215	14.64	1281	14.7	1360	16	1450	16.9	1514	16.9
1591	17.9	1669	17.5	1706	18.1	1797	19.4	1861	19.4
1945	19.8	2044	20.7	2128	21.5				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.11	953	.0139	1044	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	953	1044		0	0	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

Element	Value	Left OB	Channel	Right OB
E.G. Elev (ft)	8.46			
Vel Head (ft)	0.09	0.110	0.014	0.110
W.S. Elev (ft)	8.37			
Crit W.S. (ft)	3.07			
E.G. Slope (ft/ft)	0.000041	5.80	624.88	3.25
Q Total (cfs)	1510.00	5.80	624.88	3.25
Top Width (ft)	115.66	0.42	1509.40	0.18
Vel Total (ft/s)	2.38	18.63	91.00	6.03
Max Chl Dpth (ft)	8.41	0.07	2.42	0.06
Conv. Total (cfs)	235820.9	0.31	6.87	0.54
Length Wtd. (ft)		65.4	235726.7	28.8
Min Ch El (ft)	-0.04	18.89	94.26	6.13
Alpha	1.03	0.00	0.02	0.00
Frctn Loss (ft)		0.00	0.04	0.00
C & E Loss (ft)				

SUMMARY OF MANNING'S N VALUES
 River:Ublutuoch River

Reach	River Sta.	n1	n2	n3
13.7-8	13.7	.11	.0205	.11
13.7-8	13.13*	.11	.0198	.11
13.7-8	12.56	.11	.0192	.11
13.7-8	11.99*	.11	.0185	.11
13.7-8	11.42	.11	.0179	.11
13.7-8	10.85*	.11	.0172	.11
13.7-8	10.28	.11	.0165	.11

13.7-8	9.71*	.11	.0159	.11
13.7-8	9.14	.11	.0152	.11
13.7-8	8.57*	.11	.0146	.11
13.7-8	8	.11	.0139	.11

SUMMARY OF REACH LENGTHS

River: Ublutuoch River

Reach	River Sta.	Left	Channel	Right
13.7-8	13.7	3000	3010	3000
13.7-8	13.13*	3000	3010	3000
13.7-8	12.56	3000	3010	3000
13.7-8	11.99*	3000	3010	3000
13.7-8	11.42	3000	3010	3000
13.7-8	10.85*	3000	3010	3000
13.7-8	10.28	3000	3010	3000
13.7-8	9.71*	3000	3010	3000
13.7-8	9.14	3000	3010	3000
13.7-8	8.57*	3000	3010	3000
13.7-8	8	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Ublutuoch River

Reach	River Sta.	Contr.	Expan.
13.7-8	13.7	.1	.3
13.7-8	13.13*	.1	.3
13.7-8	12.56	.1	.3
13.7-8	11.99*	.1	.3
13.7-8	11.42	.1	.3
13.7-8	10.85*	.1	.3
13.7-8	10.28	.1	.3
13.7-8	9.71*	.1	.3
13.7-8	9.14	.1	.3
13.7-8	8.57*	.1	.3
13.7-8	8	.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
13.7-8	8	1510.00	-0.04	8.37	3.07	8.46	0.000041	2.42	633.93	115.66	0.16	
13.7-8	8.57*	1481.00	0.66	8.52		8.63	0.000064	2.67	557.92	95.96	0.19	
13.7-8	9.14	1481.00	1.36	8.75		8.88	0.000101	3.00	495.03	92.75	0.23	
13.7-8	9.71*	1451.00	2.06	9.10		9.27	0.000148	3.26	445.62	90.77	0.26	
13.7-8	10.28	1451.00	2.76	9.61		9.81	0.000205	3.53	411.31	89.42	0.29	
13.7-8	10.85*	1422.00	3.46	10.29		10.49	0.000248	3.63	392.29	88.72	0.30	
13.7-8	11.42	1422.00	4.17	11.08		11.30	0.000285	3.70	384.59	88.47	0.31	
13.7-8	11.99*	1392.00	4.87	11.96		12.16	0.000290	3.62	384.47	88.46	0.30	
13.7-8	12.56	1392.00	5.57	12.85		13.05	0.000304	3.60	386.93	88.36	0.30	
13.7-8	13.13*	1363.00	6.27	13.77		13.96	0.000296	3.48	391.97	88.31	0.29	
13.7-8	13.7	1363.00	6.97	14.68		14.86	0.000303	3.45	396.78	88.16	0.28	

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)
13.7-8	8	8.46	8.37	0.09			0.42	1509.40	0.18	115.66
13.7-8	8.57*	8.63	8.52	0.11	0.16	0.01	0.18	1480.82	0.00	95.96
13.7-8	9.14	8.88	8.75	0.14	0.25	0.01	0.06	1480.94		92.75

13.7-8	9.71*	9.27	9.10	0.16	0.38	0.01	0.01	1450.99	90.77
13.7-8	10.28	9.81	9.61	0.19	0.53	0.01	0.00	1451.00	89.42
13.7-8	10.85*	10.49	10.29	0.20	0.68	0.00	0.00	1422.00	88.72
13.7-8	11.42	11.30	11.08	0.21	0.80	0.00	0.00	1422.00	88.47
13.7-8	11.99*	12.16	11.96	0.20	0.86	0.00	0.02	1391.98	88.46
13.7-8	12.56	13.05	12.85	0.20	0.89	0.00	0.04	1391.96	88.36
13.7-8	13.13*	13.96	13.77	0.19	0.90	0.00	0.10	1362.90	88.31
13.7-8	13.7	14.86	14.68	0.18	0.90	0.00	0.17	1362.83	88.16

Table E.6

HEC-RAS Run, Ublutuoch River, 100-Year Flood with Snow & Ice

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

```
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
XXXXXXXX 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
```

UBLUTUOCH RIVER SNOW & ICE AFFECTED CHANNEL MODEL
CALIBRATED TO CONDITIONS MEASURED IN CHANNEL ON 24 MAY 2002
SLOPE = 0.0000905

PROJECT DATA

Project Title: Ublutuoch River 100-yr Snowblocked Flow
Project File : Ub3.prj
Run Date and Time: 12/18/2002 10:23:27 AM

Project in English units

PLAN DATA

Plan Title: Plan 03
Plan File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub3.p03

Geometry Title: 100-year snowblocked channel-revisited
Geometry File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub3.g02

Flow Title : 100-Year snowblocked Flow
Flow File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub3.f01

Plan Summary Information:

Number of: Cross Sections = 11 Multiple Openings = 0
 Culverts = 0 Inline Weirs = 0
 Bridges = 0

Computational Information

Water surface calculation tolerance = 0.003
Critical depth calculaton tolerance = 0.003
Maximum number of interations = 20
Maximum difference tolerance = 0.1
Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 100-Year snowblocked Flow

Flow File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub3.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Ublutuoch River	RM 13.7--RM 8.0	13.7	8500
Ublutuoch River	RM 13.7--RM 8.0	12.56	8573
Ublutuoch River	RM 13.7--RM 8.0	11.42	8646
Ublutuoch River	RM 13.7--RM 8.0	10.28	8719
Ublutuoch River	RM 13.7--RM 8.0	9.14	8792
Ublutuoch River	RM 13.7--RM 8.0	8.00	8865

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Ublutuoch River	RM 13.7--RM 8.0	PF 1		Normal S = .0000905

GEOMETRY DATA

Geometry Title: 100-year snowblocked channel-revisited
 Geometry File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub3.g02

CROSS SECTION RIVER: Ublutuoch River
 REACH: RM 13.7--RM 8.0 RS: 13.7

INPUT

Description: Peak Discharge X-section for RM 13.7

Station Elevation Data num= 50									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	30.8	99	27.2	286	23.3	336	20.8	430	17.2
473	17.2	500	17.2	517	17.2	556	17.2	583	16.9
593	18.1	600	16	609.9	14.68	615	14	632	12.7
634.5	11.51	642	11.51	647	11.51	649.5	11.51	652	11.51
654.5	11.51	657	11.51	659.5	11.51	662	11.51	664.5	11.51
667	11.51	669.5	11.51	672	11.51	674.5	11.51	677	11.51
679.5	11.51	682	11.51	692.5	13.9	694.8	14.67	705	18.1
713	18.6	721	18.7	810	15.9	985	16.1	1011	17.1
1104	16.9	1189	18.5	1288	19.2	1381	19.2	1471	19.7
1568	20.3	1649	19.9	1755	23	1807	25.3	1875	26.2

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.045	609.9	.0301	705	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	609.9	705		2900	3010	2900	.1	.3

Blocked Obstructions num= 1			
Sta L	Sta R	Elev	
430	556	17.2	

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	22.12				
Vel Head (ft)	0.06	Wt. n-Val.	0.045	0.030	0.045
W.S. Elev (ft)	22.06	Reach Len. (ft)	2900.00	3010.00	2900.00
Crit W.S. (ft)		Flow Area (sq ft)	1198.94	887.64	3783.27
E.G. Slope (ft/ft)	0.000206	Area (sq ft)	1198.94	887.64	3783.27
Q Total (cfs)	8500.00	Flow (cfs)	1432.53	2763.80	4303.67
Top Width (ft)	1412.17	Top Width (ft)	299.14	95.10	1017.93
Vel Total (ft/s)	1.45	Avg. Vel. (ft/s)	1.19	3.11	1.14
Max Chl Dpth (ft)	10.55	Hydr. Depth (ft)	4.01	9.33	3.72
Conv. Total (cfs)	591959.5	Conv. (cfs)	99764.3	192477.5	299717.7
Length Wtd. (ft)	2938.63	Wetted Per. (ft)	299.71	96.42	1018.06
Min Ch El (ft)	11.51	Shear (lb/sq ft)	0.05	0.12	0.05
Alpha	1.93	Stream Power (lb/ft s)	0.06	0.37	0.05
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	1015.86	698.07	952.98
C & E Loss (ft)	0.00	Cum SA (acres)	294.01	70.52	355.27

CROSS SECTION RIVER: Ublutuoch River
 REACH: RM 13.7--RM 8.0 RS: 13.13*

INPUT

Description:

Station	Elevation	Data	num=	128	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	30.16	40.93	28.65	84.58	26.86	104.41	25.79	112.54	25.47			
141.19	24.77	196.44	23.77	205.99	23.66	220.31	23.36	250.33	22.98			
283.75	22.24	301.48	21.93	301.62	21.93	307.62	21.77	341.04	20.25			
353.32	19.87	354.35	19.81	361.51	19.44	383.33	18.68	422.9	17.43			
453.48	16.44	463.82	16.44	473.37	16.57	477.46	16.44	491.1	16.45			
493.83	16.52	495.88	16.45	498.83	16.45	527.31	16.42	531.35	16.42			
544.31	16.45	545.24	16.45	571.59	16.51	575.68	16.6	578.41	16.53			
586.37	16.45	600.24	16.18	614.84	16.06	622.07	16.81	625.39	17.14			
632.3	15.35	632.77	15.25	637.07	14.92	643.21	14.13	645.11	13.85			
647.96	13.37	649.02	13.16	649.86	13.04	652.24	12.86	654.62	12.69			
656.99	12.47	659.37	12.22	661.74	12.01	664.12	11.83	666.5	11.67			
667.69	11.61	668.4	11.56	668.87	11.38	670.06	10.92	671.25	10.45			
678	10.45	682.5	10.45	684.75	10.45	687	10.45	689.25	10.45			
691.5	10.45	693.75	10.45	696	10.45	698.25	10.45	700.5	10.45			
702.75	10.45	705	10.45	707.25	10.45	709.5	10.45	711.75	10.45			
714	10.45	715.29	10.71	716.57	10.95	717.86	11.2	719.14	11.44			
720.42	11.66	721.71	11.89	722.99	12.13	724.28	12.37	725.57	12.61			
725.73	12.64	726.85	12.94	728.14	13.26	728.3	13.31	730.71	13.97			
733.28	14.95	735.59	15.91	738.67	16.85	739.7	17.2	747.64	17.68			
755.57	17.8	767.74	17.5	774.22	17.21	783.92	17.11	843.25	15.58			
843.86	15.55	852.96	15.44	860.51	15.54	914.44	15.77	915.52	15.85			
986.71	15.93	1017.45	16.01	1043.24	16.95	1071.92	16.93	1135.49	16.87			
1168.99	17.47	1219.81	18.34	1238.02	18.46	1318.02	19.07	1321.08	19.07			
1405.21	19.03	1410.27	19.04	1445.12	19.27	1499.55	19.61	1543.28	19.92			
1595.77	20.21	1612.31	20.14	1676.12	19.88	1702.91	20.6	1781.26	22.75			
1809.7	23.91	1832.85	24.86	1900.3	25.73							

Manning's n Values	num=	3
Sta	n Val	Sta
0	.045	643.21
		.029
		739.7
		.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	643.21	739.7	2900	3010	2900	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	21.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.045	0.029	0.045
W.S. Elev (ft)	21.40	Reach Len. (ft)	2900.00	3010.00	2900.00
Crit W.S. (ft)		Flow Area (sq ft)	1328.57	926.59	3274.83
E.G. Slope (ft/ft)	0.000227	Area (sq ft)	1328.57	926.59	3274.83
Q Total (cfs)	8500.00	Flow (cfs)	1680.89	3205.49	3613.62
Top Width (ft)	1416.54	Top Width (ft)	327.54	96.49	992.51
Vel Total (ft/s)	1.54	Avg. Vel. (ft/s)	1.27	3.46	1.10
Max Chl Dpth (ft)	10.95	Hydr. Depth (ft)	4.06	9.60	3.30
Conv. Total (cfs)	563704.9	Conv. (cfs)	111473.7	212582.4	239648.8
Length Wtd. (ft)	2945.36	Wetted Per. (ft)	328.00	97.80	992.62
Min Ch El (ft)	10.45	Shear (lb/sq ft)	0.06	0.13	0.05
Alpha	2.26	Stream Power (lb/ft s)	0.07	0.47	0.05
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	931.73	635.39	718.03
C & E Loss (ft)	0.00	Cum SA (acres)	273.15	63.90	288.35

CROSS SECTION RIVER: Ublutuoch River
 REACH: RM 13.7--RM 8.0 RS: 12.56*

INPUT

Description:

Station	Elevation	Data	num=	128	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	29.52	43.04	27.91	88.96	25.83	109.81	24.39	118.37	23.89			
148.5	23.06	206.61	22.16	216.66	22.13	231.72	21.81	263.29	21.65			
298.44	20.82	317.1	20.56	317.24	20.56	323.55	20.53	358.71	19.06			
371.62	18.9	372.7	18.82	380.23	18.33	403.19	17.62	444.8	16.55			
476.97	15.67	487.84	15.68	497.88	15.94	502.19	15.68	516.54	15.7			
519.41	15.84	521.56	15.7	524.67	15.7	554.62	15.65	558.86	15.64			
572.5	15.7	573.47	15.7	601.19	15.82	605.5	15.99	608.37	15.86			
616.73	15.7	631.32	15.3	646.68	15.22	654.28	15.9	657.77	16.18			
665.04	14.57	665.54	14.5	670.06	14.38	676.52	13.58	678.65	13.24			
681.86	12.62	683.05	12.33	683.99	12.13	686.66	11.93	689.33	11.75			
691.99	11.48	694.66	11.14	697.33	10.87	700	10.68	702.66	10.51			
704	10.47	704.8	10.42	705.33	10.25	706.67	9.84	708	9.4			
714	9.4	718	9.4	720	9.4	722	9.4	724	9.4			
726	9.4	728	9.4	730	9.4	732	9.4	734	9.4			
736	9.4	738	9.4	740	9.4	742	9.4	744	9.4			
746	9.4	747.42	9.65	748.84	9.86	750.26	10.11	751.68	10.32			
753.1	10.51	754.52	10.7	755.94	10.93	757.36	11.14	758.78	11.34			
758.97	11.37	760.2	11.64	761.62	11.91	761.81	11.95	764.46	12.55			
767.3	13.73	769.86	14.95	773.26	15.9	774.4	16.3	782.27	16.76			
790.14	16.9	802.22	16.69	808.64	16.31	818.27	16.42	877.11	15.24			
877.71	15.2	886.74	14.97	894.23	15.16	947.72	15.56	948.79	15.71			
1019.4	15.79	1049.9	15.91	1075.48	16.79	1103.93	16.83	1166.99	16.84			
1200.22	17.41	1250.62	18.18	1268.69	18.28	1348.03	18.93	1351.07	18.94			
1434.52	18.86	1439.54	18.88	1474.11	19.14	1528.09	19.52	1571.47	19.86			
1623.53	20.12	1639.94	20.05	1703.23	19.86	1729.81	20.51	1807.53	22.49			
1835.73	23.55	1858.69	24.42	1925.6	25.26							

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	676.52	.027	774.4	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	676.52	774.4		3010	3010		.1	.3

CROSS SECTION OUTPUT

Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	20.77				
Vel Head (ft)	0.12	Wt. n-Val.	0.045	0.027	0.045
W.S. Elev (ft)	20.65	Reach Len. (ft)	3010.00	3010.00	3010.00
Crit W.S. (ft)		Flow Area (sq ft)	1437.46	956.40	2689.43
E.G. Slope (ft/ft)	0.000259	Area (sq ft)	1437.46	956.40	2689.43
Q Total (cfs)	8573.00	Flow (cfs)	1900.95	3834.55	2837.50
Top Width (ft)	1424.18	Top Width (ft)	365.57	97.88	960.74
Vel Total (ft/s)	1.69	Avg. Vel. (ft/s)	1.32	4.01	1.06
Max Chl Dpth (ft)	11.25	Hydr. Depth (ft)	3.93	9.77	2.80
Conv. Total (cfs)	532900.4	Conv. (cfs)	118163.9	238356.7	176379.8
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	365.96	99.24	960.84
Min Ch El (ft)	9.40	Shear (lb/sq ft)	0.06	0.16	0.05
Alpha	2.79	Stream Power (lb/ft s)	0.08	0.62	0.05
Froctn Loss (ft)	0.83	Cum Volume (acre-ft)	839.66	570.33	519.50
C & E Loss (ft)	0.00	Cum SA (acres)	250.07	57.18	223.33

CROSS SECTION REACH: RM 13.7--RM 8.0

RIVER: Ublutuoch River RS: 11.99*

INPUT

Description:

Station	Elevation	Data	num=	128
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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	28.88	45.16	27.17	93.34	24.8	115.22	22.98	124.2	22.32
155.82	21.35	216.79	20.56	227.33	20.6	243.13	20.26	276.25	20.32
313.14	19.41	332.71	19.19	332.86	19.2	339.48	19.29	376.37	17.88
389.92	17.92	391.05	17.83	398.95	17.23	423.04	16.55	466.7	15.67
500.45	14.91	511.86	14.92	522.4	15.31	526.92	14.92	541.97	14.95
544.98	15.16	547.24	14.95	550.5	14.94	581.92	14.87	586.38	14.86
600.68	14.95	601.71	14.96	630.79	15.13	635.31	15.39	638.32	15.19
647.1	14.95	662.41	14.43	678.52	14.38	686.5	14.99	690.16	15.22
697.79	13.78	698.31	13.74	703.06	13.85	709.83	13.04	712.2	12.63
715.75	11.87	717.07	11.49	718.12	11.22	721.08	11	724.03	10.82
726.99	10.49	729.95	10.05	732.91	9.73	735.87	9.53	738.83	9.36
740.31	9.33	741.2	9.28	741.79	9.13	743.27	8.75	744.75	8.35
750	8.35	753.5	8.35	755.25	8.35	757	8.35	758.75	8.35
760.5	8.35	762.25	8.35	764	8.35	765.75	8.35	767.5	8.35
769.25	8.35	771	8.35	772.75	8.35	774.5	8.35	776.25	8.35
778	8.35	779.55	8.59	781.11	8.77	782.66	9.01	784.22	9.2
785.78	9.35	787.33	9.5	788.89	9.72	790.44	9.9	791.99	10.08
792.2	10.11	793.55	10.34	795.11	10.55	795.31	10.59	798.22	11.12
801.33	12.5	804.12	13.99	807.86	14.96	809.1	15.4	816.91	15.84
824.71	16.01	836.69	15.88	843.06	15.41	852.61	15.73	910.97	14.89
911.57	14.86	920.52	14.5	927.95	14.77	981.01	15.35	982.07	15.58
1052.1	15.66	1082.35	15.82	1107.72	16.64	1135.93	16.73	1198.48	16.81
1231.44	17.34	1281.43	18.02	1299.35	18.11	1378.05	18.8	1381.06	18.81
1463.83	18.69	1468.81	18.71	1503.09	19.01	1556.64	19.44	1599.66	19.8
1651.3	20.03	1667.57	19.97	1730.35	19.83	1756.71	20.42	1833.79	22.24
1861.76	23.2	1884.54	23.98	1950.9	24.79				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .045 709.83 .026 809.1 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 709.83 809.1 2310 3010 2770 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

Element	Left OB	Channel	Right OB
E.G. Elev (ft)	19.94		
Vel Head (ft)	0.17	0.045	0.026
W.S. Elev (ft)	19.77	2310.00	3010.00
Crit W.S. (ft)		1521.29	2039.17
E.G. Slope (ft/ft)	0.000294	1521.29	975.44
Q Total (cfs)	8573.00	2057.50	4338.99
Top Width (ft)	1297.37	411.24	99.27
Vel Total (ft/s)	1.89	1.35	4.45
Max Chl Dpth (ft)	11.42	3.70	9.83
Conv. Total (cfs)	500345.4	120081.6	253236.0
Length Wtd. (ft)	2786.18	411.62	100.75
Min Ch El (ft)	8.35	0.07	0.18
Alpha	3.01	0.09	0.79
Fretn Loss (ft)	0.85	737.43	503.59
C & E Loss (ft)	0.01	223.23	50.37

CROSS SECTION RIVER: Ublutuoch River
 REACH: RM 13.7--RM 8.0 RS: 11.42*

INPUT Description:

Station	Elevation	Data	num=	128					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	28.24	47.28	26.43	97.72	23.77	120.63	21.57	130.03	20.74
163.13	19.64	226.96	18.95	237.99	19.07	254.54	18.7	289.22	18.99

327.83	17.99	348.32	17.82	348.48	17.83	355.41	18.05	394.03	16.7
408.21	16.95	409.4	16.84	417.67	16.12	442.89	15.49	488.6	14.79
523.94	14.15	535.88	14.16	546.91	14.68	551.64	14.16	567.4	14.2
570.55	14.48	572.92	14.2	576.33	14.19	609.23	14.09	613.9	14.08
628.87	14.2	629.94	14.21	660.39	14.44	665.12	14.79	668.27	14.52
677.46	14.2	693.49	13.55	710.36	13.54	718.71	14.07	722.55	14.26
730.53	13	731.08	12.99	736.05	13.31	743.14	12.49	745.74	12.02
749.64	11.11	751.09	10.65	752.24	10.31	755.49	10.07	758.74	9.88
761.99	9.5	765.25	8.97	768.5	8.59	771.75	8.38	775	8.2
776.62	8.19	777.6	8.14	778.25	8.01	779.87	7.67	781.5	7.29
786	7.29	789	7.29	790.5	7.29	792	7.29	793.5	7.29
795	7.29	796.5	7.29	798	7.29	799.5	7.29	801	7.29
802.5	7.29	804	7.29	805.5	7.29	807	7.29	808.5	7.29
810	7.29	811.69	7.53	813.38	7.68	815.07	7.92	816.76	8.08
818.45	8.2	820.14	8.31	821.83	8.51	823.52	8.67	825.21	8.82
825.43	8.84	826.9	9.04	828.59	9.2	828.81	9.23	831.97	9.7
835.35	11.28	838.39	13.04	842.45	14.02	843.8	14.5	851.54	14.92
859.29	15.11	871.16	15.07	877.48	14.51	886.95	15.04	944.83	14.55
945.43	14.51	954.3	14.03	961.67	14.39	1014.29	15.14	1015.34	15.45
1084.8	15.52	1114.8	15.73	1139.97	16.49	1167.94	16.62	1229.98	16.78
1262.66	17.28	1312.25	17.86	1330.02	17.94	1408.06	18.67	1411.05	18.68
1493.14	18.52	1498.08	18.55	1532.08	18.88	1585.18	19.35	1627.85	19.74
1679.07	19.94	1695.2	19.89	1757.46	19.81	1783.61	20.33	1860.06	21.98
1887.8	22.84	1910.39	23.54	1976.2	24.32				

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.045	743.14	.024	843.8	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	743.14	843.8		2110	3010	2510	.1	.3

CROSS SECTION OUTPUT	Profile #PF 1				
E.G. Elev (ft)	19.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.045	0.024	0.045
W.S. Elev (ft)	18.85	Reach Len. (ft)	2110.00	3010.00	2510.00
Crit W.S. (ft)		Flow Area (sq ft)	1598.69	990.51	1505.14
E.G. Slope (ft/ft)	0.000317	Area (sq ft)	1598.69	990.51	1505.14
Q Total (cfs)	8646.00	Flow (cfs)	2188.97	4961.04	1495.99
Top Width (ft)	1257.70	Top Width (ft)	472.29	100.66	684.75
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)	1.37	5.01	0.99
Max Chl Dpth (ft)	11.56	Hydr. Depth (ft)	3.38	9.84	2.20
Conv. Total (cfs)	485526.4	Conv. (cfs)	122924.3	278593.0	84009.0
Length Wtd. (ft)	2711.24	Wetted Per. (ft)	472.68	102.30	684.90
Min Ch El (ft)	7.29	Shear (lb/sq ft)	0.07	0.19	0.04
Alpha	3.37	Stream Power (lb/ft s)	0.09	0.96	0.04
Frctn Loss (ft)	0.89	Cum Volume (acre-ft)	654.70	435.66	243.43
C & E Loss (ft)	0.01	Cum SA (acres)	199.81	43.46	116.16

CROSS SECTION RIVER: Ublutuoch River
 REACH: RM 13.7--RM 8.0 RS: 10.85*

INPUT									
Description:									
Station Elevation Data	num=	128							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	27.6	49.4	25.69	102.1	22.74	126.03	20.17	135.86	19.17
170.44	17.94	237.13	17.34	248.66	17.55	265.95	17.15	302.18	17.66
342.53	16.58	363.94	16.45	364.1	16.46	371.35	16.81	411.69	15.52
426.51	15.97	427.75	15.85	436.39	15.02	462.74	14.42	510.5	13.91
547.42	13.39	559.9	13.4	571.43	14.05	576.37	13.4	592.84	13.45

596.13	13.8	598.6	13.45	602.17	13.44	636.54	13.32	641.42	13.3
657.06	13.45	658.18	13.46	689.99	13.75	694.94	14.19	698.23	13.85
707.83	13.45	724.58	12.68	742.2	12.7	750.93	13.16	754.93	13.3
763.28	12.22	763.85	12.24	769.04	12.78	776.45	11.94	779.28	11.41
783.53	10.36	785.12	9.81	786.37	9.4	789.91	9.14	793.45	8.94
797	8.51	800.54	7.88	804.08	7.45	807.62	7.22	811.17	7.04
812.94	7.05	814	7	814.71	6.88	816.48	6.58	818.25	6.24
822	6.24	824.5	6.24	825.75	6.24	827	6.24	828.25	6.24
829.5	6.24	830.75	6.24	832	6.24	833.25	6.24	834.5	6.24
835.75	6.24	837	6.24	838.25	6.24	839.5	6.24	840.75	6.24
842	6.24	843.83	6.47	845.65	6.6	847.47	6.83	849.3	6.96
851.12	7.04	852.95	7.12	854.78	7.3	856.6	7.43	858.42	7.56
858.66	7.58	860.25	7.75	862.08	7.84	862.31	7.87	865.72	8.28
869.38	10.06	872.66	12.08	877.04	13.08	878.5	13.6	886.18	14.01
893.86	14.21	905.64	14.26	911.9	13.6	921.29	14.35	978.69	14.21
979.28	14.16	988.09	13.56	995.39	14.01	1047.58	14.93	1048.62	15.31
1117.5	15.38	1147.25	15.63	1172.21	16.33	1199.95	16.52	1261.47	16.74
1293.88	17.22	1343.06	17.7	1360.68	17.76	1438.08	18.53	1441.04	18.55
1522.45	18.35	1527.34	18.39	1561.07	18.75	1613.73	19.26	1656.04	19.69
1706.83	19.85	1722.84	19.81	1784.58	19.79	1810.51	20.25	1886.32	21.73
1913.83	22.48	1936.23	23.1	2001.5	23.85				

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
0 .045	776.45 .023	878.5 .045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
776.45	878.5	2640	3010	1980	.1	.3

CROSS SECTION OUTPUT	Profile #PF 1					
E.G. Elev (ft)	18.18	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.29	Wt. n-Val.	0.045	0.023	0.045	
W.S. Elev (ft)	17.89	Reach Len. (ft)	2640.00	3010.00	1980.00	
Crit W.S. (ft)		Flow Area (sq ft)	1709.67	1002.10	1085.88	
E.G. Slope (ft/ft)	0.000342	Area (sq ft)	1709.67	1002.10	1085.88	
Q Total (cfs)	8646.00	Flow (cfs)	2098.07	5428.10	1119.83	
Top Width (ft)	1197.00	Top Width (ft)	600.06	102.05	494.89	
Vel Total (ft/s)	2.28	Avg. Vel. (ft/s)	1.23	5.42	1.03	
Max Chl Dpth (ft)	11.65	Hydr. Depth (ft)	2.85	9.82	2.19	
Conv. Total (cfs)	467324.4	Conv. (cfs)	113402.4	293393.9	60528.1	
Length Wtd. (ft)	2808.83	Wetted Per. (ft)	600.51	103.87	495.10	
Min Ch El (ft)	6.24	Shear (lb/sq ft)	0.06	0.21	0.05	
Alpha	3.65	Stream Power (lb/ft s)	0.07	1.12	0.05	
Frctn Loss (ft)	0.98	Cum Volume (acre-ft)	574.58	366.82	168.78	
C & E Loss (ft)	0.00	Cum SA (acres)	173.84	36.46	82.17	
CROSS SECTION	RIVER: Ublutuoch River					
REACH: RM 13.7--RM 8.0	RS: 10.28*					

INPUT									
Description:									
Station Elevation Data	num=	128							
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
0 26.96	51.52 24.96	106.48 21.71	131.44 18.76	141.69 17.6					
177.75 16.23	247.31 15.73	259.33 16.02	277.36 15.6	315.15 16.33					
357.22 15.16	379.55 15.08	379.72 15.09	387.28 15.57	429.35 14.33					
444.81 15	446.1 14.86	455.11 13.92	482.59 13.36	532.4 13.02					
570.91 12.62	583.92 12.64	595.94 13.42	601.09 12.64	618.27 12.7					
621.7 13.12	624.28 12.7	628 12.69	663.85 12.54	668.93 12.52					
685.25 12.7	686.42 12.71	719.6 13.06	724.75 13.58	728.18 13.18					
738.2 12.7	755.66 11.8	774.05 11.86	783.14 12.25	787.32 12.34					

796.02	11.43	796.62	11.49	802.03	12.24	809.76	11.39	812.83	10.8
817.43	9.61	819.14	8.98	820.49	8.49	824.33	8.21	828.16	8.01
832	7.52	835.83	6.8	839.66	6.31	843.5	6.07	847.33	5.89
849.25	5.92	850.4	5.86	851.17	5.76	853.08	5.5	855	5.18
858	5.18	860	5.18	861	5.18	862	5.18	863	5.18
864	5.18	865	5.18	866	5.18	867	5.18	868	5.18
869	5.18	870	5.18	871	5.18	872	5.18	873	5.18
874	5.18	875.96	5.4	877.92	5.51	879.88	5.73	881.84	5.84
883.8	5.88	885.76	5.93	887.72	6.09	889.68	6.2	891.64	6.3
891.9	6.32	893.6	6.45	895.56	6.48	895.82	6.51	899.48	6.85
903.4	8.84	906.93	11.13	911.63	12.13	913.2	12.7	920.81	13.09
928.43	13.31	940.11	13.45	946.32	12.7	955.63	13.66	1012.55	13.87
1013.14	13.81	1021.87	13.08	1029.11	13.63	1080.86	14.71	1081.9	15.18
1150.2	15.25	1179.7	15.54	1204.45	16.18	1231.96	16.42	1292.97	16.71
1325.11	17.15	1373.87	17.54	1391.34	17.59	1468.1	18.4	1471.03	18.42
1551.76	18.18	1556.61	18.23	1590.05	18.62	1642.27	19.17	1684.23	19.63
1734.6	19.76	1750.47	19.73	1811.69	19.77	1837.41	20.16	1912.58	21.48
1939.86	22.13	1962.08	22.66	2026.8	23.38				

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.045	809.76	.022	913.2	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	809.76	913.2		3010	3010	2640	.1	.3

CROSS SECTION OUTPUT	Profile #PF 1								
E.G. Elev (ft)	17.20	Element		Left OB	Channel	Right OB			
Vel Head (ft)	0.34	Wt. n-Val.		0.045	0.022	0.045			
W.S. Elev (ft)	16.85	Reach Len. (ft)		3010.00	3010.00	2640.00			
Crit W.S. (ft)		Flow Area (sq ft)		1820.82	1006.55	743.08			
E.G. Slope (ft/ft)	0.000354	Area (sq ft)		1820.82	1006.55	743.08			
Q Total (cfs)	8719.00	Flow (cfs)		2251.68	5758.08	709.25			
Top Width (ft)	1142.18	Top Width (ft)		648.44	103.44	390.30			
Vel Total (ft/s)	2.44	Avg. Vel. (ft/s)		1.24	5.72	0.95			
Max Chl Dpth (ft)	11.67	Hydr. Depth (ft)		2.81	9.73	1.90			
Conv. Total (cfs)	463125.8	Conv. (cfs)		119602.0	305850.8	37673.0			
Length Wtd. (ft)	2985.59	Wetted Per. (ft)		648.99	105.48	390.59			
Min Ch El (ft)	5.18	Shear (lb/sq ft)		0.06	0.21	0.04			
Alpha	3.70	Stream Power (lb/ft s)		0.08	1.21	0.04			
Frctn Loss (ft)	1.01	Cum Volume (acre-ft)		467.59	297.42	127.22			
C & E Loss (ft)	0.00	Cum SA (acres)		136.00	29.36	62.05			
CROSS SECTION		RIVER: Ublutuoch River							
REACH: RM 13.7--RM 8.0		RS: 9.71*							

INPUT									
Description:									
Station Elevation Data	num=	128							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	26.32	53.64	24.22	110.86	20.69	136.85	17.35	147.51	16.02
185.06	14.52	257.48	14.12	270	14.49	288.77	14.05	328.11	14.99
371.92	13.75	395.16	13.71	395.34	13.73	403.21	14.32	447.01	13.15
463.11	14.02	464.46	13.87	473.84	12.81	502.44	12.29	554.3	12.14
594.39	11.86	607.94	11.88	620.46	12.79	625.82	11.88	643.7	11.95
647.28	12.44	649.96	11.95	653.83	11.93	691.15	11.76	696.45	11.74
713.44	11.95	714.65	11.96	749.2	12.37	754.56	12.98	758.14	12.51
768.56	11.95	786.75	10.93	805.89	11.02	815.36	11.34	819.71	11.38
828.77	10.65	829.39	10.73	835.02	11.71	843.07	10.84	846.37	10.19
851.32	8.86	853.16	8.14	854.62	7.59	858.75	7.29	862.87	7.07
867	6.53	871.12	5.71	875.25	5.18	879.37	4.92	883.5	4.73

885.56	4.78	886.8	4.72	887.62	4.63	889.69	4.41	891.75	4.12
894	4.12	895.5	4.12	896.25	4.12	897	4.12	897.75	4.12
898.5	4.12	899.25	4.12	900	4.12	900.75	4.12	901.5	4.12
902.25	4.12	903	4.12	903.75	4.12	904.5	4.12	905.25	4.12
906	4.12	908.1	4.34	910.19	4.42	912.28	4.64	914.38	4.72
916.47	4.73	918.57	4.74	920.66	4.88	922.76	4.96	924.85	5.04
925.13	5.05	926.95	5.15	929.04	5.13	929.32	5.15	933.23	5.43
937.42	7.62	941.2	10.17	946.22	11.19	947.9	11.8	955.45	12.17
963	12.42	974.58	12.63	980.74	11.8	989.97	12.97	1046.42	13.53
1046.99	13.46	1055.65	12.61	1062.84	13.25	1114.15	14.5	1115.17	15.04
1182.9	15.11	1212.15	15.45	1236.69	16.02	1263.97	16.31	1324.46	16.68
1356.33	17.09	1404.68	17.38	1422.01	17.42	1498.11	18.26	1501.03	18.29
1581.07	18.01	1585.88	18.06	1619.04	18.49	1670.82	19.08	1712.43	19.57
1762.37	19.67	1778.1	19.65	1838.81	19.75	1864.3	20.07	1938.85	21.22
1965.9	21.77	1987.92	22.22	2052.1	22.91				

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
0 .045	843.07	.02 947.9 .045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
843.07	947.9	530	3010	2640	.1	.3

CROSS SECTION OUTPUT	Profile #PF 1					
E.G. Elev (ft)	16.18	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.39	Wt. n-Val.	0.045	0.020	0.045	
W.S. Elev (ft)	15.80	Reach Len. (ft)	530.00	3010.00	2640.00	
Crit W.S. (ft)		Flow Area (sq ft)	1927.78	1008.30	502.31	
E.G. Slope (ft/ft)	0.000324	Area (sq ft)	1927.78	1008.30	502.31	
Q Total (cfs)	8719.00	Flow (cfs)	2269.98	6008.03	440.99	
Top Width (ft)	1073.93	Top Width (ft)	689.95	104.83	279.15	
Vel Total (ft/s)	2.54	Avg. Vel. (ft/s)	1.18	5.96	0.88	
Max Chl Dpth (ft)	11.68	Hydr. Depth (ft)	2.79	9.62	1.80	
Conv. Total (cfs)	484720.2	Conv. (cfs)	126196.3	334007.8	24516.1	
Length Wtd. (ft)	2294.34	Wetted Per. (ft)	690.63	107.10	279.53	
Min Ch El (ft)	4.12	Shear (lb/sq ft)	0.06	0.19	0.04	
Alpha	3.87	Stream Power (lb/ft s)	0.07	1.13	0.03	
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	338.08	227.81	89.48	
C & E Loss (ft)	0.02	Cum SA (acres)	89.76	22.16	41.77	

CROSS SECTION RIVER: Ublutuoch River
 REACH: RM 13.7--RM 8.0 RS: 9.14*

INPUT

Description:

Station Elevation Data	num=	128							
Sta Elev	Sta Elev	Sta Elev	Sta Elev						
0 25.68	55.76	23.48	115.24	19.66	142.26	15.95	153.34	14.45	
192.38	12.81	267.65	12.52	280.66	12.96	300.18	12.5	341.07	13.66
386.61	12.33	410.77	12.34	410.96	12.36	419.14	13.08	464.68	11.97
481.4	13.05	482.81	12.88	492.56	11.71	522.3	11.23	576.2	11.26
617.88	11.1	631.96	11.12	644.97	12.16	650.55	11.12	669.13	11.2
672.85	11.76	675.64	11.2	679.67	11.18	718.46	10.99	723.97	10.96
741.62	11.2	742.89	11.22	778.8	11.68	784.37	12.38	788.09	11.84
798.93	11.2	817.83	10.05	837.73	10.18	847.57	10.42	852.1	10.42
861.51	9.87	862.15	9.98	868.02	11.17	876.38	10.3	879.91	9.58
885.21	8.1	887.19	7.3	888.75	6.68	893.16	6.36	897.58	6.13
902	5.54	906.42	4.63	910.83	4.04	915.25	3.77	919.67	3.57
921.87	3.64	923.2	3.58	924.08	3.51	926.29	3.33	928.5	3.07
930	3.07	931	3.07	931.5	3.07	932	3.07	932.5	3.07
933	3.07	933.5	3.07	934	3.07	934.5	3.07	935	3.07

935.5	3.07	936	3.07	936.5	3.07	937	3.07	937.5	3.07
938	3.07	940.23	3.28	942.46	3.33	944.69	3.55	946.92	3.6
949.15	3.57	951.38	3.54	953.61	3.68	955.84	3.73	958.07	3.78
958.36	3.79	960.3	3.85	962.53	3.77	962.82	3.79	966.99	4.01
971.45	6.4	975.46	9.21	980.82	10.25	982.6	10.9	990.09	11.25
997.57	11.52	1009.05	11.82	1015.16	10.9	1024.32	12.28	1080.28	13.18
1080.85	13.11	1089.43	12.14	1096.56	12.86	1147.43	14.29	1148.45	14.91
1215.6	14.97	1244.6	15.36	1268.93	15.87	1295.98	16.21	1355.95	16.65
1387.55	17.03	1435.49	17.22	1452.67	17.25	1528.13	18.13	1531.02	18.16
1610.38	17.84	1615.15	17.9	1648.03	18.36	1699.37	19	1740.62	19.51
1790.13	19.58	1805.73	19.56	1865.93	19.73	1891.2	19.98	1965.11	20.97
1991.93	21.41	2013.77	21.78	2077.4	22.44				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .045 876.38 .019 982.6 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 876.38 982.6 3010 3010 3010 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	15.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.045	0.019	0.045
W.S. Elev (ft)	15.22	Reach Len. (ft)	3010.00	3010.00	3010.00
Crit W.S. (ft)		Flow Area (sq ft)	2394.17	1061.38	445.49
E.G. Slope (ft/ft)	0.000234	Area (sq ft)	2394.17	1061.38	445.49
Q Total (cfs)	8792.00	Flow (cfs)	2668.44	5795.03	328.53
Top Width (ft)	1086.71	Top Width (ft)	728.74	106.22	251.75
Vel Total (ft/s)	2.25	Avg. Vel. (ft/s)	1.11	5.46	0.74
Max Chl Dpth (ft)	12.15	Hydr. Depth (ft)	3.29	9.99	1.77
Conv. Total (cfs)	575186.4	Conv. (cfs)	174573.4	379120.0	21493.1
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	729.62	108.74	252.24
Min Ch El (ft)	3.07	Shear (lb/sq ft)	0.05	0.14	0.03
Alpha	3.95	Stream Power (lb/ft s)	0.05	0.78	0.02
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	311.79	156.30	60.76
C & E Loss (ft)	0.02	Cum SA (acres)	81.13	14.87	25.68

CROSS SECTION RIVER: Ublutuoch River
 REACH: RM 13.7--RM 8.0 RS: 8.57*

INPUT

Description:

Station Elevation Data num= 128

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	25.04	57.88	22.74	119.62	18.63	147.66	14.54	159.17	12.87
199.69	11.11	277.83	10.91	291.33	11.43	311.59	10.95	354.04	12.33
401.31	10.92	426.39	10.97	426.58	10.99	435.07	11.84	482.34	10.78
499.7	12.07	501.16	11.89	511.28	10.6	542.15	10.16	598.1	10.38
641.36	10.34	655.98	10.36	669.49	11.53	675.27	10.36	694.57	10.45
698.43	11.08	701.32	10.45	705.5	10.43	745.77	10.21	751.48	10.18
769.81	10.45	771.13	10.47	808.4	10.99	814.19	11.77	818.05	11.17
829.3	10.45	848.92	9.18	869.57	9.34	879.79	9.51	884.48	9.46
894.26	9.08	894.92	9.23	901.01	10.64	909.69	9.75	913.46	8.97
919.11	7.35	921.21	6.47	922.87	5.77	927.58	5.43	932.29	5.2
937	4.55	941.71	3.54	946.42	2.9	951.12	2.61	955.83	2.42
958.19	2.5	959.6	2.44	960.54	2.38	962.9	2.24	965.25	2.02
966	2.02	966.5	2.02	966.75	2.02	967	2.02	967.25	2.02
967.5	2.02	967.75	2.02	968	2.02	968.25	2.02	968.5	2.02
968.75	2.02	969	2.02	969.25	2.02	969.5	2.02	969.75	2.02
970	2.02	972.36	2.22	974.73	2.25	977.1	2.45	979.46	2.48
981.83	2.42	984.19	2.35	986.55	2.47	988.92	2.49	991.28	2.52

991.59	2.52	993.65	2.56	996.02	2.42	996.32	2.43	1000.74	2.58
1005.47	5.18	1009.73	8.26	1015.41	9.3	1017.3	10	1024.72	10.33
1032.14	10.62	1043.53	11.01	1049.58	10	1058.66	11.59	1114.14	12.84
1114.71	12.77	1123.22	11.67	1130.28	12.48	1180.72	14.08	1181.72	14.77
1248.3	14.84	1277.05	15.26	1301.17	15.72	1327.99	16.1	1387.45	16.62
1418.78	16.96	1466.3	17.06	1483.34	17.07	1558.14	18	1561.01	18.03
1639.69	17.67	1644.42	17.74	1677.01	18.23	1727.91	18.91	1768.81	19.46
1817.9	19.49	1833.37	19.48	1893.04	19.7	1918.1	19.89	1991.38	20.71
2017.97	21.06	2039.62	21.34	2102.7	21.97				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .045 909.69 .017 1017.3 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 909.69 1017.3 1650 3010 3010 .1 .3

CROSS SECTION OUTPUT Profile #PF 1
 E.G. Elev (ft) 14.97 Element Left OB Channel Right OB
 Vel Head (ft) 0.25 Wt. n-Val. 0.045 0.017 0.045
 W.S. Elev (ft) 14.72 Reach Len. (ft) 1650.00 3010.00 3010.00
 Crit W.S. (ft) Flow Area (sq ft) 2950.87 1123.27 423.41
 E.G. Slope (ft/ft) 0.000146 Area (sq ft) 2950.87 1123.27 423.41
 Q Total (cfs) 8792.00 Flow (cfs) 2899.82 5575.21 316.98
 Top Width (ft) 1035.20 Top Width (ft) 763.25 107.61 164.34
 Vel Total (ft/s) 1.95 Avg. Vel. (ft/s) 0.98 4.96 0.75
 Max Chl Dpth (ft) 12.70 Hydr. Depth (ft) 3.87 10.44 2.58
 Conv. Total (cfs) 727024.2 Conv. (cfs) 239790.2 461022.4 26211.6
 Length Wtd. (ft) 2531.23 Wetted Per. (ft) 764.37 110.39 164.94
 Min Ch El (ft) 2.02 Shear (lb/sq ft) 0.04 0.09 0.02
 Alpha 4.18 Stream Power (lb/ft s) 0.03 0.46 0.02
 Frctn Loss (ft) 0.29 Cum Volume (acre-ft) 127.11 80.82 30.74
 C & E Loss (ft) 0.02 Cum SA (acres) 29.58 7.48 11.30
 CROSS SECTION RIVER: Ublutuoch River
 REACH: RM 13.7--RM 8.0 RS: 8.00

INPUT
 Description: Peak Discharge X-section for RM 8.0
 Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	24.4	60	22	124	17.6	165	11.3	207	9.4
288	9.3	302	9.9	323	9.4	367	11	416	9.5
442	9.6	451	10.6	500	9.6	518	11.1	530	9.5
562	9.1	620	9.5	680	9.6	694	10.9	700	9.6
720	9.7	724	10.4	727	9.7	779	9.4	798	9.7
838	10.3	844	11.17	848	10.5	880	8.3	912	8.6
927	8.3	934	10.1	943	9.2	947	8.36	953	6.6
957	4.86	962	4.5	967	4.26	972	3.56	977	2.46
982	1.76	987	1.46	992	1.26	994.5	1.36	997	1.26
999.5	1.16	1002	.96	1004.5	1.16	1007	1.16	1009.5	1.36
1012	1.36	1014.5	1.26	1017	1.16	1019.5	1.26	1022	1.26
1024.5	1.26	1027	1.26	1029.5	1.06	1034.5	1.16	1039.5	3.96
1044	7.3	1050	8.36	1052	9.1	1078	10.2	1084	9.1
1093	10.9	1148	12.5	1157	11.2	1164	12.1	1214	13.87
1215	14.64	1281	14.7	1360	16	1450	16.9	1514	16.9
1591	17.9	1669	17.5	1706	18.1	1797	19.4	1861	19.4
1945	19.8	2044	20.7	2128	21.5				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

0 .045 943 .01604 1052 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 943 1052 0 0 0 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	14.66	Wt. n-Val.	0.045	0.016	0.045
Vel Head (ft)	0.18	Reach Len. (ft)			
W.S. Elev (ft)	14.48	Flow Area (sq ft)	3760.74	1215.96	466.23
Crit W.S. (ft)	10.31	Area (sq ft)	3760.74	1215.96	466.23
E.G. Slope (ft/ft)	0.000091	Flow (cfs)	3316.06	5254.33	294.61
Q Total (cfs)	8865.00	Top Width (ft)	798.69	109.00	162.79
Top Width (ft)	1070.49	Avg. Vel. (ft/s)	0.88	4.32	0.63
Vel Total (ft/s)	1.63	Hydr. Depth (ft)	4.71	11.16	2.86
Max Chl Dpth (ft)	13.52	Conv. (cfs)	348448.2	552119.8	30957.0
Conv. Total (cfs)	931524.9	Wetted Per. (ft)	800.11	112.06	163.51
Length Wtd. (ft)		Shear (lb/sq ft)	0.03	0.06	0.02
Min Ch El (ft)	0.96	Stream Power (lb/ft s)	0.02	0.27	0.01
Alpha	4.29	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

SUMMARY OF MANNING'S N VALUES

River:Ublutuoch River

Reach	River Sta.	n1	n2	n3
RM 13.7--RM 8.0	13.7	.045	.0301	.045
RM 13.7--RM 8.0	13.13*	.045	.029	.045
RM 13.7--RM 8.0	12.56*	.045	.027	.045
RM 13.7--RM 8.0	11.99*	.045	.026	.045
RM 13.7--RM 8.0	11.42*	.045	.024	.045
RM 13.7--RM 8.0	10.85*	.045	.023	.045
RM 13.7--RM 8.0	10.28*	.045	.022	.045
RM 13.7--RM 8.0	9.71*	.045	.02	.045
RM 13.7--RM 8.0	9.14*	.045	.019	.045
RM 13.7--RM 8.0	8.57*	.045	.017	.045
RM 13.7--RM 8.0	8.00	.045	.01604	.045

SUMMARY OF REACH LENGTHS

River: Ublutuoch River

Reach	River Sta.	Left	Channel	Right
RM 13.7--RM 8.0	13.7	2900	3010	2900
RM 13.7--RM 8.0	13.13*	2900	3010	2900
RM 13.7--RM 8.0	12.56*	3010	3010	3010
RM 13.7--RM 8.0	11.99*	2310	3010	2770
RM 13.7--RM 8.0	11.42*	2110	3010	2510
RM 13.7--RM 8.0	10.85*	2640	3010	1980
RM 13.7--RM 8.0	10.28*	3010	3010	2640
RM 13.7--RM 8.0	9.71*	530	3010	2640
RM 13.7--RM 8.0	9.14*	3010	3010	3010
RM 13.7--RM 8.0	8.57*	1650	3010	3010
RM 13.7--RM 8.0	8.00	0	0	0

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
RM 13.7--RM 8.0	8.00	8865.00	0.96	14.48	10.31	14.66	0.000091	4.32	5442.93	1070.49		0.23
RM 13.7--RM 8.0	8.57*	8792.00	2.02	14.72		14.97	0.000146	4.96	4497.55	1035.20		0.27
RM 13.7--RM 8.0	9.14*	8792.00	3.07	15.22		15.53	0.000234	5.46	3901.04	1086.71		0.30
RM 13.7--RM 8.0	9.71*	8719.00	4.12	15.80		16.18	0.000324	5.96	3438.38	1073.93		0.34
RM 13.7--RM 8.0	10.28*	8719.00	5.18	16.85		17.20	0.000354	5.72	3570.45	1142.18		0.32
RM 13.7--RM 8.0	10.85*	8646.00	6.24	17.89		18.18	0.000342	5.42	3797.64	1197.00		0.30
RM 13.7--RM 8.0	11.42*	8646.00	7.29	18.85		19.08	0.000317	5.01	4094.34	1257.70		0.28
RM 13.7--RM 8.0	11.99*	8573.00	8.35	19.77		19.94	0.000294	4.45	4535.91	1297.37		0.25
RM 13.7--RM 8.0	12.56*	8573.00	9.40	20.65		20.77	0.000259	4.01	5083.29	1424.18		0.23
RM 13.7--RM 8.0	13.13*	8500.00	10.45	21.40		21.49	0.000227	3.46	5529.99	1416.54		0.20
RM 13.7--RM 8.0	13.7	8500.00	11.51	22.06		22.12	0.000206	3.11	5869.84	1412.17		0.18

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)
RM 13.7--RM 8.0	8.00	14.66	14.48	0.18			3316.06	5254.33	294.61	1070.49
RM 13.7--RM 8.0	8.57*	14.97	14.72	0.25	0.29	0.02	2899.82	5575.21	316.98	1035.20
RM 13.7--RM 8.0	9.14*	15.53	15.22	0.31	0.55	0.02	2668.44	5795.03	328.53	1086.71
RM 13.7--RM 8.0	9.71*	16.18	15.80	0.39	0.63	0.02	2269.98	6008.03	440.99	1073.93
RM 13.7--RM 8.0	10.28*	17.20	16.85	0.34	1.01	0.00	2251.68	5758.08	709.25	1142.18
RM 13.7--RM 8.0	10.85*	18.18	17.89	0.29	0.98	0.00	2098.07	5428.10	1119.83	1197.00
RM 13.7--RM 8.0	11.42*	19.08	18.85	0.23	0.89	0.01	2188.97	4961.04	1495.99	1257.70
RM 13.7--RM 8.0	11.99*	19.94	19.77	0.17	0.85	0.01	2057.50	4338.99	2176.52	1297.37
RM 13.7--RM 8.0	12.56*	20.77	20.65	0.12	0.83	0.00	1900.95	3834.55	2837.50	1424.18
RM 13.7--RM 8.0	13.13*	21.49	21.40	0.08	0.71	0.00	1680.89	3205.49	3613.62	1416.54
RM 13.7--RM 8.0	13.7	22.12	22.06	0.06	0.64	0.00	1432.53	2763.80	4303.67	1412.17

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Plan 07

No Errors, Warnings or Notes in Computations

Table E.7

HEC-RAS Run, Ublutuoch River, 100-Year Flood without Snow & Ice

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

```
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   X
XXXXXXXX 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
```

100-Yr Model, Open Water Channel, Slope = 0.000099 Ft/Ft

PROJECT DATA

Project Title: Ublutuoch River Open Water 100-year
Project File : Ub4.prj
Run Date and Time: 9/30/2002 3:06:01 PM

Project in English units

PLAN DATA

Plan Title: Plan 01
Plan File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub4.p01

Geometry Title: Open Water Geometry for Ublutuoch 2002
Geometry File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub4.g01

Flow Title : 100-Year Open Water
Flow File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub4.f01

Plan Summary Information:

Number of:	Cross Sections =	11	Multiple Openings =	0
	Culverts =	0	Inline Weirs =	0
	Bridges =	0		

Computational Information

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

Computation Options

Critical depth computed only where necessary	
Conveyance Calculation Method:	At breaks in n values only
Friction Slope Method:	Average Conveyance

Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 100-Year Open Water
 Flow File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub4.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Ublutuoch	RM 13.7--RM 8.00	13.7	8500
Ublutuoch	RM 13.7--RM 8.00	12.56	8573
Ublutuoch	RM 13.7--RM 8.00	11.42	8646
Ublutuoch	RM 13.7--RM 8.00	10.28	8719
Ublutuoch	RM 13.7--RM 8.00	9.14	8792
Ublutuoch	RM 13.7--RM 8.00	8.00	8865

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Ublutuoch	RM 13.7--RM 8.00	PF 1		Normal S = .000099

GEOMETRY DATA

Geometry Title: Open Water Geometry for Ublutuoch 2002
 Geometry File : s:\Projects\2002\NPRA Hydrologic Monitoring\2002 Ublutuoch Stuff\HEC-RAS Runs\Ub4.g01

Cross Section Data

CROSS SECTION RIVER: Ublutuoch
 REACH: RM 13.7--RM 8.00 RS: 13.7

INPUT

Description: Ub @ RM 13.7, Open Water

Station Elevation Data num= 37									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	30.8	99	27.2	286	23.3	336	20.8	430	17.2
473	17.2	500	17.2	517	17.2	556	17.2	583	16.9
613	13.7	629	10.8	637	8.2	647	7.4	650	5.9
655	6	657	4.6	669	3.7	679	3.4	682	6.2
693	11.9	705	18.1	713	18.6	721	18.7	810	15.9
985	16.1	1011	17.1	1104	16.9	1189	18.5	1288	19.2
1381	19.2	1471	19.7	1568	20.3	1649	19.9	1755	23
1807	25.3	1875	26.2						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	613	.0446	705	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	613	705		2900 3010	2900	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	21.90	Element	Left OB	Channel	Right OB
----------------	-------	---------	---------	---------	----------

Vel Head (ft)	0.05	Wt. n-Val.	0.045	0.045	0.045
W.S. Elev (ft)	21.85	Reach Len. (ft)	2900.00	3010.00	2900.00
Crit W.S. (ft)		Flow Area (sq ft)	1191.15	1220.72	3569.03
E.G. Slope (ft/ft)	0.000207	Area (sq ft)	1191.15	1220.72	3569.03
Q Total (cfs)	8500.00	Flow (cfs)	1422.69	3150.43	3926.88
Top Width (ft)	1400.72	Top Width (ft)	298.02	92.00	1010.70
Vel Total (ft/s)	1.42	Avg. Vel. (ft/s)	1.19	2.58	1.10
Max Chl Dpth (ft)	18.45	Hydr. Depth (ft)	4.00	13.27	3.53
Conv. Total (cfs)	591495.4	Conv. (cfs)	99001.8	219230.9	273262.6
Length Wtd. (ft)	2943.50	Wetted Per. (ft)	298.28	97.54	1010.83
Min Ch El (ft)	3.40	Shear (lb/sq ft)	0.05	0.16	0.05
Alpha	1.62	Stream Power (lb/ft s)	0.06	0.42	0.05
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	1035.37	882.22	935.51
C & E Loss (ft)	0.00	Cum SA (acres)	293.58	63.23	361.09

CROSS SECTION RIVER: Ublutuoch
 REACH: RM 13.7--RM 8.00 RS: 13.13*

INPUT

Description:

Station	Elevation	Data	num=	95	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	30.16	40.73	28.66	84.18	26.87	104.49	25.78	112.02	25.48			
140.53	24.78	195.53	23.79	205.03	23.68	219.29	23.38	249.16	23.01			
282.43	22.27	300.08	21.96	301.86	21.96	306.19	21.85	339.45	20.33			
351.67	19.96	354.64	19.77	359.82	19.5	381.55	18.75	420.92	17.51			
453.85	16.44	461.66	16.44	471.16	16.57	475.24	16.44	488.81	16.45			
491.53	16.52	493.57	16.45	499.23	16.45	527.73	16.42	528.87	16.42			
541.77	16.45	545.68	16.46	568.93	16.51	573	16.6	575.71	16.53			
586.84	16.42	597.44	16.21	615.34	16.06	619.16	15.72	629.35	14.77			
634.1	14.51	640.21	13.87	647	12.99	653.97	11.5	657.46	10.86			
663.27	9.76	671.4	7.18	681.57	6.39	684.47	5.08	684.62	5.02			
689.7	5.1	691.73	3.84	694.06	3.69	703.93	3.02	704.51	3			
714.1	2.74	716.96	5.38	726.5	10.43	727.45	10.94	738.9	17.02			
746.84	17.64	747.47	17.66	754.78	17.77	775.33	17.26	781.76	16.97			
791.4	16.88	843.13	15.54	850.33	15.57	859.97	15.45	867.47	15.55			
921.04	15.78	922.11	15.86	992.82	15.94	1016.84	16	1042.65	16.94			
1077.46	16.92	1134.97	16.86	1173.89	17.56	1219.34	18.34	1242.46	18.49			
1317.61	19.06	1324.96	19.07	1408.53	19.03	1409.93	19.03	1448.17	19.28			
1499.27	19.61	1545.67	19.93	1595.56	20.21	1614.24	20.13	1675.96	19.88			
1704.23	20.64	1781.18	22.75	1810.3	23.94	1832.8	24.86	1900.3	25.73			

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	647	.0426	738.9	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	647	738.9		2900	3010	3040	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	21.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.045	0.043	0.045
W.S. Elev (ft)	21.20	Reach Len. (ft)	2900.00	3010.00	3040.00
Crit W.S. (ft)		Flow Area (sq ft)	1318.13	1245.55	3082.90
E.G. Slope (ft/ft)	0.000226	Area (sq ft)	1318.13	1245.55	3082.90
Q Total (cfs)	8500.00	Flow (cfs)	1656.79	3572.71	3270.50
Top Width (ft)	1404.22	Top Width (ft)	326.58	91.90	985.74
Vel Total (ft/s)	1.51	Avg. Vel. (ft/s)	1.26	2.87	1.06
Max Chl Dpth (ft)	18.46	Hydr. Depth (ft)	4.04	13.55	3.13
Conv. Total (cfs)	565775.9	Conv. (cfs)	110279.2	237806.3	217690.4
Length Wtd. (ft)	2997.26	Wetted Per. (ft)	326.84	97.26	985.86
Min Ch El (ft)	2.74	Shear (lb/sq ft)	0.06	0.18	0.04
Alpha	1.85	Stream Power (lb/ft s)	0.07	0.52	0.05
Frotn Loss (ft)	0.73	Cum Volume (acre-ft)	951.84	797.01	714.09
C & E Loss (ft)	0.00	Cum SA (acres)	272.79	56.87	294.64

CROSS SECTION RIVER: Ublutuoch
 REACH: RM 13.7--RM 8.00 RS: 12.56*

INPUT

Description:

Station Elevation Data		num= 95									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	29.52	42.88	27.92	88.61	25.84	109.98	24.36	117.91	23.9		
147.92	23.07	205.8	22.18	215.8	22.15	230.81	21.83	262.25	21.67		
297.27	20.85	315.85	20.59	317.73	20.62	322.28	20.6	357.29	19.14		
370.16	18.97	373.27	18.74	378.73	18.39	401.6	17.68	443.04	16.62		
477.7	15.68	485.92	15.68	495.92	15.94	500.21	15.68	514.5	15.7		
517.36	15.84	519.5	15.7	525.47	15.69	555.46	15.64	556.66	15.64		
570.24	15.7	574.35	15.72	598.82	15.82	603.11	15.99	605.97	15.86		
617.68	15.63	628.84	15.33	647.67	15.23	651.7	14.93	662.42	14.05		
667.42	14.02	673.85	13.35	681	12.28	688.09	10.55	691.63	9.89		
697.53	8.72	705.8	6.16	716.13	5.38	719.09	4.2	719.23	4.14		
724.4	4.21	726.47	3.08	728.83	2.94	738.87	2.34	739.46	2.33		
749.2	2.08	751.92	4.56	761	9.49	761.91	9.98	772.8	15.94		
780.68	16.67	781.31	16.71	788.56	16.84	808.96	16.48	815.34	16.1		
824.91	16.21	876.26	15.18	883.4	15.23	892.97	14.98	900.42	15.16		
953.59	15.57	954.65	15.72	1024.84	15.8	1048.68	15.89	1074.3	16.77		
1108.86	16.82	1165.93	16.83	1204.57	17.49	1249.68	18.18	1272.63	18.31		
1347.23	18.92	1354.52	18.94	1437.47	18.86	1438.86	18.86	1476.82	19.15		
1527.54	19.52	1573.59	19.87	1623.11	20.12	1641.65	20.05	1702.92	19.85		
1730.99	20.55	1807.36	22.49	1836.27	23.58	1858.6	24.42	1925.6	25.26		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.045	681	.0407
		772.8	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	681	772.8		3010	3010	3010	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	20.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.045	0.041	0.045
W.S. Elev (ft)	20.45	Reach Len. (ft)	3010.00	3010.00	3010.00
Crit W.S. (ft)		Flow Area (sq ft)	1423.50	1260.78	2518.13
E.G. Slope (ft/ft)	0.000260	Area (sq ft)	1423.50	1260.78	2518.13
Q Total (cfs)	8573.00	Flow (cfs)	1911.36	4101.78	2559.86
Top Width (ft)	1400.95	Top Width (ft)	355.06	91.80	954.08
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)	1.34	3.25	1.02
Max Chl Dpth (ft)	18.37	Hydr. Depth (ft)	4.01	13.73	2.64
Conv. Total (cfs)	531783.9	Conv. (cfs)	118561.9	254433.6	158788.5
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	355.34	97.01	954.20
Min Ch El (ft)	2.08	Shear (lb/sq ft)	0.06	0.21	0.04
Alpha	2.13	Stream Power (lb/ft s)	0.09	0.69	0.04
Frotn Loss (ft)	0.82	Cum Volume (acre-ft)	860.58	710.42	518.64
C & E Loss (ft)	0.00	Cum SA (acres)	250.10	50.53	226.95

CROSS SECTION RIVER: Ublutuoch

REACH: RM 13.7--RM 8.00 RS: 11.99*

INPUT

Description:

Station Elevation Data num= 95									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	28.88	45.02	27.18	93.03	24.81	115.47	22.94	123.79	22.33
155.3	21.36	216.08	20.57	226.58	20.62	242.33	20.27	275.35	20.34
312.11	19.43	331.62	19.21	333.59	19.28	338.37	19.35	375.13	17.94
388.64	17.99	391.91	17.72	397.64	17.28	421.65	16.61	465.16	15.73
501.55	14.91	510.18	14.92	520.68	15.31	525.18	14.92	540.19	14.95
543.19	15.16	545.44	14.95	551.7	14.94	583.2	14.86	584.45	14.86
598.71	14.95	603.03	14.98	628.72	15.13	633.22	15.39	636.22	15.19
648.52	14.85	660.23	14.45	680.01	14.39	684.24	14.14	695.49	13.33
700.74	13.53	707.5	12.83	715	11.57	722.2	9.59	725.8	8.91
731.8	7.68	740.2	5.14	750.7	4.37	753.7	3.31	753.85	3.26
759.1	3.31	761.2	2.33	763.6	2.2	773.8	1.66	774.4	1.65
784.3	1.42	786.88	3.73	795.5	8.54	796.36	9.02	806.7	14.86
814.52	15.71	815.14	15.76	822.35	15.91	842.59	15.69	848.92	15.22
858.42	15.55	909.38	14.82	916.48	14.89	925.98	14.5	933.36	14.78
986.14	15.35	987.2	15.59	1056.86	15.66	1080.53	15.79	1105.95	16.61
1140.25	16.72	1196.9	16.79	1235.25	17.42	1280.03	18.02	1302.8	18.14
1376.84	18.78	1384.08	18.81	1466.41	18.69	1467.79	18.7	1505.46	19.02
1555.81	19.42	1601.52	19.81	1650.67	20.03	1669.07	19.96	1729.88	19.83
1757.74	20.45	1833.55	22.24	1862.24	23.22	1884.4	23.98	1950.9	24.79

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.045	715	.0387	806.7	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	715	806.7		2310	3010	2770	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	19.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.045	0.039	0.045
W.S. Elev (ft)	19.59	Reach Len. (ft)	2310.00	3010.00	2770.00
Crit W.S. (ft)		Flow Area (sq ft)	1504.39	1266.18	1924.64
E.G. Slope (ft/ft)	0.000288	Area (sq ft)	1504.39	1266.18	1924.64
Q Total (cfs)	8573.00	Flow (cfs)	2006.11	4579.33	1987.56
Top Width (ft)	1269.78	Top Width (ft)	409.27	91.70	768.81
Vel Total (ft/s)	1.83	Avg. Vel. (ft/s)	1.33	3.62	1.03
Max Chl Dpth (ft)	18.17	Hydr. Depth (ft)	3.68	13.81	2.50
Conv. Total (cfs)	505331.8	Conv. (cfs)	118249.5	269926.5	117155.7
Length Wtd. (ft)	2792.91	Wetted Per. (ft)	409.61	96.78	768.96
Min Ch El (ft)	1.42	Shear (lb/sq ft)	0.07	0.24	0.04
Alpha	2.29	Stream Power (lb/ft s)	0.09	0.85	0.05
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)	759.42	623.11	365.14
C & E Loss (ft)	0.00	Cum SA (acres)	223.69	44.19	167.42

CROSS SECTION RIVER: Ublutuoch
 REACH: RM 13.7--RM 8.00 RS: 11.42*

INPUT

Description:

Station	Elevation	Data	num=	95	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	28.24	47.16	26.44	97.46	23.78	120.96	21.52	129.68	20.75			
162.69	19.65	226.35	18.96	237.35	19.09	253.86	18.72	288.44	19			
326.95	18.01	347.39	17.84	349.45	17.94	354.46	18.1	392.97	16.75			
407.12	17	410.54	16.69	416.55	16.17	441.7	15.53	487.28	14.84			
525.4	14.15	534.44	14.16	545.44	14.68	550.16	14.16	565.88	14.2			
569.02	14.48	571.38	14.2	577.94	14.18	610.93	14.08	612.25	14.08			
627.18	14.2	631.7	14.23	658.62	14.44	663.33	14.79	666.48	14.52			
679.35	14.07	691.63	13.57	712.34	13.56	716.78	13.35	728.57	12.61			
734.07	13.04	741.14	12.31	749	10.86	756.31	8.63	759.97	7.94			
766.07	6.64	774.6	4.12	785.27	3.36	788.31	2.42	788.47	2.38			
793.8	2.42	795.93	1.57	798.37	1.46	808.73	.98	809.34	.97			
819.4	.76	821.85	2.91	830	7.59	830.82	8.07	840.6	13.78			
848.36	14.75	848.98	14.8	856.13	14.98	876.22	14.91	882.5	14.35			
891.93	14.88	942.51	14.46	949.55	14.54	958.98	14.03	966.31	14.4			
1018.69	15.14	1019.74	15.45	1088.88	15.52	1112.37	15.69	1137.6	16.45			
1171.64	16.61	1227.87	16.75	1265.93	17.34	1310.37	17.86	1332.97	17.96			
1406.46	18.64	1413.64	18.68	1495.35	18.52	1496.72	18.53	1534.11	18.89			
1584.08	19.33	1629.44	19.75	1678.23	19.94	1696.49	19.88	1756.84	19.81			
1784.49	20.36	1859.73	21.98	1888.2	22.86	1910.2	23.54	1976.2	24.32			

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	749	.0368	840.6	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	749	840.6		2110	3010	2510	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	18.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.045	0.037	0.045
W.S. Elev (ft)	18.71	Reach Len. (ft)	2110.00	3010.00	2510.00
Crit W.S. (ft)		Flow Area (sq ft)	1592.73	1269.36	1443.93
E.G. Slope (ft/ft)	0.000315	Area (sq ft)	1592.73	1269.36	1443.93
Q Total (cfs)	8646.00	Flow (cfs)	2170.53	5069.30	1406.16
Top Width (ft)	1215.30	Top Width (ft)	449.17	91.60	674.53
Vel Total (ft/s)	2.01	Avg. Vel. (ft/s)	1.36	3.99	0.97
Max Chl Dpth (ft)	17.95	Hydr. Depth (ft)	3.55	13.86	2.14
Conv. Total (cfs)	486838.0	Conv. (cfs)	122218.2	285441.8	79178.0
Length Wtd. (ft)	2717.64	Wetted Per. (ft)	449.60	96.58	674.73
Min Ch El (ft)	0.76	Shear (lb/sq ft)	0.07	0.26	0.04
Alpha	2.47	Stream Power (lb/ft s)	0.10	1.03	0.04
Frotn Loss (ft)	0.88	Cum Volume (acre-ft)	677.30	535.51	258.04
C & E Loss (ft)	0.00	Cum SA (acres)	200.93	37.85	121.53

CROSS SECTION RIVER: Ublutuoch
 REACH: RM 13.7--RM 8.00 RS: 10.85*

INPUT

Description:

Station	Elevation	Data	num=	95	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	27.6	49.3	25.7	101.88	22.75	126.46	20.1	135.57	19.18			
170.07	17.94	236.63	17.35	248.13	17.56	265.38	17.17	301.53	17.67			
341.79	16.59	363.15	16.47	365.31	16.6	370.55	16.85	410.81	15.56			
425.6	16.02	429.18	15.66	435.46	15.06	461.75	14.46	509.4	13.95			
549.25	13.39	558.7	13.4	570.2	14.05	575.13	13.4	591.56	13.45			
594.85	13.8	597.31	13.45	604.17	13.43	638.66	13.3	640.04	13.3			
655.65	13.45	660.38	13.49	688.51	13.75	693.44	14.19	696.73	13.85			
710.19	13.29	723.02	12.69	744.68	12.72	749.31	12.56	761.64	11.89			
767.39	12.55	774.78	11.79	783	10.15	790.43	7.68	794.14	6.97			
800.33	5.6	809	3.1	819.83	2.35	822.93	1.54	823.08	1.5			
828.5	1.52	830.67	.81	833.14	.71	843.67	.3	844.29	.29			
854.5	.1	856.81	2.09	864.5	6.64	865.27	7.11	874.5	12.7			
882.21	13.78	882.82	13.85	889.91	14.04	909.85	14.12	916.09	13.47			
925.44	14.22	975.64	14.1	982.63	14.2	991.98	13.56	999.26	14.01			
1051.24	14.93	1052.28	15.32	1120.9	15.39	1144.21	15.58	1169.25	16.28			
1203.04	16.51	1258.84	16.72	1296.61	17.27	1340.71	17.7	1363.14	17.78			
1436.07	18.51	1443.2	18.55	1524.29	18.35	1525.66	18.36	1562.76	18.76			
1612.35	19.24	1657.37	19.69	1705.78	19.85	1723.91	19.8	1783.81	19.79			
1811.24	20.27	1885.91	21.73	1914.17	22.5	1936	23.1	2001.5	23.85			

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	783	.0348	874.5	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	783	874.5		2640	3010	1980	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	17.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.045	0.035	0.045
W.S. Elev (ft)	17.78	Reach Len. (ft)	2640.00	3010.00	1980.00
Crit W.S. (ft)		Flow Area (sq ft)	1701.98	1268.06	1068.47
E.G. Slope (ft/ft)	0.000332	Area (sq ft)	1701.98	1268.06	1068.47
Q Total (cfs)	8646.00	Flow (cfs)	2063.48	5499.03	1083.48
Top Width (ft)	1174.52	Top Width (ft)	594.74	91.50	488.28
Vel Total (ft/s)	2.14	Avg. Vel. (ft/s)	1.21	4.34	1.01
Max Chl Dpth (ft)	17.68	Hydr. Depth (ft)	2.86	13.86	2.19
Conv. Total (cfs)	474353.1	Conv. (cfs)	113210.7	301698.3	59444.1
Length Wtd. (ft)	2811.44	Wetted Per. (ft)	595.29	96.41	488.56
Min Ch El (ft)	0.10	Shear (lb/sq ft)	0.06	0.27	0.05
Alpha	2.71	Stream Power (lb/ft s)	0.07	1.18	0.05
Frotn Loss (ft)	0.93	Cum Volume (acre-ft)	597.50	447.84	185.66
C & E Loss (ft)	0.00	Cum SA (acres)	175.65	31.53	88.03

CROSS SECTION RIVER: Ublutuoch
 REACH: RM 13.7--RM 8.00 RS: 10.28*

INPUT

Description:

Station	Elevation	Data	num=	95	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	26.96	51.44	24.96	106.3	21.72	131.95	18.68	141.45	17.6			
177.46	16.24	246.9	15.74	258.9	16.03	276.91	15.61	314.63	16.34			
356.63	15.17	378.92	15.09	381.18	15.26	386.64	15.6	428.65	14.37			
444.08	15.04	447.82	14.63	454.37	13.94	481.8	13.39	531.52	13.06			
573.1	12.63	582.96	12.64	594.96	13.42	600.1	12.64	617.25	12.7			
620.68	13.12	623.25	12.7	630.41	12.67	666.39	12.53	667.83	12.52			
684.12	12.7	689.05	12.75	718.41	13.06	723.56	13.58	726.98	13.18			
741.03	12.5	754.42	11.82	777.02	11.89	781.85	11.77	794.71	11.17			
800.71	12.06	808.43	11.27	817	9.44	824.54	6.72	828.31	5.99			
834.6	4.55	843.4	2.08	854.4	1.34	857.54	.65	857.7	.62			
863.2	.63	865.4	.05	867.91	-.03	878.6	-.38	879.23	-.39			
889.6	-.56	891.77	1.27	899	5.69	899.72	6.15	908.4	11.62			
916.05	12.82	916.65	12.9	923.69	13.11	943.48	13.34	949.67	12.6			
958.95	13.56	1008.77	13.74	1015.7	13.86	1024.99	13.09	1032.21	13.63			
1083.79	14.72	1084.83	15.18	1152.92	15.25	1176.05	15.48	1200.9	16.12			
1234.43	16.41	1289.8	16.68	1327.28	17.2	1371.05	17.54	1393.32	17.61			
1465.69	18.37	1472.76	18.42	1553.23	18.18	1554.59	18.19	1591.41	18.63			
1640.62	19.15	1685.3	19.64	1733.34	19.76	1751.33	19.72	1810.77	19.76			
1837.99	20.17	1912.09	21.47	1940.13	22.14	1961.8	22.66	2026.8	23.38			

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	817	.0328	908.4	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	817	908.4		3010	3010	2640	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	17.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.045	0.033	0.045
W.S. Elev (ft)	16.83	Reach Len. (ft)	3010.00	3010.00	2640.00
Crit W.S. (ft)		Flow Area (sq ft)	1856.35	1264.40	772.19
E.G. Slope (ft/ft)	0.000328	Area (sq ft)	1856.35	1264.40	772.19
Q Total (cfs)	8719.00	Flow (cfs)	2220.79	5773.09	725.12
Top Width (ft)	1138.28	Top Width (ft)	655.03	91.40	391.85
Vel Total (ft/s)	2.24	Avg. Vel. (ft/s)	1.20	4.57	0.94
Max Chl Dpth (ft)	17.39	Hydr. Depth (ft)	2.83	13.83	1.97
Conv. Total (cfs)	481600.2	Conv. (cfs)	122666.9	318880.8	40052.5
Length Wtd. (ft)	2983.79	Wetted Per. (ft)	655.74	96.26	392.22
Min Ch El (ft)	-0.56	Shear (lb/sq ft)	0.06	0.27	0.04
Alpha	2.84	Stream Power (lb/ft s)	0.07	1.23	0.04
Frotn Loss (ft)	0.93	Cum Volume (acre-ft)	489.67	360.34	143.82
C & E Loss (ft)	0.00	Cum SA (acres)	137.78	25.21	68.02

CROSS SECTION RIVER: Ublutuoch
 REACH: RM 13.7--RM 8.00 RS: 9.71*

INPUT

Description:

Station	Elevation	Data	num=	95	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	26.32	53.58	24.22	110.73	20.69	137.44	17.26	147.34	16.03			
184.84	14.53	257.18	14.13	269.68	14.49	288.43	14.06	327.72	15			
371.48	13.76	394.69	13.72	397.04	13.91	402.73	14.35	446.48	13.18			
462.56	14.05	466.45	13.6	473.27	12.83	501.85	12.32	553.64	12.17			
596.95	11.87	607.22	11.88	619.72	12.79	625.08	11.88	642.94	11.95			
646.51	12.44	649.19	11.95	656.64	11.92	694.13	11.75	695.62	11.74			
712.59	11.95	717.73	12.01	748.31	12.37	753.67	12.98	757.24	12.51			
771.87	11.72	785.81	10.94	809.35	11.05	814.39	10.97	827.78	10.46			
834.03	11.57	842.07	10.76	851	8.73	858.66	5.77	862.49	5.02			
868.87	3.51	877.8	1.06	888.97	.33	892.16	-.24	892.32	-.26			
897.9	-.27	900.13	-.7	902.69	-.77	913.53	-1.06	914.17	-1.07			
924.7	-1.22	926.73	.44	933.5	4.74	934.18	5.19	942.3	10.54			
949.89	11.86	950.49	11.95	957.48	12.18	977.11	12.55	983.25	11.72			
992.47	12.89	1041.9	13.38	1048.78	13.52	1057.99	12.62	1065.16	13.25			
1116.35	14.51	1117.37	15.05	1184.94	15.11	1207.89	15.38	1232.56	15.96			
1265.82	16.31	1320.77	16.65	1357.96	17.12	1401.4	17.38	1423.49	17.43			
1495.3	18.23	1502.32	18.29	1582.18	18.01	1583.52	18.02	1620.06	18.49			
1668.89	19.06	1713.22	19.58	1760.9	19.67	1778.75	19.64	1837.73	19.74			
1864.74	20.08	1938.27	21.22	1966.1	21.78	1987.6	22.22	2052.1	22.91			

Manning's n Values

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.045		851	.0309		942.3	.045	

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	851	942.3		530	3010	2640		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	16.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.045	0.031	0.045
W.S. Elev (ft)	15.89	Reach Len. (ft)	530.00	3010.00	2640.00
Crit W.S. (ft)		Flow Area (sq ft)	2043.02	1261.89	568.30
E.G. Slope (ft/ft)	0.000298	Area (sq ft)	2043.02	1261.89	568.30
Q Total (cfs)	8719.00	Flow (cfs)	2377.22	5831.50	510.29
Top Width (ft)	1078.52	Top Width (ft)	700.08	91.30	287.14
Vel Total (ft/s)	2.25	Avg. Vel. (ft/s)	1.16	4.62	0.90
Max Chl Dpth (ft)	17.11	Hydr. Depth (ft)	2.92	13.82	1.98
Conv. Total (cfs)	504859.3	Conv. (cfs)	137648.8	337663.3	29547.3
Length Wtd. (ft)	2254.17	Wetted Per. (ft)	700.96	96.14	287.63
Min Ch El (ft)	-1.22	Shear (lb/sq ft)	0.05	0.24	0.04
Alpha	2.90	Stream Power (lb/ft s)	0.06	1.13	0.03
Fretn Loss (ft)	0.57	Cum Volume (acre-ft)	354.95	273.06	103.20
C & E Loss (ft)	0.01	Cum SA (acres)	90.96	18.90	47.45

CROSS SECTION RIVER: Ublutuoch
 REACH: RM 13.7--RM 8.00 RS: 9.14*

INPUT

Description:

Station	Elevation	Data	num=	95	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	25.68	55.72	23.48	115.15	19.66	142.93	15.84	153.23	14.45			
192.23	12.82	267.45	12.52	280.45	12.96	299.95	12.51	340.81	13.67			
386.32	12.34	410.46	12.35	412.9	12.57	418.82	13.1	464.32	11.98			
481.04	13.07	485.09	12.57	492.18	11.72	521.9	11.24	575.76	11.28			
620.8	11.1	631.48	11.12	644.48	12.16	650.05	11.12	668.63	11.2			
672.34	11.76	675.13	11.2	682.88	11.16	721.86	10.97	723.42	10.96			
741.06	11.2	746.4	11.27	778.21	11.68	783.78	12.38	787.49	11.84			
802.71	10.94	817.21	10.06	841.69	10.22	846.93	10.18	860.86	9.74			
867.36	11.08	875.71	10.24	885	8.02	892.77	4.81	896.66	4.05			
903.13	2.47	912.2	.04	923.53	-.68	926.77	-1.13	926.93	-1.14			
932.6	-1.16	934.87	-1.46	937.46	-1.51	948.47	-1.74	949.11	-1.74			
959.8	-1.88	961.69	-.38	968	3.8	968.63	4.23	976.2	9.46			
983.73	10.89	984.33	11	991.26	11.25	1010.74	11.77	1016.83	10.85			
1025.98	12.23	1075.03	13.02	1081.85	13.18	1090.99	12.14	1098.1	12.87			
1148.9	14.29	1149.91	14.91	1216.96	14.97	1239.74	15.28	1264.21	15.79			
1297.21	16.2	1351.74	16.61	1388.64	17.05	1431.74	17.22	1453.66	17.25			
1524.92	18.09	1531.88	18.16	1611.12	17.84	1612.45	17.86	1648.7	18.36			
1697.16	18.97	1741.15	19.52	1788.45	19.58	1806.16	19.56	1864.69	19.72			
1891.5	19.99	1964.46	20.96	1992.07	21.42	2013.4	21.78	2077.4	22.44			

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	885	.0289	976.2	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	885	976.2		3010	3010	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	15.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.045	0.029	0.045
W.S. Elev (ft)	15.35	Reach Len. (ft)	3010.00	3010.00	3010.00
Crit W.S. (ft)		Flow Area (sq ft)	2544.01	1295.76	522.25
E.G. Slope (ft/ft)	0.000218	Area (sq ft)	2544.01	1295.76	522.25
Q Total (cfs)	8792.00	Flow (cfs)	2824.17	5570.40	397.43
Top Width (ft)	1096.51	Top Width (ft)	738.44	91.20	266.87
Vel Total (ft/s)	2.02	Avg. Vel. (ft/s)	1.11	4.30	0.76
Max Chl Dpth (ft)	17.23	Hydr. Depth (ft)	3.45	14.21	1.96
Conv. Total (cfs)	595922.8	Conv. (cfs)	191422.4	377562.6	26937.8
Length Wtd. (ft)	3010.00	Wetted Per. (ft)	739.57	96.04	267.51
Min Ch El (ft)	-1.88	Shear (lb/sq ft)	0.05	0.18	0.03
Alpha	2.99	Stream Power (lb/ft s)	0.05	0.79	0.02
Frotn Loss (ft)	0.55	Cum Volume (acre-ft)	327.05	184.69	70.15
C & E Loss (ft)	0.01	Cum SA (acres)	82.21	12.59	30.66

CROSS SECTION RIVER: Ublutuoch
 REACH: RM 13.7--RM 8.00 RS: 8.57*

INPUT

Description:

Station Elevation Data		num= 95									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	25.04	57.86	22.74	119.58	18.63	148.42	14.42	159.11	12.88		
199.61	11.11	277.73	10.91	291.23	11.43	311.48	10.95	353.91	12.33		
401.16	10.92	426.23	10.97	428.77	11.23	434.91	11.85	482.16	10.79		
499.52	12.08	503.73	11.55	511.09	10.61	541.95	10.17	597.88	10.39		
644.65	10.34	655.74	10.36	669.24	11.53	675.03	10.36	694.31	10.45		
698.17	11.08	701.06	10.45	709.11	10.41	749.59	10.19	751.21	10.18		
769.53	10.45	775.08	10.53	808.1	10.99	813.89	11.77	817.75	11.17		
833.55	10.16	848.6	9.18	874.02	9.38	879.46	9.39	893.93	9.02		
900.68	10.59	909.36	9.72	919	7.31	926.89	3.86	930.83	3.07		
937.4	1.43	946.6	- .98	958.1	-1.69	961.39	-2.01	961.55	-2.02		
967.3	-2.06	969.6	-2.22	972.23	-2.26	983.4	-2.41	984.06	-2.42		
994.9	-2.54	996.65	-1.2	1002.5	2.85	1003.08	3.27	1010.1	8.38		
1017.57	9.93	1018.16	10.05	1025.04	10.32	1044.37	10.98	1050.42	9.97		
1059.49	11.56	1108.15	12.66	1114.93	12.84	1124	11.67	1131.05	12.48		
1181.45	14.08	1182.46	14.78	1248.98	14.84	1271.58	15.17	1295.86	15.63		
1328.61	16.1	1382.7	16.57	1419.32	16.97	1462.08	17.06	1483.83	17.08		
1554.53	17.95	1561.44	18.03	1640.06	17.67	1641.38	17.69	1677.35	18.23		
1725.43	18.87	1769.07	19.46	1816.01	19.49	1833.58	19.48	1891.65	19.7		
1918.25	19.89	1990.64	20.71	2018.03	21.06	2039.2	21.34	2102.7	21.97		

Manning's n Values

num= 3	
Sta	n Val
0	.045
919	.027
1010.1	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	919	1010.1		1650	3010	3010	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	14.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.045	0.027	0.045
W.S. Elev (ft)	14.83	Reach Len. (ft)	1650.00	3010.00	3010.00
Crit W.S. (ft)		Flow Area (sq ft)	3095.52	1330.84	489.76
E.G. Slope (ft/ft)	0.000155	Area (sq ft)	3095.52	1330.84	489.76
Q Total (cfs)	8792.00	Flow (cfs)	3199.53	5255.41	337.06
Top Width (ft)	1089.31	Top Width (ft)	773.37	91.10	224.84
Vel Total (ft/s)	1.79	Avg. Vel. (ft/s)	1.03	3.95	0.69
Max Chl Dpth (ft)	17.37	Hydr. Depth (ft)	4.00	14.61	2.18
Conv. Total (cfs)	707213.1	Conv. (cfs)	257364.5	422736.3	27112.4
Length Wtd. (ft)	2484.34	Wetted Per. (ft)	774.79	95.98	225.63
Min Ch El (ft)	-2.54	Shear (lb/sq ft)	0.04	0.13	0.02
Alpha	3.04	Stream Power (lb/ft s)	0.04	0.53	0.01
Frotn Loss (ft)	0.30	Cum Volume (acre-ft)	132.20	93.94	35.19
C & E Loss (ft)	0.01	Cum SA (acres)	29.97	6.29	13.67

CROSS SECTION RIVER: Ublutuoch
 REACH: RM 13.7--RM 8.00 RS: 8.00

INPUT

Description: Ub @ RM 8.00 Open Water

Station Elevation Data		num= 64									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	24.4	60	22	124	17.6	165	11.3	207	9.4		

288	9.3	302	9.9	323	9.4	367	11	416	9.5
442	9.6	451	10.6	500	9.6	518	11.1	530	9.5
562	9.1	620	9.5	680	9.6	694	10.9	700	9.6
720	9.7	724	10.4	727	9.7	779	9.4	798	9.7
838	10.3	844	11.17	848	10.5	880	8.3	912	8.6
927	8.3	934	10.1	943	9.2	953	6.6	961	2.9
965	2.1	981	-2	996	-2.9	1007	-3	1019	-3.1
1030	-3.2	1037	1.9	1044	7.3	1052	9.1	1078	10.2
1084	9.1	1093	10.9	1148	12.5	1157	11.2	1164	12.1
1214	13.87	1215	14.64	1281	14.7	1360	16	1450	16.9
1514	16.9	1591	17.9	1669	17.5	1706	18.1	1797	19.4
1861	19.4	1945	19.8	2044	20.7	2128	21.5		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.045	953	.025
		1044	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	953	1044		0	0		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	14.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.045	0.025	0.045
W.S. Elev (ft)	14.55	Reach Len. (ft)			
Crit W.S. (ft)	5.83	Flow Area (sq ft)	3884.62	1388.20	528.74
E.G. Slope (ft/ft)	0.000099	Area (sq ft)	3884.62	1388.20	528.74
Q Total (cfs)	8865.00	Flow (cfs)	3625.14	4872.52	367.34
Top Width (ft)	1071.05	Top Width (ft)	809.16	91.00	170.89
Vel Total (ft/s)	1.53	Avg. Vel. (ft/s)	0.93	3.51	0.69
Max Chl Dpth (ft)	17.75	Hydr. Depth (ft)	4.80	15.25	3.09
Conv. Total (cfs)	891389.6	Conv. (cfs)	364513.8	489939.3	36936.6
Length Wtd. (ft)		Wetted Per. (ft)	810.91	95.94	171.82
Min Ch El (ft)	-3.20	Shear (lb/sq ft)	0.03	0.09	0.02
Alpha	3.06	Stream Power (lb/ft s)	0.03	0.31	0.01
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Ublutuoch

Reach	River Sta.	n1	n2	n3
RM 13.7--RM 8.00	13.7	.045	.0446	.045
RM 13.7--RM 8.00	13.13*	.045	.0426	.045
RM 13.7--RM 8.00	12.56*	.045	.0407	.045
RM 13.7--RM 8.00	11.99*	.045	.0387	.045
RM 13.7--RM 8.00	11.42*	.045	.0368	.045
RM 13.7--RM 8.00	10.85*	.045	.0348	.045
RM 13.7--RM 8.00	10.28*	.045	.0328	.045
RM 13.7--RM 8.00	9.71*	.045	.0309	.045
RM 13.7--RM 8.00	9.14*	.045	.0289	.045
RM 13.7--RM 8.00	8.57*	.045	.027	.045
RM 13.7--RM 8.00	8.00	.045	.025	.045

SUMMARY OF REACH LENGTHS

River: Ublutuoch

Reach	River Sta.	Left	Channel	Right
RM 13.7--RM 8.00	13.7	2900	3010	2900
RM 13.7--RM 8.00	13.13*	2900	3010	3040
RM 13.7--RM 8.00	12.56*	3010	3010	3010
RM 13.7--RM 8.00	11.99*	2310	3010	2770
RM 13.7--RM 8.00	11.42*	2110	3010	2510
RM 13.7--RM 8.00	10.85*	2640	3010	1980
RM 13.7--RM 8.00	10.28*	3010	3010	2640
RM 13.7--RM 8.00	9.71*	530	3010	2640
RM 13.7--RM 8.00	9.14*	3010	3010	3010
RM 13.7--RM 8.00	8.57*	1650	3010	3010
RM 13.7--RM 8.00	8.00	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Ublutuoch

Reach	River Sta.	Contr.	Expan.
RM 13.7--RM 8.00	13.7	.1	.3
RM 13.7--RM 8.00	13.13*	.1	.3
RM 13.7--RM 8.00	12.56*	.1	.3
RM 13.7--RM 8.00	11.99*	.1	.3
RM 13.7--RM 8.00	11.42*	.1	.3
RM 13.7--RM 8.00	10.85*	.1	.3
RM 13.7--RM 8.00	10.28*	.1	.3
RM 13.7--RM 8.00	9.71*	.1	.3
RM 13.7--RM 8.00	9.14*	.1	.3
RM 13.7--RM 8.00	8.57*	.1	.3
RM 13.7--RM 8.00	8.00	.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
RM 13.7--RM 8.00	8.00	8865.00	-3.20	14.55		5.83	14.66	0.000099	3.51	5801.56	1071.05	0.16
RM 13.7--RM 8.00	8.57*	8792.00	-2.54	14.83			14.98	0.000155	3.95	4916.13	1089.31	0.18
RM 13.7--RM 8.00	9.14*	8792.00	-1.88	15.35			15.54	0.000218	4.30	4362.02	1096.51	0.20
RM 13.7--RM 8.00	9.71*	8719.00	-1.22	15.89			16.11	0.000298	4.62	3873.20	1078.52	0.22
RM 13.7--RM 8.00	10.28*	8719.00	-0.56	16.83			17.05	0.000328	4.57	3892.93	1138.28	0.22
RM 13.7--RM 8.00	10.85*	8646.00	0.10	17.78			17.97	0.000332	4.34	4038.51	1174.52	0.21
RM 13.7--RM 8.00	11.42*	8646.00	0.76	18.71			18.86	0.000315	3.99	4306.01	1215.30	0.19
RM 13.7--RM 8.00	11.99*	8573.00	1.42	19.59			19.71	0.000288	3.62	4695.21	1269.78	0.17
RM 13.7--RM 8.00	12.56*	8573.00	2.08	20.45			20.54	0.000260	3.25	5202.41	1400.95	0.15
RM 13.7--RM 8.00	13.13*	8500.00	2.74	21.20			21.26	0.000226	2.87	5646.58	1404.22	0.14
RM 13.7--RM 8.00	13.7	8500.00	3.40	21.85			21.90	0.000207	2.58	5980.90	1400.72	0.12

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)
RM 13.7--RM 8.00	8.00	14.66	14.55	0.11			3625.14	4872.52	367.34	1071.05
RM 13.7--RM 8.00	8.57*	14.98	14.83	0.15	0.30	0.01	3199.53	5255.41	337.06	1089.31
RM 13.7--RM 8.00	9.14*	15.54	15.35	0.19	0.55	0.01	2824.17	5570.40	397.43	1096.51
RM 13.7--RM 8.00	9.71*	16.11	15.89	0.23	0.57	0.01	2377.22	5831.50	510.29	1078.52
RM 13.7--RM 8.00	10.28*	17.05	16.83	0.22	0.93	0.00	2220.79	5773.09	725.12	1138.28
RM 13.7--RM 8.00	10.85*	17.97	17.78	0.19	0.93	0.00	2063.48	5499.03	1083.48	1174.52
RM 13.7--RM 8.00	11.42*	18.86	18.71	0.15	0.88	0.00	2170.53	5069.30	1406.16	1215.30
RM 13.7--RM 8.00	11.99*	19.71	19.59	0.12	0.84	0.00	2006.11	4579.33	1987.56	1269.78
RM 13.7--RM 8.00	12.56*	20.54	20.45	0.09	0.82	0.00	1911.36	4101.78	2559.86	1400.95
RM 13.7--RM 8.00	13.13*	21.26	21.20	0.07	0.73	0.00	1656.79	3572.71	3270.50	1404.22
RM 13.7--RM 8.00	13.7	21.90	21.85	0.05	0.64	0.00	1422.69	3150.43	3926.88	1400.72

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Plan 01

No Errors, Warnings or Notes in Computations

APPENDIX F

RIVER BED GRADATION

LIST OF TABLES AND FIGURES

<u>Table or Figure</u>	<u>Title</u>
Table F-1.1	Bed Material Grain-Size Classification on Fish Creek at River Mile 25.1
Figure F-1.1	Bed Material Grain-Size Classification on Fish Creek at River Mile 25.1
Table F-2.1	Bed Load Grain-Size Classification on Fish Creek at River Mile 25.1 Collected 25 May 2002
Figure F-2.1	Bed Load Grain-Size Classification on Fish Creek at River Mile 25.1 Collected 25 May 2002
Table F-3.1	Bed Load Grain-Size Classification on Fish Creek at River Mile 25.1 Collected 26 May 2002
Figure F-3.1	Bed Load Grain-Size Classification on Fish Creek at River Mile 25.1 Collected 26 May 2002

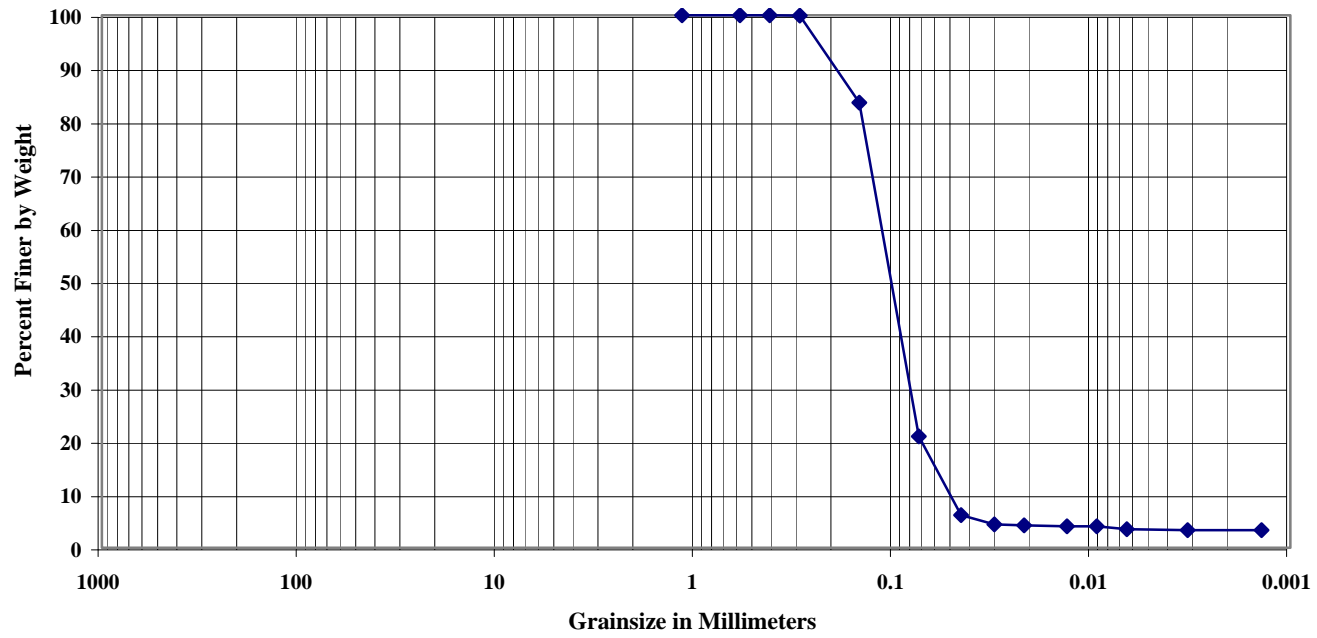
RIVER BED GRADATION

ON FISH CREEK AT RIVER MILE 25.1

Table F-1.1
Bed Material Grain-size Classification
on Fish Creek at River Mile 25.1

Sieve (mm)	Percent Passing
75.00	
63.50	
37.50	
25.00	
19.00	
12.50	
9.50	
4.75	
2.00	
1.18	100
0.600	99.98
0.425	99.97
0.300	99.92
0.150	83.6
0.075	20.9
0.0459	6.1
0.0312	4.4
0.0221	4.2
0.0134	4.0
0.0095	4.0
0.0067	3.5
0.0033	3.3
0.0014	3.3
Notes:	
1. mm = millimeter	
2. The grain-size classification was performed in accordance with ASTM D 422.	
3. The specific gravity was 2.67, measured in accordance to the procedures outlined in ASTM Method D 857.	

Figure F-1.1
Grain-Size Classification on Fish Creek at River Mile 25.1



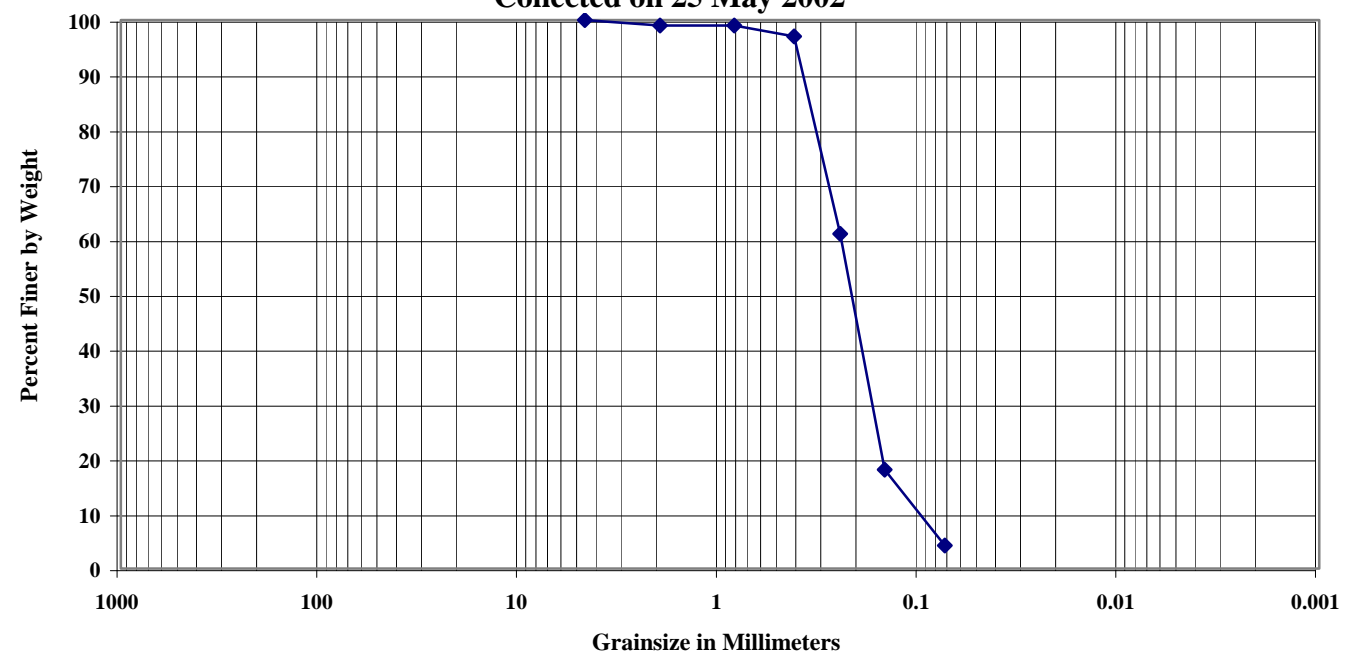
BED LOAD GRADATION

ON FISH CREEK AT RIVER MILE 25.1 ON 25 MAY 2002

Table F-2.1
Bed Load Grain-size Classification
on Fish Creek at River Mile 25.1
Collected 25 May 2002

Sieve (mm)	Percent Passing
75.00	
63.50	
37.50	
25.00	
19.00	
12.50	
9.50	
4.75	100
2.00	99
0.85	99
0.425	97
0.250	61
0.150	18
0.075	4.2
Notes: 1. mm = millimeter 2. The grain-size classification was performed in accordance with ASTM D 422. 3. The organic content of the sample was 3.3%. The specific gravity of the material with organics was determined to be 2.634. 4. The specific gravity of the material without organics was determined to be 2.642. 4. The specific gravity was measured in accordance to the procedures outlined in ASTM Method D 857.	

Figure F-2.1
Grain-Size Classification of Bed Load on Fish Creek at River Mile 25.1
Collected on 25 May 2002



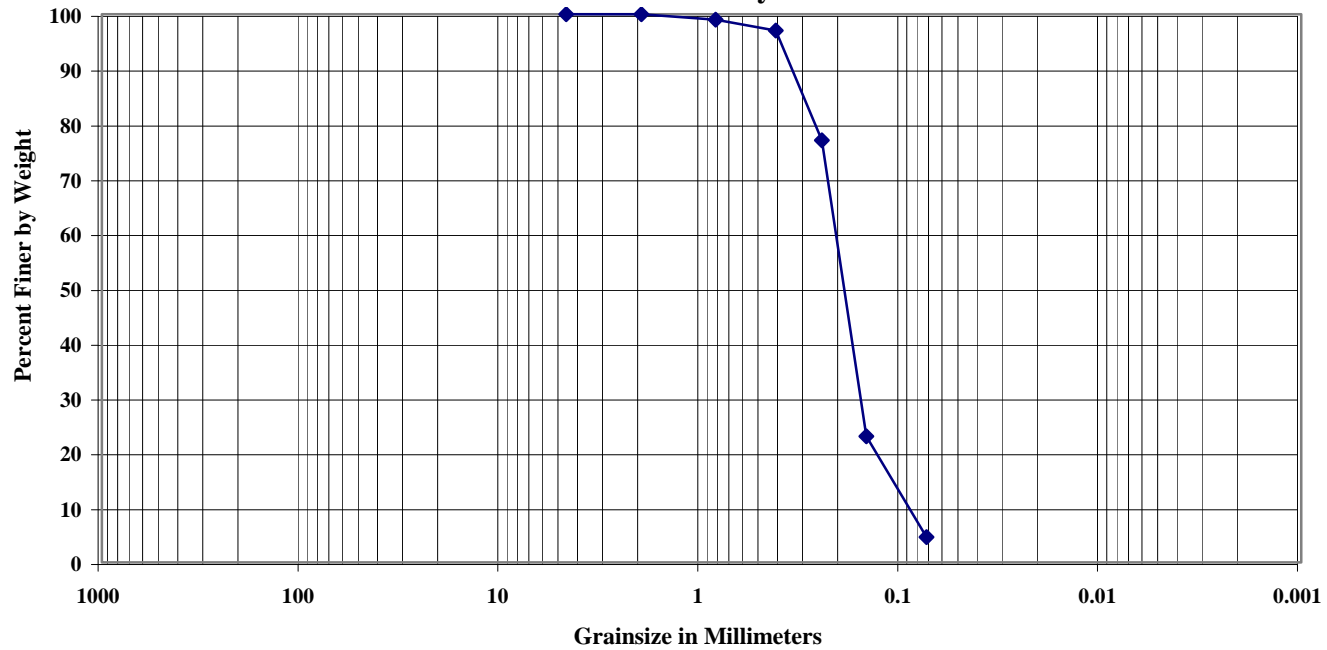
BED LOAD GRADATION

ON FISH CREEK AT RIVER MILE 25.1 ON 26 MAY 2002

Table F-3.1
Bed Load Grain-size Classification
on Fish Creek at River Mile 25.1
Collected 26 May 2002

Sieve (mm)	Percent Passing
75.00	
63.50	
37.50	
25.00	
19.00	
12.50	
9.50	
4.75	100
2.00	100
0.85	99
0.425	97
0.250	77
0.150	23
0.075	4.6
Notes: 1. mm = millimeter 2. The grain-size classification was performed in accordance with ASTM D 422. 3. The organic content of the sample was 6.1%. The specific gravity of the material with organics was determined to be 2.623. 4. The specific gravity of the material without organics was determined to be 2.640. 4. The specific gravity was measured in accordance to the procedures outlined in ASTM Method D 857.	

Figure F-3.1
Grain-Size Classification on Fish Creek at River Mile 25.1
Collected on 26 May 2002



APPENDIX G
SURVEYED CROSS SECTIONS

LIST OF TABLES

	<u>Page</u>
Table G.1 Cross Section Survey of Fish Creek at River Mile 12.6.....	G-1
Table G.2 Cross-Section Survey of the Ublutuoch River at River Mile 8.0	G-4

Table G.1: Cross Section Survey of Fish Creek at River Mile 12.6

POINT	STA.	Y	X	LATITUDE	LONGITUDE	ELEV.	DESCRIPTION
10	0+00	5,969,378	322,127	70° 19.3085'	151° 26.5332'	8.1	Edge of Lake
11	0+41	5,969,337	322,136	70° 19.3019'	151° 26.5285'	8.1	Edge of Pond, (100' x 60' x 3.5' plus/minus)
12	1+47	5,969,234	322,158	70° 19.2851'	151° 26.5162'	8.1	Edge of Pond, (100' x 60' x 3.5' plus/minus)
13	2+04	5,969,178	322,170	70° 19.2761'	151° 26.5097'	8.1	Edge of Pond, (250' x 60' x 4' plus/minus)
14	2+98	5,969,086	322,191	70° 19.2611'	151° 26.4988'	8.3	Edge of Pond, (250' x 60' x 4' plus/minus)
15	3+42	5,969,044	322,200	70° 19.2541'	151° 26.4938'	9.1	Tundra
16	4+12	5,968,976	322,215	70° 19.2430'	151° 26.4857'	8.1	Tundra
17	4+42	5,968,946	322,221	70° 19.2381'	151° 26.4822'	9.5	Tundra
18	4+96	5,968,893	322,233	70° 19.2296'	151° 26.4760'	8.3	Tundra
19	5+37	5,968,853	322,242	70° 19.2230'	151° 26.4712'	9.7	Tundra
20	5+68	5,968,823	322,248	70° 19.2180'	151° 26.4677'	8.5	Tundra
21	6+53	5,968,740	322,267	70° 19.2046'	151° 26.4579'	8.8	Tundra
22	6+64	5,968,729	322,269	70° 19.2028'	151° 26.4566'	9.7	Tundra
23	6+71	5,968,722	322,270	70° 19.2017'	151° 26.4558'	8.9	Edge of Swamp
24	7+41	5,968,654	322,285	70° 19.1906'	151° 26.4478'	8.1	Swamp, 0.5' Grass
25	8+16	5,968,581	322,301	70° 19.1787'	151° 26.4391'	8.7	Edge of Swamp
26	8+60	5,968,537	322,311	70° 19.1715'	151° 26.4339'	9.3	Tundra
27	9+11	5,968,488	322,322	70° 19.1635'	151° 26.4281'	9.3	Toe of Dune
28	9+63	5,968,437	322,333	70° 19.1552'	151° 26.4221'	11.5	Dune
1	9+80	5,968,421	322,337	70° 19.1525'	151° 26.4202'	15.06	F126-N Monument w/ 2" Aluminum Cap 0.4' above gnd.
29	9+90	5,968,411	322,339	70° 19.1509'	151° 26.4190'	14.7	Edge of Bank
30	9+99	5,968,402	322,341	70° 19.1494'	151° 26.4179'	5.2	Toe of Bank
31	10+03	5,968,398	322,342	70° 19.1488'	151° 26.4175'	4.1	Edge of Water
32	10+14	5,968,387	322,344	70° 19.1470'	151° 26.4162'	0.4	Bottom of River
33	10+25	5,968,376	322,346	70° 19.1453'	151° 26.4149'	-2.5	Bottom of River
34	10+44	5,968,358	322,350	70° 19.1423'	151° 26.4127'	-1.7	Bottom of River
35	10+72	5,968,331	322,356	70° 19.1378'	151° 26.4095'	-2.1	Bottom of River

Table G.1: (Continued)

POINT	STA	Y	X	LATITUDE	LONGITUDE	ELEV.	DESCRIPTION
36	11+00	5,968,303	322,362	70° 19.1333'	151° 26.4062'	-0.3	Bottom of River
37	11+34	5,968,270	322,370	70° 19.1280'	151° 26.4024'	0.0	Bottom of River
38	11+70	5,968,235	322,377	70° 19.1222'	151° 26.3982'	0.3	Bottom of River
39	12+10	5,968,196	322,386	70° 19.1159'	151° 26.3936'	0.4	Bottom of River
40	12+56	5,968,151	322,396	70° 19.1085'	151° 26.3883'	1.5	Bottom of River
41	13+01	5,968,106	322,406	70° 19.1013'	151° 26.3830'	2.8	Bottom of River
42	13+14	5,968,094	322,408	70° 19.0992'	151° 26.3815'	4.2	Edge of Water
43	13+52	5,968,057	322,416	70° 19.0932'	151° 26.3771'	6.6	Sand/Break
44	13+75	5,968,035	322,421	70° 19.0896'	151° 26.3746'	9.7	High Water Mark
45	13+75	5,968,034	322,421	70° 19.0895'	151° 26.3745'	9.6	Toe of Dune - Sparse 4' Willows
46	14+08	5,968,003	322,428	70° 19.0844'	151° 26.3708'	15.5	Break on Dune - Sparse 4' Willows
47	14+16	5,967,994	322,430	70° 19.0830'	151° 26.3698'	14.3	Toe of Dune - Sparse 4' Willows
48	14+33	5,967,978	322,434	70° 19.0803'	151° 26.3679'	20.3	Edge of Bank
2	14+39	5,967,972	322,435	70° 19.0794'	151° 26.3672'	21.16	F126-S Monument w/ 2" Aluminum Cap 0.3' above gnd
49	14+77	5,967,935	322,443	70° 19.0733'	151° 26.3628'	16.1	Dune - 1' Willows
50	15+23	5,967,890	322,453	70° 19.0660'	151° 26.3575'	13.1	Dune / Break - 2' Willows
51	15+53	5,967,861	322,459	70° 19.0612'	151° 26.3540'	8.5	Toe of Dune - 2' Willows
52	16+17	5,967,798	322,473	70° 19.0510'	151° 26.3466'	7.4	Edge of Swamp - 2' Willows
53	16+63	5,967,753	322,483	70° 19.0437'	151° 26.3413'	7.0	Swamp, 0.5' Grass - 2' Willows
54	16+84	5,967,733	322,487	70° 19.0404'	151° 26.3389'	7.3	Edge of Swamp - 2' Willows
55	17+00	5,967,717	322,491	70° 19.0378'	151° 26.3370'	7.7	Sand - 4' Willows
56	17+73	5,967,646	322,507	70° 19.0262'	151° 26.3286'	9.2	Sand / Break - 4' Willows
57	17+85	5,967,634	322,509	70° 19.0243'	151° 26.3273'	11.5	Sand / Break - 4' Willows
58	17+97	5,967,622	322,512	70° 19.0223'	151° 26.3258'	9.4	Sand / Break - 4' Willows
59	18+52	5,967,569	322,523	70° 19.0137'	151° 26.3195'	9.3	Sand / Break - 4' Willows
60	18+72	5,967,549	322,528	70° 19.0104'	151° 26.3172'	11.6	Sand / Break - 4' Willows
61	18+80	5,967,541	322,530	70° 19.0091'	151° 26.3163'	10.6	Sand / Break - 4' Willows

Table G.1: (Continued)

POINT	STA	Y	X	LATITUDE	LONGITUDE	ELEV.	DESCRIPTION
62	18+92	5,967,530	322,532	70° 19.0072'	151° 26.3149'	11.7	Sand / Break - 4' Willows
63	19+14	5,967,508	322,537	70° 19.0037'	151° 26.3124'	9.8	Sand / Break - 4' Willows
64	19+48	5,967,475	322,544	70° 18.9984'	151° 26.3085'	10.7	Sand / Break - 4' Willows
65	19+84	5,967,440	322,552	70° 18.9927'	151° 26.3043'	9.8	Sand / Break - 4' Willows
66	20+05	5,967,419	322,556	70° 18.9892'	151° 26.3018'	12.3	Sand / Break - 4' Willows
67	20+46	5,967,379	322,565	70° 18.9827'	151° 26.2971'	10.4	Sand / Break - 4' Willows
68	21+63	5,967,265	322,590	70° 18.9641'	151° 26.2836'	7.5	Sand / Break - 6' Willows
69	22+27	5,967,203	322,604	70° 18.9539'	151° 26.2763'	7.9	Sand / Break - 6' Willows
70	22+72	5,967,158	322,614	70° 18.9467'	151° 26.2710'	10.1	Sand / Break - 4' Willows
71	22+89	5,967,142	322,617	70° 18.9440'	151° 26.2691'	8.9	Sand / Break - 4' Willows
72	23+00	5,967,131	322,620	70° 18.9422'	151° 26.2678'	10.3	Sand / Break - 4' Willows
73	23+13	5,967,119	322,622	70° 18.9403'	151° 26.2664'	8.2	Sand / Break - 4' Willows
74	23+67	5,967,066	322,634	70° 18.9316'	151° 26.2601'	8.2	Sand / Break - Sparse 4' Willows
75	24+30	5,967,004	322,647	70° 18.9216'	151° 26.2528'	8.0	Sand / Break - Sparse 4' Willows
76	24+69	5,966,966	322,656	70° 18.9153'	151° 26.2483'	7.3	Sand / Break - Sparse 4' Willows

Notes:

1. Elevations shown are British Petroleum Mean Sea Level.
2. Y,X Coordinates are Alaska State Plane, Zone 4, NAD 27.
3. Geographic Coordinates are NAD 27.
4. Basis of location and elevation is NPRA control monuments per Lounsbury & Associates.
5. Control point found this survey: 3/8" Rebar approximately 5' north of new Monument F-126-N, elevation = 14.33.

Table G.2: Cross-Section Survey of Ublutuoch River at River Mile 8.0

PNT	STA.	Y	X	LATITUDE	LONGITUDE	ELEV.	DESCRIPTION
1	0+00	5,954,207	347,111	70° 16.9124'	151° 14.2328'	21.5	Tundra
2	0+84	5,954,134	347,069	70° 16.9003'	151° 14.2524'	20.7	Tundra
3	1+83	5,954,048	347,020	70° 16.8861'	151° 14.2754'	19.8	Tundra
4	2+67	5,953,976	346,978	70° 16.8740'	151° 14.2950'	19.4	Tundra
5	3+31	5,953,919	346,945	70° 16.8647'	151° 14.3101'	19.4	Tundra
6	4+22	5,953,841	346,900	70° 16.8516'	151° 14.3313'	18.1	Tundra
7	4+59	5,953,809	346,882	70° 16.8464'	151° 14.3398'	17.5	Tundra
8	5+37	5,953,741	346,843	70° 16.8351'	151° 14.3581'	17.9	Tundra
9	6+14	5,953,674	346,805	70° 16.8241'	151° 14.3760'	16.9	Tundra
10	6+78	5,953,619	346,773	70° 16.8149'	151° 14.3909'	16.9	Tundra
11	7+68	5,953,541	346,728	70° 16.8020'	151° 14.4118'	16.0	Tundra
12	8+47	5,953,472	346,689	70° 16.7906'	151° 14.4303'	14.7	Tundra
13	9+13	5,953,415	346,656	70° 16.7811'	151° 14.4457'	14.64	U 6.0 Fnd. 3/8" Rebar
14	9+14	5,953,414	346,655	70° 16.7809'	151° 14.4460'	13.87	U 6.0-N Monument w/ 2" Aluminum Cap 0.4' above gnd.
15	9+64	5,953,371	346,630	70° 16.7737'	151° 14.4577'	12.1	Tundra
16	9+71	5,953,365	346,627	70° 16.7728'	151° 14.4592'	11.2	Tundra
17	9+80	5,953,357	346,622	70° 16.7715'	151° 14.4613'	12.5	Tundra
18	10+35	5,953,309	346,595	70° 16.7636'	151° 14.4742'	10.9	Tundra
19	10+44	5,953,301	346,590	70° 16.7622'	151° 14.4764'	9.1	Tundra
20	10+50	5,953,297	346,587	70° 16.7615'	151° 14.4776'	10.2	Tundra w/ 2' Willows
21	10+76	5,953,274	346,574	70° 16.7577'	151° 14.4837'	9.1	Tundra - Edge of Bank w/ 2' Willows
22	10+84	5,953,267	346,571	70° 16.7566'	151° 14.4856'	7.3	Tundra - Break w/ 2' Willows
23	10+91	5,953,261	346,567	70° 16.7556'	151° 14.4872'	1.9	Ublutuoch X-ing Edge of Water
24	10+98	5,953,255	346,563	70° 16.7545'	151° 14.4889'	-3.2	Ublutuoch X-ing - Bottom of River
25	11+09	5,953,245	346,558	70° 16.7530'	151° 14.4914'	-3.1	Ublutuoch X-ing - Bottom of River
26	11+21	5,953,235	346,552	70° 16.7512'	151° 14.4942'	-3.0	Ublutuoch X-ing - Bottom of River
27	11+32	5,953,225	346,547	70° 16.7496'	151° 14.4968'	-2.9	Ublutuoch X-ing - Bottom of River
28	11+47	5,953,212	346,539	70° 16.7474'	151° 14.5004'	-2.0	Ublutuoch X-ing - Bottom of River
29	11+63	5,953,198	346,531	70° 16.7451'	151° 14.5041'	2.1	Ublutuoch X-ing Break Edge of Water
30	11+67	5,953,195	346,529	70° 16.7446'	151° 14.5050'	2.9	Ublutuoch X-ing Sand- Break
31	11+75	5,953,188	346,525	70° 16.7434'	151° 14.5069'	6.6	Sand- Edge of Bank

Table G.2: (Continued)

PNT	STA.	Y	X	LATITUDE	LONGITUDE	ELEV.	DESCRIPTION
32	11+85	5,953,179	346,520	70° 16.7420'	151° 14.5092'	9.2	Tundra - w/ 4' willows
33	11+94	5,953,172	346,516	70° 16.7408'	151° 14.5112'	10.1	Tundra - break - w/ 4' willows
34	12+01	5,953,166	346,512	70° 16.7397'	151° 14.5128'	8.3	Tundra - break - w/ 4' willows
35	12+16	5,953,153	346,505	70° 16.7376'	151° 14.5163'	8.6	Tundra - w/ 4' willows
36	12+48	5,953,125	346,489	70° 16.7330'	151° 14.5239'	8.3	Tundra - Break
37	12+80	5,953,097	346,473	70° 16.7283'	151° 14.5314'	10.5	Tundra
38	12+84	5,953,093	346,471	70° 16.7277'	151° 14.5324'	11.17	U6.0-S Monument w/ 2" Aluminum Cap 0.3' above gnd.
39	12+90	5,953,091	346,465	70° 16.7274'	151° 14.5350'	10.3	Tundra
40	13+30	5,953,078	346,428	70° 16.7251'	151° 14.5528'	9.7	Tundra - Edge of Swampy area
41	13+49	5,953,071	346,410	70° 16.7239'	151° 14.5617'	9.4	Tundra - Swamp - Short grass
42	14+01	5,953,053	346,361	70° 16.7208'	151° 14.5853'	9.7	Tundra - Edge of Swampy area
43	14+04	5,953,053	346,358	70° 16.7207'	151° 14.5864'	10.4	Tundra - Break
44	14+08	5,953,051	346,354	70° 16.7204'	151° 14.5886'	9.7	Tundra - Edge of Swampy area - Short grass
45	14+28	5,953,044	346,335	70° 16.7192'	151° 14.5975'	9.6	Tundra - Edge of Swampy area - Short grass
46	14+34	5,953,042	346,330	70° 16.7189'	151° 14.6002'	10.9	Tundra - Break
47	14+48	5,953,038	346,317	70° 16.7181'	151° 14.6064'	9.6	Tundra -Edge of Swampy area - Short grass
48	15+08	5,953,017	346,261	70° 16.7146'	151° 14.6335'	9.5	Tundra - Swamp - Short grass
49	15+66	5,952,997	346,206	70° 16.7111'	151° 14.6600'	9.1	Tundra - Swamp - Short grass
50	15+98	5,952,986	346,176	70° 16.7092'	151° 14.6745'	9.5	Tundra -Edge of Swampy area - Short grass
51	16+10	5,952,983	346,165	70° 16.7086'	151° 14.6798'	11.1	Tundra - Break -Short Grass
52	16+28	5,952,976	346,147	70° 16.7075'	151° 14.6882'	9.6	Tundra - Break -Short Grass
53	16+77	5,952,960	346,101	70° 16.7046'	151° 14.7104'	10.6	Tundra - Break -Short Grass
54	16+86	5,952,957	346,093	70° 16.7041'	151° 14.7141'	9.6	Tundra - Break -Short Grass
55	17+12	5,952,948	346,068	70° 16.7025'	151° 14.7261'	9.5	Tundra - Short grass
56	17+61	5,952,931	346,022	70° 16.6996'	151° 14.7484'	11.0	Tundra - Break - Short grass w/ 1' willows
57	18+05	5,952,916	345,981	70° 16.6971'	151° 14.7681'	9.4	Tundra - Break - Short grass - End of 1' willows
58	18+26	5,952,909	345,962	70° 16.6959'	151° 14.7775'	9.9	Tundra - Break - Short grass
59	18+40	5,952,904	345,948	70° 16.6950'	151° 14.7842'	9.3	Tundra - East Edge of Pond - Short grass
60	19+21	5,952,877	345,872	70° 16.6902'	151° 14.8209'	9.4	Tundra - East Edge of Pond - Short grass
61	19+63	5,952,862	345,832	70° 16.6877'	151° 14.8400'	11.3	Tundra - Break - No grass
62	20+04	5,952,848	345,794	70° 16.6853'	151° 14.8585'	17.6	Tundra - Break - No grass

Table G.2: (Continued)

PNT	STA.	Y	X	LATITUDE	LONGITUDE	ELEV.	DESCRIPTION
63	20+68	5,952,827	345,734	70° 16.6816'	151° 14.8874'	22.0	Tundra
64	21+28	5,952,806	345,677	70° 16.6780'	151° 14.9146'	24.4	Tundra

NOTES:

1. Elevations shown are British Petroleum Mean Sea Level.
2. Y,X Coordinates are Alaska State Plane, Zone 4, NAD 27.
3. Geographic Coordinates are NAD 27.
4. Basis of location and elevation is NPRA control monuments per Lounsbury & Associates.
5. Control point found this survey: 3/8" Rebar approximately 1' north of new Monument U6.0-N, elevation = 14.64.