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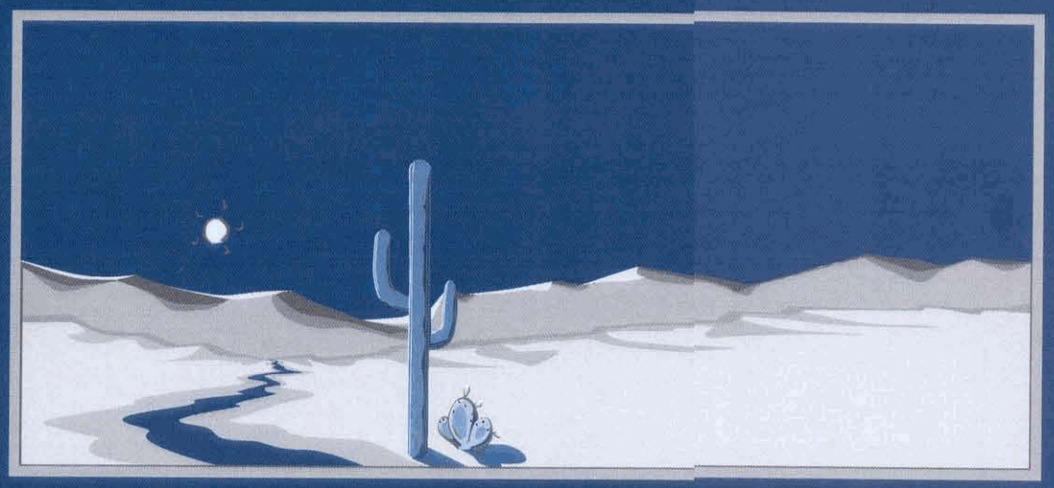

Watercourse Master Plan

Attachment 4: Hydraulics and Sediment Report

Book 1 of 2

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Book 1 of 2

Hydraulics and Sediment Report

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19 March 2001

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Report by Mr. H.W. Hjalmarson, PE, Dated 13 July 1999

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4-1.0 INTRODUCTION

4-1.1 GENERAL

Fluvial sediment analyses are performed for study reaches of Cave Creek, Apache Wash, Paradise Wash and Desert Hills Wash in support of the Upper Cave Creek and Apache Wash Watercourse Master Plan. The analyses are performed for the purpose of:

- Developing an understanding of the existing fluvial system in regard to sediment transport during floods, tendencies for aggradation and/or degradation during floods, and riverine hydraulics that may constitute flood hazards as a result of sediment transport processes.

- Qualitatively and quantitatively defining sediment transport in the watercourses during floods of selected frequency.

- Establishing baseline sediment transport models of the watercourses for existing (natural) conditions.

- Evaluating various structural and non structural alternatives including encroachment as part of the Watercourse Master Plan.

- Evaluating potential impacts of alterations to the watercourse, such as gravel mining and bridge crossings, on the watercourse.

- Assessing mine reclamation concepts that may be required as part of an overall watercourse master.

The analyses include the compilation of site-specific and regional sediment yield estimates, compilation and review of previous studies including floodplain delineation studies and reports by the U.S. Army Corps of Engineers and others in regard to Cave Buttes Dam and Cave Creek Dam, compilation and analyses of field data collection by others, field reconnaissance, and the development and analyses of sediment transport models for the four watercourse study reaches.

The study area is contained within the corporate limits of the City of Phoenix and the study limits of the watercourses are shown in Figure 4-1.1. All four watercourses extend to the north beyond the boundary of the City of Phoenix. The hydrology for each watercourse is provided by separate study and includes the entire contributing watershed of each watercourse. Sediment inflow to the study reach of each watercourse is established by sediment load rating curves at the northern terminus of each watercourse.

The sediment analyses are significantly impacted by the impoundment of flood waters behind Cave Buttes Dam. Prior to the construction of Cave Buttes Dam, the older Cave Creek Dam had resulted in sediment deposition within the impoundment and tailwater reaches of both Cave Creek and Apache Wash.

Current and previous sand and gravel mining has occurred in Cave Creek. A separate report, Summary of Sand and Gravel Mining Operations in Cave Creek, documents the history, location and extent of mining in the study area. Information from that report is used to evaluate effects of that mining on Cave Creek and is used to assess structural alternatives for Cave Creek.

4-1.2 ORGANIZATION OF THE SEDIMENT REPORT

- Sections 4-2 through 4-4 provide a presentation of the data that was used for the sedimentation analysis.

- Sections 4-5 through 4-7 provide a description of the sedimentation modeling procedures, sensitivity analysis, and results.

Supporting material for all analyses are presented in appendices. Files of HEC-6 models are provided on diskettes.

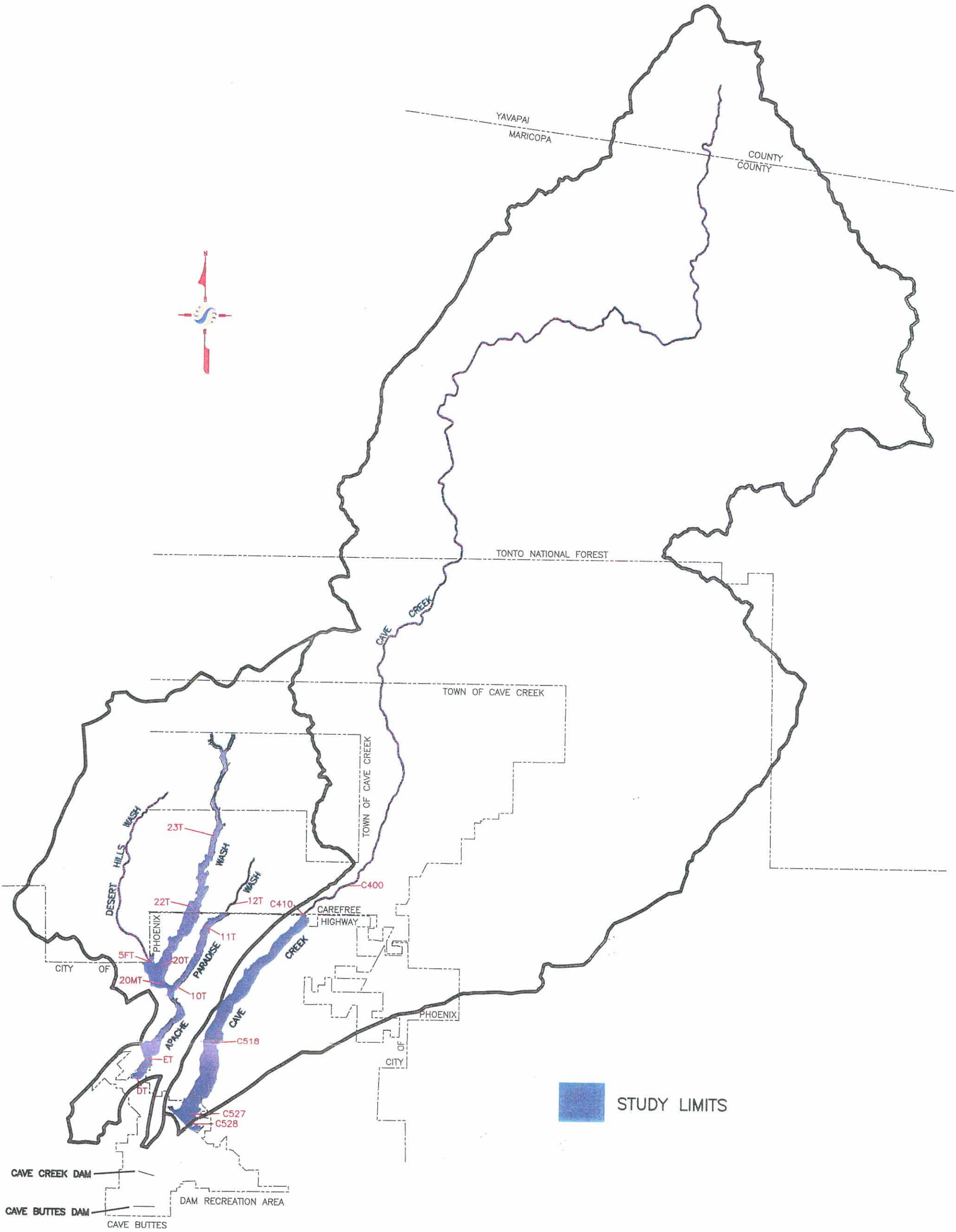

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Figure 4–1.1
Cave Creek and Apache Wash
Watercourse Master Plan
Study Limits

4-2.0 DATA COLLECTION

4-2.1 SEDIMENT YIELD

Sediment yield from small (less than 121 square miles) watersheds in Arizona and New Mexico is compiled and presented in Appendix A. The data consists of measured sediment yield from certain watersheds and also sediment yield estimates that were performed for the purpose of various regional studies. A summary of the sediment yields for the various watersheds (both measured and estimated sediment yields) is provided in Table A-1 (Appendix A). It is noted in that figure that data point RR is a fully urbanized watershed in Albuquerque with correspondingly low sediment yield and that data is not plotted in either Figure A-1 or A-2. Figure A-1 is a plot of that data, and that figure indicates a range of sediment yield from about 0.01 to more than 1.0 acre-feet per square mile per year for small watersheds. The scatter of data generally covers more than two log cycles on the graph. Figure A-2 is a plot of only the measured sediment yield data. That figure indicates a range of sediment yield from about 0.3 to about 1.0 acre-feet per square mile per year. Envelope lines are shown in Figure A-2 indicating a wider variability for smaller watersheds. For a drainage area of about 100 square miles, which is slightly less than the drainage area of Cave Creek at the upper study boundary, the sediment yield from Figure A-2 is in the range from about 0.2 to slightly more than 0.3 acre-feet per square mile per year.

Of most notable interest in the sediment yield data is the value used by the U.S. Army Corps of Engineers for the design of Cave Buttes Dam. That value is 0.31 acre-feet per square mile per year. The data used to derive that estimate is unknown, but presumably is based on an analysis of sediment deposition behind the old Cave Creek Dam.

Supporting references on the source of sediment yield estimates for regional studies are provided in Appendix A. It is noted that measured sediment yield data accounts for the total sediment load; that is bed material load plus wash load. Whereas, estimates of sediment yield by empirical methods may only account for bed material load since wash load is difficult to quantify. This may partially explain the wide range in sediment yield data and estimates. However, sediment yield is highly variable and a wide range is expected, particularly for smaller watersheds.

The sediment yield of Cave Creek and Apache Wash can be estimated from HEC-6 output. The results of the HEC-6 models are discussed in Section 5.7 and presented in appendices. Sediment passing into Cave Buttes Dam impoundment is the sum of sediment from Cave Creek plus Apache Wash and some relatively inconsequential sediment from minor local runoff. For the 100-year flood and existing watershed conditions, the bed material sediment yield is estimated from HEC-6 results as follows: Assuming a coarse bed material, the bed material sediment load in Cave Creek is about 55,000 tons (see Figure CC-C-3 of Appendix K at River Station 27.5 miles), and from Apache Wash the load is 17,000 tons (see Figure AW-C-3 of Appendix K at River Station 0.0 miles). The total bed material load is 72,000 tons which is approximately 28 acre-feet of sediment. Assuming a finer bed material, the Cave Creek load is 84,000 tons (see Figure CC-O-3) and the Apache Wash load is 34,000 tons (see Figure AW-O-3). The total bed material load is 118,000 tons which is approximately 47 acre-feet of sediment. The sediment yield for Cave Creek is measured at River Station 27.5 miles because downstream of that section the watercourse can be a deposition reach depending on the water surface elevation behind Cave Buttes Dam. For Apache Wash, the sediment yield is measured at River Station 0.0 since the Apache Wash model does not extend into the backwater effects of Cave Buttes Dam. The 100-year flood bed material sediment yield is estimated as the average of 28 and 47 acre-feet which is 37.5 acre-feet. An independent estimate of total sediment yield for the 100-year flood is 245 acre-feet (see Appendix B, page 20). That estimate is total sediment load of which bed material load is often estimated as 10 to 15 percent of total load. The 37.5 acre-feet estimate is 15 percent of 245 acre-feet, and therefore the HEC-6 model results correlate well with sediment yield using empirical data.

4-2.2 ANALYSIS OF CORPS OF ENGINEERS, USGS, AND FIELD DATA FOR CAVE CREEK

An analysis of available data from the Corps of Engineers and the USGS was performed by Mr. H.W. Hjalmarson, PE, and his report is provided in Appendix B. Important results of his analysis are the following:

(1) Comparison of the Cave Creek Dam reservoir capacity relation for 1923 and 1958 indicates a sediment yield of 0.24 acre-feet per square mile per year. That time period does not include the major flood of September 1970. Therefore, the

Corps estimate of 0.31 acre-feet per square mile per year may more correctly estimate sediment yield from a long duration time period including major floods.

(2) No trend in size distribution of Cave Creek bed material is detected. Variation in bed material size distribution along the length of Cave Creek is random.

(3) Sediment yield for a range of flood frequencies from 2- to 100-years is provided based on empirical estimation methods and analysis of flow duration relations for Cave Creek.

(4) Field inspection of Cave Creek after major floods indicates the occurrence of large bed load from channel transport processes. Wash load can have wide variability which greatly affects total sediment load being transported by floods.

4-2.3 HYDRAULIC AND GEOMETRIC INPUT

The base hydraulic and geometric data utilized in the sediment transport analysis for the project study reaches of the Cave Creek and Apache Wash system are taken from three existing floodplain delineation studies. Those studies are as follows.

- Cave Creek above Carefree Highway Floodplain Delineation Study, July 1997 by George V. Sabol Consulting Engineers, Inc. (GVSCE) for the Flood Control District of Maricopa County, FCD 95-28.

- Cave Creek below Carefree Highway Floodplain Delineation Study, June 1997 by Willdan Associates for the Flood Control District of Maricopa County, FCD 95-30.

- Apache Wash Flood Insurance Study, August 1992 by Jerry R. Jones and Associates, Inc. for the Flood Control District of Maricopa County, FCD 89-66.

4-2.4 SEDIMENT INPUT

Pebble count and sieve-analyzed data provided by JE Fuller/Hydrology & Geomorphology, Inc. (JEF, Inc.) was used for the sediment input. The pebble count data were collected by the following procedure.

- Laying a cloth tape across the channel and measuring the channel width.
- A sample interval was determined that would yield approximately 100 samples.
- At each sampling interval, the sediment particle directly beneath the tape interval was measured. In cases where that particle size was less than 3 mm, the sediment classification was recorded (that is; gravel, coarse sand, sand, fine sand, very fine sand, and silt).

The sieve-analyzed samples were collected from bulk samples generally taken at the locations where test pits were excavated and logged. The data collection is further described in Attachment 6.

4-2.5 HYDROLOGIC INPUT

The base hydrologic data utilized in the sediment transport analysis for the project study reaches of the Cave Creek and Apache Wash system were provided by ASL Consulting Engineers for the existing and future conditions. The development of the data is described in Upper Cave Creek and Apache Wash Watercourse Master Plan Attachment 1.

4-3.0 HYDROLOGIC DATA

4-3.1 BACKGROUND

The base hydrologic data utilized in the sediment analyses for the project study reaches of Cave Creek and the Apache Wash system are taken from three existing floodplain delineation studies. Those studies are identified in Section 4-2.3. For this study, sediment transport modeling is performed for the 100- and 10-year events for both existing and future hydrologic watershed conditions. Watershed models were developed for each of the floodplain delineation studies (FDS) for the existing condition 100-year event, and those discharges are used in the sediment analyses, herein. The flood discharges for the existing condition 10-year flood and the future condition 10-year and 100-year floods, respectively, were provided by separate study by others as part of the watercourse master plan.

4-3.2 GENERAL

Hydrologic data required as input to the HEC-6 model consists of water discharge and temperature, flow duration and downstream water surface elevations. Discharge data is in the form of runoff hydrographs. Several locations for runoff input along each study watercourse are identified for sediment modeling. These locations are shown of Figure 4-1.1 and are the same as those in the FDS water surface profile models. Figures 4-3.1, 4-3.2 and 4-3.3 are plots of the 100-year, existing condition hydrographs at each discharge input location in Cave Creek, Apache Wash and Desert Hills and Paradise Washes, respectively. Those hydrographs are provided for reference. Similar hydrographs were developed at concentration points for each of the other three hydrologic conditions.

For Cave Creek, the majority of the runoff is produced in the upper part of the watershed, upstream of the study limits as shown in Figure 4-1.1. The 100-year, existing condition peak flow at the upstream limits of the study reach (C410) is approximately 33,800 cfs. The 100-year, existing condition peak flow at the downstream limits of the study reach (C528) is approximately 38,100 cfs. The time to peak at the downstream end of the study limits (C528) occurs approximately 1 hour after the time to peak at the upstream end (C410). This indicates that the study reach portion of Cave

Creek functions primarily as a conveyance system for runoff produced in the upper part of the watershed. Tributary inflows to Cave Creek within the study limits are therefore considered to be insignificant and only the hydrograph at C528 is used for the sediment analyses.

Unlike Cave Creek, tributary inflows to Apache Wash are significant, particularly from the major tributaries of Desert Hills Wash and Paradise Wash. Therefore all runoff input locations identified in the Apache Wash FDS are utilized for the sediment analyses.

Figure 4-3.1
100-year existing condition inflow hydrographs for Cave Creek

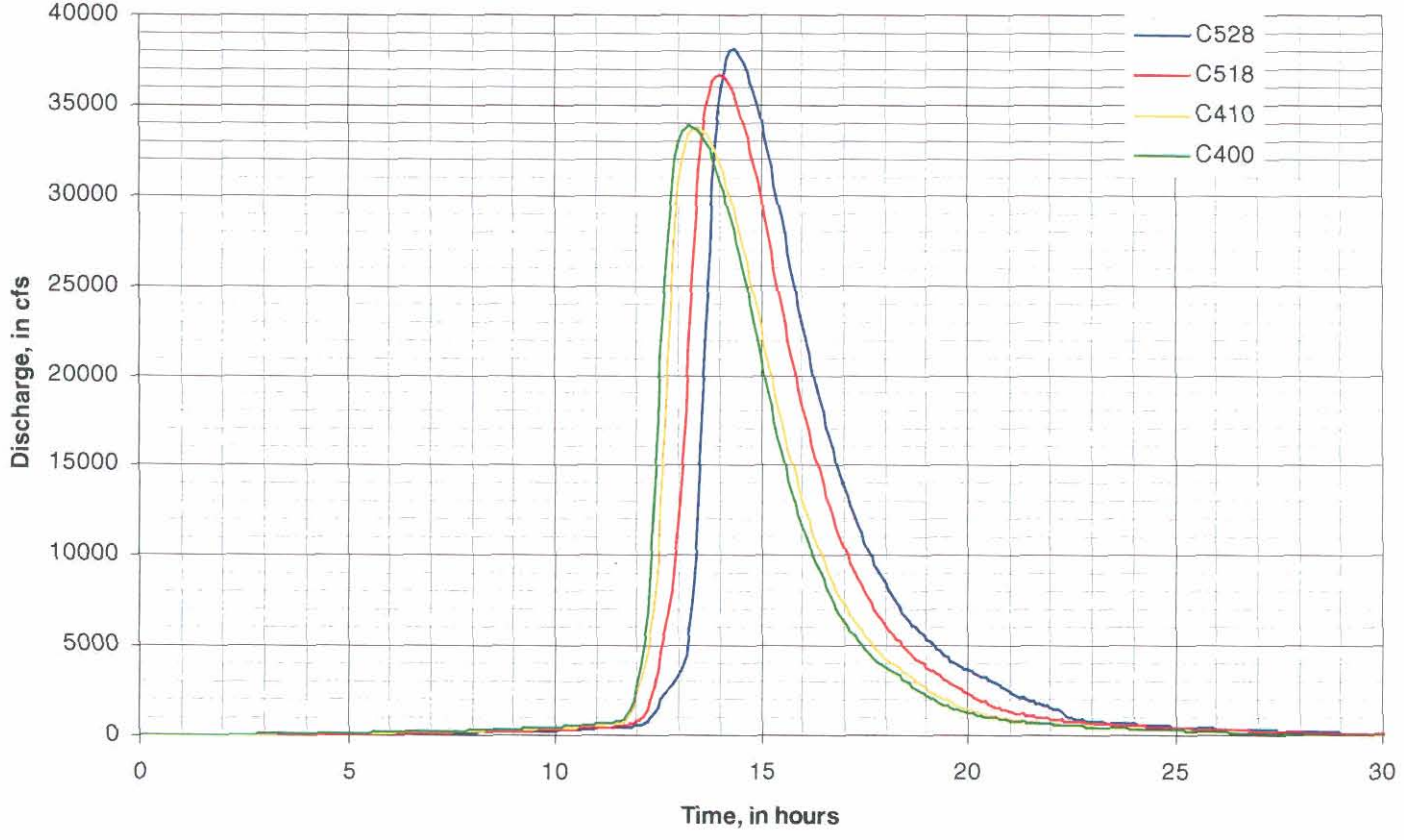


Figure 4-3.2
100-year existing condition inflow hydrographs for Apache Wash

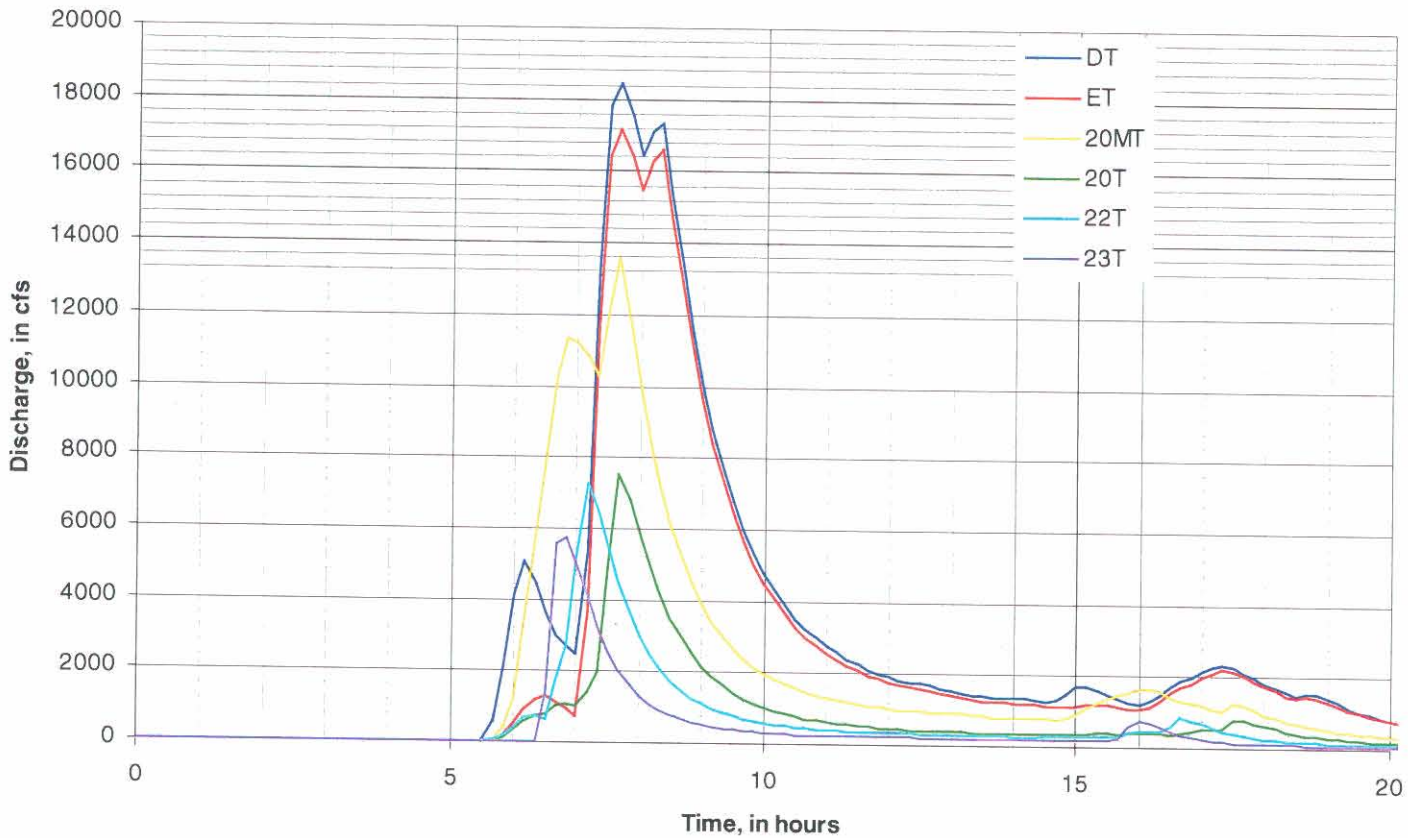
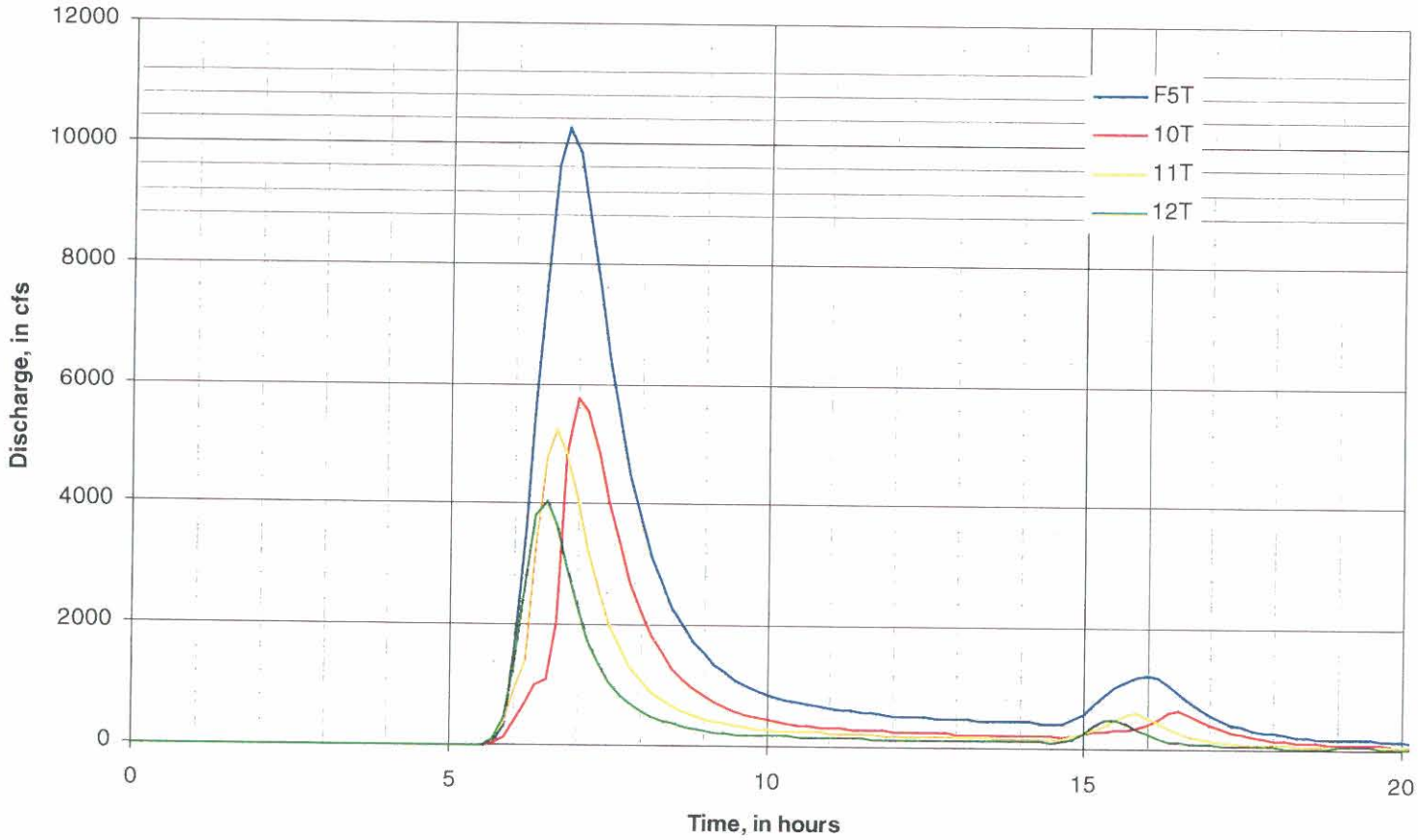


Figure 4-3.3
100-year existing condition inflow hydrographs for Desert Hills Wash and Paradise Wash

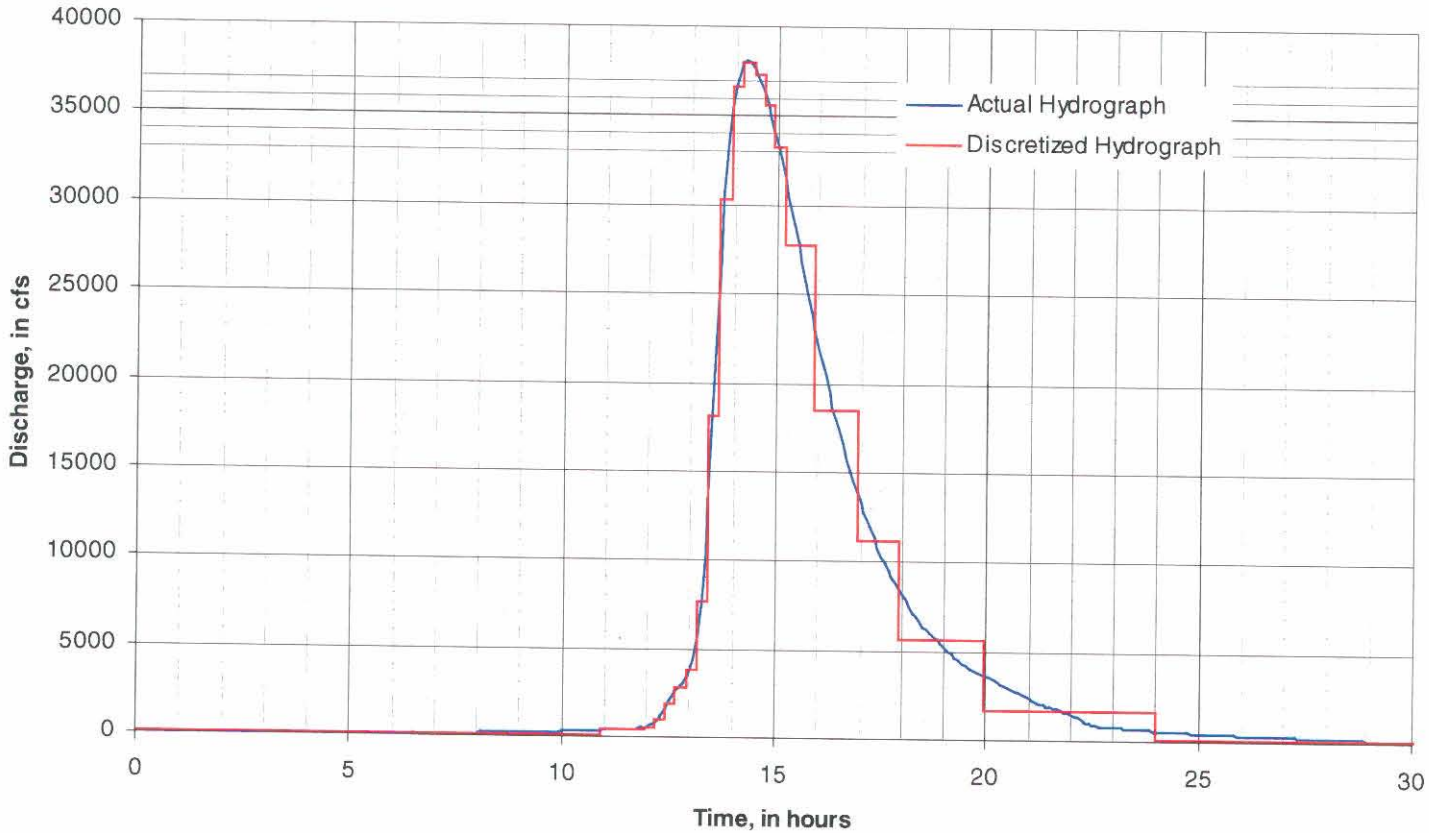


4-3.3 DISCRETIZED HYDROGRAPHS

The final hydrographs are input into the model as a series of discrete steady flow values for a specified flow duration that represents the actual hydrographs. The discrete steady flows are an average of the hydrograph for specified time intervals. The duration of the time intervals are adjusted until the discretized hydrograph is representative of the actual hydrograph. The results of this process are illustrated in Figure 4-3.4 for the 100-year, existing condition runoff hydrograph for Cave Creek. Similar discretized hydrographs were developed for each concentration point for each study watercourse.

For watercourse networks with tributary and/or local inflows, such as the Apache Wash system, the first discretized hydrograph input to the HEC-6 models is at the downstream limits of each study reach. Hydrographs at each upstream flow change locations along the mainstem that are coded into the model are the tributary or local inflow hydrographs. The mainstem hydrographs are then computed by subtracting the tributary or local inflow hydrograph from the downstream hydrograph. This process is accumulative in the sense that the calculated mainstem hydrograph becomes the downstream hydrograph for each subsequent inflow location. Discretization of these tributary and local inflow hydrographs is performed using the same time durations as the downstream hydrograph. This process is problematic for watercourses systems with significant hydrologic channel routing effects, particularly in regard to hydrograph timing. For watercourses where the downstream hydrograph is significantly lagged behind the upstream hydrograph and where tributary or local inflow is negligible, subtraction of the tributary or local inflow from the downstream hydrograph may result in negative flow values along the rising limb of the computed mainstem hydrograph. This situation can be seen by inspection of runoff hydrographs at concentration points 10T and 11T of Paradise Wash (Figure 4-3.3). The hydrograph at 10T is the total runoff from the Paradise Wash sub-watershed. Local inflow that occurs between concentration points 11T and 10T is negligible and

Figure 4-3.4
100-year existing conditon discretized hydrograph for Cave Creek



because of hydrologic routing effects, the downstream hydrograph (10T) is essentially the same as the hydrograph at 11T, but lagged in time. Calculation of discrete steady flow values for each of these hydrographs at the same time duration and starting point in time will result in higher steady flow values for 11T along the rising limb of the hydrograph than for 10T. This situation is resolved by aligning the peaks of the hydrographs at the tributary locations to the most downstream location. In other words, the hydrologic channel routing is eliminated from consideration. The resulting aligned hydrographs are shown in Figures 4-3.5 for Apache Wash and Figure 4-3.6 for Desert Hills and Paradise Washes.

The process of aligning the hydrograph peaks and hydrograph discretization is performed for the 100-year and 10-year events for both existing and future watershed conditions. The resulting discretized input hydrographs for each watercourse for each hydrologic condition are shown in Tables 4-3.1 through 4-3.10. For Apache Wash, the continual subtraction of tributary and local inflows resulted in negative discharge values at a few discrete time intervals at the most upstream inflow location. Therefore, the discharge at these time intervals for the most downstream hydrograph is adjusted such that the general shape of the most upstream hydrograph is maintained. These adjusted values for each hydrologic event are highlighted in the tables and the actual flow value is noted.

Figure 4-3.5
100-year existing condition aligned hydrographs for Apache Wash

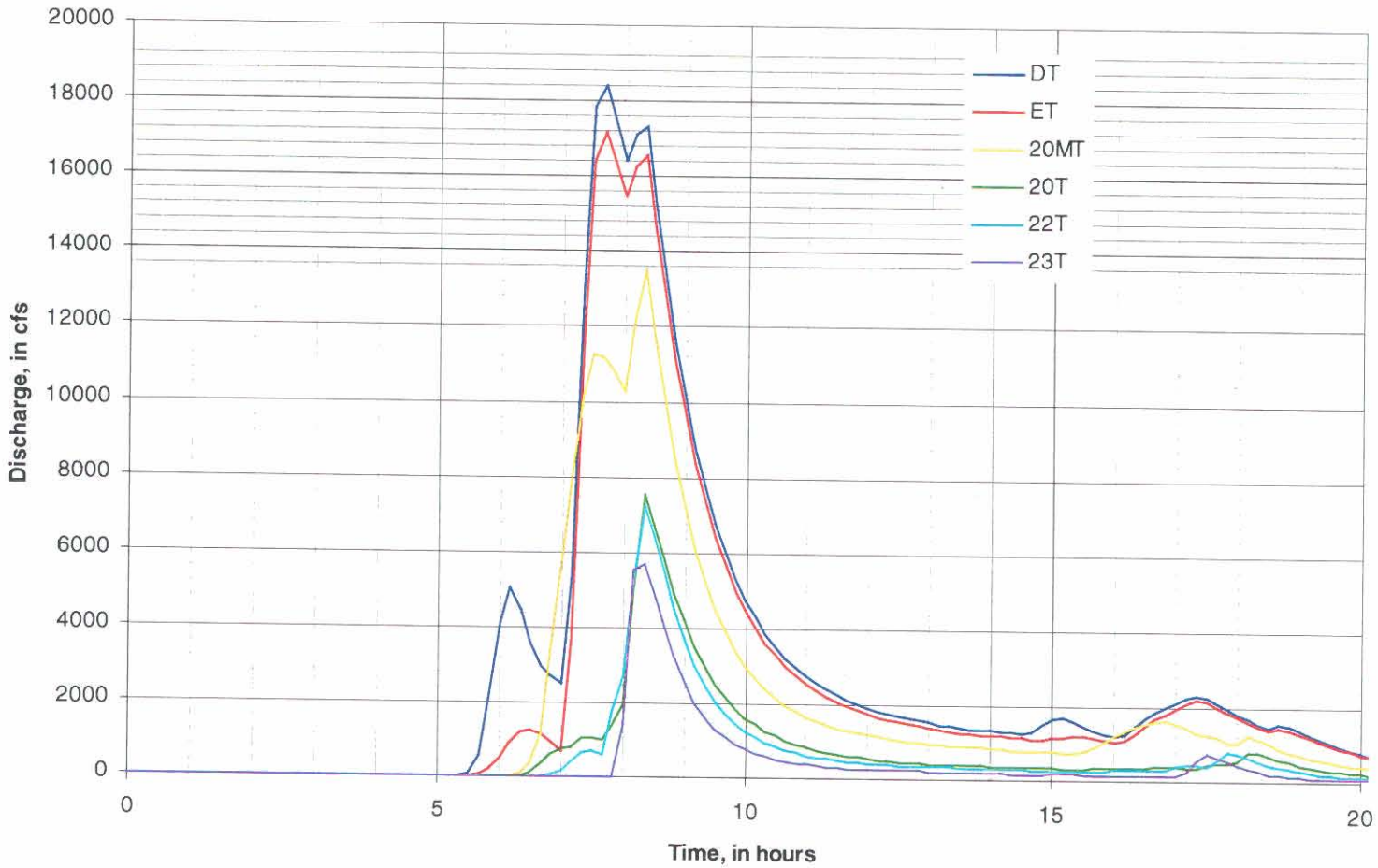


Figure 4-3.6
100-year existing condition aligned hydrographs for Desert Hills and Paradise Washes

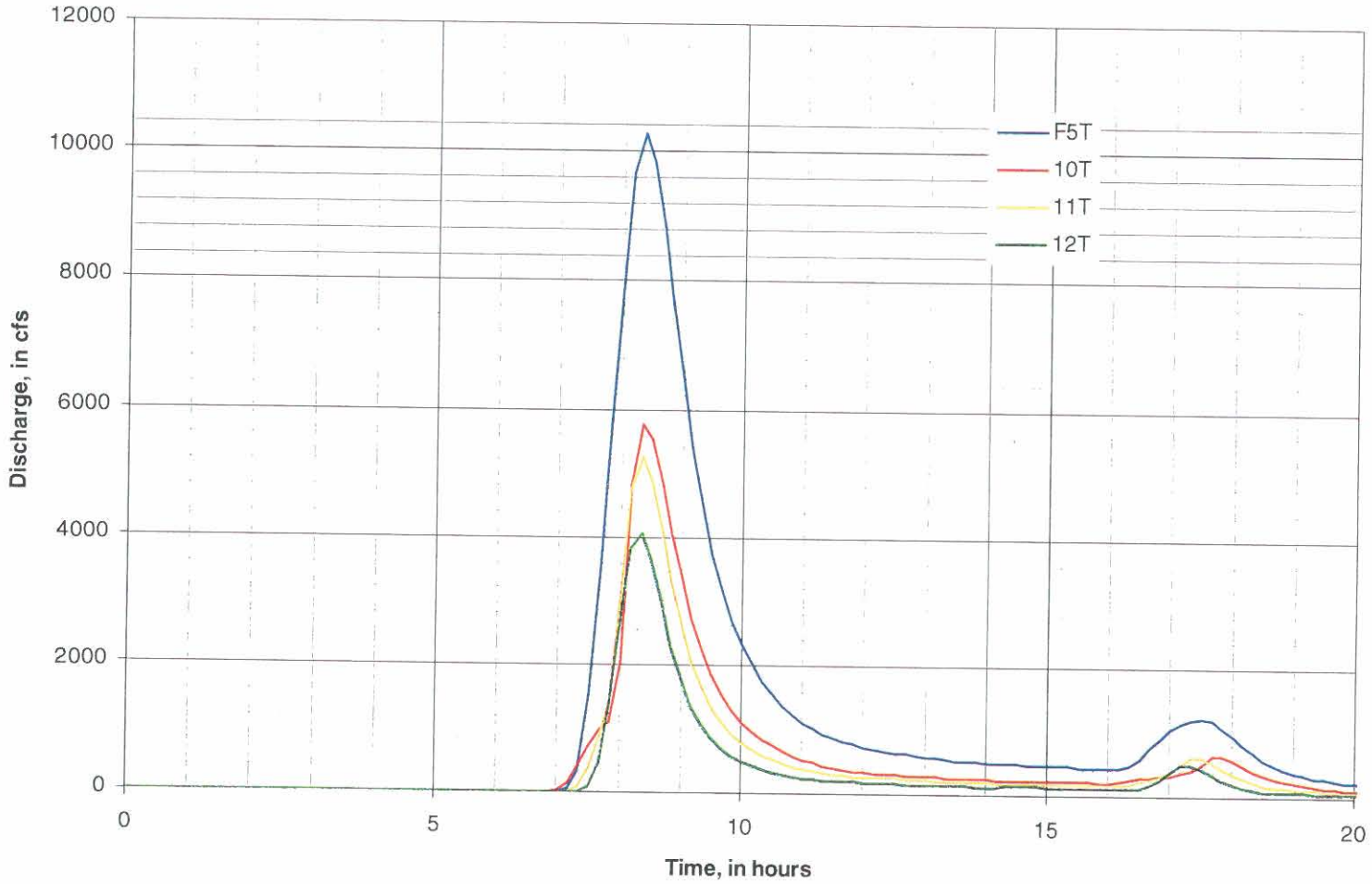


Table 4-3.1

Summary of discretized hydrographs for Cave Creek

Time, in hours		Discretized Hydrographs, in cfs			
		100-year	10-year	100-year	10-year
Incremental	Accumulative	Existing	Existing	Future	Future
(1)	(2)	(3)	(4)	(5)	(6)
10.92	10.92	87	35	246	132
1.00	11.92	446	210	956	565
0.25	12.17	608	321	1391	877
0.25	12.42	1006	600	2121	1549
0.25	12.67	1969	1303	3185	2433
0.25	12.92	2824	2087	4151	2981
0.25	13.17	3842	2489	5969	3738
0.25	13.42	7705	3376	1204	5453
0.25	13.67	18133	5924	24313	9653
0.25	13.92	30296	10852	35599	15146
0.25	14.17	36586	15497	40542	19300
0.25	14.42	37995	17731	41164	20690
0.25	14.67	37252	17953	39766	20271
0.25	14.92	35585	17179	37281	18894
0.25	15.17	33288	16164	34358	17368
0.75	15.92	27701	14296	28052	14946
1.00	16.92	18479	11412	18811	11812
1.00	17.92	11129	7756	11495	8078
2.00	19.92	5648	4153	5976	4375
4.08	24.00	1706	1151	1989	1362
13.42	37.42	161	110	213	147
1.08	38.50	1	0	1	0

Table 4-3.2

100-year existing condition discretized hydrographs for Apache Wash

Time, in hours		DT	DT-ET	10T	5FT	20T-22T	22T-23T
Incremental	Accumulative	cfs	Cfs	cfs	cfs	cfs	cfs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
6.00	6.00	184	165	0	1	0	0
0.33	6.33	4,750[a]	3,682	1	3	12	0
0.50	6.83	3,088	1,977	1	4	330	13
0.50	7.33	7,002	1,673	60	19	446	409
0.33	7.67	18,128	1,356	558	920	367	666
0.33	8.00	16,959	1,024	1,044	4,632	0	2,216
0.50	8.50	16,565	720	4,205	9,270	143	2,075
0.50	9.00	14,910[b]	490	4,804	8,753	413	447
0.67	9.67	8,790[c]	340	2,529	5,004	470	440
0.67	10.33	4,710[d]	263	1,230	2,535	347	333
0.67	11.00	3,090	205	705	1,469	243	236
0.83	11.83	2,243	172	454	943	159	175
1.83	13.67	1,602	147	304	636	89	120
1.83	15.50	1,429	268	233	482	66	88
3.50	19.00	1,706	123	354	745	52	137
5.00	24.00	513	15	87	156	51	41

Notes: Actual Values

a. 4,732 cfs
b. 11,639 cfs
c. 7,264 cfs
d. 4,539 cfs

Table 4-3.3

10-year existing condition discretized hydrographs for Apache Wash

Time, in hours		DT	DT-ET	10T	5FT	20T-22T	22T-23T
Incremental	Accumulative	cfs	cfs	cfs	cfs	cfs	cfs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
6.00	6.00	34	31	0	0	0	0
0.33	6.33	992	791	0	1	1	0
0.50	6.83	631	404	0	1	56	1
0.50	7.33	500[a]	346	10	3	74	59
0.33	7.67	2,467	337	104	111	75	0
0.33	8.00	3,555	287	209	741	0	0
0.50	8.50	3,102	213	514	1,632	0	59
0.50	9.00	3,420[b]	158	1,068	1,839	281	72
0.67	9.67	2,180[c]	109	625	1,130	223	87
0.67	10.33	1,253	81	312	588	145	62
0.67	11.00	842	61	179	344	94	41
0.83	11.83	599	50	114	222	62	26
1.83	13.67	409	41	74	149	34	15
1.83	15.50	349	69	56	112	25	9
3.50	19.00	394	35	82	173	19	10
5.00	24.00	147	6	23	39	19	8

Notes: Actual Values

a. 466 cfs

b. 2,993 cfs

c. 1,992 cfs

Table 4-3.4

100-year future condition discretized hydrographs for Apache Wash

Time, in hours		DT	DT-ET	10T	5FT	20T-22T	22T-23T
Incremental	Accumulative	cfs	cfs	cfs	cfs	cfs	cfs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
6.00	6.00	199	169	3	11	4	0
0.33	6.33	4,921	3,731	11	31	39	0
0.50	6.83	3,290	2,064	15	39	437	9
0.50	7.33	9,407	1,732	91	87	563	384
0.33	7.67	19,145	1,391	636	1,246	468	0
0.33	8.00	17,810	1,046	1,162	5,179	0	261
0.50	8.50	17,309	733	4,610	9,881	286	417
0.50	9.00	14,900[a]	497	4,921	9,060	414	0
0.67	9.67	8,650[b]	344	2,570	5,219	474	127
0.67	10.33	4,620[c]	265	1,245	2,584	351	166
0.67	11.00	3,121	207	712	1,491	245	123
0.83	11.83	2,264	173	457	955	162	80
1.83	13.67	1,616	148	307	643	90	44
1.83	15.50	1,440	268	235	487	67	24
3.50	19.00	1,717	124	357	751	54	33
5.00	24.00	516	15	87	157	51	29

Notes: Actual Values

a. 11,824 cfs

b. 11,639 cfs

c. 4,590 cfs

Table 4-3.5

10-year future condition discretized hydrographs for Apache Wash

Time, in hours		DT	DT-ET	10T	5FT	20T-22T	22T-23T
Incremental	Accumulative	cfs	cfs	cfs	cfs	cfs	cfs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
6.00	6.00	38	34	0	0	0	0
0.33	6.33	1,084	866	0	1	2	0
0.50	6.83	690	443	0	1	60	1
0.50	7.33	540[a]	378	10	3	82	62
0.33	7.67	2,696	376	110	119	86	0
0.33	8.00	3,886	326	222	797	0	0
0.50	8.50	3,391	243	545	1,755	0	55
0.50	9.00	3710[b]	184	1,132	1,978	340	69
0.67	9.67	2360[c]	126	662	1,215	260	87
0.67	10.33	1,369	92	331	632	167	63
0.67	11.00	921	69	190	370	108	42
0.83	11.83	655	56	121	239	71	26
1.83	13.67	447	46	78	160	40	15
1.83	15.50	382	76	59	121	29	9
3.50	19.00	431	40	87	186	24	10
5.00	24.00	161	7	24	41	21	9

Notes: Actual Values

a. 510 cfs

b. 3,272 cfs

c. 2,177 cfs

Table 4-3.6

Summary of discretized hydrographs for Desert Hills Wash

Time, in hours		Discretized Hydrographs at 5FT, in cfs			
		100-year	10-year	100-year	10-year
Incremental	Accumulative	Existing	Existing	Future	Future
(1)	(2)	(3)	(4)	(5)	(6)
6.00	6.00	1	0	11	0
0.33	6.33	3	1	31	1
0.50	6.83	4	1	39	1
0.50	7.33	19	3	87	3
0.33	7.67	920	111	1,246	119
0.33	8.00	4,632	741	5,179	797
0.50	8.50	9,270	1,632	9,881	1,755
0.50	9.00	8,753	1,839	9,060	1,978
0.67	9.67	5,004	1,130	5,129	1,215
0.67	10.33	2,535	588	2,584	632
0.67	11.00	1,469	344	1,491	370
0.83	11.83	943	222	955	239
1.83	13.67	636	149	643	160
1.83	15.50	482	112	487	131
3.50	19.00	745	173	751	186
5.00	24.00	156	39	157	41

Table 4-3.7

100-year existing condition discretized hydrographs for Paradise Wash

Time, in hours		10T	10T-11T	11T-12T
Incremental	Accumulative	cfs	cfs	cfs
(1)	(2)	(3)	(4)	(5)
6.00	6.00	0	0	0
0.33	6.33	1	1	0
0.50	6.83	1	1	0
0.50	7.33	60	60	0
0.33	7.67	558	513	43
0.33	8.00	1,044	402	358
0.50	8.50	4,205	1,064	493
0.50	9.00	4,804	84	1,161
0.67	9.67	2,529	142	765
0.67	10.33	1,230	203	368
0.67	11.00	705	149	200
0.83	11.83	454	107	122
1.83	13.67	304	60	75
1.83	15.50	233	43	58
3.50	19.00	354	59	87
5.00	24.00	87	29	23

Table 4-3.8

10-year existing condition discretized hydrographs for Paradise Wash

Time, in hours		10T	10T-11T	11T-12T
Incremental	Accumulative	cfs	cfs	cfs
(1)	(2)	(3)	(4)	(5)
6.00	6.00	0	0	0
0.33	6.33	0	0	0
0.50	6.83	0	0	0
0.50	7.33	10	10	0
0.33	7.67	104	98	6
0.33	8.00	209	100	67
0.50	8.50	514	38	10
0.50	9.00	1068	102	424
0.67	9.67	625	86	189
0.67	10.33	312	73	93
0.67	11.00	179	48	50
0.83	11.83	114	32	31
1.83	13.67	74	17	18
1.83	15.50	56	12	14
3.50	19.00	82	14	20
5.00	24.00	23	9	6

Table 4-3.9

100-year future condition discretized hydrographs for Paradise Wash

Time, in hours		10T	10T-11T	11T-12T
Incremental	Accumulative	cfs	cfs	cfs
(1)	(2)	(3)	(4)	(5)
6.00	6.00	3	0	1
0.33	6.33	11	2	4
0.50	6.83	15	4	4
0.50	7.33	91	75	6
0.33	7.67	363	557	58
0.33	8.00	1,132	431	393
0.50	8.50	4,610	1,226	610
0.50	9.00	4,921	74	1,210
0.67	9.67	2,570	141	783
0.67	10.33	1,245	205	373
0.67	11.00	712	151	203
0.83	11.83	457	108	123
1.83	13.67	307	61	76
1.83	15.50	235	44	59
3.50	19.00	357	60	88
5.00	24.00	87	29	23

Table 4-3.10

10-year future condition discretized hydrographs for Paradise Wash

Time, in hours		10T	10T-11T	11T-12T
Incremental	Accumulative	cfs	cfs	cfs
(1)	(2)	(3)	(4)	(5)
6.00	6.00	0	0	0
0.33	6.33	0	0	0
0.50	6.83	0	0	0
0.50	7.33	10	10	0
0.33	7.67	110	104	6
0.33	8.00	222	105	72
0.50	8.50	545	38	19
0.50	9.00	1132	105	270
0.67	9.67	662	89	207
0.67	10.33	331	76	101
0.67	11.00	190	51	55
0.83	11.83	121	34	33
1.83	13.67	78	18	20
1.83	15.50	59	12	15
3.50	19.00	87	15	23
5.00	24.00	24	9	7

4-3.4 BOUNDARY CONDITIONS

In HEC-6 models, the water surface elevation is specified at the downstream limit at each hydrograph time step using one of two methods. The first method is a rating curve. That method is utilized for the three watercourses in the Apache Wash system. The rating curve is developed for each watercourse using the normal depth option in the HEC-RAS program. The rating curves are used as a boundary condition for each hydrologic condition (100-year and 10-year for both existing and future watershed conditions).

The second method involves computing a water surface elevation at the most downstream cross section corresponding to discharges in the discretized hydrograph. This method can also be used in combination with the rating curve to set water surface elevations at specific flow elements. This combined approach is used for the Cave Creek analysis to account for backwater conditions due to ponding at Cave Buttes Dam.

The rating curve for the combined approach is developed in the same manner for Cave Creek and the Apache Wash system. Development of the rating curves is generally described as follows: The ponded water surface elevations at the dam are developed from a reservoir routing analysis using the HEC-1 program. The analysis is performed for each hydrologic condition using the total inflow hydrograph and the stage-storage-discharge relations for the dam. The stage-storage-discharge relations are taken from the 1976 COE report entitled Gila River, New River and Phoenix City Streams, Arizona Design Memorandum No. 3, General Design Memorandum – Phase II Project Design Part I. For the purposes of this analysis, the effects of the Cave Creek Dam, located immediately upstream of the Cave Buttes Dam are neglected. The total inflow hydrograph consists of the Cave Creek and Apache Wash runoff hydrographs plus runoff intercepted by the east Cave Buttes Dam dike. This additional drainage area encompasses approximately 17 square miles and is located directly south of the Cave Creek study watershed boundary and east of Cave Buttes Dam. Figure 4-3.7 shows the location of this area in relation the overall study limits. Although this area is not included as part of the study area, the inclusion of this area is necessary for the ponding analysis and thus the sediment analyses. A watershed model is therefore developed for this area

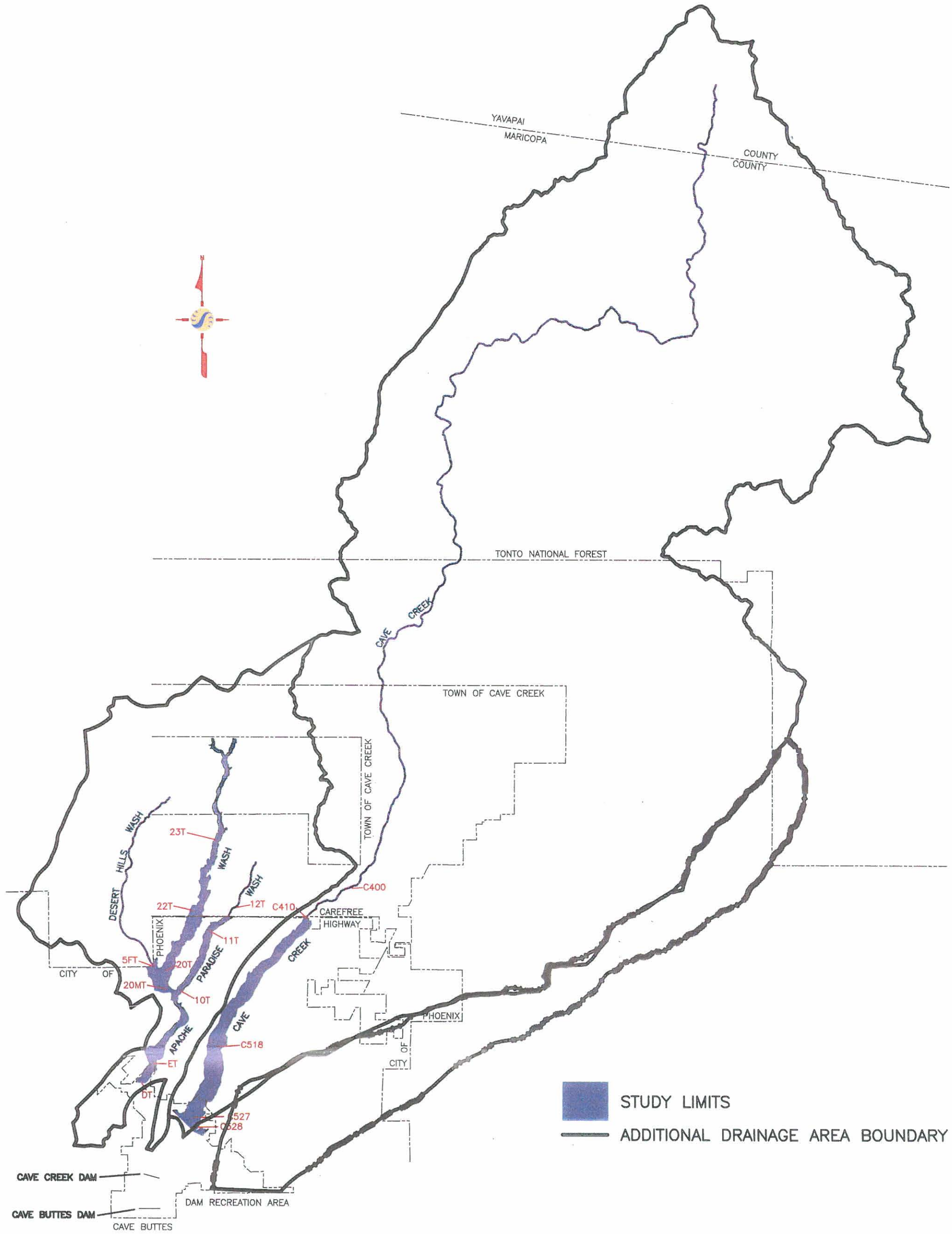


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Figure 4–3.7
Cave Creek and Apache Wash
Watercourse Master Plan
Cave Buttes Dam Watershed

for the 100- and 10-year events for both the existing and future watershed conditions. A detailed discussion of the methodology for the determination of the watershed model input data as well as a summary of that data is provided in Appendix C. The resulting pool water surface elevations above the minimum channel elevation of the most downstream cross section are compared with normal depth water surface elevations at each discrete discharge value. The pool and normal depth water surface elevations are compared for each hydrologic condition and shown in Tables 4-3.11 through 4-3.14. For the discharge values where the pool elevation is higher than the normal depth elevation, the pool elevation is coded into the model using the R record at that discharge value.

TABLE 4-3.11

Starting water surface elevations for 100-year existing conditions Cave Creek sediment transport modeling

Time hours (1)	Discharge[a] cfs (2)	Water Surface Elevation Channel[b] feet (3)	Water Surface Elevation Pool feet (4)	Controlling WSEL feet (5)
0.00	0	1623.9	N/A	1623.9
10.92	87	1624.9	N/A	1624.9
11.92	446	1625.8	N/A	1625.8
12.17	608	1626.1	N/A	1626.1
12.42	1006	1626.7	N/A	1626.7
12.67	1969	1627.9	N/A	1627.9
12.92	2824	1626.8	N/A	1626.8
13.17	3842	1627.3	N/A	1627.3
13.42	7705	1628.4	N/A	1628.4
13.67	18133	1630.4	N/A	1630.4
13.92	30296	1631.7	N/A	1631.7
14.17	36586	1632.3	N/A	1632.3
14.42	37995	1632.4	1624.7	1632.4
14.67	37252	1632.3	1626.6	1632.3
14.92	35585	1632.1	1628.2	1632.1
15.17	33288	1631.9	1629.6	1631.9
15.92	27701	1631.4	1631.7	1631.7[c]
16.92	18479	1630.4	1634.4	1634.4
17.92	11129	1629.1	1636.0	1636.0
19.92	5648	1628.1	1637.2	1637.2
24.00	1706	1627.6	1638.8	1638.8
24.08	161	1625.1	1638.8	1638.8
24.13	1	1624.1	1638.8	1638.8

Notes

a: Discretized Cave Creek inflow hydrograph at C528
b: taken from hydraulic model at RM 24.525
c: Point at which the pool elevation is greater than the channel elevation.

TABLE 4-3.12

Starting water surface elevations for 10-year existing conditions Cave Creek sediment transport modeling

Time hours (1)	Discharge[a] cfs (2)	Water Surface Elevation Channel[b] feet (3)	Water Surface Elevation Pool feet (4)	Controlling WSEL feet (5)
0.00	0	1623.9	N/A	1623.9
10.92	35	1624.6	N/A	1624.6
11.92	210	1625.2	N/A	1625.2
12.17	321	1625.5	N/A	1625.5
12.42	600	1626.1	N/A	1626.1
12.67	1303	1627.1	N/A	1627.1
12.92	2087	1628.0	N/A	1628.0
13.17	2489	1626.6	N/A	1626.6
13.42	3376	1627.1	N/A	1627.1
13.67	5924	1628.1	N/A	1628.1
13.92	10852	1629.1	N/A	1629.1
14.17	15497	1629.9	N/A	1629.9
14.42	17731	1630.3	N/A	1630.3
14.67	17953	1630.3	N/A	1630.3
14.92	17179	1630.1	N/A	1630.1
15.17	16164	1630.0	N/A	1630.0
15.92	14296	1629.8	N/A	1629.8
16.92	11412	1629.2	N/A	1629.2
17.92	7756	1628.4	N/A	1628.4
19.92	4153	1627.5	1624.7	1627.5
24.00	1151	1626.9	1625.7	1626.9
24.08	110	1624.9	1625.7	1625.7[c]

Notes

a: Discretized Cave Creek inflow hydrograph at C528
b: taken from hydraulic model at RM 24.525
c: Point at which the pool elevation is greater than the channel elevation.

TABLE 4-3.13

Starting water surface elevations for 100-year future conditions Cave Creek sediment transport modeling

Time hours (1)	Discharge[a] cfs (2)	Water Surface Elevation Channel[b] feet (3)	Water Surface Elevation Pool feet (4)	Controlling WSEL feet (5)
0.00	0	1623.9	N/A	1623.9
10.92	258	1625.4	N/A	1625.4
11.92	1036	1626.8	N/A	1626.8
12.17	1823	1627.7	N/A	1627.7
12.42	2829	1626.8	N/A	1626.8
12.67	3820	1627.3	N/A	1627.3
12.92	5119	1628.0	N/A	1628.0
13.17	9327	1628.8	N/A	1628.8
13.42	19790	1630.6	N/A	1630.6
13.67	32471	1631.9	N/A	1631.9
13.92	39534	1632.5	N/A	1632.5
14.17	41252	1632.6	1624.6	1632.6
14.42	40388	1632.6	1626.5	1632.6
14.67	38186	1632.4	1628.4	1632.4
14.92	35366	1632.1	1630.1	1632.1
15.17	32226	1631.9	1631.5	1631.9
15.92	26075	1631.3	1633.7	1633.7[c]
16.92	17337	1630.2	1636.1	1636.1
17.92	10616	1629.0	1637.7	1637.7
19.92	5570	1628.1	1638.9	1638.9
24.00	1867	1627.8	1640.2	1640.2
24.08	203	1625.2	1640.2	1640.2
24.13	1	1624.1	1640.2	1640.2

Notes

a: Discretized Cave Creek inflow hydrograph at C528
b: taken from hydraulic model at RM 24.525
c: Point at which the pool elevation is greater than the channel elevation.

TABLE 4-3.14

Starting water surface elevations for 10-year future conditions
Cave Creek sediment transport modeling

Time hours (1)	Discharge[a] cfs (2)	Water Surface Elevation Channel[b] feet (3)	Pool feet (4)	Controlling WSEL feet (5)
0.00	0	1623.9	N/A	1623.9
10.92	132	1625.0	N/A	1625.0
11.92	565	1626.0	N/A	1626.0
12.17	877	1626.5	N/A	1626.5
12.42	1549	1627.4	N/A	1627.4
12.67	2433	1626.6	N/A	1626.6
12.92	2981	1626.9	N/A	1626.9
13.17	3738	1627.3	N/A	1627.3
13.42	5453	1628.1	N/A	1628.1
13.67	9653	1628.8	N/A	1628.8
13.92	15146	1629.9	N/A	1629.9
14.17	19300	1630.5	N/A	1630.5
14.42	20690	1630.7	N/A	1630.7
14.67	20271	1630.6	N/A	1630.6
14.92	18894	1630.4	N/A	1630.4
15.17	17368	1630.2	N/A	1630.2
15.92	14946	1629.8	1624.0	1629.8
16.92	11812	1629.2	1625.8	1629.2
17.92	8078	1628.5	1627.4	1628.5
19.92	4375	1627.6	1628.6	1628.6[c]
24.00	1362	1627.2	1629.8	1629.8
24.08	147	1625.1	1629.8	1629.8

Notes

a: Discretized Cave Creek inflow hydrograph at C528
b: taken from hydraulic model at RM 24.525
c: Point at which the pool elevation is greater than the channel elevation.

4-3.5 ASSUMPTIONS AND LIMITATIONS

In general, single runoff event modeling in HEC-6 is not recommended.

1) Runoff input to HEC-6 at all tributary and local inflow locations must be at the same time increment.
2) All discrete steady state discharges can be conveyed from one cross section to the next in the specified time interval.
3) The source of the runoff input was developed for a specific purpose (100-year peak discharge estimation) using a specified design storm.
4) Starting water surface elevations that are based on normal depth hydraulics assume a stable reach with neither scour or fill.

4-4.0 EROSION AND SEDIMENTATION ANALYSIS

4-4.1 ANALYSIS TECHNIQUE

The erosion and sedimentation of watercourses within the study area was investigated by modeling the sediment transport through each watercourse under a variety of hydrologic and development conditions. The modeling was performed using the U.S. Army Corps of Engineers, HEC-6 model (1993). Input to the HEC-6 models was obtained from hydraulic models (HEC-2 and HEC-RAS) of the watercourses, field data collection regarding sediment characteristics, assumption regarding hydrologic and hydraulic conditions, and the selection of the appropriate sediment transport functions.

The models were verified by comparison of hydraulic results of the HEC-6 fixed bed models to the corresponding HEC-RAS models developed as part of this study. Sensitivity of model input was investigated to assess how critical various model input and assumptions are to model results. Calibration of the models cannot be performed since there is not an adequate database for such calibration. Erosion and sedimentation results are analyzed by evaluation of quantitative results and by the qualitative interpretation of graphical results from the various HEC-6 models.

4-4.2 HYDRAULIC AND GEOMETRIC DATA

4-4.2.1 Background

The base hydraulic and geometric data utilized in the sediment transport analysis for the project study reaches of the Cave Creek and Apache Wash system are taken from three existing floodplain delineation studies. Those studies are described in Section 4-2.3.

Water surface profiles models were developed for each of the floodplain delineation studies (FDS) using the U.S Army Corps of Engineers (COE) HEC-2 computer model. The study limits of the Cave Creek above Carefree Highway FDS, herein referred to as the GVSCE model, were from the Carefree Highway to Morningstar

Road in the Town of Cave Creek. The study limits of the Cave Creek below Carefree Highway FDS, herein referred to as the Willdan model, were from the northern boundary of the Cave Buttes Dam Recreation Area (river mile 24.525) to the Carefree Highway and the City of Phoenix corporate limits (river mile 29.71). The study limits of the Apache Wash FIS, herein referred to as the Jerry Jones model, were from the northern boundary of the Cave Buttes Dam Recreation Area to just upstream of the Town of Cave Creek corporate limits. The Jerry Jones study of Apache Wash also included two tributaries, Desert Hills Wash and Paradise Wash. Separate HEC-2 models were developed for both Desert Hills Wash and Paradise Wash.

4-4.2.2 Hydraulic Modeling Approach

For the purposes of this study the FDS models are converted to HEC-RAS models to be updated for current conditions and modified as necessary to meet the needs of this study. The final HEC-RAS models are then converted to a format compatible for HEC-6 modeling. The process for these conversions is summarized below and described in detail in the following sections.

1) Convert the FDS HEC-2 models to HEC-RAS format.
2) Update the HEC-RAS model to reflected current conditions.
3) Compare the FDS HEC-2 model results to the updated HEC-RAS model results.
4) Modify the HEC-RAS model to meet the needs of this study.
5) Compare the updated HEC-RAS model with the modified HEC-RAS model.
6) Convert the modified HEC-RAS model to a format compatible for HEC-6 modeling.
7) Compare the modified HEC-RAS model results to the HEC-6 fixed bed model results.

4-4.2.3 Model Conversion, Update and Verification

For the purposes of this study, the two Cave Creek HEC-2 models are combined into a single HEC-2 model and converted to the HEC-RAS computer model. This combined model is truncated at the first flow change location upstream of the study limits. The portion of the model upstream of the study limits is included for model stability. Similarly, the three HEC-2 models of the Jerry Jones study (one model each for Apache, Desert Hills and Paradise Washes) are combined into a single HEC-2 model, converted to HEC-RAS and truncated at the first upstream flow change from the study limits. These combined HEC-RAS models are also updated to reflect the current conditions along the watercourses.

Since the completion of the original studies, there are only two changes in the hydraulic conditions along the watercourses. The first change is the expansion of the Wheeler gravel mine, which is located near the downstream limits of Cave Creek. Although the gravel mining operations have significantly changed the hydraulic conditions at this location, these changes are not incorporated into the base model. The impact from the gravel mining operation is not incorporated into that model primarily because the gravel mine is in a constant state of change and current mapping is unavailable. The Wheeler gravel mining operation and the reclamation of that mine are considered with the alternatives for the watercourse master plan. The second change in hydraulic conditions is the addition of two traffic lanes to Carefree Highway, in particular the addition of a second bridge at Cave Creek and the extension of a culvert crossing at Apache Wash. The hydraulic parameters for both the bridge and the culvert are obtained from the Carefree Highway design plans. Several problems were encountered while developing the new bridge data. First, a correlation between the Cave Creek FDS elevation datum and the bridge plans could not be established. The bridge elevation datum is therefore assumed to be the same as the FDS. Second, elevations shown on the bridge plan and profile sheet do not match elevations shown on various bridge details. This is resolved by adjusting the plan and profile elevations by the bridge deck dimensions to calculate the high and low chords. Finally, the new bridge piers are at a different skew than the existing (upstream) bridge piers. The design plans do not agree with the construction in this

regard. To account for the unaligned pier skew, a larger pier drag coefficient is used than what is commonly recommended.

At both the Cave Creek and Apache Wash crossings, the additional lanes of the Carefree Highway are on the downstream side of the existing lanes. Therefore the downstream cross section for both the bridge and culvert are revised. These new cross sections are a combination of proposed grading of the channel banks and bed and the existing contours of the channel overbanks. For Cave Creek, the existing downstream cross section (river mile 29.71) is adjusted to reflect the proposed condition. For Apache Wash, the existing downstream cross section (river mile 4.57) is deleted and the next downstream cross section (river mile 4.56) is adjusted to reflect the proposed condition.

In order to verify that the updated HEC-RAS models are performing similarly to the original FDS models, the water surface elevations at each cross section are compared. The water surface elevation comparison for Cave Creek, Apache Wash, Desert Hills Wash and Paradise Wash is provided in Tables 4-4.1 through 4-4.4, respectively. In general, the water surface elevation differential (difference between the original model and the HEC-RAS model) for Cave Creek is less that 0.5 feet with a maximum difference of 1.19 feet at river mile 29.72, which is immediately upstream of the bridge. For Apache Wash and tributaries the water surface elevation differential is in general less than 0.5 feet with a maximum difference of 2.88 feet at river mile 1.18 of Apache Wash. The maximum water surface differential is most likely due to a significant decrease in flow area at river mile 1.18 compared to the flow area of the downstream cross section (river mile 1.09). There are only relatively small differences between the HEC-6 model hydraulic results and the original HEC-2 model results for Desert Hills Wash and Paradise Wash. Some difference in results is attributed to the computational difference between HEC-6 and HEC-2. These results are considered to be reasonable, particularly in regard to the computational differences between HEC-2 and HEC-RAS.

Table 4-4.1
Comparison of HEC-RAS and HEC-2 model results for Cave Creek (100-year, existing conditions)

River Mile (1)	Water Surface Elevation, feet HEC-2 (2)	HEC-RAS (3)	Difference (4)
31.910	1966.97	1966.96	0.01
31.870	1965.46	1965.43	0.03
31.820	1962.36	1962.31	0.05
31.750	1958.04	1958.16	-0.12
31.630	1952.33	1952.28	0.05
31.540	1948.32	1948.39	-0.07
31.450	1944.77	1944.79	-0.02
31.340	1940.00	1939.91	0.09
31.250	1934.91	1935.02	-0.11
31.170	1931.33	1931.34	-0.01
31.140	1929.48	1929.44	0.04
31.050	1925.38	1925.45	-0.07
30.960	1922.04	1921.96	0.08
30.850	1917.16	1917.31	-0.15
30.750	1913.90	1913.83	0.07
30.650	1909.79	1909.80	-0.01
30.520	1902.23	1902.20	0.03
30.420	1897.40	1897.33	0.07
30.280	1891.54	1891.62	-0.08
30.200	1885.68	1885.55	0.13
30.100	1880.24	1880.25	-0.01
29.850	1871.83	1871.82	0.01
29.770	1867.55	1868.36	-0.81
29.720	1866.16	1867.35	-1.19
29.710	1865.57	1865.50	0.07
29.663	1864.50	1864.38	0.12
29.601	1859.72	1859.85	-0.13
29.538	1854.96	1855.00	-0.04
29.493	1852.27	1852.91	-0.64
29.387	1849.60	1849.61	-0.01
29.351	1848.75	1848.80	-0.05
29.258	1842.95	1842.59	0.36
29.130	1836.92	1837.34	-0.42
29.012	1832.94	1832.98	-0.04
28.934	1829.45	1829.49	-0.04
28.847	1825.53	1825.52	0.01
28.750	1822.94	1822.93	0.01
28.657	1819.95	1819.89	0.06
28.555	1814.02	1814.13	-0.11
28.462	1810.03	1810.15	-0.12
28.390	1807.39	1807.21	0.18
28.326	1803.41	1803.94	-0.53
28.241	1799.07	1799.11	-0.04
28.157	1794.06	1794.11	-0.05
28.091	1790.41	1790.54	-0.13
28.023	1787.52	1787.35	0.17
27.913	1783.23	1783.54	-0.31

River Mile (1)	Water Surface Elevation, feet HEC-2 (2)	HEC-RAS (3)	Difference (4)
27.797	1779.81	1779.37	0.44
27.693	1774.29	1775.19	-0.90
27.604	1768.51	1768.46	0.05
27.502	1764.57	1764.39	0.18
27.417	1757.21	1757.52	-0.31
27.366	1755.30	1755.30	0.00
27.320	1752.39	1752.37	0.02
27.265	1749.27	1749.27	0.00
27.226	1743.08	1743.36	-0.28
27.169	1741.54	1741.42	0.12
27.106	1738.47	1738.74	-0.27
27.008	1734.50	1734.46	0.04
26.921	1731.00	1731.13	-0.13
26.845	1727.72	1727.74	-0.02
26.775	1723.99	1723.98	0.01
26.695	1720.60	1720.67	-0.07
26.623	1716.40	1716.40	0.00
26.529	1711.54	1711.52	0.02
26.430	1707.78	1707.80	-0.02
26.335	1705.64	1705.42	0.22
26.239	1701.16	1701.54	-0.38
26.137	1698.90	1698.79	0.11
26.044	1695.28	1695.38	-0.10
25.919	1689.02	1689.05	-0.03
25.843	1685.95	1685.97	-0.02
25.750	1684.90	1684.91	-0.01
25.699	1682.46	1682.57	-0.11
25.644	1678.52	1678.48	0.04
25.580	1676.35	1676.34	0.01
25.519	1674.75	1674.72	0.03
25.458	1673.33	1673.22	0.11
25.388	1669.17	1669.29	-0.12
25.326	1665.34	1665.26	0.08
25.233	1661.80	1661.83	-0.03
25.180	1659.91	1659.89	0.02
25.099	1656.67	1656.69	-0.02
25.010	1650.88	1650.85	0.03
24.919	1648.73	1648.67	0.06
24.845	1645.92	1645.98	-0.06
24.752	1639.89	1639.84	0.05
24.646	1636.13	1636.38	-0.25
24.525	1633.13	1633.13	0.00
		Maximum	0.44
		Minimum	-1.19
		Average	-0.06

Table 4-4.2
Comparison of HEC-RAS and HEC-2 model results for Apache Wash (100-year, existing conditions)

River Mile (1)	Water Surface Elevation, feet HEC-2 (2)	HEC-RAS (3)	Difference (4)
	Apache Wash		
8.020	1992.24	1992.58	-0.34
7.980	1989.73	1989.82	-0.09
7.890	1984.83	1984.96	-0.13
7.840	1981.96	1982.05	-0.09
7.740	1975.24	1975.29	-0.05
7.650	1969.66	1969.73	-0.07
7.550	1964.00	1964.12	-0.12
7.460	1959.04	1959.07	-0.03
7.360	1951.97	1952.08	-0.11
7.280	1948.95	1949.00	-0.05
7.170	1943.79	1943.95	-0.16
7.080	1937.93	1937.86	0.07
6.980	1933.26	1933.57	-0.31
6.900	1928.18	1928.27	-0.09
6.800	1923.29	1923.45	-0.16
6.710	1919.00	1919.13	-0.13
6.630	1914.12	1914.42	-0.30
6.580	1910.89	1911.03	-0.14
6.500	1906.05	1906.16	-0.11
6.430	1903.42	1903.47	-0.05
6.320	1898.46	1898.73	-0.27
6.250	1895.03	1895.04	-0.01
6.160	1889.31	1889.40	-0.09
6.090	1885.51	1885.56	-0.05
6.010	1881.73	1881.80	-0.07
5.920	1876.34	1876.52	-0.18
5.830	1871.62	1871.62	0.00
5.760	1868.27	1868.46	-0.19
5.660	1862.29	1862.45	-0.16
5.640	1860.16	1860.22	-0.06
5.570	1857.88	1857.85	0.03
5.480	1853.30	1853.46	-0.16
5.380	1848.85	1848.97	-0.12
5.310	1845.53	1845.62	-0.09
5.210	1840.74	1840.84	-0.10
5.150	1837.47	1837.57	-0.10
5.090	1834.36	1834.45	-0.09
5.030	1831.43	1831.56	-0.13
4.960	1827.78	1827.85	-0.07
4.900	1824.49	1824.72	-0.23
4.820	1822.32	1822.28	0.04
4.780	1817.31	1817.81	-0.50
4.740	1816.55	1816.59	-0.04
4.650	1810.17	1810.32	-0.15
4.600	1809.14	1809.94	-0.80
4.580	1809.02	1809.88	-0.86
4.560	1806.08	1806.26	-0.18
4.490	1803.25	1803.44	-0.19
4.400	1800.58	1800.82	-0.24
4.310	1796.08	1796.26	-0.18
4.230	1792.66	1792.77	-0.11
4.220	1791.94	1792.06	-0.12
4.110	1788.38	1788.56	-0.18

River Mile (1)	Water Surface Elevation, feet HEC-2 (2)	HEC-RAS (3)	Difference (4)
	Apache Wash - continued		
4.050	1786.02	1786.52	-0.50
3.960	1782.42	1782.52	-0.10
3.860	1778.23	1778.48	-0.25
3.780	1774.46	1774.67	-0.21
3.750	1773.02	1773.10	-0.08
3.650	1769.78	1769.94	-0.16
3.600	1768.44	1768.70	-0.26
3.520	1765.07	1765.29	-0.22
3.480	1763.34	1763.56	-0.22
3.400	1759.99	1760.15	-0.16
3.320	1756.42	1756.47	-0.05
3.210	1752.32	1752.36	-0.04
3.130	1750.48	1750.54	-0.06
3.070	1749.40	1749.46	-0.06
2.970	1744.91	1744.93	-0.02
2.920	1743.23	1743.23	0.00
2.900	1742.63	1742.82	-0.19
2.870	1742.40	1742.60	-0.20
2.820	1741.74	1741.98	-0.24
2.730	1738.95	1739.36	-0.41
2.600	1735.66	1735.86	-0.20
2.520	1734.29	1734.50	-0.21
2.470	1733.38	1733.60	-0.22
2.400	1731.18	1731.42	-0.24
2.330	1727.98	1728.12	-0.14
2.240	1724.34	1724.49	-0.15
2.170	1721.61	1721.87	-0.26
2.080	1717.94	1718.26	-0.32
2.000	1715.00	1715.20	-0.20
1.880	1712.76	1712.91	-0.15
1.850	1711.91	1712.10	-0.19
1.810	1711.15	1711.37	-0.22
1.750	1709.30	1709.53	-0.23
1.660	1706.48	1706.68	-0.20
1.600	1705.16	1705.27	-0.11
1.560	1703.88	1704.03	-0.15
1.470	1701.17	1701.26	-0.09
1.370	1697.50	1697.80	-0.30
1.270	1695.18	1695.28	-0.10
1.180	1691.48	1694.36	-2.88
1.090	1687.53	1686.40	1.13
0.990	1684.13	1684.48	-0.35
0.840	1679.29	1679.61	-0.32
0.750	1676.96	1677.21	-0.25
0.710	1675.34	1675.58	-0.24
0.630	1672.90	1673.21	-0.31
0.540	1669.04	1669.23	-0.19
0.430	1665.53	1665.71	-0.18
0.330	1662.78	1663.09	-0.31
0.200	1659.64	1660.00	-0.36
		Maximum	1.13
		Minimum	-2.88
		Average	-0.19

Table 4-4.3
Comparison of HEC-RAS and HEC-2 model results for Desert Hills Wash (100-year, existing conditions)

River Mile (1)	Water Surface Elevation, feet HEC-2 (2)	HEC-RAS (3)	Difference (4)
0.990	1757.75	1757.96	-0.21
0.900	1755.88	1756.07	-0.19
0.810	1753.58	1753.78	-0.20
0.720	1751.29	1751.47	-0.18
0.640	1749.71	1749.92	-0.21
0.560	1748.52	1748.68	-0.16
0.480	1747.54	1747.63	-0.09
0.400	1746.40	1746.27	0.13
0.310	1744.47	1744.16	0.31
0.220	1743.20	1743.22	-0.02
		Maximum	0.31
		Minimum	-0.21
		Average	-0.08

Table 4-4.4
Comparison of HEC-RAS and HEC-2 model results for Paradise Wash (100-year, existing conditions)

River Mile (1)	Water Surface Elevation, feet HEC-2 (2)	HEC-RAS (3)	Difference (4)
2.230	1832.36	1832.54	-0.18
2.140	1827.19	1827.09	0.10
2.070	1823.72	1823.94	-0.22
2.000	1820.01	1819.88	0.13
1.920	1815.40	1815.30	0.10
1.830	1810.73	1810.91	-0.18
1.750	1805.54	1805.38	0.16
1.650	1799.99	1799.63	0.36
1.540	1794.76	1794.79	-0.03
1.460	1791.96	1792.20	-0.24
1.370	1789.38	1789.61	-0.23
1.270	1785.12	1785.20	-0.08
1.210	1782.91	1782.97	-0.06
1.120	1778.39	1778.58	-0.19
1.040	1776.25	1776.36	-0.11
0.950	1773.44	1773.48	-0.04
0.890	1771.64	1771.70	-0.06
0.800	1766.71	1766.76	-0.05
0.720	1762.97	1763.04	-0.07
0.620	1759.57	1759.67	-0.10
0.530	1755.75	1755.85	-0.10
0.440	1751.49	1751.58	-0.09
0.340	1748.28	1748.34	-0.06
0.280	1743.70	1743.72	-0.02
0.170	1739.30	1739.33	-0.03
0.130	1737.91	1737.98	-0.07
0.040	1737.04	1737.06	-0.02
		Maximum	0.36
		Minimum	-0.24
		Average	-0.05

4-4.2.4 Model Modifications

Sediment transport modeling is performed for both the 100- and 10-year hydrologic events and for both existing and future hydrologic conditions, respectively. Sediment modeling is accomplished using the HEC-6 computer program. The converted HEC-RAS models from the floodplain delineation studies are modified for sediment modeling such that the hydraulic parameters are representative of both 100- and 10-year flow conditions. In addition, HEC-6 does not have the full range of hydraulic computational options as HEC-2 and HEC-RAS, in particular the horizontal variation of roughness. Therefore, the converted models are also modified so that the hydraulic parameters are compatible with HEC-6. A detailed discussion of the methodology for the modifications is provided in Appendix D. The following is a list of hydraulic and geometric properties that are modified:

- Channel bank stations are adjusted based on concepts of bank full discharge.
- Horizontal variations in roughness values are eliminated.
- River sub-reaches are identified and a single set of Manning's n-values are used for each sub-reach that are appropriate for the full range of modeling discharges.
- Channel geometry well in excess of the 100-year flood elevation is eliminated.
- Minor ineffective channels or localized depressions are eliminated.
- Levees and ineffective flow areas are added where it is necessary to restrict flows, particularly the low flows in the main channel.

For the Apache Wash system, some additional changes are made. The first is a change in the contraction/expansion coefficients throughout the model. In the Jerry Jones study, contraction/expansion coefficients are set at values higher than what is commonly recommended or expected. Therefore, contraction/expansion coefficients of 0.1 and 0.3 are used for all cross sections except at the culvert and at areas of rapid contraction or expansion of the floodplain.

The second change is the treatment of the flow split at the Carefree Highway culvert crossing of Apache Wash. Apache Wash cannot convey the 100-year flow at this location and the culvert is not sized to convey the 100-year flow. Flow in excess of the conveyance capacity

breaks out over the right (western) bank. The Jerry Jones study estimated that 1,250 cfs breaks out of Apache Wash upstream of the culvert and that a small parallel channel intercepts the breakout flow. That parallel channel, identified in the model as the west channel, is tributary to Apache Wash at approximately river mile 3.96. However, the additional lanes of the Carefree Highway are separated at this location by a median. This median will divert the flow to the west where it will eventually be intercepted by other tributaries. Under existing conditions, all the flow is eventually returned to Apache Wash. Furthermore, in discussions with the Flood Control District, it is anticipated that a larger culvert will be installed at that location to convey the 100-year discharge. That assumption is partially based on the fact that the parcel of land south of the Carefree Highway at that location, which is subject to breakout flooding, is zoned commercial and future development of that land will dictate an improved culvert crossing. Therefore, all the flow in Apache Wash is assumed to be conveyed by the culvert.

The third change is at the confluence of Desert Hills Wash with Apache Wash. Neither Apache Wash nor Desert Hills Wash can convey the 100-year flow near their confluence. The resulting inundated area extends for approximately 0.4 miles upstream of the confluence. The Jerry Jones study accounted for this condition by using the side flow weir option of HEC-2 to estimate the breakout flow from Apache Wash to Desert Hills Wash. This flow is added to Desert Hills Wash and the cross sectional geometry of the two most downstream stations of Desert Hills Wash include the Apache Wash geometry. For this study, the analysis of the confluence is simplified by moving the confluence to a point just upstream of the inundation limits and combining the cross sectional geometry of Apache and Desert Hills Washes. In addition, cross sectional alignments are revised to be more perpendicular to the direction of flow. For the 10-year flow, both Apache Wash and Desert Hills Wash have the necessary capacity. Therefore, a separate geometry file is used for the 10-year flows in the HEC-RAS model. With the junction of Desert Hills and Apache Wash in the 10-year HEC-RAS model at the confluence, only one cross section, river mile 2.70, is left to define the Apache Wash reach between the confluence with Desert Hills Wash and Paradise Wash.

Because HEC-RAS requires that a reach must be defined by a minimum of three cross sections, two cross sections are added to the 10-year model, river mile 2.70 and 2.67. Geometry of these new cross sections is taken from the 1 inch equals 200 feet, 2-foot CI mapping prepared as part of the original study. Figures E-1 and E-2 of Appendix E, show the new and revised cross sectional alignments for the 100- and 10-year models, respectively.

The results of the modified HEC-RAS models are compared with the converted HEC-RAS model to verify that there are no significant changes in the hydraulic conditions. Table 4-4.5 is a comparison of channel velocity and hydraulic depth at each cross section for Cave Creek for the 100-year, existing condition peak flows. In general, the channel velocities for the modified model vary (either increased or decreased) by less than 2 fps and the hydraulic depths vary by less than 1 foot. The maximum velocity change is an increase of 9 fps at river mile 24.646 and the maximum hydraulic depth change is a decrease of 2.2 feet at river mile 27.913. The maximum channel velocity change at river mile 24.646 is due to a significant reduction in Manning's n-values and the addition of a large ineffective flow area in the left overbank. The maximum change in hydraulic depth at river mile 27.913 is due to a significant reduction in Manning's n-values. This reduction in n-values results in a lower water surface elevation such that all the flow is contained in the main channel, therefore the top width is decreased significantly. The large decrease in top width compared to the relatively small change in flow area results in a large increase in hydraulic depth. Based on these results, the modifications to the converted model are considered to be acceptable. The modified model is therefore used as the base model for the sediment transport analysis.

Tables 4-4.6 through 4-4.8 are a comparison of channel velocity and hydraulic depth at each cross section for Apache Wash, Desert Hills Wash and Paradise Wash, respectively, for the 100-year, existing condition peak flows. In general, the channel velocities for the modified model vary (either increased or decreased) by less than 5 fps and the hydraulic depths vary by less than 1 foot. The maximum velocity change is a decrease of 11.3 fps at river mile 1.09 of Apache Wash and the maximum change in hydraulic depth is a decrease of 2.2 feet river mile 2.47 of Apache Wash. The maximum channel velocity change at river mile 1.09 of Apache Wash is due to an altered hydraulic condition caused by a reduction in Manning's n-values and therefore a reduction in water surface elevation. A similar altered hydraulic condition at river mile 0.84 of Apache Wash results in a reduction in channel velocity at river mile 1.09 of Apache Wash.

The maximum change in hydraulic depth at river mile 2.47 is a result in a reduction in the water surface elevation due to reduction in Manning's n-values. At this location the lower water surface elevation results in a significant change in the top width compared to the decrease in flow area, therefore the hydraulic depth is reduced. The modified model is therefore accepted as the base model for the sediment transport analysis. Additional tables comparing Manning's n-values, bank stations and other hydraulic parameters for both Cave Creek and the Apache Wash system are provided in Appendix E.

Table 4-4.5
Comparison of HEC-RAS and modified HEC-RAS hydraulic results for Cave Creek

River Station (1)	Channel Velocity, fps FDS (2)	WMP (3)	Difference (4)	Hydraulic Depth, feet FDS (5)	WMP (6)	Difference (7)
31.910	15.6	9.1	6.5	7.2	9.5	-2.3
31.870	12.6	16.5	-3.9	6.4	6.8	-0.4
31.820	14.0	12.8	1.2	4.4	4.9	-0.6
31.750	13.0	14.4	-1.5	3.9	3.8	0.1
31.630	11.8	12.6	-0.8	4.9	4.8	0.1
31.540	10.7	11.8	-1.1	4.0	3.8	0.2
31.450	9.3	11.7	-2.4	4.4	4.4	0.0
31.340	9.9	10.9	-1.0	4.8	5.1	-0.3
31.250	11.5	12.6	-1.1	3.5	4.6	-1.0
31.170	10.8	10.4	0.4	4.3	4.5	-0.2
31.140	14.9	12.3	2.6	3.6	3.8	-0.2
31.050	11.2	10.9	0.3	4.1	4.2	-0.1
30.960	10.1	9.2	0.9	4.9	5.2	-0.3
30.850	11.6	12.9	-1.3	4.7	4.8	-0.1
30.750	10.1	9.4	0.7	6.7	6.8	0.0
30.650	15.0	14.7	0.3	4.5	4.9	-0.4
30.520	14.2	10.9	3.3	3.5	3.4	0.1
30.420	9.4	8.5	1.0	5.1	5.0	0.1
30.280	14.4	13.5	0.9	4.4	4.7	-0.4
30.200	13.0	12.8	0.3	3.6	3.8	-0.3
30.100	11.4	11.5	0.0	4.2	4.3	0.0
29.850	17.3	15.9	1.4	5.9	5.9	-0.1
29.770	13.0	13.5	-0.5	9.6	9.2	0.4
29.720	12.5	12.4	0.1	9.8	9.7	0.0
29.715		Bridge			Bridge	
29.710	12.0	14.2	-2.1	9.1	7.9	1.1
29.663	8.0	11.3	-3.4	4.9	3.9	0.9
29.601	10.2	12.8	-2.6	4.3	4.1	0.2
29.538	11.4	11.0	0.4	4.0	4.1	-0.1
29.493	7.8	8.4	-0.6	4.7	4.6	0.1
29.387	6.4	7.5	-1.0	6.2	6.1	0.2
29.351	6.7	8.1	-1.4	7.2	7.4	-0.2
29.258	14.2	13.5	0.7	8.2	9.8	-1.7
29.130	11.7	15.8	-4.1	4.3	6.0	-1.7
29.012	14.0	14.2	-0.2	4.1	4.8	-0.7
28.934	9.0	13.6	-4.5	3.8	4.1	-0.3
28.847	12.1	13.9	-1.8	4.3	4.6	-0.3
28.750	8.8	14.2	-5.5	5.6	4.0	1.6
28.657	6.9	13.7	-6.8	7.0	4.7	2.4
28.555	13.6	14.2	-0.6	4.3	4.6	-0.3
28.462	10.5	13.9	-3.4	4.9	4.4	0.5
28.390	7.0	13.8	-6.8	5.2	4.7	0.5
28.326	10.0	13.3	-3.3	4.2	4.1	0.1
28.241	13.0	11.8	1.2	3.8	3.7	0.1
28.157	14.5	10.8	3.8	3.7	3.7	0.1
28.091	13.1	11.0	2.1	4.2	4.3	0.0

Table 4-4.5 (Cont.)
Comparison of HEC-RAS and modified HEC-RAS hydraulic results for Cave Creek

River Station	Channel Velocity, fps			Hydraulic Depth, feet		
	FDS	WMP	Difference	FDS	WMP	Difference
(1)	(2)	(3)	(4)	(5)	(6)	(7)
28.023	9.6	10.1	-0.5	4.0	4.1	-0.1
27.913	9.8	15.3	-5.5	3.7	8.4	-4.7
27.797	11.6	13.1	-1.5	3.8	3.6	0.2
27.693	9.8	14.1	-4.3	4.0	3.9	0.1
27.604	12.1	13.9	-1.8	5.6	5.7	-0.1
27.502	12.7	13.3	-0.6	3.9	4.3	-0.4
27.417	13.6	13.6	0.0	4.7	4.7	0.0
27.366	7.0	7.3	-0.3	5.2	5.3	-0.1
27.320	14.4	17.0	-2.6	3.5	3.2	0.3
27.265	11.5	12.2	-0.8	4.1	4.1	0.0
27.226	12.1	11.8	0.4	4.7	4.8	-0.1
27.169	9.6	9.2	0.4	5.7	5.7	-0.1
27.106	10.4	12.1	-1.7	4.9	4.7	0.3
27.008	8.6	10.0	-1.3	5.6	6.6	-1.0
26.921	10.0	10.0	0.0	5.9	6.0	-0.2
26.845	10.7	11.6	-0.9	4.7	4.8	-0.1
26.775	14.9	11.8	3.1	5.0	5.2	-0.2
26.695	13.7	14.3	-0.6	4.5	5.2	-0.7
26.623	8.1	8.8	-0.6	6.1	5.8	0.3
26.529	14.2	12.9	1.4	5.0	4.9	0.0
26.430	10.4	10.4	-0.1	4.9	5.1	-0.2
26.335	6.7	7.7	-1.0	4.4	4.1	0.3
26.239	8.9	9.1	-0.3	3.2	3.2	0.0
26.137	12.5	10.0	2.5	3.9	3.3	0.5
26.044	16.0	9.2	6.7	3.9	3.7	0.2
25.919	11.3	13.2	-1.9	2.8	3.3	-0.5
25.843	9.4	11.6	-2.2	3.1	3.5	-0.4
25.750	4.8	9.0	-4.2	4.5	4.6	0.0
25.699	13.7	13.0	0.7	4.5	3.8	0.7
25.644	12.6	13.3	-0.7	3.1	3.5	-0.3
25.580	6.0	10.5	-4.5	4.1	4.3	-0.2
25.519	9.0	8.8	0.2	4.6	4.1	0.5
25.458	4.5	8.0	-3.5	5.9	4.7	1.2
25.388	15.5	12.7	2.7	4.5	3.5	1.0
25.326	15.6	12.1	3.5	4.5	4.0	0.6
25.233	12.3	11.2	1.1	4.7	3.7	1.0
25.180	13.0	9.0	4.0	4.9	4.6	0.3
25.099	18.8	13.7	5.0	4.7	3.3	1.4
25.010	7.2	8.9	-1.7	5.2	4.6	0.6
24.919	9.5	8.9	0.6	5.0	5.0	0.0
24.845	9.9	13.7	-3.9	4.5	3.8	0.7
24.752	15.6	9.7	5.9	3.7	4.6	-0.8
24.646	4.0	13.0	-9.0	4.1	3.5	0.6
24.525	2.8	6.2	-3.4	6.0	4.6	1.4
		Maximum	6.7		Maximum	2.4
		Minimum	-9.0		Minimum	-4.7
		Average	-0.9		Average	0.1

Table 4-4.6
Comparison of HEC-RAS and modified HEC-RAS hydraulic results for Apache Wash

River Station	Channel Velocity, fps			Hydraulic Depth, feet		
	FDS	WMP	Difference	FDS	WMP	Difference
(1)	(2)	(3)	(4)	(5)	(6)	(7)
8.020	11.6	11.7	0.0	2.9	2.9	0.0
7.980	9.7	11.5	-1.8	3.4	2.5	0.8
7.890	10.5	11.4	-0.8	3.1	2.4	0.6
7.840	9.5	13.1	-3.6	4.0	3.1	0.9
7.740	11.4	12.7	-1.3	3.5	2.9	0.6
7.650	9.1	13.2	-4.1	4.4	3.2	1.2
7.550	10.5	13.1	-2.7	4.5	3.6	0.8
7.460	9.0	12.3	-3.2	4.3	3.3	0.9
7.360	11.4	11.8	-0.5	3.2	3.3	-0.1
7.280	5.7	8.3	-2.6	5.8	5.4	0.4
7.170	10.3	14.9	-4.6	5.5	5.0	0.4
7.080	12.0	14.0	-2.0	5.3	4.8	0.5
6.980	9.4	12.0	-2.6	3.7	3.1	0.5
6.900	12.5	11.3	1.2	2.8	2.9	-0.2
6.800	7.7	12.9	-5.2	4.0	3.3	0.7
6.710	9.9	12.8	-2.9	3.7	3.9	-0.2
6.630	11.7	13.2	-1.5	3.2	3.6	-0.5
6.580	9.7	12.1	-2.4	3.2	3.1	0.1
6.500	12.7	10.5	2.3	2.8	2.6	0.2
6.430	8.1	10.9	-2.9	3.5	2.8	0.7
6.320	10.5	11.9	-1.4	2.6	2.9	-0.4
6.250	7.5	10.6	-3.1	3.0	2.5	0.5
6.160	10.8	11.7	-0.9	2.6	2.9	-0.3
6.090	6.5	9.9	-3.3	3.0	2.3	0.7
6.010	9.8	10.8	-1.0	2.9	2.6	0.3
5.920	7.7	12.5	-4.8	2.5	2.3	0.2
5.830	9.8	11.5	-1.7	2.4	2.8	-0.4
5.760	7.8	11.3	-3.5	3.2	2.7	0.5
5.660	12.0	16.1	-4.1	1.9	2.5	-0.5
5.640	5.3	6.3	-0.9	3.0	2.8	0.2
5.570	9.5	12.2	-2.7	2.3	2.2	0.0
5.480	9.4	10.4	-1.0	2.0	2.1	-0.1
5.380	9.3	14.1	-4.8	2.1	2.6	-0.4
5.310	6.2	10.5	-4.4	1.7	1.7	0.0
5.210	8.2	11.3	-3.1	2.3	2.1	0.2
5.150	9.3	11.7	-2.5	2.5	2.5	0.0
5.090	6.0	9.4	-3.4	1.9	1.8	0.1
5.030	6.5	12.0	-5.5	1.9	1.7	0.2
4.960	6.2	8.9	-2.7	2.0	2.1	-0.2
4.900	5.9	15.1	-9.1	2.0	1.7	0.3
4.820	8.6	9.6	-1.0	2.3	2.1	0.2
4.780	4.8	9.2	-4.3	2.8	2.3	0.5
4.740	5.4	10.9	-5.5	2.3	1.9	0.4
4.650	8.7	10.3	-1.6	1.8	2.2	-0.4
4.600	3.3	6.2	-2.8	4.2	3.8	0.5
4.580	3.2	6.3	-3.1	4.0	3.6	0.4
4.575	0.0	0.0	0.0	0.0	0.0	0.0
4.560	10.0	5.9	4.0	5.5	4.9	0.6

Table 4-4.6, (Cont.)
Comparison of HEC-RAS and modified HEC-RAS hydraulic results for Apache Wash

River Station	Channel Velocity, fps			Hydraulic Depth, feet		
	FDS	WMP	Difference	FDS	WMP	Difference
(1)	(2)	(3)	(4)	(5)	(6)	(7)
4.490	8.2	11.6	-3.4	2.9	2.9	0.0
4.400	7.9	15.2	-7.3	3.6	3.4	0.2
4.310	11.3	12.5	-1.3	2.4	3.1	-0.7
4.230	6.7	12.1	-5.4	3.0	2.8	0.2
4.220	5.7	12.4	-6.7	3.0	2.5	0.4
4.110	11.3	10.7	0.6	2.6	2.7	-0.2
4.050	6.0	13.8	-7.8	3.8	3.4	0.4
3.960	7.5	9.0	-1.5	1.9	1.8	0.2
3.860	8.3	11.8	-3.5	2.6	2.4	0.2
3.780	9.1	12.9	-3.8	1.8	2.7	-1.0
3.750	9.2	10.8	-1.6	1.9	2.1	-0.2
3.650	7.7	11.6	-3.9	2.8	2.6	0.2
3.600	7.9	12.1	-4.2	2.6	2.2	0.4
3.520	10.9	11.6	-0.7	2.0	2.2	-0.2
3.480	9.7	11.8	-2.1	2.0	2.1	-0.1
3.400	9.0	11.2	-2.2	1.8	2.0	-0.2
3.320	7.8	10.4	-2.6	1.7	1.7	0.0
3.210	6.7	10.6	-3.9	2.2	2.2	0.0
3.130	8.2	11.4	-3.2	2.8	2.5	0.3
3.070	6.6	11.8	-5.2	3.7	2.7	1.0
2.970	11.4	3.8	7.7	3.1	2.5	0.6
2.920	2.7	4.0	-1.3	3.1	2.6	0.5
2.900	5.4	3.8	1.5	3.6	3.8	-0.2
2.870	3.3	3.7	-0.3	4.5	4.8	-0.3
2.820	4.5	3.8	0.7	6.0	6.2	-0.3
2.730	11.0	15.3	-4.4	5.5	4.9	0.7
2.600	8.0	13.5	-5.5	5.1	3.9	1.3
2.520	7.3	11.3	-4.0	6.5	5.6	0.9
2.470	8.0	15.0	-6.9	7.6	5.4	2.2
2.400	10.9	13.0	-2.1	9.3	8.0	1.3
2.330	12.8	16.8	-3.9	7.2	6.4	0.8
2.240	10.6	14.5	-3.9	5.6	4.8	0.8
2.170	8.9	13.7	-4.7	4.5	3.8	0.8
2.080	8.4	14.2	-5.8	3.8	3.0	0.8
2.000	9.1	12.3	-3.3	3.8	3.2	0.6
1.880	9.1	13.5	-4.4	4.9	3.7	1.2
1.850	6.8	11.5	-4.7	5.8	4.8	0.9
1.810	7.8	12.6	-4.7	6.2	5.5	0.7
1.750	9.9	13.9	-4.0	5.1	4.3	0.8
1.660	9.1	15.2	-6.1	5.6	4.4	1.2
1.600	9.7	15.0	-5.3	5.2	4.4	0.8
1.560	10.0	14.1	-4.1	4.8	4.2	0.6
1.470	9.8	14.6	-4.8	5.0	4.2	0.8
1.370	9.8	14.2	-4.5	4.9	4.2	0.7
1.270	7.9	13.5	-5.6	5.0	4.2	0.8
1.180	5.3	12.6	-7.3	4.2	3.2	1.0
1.090	23.6	12.3	11.3	1.4	2.5	-1.1
0.990	6.8	9.5	-2.7	2.8	2.7	0.0
0.840	8.8	18.8	-10.0	3.7	3.6	0.2

Table 4-4.6, (Cont.)
Comparison of HEC-RAS and modified HEC-RAS hydraulic results for Apache Wash

River Station (1)	Channel Velocity, fps FDS (2)	WMP (3)	Difference (4)	Hydraulic Depth, feet FDS (5)	WMP (6)	Difference (7)
0.710	10.0	14.8	-4.8	4.0	3.8	0.2
0.630	9.1	13.4	-4.4	3.6	3.2	0.4
0.540	10.9	14.8	-3.9	3.5	3.4	0.1
0.430	8.6	13.2	-4.6	4.1	3.6	0.5
0.330	7.9	12.8	-4.9	4.5	3.4	1.1
0.200	9.8	13.8	-4.0	3.9	3.5	0.4
		Maximum	11.3		Maximum	2.2
		Minimum	-10.0		Minimum	-1.1
		Average	-3.0		Average	0.3

Table 4-4.7
Comparison of HEC-RAS and modified HEC-RAS hydraulic results for Desert Hills Wash

River Station (1)	Channel Velocity, fps FDS (2)	WMP (3)	Difference (4)	Hydraulic Depth, feet FDS (5)	WMP (6)	Difference (7)
0.990	6.1	9.5	-3.4	3.3	3.0	0.3
0.900	7.7	12.4	-4.7	3.2	2.9	0.3
0.810	6.8	10.4	-3.6	3.1	2.8	0.3
0.720	7.4	12.2	-4.8	2.7	2.4	0.3
0.640	6.3	10.4	-4.0	3.0	2.6	0.4
0.560	6.1	9.7	-3.5	3.0	2.7	0.2
0.480	5.5	8.3	-2.8	3.6	3.3	0.3
0.400	6.8	9.7	-2.9	3.1	2.9	0.2
		Maximum	-2.8		Maximum	0.4
		Minimum	-4.8		Minimum	0.2
		Average	-3.7		Average	0.3

Table 4-4.8
Comparison of HEC-RAS and modified HEC-RAS hydraulic results for Paradise Wash

River Station	Channel Velocity, fps			Hydraulic Depth, feet		
	FDS	WMP	Difference	FDS	WMP	Difference
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2.230	9.0	9.6	-0.6	1.7	1.8	-0.1
2.140	7.7	9.7	-2.0	1.5	1.5	0.0
2.070	4.2	8.6	-4.5	1.9	1.3	0.6
2.000	10.8	9.4	1.4	1.6	1.8	-0.2
1.920	7.8	8.9	-1.1	2.1	1.8	0.2
1.830	8.4	9.8	-1.4	2.0	2.0	0.0
1.750	8.1	10.1	-2.0	2.0	2.0	0.1
1.650	7.2	10.5	-3.3	1.6	2.2	-0.6
1.540	6.6	12.7	-6.1	1.9	1.5	0.5
1.460	6.8	9.1	-2.3	2.0	1.8	0.2
1.370	7.0	12.5	-5.6	2.4	3.0	-0.5
1.270	8.4	9.6	-1.2	1.8	1.7	0.1
1.210	5.7	12.0	-6.3	2.5	1.8	0.7
1.120	9.5	10.0	-0.5	1.9	2.1	-0.1
1.040	4.9	8.5	-3.6	3.3	2.7	0.6
0.950	7.7	9.6	-1.8	2.1	1.9	0.2
0.890	6.4	10.6	-4.3	2.3	2.1	0.2
0.800	9.7	11.2	-1.5	1.8	1.9	-0.2
0.720	5.9	11.4	-5.6	2.7	2.0	0.7
0.620	7.6	9.8	-2.2	2.2	2.0	0.2
0.530	7.8	11.3	-3.6	2.6	2.3	0.3
0.440	6.5	9.9	-3.4	2.6	2.4	0.2
0.340	4.6	11.7	-7.1	3.0	2.0	1.0
0.280	9.1	10.9	-1.8	2.3	2.1	0.2
0.170	6.5	10.2	-3.8	2.4	2.3	0.1
0.130	6.6	9.8	-3.2	2.6	2.1	0.5
0.040	3.5	5.1	-1.5	4.4	4.4	0.0
		Maximum	1.4		Maximum	1.0
		Minimum	-7.1		Minimum	-0.6
		Average	-2.9		Average	0.2

4-4.2.5 Description of Final HEC-RAS Base Models

The HEC-RAS program organizes the models into projects, plans, flow data and geometric data. Two model "projects", one for Cave Creek and one for the Apache Wash system are developed for this study. The Apache Wash system includes Apache Wash, Paradise Wash and Desert Hills Wash. Each model project contains multiple plans for the various hydraulic and hydrologic conditions that are considered for the sediment analyses. The plans also include encroachment data. A printout for each HEC-RAS model project is provided in Appendix F. The following is a summary of the model organizational structure:

Plan	Geometry Data	Hydrologic Condition	Description
Cave Creek FDS	Base geometry (imported from FDS models)	Existing condition (2-, 10- & 100-year)	Combined, original HEC-2 models including floodway encroachment stations (used as the base model for all comparisons).
Existing condition study reach	Revised geometry	Existing condition study discharges (2-, 10- & 100-year)	Updated and revised model for existing, FDS watershed conditions including floodway encroachment stations.
Future condition study reach	Revised geometry	Future condition study discharges (2- 10- and 100-year)	Updated and revised model for future, full build out watershed conditions including floodway encroachment stations.
Team Alt 100-year existing condition	Revised geometry	Existing condition study discharges (2-, 10- & 100-year)	Updated and revised model for existing, FDS watershed conditions, including Team encroachment stations.
Team Alt 10-year existing condition	Revised geometry	Existing condition study discharges (2-, 10- & 100-year)	Updated and revised model for existing, FDS watershed conditions, including Team encroachment stations.
Team Alt 100-year future condition	Revised geometry	Future condition study discharges (2-, 10- & 100-year)	Updated and revised model for future, full build out watershed conditions, including Team encroachment stations.
Team Alt 10-year future condition	Revised geometry	Future condition study discharges (2-, 10- & 100-year)	Updated and revised model for future, full build out watershed conditions, including Team encroachment stations.

Plan	Geometry Data	Hydrologic Condition	Description
Apache Wash FDS	Base geometry (imported from FDS models)	Existing Condition (100-year)	Combined, original HEC-2 models including floodway encroachment stations (used as the base model for all comparisons).
Existing condition 100-year	Revised geometry (100-year model)	Existing condition (100-year)	Updated and revised model for existing, FDS watershed conditions.
Existing condition 10-year	Revised geometry (10-year model)	Existing condition (2- and 10-year)	Updated and revised model for existing, FDS watershed conditions including floodway encroachment stations.
Future condition 100-year	Revised geometry (100-year model)	Future condition (100-year)	Updated and revised model for future, full build out watershed conditions including floodway encroachment stations.
Future condition 10-year	Revised geometry (10-year model)	Future condition (2- and 10-year)	Updated and revised model for future, full build out watershed conditions.
Team Alt 100-year existing condition	Revised geometry (100-year model)	Existing condition (100-year)	Updated and revised model for existing, FDS watershed conditions, including Team encroachment stations.
Team Alt 10-year existing condition	Revised geometry (10-year model)	Existing condition (10-year)	Updated and revised model for existing, FDS watershed conditions, including Team encroachment stations.
Team Alt 100-year future condition	Revised geometry (100-year model)	Future condition (100-year)	Updated and revised model for future, full build out watershed conditions including floodway encroachment stations.
Team Alt 10-year future condition	Revised geometry (10-year model)	Future condition (10-year)	Updated and revised model for future, full build out watershed conditions including floodway encroachment stations.

4-4.2.6 Model Conversion to HEC-6

Prior to conversion to HEC-6, the modified HEC-RAS model was modified because HEC-6 does not have the full range of hydraulic computational options as HEC-RAS. The bridges and culverts were removed because HEC-6 can not model these. Also, the Apache Wash system was spilt into three different models, Apache Wash, Paradise Wash and Desert Hills Wash. The results of the HEC-6 fixed based model was compared to the modified HEC-RAS model to verify that there are no significant changes in the hydraulic conditions. Table 4-4.9 is a comparison of the water surface elevation for Cave Creek. In general, the water surface elevation differential (difference between the HEC-RAS and the HEC-6 model) is approximately zero. The maximum difference of 2.14 feet occurs at river mile 29.72, which is located just upstream of Carefree Highway bridge. This difference in water surface elevation is due to HEC-6 inability to model bridges.

Table 4-4.10 compares the water surface elevation of the modified HEC-RAS model to the HEC-6 fixed based model for Apache Wash. The average difference in water surface elevation is 0.09 feet. The maximum difference of 2.26 feet occurs at river mile 4.58, which is located just upstream of the Carefree Highway culvert. This difference is due to HEC-6 not modeling the culvert.

Table 4-4.11 compares the water surface elevation of the modified HEC-RAS model to the HEC-6 fixed based model for Paradise Wash. The average difference in water surface elevation is 0.09 feet. The maximum difference is 1.27 feet occurs at river mile 0.17, which is located near the confluence with Apache Wash. The difference could be due to modeling Apache Wash and Paradise Wash as a system in HEC-RAS, but separately in HEC-6.

Table 4-4.12 compares the water surface elevation of the modified HEC-RAS model to the HEC-6 fixed based model for Desert Hills Wash. The average difference in water surface elevation is approximately zero.

Table 4-4.9
Comparison of modified HEC-RAS and HEC-6 fixed bed model results for Cave Creek

River	Water Surface Elevation (feet)			River	Water Surface Elevation (feet)		
Mile	HEC-RAS	HEC-6	Difference	Mile	HEC-RAS	HEC-6	Difference
24.525	1632.64	1633.01	-0.37	28.157	1795.64	1795.80	-0.16
24.646	1636.13	1636.07	0.06	28.241	1799.59	1799.60	-0.01
24.752	1641.09	1641.08	0.01	28.326	1804.48	1804.47	0.02
24.845	1644.66	1644.62	0.05	28.390	1807.31	1807.35	-0.04
24.919	1648.14	1648.18	-0.04	28.462	1810.48	1810.49	-0.01
25.010	1650.09	1650.22	-0.13	28.555	1815.40	1815.41	-0.01
25.099	1654.80	1654.82	-0.02	28.657	1818.29	1818.21	0.08
25.180	1659.85	1659.94	-0.09	28.750	1822.20	1822.19	0.01
25.233	1661.03	1660.97	0.06	28.847	1826.70	1826.70	0.00
25.326	1664.91	1664.94	-0.03	28.934	1830.60	1830.62	-0.02
25.388	1668.61	1668.56	0.05	29.012	1834.58	1834.60	-0.02
25.458	1672.42	1672.48	-0.06	29.130	1838.90	1839.94	-1.04
25.519	1674.75	1674.71	0.05	29.258	1843.82	1844.00	-0.18
25.580	1677.33	1677.32	0.01	29.351	1849.52	1849.41	0.11
25.644	1680.26	1680.18	0.08	29.387	1850.29	1850.20	0.09
25.699	1682.82	1682.55	0.27	29.493	1853.35	1853.42	-0.07
25.750	1685.43	1685.55	-0.12	29.538	1855.65	1855.70	-0.05
25.843	1686.78	1686.72	0.06	29.601	1860.33	1860.30	0.03
25.919	1690.31	1690.29	0.02	29.663	1863.83	1863.70	0.13
26.044	1695.39	1695.30	0.09	29.710	1864.67	1864.71	-0.04
26.137	1698.43	1698.46	-0.03	29.720	1869.08	1866.94	2.14
26.239	1701.88	1701.85	0.03	29.770	1869.81	1870.37	-0.56
26.335	1705.24	1705.42	-0.17	29.850	1873.77	1873.80	-0.03
26.430	1707.62	1707.56	0.06	30.100	1882.09	1881.79	0.30
26.529	1712.37	1712.41	-0.04	30.200	1886.43	1886.30	0.13
26.623	1716.97	1717.09	-0.12	30.280	1892.76	1892.56	0.20
26.695	1720.90	1721.14	-0.24	30.420	1898.04	1897.87	0.17
26.775	1725.79	1725.68	0.11	30.520	1902.58	1902.63	-0.05
26.845	1728.35	1728.37	-0.02	30.650	1911.01	1910.83	0.18
26.921	1731.47	1731.69	-0.22	30.750	1914.87	1915.08	-0.21
27.008	1734.38	1734.30	0.08	30.850	1918.14	1918.67	-0.53
27.106	1738.34	1738.47	-0.13	30.960	1923.17	1922.92	0.25
27.169	1742.89	1742.64	0.25	31.050	1926.39	1926.41	-0.02
27.226	1744.40	1744.20	0.20	31.140	1930.34	1930.29	0.05
27.265	1749.63	1749.54	0.09	31.170	1931.98	1931.93	0.05
27.320	1754.91	1754.95	-0.04	31.250	1936.08	1936.13	-0.05
27.366	1755.59	1755.60	-0.01	31.340	1941.32	1941.28	0.04
27.417	1759.10	1759.10	0.00	31.450	1945.82	1945.77	0.05
27.502	1765.56	1765.58	-0.02	31.540	1949.50	1949.47	0.03
27.604	1768.03	1768.03	0.00	31.630	1953.47	1953.48	-0.01

Table 4-4.9 (Cont.)

Comparison of modified HEC-RAS and HEC-6 fixed bed model results for Cave Creek

River	Water Surface Elevation (feet)			River	Water Surface Elevation (feet)		
Mile	HEC-RAS	HEC-6	Difference	Mile	HEC-RAS	HEC-6	Difference
27.693	1775.61	1775.66	-0.05	31.750	1959.48	1959.48	0.00
27.797	1779.40	1779.97	-0.57	31.820	1963.94	1963.98	-0.04
27.913	1783.67	1783.69	-0.02	31.870	1966.21	1966.02	0.19
28.023	1787.10	1787.70	-0.60	31.910	1969.29	1969.36	-0.07
28.091	1791.24	1791.05	0.19		Maximum		2.14
					Minimum		-1.04
					Average		0.00

Table 4-4.10

Comparison of modified HEC-RAS and HEC-6 fixed bed model results for Apache Wash

River	Water Surface Elevation (feet)			River	Water Surface Elevation (feet)		
Mile	HEC-RAS	HEC-6	Difference	Mile	HEC-RAS	HEC-6	Difference
0.20	1659.69	1659.66	0.03	4.23	1790.05	1790.01	0.04
0.33	1661.91	1661.68	0.23	4.31	1792.54	1792.62	-0.08
0.43	1664.33	1664.55	-0.22	4.40	1796.77	1796.77	0.00
0.54	1669.08	1669.16	-0.08	4.49	1799.72	1799.72	0.01
0.63	1672.71	1672.78	-0.07	4.56	1802.03	1802.01	0.02
0.71	1675.44	1675.53	-0.09	4.57	1803.50	1803.55	-0.05
0.75	1677.05	1677.08	-0.03	4.58	1807.46	1805.21	2.26
0.84	1677.92	1679.23	-1.31	4.60	1807.48	1806.51	0.97
0.99	1684.81	1684.11	0.70	4.65	1808.65	1808.71	-0.06
1.09	1688.11	1688.19	-0.08	4.74	1813.85	1814.44	-0.59
1.18	1692.13	1692.11	0.02	4.78	1816.01	1816.73	-0.72
1.27	1693.49	1693.41	0.08	4.82	1820.09	1820.18	-0.09
1.37	1696.99	1697.06	-0.07	4.90	1824.00	1824.51	-0.51
1.47	1701.37	1701.44	-0.07	4.96	1826.04	1826.71	-0.67
1.56	1703.52	1703.44	0.09	5.03	1830.01	1830.71	-0.70
1.60	1704.34	1704.45	-0.11	5.09	1832.70	1832.74	-0.03
1.66	1705.56	1705.64	-0.08	5.15	1834.86	1835.03	-0.17
1.75	1708.53	1708.61	-0.08	5.21	1837.99	1838.33	-0.34
1.81	1710.74	1710.72	0.02	5.31	1842.64	1842.71	-0.07
1.85	1711.30	1711.31	-0.01	5.38	1845.48	1845.54	-0.06
1.88	1711.76	1711.73	0.03	5.48	1849.96	1849.96	0.00
2.00	1714.68	1714.75	-0.07	5.57	1854.53	1854.58	-0.05
2.08	1717.47	1717.68	-0.21	5.64	1856.78	1856.63	0.15
2.17	1720.97	1721.05	-0.08	5.66	1859.33	1859.40	-0.07
2.24	1723.49	1723.58	-0.09	5.76	1864.61	1864.69	-0.08
2.33	1727.20	1727.28	-0.08	5.83	1868.77	1868.81	-0.04
2.40	1730.17	1730.16	0.01	5.92	1873.10	1873.14	-0.04

Table 4-4.10 (Cont.)

Comparison of modified HEC-RAS and HEC-6 fixed bed model results for Apache Wash

River	Water Surface Elevation (feet)			River	Water Surface Elevation (feet)		
Mile	HEC-RAS	HEC-6	Difference	Mile	HEC-RAS	HEC-6	Difference
2.47	1731.53	1731.79	-0.26	6.01	1878.69	1878.72	-0.02
2.52	1733.29	1733.29	0.00	6.09	1881.88	1881.87	0.01
2.60	1734.96	1735.02	-0.06	6.16	1886.59	1886.64	-0.05
2.73	1737.82	1737.87	-0.05	6.25	1890.96	1891.00	-0.04
2.82	1741.32	1741.33	-0.01	6.32	1894.06	1894.02	0.04
2.87	1741.53	1741.52	0.01	6.43	1899.41	1899.48	-0.07
2.90	1741.78	1741.77	0.01	6.50	1902.57	1902.50	0.07
2.92	1742.14	1742.24	-0.10	6.58	1905.90	1905.96	-0.06
2.97	1742.96	1742.52	0.44	6.63	1908.85	1908.92	-0.07
3.07	1745.42	1745.47	-0.05	6.71	1912.16	1912.10	0.06
3.13	1747.18	1747.17	0.01	6.80	1918.12	1918.20	-0.08
3.21	1750.49	1750.55	-0.06	6.90	1924.11	1924.20	-0.09
3.32	1754.54	1754.62	-0.08	6.98	1928.12	1928.04	0.08
3.40	1757.07	1757.12	-0.05	7.08	1932.22	1932.30	-0.08
3.48	1760.43	1760.47	-0.04	7.17	1937.26	1937.33	-0.07
3.52	1761.70	1761.73	-0.03	7.28	1943.29	1943.40	-0.11
3.60	1764.63	1764.57	0.06	7.36	1948.11	1948.12	-0.01
3.65	1766.41	1766.40	0.01	7.46	1953.95	1954.02	-0.07
3.75	1769.23	1769.29	-0.06	7.55	1960.33	1960.38	-0.05
3.78	1770.97	1771.01	-0.04	7.65	1965.20	1965.23	-0.03
3.86	1774.40	1774.32	0.08	7.74	1972.69	1972.76	-0.07
3.96	1777.94	1778.03	-0.09	7.84	1977.44	1977.51	-0.07
4.05	1782.88	1782.93	-0.05	7.89	1980.50	1980.59	-0.09
4.11	1785.38	1785.45	-0.06	7.98	1985.73	1985.79	-0.06
4.22	1789.12	1789.18	-0.06	8.02	1988.58	1988.64	-0.06
					Maximum		2.26
					Minimum		-1.31
					Average		-0.04

Table 4-4.11

Comparison of modified HEC-RAS and HEC-6 fixed bed model results for Paradise Wash

River	Water Surface Elevation (feet)			River	Water Surface Elevation (feet)		
Mile	HEC-RAS	HEC-6	Difference	Mile	HEC-RAS	HEC-6	Difference
0.04	1733.0	1733.0	-0.02	1.21	1781.6	1781.6	-0.06
0.13	1735.9	1737.1	-1.26	1.27	1783.7	1783.8	-0.06
0.17	1740.1	1738.8	1.27	1.37	1787.5	1787.6	-0.06
0.28	1743.4	1743.5	-0.07	1.46	1791.1	1791.2	-0.09
0.34	1746.8	1746.8	0.01	1.54	1793.8	1793.9	-0.09

Table 4-4.11 (Cont.)

Comparison of modified HEC-RAS and HEC-6 fixed bed model results for Paradise Wash

River Mile	Water Surface Elevation (feet) HEC-RAS	HEC-6	Difference	River Mile	Water Surface Elevation (feet) HEC-RAS	HEC-6	Difference
0.44	1750.7	1750.7	0.00	1.65	1800.7	1800.8	-0.05
0.53	1754.9	1755.0	-0.04	1.75	1805.3	1805.3	-0.06
0.62	1757.9	1758.1	-0.24	1.83	1810.9	1811.0	-0.08
0.72	1762.8	1763.3	-0.45	1.92	1815.0	1815.1	-0.08
0.8	1766.6	1766.7	-0.07	2.00	1820.5	1820.6	-0.06
0.89	1771.2	1771.3	-0.10	2.07	1823.2	1823.3	-0.06
0.95	1772.5	1772.5	-0.06	2.14	1827.1	1827.2	-0.06
1.04	1774.9	1775.0	-0.11	2.23	1832.7	1832.8	-0.09
1.12	1777.9	1778.4	-0.46		Maximum		1.27
					Minimum		-1.26
					Average		-0.09

Table 4-4.12

Comparison of modified HEC-RAS and HEC-6 fixed bed model results for Desert Hills Wash

River Mile	Water Surface Elevation (feet) HEC-RAS	HEC-6	Difference	River Mile	Water Surface Elevation (feet) HEC-RAS	HEC-6	Difference
0.386	1745.37	1745.40	-0.03	0.720	1751.58	1751.62	-0.04
0.400	1746.54	1746.48	0.07	0.810	1754.00	1753.97	0.03
0.480	1748.01	1748.02	-0.01	0.900	1756.24	1756.25	-0.01
0.560	1748.92	1748.92	0.00	0.990	1758.25	1758.31	-0.06
0.640	1750.06	1749.99	0.07		Maximum		0.07
					Minimum		-0.06
					Average		0.00

4-4.2.7 Hydraulic Model Applications

In addition to sedimentation and erosion analyses, the HEC-RAS base models described in Section 4-4.2.4 were also used in the evaluation of lateral stability and various alternative formulations. In general, for the lateral stability evaluation the HEC-RAS modeling results, in particular energy slope, hydraulic depth, channel velocity and top width, were inspected for trends and the establishment of reach average hydraulic properties. The reach average hydraulic properties in conjunction with other data and analyses were used for the mapping of erosion hazards along the study reaches. A detailed discussion of the lateral stability evaluation is provided as a separate report entitled Upper Cave Creek/Apache Wash

4-4.3 SEDIMENT DATA AND ANALYSIS

4-4.3.1 General

Base models of each watercourse are established for analyzing sediment processes in the main channels and separate models for the overbanks. Those models are referred to as Main Channel Models, and Overbank Models, respectively. Those separate models are necessary because of the wide disparity in the bed material grain size between the main channels and the adjacent overbank floodplains. The main channels are composed of coarser sediments ranging in size up to boulders. The overbanks are composed of finer material in the silt and sand size with some gravel. The overbanks are also occupied by denser and more diverse vegetation. The Main Channel Models and Overbank Models are different in two ways; first, by grain size of the bed material, and second, by use of the sediment transport function. The Main Channel Models use the Meyer-Peter, Muller function and the Overbank Models use the Yang Stream Power function. The description of the selection of the sediment transport function is provided in Section 4-4.3.2.

Sediment data consists of rating curves of sediment load at upper boundaries and tributaries of each watercourse and size distributions of the bed material. The sediment load rating curves are a function of discharge and the size distribution of incoming sediment is specified. The sediment load rating curves are developed by modeling a "dummy" reach for each watercourse and using HEC-6 to estimate a bed material transport relation. Notice that the incoming sediment load is modeled as bed material and not total load. This is not a limitation to the model as it is reasonably assumed that the wash load component of total load will either be deposited upstream of Cave Creek Dam or will pass through the dam spillway. The description of inflowing sediment data and its analyses are provided in Section 4-4.3.4.

Size distributions of the bed material for each watercourse are estimated based on field data. The bed material size distribution is different for the Main Channel and Overbank Models as represented by field data. The description of bed material and the analyses of that data are provided in Section 4-4.3.3.

4-4.3.2 Selection of Sediment Transport Function

Two sediment transport functions are used for the erosion and sedimentation modeling of the watercourses. The Meyer-Peter, Muller sediment transport function is used for the Main

Channel Models, while the Yang Stream Power transport function is used for the Overbank Model.

The Meyer-Peter, Muller function, which was originally developed using coarse sands and gravels, is recommended for rivers with bed materials greater than 5.0 mm (Stevens and Yang, 1989; FCDMC, 1994). From the reach-wide characterization analysis of the sediment data for the watercourse systems, a large percentage of channel bed materials are larger than 5.0 mm.

The development and establishment of the Meyer-Peter, Muller function is based on flume data and extensive experiments (Stevens and Yang, 1989). The sediment transport function was derived from sediment data with mean sizes and effective diameters ranging from 0.40 to 30 mm (Vanoni, 1975). The selection of the Meyer-Peter, Muller function for the Main Channel Models is also supported by sediment modeling for the Agua Fria River in Arizona from 1983 to 1994 (SLA, 1983; WRA, 1986; FCDMC, 1994). Both the Agua Fria River and Cave Creek, like most watercourses in Arizona, are ephemeral streams and physical similarities between the watercourses justify the use of this sediment transport function.

The Yang Stream Power function was originally established using a sediment size range from 0.015 to 1.72 mm (Vanoni, 1975). Since a large percentage of the stream cross-section is covered by the overbank floodplain, a model to evaluate the erosion and sedimentation process in that part of the watercourse is needed.

The use of the Yang Stream Power function for the Overbank Models is due to the well-documented applications and capability of the Yang function to estimate sediment load for sand streams (Stevens et al, 1989; Yang, 1973, Yang 1984; Yang, 1988, Yang and Molinas, 1982; and Yang and Stall, 1976). Since the bed materials in the overbanks of the watercourses are predominantly finer than the bed materials in the main channels, Yang's Stream Power function for sand is reasonable.

4-4.3.3 Bed Material Size Distribution

A series of channel bed material pebble count data and sieve-analyzed samples from the channel and overbank were collected, as part of this study, by JEF, Inc. The pebble count data were collected as described in Section 4-2.0.

Two different HEC-6 models are developed to model the channel and the overbanks. The watercourses in Cave Creek and Apache Wash systems typically have coarse bed material, with grain sizes ranging from coarse sand to large cobbles and boulders. The watercourse banks and overbank floodplains typically have finer material, with grain sizes ranging from silts and clays to coarse sand. Overbank floods, such as the 100-year flood and often the 10-year flood, occupy both the channel and portions of the floodplain. Thus, to correctly model the sediment transport of the watercourses would require delineation and quantification of the size gradation of the bed material of both the main channel and the floodplain. However, a limitation of the HEC-6 program is that only one bed material size characteristic can be provided for any reach of the watercourse. Therefore, two HEC-6 models are developed for each watercourse; one for the main channel which uses bed material sized gradation for the channel, and the other for the floodplain which uses size gradation that is representative of the surface of the floodplain.

The Main Channel Model, with coarser bed material size gradation, uses the Meyer-Peter, Muller transport function. The bed material for that model is developed using a composite of the bed material count data and sieve-analyzed data provided by JEF, Inc. Various percentiles of the pebble count data are computed and plotted. No trend in the size distribution of bed material of the watercourses is detected (see analysis by Hjalmarson in Appendix B). Variation of size distribution along the length of watercourses is random. Therefore, a composite of the pebble count data was computed and combined with an average of the sieve-analyzed samples. The pebble count composite for each wash was calculated by using the following method.

- The pebble count data less than 2 millimeters (all material finer than coarse sand) was removed from the data set.
- The remainder of the pebble count data are sorted based on grain size.
- An average is found for each grain size classification in Table G-1, Appendix G.
- The number points in each classification is totaled.
- The percentage of the number of points is calculated by dividing the number in the classification by the total number of data points.
- The percent finer is calculated by cumulatively adding the percentages.

Sieve-analyzed samples for each watercourse are plotted and an average distribution is visually fitted. The percent finer from the pebble count data and the average curve from the

sieve-analyzed samples are combined to a single composite curve by visual fit. A composite curve is representative of the bed material size distribution for each of the watercourse Channel Models.

The Overbank Models use a representative sieve-analyzed sample from the overbank floodplain. Following sections describe the data used to estimate bed material size distributions for the Channel and Overbank Models, and provides results of data analyses.

Bed Material Size Distribution for Cave Creek - The composite grain size distribution for the Cave Creek Channel Model is derived from 34 pebble count data sets and eight sieve-analyzed samples. Analysis of the pebble count data is provided in Appendix G (Table G-1). A graph of the nine sieve-analyzed samples and the average size gradation curve is provided in Appendix G (Figure G-1).

The grain size distribution for the Cave Creek Overbank Model is taken from a representative sieve-analyzed sample (CC-11) from the overbank floodplain. The size distribution curves for the Cave Creek Channel Model and the Overbank Model, respectively, are shown in Figure 4-4.1.

Bed Material Size Distribution for Apache Wash - The composite grain size distribution for the Apache Wash Channel Model is derived from 33 pebble count data sets and five sieve-analyzed samples. Analysis of the pebble count data is provided in Appendix G (Table G-3). A graph of the five sieve-analyzed samples and the average size gradation curve is provided in Appendix G (Figure G-2).

The grain size distribution for the Apache Wash Floodplain Model is taken from a representative sieve-analyzed sample (AW-5) from the floodplain. The size distribution curves for the Apache Wash Channel Model and the Overbank Model, respectively, are shown in Figure 4-4.2.

Bed Material Size Distribution for Paradise Wash - The composite grain size distribution for the Paradise Wash Channel Model is derived from 12 pebble count data sets and two sieve-analyzed samples. Analysis of the pebble count data is provided in Appendix G (Table

G-3). A graph of the five sieve-analyzed samples and the average size gradation curve is provided in Appendix G (Figure G-3).

The grain size distribution for the Paradise Wash Floodplain Model is taken from a representative sieve-analyzed sample (PW-1) from the floodplain. The size distribution curves for the Paradise Wash Channel Model and the Overbank Model, respectively, are shown in Figure 4-4.3.

Bed Material Size Distribution for Desert Hills Wash - The composite grain size distribution for the Desert Hills Wash Channel Model is derived from five pebble count data sets and one sieve-analyzed sample. Analysis of the pebble count data is provided in Appendix G (Table G-4).

The grain size distribution for the Desert Hills Wash Floodplain Model is taken from a representative sieve-analyzed sample (DHW-1) from the floodplain. The size distribution curves for the Desert Hills Wash Channel Model and the Overbank Model, respectively, are shown in Figure 4-4.4.

Figure 4-4.1
Bed Material Size Distribution for Cave Creek

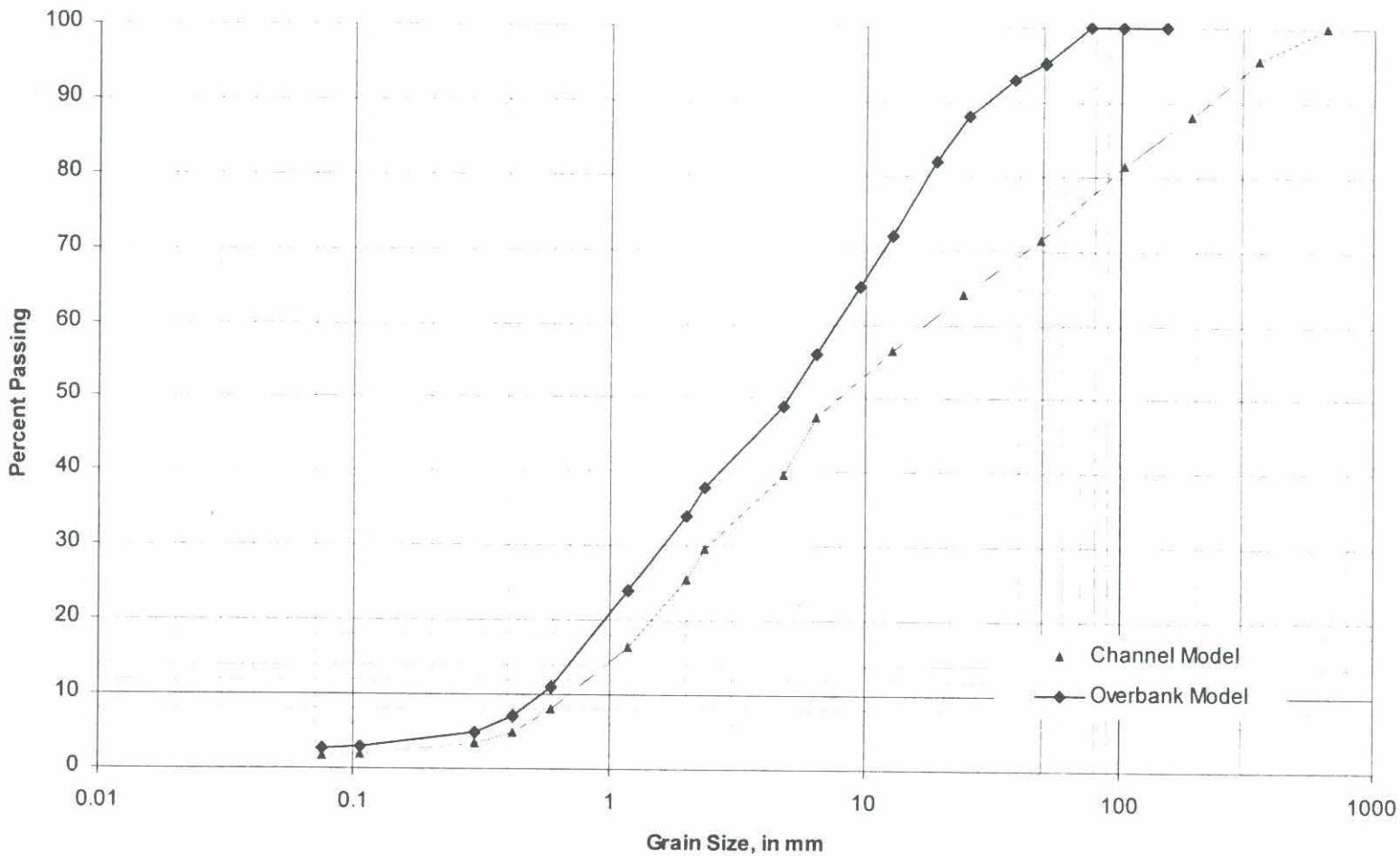


Figure 4-4.2
Bed Material Size Distribution for Apache Wash

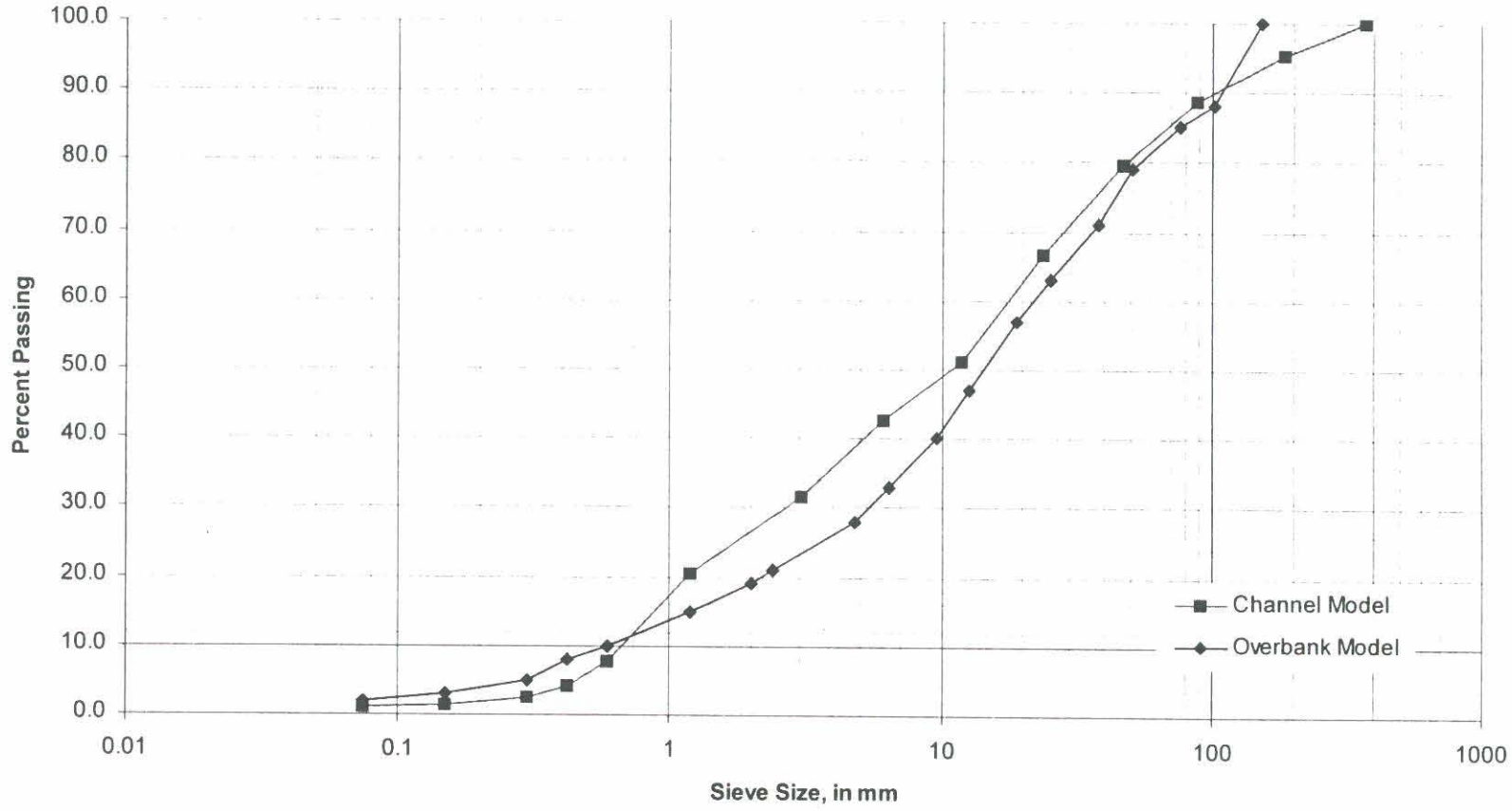


Figure 4-4.3
Bed Material Size Distribution for Paradise Wash

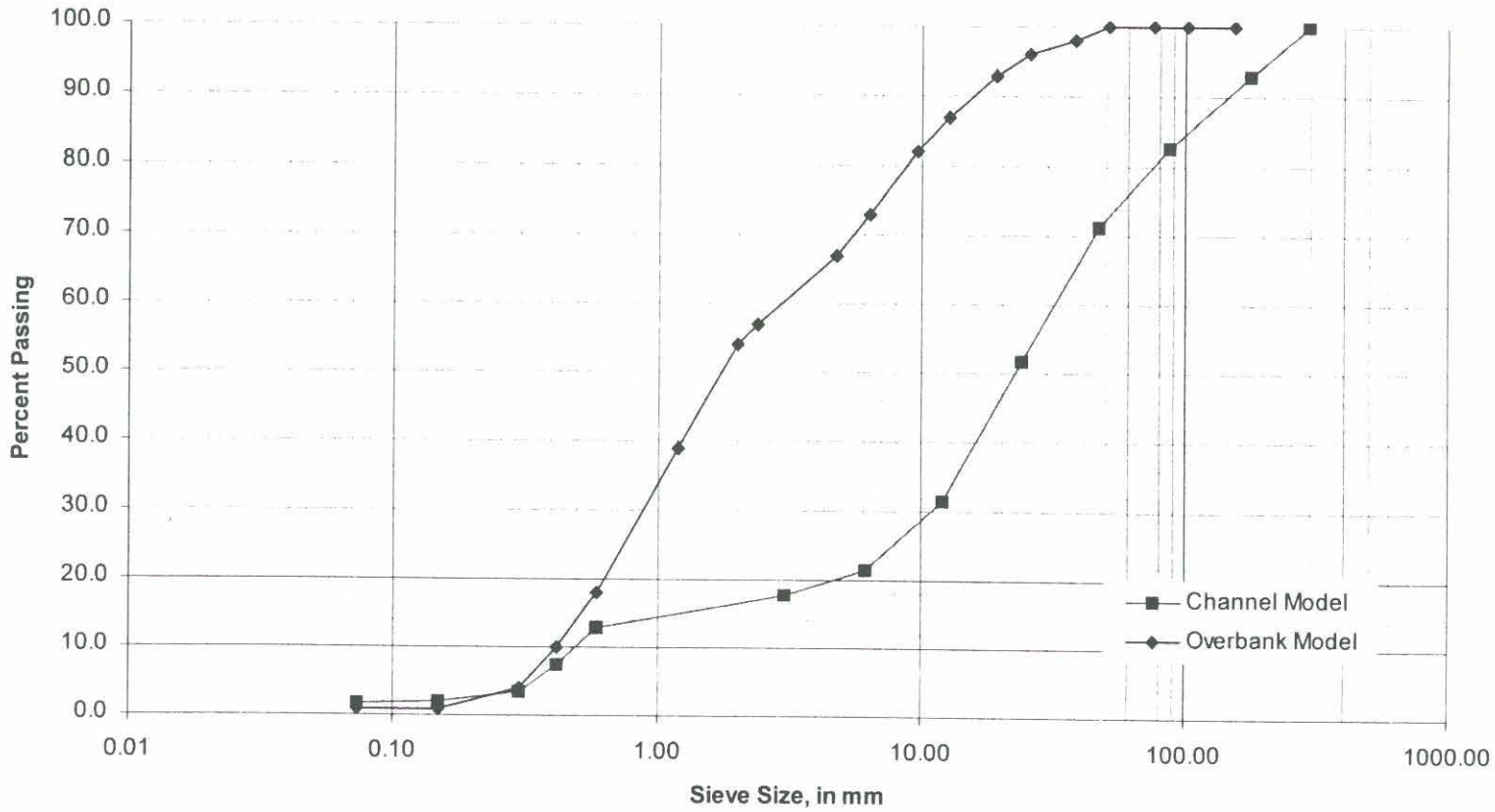
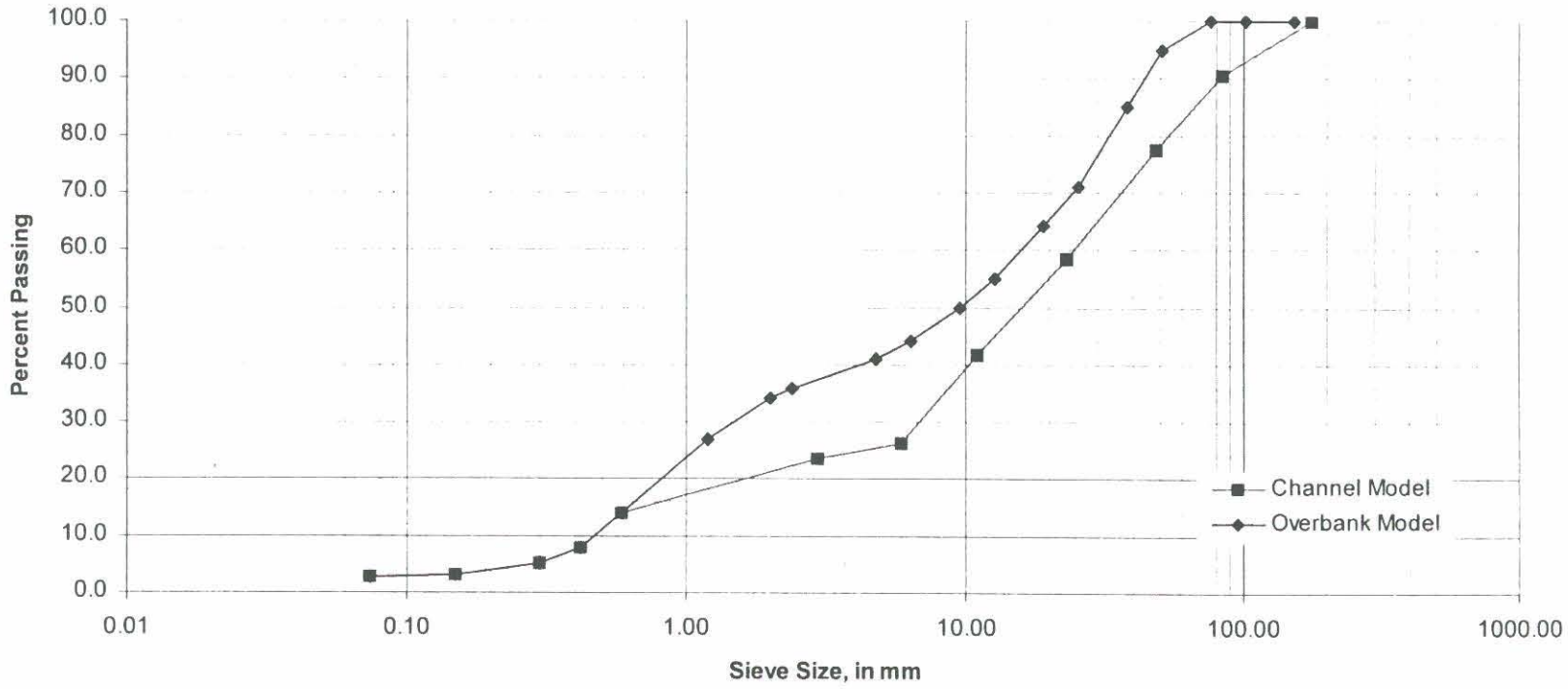


Figure 4-4.4
Bed Material Size Distribution for Desert Hills Wash



4-4.3.4 Inflowing Sediment Load

Inflowing sediment data is defined for the each of the four study watercourses, Cave Creek, Apache Wash, Paradise Wash, and Desert Hills Wash. For Cave Creek, Paradise Wash and Desert Hills Wash, inflowing sediment data is defined for the upper boundary. For Apache Wash, inflowing sediment data is defined for the upper boundary and the confluence with Paradise Wash and Desert Hills Wash. The inflowing sediment for the rest of the tributaries of the watercourses are assumed to be zero because the discharges from the tributaries are relatively small.

4-4.3.4.1 Inflowing Sediment Rating Curves

Neither an established sediment load rating curve nor recorded sediment load data are available for Cave Creek and other watercourses within the study limits. Therefore, inflowing sediment rating curves for the watercourses are estimated as input to the HEC-6 models. The same rating curves are applied to both the Channel and Overbank Models.

The synthesized rating curves are for bed material only not total load. Bed material is defined as the material moving on or near the bed. Total load is comprised of bed load and suspended load (Vanoni, 1977). The Meyer-Peter, Muller method was developed for estimating bed load for watercourses with coarse bed material. Suspended loads are typically comprised of finer material, such as clays, silts, and fine sand. Most of those materials will stay in suspension, even during low flow events, and pass through the system. Much of the critical transport processes in the study area are controlled by the coarser bed materials in the watercourses.

An iterative approach using HEC-6 is used to generate synthetic inflowing sediment load rating curves. The HEC-6 models use the sediment load rating curve as the inflowing sediment loads at boundary conditions to the model. For the sediment load in the Apache Wash model (the boundary condition at the confluence of Paradise Wash and Desert Hills Wash) the output from the base models of the Paradise Wash and Desert Hills Wash are input to the Apache Wash HEC-6 models. In general, the

procedure involves adjusting the inflowing sediment until it balances with the outflowing sediment for a "dummy" reach. The HEC-6 models for developing the sediment rating curves are comprised of the following:

- Geometric data for five cross sections are used as a "dummy" reach. These sections are assumed to be stable, and can neither degrade nor agrade. Therefore, the sediment transport for the reach is in equilibrium, that is, the inflowing sediment load equals outflowing sediment load.
- One sieve-analyzed sample is selected as representative of bed material in the "dummy" reach. Size gradation of the bed material is determined from the sieve-analysis.
- The initial inflowing sediment loads are set to zero. This is as an initial condition in the iteration process.
- Sediment loads are estimated for a range of discharges using the Meyer-Peter, Muller sediment transport function.

The model is run with the above conditions. The sediment outflow from the downstream cross section is used to set the inflowing sediment load for the next iteration. The sediment outflow for each grain size classification is found in the output of HEC-6 in Table SB-1, Sediment Load Passing the Boundaries of Stream Segment (see Table 4-4.13). The outflow grain size classifications are in terms of tons per day. The values that are placed in the HEC-6 input are in terms of percent finer, which is found by dividing each grain size classification by the total calculated load. The models are iterated for each discharge until:

- The inflowing sediment by size fraction approximately equals the outflowing sediment by size fraction. This is found in Table SB-1 in the HEC-6 output (Table 4-4.13).
- The transport rate is approximately equal at each cross section in the "dummy" reach. This is also found in Table SB-1 in the HEC-6 output. (Table 4-4.13),

- The change in bed elevation is relatively equal at each cross section. This is found in the HEC-6 output Table SB-2 Status of the Bed Profile at Time in HEC-6 output (Table 4-4.13).

Table 4-4.13

Sample HEC-6 Output for developing the inflowing sediment load rating curve

```
TABLE SB-1:  SEDIMENT LOAD PASSING THE  BOUNDARIES OF STREAM SEGMENT #  1
 ------------------------------------------------------------------------------
   SEDIMENT INFLOW at the Upstream Boundary:
       GRAIN SIZE      LOAD (tons/day) |    GRAIN SIZE      LOAD (tons/day)
   ---------------------------------------------------------------------------
     VERY FINE SAND....          32.43  |  FINE GRAVEL.......        1184.08
     FINE SAND.........          43.07  |  MEDIUM GRAVEL.....        1412.17
     MEDIUM SAND.......         202.04  |  COARSE GRAVEL.....         212.14
     COARSE SAND.......         462.04  |  VERY COARSE GRAVEL           0.00
     VERY COARSE SAND..         839.54  |  SMALL COBBLES.....           0.00
     VERY FINE GRAVEL..         929.40  |  LARGE COBBLES.....           0.00
                        -------------                          -------------
                                                     TOTAL =        5316.91
   SEDIMENT OUTFLOW from the Downstream Boundary
       GRAIN SIZE      LOAD (tons/day) |    GRAIN SIZE      LOAD (tons/day)
   ---------------------------------------------------------------------------
     VERY FINE SAND....          32.32  |  FINE GRAVEL.......        1159.71
     FINE SAND.........          42.96  |  MEDIUM GRAVEL.....        1375.68
     MEDIUM SAND.......         199.19  |  COARSE GRAVEL.....         201.04
     COARSE SAND.......         454.14  |  VERY COARSE GRAVEL           0.00
     VERY COARSE SAND..         824.80  |  SMALL COBBLES.....           0.00
     VERY FINE GRAVEL..         912.21  |  LARGE COBBLES.....           0.00
                        -------------                          -------------
                                                     TOTAL =        5202.05

TABLE SB-2:  STATUS OF THE BED PROFILE AT TIME =   120.000 DAYS
 ------------------------------------------------------------------------------
   SECTION    BED CHANGE    WS ELEV    THALWEG          Q       TRANSPORT RATE (tons/day)
   NUMBER        (ft)         (ft)       (ft)         (cfs)        SAND
       5.000      -1.50    1670.53    1666.94        3800.        5484.
       4.000      -1.86    1670.28    1665.97        3800.        5497.
       3.000      -0.95    1669.29    1666.27        3800.        5324.
       2.000      -2.13    1669.29    1664.48        3800.        5241.
       1.000      -1.12    1668.60    1663.47        3800.        5202.
```

Cave Creek Sediment Rating Curve - An inflowing sediment load rating curve is generated for the upper boundary of Cave Creek. The generation of the rating curve for the upper boundary is based on site-specific bed material characteristics and channel flow hydraulics. The "dummy" reach uses cross sections 29.387, 29.493, 29.538, 29.601, and 29.663 and sieve-analyzed data 11-CHL. The inflowing sediment load curve is shown on Figure 4-4.5. The sediment load by size fraction for various discharges is included in Table 4-4.10. The inflowing sediment load for the

tributaries are assumed to be zero because the discharge from the tributaries to Cave Creek are relatively small.

Apache Wash Sediment Rating Curve - Three inflowing sediment load rating curves are generated for the sediment transport modeling of Apache Wash. The generation of the inflowing sediment load rating curve for the upper boundary is based on cross sections 8.02, 8.12, 8.21, 8.31, and 8.40 and sieve-analyzed data AW-5. The inflowing sediment load to Apache Wash from Paradise Wash and Desert Hills Wash are generated using the outflowing sediment results from the base HEC-6 models of Paradise Wash and Desert Hills Wash. The inflowing sediment load from minor tributaries of Apache Wash are assumed to be insignificant. The three inflowing sediment load curves are shown on Figure 4-4.5. Tables 4-4.11 through 4-4.13 show the sediment load by size fraction for various discharges.

Paradise Wash Sediment Rating Curve - One inflowing sediment load rating curve is generated for the upper boundary of Paradise Wash. The "dummy" reach uses cross sections 2.23, 2.37, 2.45, 2.53, and 2.62 and sieve-analyzed data PW-1. The inflowing sediment from minor tributaries of Paradise Wash are assumed to be insignificant. The inflowing sediment load curve is shown on Figure 4-4.5. The sediment load by size fraction for various discharges is included in Table 4-4.14.

Desert Hills Wash Sediment Rating Curve - One inflowing sediment load rating curve is generated for the upper boundary of Desert Hills Wash. The "dummy" reach uses cross sections 0.99, 1.10, 1.19, 1.29, and 1.35 and sieve-analyzed data DHW-1. The sediment load curve is shown on Figure 4-4.5. The sediment load by size fraction for various discharges is included in Table 4-4.15.

Figure 4-4.5
Sediment Load for Inflowing Sediment

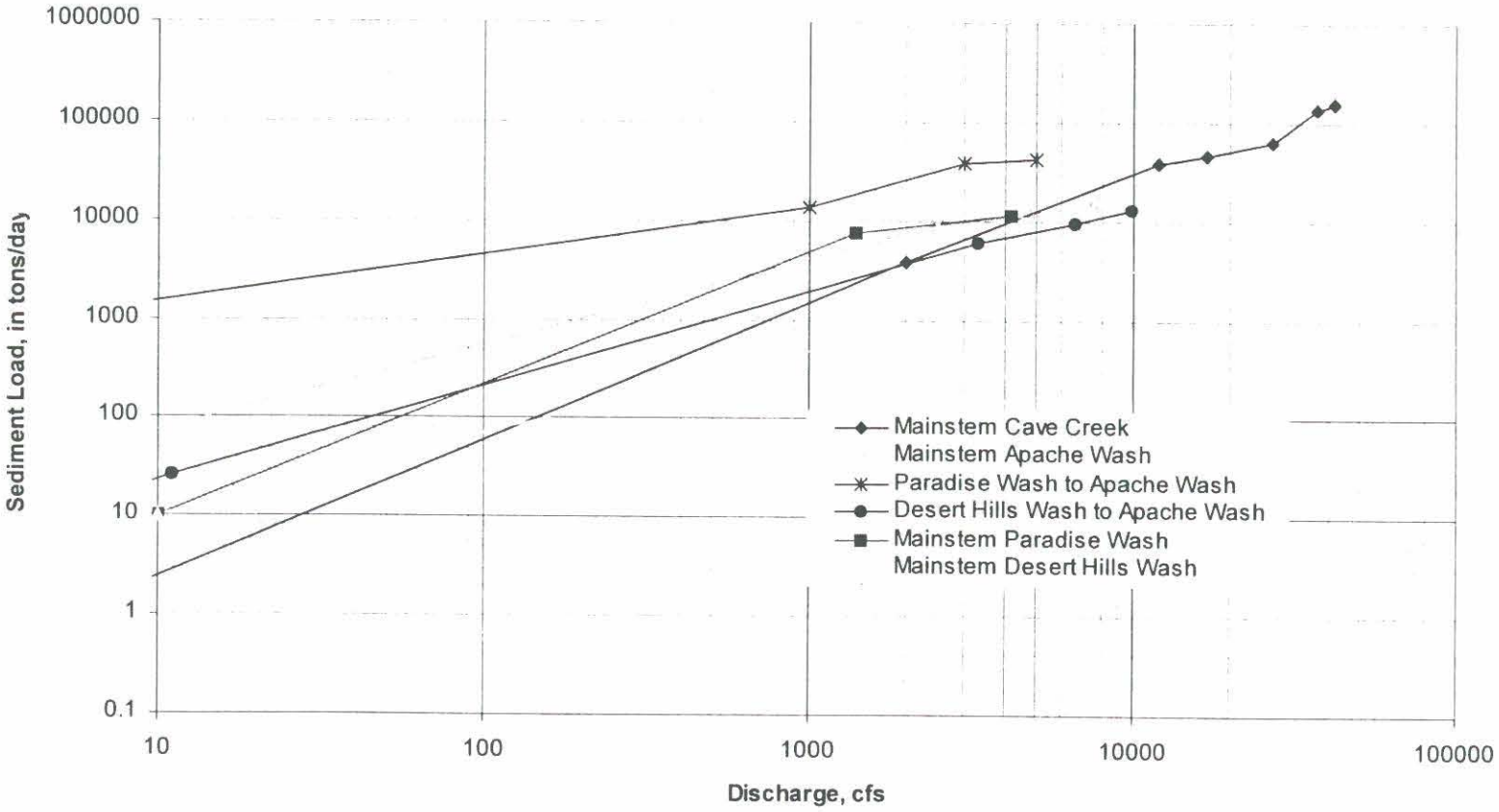


Table 4-4.14
Inflowing Sediment Load for the Upper Boundary of Cave Creek

Discharge, in cfs (1)	Sediment Load, in tons (2)	Sediment Load by Size Fraction, in percent: Very Fine Sand (3)	Fine Sand (4)	Medium Sand (5)	Coarse Sand (6)	Very Coarse Sand (7)	Very Fine Gravel (8)	Fine Gravel (9)	Medium Gravel (10)	Coarse Gravel (11)	Very Coarse Gravel (12)	Small Cobbles (13)
1	0.1	1.42	2.80	8.79	22.99	23.24	18.02	14.79	7.87	0.08	--	--
2000	3732	1.42	2.80	8.79	22.99	23.24	18.02	14.79	7.87	0.08	--	--
12000	38488	0.82	1.93	6.38	17.27	19.05	17.32	19.07	15.15	3.00	0.01	--
17000	45655	1.31	2.67	5.66	15.14	16.51	14.73	16.34	16.32	11.16	0.18	--
27000	63313	1.90	4.30	6.39	15.04	16.54	15.68	17.50	16.20	6.24	0.21	--
37000	135982	2.78	1.51	5.39	14.27	15.49	15.12	16.92	18.44	9.28	0.78	0.02
42000	155000	2.91	1.61	5.45	14.21	15.42	14.96	16.83	18.23	9.27	1.09	0.02

Table 4-4.15
Inflowing Sediment Loads for Upper Boundary of Apache Wash

Discharge, in cfs (1)	Sediment Load, in tons (2)	Sediment Load by Size Fraction, in percent: Very Fine Sand (3)	Fine Sand (4)	Medium Sand (5)	Coarse Sand (6)	Very Coarse Sand (7)	Very Fine Gravel (8)	Fine Gravel (9)	Medium Gravel (10)	Coarse Gravel (11)	Very Coarse Gravel (12)	Small Cobbles (13)	Large Cobbles (14)
1	10	1.51	3.12	6.24	6.51	7.19	9.97	14.70	21.41	26.30	2.18	0.87	0.01
2500	8916	1.51	3.12	6.24	6.51	7.19	9.97	14.70	21.41	26.30	2.18	0.87	0.01
5000	11552	1.90	3.24	6.56	6.83	7.56	10.45	15.38	22.36	20.83	3.43	1.30	0.16
7500	15559	2.00	3.32	6.75	7.00	7.74	10.68	15.63	22.41	20.07	2.74	1.58	0.08

Table 4-4.16
Inflowing Sediment from Paradise Wash to Apache Wash

Discharge, in cfs (1)	Sediment Load, in tons (2)	Sediment Load by Size Fraction, in percent: Very Fine Sand (3)	Fine Sand (4)	Medium Sand (5)	Coarse Sand (6)	Very Coarse Sand (7)	Very Fine Gravel (8)	Fine Gravel (9)	Medium Gravel (10)	Coarse Gravel (11)	Very Coarse Gravel (12)	Small Cobbles (13)
0.1	0.1	1.06	4.44	26.27	14.80	6.60	7.78	14.90	22.44	1.72	--	--
3	850	1.06	4.44	26.27	14.80	6.60	7.78	14.90	22.44	1.72	--	--
1000	13715	0.64	2.54	14.85	8.56	3.99	5.01	10.06	16.71	21.84	15.80	--
3000	37712	0.55	2.01	12.89	7.57	3.59	4.73	10.45	20.64	20.78	12.95	3.85
5000	41663	0.63	2.53	13.13	7.55	3.58	4.70	10.21	19.29	19.20	13.98	5.20

Table 4-4.17
Inflowing Sediment from Desert Hills Wash to Apache Wash

Discharge, in cfs (1)	Sediment Load, in tons (2)	Sediment Load by Size Fraction, in percent: Very Fine Sand (3)	Fine Sand (4)	Medium Sand (5)	Coarse Sand (6)	Very Coarse Sand (7)	Very Fine Gravel (8)	Fine Gravel (9)	Medium Gravel (10)	Coarse Gravel (11)	Very Coarse Gravel (12)	Small Cobbles (13)
0.1	0.1	1.25	7.37	30.24	26.03	15.27	9.03	9.43	1.38	--	--	--
11	26	1.25	7.37	30.24	26.03	15.27	9.03	9.43	1.38	--	--	--
3300	5970	0.41	2.29	9.48	8.81	5.88	4.72	12.01	20.33	23.98	12.09	--
6600	9596	0.35	2.02	7.21	6.43	4.31	3.49	8.69	14.04	34.60	18.87	--
9900	12935	0.33	1.89	7.28	6.38	4.28	3.48	8.96	15.31	30.20	21.61	0.29

Table 4-4.18
Inflowing Sediment Load for the Upper Boundary of Paradise Wash

		Sediment Load by Size Fraction, in percent									
Discharge, in cfs (1)	Sediment Load, in tons (2)	Very Fine Sand (3)	Fine Sand (4)	Medium Sand (5)	Coarse Sand (6)	Very Coarse Sand (7)	Very Fine Gravel (8)	Fine Gravel (9)	Medium Gravel (10)	Coarse Gravel (11)	Very Coarse Gravel (12)
10	10	0.08	2.65	11.92	21.45	21.79	11.09	13.40	12.24	4.51	0.88
1400	7358	0.08	2.65	11.92	21.45	21.79	11.09	13.40	12.24	4.51	0.88
4200	11381	0.05	2.38	11.37	20.54	21.02	10.88	13.94	12.30	6.26	1.27

Table 4-4.19
Inflowing Sediment Load for the Upper Boundary of Desert Hills Wash

		Sediment Load by Size Fraction, in percent									
Discharge, in cfs (1)	Sediment Load, in tons (2)	Very Fine Sand (3)	Fine Sand (4)	Medium Sand (5)	Coarse Sand (6)	Very Coarse Sand (7)	Very Fine Gravel (8)	Fine Gravel (9)	Medium Gravel (10)	Coarse Gravel (11)	Very Coarse Gravel (12)
10	10	0.67	3.43	13.71	24.06	20.68	11.06	12.62	12.23	1.53	--
1400	7358	0.67	3.43	13.71	24.06	20.68	11.06	12.62	12.23	1.53	--
4200	11381	0.41	2.45	10.37	19.78	15.65	8.50	10.52	14.98	15.98	1.35

4-4.3.5 Other Input Data

The following input data is the same for all models.

- The depth of sediment reservoir for each cross section station for all models is set to 10 feet. That limits scour or streambed degradation to 10 feet, or less. Model results are checked to verify that the 10-foot limit was not reached for any of the models.

- The fraction of bed material that is exposed to erosion is set to 100 percent. This indicates that the entire bed is allowed to erode.

- The limits of transported sediment are in the range of very fine sand (0.0625 to 0.125 mm) to large cobbles (128 to 256mm), respectively (HEC, 1993).

- The specific gravity of bed material is set to the HEC-6 default of 2.65.

- The grain shape factor is set to the HEC-6 default of 0.667. A shape factor of a perfect sphere is 1.0 while a very irregular shape has a factor as low as 0.1.

- The coefficient in surface area exposed is set to the HEC-6 default of 0.5.

- The unit weight of deposited sediment is set to the HEC-6 default of 93 pounds / cubic feet.

- The water temperature is set to 68° Fahrenheit.

4-4.4 LIMITATIONS AND ASSUMPTIONS

The following is a summary of limitations and assumptions made in this section.

- Topographic mapping is based on circa 1995 aerial photography and does not reflect changes in geometry due to active sand and gravel mining.

- Base hydraulic parameters are taken from previous studies for specific purposes (100-year floodplain/floodway mapping) using a one-dimensional, fix-bed model.

- HEC-6 does not model horizontal variations in Manning's *n* value. A composite n-value for the left and right overbanks and channel are calculated where necessary.

- HEC-6 can not model bridges or culverts. Those structures were replaced with an equivalent hydraulic section in the HEC-6 models.

- HEC-6 agrades and degrades sediment only located between bank stations. Bank stations are adjusted to account for multiple channels, where appropriate.

- HEC-6 allows only one set of bed material data for a cross section. There is a wide variability in the bed material between the main channels and overbank floodplains. Two types of models, Main Channel and Overbank Models, are used to model the two types of material.

- The coarser bed materials in the channel are modeled using the Meyer-Peter, Muller transport function. The finer bed materials in the overbank floodplain are modeled using the Yang Stream Power transport function.

- Neither an established sediment load rating curve nor recorded sediment load data are available for the watercourses. Inflowing sediment data are synthesized based on transport capacity of hydraulic section and bed material size distribution.

- Inflowing sediment for tributaries of Cave Creek, Paradise Wash, or Desert Hills Wash are assumed to be zero because the discharges from the tributaries are relatively small. The sediment to Apache Wash from Paradise Wash and Desert Hills Wash are generated from the outflowing results from base HEC-6 models of Paradise Wash and Desert Hills Wash. The inflowing sediment load from minor tributaries of Apache Wash are assumed to be insignificant.

- Bed material size gradation is based on field data collection.

4-5.0 MODELING METHODOLOGY

4-5.1 MODELING APPROACH

4-5.1.1 Model Selection And Application

The HEC-6 program, Scour and Deposition in Rivers and Reservoirs, (U.S. Army Corps of Engineers, 1993), was selected during the scoping phase of the project for erosion and sedimentation modeling. This program is typically used for such applications and has been used for erosion and sedimentation studies in Arizona and Maricopa County. However, it is well recognized by the developer of that program (U.S. Army Corps of Engineers, Hydrologic Engineering Center) and the users of that program, that use of HEC-6 for single-event modeling is limited. Results of HEC-6 modeling must be used with care and HEC-6 output is subject to interpretation. Furthermore, use of HEC-6 for watercourses is complicated by the following:

a. Flow is unsteady with rapidly rising and falling discharge rates.
b. Flow is nonuniform and may be critical or supercritical under certain flow conditions in various reaches of the watercourse.
c. The geometry of the watercourse varies spatially leading to frequent changes in flow characteristics (velocity, depth, width, etc.).
d. The hydraulic resistance to flow is highly variable due to nonuniform bed and bank material and vegetation conditions throughout the watercourse.
e. The size gradations of the watercourse bed, bank and overbank floodplains are highly variable.
f. The watercourses can be subject to large sediment inflows during floods.

Those factors, coupled with the lack of model calibration data for the study watercourses, requires that model input be carefully developed and evaluated by sensitivity analyses, and that several models be developed so that results can be interpreted within the realm of physical possibilities.

The use of multiple models and the interpretation of those model results provide reasonable confidence that the qualitative aspects of erosion and sedimentation can be

correctly assessed, and that quantitative magnitudes of sedimentation (sediment loads, erosion, deposition, aggradation and degradation) can be estimated and compared under various development alternatives for the watersheds and watercourses.

4-5.1.2 Model Development

HEC-6 models of watercourses were developed for the following conditions and/or modeling assumptions:

Hydrology – Models were developed for the 10-year and 100-year floods with both existing (1997) watershed conditions and future (full build-out) watershed conditions.

Condition of Watercourse – Models were developed for the watercourses in their existing (1997) physical condition.

Bed Material Size Gradation – Models were developed based on bed material size gradation as determined by field data collection from the main channels and overbank floodplains of the watercourses.

Incoming Sediment Load – The incoming sediment load for the models was estimated, as previously described, and was entered into the models by a rating curve. Those rating curves are used for all models except for the sensitivity analyses.

Sensitivity Analyses – Numerous HEC-6 models were developed for the purpose of evaluating the sensitivity of model input. Discussion of HEC-6 models for sensitivity analyses is presented in Section 4-6.0.

4-5.1 MODEL IDENTIFICATION

A total of 50 HEC-6 models were developed and used for the purpose of evaluating erosion and sedimentation of Cave Creek, Apache Wash, Paradise Wash and Desert Hills Wash and for sensitivity analysis of model input. Tables 4-5.1 through 4-5.8 identify each of the HEC-6 models. Tables 4-5.1, 4-5.3, 4-5.5, and 4-5.7 are for the Main Channel Models, and Tables 4-5.2, 4-5.4, 4-5.6, and 4-5.8 are for the Overbank Models. The first four models that are listed in each of those tables are used for evaluating the erosion and sedimentation of the watercourses. The input and output files are included in Appendix H for the 100-year conditions. The four models at the bottom of Main

Channel Models list are the HEC-6 models that were used for sensitivity analyses. A CD containing the input files for each of the 50 HEC-6 models is provided in Appendix J.

Table 4-5.1

Cave Creek HEC-6 Main Channel Models

File Name	Condition	Flood Event	Tributary Sediment Inflow	Transport Function	D_{50} Bed Material, in mm	Inflowing Sediment	Purpose
CC-E100C	Existing	100-year	None	Meyer-Peter, Muller	8.2	Base	100-year, existing watershed condition base model
CC-F100C	Future	100-year	None	Meyer-Peter, Muller	8.2	Base	100-year, future watershed condition base model
CC-E10C	Existing	10-year	None	Meyer-Peter, Muller	8.2	Base	10-year, existing watershed condition base model
CC-F10C	Future	10-year	None	Meyer-Peter, Muller	8.2	Base	10-year future watershed condition base model
CC-QSX00	Future	100-year	None	Meyer-Peter, Muller	8.2	None	Evaluate sensitivity to low sediment inflow
CC-QSX10	Future	100-year	None	Meyer-Peter, Muller	8.2	10 times Base	Evaluate sensitivity to high sediment inflow
CC-SD75C	Future	100-year	None	Meyer-Peter, Muller	14.2	Base	Evaluate sensitivity to larger bed material
CC-SD75F	Future	100-year	None	Meyer-Peter, Muller	2.0	Base	Evaluate sensitivity to smaller bed material

Table 4-5.2

Cave Creek HEC-6 Overbank Models

File Name	Condition	Flood Event	Tributary Sediment Inflow	Transport Function	D_{50} Bed Material, in mm	Inflowing Sediment	Purpose
CC-E100F	Existing	100-year	None	Yang Stream Power	8.2	Base	100-year, existing watershed condition base model
CC-F100F	Future	100-year	None	Yang Stream Power	8.2	Base	100-year, future watershed condition base model
CC-E10F	Existing	10-year	None	Yang Stream Power	8.2	Base	10-year, existing watershed condition base model
CC-F10F	Future	10-year	None	Yang Stream Power	8.2	Base	10-year future watershed condition base model

Table 4-5.3

Apache Wash HEC-6 Main Channel Models

File Name	Condition	Flood Event	Tributary Sediment Inflow	Transport Function	D_{50} Bed Material, in mm	Inflowing Sediment	Purpose
AW-E100C	Existing	100-year	None	Meyer-Peter, Muller	11.0	Base	100-year, existing watershed condition base model
AW-F100C	Future	100-year	None	Meyer-Peter, Muller	11.0	Base	100-year, future watershed condition base model
AW-E10C	Existing	10-year	None	Meyer-Peter, Muller	11.0	Base	10-year, existing watershed condition base model
AW-F10C	Future	10-year	None	Meyer-Peter, Muller	11.0	Base	10-year future watershed condition base model
AW-QSX00	Future	100-year	None	Meyer-Peter, Muller	11.0	None	Evaluate sensitivity to low sediment inflow
AW-QSX05	Future	100-year	None	Meyer-Peter, Muller	11.0	10 times Base	Evaluate sensitivity to high sediment inflow
AW-SD75C	Future	100-year	None	Meyer-Peter, Muller	19.3	Base	Evaluate sensitivity to larger bed material
AW-SD75F	Future	100-year	None	Meyer-Peter, Muller	2.8	Base	Evaluate sensitivity to smaller bed material

Table 4-5.4

Apache Wash HEC-6 Overbank Models

File Name	Condition	Flood Event	Tributary Sediment Inflow	Transport Function	D_{50} Bed Material, in mm	Inflowing Sediment	Purpose
AW-E100F	Existing	100-year	None	Yang Stream Power	11.0	Base	100-year, existing watershed condition base model
AW-F100F	Future	100-year	None	Yang Stream Power	11.0	Base	100-year, future watershed condition base model
AW-E10F	Existing	10-year	None	Yang Stream Power	11.0	Base	10-year, existing watershed condition base model
AW-F10F	Future	10-year	None	Yang Stream Power	11.0	Base	10-year future watershed condition base model

Table 4-5.5

Paradise Wash HEC-6 Main Channel Models

File Name	Condition	Flood Event	Tributary Sediment Inflow	Transport Function	D_{50} Bed Material, in mm	Inflowing Sediment	Purpose
PW-E100C	Existing	100-year	None	Meyer-Peter, Muller	22.8	Base	100-year, existing watershed condition base model
PW-F100C	Future	100-year	None	Meyer-Peter, Muller	22.8	Base	100-year, future watershed condition base model
PW-E10C	Existing	10-year	None	Meyer-Peter, Muller	22.8	Base	10-year, existing watershed condition base model
PW-F10C	Future	10-year	None	Meyer-Peter, Muller	22.8	Base	10-year future watershed condition base model
PW-QSX00	Future	100-year	None	Meyer-Peter, Muller	22.8	None	Evaluate sensitivity to low sediment inflow
PW-QSX10	Future	100-year	None	Meyer-Peter, Muller	22.8	10 times Base	Evaluate sensitivity to high sediment inflow
PW-SD75C	Future	100-year	None	Meyer-Peter, Muller	39.9	Base	Evaluate sensitivity to larger bed material
PW-SD75F	Future	100-year	None	Meyer-Peter, Muller	5.7	Base	Evaluate sensitivity to smaller bed material

Table 4-5.6

Paradise Wash HEC-6 Overbank Models

File Name	Condition	Flood Event	Tributary Sediment Inflow	Transport Function	D_{50} Bed Material, in mm	Inflowing Sediment	Purpose
PW-E100F	Existing	100-year	None	Yang Stream Power	22.8	Base	100-year, existing watershed condition base model
PW-F100F	Future	100-year	None	Yang Stream Power	22.8	Base	100-year, future watershed condition base model
PW-E10F	Existing	10-year	None	Yang Stream Power	22.8	Base	10-year, existing watershed condition base model
PW-F10F	Future	10-year	None	Yang Stream Power	22.8	Base	10-year future watershed condition base model

Table 4-5.7

Desert Hills Wash HEC-6 Main Channel Models

File Name	Condition	Flood Event	Tributary Sediment Inflow	Transport Function	D_{50} Bed Material, in mm	Inflowing Sediment	Purpose
DH-E100C	Existing	100-year	None	Meyer-Peter, Muller	16.9	Base	100-year, existing watershed condition base model
DH-F100C	Future	100-year	None	Meyer-Peter, Muller	16.9	Base	100-year, future watershed condition base model
DH-E10C	Existing	10-year	None	Meyer-Peter, Muller	16.9	Base	10-year, existing watershed condition base model
DH-F-10C	Future	10-year	None	Meyer-Peter, Muller	16.9	Base	10-year future watershed condition base model
DH-QSX00	Future	100-year	None	Meyer-Peter, Muller	16.9	None	Evaluate sensitivity to low sediment inflow
DH-QSX10	Future	100-year	None	Meyer-Peter, Muller	16.9	10 times Base	Evaluate sensitivity to high sediment inflow
DH-SD75C	Future	100-year	None	Meyer-Peter, Muller	29.6	Base	Evaluate sensitivity to larger bed material
DH-SD75F	Future	100-year	None	Meyer-Peter, Muller	4.2	Base	Evaluate sensitivity to smaller bed material

Table 4-5.8

Desert Hills Wash HEC-6 Overbank Models

File Name	Condition	Flood Event	Tributary Sediment Inflow	Transport Function	D_{50} Bed Material, in mm	Inflowing Sediment	Purpose
DH-E100F	Existing	100-year	None	Yang Stream Power	16.9	Base	100-year, existing watershed condition base model
DH-F100F	Future	100-year	None	Yang Stream Power	16.9	Base	100-year, future watershed condition base model
DH-E10F	Existing	10-year	None	Yang Stream Power	16.9	Base	10-year, existing watershed condition base model
DH-F-10F	Future	10-year	None	Yang Stream Power	16.9	Base	10-year future watershed condition base model

4-6.0 SENSITIVITY ANALYSES

4-6.1 PURPOSE OF SENSITIVITY ANALYSES

Sensitivity analyses of input to the HEC-6 models were performed to assess if variability in model input would substantively change the model results. Sensitivity analyses were performed on the major input parameters that are expected to have significant impact on model results. The sensitivity analyses were performed for bed material size distribution, and incoming sediment load, as discussed in the following.

The HEC-6 models that are used for sensitivity testing are identified in Tables 4-5.1 through 4-5.8. HEC-6 input files are provided in Appendix 4-I. The results of the sensitivity analyses are presented in graphical form in the appendices. A set of three graphs is used to illustrate the HEC-6 model results for each sensitivity run. Those three graphs are described as follows:

Bed Elevation Change at Last Time Step – This graph shows the change in bed elevation at each modeling cross section at the end of the flood hydrograph. A positive number indicates bed aggradation and a negative number indicates be degradation.

Sediment Passing Through Section – This graph illustrates the sediment load, in tons, that passes through each modeling section for the duration of the flood hydrograph. Water flow and sediment transport is from larger river mile to smaller river mile (right to left on the graph). A rise in the line (from right to left) indicates an increasing sediment load passing the next downstream section, and that indicates "scour" from that reach of watercourse. Conversely, a fall in the line indicates "fill" from that reach of watercourse.

Accumulative Sediment Deposited Upstream of Section – This is a running accumulation of sediment deposited (+ number) or eroded (- number) starting at the upstream end (right side of graph) and progressing downstream (to the left). Line segments (or trend of sections of the graph) sloping downward to the left indicate reaches of overall degradation. Line segments sloping upward to the left indicate reaches of overall aggradation.

4-6.2 BED MATERIAL SIZE DISTRIBUTION

Sensitivity to the input of sediment bed material size distribution was evaluated by running 100-year flood, future condition Main Channel HEC-6 models with finer bed material and coarser bed material. For the finer bed material, the base input size distribution was multiplied by 0.25. That is, each sediment size within a fraction of the grain size distribution was multiplied by 0.25. For the coarser grain size, the base input size distribution was multiplied by 1.75. The same procedure was used as for the finer grain size.

The results of the sensitivity analyses of bed material size distribution are shown in Appendix I for all watercourses. The runs with the finer bed material generally result in greater magnitudes of sediment transport, and the runs with coarser bed material generally result in lesser magnitudes of sediment transport, both as expected. However, in general, a change in bed material size distribution does not change the overall performance of the models; that is, although the magnitudes of scour (degradation) and fill (aggradation) change, the overall sedimentation process is not significantly affected by a change in bed material size. Although flow resistance is dependant on bed material grain size, no adjustment in Manning's *n* was made in these sensitivity analyses.

4-6.3 INFLOWING SEDIMENT LOAD

Sensitivity to the input of inflowing sediment load was evaluated by running 100-year, future condition, Main Channel HEC-6 models with increased sediment load and reduced sediment load. For increased sediment load, the inflowing sediment load rating curves for most models were multiplied by 10. For Apache Wash the inflowing sediment load rating curve was multiplied by 5. For reduced sediment load, the inflowing sediment load was completely eliminated; that is, zero inflowing sediment load as compared to the base models. The results of the sensitivity analyses of inflowing sediment load are shown in Appendix I for all the watercourses.

For Cave Creek, Apache Wash, Paradise Wash and Desert Hills Wash, an increase in the inflowing sediment at the upper boundary causes localized deposition, but that effect does not propagate downstream any appreciable distance. The inflow of Paradise Wash and Desert Hills Wash to Apache Wash also has a localized depositional effect. A decrease in inflowing sediment causes localized degradation, but that effect does not

propagate downstream any appreciable distance. The only significant impact is at the lower end where increased or decreased sediment load would result in larger or smaller magnitudes of sediment deposition upstream of Cave Creek Dam.

Overall, this analysis indicates that the watercourses have the hydraulic capacity to transport large quantities of inflowing sediment through the systems. High concentrations of inflowing sediment can result in the build-up of local sediment bars that can result in breakout flooding. Any increase in inflowing sediment exacerbates the sediment deposition upstream of Cave Creek Dam. Reduced sediment inflow would result in some long-term degradation, however bed armoring would likely limit that action, and would decrease deposition upstream of the dam.

4-7.0 EROSION & SEDIMENTATION ANALYSES RESULTS

4-7.1 GENERAL

The erosion and sedimentation analyses of Cave Creek, Apache Wash, Desert Hills Wash and Paradise Wash within the study area were performed by modeling the watercourses using the HEC-6 program. Various models were prepared to investigate the erosion and sedimentation potential of those watercourses under a variety of watershed hydrologic conditions and hydraulic conditions. The HEC-6 results are interpreted with the intent of understanding how the watercourses will respond under various development conditions in the watersheds and under selected management scenarios for the watercourses. The interpretation of those model results are presented herein.

HEC-6 modeling was performed for existing and future watershed conditions, and for 10- and 100-year floods. These are termed "base conditions," and they describe a range of conditions that can be expected under reasonable scenarios of land development and floodplain management. Interpretation of those results provides an assessment of sedimentation impacts of selected alternatives in watercourse management. The HEC-6 modeling methodology that is employed uses a reasonable range of values for certain input parameters and two different sediment transport functions. The use of two transport functions is to appropriately model the range of bed material size gradation that exists in the watercourses.

HEC-RAS models of the encroached watercourses were developed (Section 4-7.2) for the purpose of hydraulic analyses and evaluation of alternatives. HEC-6 modeling of encroached watercourses was performed and those results were compared to results for unencroached conditions. The general results are the same with deviation only in regard to magnitude. The numeric difference in HEC-6 model results between encroached and unencroached conditions is within the accuracy expectation for sediment modeling. Therefore, although the magnitudes of erosion and fill or aggradation and degradation will vary somewhat for encroached conditions, the tendencies and general sedimentation response is the same as for unencroached

conditions. Results for unencroached HEC-6 models are presented, and these are applicable for encroached conditions, within the accuracy of such models.

4-7.2 HEC-6 MODEL OUTPUT

Numerous HEC-6 models were developed and run. Those models were developed for the purpose of investigating the erosion and sedimentation processes of the study watercourses, and those models are presented and discussed. The input and output files are provided on CD in Appendix J. Listings of the input files and summary table output for the base condition models are provided in Appendix H. The results of those HEC-6 models are presented in graphical form in this section with supplemental graphs in Appendices K and L. The results of the hydraulic validation of the HEC-6 models is provided in Section 4-4 and sensitivity analyses of key input parameters are provided in Section 4-6. The output shows the following error message: "ERROR 15." Stantec has discussed the problem with the U.S. Army Corps of Engineering Hydraulic Engineering Center. The problem has to do with running HEC-6 on a networked machine. The error message does not change the results of model. At the end of each run the following message is displayed "0 DATA ERRORS DETECTED."

4-7.3 GRAPHICAL RESULTS OF THE HEC-6 MODELS

4-7.3.1 Description of Graphs

The HEC-6 program produces voluminous output, therefore, a convenient means to present and interpret those results is necessary. The HEC-6 model output for the 100-year flood models are presented in a set of five graphs for each of the 32 base condition models. Each of those five graphs is described as follows:

Bed Elevation Change at Last Time Step – This graph shows the change in bed elevation at each modeling cross section at the end of the 100-year flood hydrograph. A positive number indicates bed aggradation and a negative number indicates bed degradation. A 4-point moving average line is also shown which better illustrates reach average conditions.

Maximum and Minimum Bed Elevation Change – This graph shows both the maximum fill (aggradation) and maximum scour (degradation) that occurs at any time during the 100-year flood. The maximum scour is represented by the minimum bed elevation

change. During the passage of a flood, a section may only experience scour, or it may only experience fill, or it may at times be scouring and at other times filling. A section that has a zero for maximum bed elevation change is always in a scour mode. A section that has a zero for minimum bed elevation change is always in a fill mode. A section that has both a positive number for maximum bed elevation change and a negative number for minimum bed elevation change experiences both scour and fill during passage of the 100-year flood. This information is useful in estimating potential toe-down requirements for watercourse bank lining and also the potential for excessive local fill that could cause breakout flows.

Sediment Passing through Section – This graph illustrates the sediment load, in tons, that passes through each modeling section for the duration of the 100-year flood. Water flow and sediment transport is from larger river station to smaller river station (right to left on the graph). A rise in the line (from right to left) indicates an increasing sediment load passing the next downstream section, and that indicates "scour" from that reach of watercourse. Conversely, a fall in the line indicates "fill" from that reach of watercourse. A 4-point moving average line is also shown which better illustrates reach average conditions.

Accumulative Sediment Deposited Upstream of Section – This is a running accumulation of sediment deposited (+ number) or eroded (- number) starting at the upstream end (right side of graph) and progressing downstream (to the left). HEC-6 calculates accumulation of sediment using the $VOL record. This record is placed after the hydrologic data in the model. Line segments (or trend of sections of the graph) sloping downward to the left indicate reaches of overall degradation. Line segments sloping upward to the left indicate reaches of overall aggradation. A 4-point moving average line is also provided on each graph.

These graphs are used to identify trends of aggradation (filling) and degradation (scour) according to the slope of the line or the slope of a reach averaged line, and also the relative magnitude of scour or fill. That is, a long sustained downward line with a steep slope indicates aggressive scour over a long reach of watercourse, thus likely degradation and or bank attack, and a similar line but sloped upward would indicate a region of sediment deposition with avulsion hazard. Alternatively, short sloping lines would indicate reaches that may be described as pool and riffle sequences or the formation of gravel bars.

Sediment Load and Flood Hydrograph – This is a graph of the flood hydrograph with the time distribution of sediment load, in tons per day, plotted at the same time scale as the flood hydrograph. One or more such graphs are provided to illustrate the flood magnitude with the corresponding sediment load. It is noted that the sediment load is bed material load not total sediment load.

A descriptive listing of the 32 100-year flood HEC-6 models is provided in the Table 4-7.1. The graphical results are provided in Appendix K.

For the 10-year flood, only two graphs (Bed Elevation Change at Last Time Step and Accumulative Sediment Deposited Upstream of Section) are used in each set to describe the erosion and sedimentation results. Those graphical results are presented in Appendix L.

4-7.3.2 General Scour and Fill

The maximum general scour and fill during floods (100-year and 10-year) are provided in Table 4-7.2. Usually the magnitudes of scour and fill is slightly greater under future conditions as opposed to existing conditions. Similarly, the magnitude of scour and fill usually is the greatest for the 100-year flood rather than the 10-year flood. However, there are a few instances where the existing or 10-year flood is larger than the future or 100-year flood, respectively. Those differences are a few tenths of a foot and are attributed to hydrograph timing and the magnitude of upstream sediment transport that may reduce downstream scour or fill magnitudes. The values in Table 4-7.2 are reasonable. There are no excessively large values that would be indicative of errors in modeling. For example, the maximum general scour and fill depths for the watercourses for various hydrologic and watershed conditions, as shown in Table 4-7.2, are reasonable.

Table 4-7.1
Index of graphical results of HEC-6 models for the Cave Creek and Apache Wash Watercourse Master Plan (100-year flood) (See Appendix K)

Figure Numbers in Appendix K	Cave Creek	Apache Wash	Desert Hills Wash	Paradise Wash	Main Channel Model	Overbank Model	Existing Conditions	Future Conditions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CC-C-1 through 4	•				•		•	
CC-O-1 through 4	•					•	•	
CC-C-5 through 13	•				•			•
CC-O-5 through 13	•					•		•
AW-C-1 through 4		•			•		•	
AW-O-1 through 4		•				•	•	
AW-C-5 through 13		•			•			•
AW-O-5 through 13		•				•		•
DHW-C-1 through 4			•		•		•	
DHW-O-1 through 4			•			•	•	
DHW-C-5 through 8			•			•	•	
DHW-O-5 through 8			•			•		•
PW-C-1 through 4				•	•		•	
PW-O-1 through 4				•		•	•	
PW-C-5 through 8				•	•			•
PW-O-5 through 8				•		•		•

Table 4-7.2

Maximum general scour and fill during floods

	Cave Creek		Apache Wash		Paradise Wash		Desert Hills Wash	
	Scour, ft. (1)	Fill, ft (2)	Scour, ft. (3)	Fill, ft (4)	Scour, ft. (5)	Fill, ft (6)	Scour, ft. (7)	Fill, ft (8)
				100-year Flood				
Existing Conditions:								
Main Channel Model	3.3	2.9	3.5	2.8	1.1	2.0	0.6	0.1
Overbank Model	1.8	0.5	0.8	0.3	0.5	0.2	0.8	0.0
Future Conditions:								
Main Channel Model	2.9	3.8	5.6	3.3	1.3	0.9	0.6	0.1
Overbank Model	1.4	0.4	0.7	0.3	0.5	0.2	0.6	0.0
				10-year Flood				
Existing Conditions:								
Main Channel Model	3.2	2.6	1.3	2.1	0.6	1.4	0.1	0.2
Overbank Model	1.3	0.4	0.4	0.2	0.5	0.2	0.0	0.1
Future Conditions:								
Main Channel Model	3.3	3.1	3.6	2.0	0.6	1.6	0.1	0.2
Overbank Model	1.3	0.4	0.4	0.2	0.5	0.2	0.0	0.1

4-7.3.3 Interpretation of Erosion and Sedimentation

The graph that is particularly useful in interpreting the erosion and sedimentation process is the Accumulative Sediment Deposited Upstream of Section graph. That graph is best interpreted by starting at the upstream end (the right edge of the graph) and to progress downstream (to the left). A line segment sloping down to the left indicates a reach experiencing degradation (scour) and conversely a line segment sloping up to the left indicates a reach experiencing aggradation (fill). The five point moving average line is used in the interpretation of results since it smooths out fluctuations at individual modeling sections and better represents reach average tendencies. Use of the moving average line is beneficial in that it avoids placing undue emphasis on numeric values at specific locations in the watercourse and rather is indicative of trends and reach average magnitudes. That graph also shows if the modeled reach is in sediment balance, that is, the line returns to zero at its left end. A negative value at the left end indicates a net scour through the modeled length of watercourse, while a positive value indicates a net fill. Figures 4-7.1 through 4-7.22 are those graphs that are used to interpret the erosion and sedimentation process in Cave Creek and the other study watercourses.

When interpreting results using those graphs, the Main Channel graphs represent the coarser bed material that is typically in the main channel of the watercourse, and the Overbank graphs represent the finer bed material that is typically in the floodplain overbanks. The actual erosion and sedimentation in the watercourses cannot be modeled using HEC-6 because of the nonuniformity of bed material that exists laterally across each cross section of watercourse. However, the HEC-6 results as depicted herein do provide spatial trends and general magnitudes of the erosion and sedimentation process.

4-7.3.4 Cave Creek

The Cave Creek HEC-6 model results are presented in graphical and tabular form in the report with supplemental graphs in Appendices K and L. The HEC-6 models extend from approximately River Station (RS) 24.5 miles, which is within the 100-year flood impoundment zone of Cave Buttes Dam, upstream to RS 31.9 miles, which is about 2.1 miles upstream of the Carefree Highway Bridge. The upstream study limit for Cave

Creek is the Carefree Highway Bridge (RS 29.8 miles) and the additional 2.1 miles of river that is modeled upstream of the study limit is used to avoid boundary conditions influencing the model results in the study area. The zone of active gravel mining in Cave Creek extends from about RS 25.2 miles to RS 26.8 miles.

100-year Flood, Existing Hydrologic Conditions

The results of the HEC-6 models that are used to interpret the general erosion and sedimentation of Cave Creek during a large flood (100-year) under existing hydrologic conditions in the watershed are shown in Figures 4-7.1 and 4-7.2.

Starting at the Carefree Highway Bridge (RS 29.8 miles), there is a short reach of the watercourse (about 0.2 miles) that is degradational, which may be induced by high velocity flows through the bridge. That scour zone is shown in both Figures 4-7.1 and 4-7.2 (by both the Main Channel and the Overbank Models). The next reach (RS 29.6 miles to about 29.2 miles) is a depositional zone with likely accumulation of the coarser bed material (cobble and gravel) but with the finer bed material (sand) being flushed through. That is an area where a gravel mine is permitted by the Arizona State Land Department (Permit Number 04-23861, D. Steffan) which suggests that the area may exhibit tendencies for gravel deposits.

The overbank floodplain from about RS 29.0 miles to about RS 27.1 miles would generally be in a scour mode during large floods. Such scour would likely result in channel cutting and bank erosion of secondary channels within the western overbank (see Figure 4-7.2). However, within that same reach, there is a tendency for the deposition of coarser material, possibly resulting in some gravel bars, between RS 28.8 miles to RS 28.2 miles (see Figure 4-7.1). Such gravel bars could produce changes in flow direction resulting in realignment of the main channel and bank attack. From RS 28.2 miles to RS 27.8 miles, there is a slight tendency for fill of coarser bed material, but that reach is in near sediment balance. From RS 27.8 miles to RS 27.3 miles is in a scour mode for both the main channel and the overbank.

From about RS 27.3 miles and downstream to the end of the study limit, Cave Creek is in an aggradation mode during large floods. This is caused by the backwater of impounded waters in Cave Buttes Dam and the high sediment load in the watercourse during a large flood. As illustrated in Figure 4-7.1, virtually all of the coarse bed material is deposited in that reach and very little, if any, of the coarse sediment would enter the

Cave Buttes Dam impoundment during a large flood. As illustrated in Figure 4-7.2, although there is a greater transport of finer material upstream of RS 27.0 miles, only a portion (maybe 25 percent) would deposit in the backwater of the dam. The majority of the finer bed material will enter the flood impoundment zone and be distributed within the reservoir area. The coarser particles settling out quickly in the reservoir followed progressively by smaller particle sizes. Only the finest sand, silt and virtually all of the clay particles will be conveyed through the reservoir to be deposited within the deeper flood inundation zone behind the dam.

As noted above, Cave Creek is a depositional (fill) reach during large floods downstream of about RS 27.3 miles. Within that reach is the active Wheeler Mine and the inactive Tanner Mine. Although the gravel pit geometry (except that shown in the 1995 topographic mapping) is not incorporated into the HEC-6 models, that reach of watercourse will benefit from the natural process of sediment filling during large floods. The gravel mining that has occurred since 1995 (which is not reflected in the topographic maps nor the hydraulic geometry of the HEC-6 models) will, for the most part, enhance the net depositional tendency in that reach resulting in somewhat more "filling" by sediment during floods than the HEC-6 results show. The effect of large floods in Cave Creek likely will be beneficial in filling the gravel pits. However, severe adverse local scour or fill can occur at gravel pits and/or gravel mounds and those impacts are beyond the capability of HEC-6 modeling to predict.

100-year Flood, Future Hydrologic Conditions

The HEC-6 model results for future hydrologic conditions are shown in Figures 4-7.3. and 4-7.4. Future land development in the large Cave Creek watershed will have the effect of only slightly increasing the peak discharge and runoff volume. A large percentage of the watershed will be unaffected by land development. Therefore, the flood hydrograph for future conditions is not much different than the flood hydrograph for existing conditions. The flood hydrographs are the only difference in the HEC-6 models between the existing and future conditions. Accordingly, the erosion and sedimentation process in Cave Creek is not affected to any large degree by future hydrologic conditions. Comparison of Figure 4-7.3 and Figure 4-7.1 indicates that under future conditions there is a slight (about 10 percent) increase in net scour upstream of RS 27.3 miles and a corresponding, slightly greater deposit of coarse material in the reservoir backwater. Comparison of Figure 4-7.4 and Figure 4-7.2 indicates approximately a similar magnitude of scour upstream of RS 27.0 but that the deposition zone is "pushed" further into the backwater zone of the

reservoir under future conditions. Apparently, the increased flood hydrograph is more effective in "flushing" the fine sediments into the reservoir. However, overall there is little discernable difference in the erosion and sedimentation process in Cave Creek for large floods under either existing or future conditions in the watershed.

10-year Flood, Existing Hydrologic Conditions

The results of the HEC-6 models that are used to interpret the general erosion and sedimentation of Cave Creek during a more frequent flood (10-year) under existing hydrologic conditions in the watershed are shown in Figure 4-7.5 and 4-7.6.

Starting at the Carefree Highway Bridge (RS 29.8 miles), there is a short reach of watercourse that is degradational, which may be induced by somewhat higher velocities through the bridge. That scour zone is mainly illustrated in Figure 4-7.6, whereas Figure 4-7.5 shows only a slight tendency toward scour. It is likely that during such floods, scour downstream of the bridge will "sort out" the finer bed material leaving the coarser material behind. This could result in some bank attack and widening of the main channel.

From about RS 27.6 miles to about RS 27.2 miles, the watercourse will be slightly degradational but with occasional build-up of gravel bars. The flow will mainly transport the finer bed material (sands) through the system with the coarser bed material (cobble and gravel) contributing to migrating riffles and pools.

Downstream of about RS 27.2 miles, which includes the gravel mining reach, is a deposition zone of virtually all the coarse material and about 30 percent of the entering finer bed material. Most of the finer material will be transported through the reach and be deposited in the Cave Buttes Dam impoundment further downstream. As discussed previously for the 100-year flood, the existing (and likely expanded) gravel mining effects in that reach could produce more effective "trapping" of the finer sediments in that reach.

Both the 100-year flood (see Figures 4-7.1 through 4-7.4) and the 10-year flood (see Figures 4-7.5 through 4-7.8) indicate deposition downstream of approximately RS 27.0; however, it is noted that for larger floods, a larger quantity of sediment load is deposited in the watercourse prior to entering the Cave Buttes Dam impoundment area as compared to smaller floods. That is because larger floods fill more of the impoundment volume resulting in the backwater zone extending further upstream. Small floods will travel further into the impoundment before entering the backwater of the dam.

A sequence of smaller, more frequent floods will have the net effect of scour upstream of about RS 27.0 miles. Since the bed of the main channel is generally well "armored" by coarser bed material and the smaller floods will generally not be able to transport those larger sizes, the smaller floods will likely result in bank erosion and lateral migration. Downstream of RS 27.0 miles, there is a tendency for the accumulation of coarser bed material. That may result in gravel bars and/or filling of gravel mined areas. The impoundment will continue to be filled with finer bed material and wash load that settles in the reservoir.

10-year Flood, Future Hydrologic Conditions

Difference between the 10-year flood under existing and future hydrologic conditions in the watershed are very minor for Cave Creek. Comparisons of Figures 4-7.5 and 4-7.7 (Main Channel Models) and Figures 4-7.6 and 4-7.8 (Overbank Models) indicate virtually no differences in erosion and sedimentation for smaller floods. The results under future conditions are essentially the same as for existing conditions.

4-7.3.5 Apache Wash

The Apache Wash HEC-6 model results are presented in graphical and tabular form in the report with supplemental graphs in Appendices K and L. The HEC-6 models extend from RS 0.20 miles, which is approximately the 100-year flood inundation limit for Cave Buttes Dam, to about RS 8.0 miles. The upper study limit boundary is RS 7.7 miles. Carefree Highway crosses the watercourse at RS 4.6 miles. The confluences of Desert Hills Wash and Paradise Wash occur between about RS 2.5 miles and RS 3.0 miles.

100-year Flood, Existing Hydrologic Conditions

The results of the HEC-6 models that are used to interpret the general erosion and sedimentation of Apache Wash during a large flood (100-year) under existing hydrologic conditions in the watershed are shown in Figures 4-7.9 and 4-7.10.

Starting at the upstream study limit (RS 7.7 miles), the watercourse is generally in a scour mode downstream to the Carefree Highway crossing (RS 4.6 miles). As demonstrated in Figure 4-7.10, there is a continuous tendency for scour of the finer bed material; however, as demonstrated in Figure 4-7.9, the coarser bed material is expected to alternate between short reaches of scour separated by reaches of fill. There is an overall tendency for deposition of coarser bed material to occur from RS 5.8 miles to the Carefree Highway crossing. Those modeling results indicate that upstream of the

Carefree Highway crossing there will be continuous erosion of finer material resulting in likely bank attack and possible lateral migration. Within the main channel, riffles and pools of coarse material may form with a net degradation upstream of RS 6.0 miles and net aggradation between RS 6.0 miles and the Carefree Highway.

Between RS 4.8 miles to RS 4.5 miles is a zone of flow expansion that contains the Carefree Highway culvert. That reach will be a likely fill zone of sediment eroded from the upstream watercourse. From that reach downstream to the confluence with Desert Hills Wash (RS 3.0 miles) is a reach in near sediment balance, although alternating riffles and pools of coarser bed material can be expected.

The confluences of Desert Hills Wash and Paradise Wash with Apache Wash occurs between RS 3.0 miles to RS 2.5 miles. The incoming sediment from those two watercourses and the channel widening at the confluence with Desert Hills Wash results in a short reach (about 0.3 miles) that will experience sediment deposition. However, past the confluence with Paradise Wash, Apache Wash gains a high sediment transport capacity thus effecting a flushing of sediment through the watercourse to the Cave Buttes Dam impoundment. Overall, there is a net erosion of both finer and coarser bed material sediment through Apache Wash for a large flood indicating that the watercourse will be subject to degradation, bank attack and possible lateral migration. Course sediment deposits at various locations throughout the watercourse could redirect flows which would exacerbate bank erosion and contribute to lateral migration.

100-year Flood, Future Hydrologic Conditions

The HEC-6 model results for future hydrologic conditions are shown in Figures 4-7.11 and 4-7.12. There is a very slight increase in runoff volume and peak discharge from the watershed for a large flood. Comparison of Figures 4-7.9 to 4-7.11 and Figures 4-7.10 to 4-7.12 indicates that the erosion and sedimentation rates are only slightly affected by future hydrologic changes. Overall, the existing erosion and sedimentation characteristics of Apache Wash will continue under future land development.

10-year Flood, Existing and Future Hydrologic Conditions

The results of the HEC-6 models that are used to interpret the general erosion and sedimentation of Apache Wash during a more frequent flood (10-year) are shown in Figures 4-7.13 and 4-7.14. Those figures are generated from HEC-6 model output for existing hydrologic conditions, however, the results are essentially identical for future

hydrologic conditions. The results in Figures 4-7.13 and 4-7.14 show a slight but continuous trend for increased sediment transport downstream throughout Apache Wash. That indicates a tendency for degradation and bank erosion during the more frequent floods. Although the rates of erosion are relatively low for a single flood event, a sequence of such floods can lead to meaningful degradation and bank erosion, especially locally.

4-7.3.6 Paradise Wash

The Paradise Wash HEC-6 model results are presented in graphical and tabular form in the report with supplemental graphs in Appendices K and L. The HEC-6 models extend from the confluence with Apache Wash (RS 0.0 miles) upstream to about RS 2.2 miles. The upstream study limit for Paradise Wash is the Carefree Highway culvert (approximately RS 2.0 miles).

100-year Flood, Existing Hydrologic Conditions

The results of the HEC-6 models that are used to interpret the general erosion and sedimentation tendencies of Paradise Wash during a large flood (100-year) under existing hydrologic conditions in the watershed are shown in Figures 4-7.15 and 4-7.16.

Figure 4-7.16 indicates that the finer bed and bank material of the watercourse will be subject to erosion and transport throughout the study reach. Figure 4-7.15 indicates that there will be erosion and transport of coarser bed material immediately downstream of the Carefree Highway culvert. From about RS 1.8 miles to RS 0.9 miles, the main channel of the watercourse will be aggradational for coarser bed material. Downstream of RS 0.9 miles there is ample transport capacity of the coarse bed material with an overall scouring of the main channel.

Overall, Paradise Wash likely will experience some net erosion, predominantly of the finer bed materials. The main channel is less likely to experience major change of the bed elevation, except due to local conditions. Erosion will be predominantly due to bank erosion, resulting in potential for bank migration. The formation of gravel bars in the channel could realign flow resulting in concentrated bank attack and possible avulsions of the main channel.

100-year Flood, Future Hydrologic Conditions

Future land development in the small Paradise Wash watershed produces relatively small changes to the flood hydrology as compared to existing hydrologic conditions. The erosion and sedimentation response of Paradise Wash is about the same under both existing and future hydrologic conditions.

10-year Flood

The erosion and sedimentation of Paradise Wash for a small flood (10-year) is about the same for both existing and future watershed conditions. Those results are demonstrated in Figures 4-7.17 and 4-7.18. Those figures illustrate a slight trend for scour of finer material throughout the watercourse and some relatively minor transport of coarser bed material. Overall, the watercourse can be expected to experience some bank erosion and the formation of gravel bars periodically in the main channel during small floods. A sequence of such small floods may result in some realignment of the main channel and some migration of channel banks.

4-7.3.7 Desert Hills Wash

The Desert Hills Wash HEC-6 model results are presented in graphical and tabular form in the report with supplemental graphs in Appendices K and L. The HEC-6 models extend from the confluence with Apache Wash (RS 0.0 miles) upstream to about RS 1.0 miles. The upstream study limit for Desert Hills Wash is about RS 0.5 miles.

100-year Flood

There is no discernable difference in erosion and sedimentation between the existing and future hydrologic conditions for Desert Hills Wash. The results are presented in Figure 4-7.19 and 4-7.20. The watercourse will be subject to erosion with a greater transport rate of finer material. The tendency to scour finer material will produce bank erosion with potential lateral migration in places.

10-year Flood

The results are presented in Figures 4-7.21 and 4-7.22 which are representative of both existing and future hydrologic conditions in the watershed. During smaller floods, the overall transport rate is slightly less than the incoming sediment load when considering either the coarser or the finer bed material. This can be caused by backwater effects in Desert Hills Wash caused by flow in Apache Wash resulting in deposition in the lower

reach. The accumulative sediment deposited during small floods is estimated to be very small (a few hundred cubic yards) which indicates that the reach is near sediment balance during small floods.

Figure 4-7.1
Accumulative Sediment Deposited Upstream of Section
Cave Creek Main Channel Model, 100-year Flood, Existing Condition

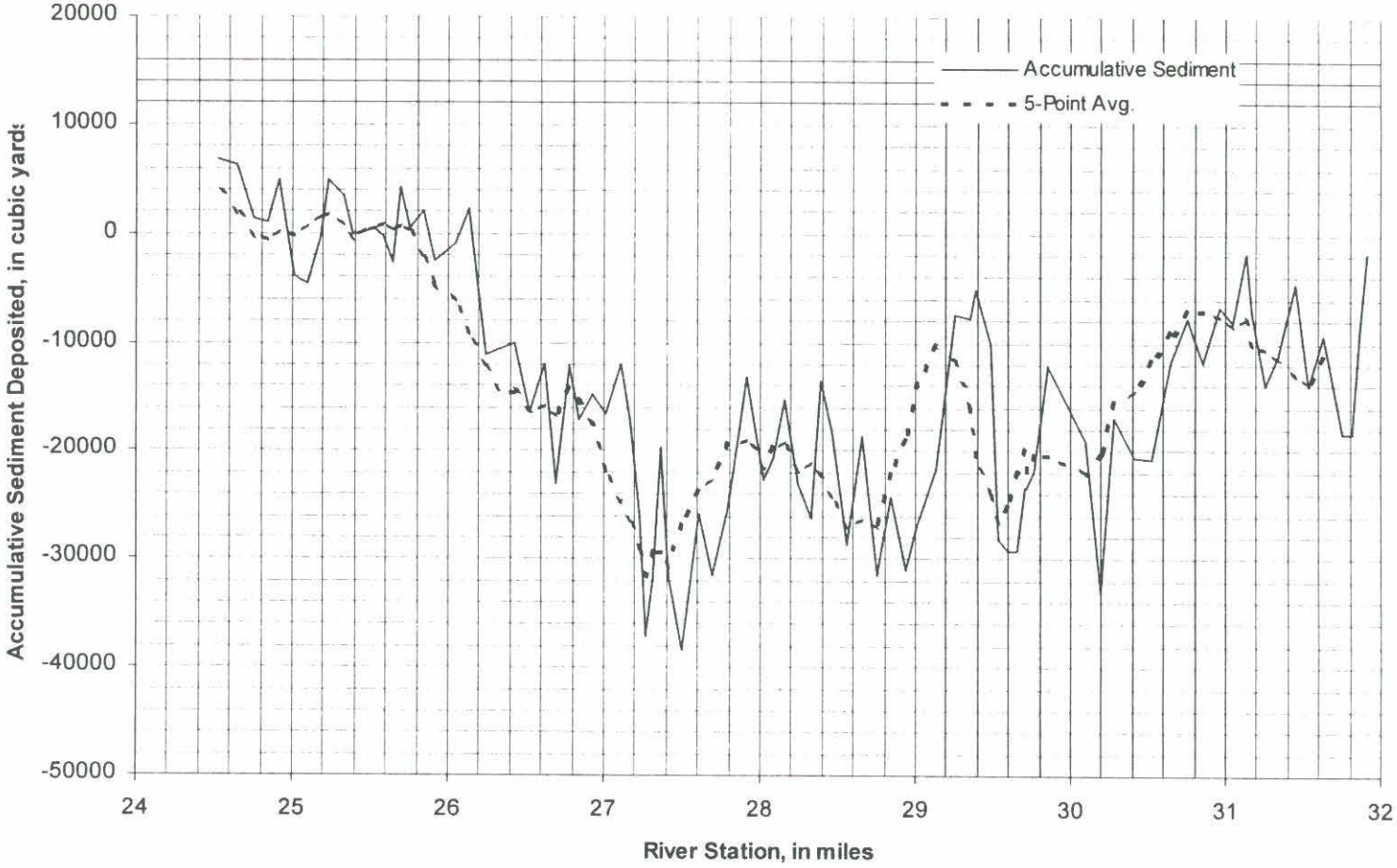


Figure 4-7.2
Accumulative Sediment Deposited Upstream of Section
Cave Creek Overbank Model, 100-year Flood, Existing Condition

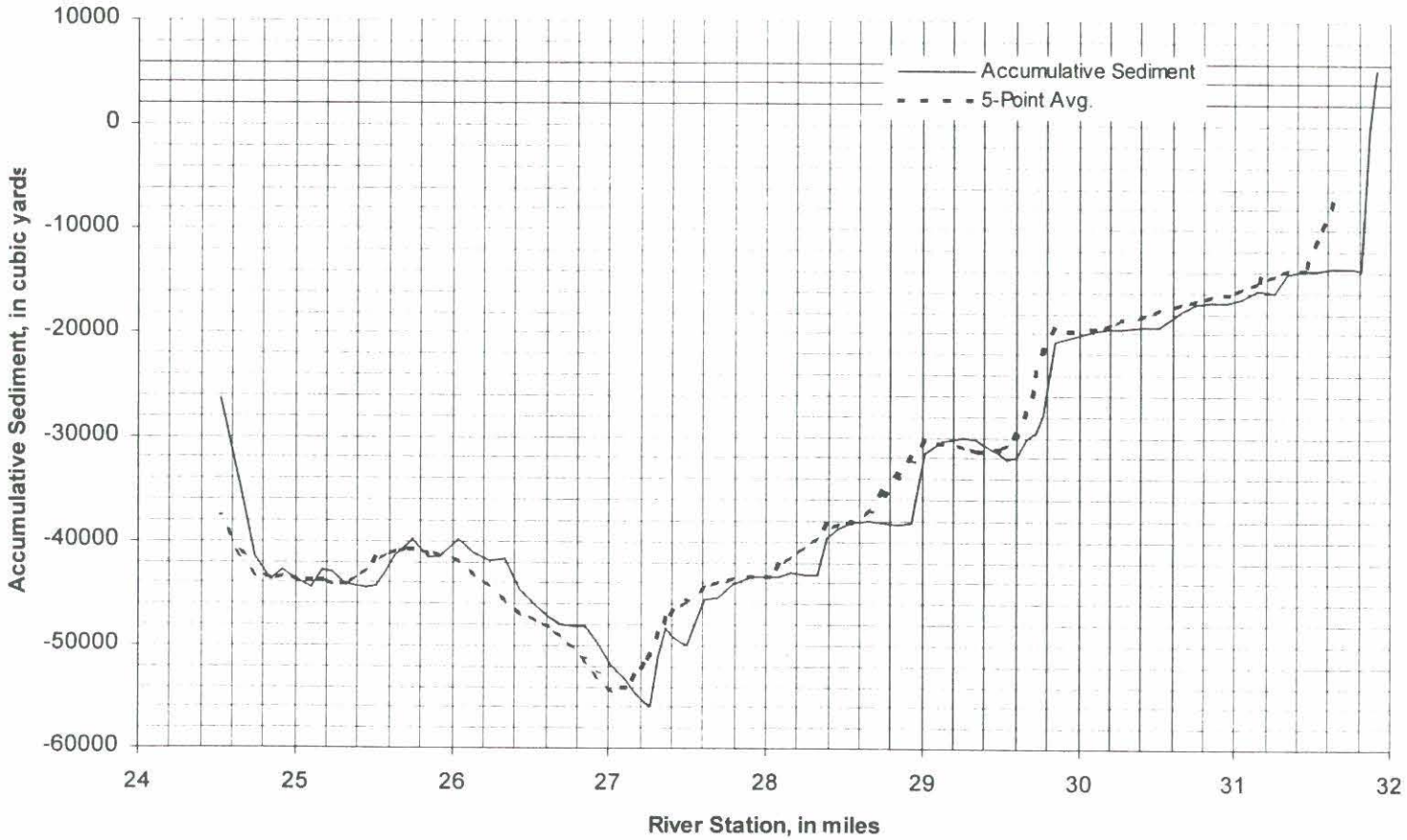


Figure 4-7.3
Accumulative Sediment Deposited Upstream of Section
Cave Creek Main Channel Model, 100-year Flood, Future Condition

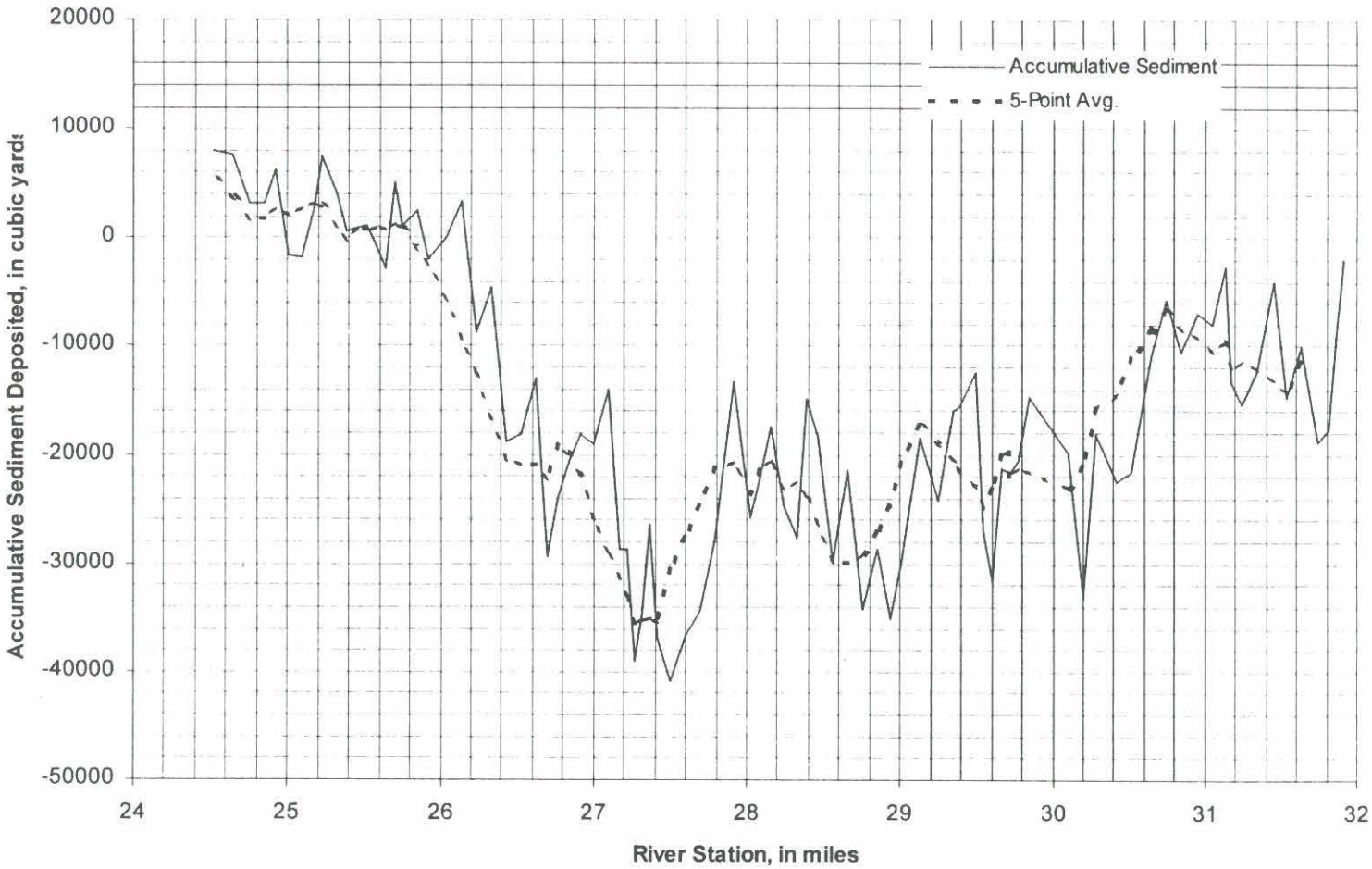


Figure 4-7.4
Accumulative Sediment Deposited Upstream of Section
Cave Creek Overbank Model, 100-year Flood, Future Condition

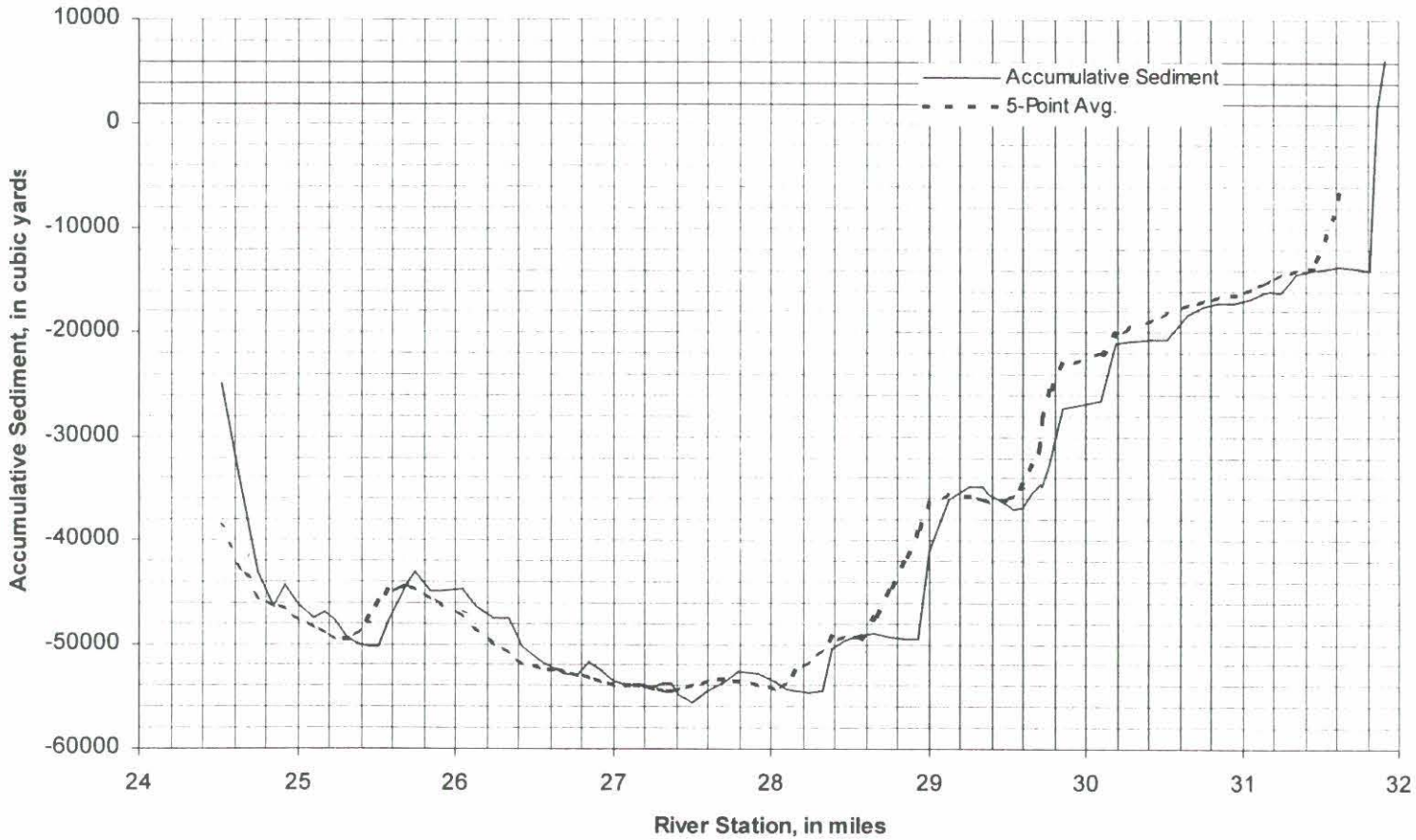


Figure 4-7.5
Accumulative Sediment Deposited Upstream of Section
Cave Creek Main Channel Model, 10-year Flood, Existing Condition

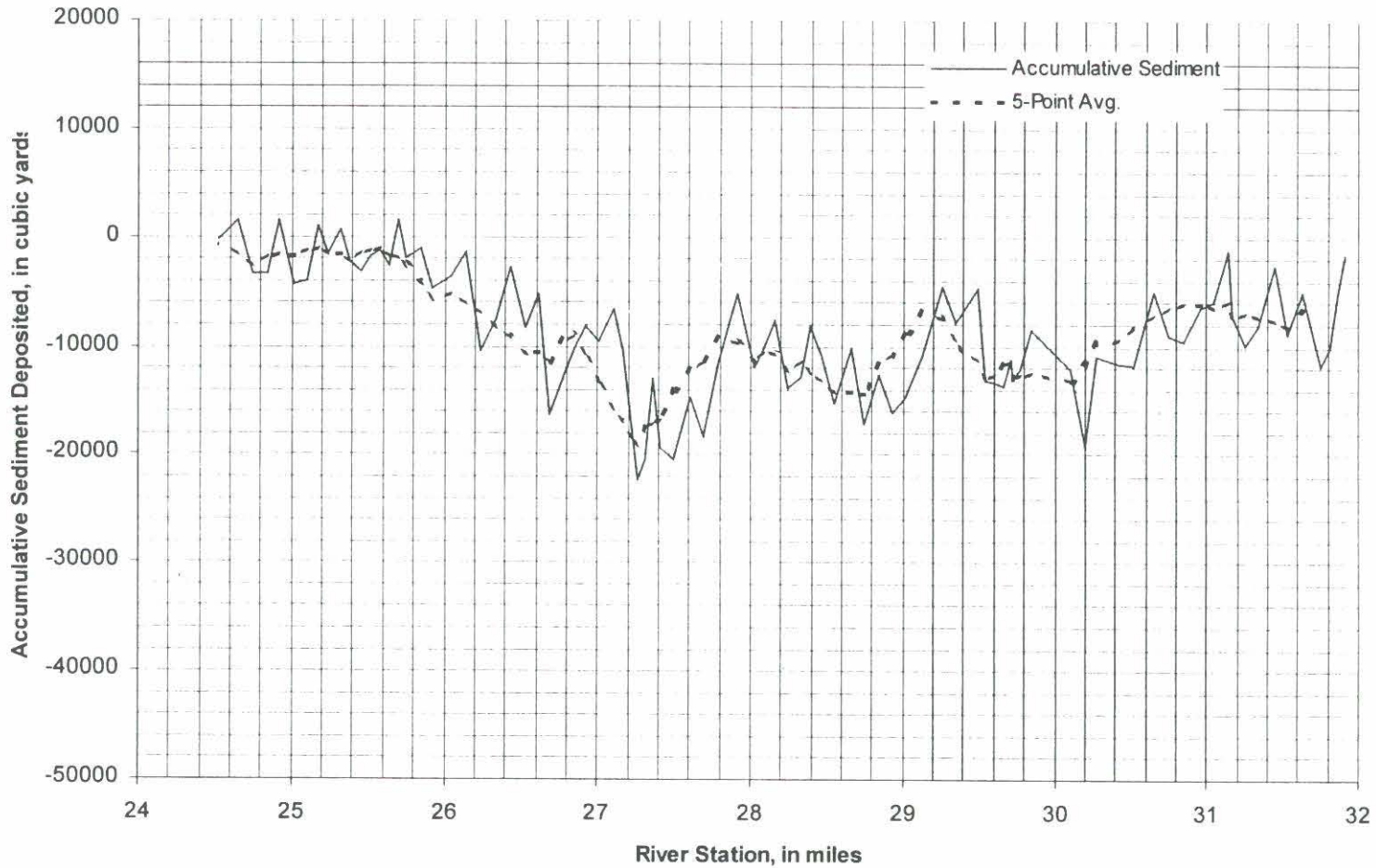


Figure 4-7.6
Accumulative Sediment Deposited Upstream of Section
Cave Creek Overbank Model, 10-year Flood, Existing Condition

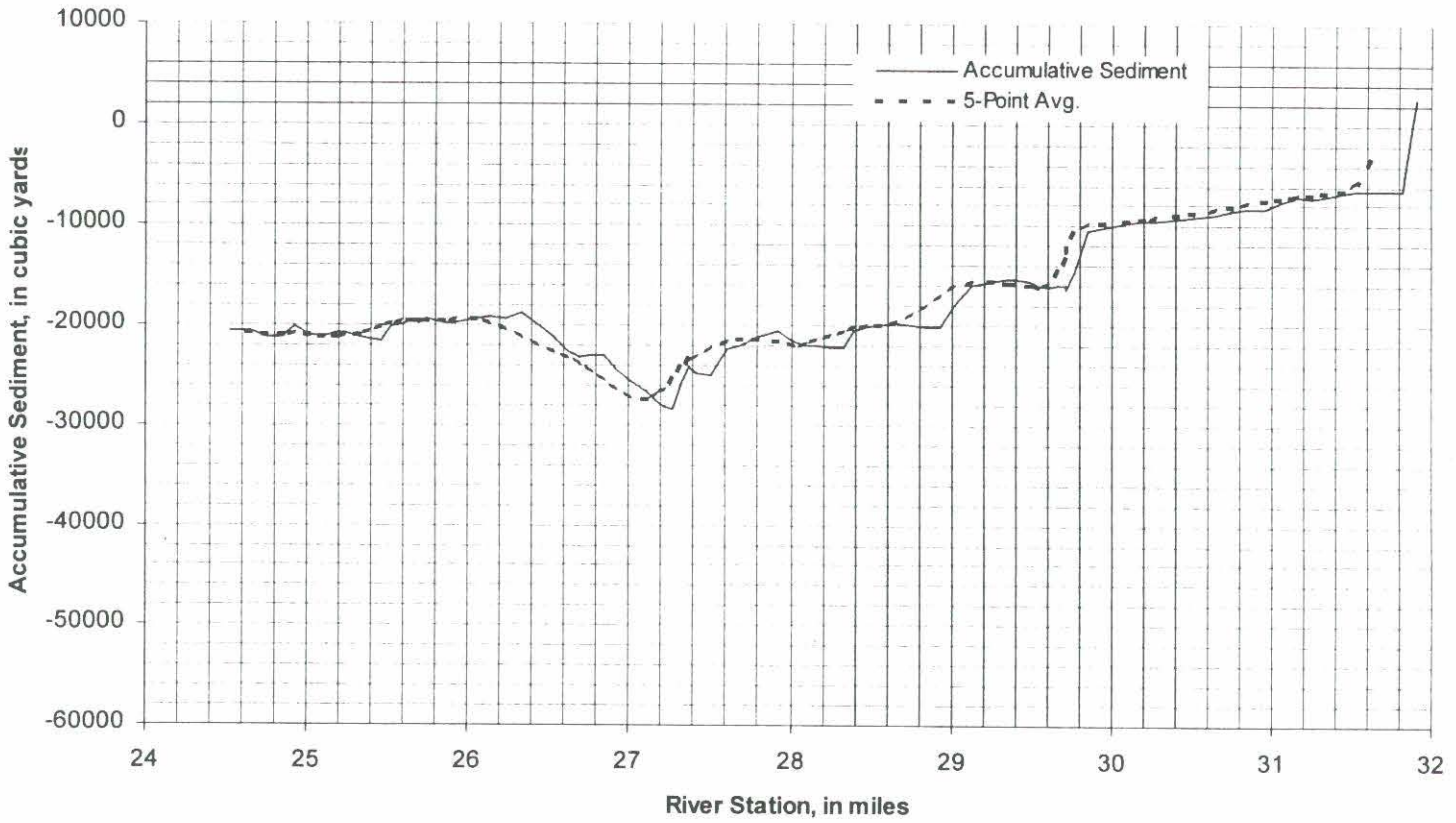


Figure 4-7.7
Accumulative Sediment Deposited Upstream of Section
Cave Creek Main Channel Model, 10-year Flood, Future Condition

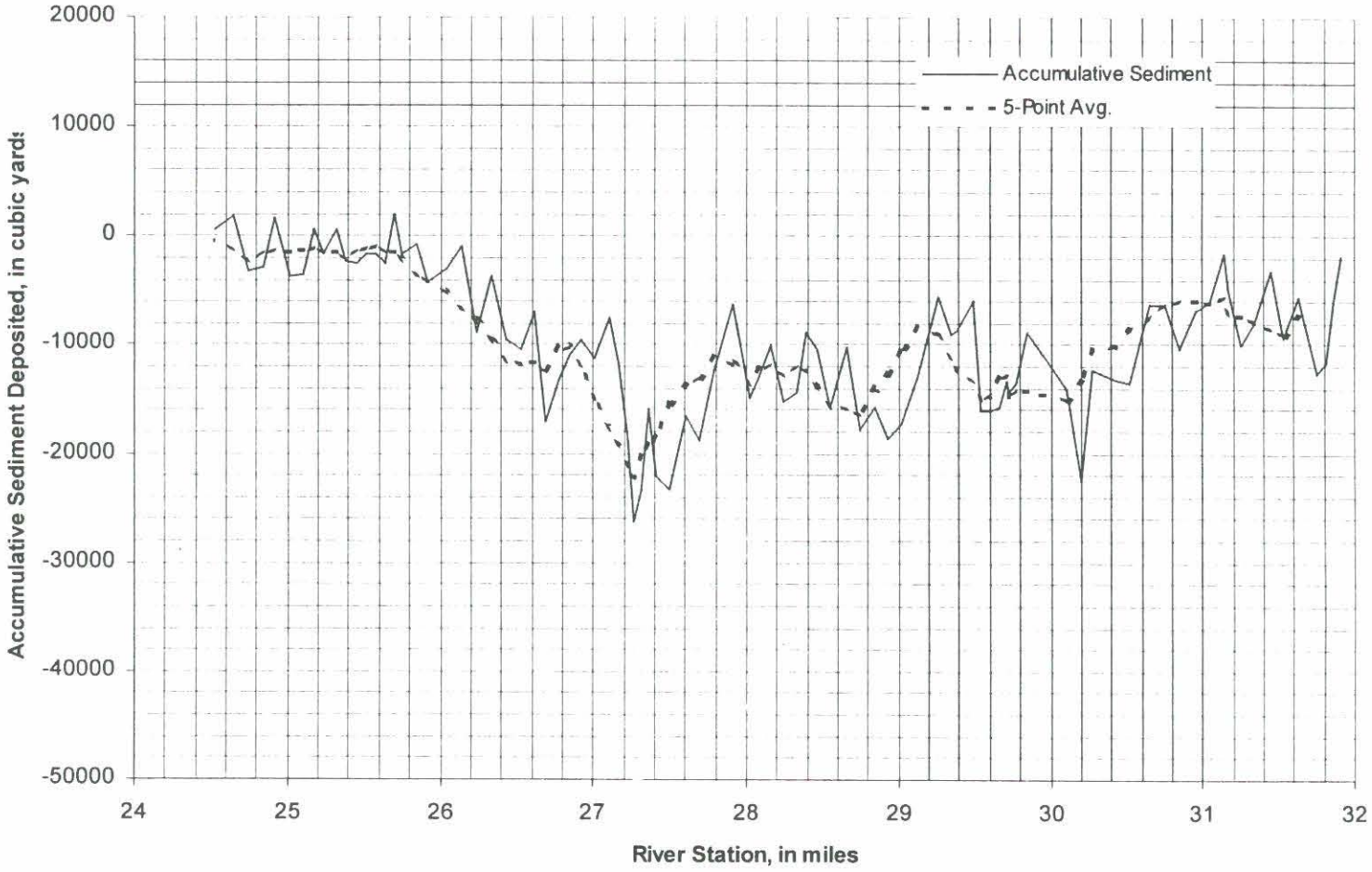


Figure 4-7.8
Accumulative Sediment Deposited Upstream of Section
Cave Creek Overbank Model, 10-year Flood, Future Condition

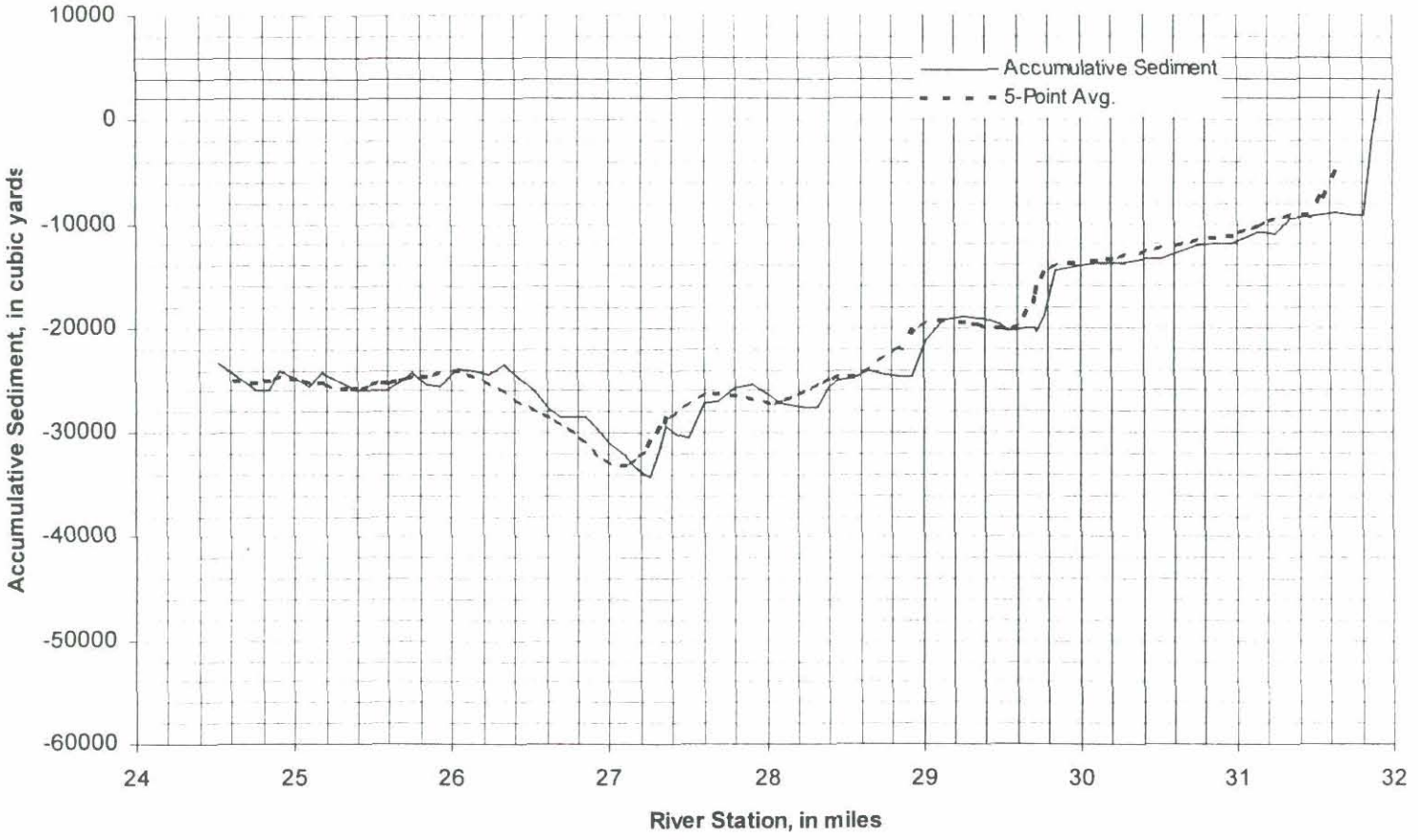


Figure 4-7.9
Accumulative Sediment Deposited Upstream of Section
Apache Wash Main Channel Model, 100-year Flood, Existing Conditions

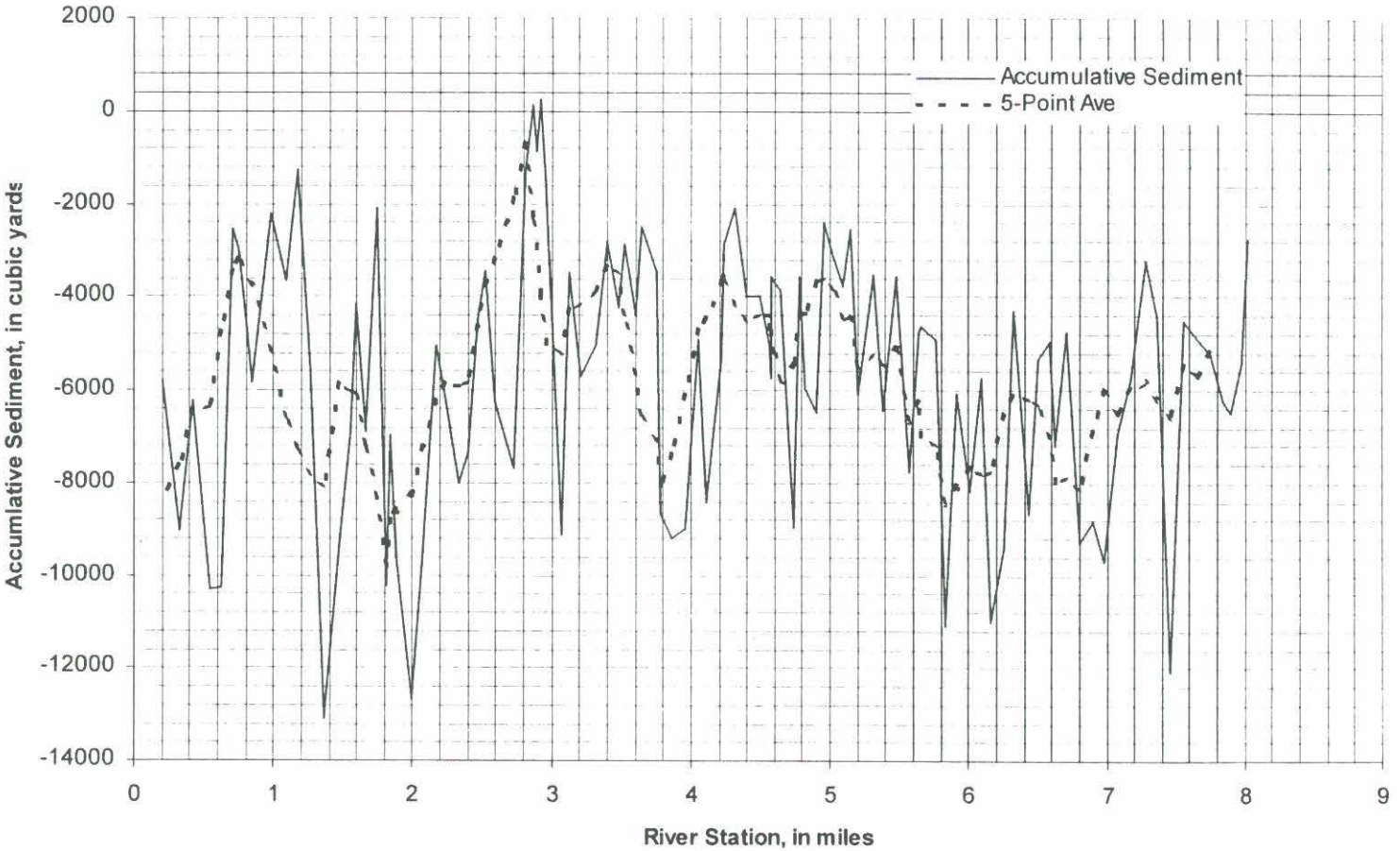


Figure 4-7.10
Accumulative Sediment Deposited Upstream of Section
Apache Wash Overbank Model, 100-year Flood, Existing Conditions

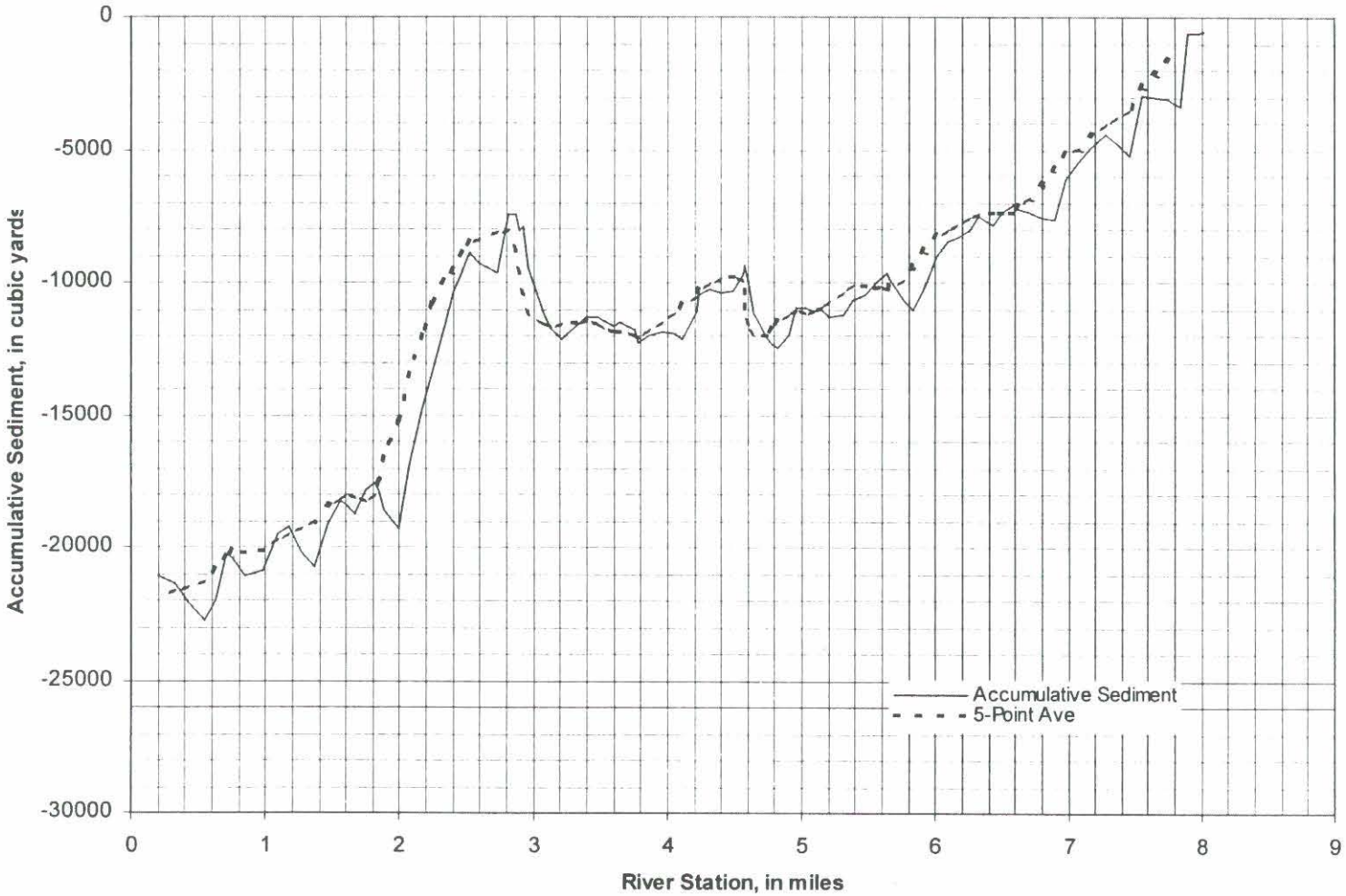


Figure 4-7.11
Accumulative Sediment Deposited Upstream of Section
Apache Wash Main Channel Model, 100-year Flood, Future Conditions

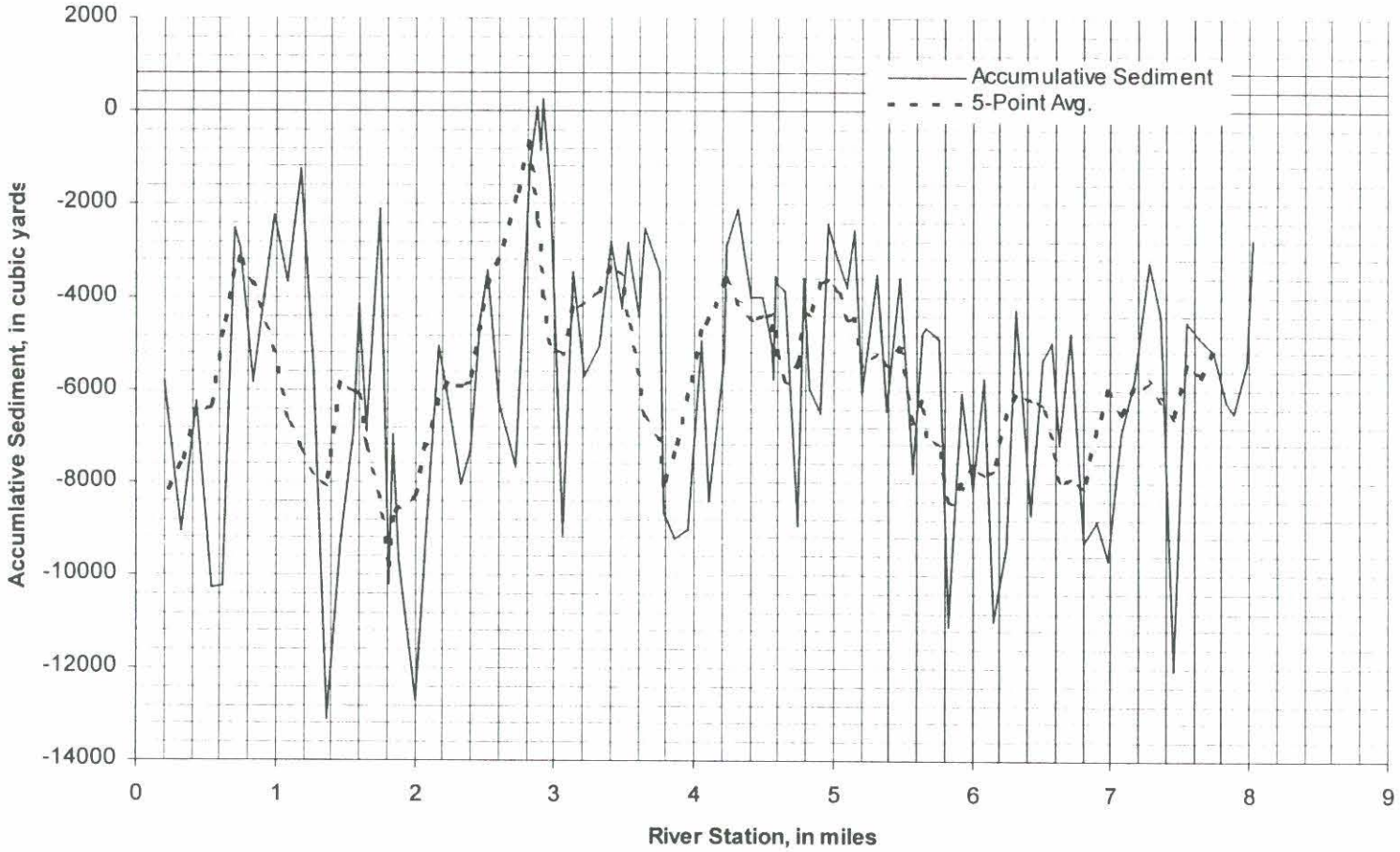


Figure 4-7.12
Accumulative Sediment Deposited Upstream of Section
Apache Wash Overbank Model, 100-year Flood, Future Conditions

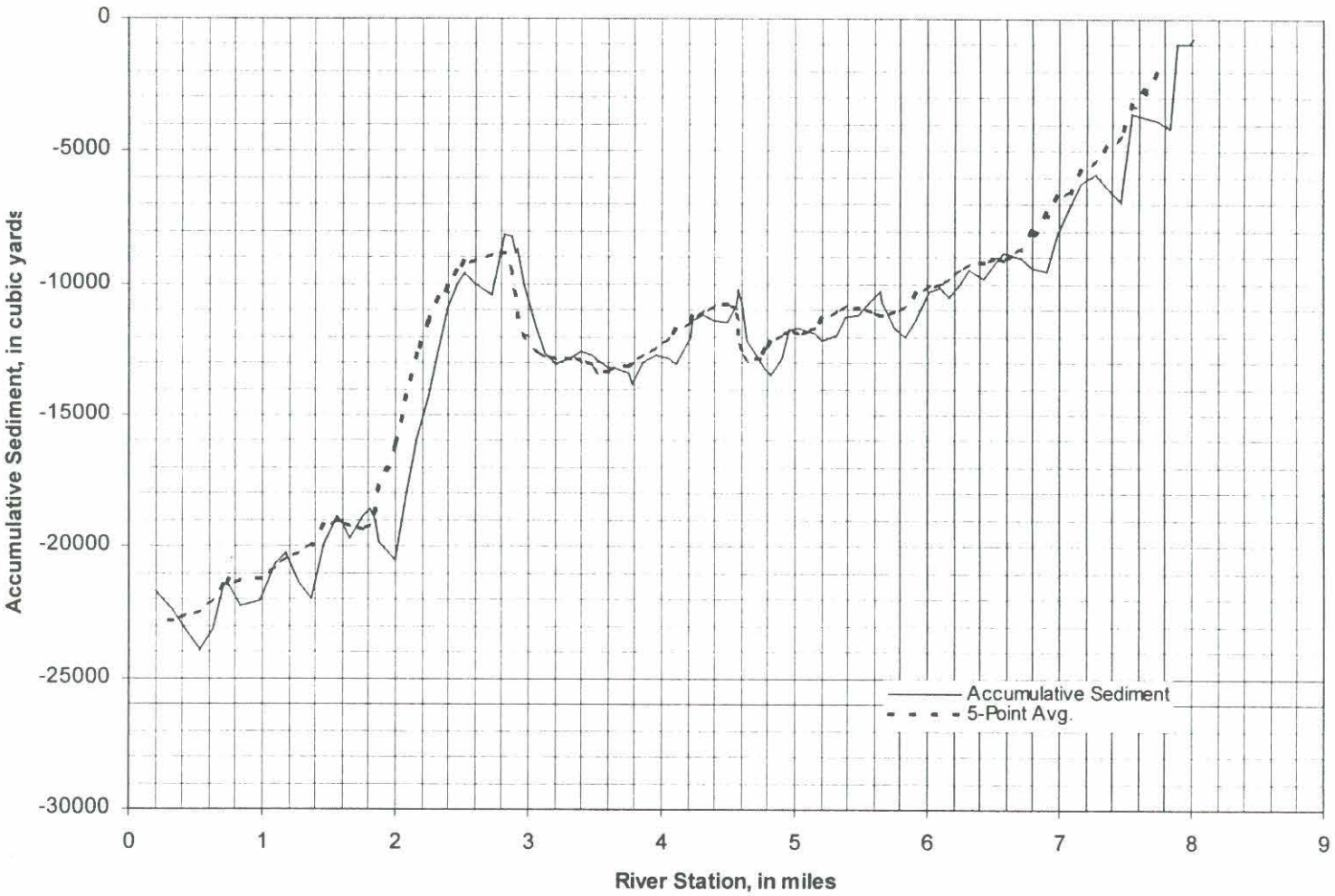


Figure 4-7.13
Accumulative Sediment Deposited Upstream of Section
Apache Wash Main Channel Model, 10-year Flood (Existing or Future Conditions)

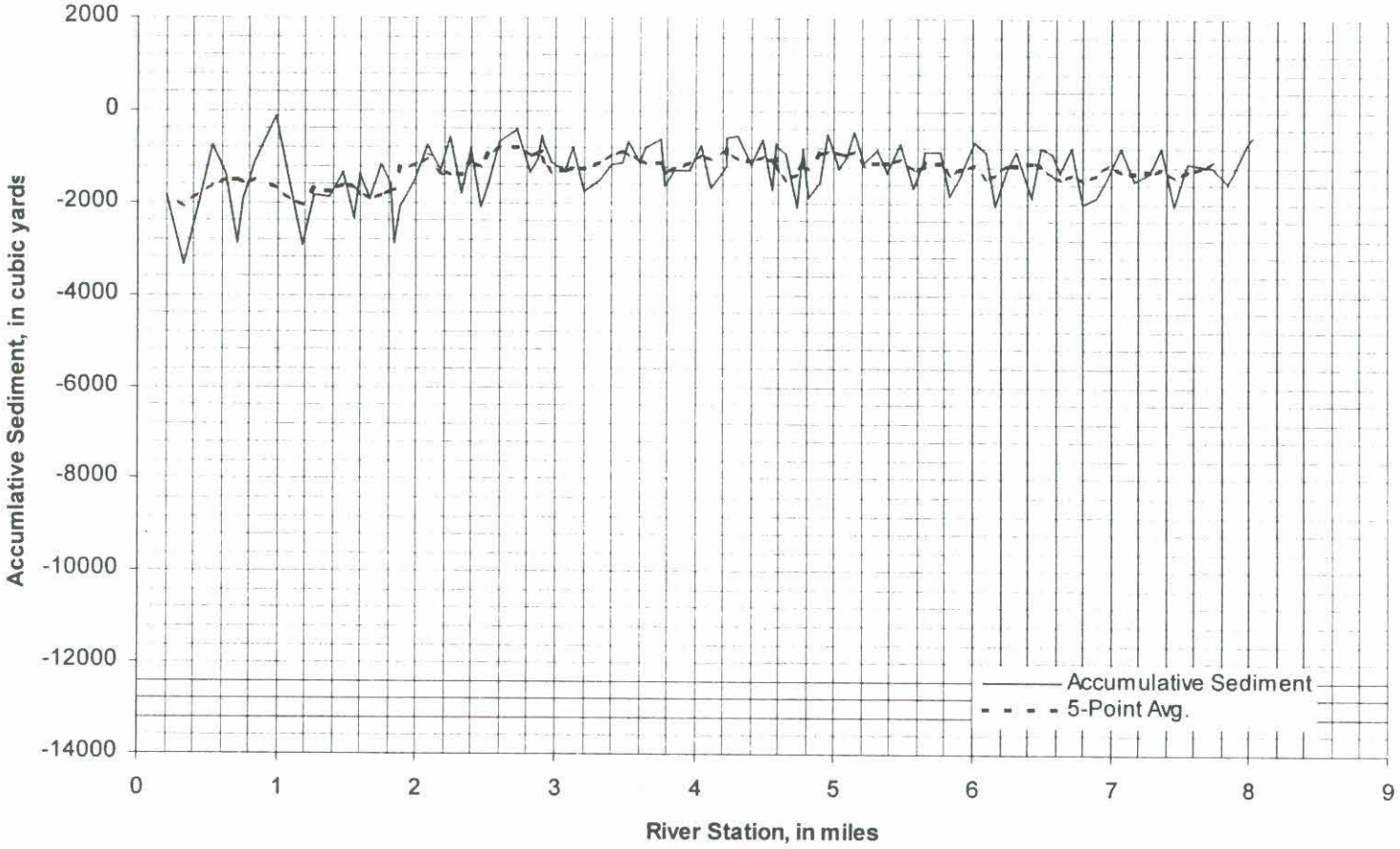


Figure 4-7.14
Accumulative Sediment Deposited Upstream of Section
Apache Wash Overbank Model, 10-year Flood (Existing or Future Conditions)

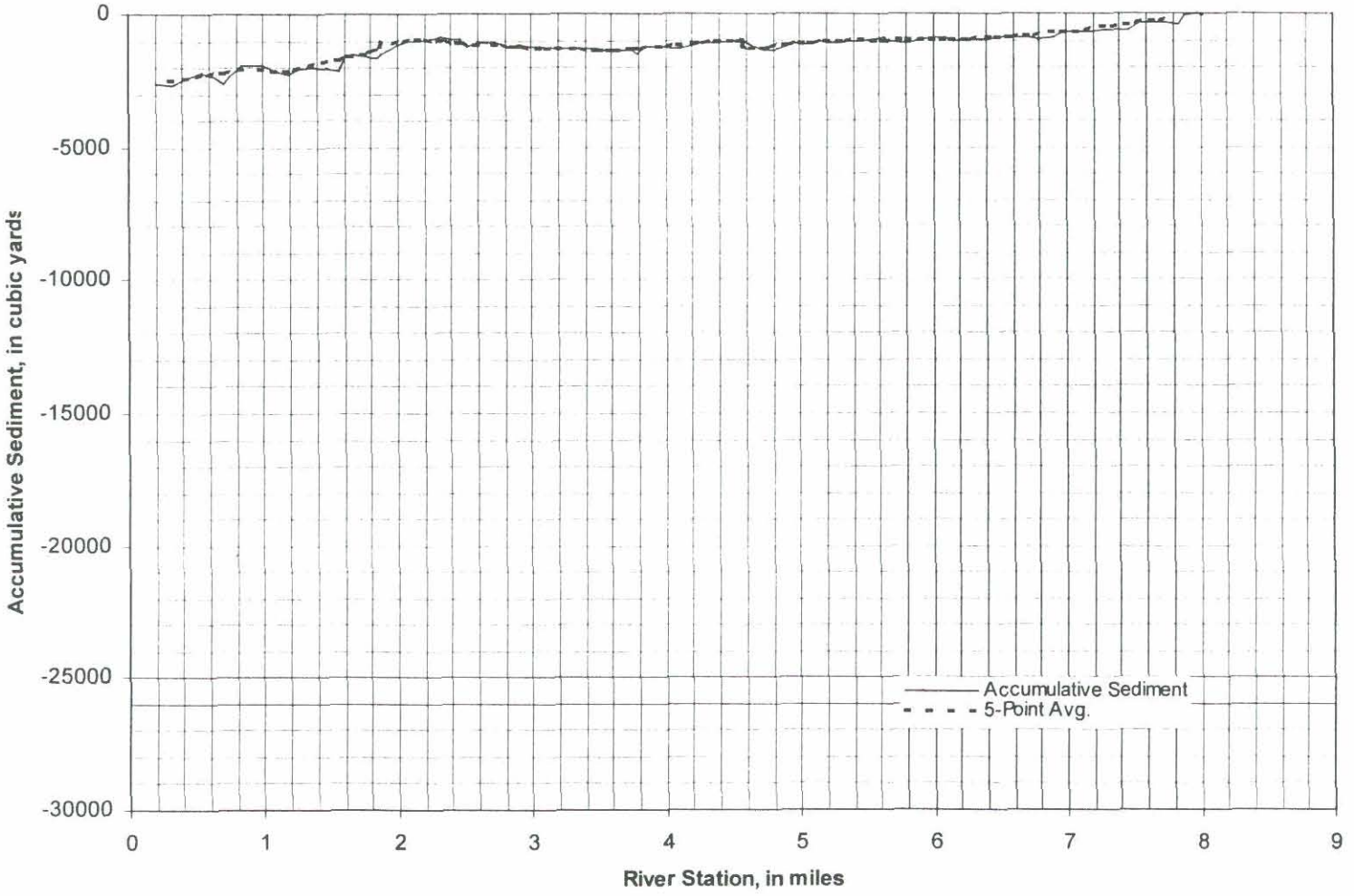


Figure 4-7.15
Accumulative Sediment Deposited Upstream of Section
Paradise Wash Main Channel Model, 100-year Flood (Existing or Future Conditions)

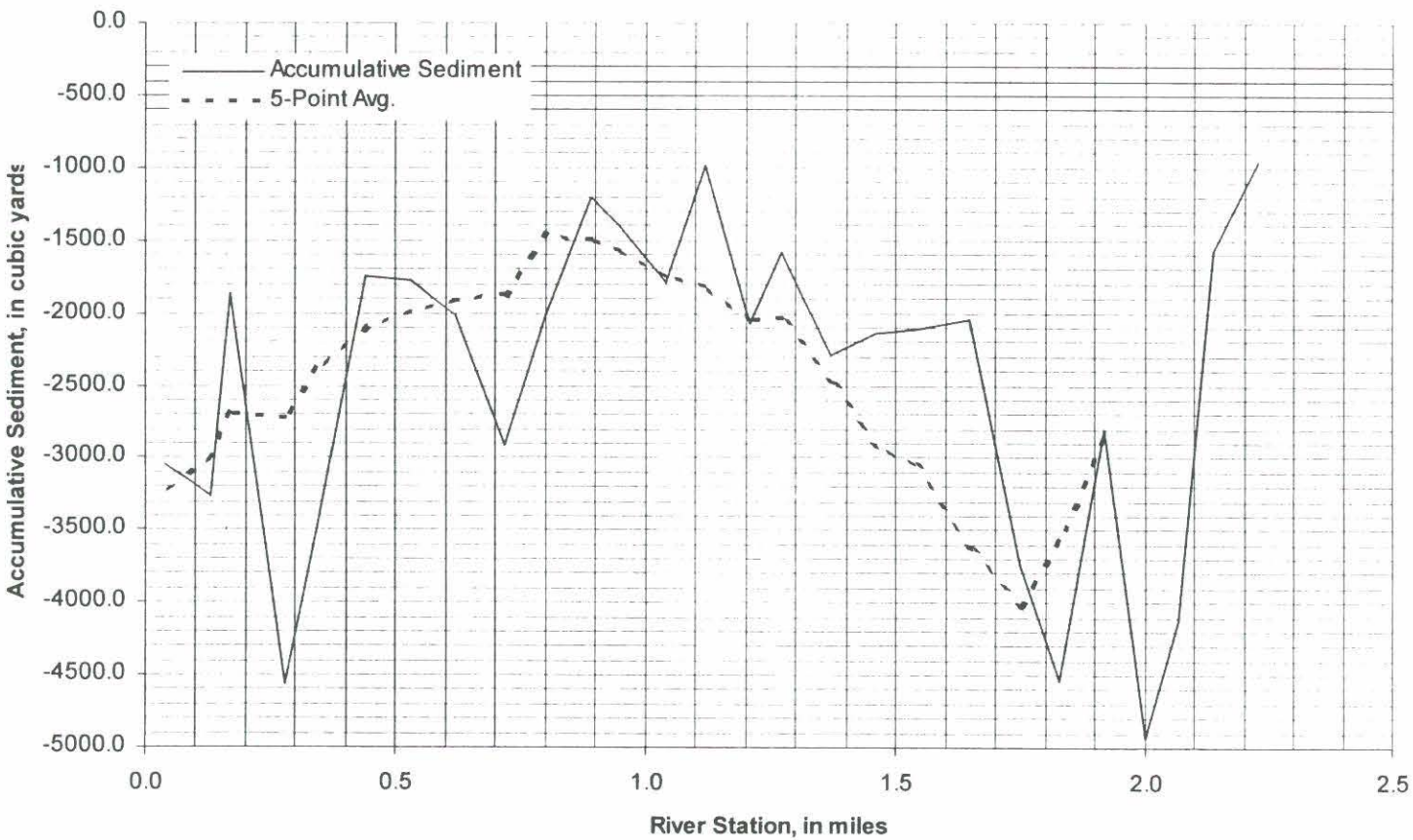


Figure 4-7.16
Accumulative Sediment Deposited Upstream of Section
Paradise Wash Overbank Model, 100-year Flood (Existing or Future Conditions)

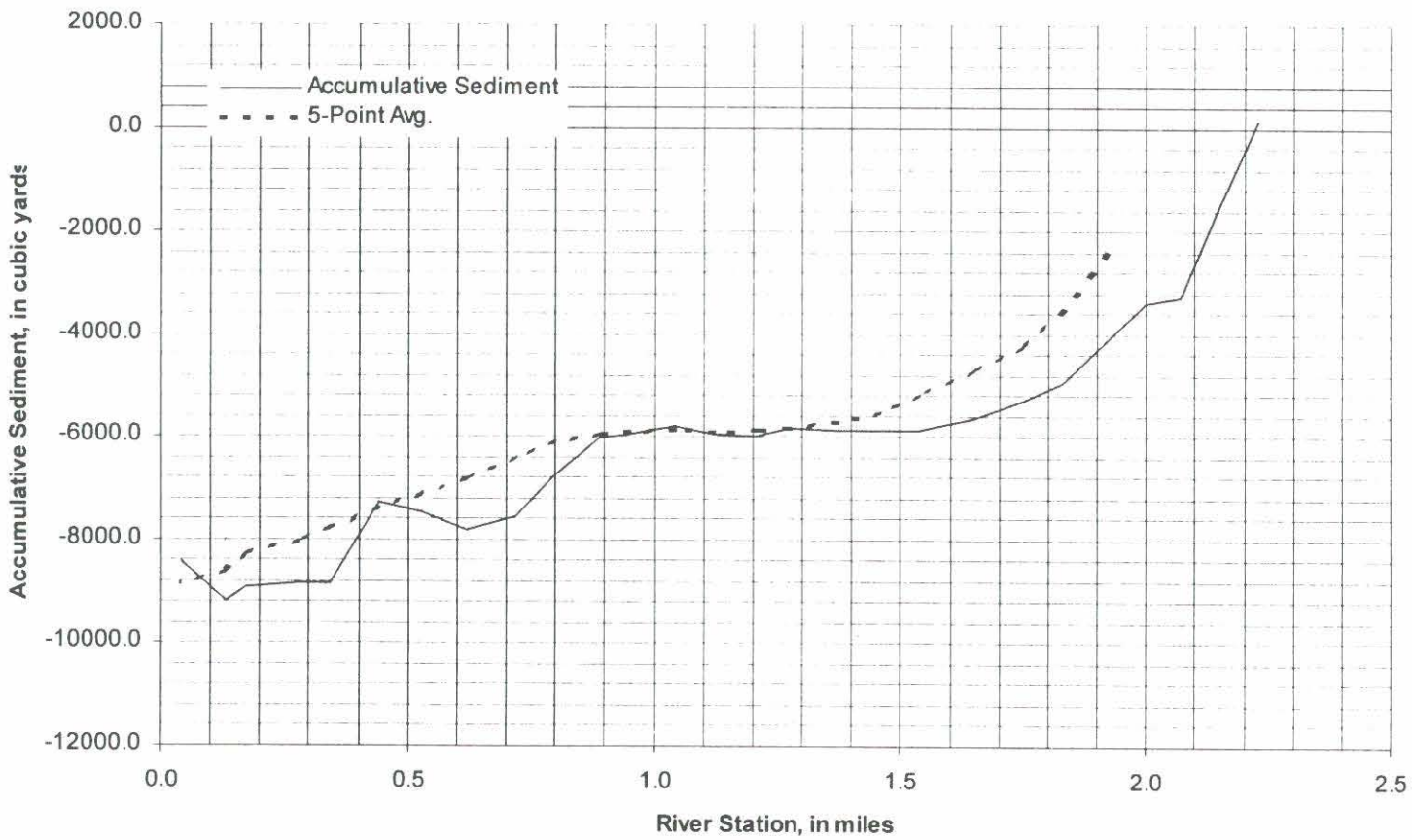


Figure 4-7.17
Accumulative Sediment Deposited Upstream of Section
Paradise Wash Main Channel Model, 10-year Flood (Existing or Future Conditions)

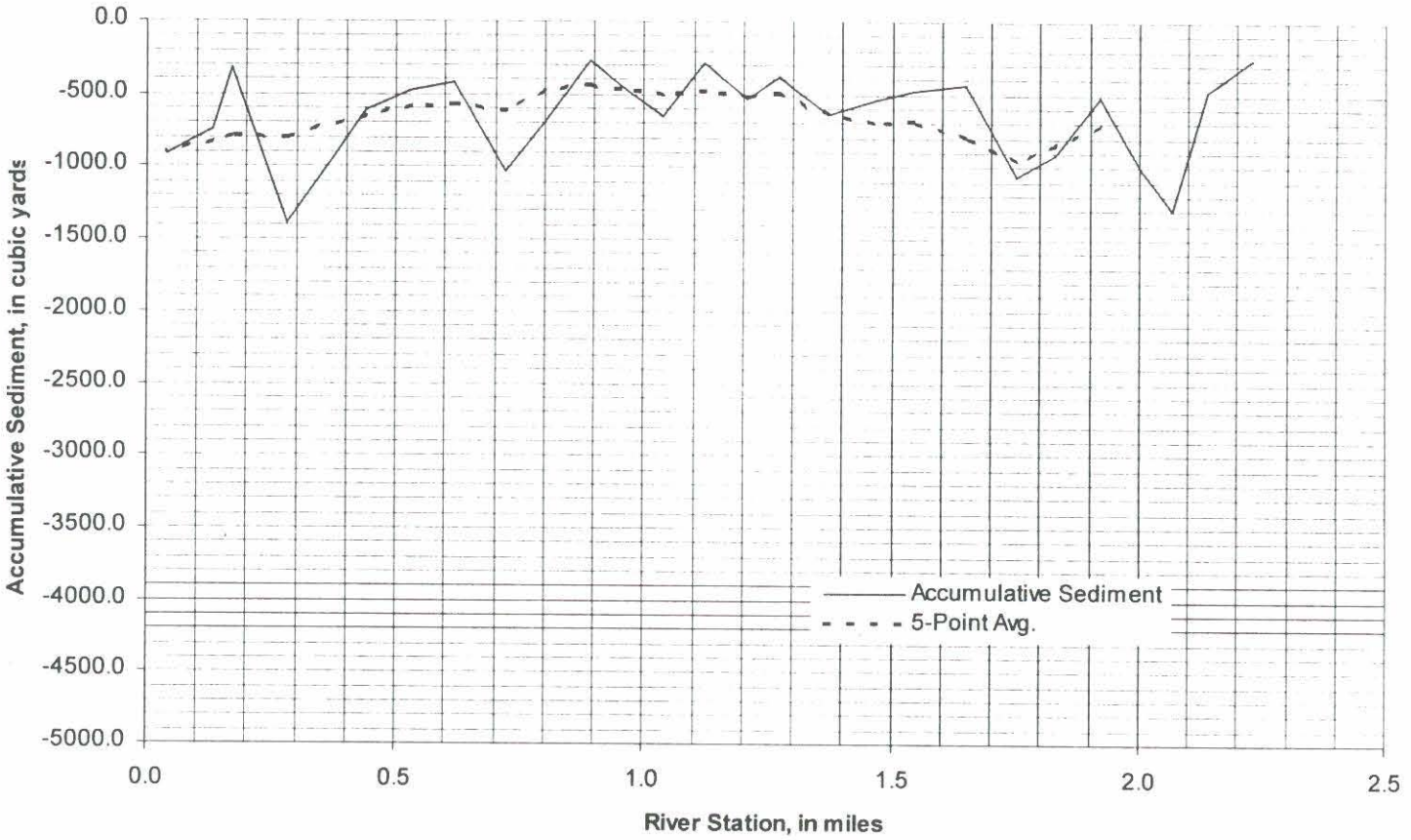


Figure 4-7.18
Accumulative Sediment Deposited Upstream of Section
Paradise Wash Overbank Model, 10-year Flood (Existing or Future Conditions)

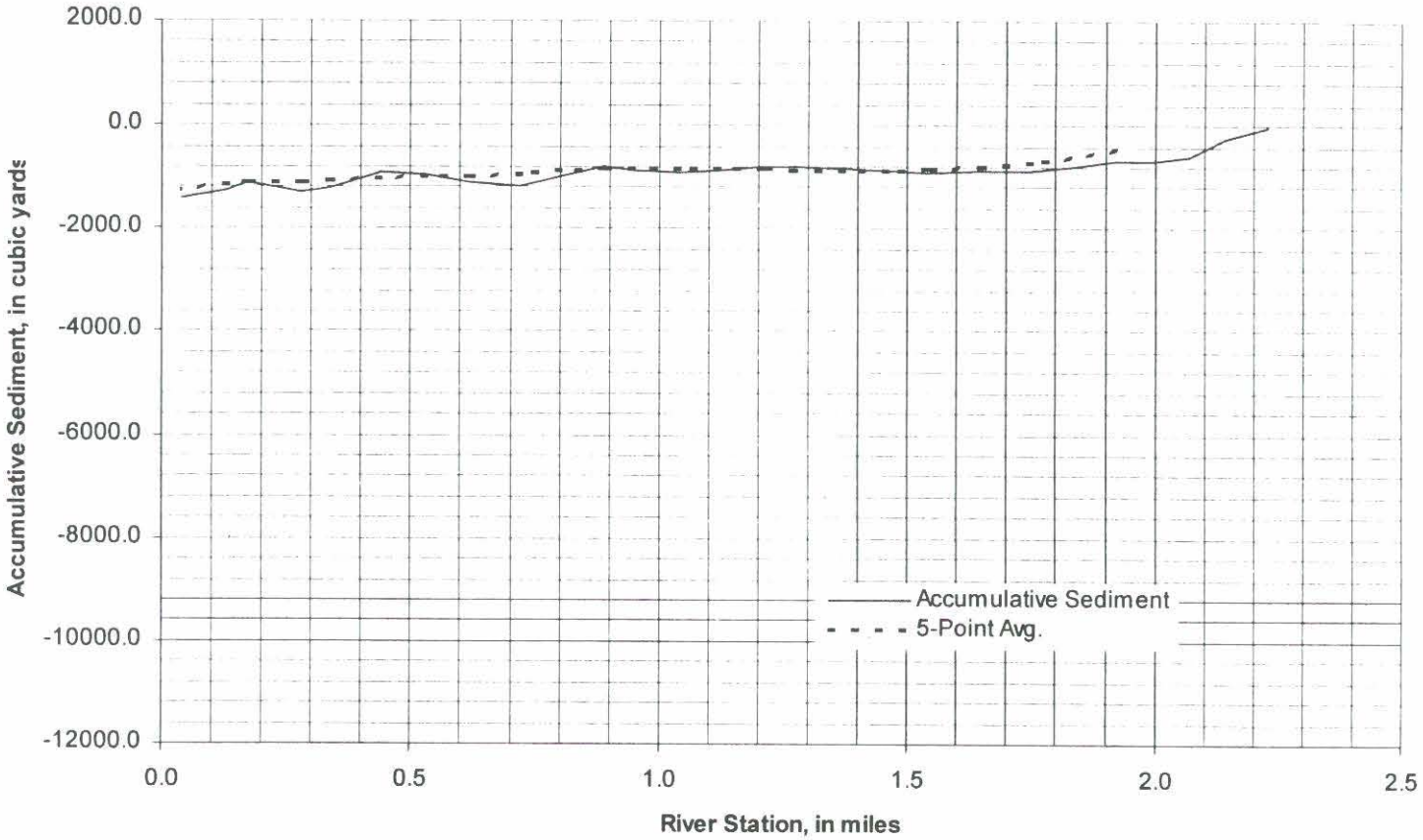


Figure 4-7.19
Accumulative Sediment Deposited Upstream of Section
Desert Hills Wash Main Channel Model, 100-year Flood (Existing or Future Conditions)

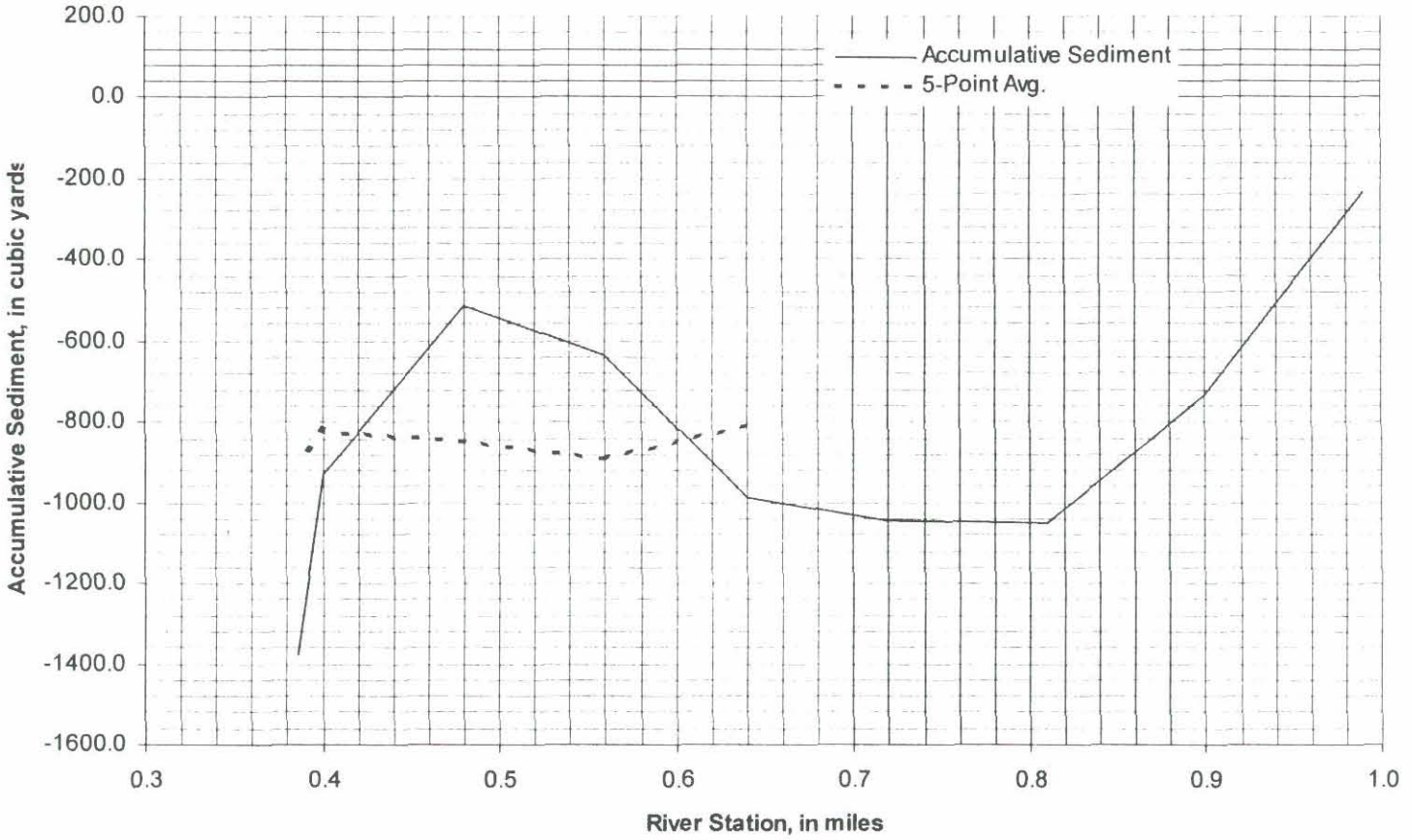


Figure 4-7.20
Accumulative Sediment Deposited Upstream of Section
Desert Hills Wash Overbank Model, 100-year Flood (Existing or Future Conditions)

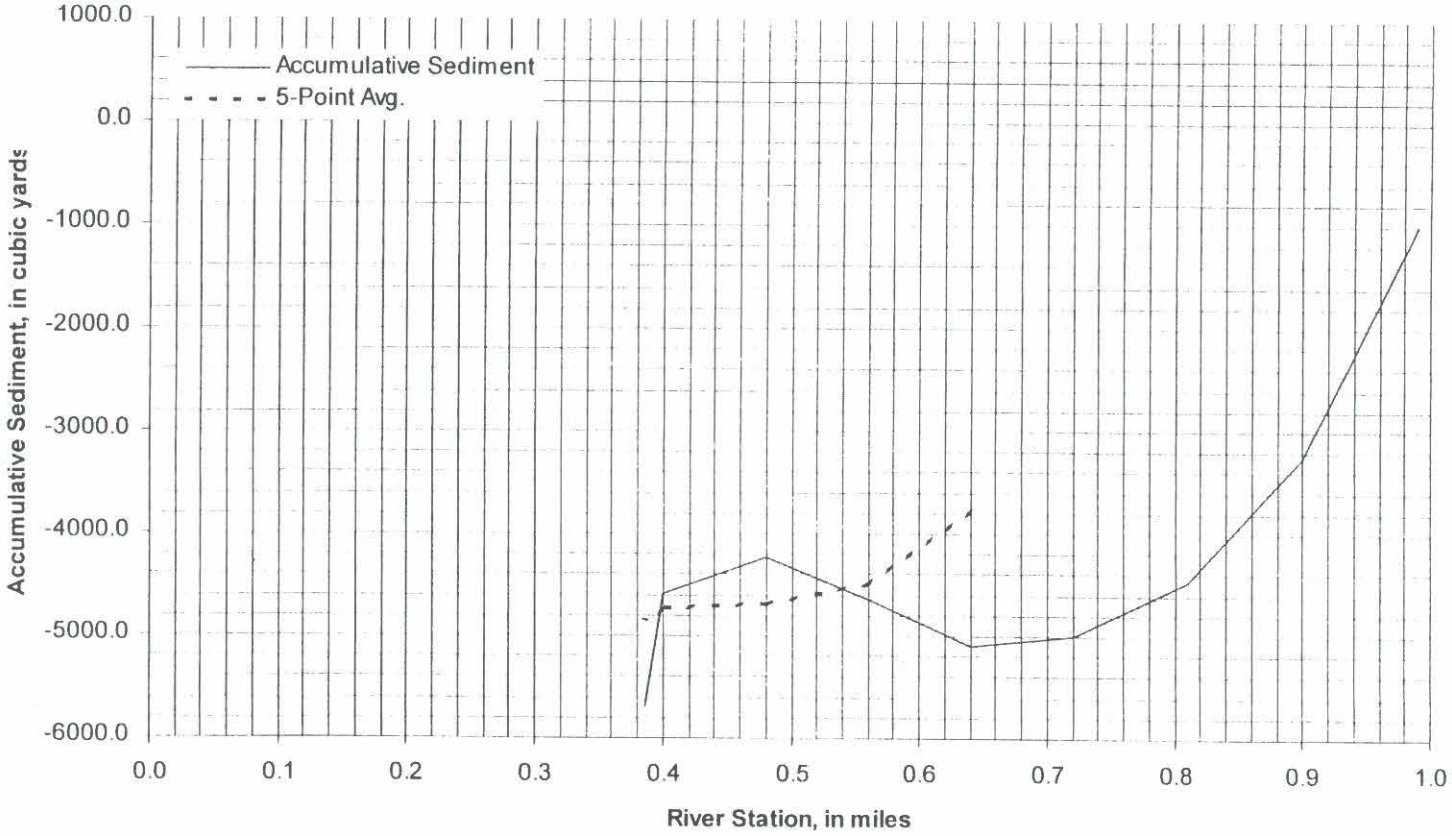


Figure 4-7.21
Accumulative Sediment Deposited Upstream of Section
Desert Hills Wash Main Channel Model, 10-year Flood (Existing or Future Conditions)

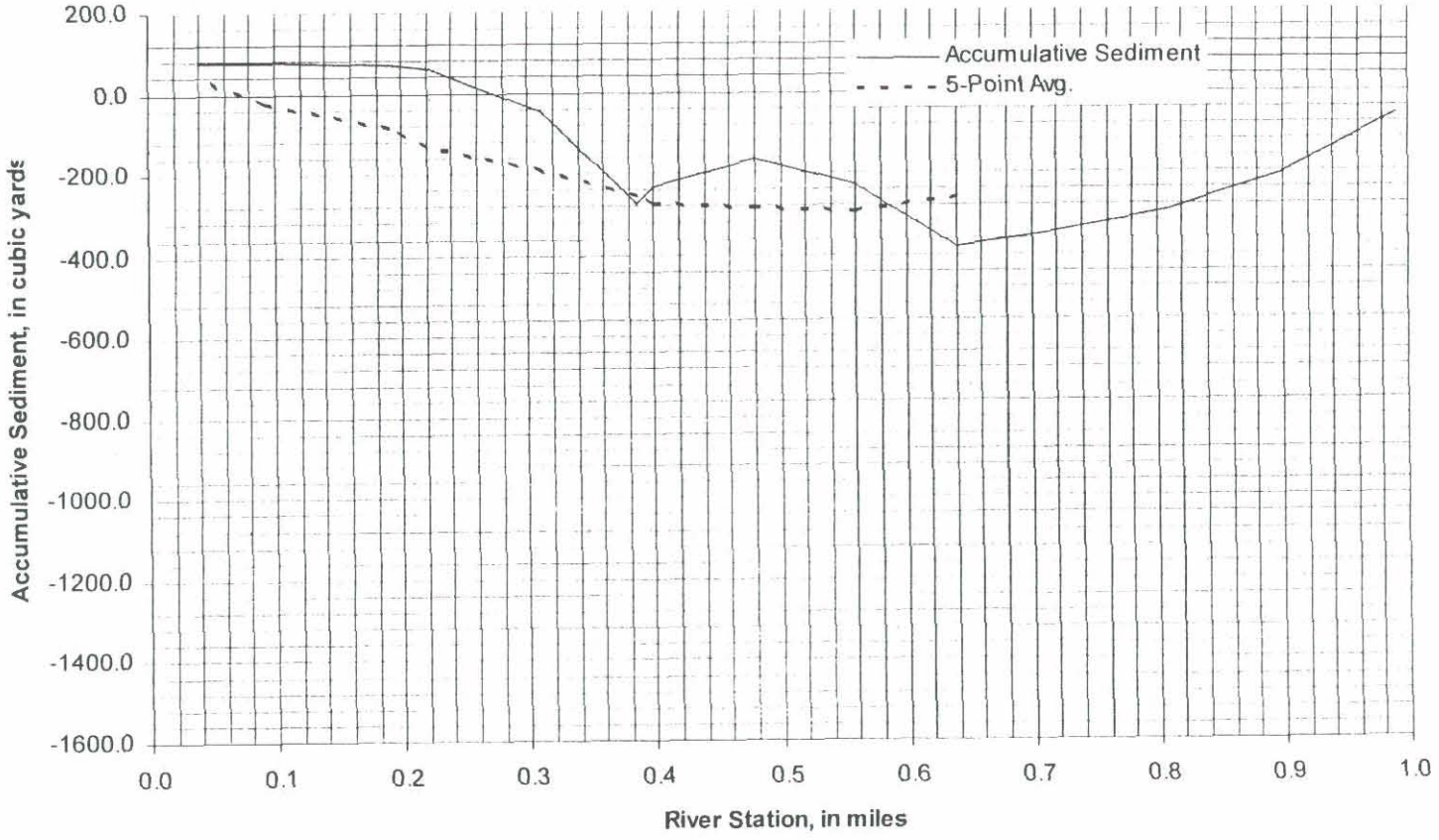
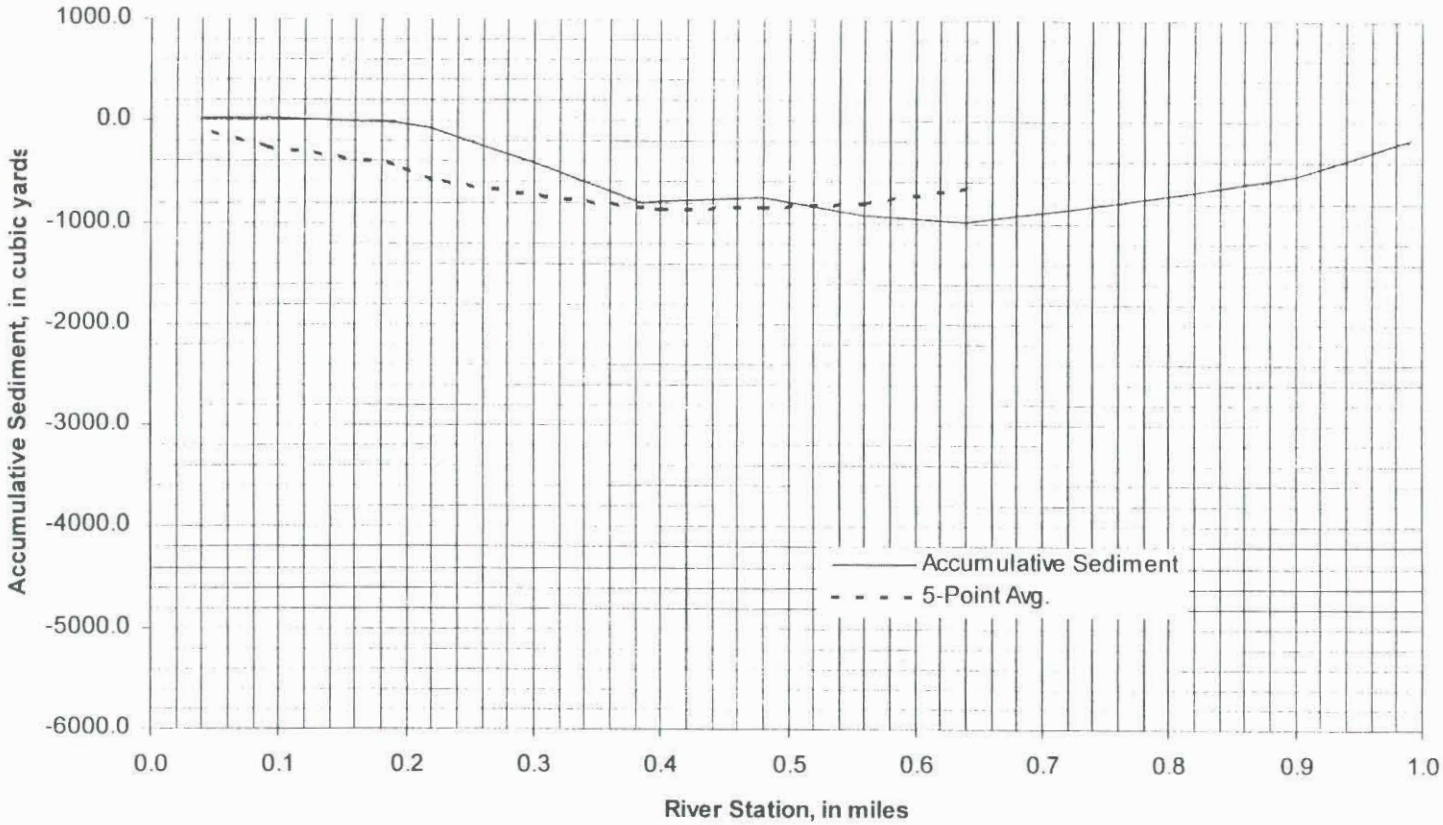


Figure 4-7.22
Accumulative Sediment Deposited Upstream of Section
Desert Hills Wash Overbank Model, 10-year Flood (Existing or Future Conditions)



4-8.0 CONCLUSIONS

4-8.1 GENERAL

An erosion and sedimentation analysis of Cave Creek, Apache Wash, Paradise Wash and Desert Hills Wash was performed by HEC-6 modeling for the purpose of evaluating trends and spatial distributions of scour and fill in those watercourses. The information is used in the Cave Creek and Apache Wash Watercourse Master Plan for evaluating erosion lateral migration limits and in formulating alternatives for the study watercourses. HEC-6 modeling and analyses were conducted for the 100-year and the 10-year flood, and for existing and future conditions in the watershed. Two different bed material size gradations and sediment transport functions are used in the analyses. The results of the HEC-6 models must be interpreted from the output from the two modeling methodologies. The hydraulic components of the models are validated by comparing the hydraulics from a fixed-bed configuration of the HEC-6 models to the hydraulics from equivalent HEC-RAS models. The sensitivity of model input was evaluated and there are no unduly sensitive parameters that could adversely affect the outcome of these studies when using reasonable values for those parameters.

4-8.2 HEC-6 MODEL INPUT

4-8.2.1 Hydrology

Hydrographs for the 100-year and 10-year floods under existing and future hydrologic conditions, respectively, in the watershed were determined by watershed modeling using HEC-1. The flood hydrology was performed by others and those hydrographs are discretized, as shown in Section 4-3.3, for input into the HEC-6 models.

4-8.2.2 Watercourse Geometry

The hydraulic geometry of watercourses was determined from previously developed HEC-2 models of the watercourses. Those models were reviewed and adjustments made, as described in Section 4-4.2, to meet HEC-6 model requirements.

4-8.2.3 Bed Material Size Gradation

The size gradation of bed material in the watercourses was established by using field data as supplied by others. The spatial variability of the bed material size distribution was assessed. It was determined that modeling would need to be performed to meet the bed material size characteristics of the main channel and another set of models meeting the bed material size characteristics of the overbank floodplains. Bed material data and related HEC-6 modeling is described in Section 4-4.3.

4-8.2.4 Inflowing Sediment Load

Inflowing sediment load rating curves were developed for the upper end of each watercourse based on sediment transport capacity, as described in Section 4-4.3.4. Incoming sediment from minor tributaries to each watercourse are negligible compared to the sediment load in the mainstem of each watercourse.

4-8.2.5 Initial Water Surface Elevation

The initial water surface at the downstream end of each watercourse model was established by a normal depth analysis or by a backwater rating curve if the initial water surface elevation was significantly impacted by impounded water in the Cave Buttes Dam flood pool. Determination of the initial water surface elevation is described in Section 4-3.4.

4-8.3 HEC-6 MODEL OUTPUT

Input and output files of HEC-6 models used in these analyses are provided in digital and hard copy. The analyses of results are facilitated by numerous graphs prepared from model output. Model input and output, and graphical representation of the output is provided in the appendices.

4-8.4 EROSION AND SEDIMENTATION RESULTS

4-8.4.1 General

The HEC-6 models indicate that all the watercourses are subject to erosion and sedimentation to some extent both for large floods (100-year) and for small floods (10-year). Erosion will be exhibited largely as bank scour, but there will be some overall

degradation throughout certain reaches of the watercourses. Bank scour of finer material will result in channel widening and lateral migration. Degradation, where occurring locally, will most likely be due to sorting of finer material with a tendency toward armoring of the channel bed. Fill will occur locally where there are reductions in sediment transport capacity. HEC-6 models indicate that the coarser bed material will be moved in gravel bars, resulting in pool and riffle formation. Certain reaches of the watercourses will be subject to general aggradation, mainly due to backwater from Cave Buttes Dam reservoir or diminished transport capacity. Model results are presented and interpreted in Section 4-7.0

4-8.4.2 Cave Creek

Large floods in Cave Creek will result in the following erosion (scour) and sedimentation (fill) tendencies:

- Scour about 0.2 miles downstream of the Carefree Highway Bridge (RS 29.8 miles).
- Deposition of coarser bed material from about RS 29.6 miles to about 29.2 miles.
- Channel widening and bank erosion, especially within the overbank floodplain, from RS 29.0 miles to RS 27.1 miles.
- Deposition of coarser bed material in the main channel from RS 28.8 miles to RS 28.2 miles and from RS 27.8 miles to RS 27.3 miles. That deposition may produce gravel bars with changes in flow direction, realignment of the main channel and bank attack.
- Aggradation from RS 27.3 miles and downstream to the end of the study limit. That reach is within the backwater of Cave Buttes Dam and that area also contains the Wheeler and Tanner gravel mines. Virtually all of the coarse bed material will be deposited in that zone. The finer bed material will be transported into the impoundment area with only about 25 percent being deposited in the backwater reach of Cave Creek. The finest sediments including the wash load will be deposited within the relatively still water of the reservoir.

- Aggradation during large floods will tend to fill gravel mine pits. However, severe adverse local scour and fill can occur at gravel pits as they are inundated and/or at gravel mounds, that are impacted by flood flows.

- Future development in the watershed will result in slightly higher peak discharges. That may result in some additional "flushing" of fine sediment into the reservoir. Future watershed conditions will result in little additional change to Cave Creek as compared to existing hydrologic conditions.

Smaller floods, or a sequence of such floods, in Cave Creek will result in the following erosion (scour) and sedimentation (fill) tendencies:

- Upstream of about RS 27.0 miles the watercourse will experience net scour. Since the main channel is well armored for smaller floods, the smaller floods will result in bank erosion and lateral migration.

- Downstream of about RS 27.0 miles the watercourse will experience net aggradation and filling of gravel mined areas.

- Sediment deposition within the Cave Buttes Dam impoundment will be closer to the dam rather than in an upstream backwater zone. That is because smaller floods will not raise the flood pool to as high an elevation as the larger floods.

- Future development in the watershed has little impact on erosion and sedimentation from small floods as compared to existing conditions.

4-8.4.3 Apache Wash

Large floods in Apache Wash will result in the following erosion (scour) and sedimentation (fill) tendencies:

- From the upstream study limit (RS 7.7 miles) to the Carefree Highway (RS 4.6 miles) there will be likely erosion of finer bed material resulting in bank attack and possible lateral migration.

- Within the main channel, riffles and pools of coarse bed material will form with a net degradation upstream of RS 6.0 miles and net aggradation between RS 6.0 miles and the Carefree Highway.

- Downstream of Carefree Highway is a short flow expansion zone (about 0.3 miles) that may experience deposition.

- The backwater of Desert Hills Wash may produce a short depositional zone.

- Below the confluence of Paradise Wash the watercourse attains a high sediment transport rate effecting the flushing of sediment to the Cave Buttes Dam impoundment.

- Overall, Apache Wash will experience net erosion and degradation. Coarse sediment deposits can occur locally causing redirection of flow and exacerbating bank scour and lateral migration.

- Future development in the watershed produces only slight changes in runoff and sediment transport. The present erosion and sedimentation of Apache Wash will continue under future land development.

Smaller floods, or a sequence of such floods, in Apache Wash will result in the following erosion (scour) and sedimentation (fill) tendencies:

- There is a slight but continuous trend for increased sediment transport rates in a downstream direction throughout Apache Wash. There is a tendency for degradation, local scour and bank erosion during more frequent floods.

- Development within the watershed will not significantly affect the erosion and sedimentation of Apache Wash as compared to existing conditions.

4-8.4.4 Paradise Wash

Flood discharges in Paradise Wash will result in the following erosion (scour) and sedimentation (fill) tendencies:

- Scour is likely for a short distance downstream of the Carefree Highway culvert.

- Aggradation of coarser material is likely between RS 1.8 miles to RS 0.9 miles.

- Degradation is likely downstream of RS 0.9 miles to the confluence with Apache Wash.

- Overall, the watercourse is erosional, particularly along the banks. Gravel bars of coarse material will form periodically resulting in bank attack and enhanced lateral migration.

- Sequences of smaller floods will result in some realignment of the main channel.

- Future land development has little impact on flood discharges and erosion of the watercourse as compared to existing conditions.

4-8.4.5 Desert Hills Wash

Flood discharges in Desert Hills Wash will result in the following erosion (scour) and sedimentation (fill) tendencies:

- The watercourse will be subject to erosion during larger floods, especially finer material from the banks. There is a tendency for bank erosion and lateral migration during such flooding.

- Smaller, more frequent floods transport sediment through the study reach in near sediment balance with incoming sediment loads. Little erosion or sedimentation during such discharges are expected, although local scour or fill may be significant.

- Future land development in the watershed will have little effect on erosion and sedimentation of the watercourse as compared to existing conditions.

4-8.5 MAJOR LIMITATIONS AND ASSUMPTIONS

The following are the major limitations and assumptions that are inherent in the analyses of erosion and sedimentation of the study watercourses:

- The HEC-6 program requires appropriate input data based on physical measurements, and data analyses.

- Interpretation of HEC-6 results is contingent upon model input and the limitations of certain modeling assumptions. Because of those input contingencies and modeling assumptions, two modeling conditions are used; one for coarse bed

material, as occurs in the main channels and the other for finer material in the overbanks.

- The flood hydrology is adequately represented by HEC-1 watershed modeling methodology as defined in the District's Hydrology Manual.

- Hydraulic geometry of the watercourse is obtained from previous floodplain delineation studies.

- Size gradation of the bed material is represented by a finite sampling of that material. Although the sample size is quite large, it represents a small area of the watercourses. Sensitivity analyses indicates that uncertainty in this parameter has small effect on model results.

- Incoming sediment loads are transport capacity controlled and are estimated by sediment transport methodologies.

- Sediment transport in the watercourses can be modeled by the Meyer-Peter, Muller transport function that is representative of the coarse material in the main channel, or by the Yang Stream Power transport function for the finer material that generally occurs in the overbank floodplains.

- Future development in the watersheds does not deviate from present zoning restrictions.

- Data are not available to determine whether sediment yield from the watershed will be significantly altered by land development. However, a large part of the watershed is in National Forest or is rugged hillslope. Hydrologic analysis of existing and future watershed conditions indicates only slight impacts to flood discharges due to urbanization in this watershed. Therefore, based on those factors, the sediment yield is not expected to appreciably vary from existing conditions due to future land development.

- Sand and gravel mining does not significantly alter the hydraulics of Cave Creek as represented in current topographic maps.

- These results are based on future hydrologic conditions as have occurred in the recent past. It is assumed that there are no large scale impacts to the

contributing watershed such as a major wildfire or extreme precipitation events producing dramatic changes to runoff or sediment yield to Cave Creek.

4-9.0 REFERENCES

1. Flood Control District of Maricopa County (1994), *Agua Fria River sediment transport study*, Volume I – Final Report, conducted by Department of Civil Engineering, Arizona State University, February, 1994.

2. Flood Control District of Maricopa County (1994), *Agua Fria River sediment transport study*, Volume II – Training Materials, conducted by Department of Civil Engineering, Arizona State University, February, 1994.

3. George V. Sabol Consulting Engineers, Inc. (1997), *Cave Creek above Carefree Highway floodplain delineation study*, FCD 95-28, prepared for Flood Control District of Maricopa County, Phoenix, Arizona, July 1997.

4. Simons, Li & Assoc., Inc. (1983), *Hydraulic and geomorphic analysis of the Agua Fria River*, Project No. AZ-MC-05, submitted to the Flood Control District of Maricopa County, Arizona, May 16, 1993.

5. Stevens, Jr., H. H. and C. T. Yang (1989), *Summary and use of selected fluvial-sediment discharge formulas*, Water Resources Investigations Report No. 89-4026, U.S. Geological Survey, Denver, Colorado, USA.

6. U.S. Army Corps of Engineers (1990), *HEC-6: Scour and deposition in rivers and reservoirs*, User's Manual, Hydrologic Engineering Center, Davis, California, September, 1990.

7. U.S. Army Corps of Engineers (1991), *HEC-6: Scour and deposition in rivers and reservoirs*, User's Manual, Hydrologic Engineering Center, Davis, California, June, 1991.

8. U.S. Army Corps of Engineers (1993), *HEC-6: Scour and deposition in rivers and reservoirs*, User's Manual, Hydrologic Engineering Center, Davis, California, August, 1993.

9. Vanoni, A. V. [Editor] (1975), Sedimentation engineering, ASCE Manuals and Reports on Engineering Practice No. 54, Reprinted 1977, prepared by The ASCE Task Committee for the Preparation of the Manual on Sedimentation, Sedimentation Committee of the Hydraulics Division, ASCE, New York, NY.

10. Water Resources Associates, Inc., (1986), *Agua Fria River sedimentation study*, submitted to Development Engineering, Phoenix, Arizona, May 30, 1986.

11. Willdan Assoc., Inc. (1997), *Cave Creek below Carefree Highway floodplain delineation study*, prepared for Flood Control District of Maricopa County, Phoenix, June 20, 1997.

12. Yang, C. T. (1973), Incipient motion and sediment transport, ASCE Journal of the Hydraulics Division, Vol. 9, No. HY10, Proc. Paper 10067, pp. 1679 – 1704.

13. Yang, C.T. (1984), Unit stream power equation for gravel, ASCE Journal of Hydraulics Division, Vol. 110, No. HY 12, pp. 1783 – 1797.

14. Yang, C. T. (1988), Sediment transport and unit streampower in civil engineering practice, Cheremisineff, P. E., Cheremisineff, N.P., and Cheng, S.L. (eds.), Vol. 5, Chapter 8, Technomic Publishing Company, Inc., Lancaster, PA, pp. 265-289.

15. Yang, C. T. and Molinas, A. M. (1982), Sediment transport and unit streampower function, ASCE Journal of the Hydraulics Division, Volume 108, No. HY6, pp. 774 – 793.

16. Yang, C. T. and Stall, J. B. (1976), Applicability of unit stream power equation, ASCE Journal of the Hydraulics Division, Vol. 102, No. HY5, pp. 559-568.

APPENDIX A

COMPILATION OF SEDIMENT YIELD DATA AND INFORMATION

Table A-1

Average annual sediment yield summary

ID	Site	Area sq. miles	Yield ac-ft/sq. mi.	Reference
(1)	(2)	(3)	(4)	(5)
A	AZ and NM	N/A	0.009 - 1.33	Corps (1995)
B	Walnut Gulch	N/A	0.12 - 0.4	Alonso (1997)
C	Camp Marston, CA	1.59	0.14	GVSCE (1996)
D	Cave Ck, AZ	121.00	0.31	GVSCE (1996)
E	San Diego, CA	N/A	0.13	GVSCE (1996)
F	San Diego, CA	N/A	0.07	GVSCE (1996)
G	Spookhill Dam, AZ	16.40	0.15	GVSCE (1996)
H	Saddleback Dam, AZ	30.00	0.08	GVSCE (1996)
I	Davis Tank, AZ	0.21	0.96	GVSCE (1996)
J	Kennedy Tank, AZ	0.97	0.27	GVSCE (1996)
K	Juniper Tank, AZ	2.00	0.29	GVSCE (1996)
L	Alhambra Tank, AZ	6.61	0.03	GVSCE (1996)
M	Black Hills Tank, AZ	1.14	0.68	GVSCE (1996)
N	Black Hills Tank, AZ	1.56	0.58	GVSCE (1996)
O	Mesquite Tank, AZ	9.00	0.03	GVSCE (1996)
P	Tank 76, AZ	1.17	0.21	GVSCE (1996)
Q	N. Scottsdale, AZ	8.58	0.041 - 0.0667	GVSCE (1996)
R	N. Scottsdale, AZ	8.58	0.129 - 0.191	GVSCE (1996)
S	N. Scottsdale, AZ	8.58	0.036 - 0.152	GVSCE (1996)
T	Cherokee Wash, AZ	0.14	4.36	WEST (1997)
U	Cherokee Wash, AZ	0.14	0.64	WEST (1997)
V	Cherokee Wash, AZ	0.14	0.69	WEST (1997)
W	Cherokee Wash, AZ	0.14	2.95	WEST (1997)
X	Cherokee Wash, AZ	0.30	4.17	WEST (1997)
Y	Cherokee Wash, AZ	0.30	0.63	WEST (1997)
Z	Cherokee Wash, AZ	0.30	0.63	WEST (1997)
AA	Cherokee Wash, AZ	0.30	2.48	WEST (1997)
BB	Casandra Wash, AZ	1.24	0.25	CH2M-Hill (1994)
CC	Casandra Wash, AZ	1.24	1.46	CH2M-Hill (1994)
DD	Casandra Wash, AZ	1.24	0.2	CH2M-Hill (1994)
EE	Casandra Wash, AZ	1.24	0.32	CH2M-Hill (1994)
FF	Rawhide Wash, AZ	13.64	1	CH2M-Hill (1994)
GG	Rawhide Wash, AZ	13.64	0.24	CH2M-Hill (1994)
HH	Rawhide Wash, AZ	13.64	0.1	CH2M-Hill (1994)
II	Rawhide Wash, AZ	13.64	0.22	CH2M-Hill (1994)
JJ	Rawhide Wash, AZ	13.64	0.4	CH2M-Hill (1994)
KK	Embudo Arroyo	20.68	0.07	AMAFCA (1994)
LL	La Gueva Arroyo	8.00	0.05	AMAFCA (1994)
MM	Baca Arroyo	11.55	0.34	AMAFCA (1994)
NN	N. Pino Arroyo	2.82	0.22	AMAFCA (1994)
OO	S. Pino Arroyo	9.33	0.13	AMAFCA (1994)
PP	Bear Arroyo	15.50	0.12	AMAFCA (1994)
QQ	Vinyard Arroyo	0.98	0.28	AMAFCA (1994)
RR	Hahn Arroyo	5.80	0.01	AMAFCA (1994)
SS	Total NDC	101.01	0.21	AMAFCA (1994)

Figure A-1
Sediment yield for watersheds in Arizona and New Mexico

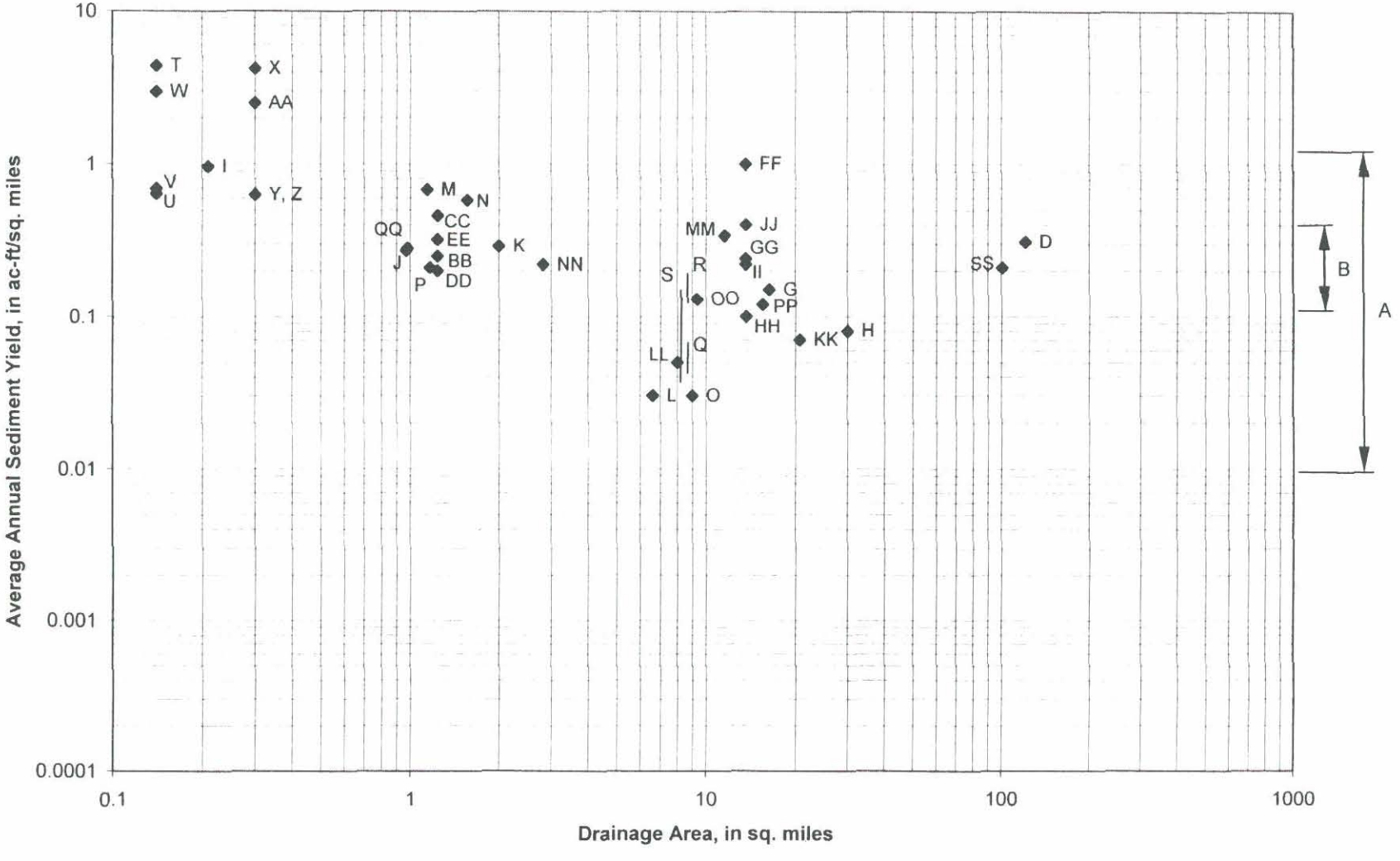
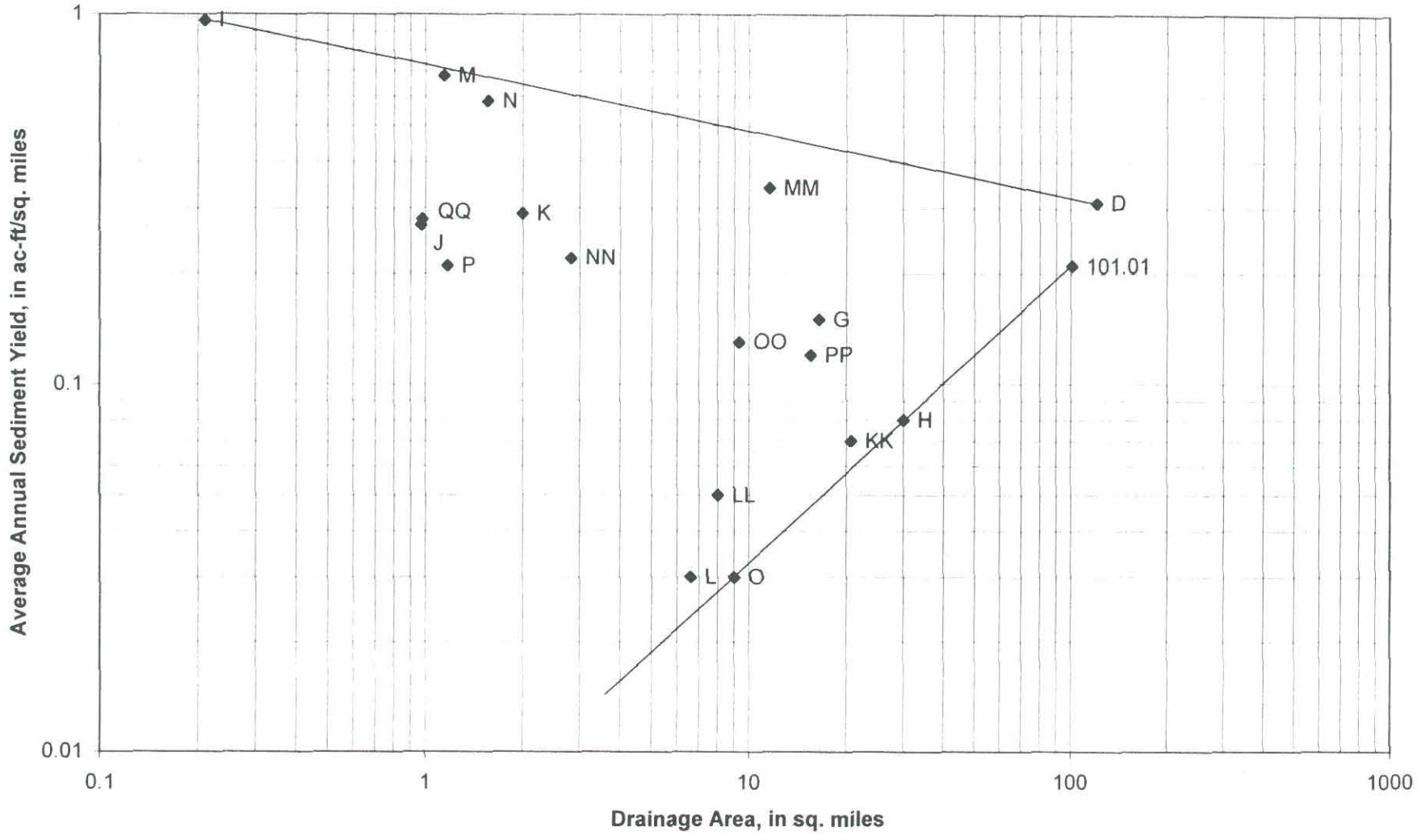


Figure A-2
Sediment Yield - Arizona and Albuquerque, NM Data



Stantech Consulting

Project: Upper Cave Creek WMP | Project Number: 28900077

Notes: Watershed Sediment Yield | Scale:

Page of Page(s)

Computed By: GVS | Date: 7 Jan 99 (amDg) | Checked By: | Date:

Ref: Sediment & Erosion Design Guide
AMAFCA, 1994
by Resource Consultants & Engineers

From Table 2-3

Sediment Yield based on Silt Haul Records

Site (Arroyo)	Area sq. mi.	Yield acft/sq. mi.
Embudo	20.68	0.07
La Cueva	8.0	0.05
Baca	11.55	0.34
N. Pino	2.82	0.22
S. Pino	9.33	0.13
Bear	15.5	0.12
Vinyard	0.98	0.28
Hahn	5.8	0.01
Total NDC	101.01	0.21

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Project: Upper Cave Creek WMP | Project Number: 28900077

Notes: Watershed Sediment Yield | Scale:

Page of Page(s)

Computed By: GVS | Date: 5 Jan 99 amDg | Checked By: | Date:

Ref: Desert Greenbelt Project, Pima Road Channel, Concept Review by GVSCE, Nov 96

Appendix H by H. W. Hjalmarson, August 96

Drainage Area = 8.58 sq. mi.

Average Annual Sediment Yield, in acft/sq.mi./yr

Flaxman (1974)	0.041 - 0.0667
Flaxman (1972)	0.129 - 0.191
RUSLE	0.036 - 0.152

Flood Event Sediment Yield, in acft/sq.mi.

Return Period	Flaxman (1974)	Flaxman (1972)	RUSLE Likely	RUSLE Max
2-yr	.0012	.0031	.0006	.0024
5-	.0708	.1818	.0382	.1447
10 -	.1597	.4103	.0861	.3262
25 -	.3688	.9476	.1988	.7531
50 -	.6159	1.5851	.3320	1.2578
100 -	1.0220	2.6224	.5508	2.0872

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Project: Upper Cave Creek WMP			Project Number: 28900077
Notes: Watershed Sediment Yield			Scale:
			Page of Page(s)
Computed By: GVS	Date: 5 Jan 99 (om Dg)	Checked By:	Date:

Ref: Cherokee Wash Hydrologic, Hydraulic and Sedimentation Study

for FCDMC
by West Consultants, Inc

30 June 1997

Drainage Area:

Western Tributary = 90 acres (.14 sq. mi.)
Desert Park Trib = 190 acres (.30 sq. mi.)

Average Annual Sediment Yield, in ac-ft/sq.mi./yr

	Western Trib.	Desert Park Trib.
MUSLE	4.36	4.17
PSIAC	0.64	0.63
Renard	0.69	0.63
USBR curve	2.95	2.48

Flood Event Sediment Yield, in ac-ft/sq.mi.
(based on the Renard average annual yield)

	$Q_b = Q_2$		$Q_b = Q_{10}$	
Return Period	W. Trib.	Desert P. Trib.	W. Trib.	Desert P. Trib
2-yr	1.29	0.33	0.43	0.07
10-yr	4.00	1.23	1.29	0.33
50-yr	7.79	2.40	2.50	0.63
100-yr	9.43	2.93	3.07	0.77

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Project: Upper Cave Creek WMP | Project Number: 28900077

Notes: Watershed sediment Yield | Scale:

Page of Page(s)

Computed By: GVS | Date: 4 Jan 99 | Checked By: | Date:

Ref: Casandra Wash Dam
CH2M-Hill by JE Fuller
30 March 1994

Drainage Area = 1.24 sq. mi.

Average Annual Sediment Yield, in ac-ft/sq.mi/yr.

Method	Yield ac-ft/sq.mi./yr
PSIAC	0.25
MUSLE	0.46
SCS studies	0.20
Yang Eq'n.	0.32
Average	0.31

Flood Event Sediment Yield, in ac-ft/sq.mi.

Return Period	MUSLE	Yang Eq'n	Avg.
2-yr	0.40	0.24	0.32
5-	0.64	0.48	0.56
10-	0.89	0.64	0.76
25-	1.21	0.89	1.05
50-	1.37	1.13	1.25
100-	1.61	1.29	1.45

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Project: Upper Cave Creek WMP | Project Number: 28900077

Notes: Watershed Sediment Yield | Scale:

Page of Page(s)

Computed By: GVS | Date: 4 Jan 99 (omDg) | Checked By: | Date:

Ref: Rawhide Wash Detention Basin
CH2M-Hill by JE Fuller
3 August 1994

Drainage Area = 13.64 sq.mi.

Average Annual Sediment Yield, in ac-ft/sq.mi./yr.

USBR Curve	1.0
PSIAC	0.24
Flaiman	0.10
MUSLE	0.22
Renard	0.40

Flood Event Sediment Yield, in ac-ft/sq.mi

Return Period	MUSLE	Yang Eq'n	Avg.
2-yr	0.15		
5-	0.30		
10-	0.46		
25-	0.67		
50-	0.88		
100-	1.63	0.32	0.98

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Project: Upper Cave Creek WMP | Project Number: 28900077

Notes: Watershed Sediment Yield | Scale:

Page of Page(s)

Computed By: GVS | Date: 5 Jan 99 amDg | Checked By: | Date:

Ref: Cherokee Wash Hydrologic, Hydraulic and Sedimentation Study

for FCDMC
by WEST Consultants, Inc.
30 June 1997

General Estimates of Sediment Yield

U.S. Army Corps of Eng (1995) for Arizona & New Mexico 0.009 – 1.33 ac-ft/sq.mi./yr

Fuller (1997) for Tatum Wash 0.1 – 0.9 ac-ft/sq.mi./yr

Alonso (1997) for Walnut Gulch 0.12 – 0.4 ac-ft/sq.mi./yr

Ref: Desert Greenbelt Project, Pima Road Channel, Concept Review
by GVSCE, Nov 96

Appendix H by H.W. Hjalmarson, August 96

Site	Area	Avg. Annual Sediment Yield
Camp Marston, CA	1.59	0.14 ac-ft/sq.mi.
Cave Creek, AZ	121.	0.31
San Diego Co., CA	–	0.13
San Diego Co., CA	–	0.07
Spookhill, AZ	16.4	0.15
Saddleback Dam, AZ	30.	0.08
Davis Tank, AZ	.21	0.96
Kennedy Tank, AZ	.97	0.27
Juniper Tank, AZ	2.00	0.29
Alhambra Tank, AZ	6.61	0.03
Black Hills Tank, AZ	1.14	0.68
Black Hills Tank, AZ	1.56	0.58
Mesquite Tank, AZ	9.0	0.03
Tank 76, AZ	1.17	0.21

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APPENDIX B

REPORT BY MR. H.W. HJALMARSON, PE, DATED 13 JULY 1999

CAVE CREEK

BELOW CAREFREE HIGHWAY
TO UPPER END OF CAVE BUTTES RESERVOIR

Analysis and comments on the following:
Capacity relations for Cave Creek Dam.
Trend analysis of surface sediment/debris samples.
Discussion of two USGS gages on Cave Creek above dam.
Sediment yield and runoff from storms.

FOR
STANTECH CONSULTING
(GEORGE SABOL)

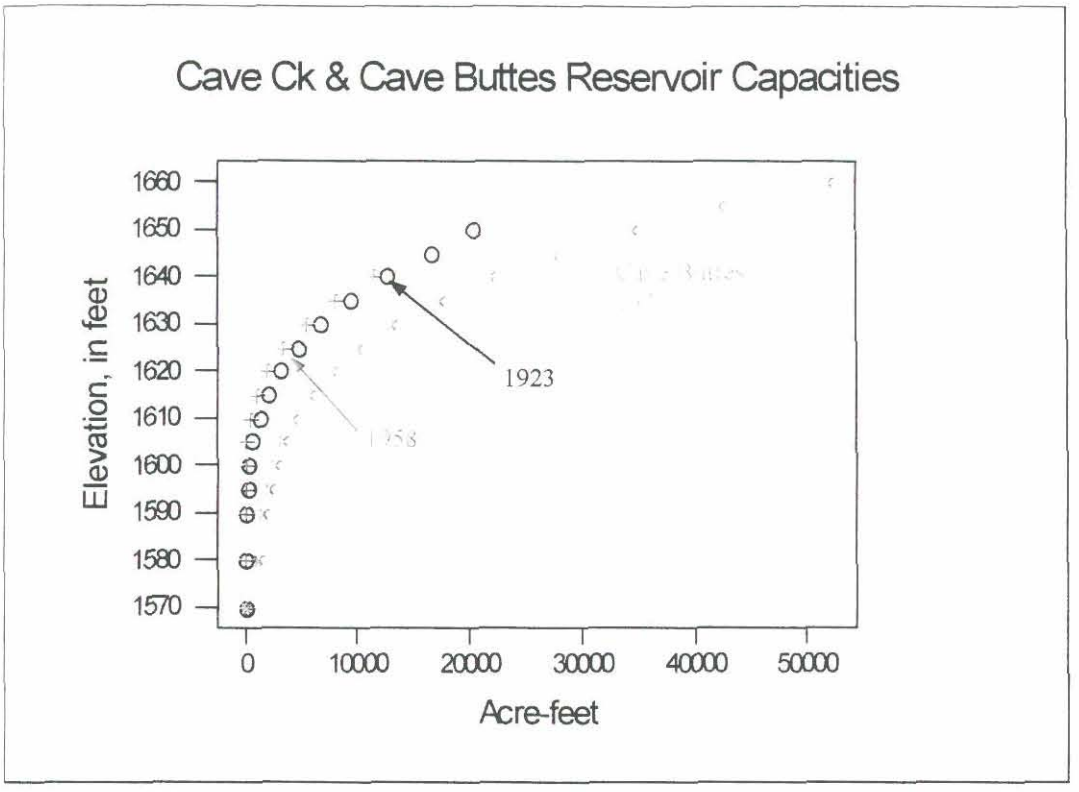
By H. W. Hjalmarson, PE

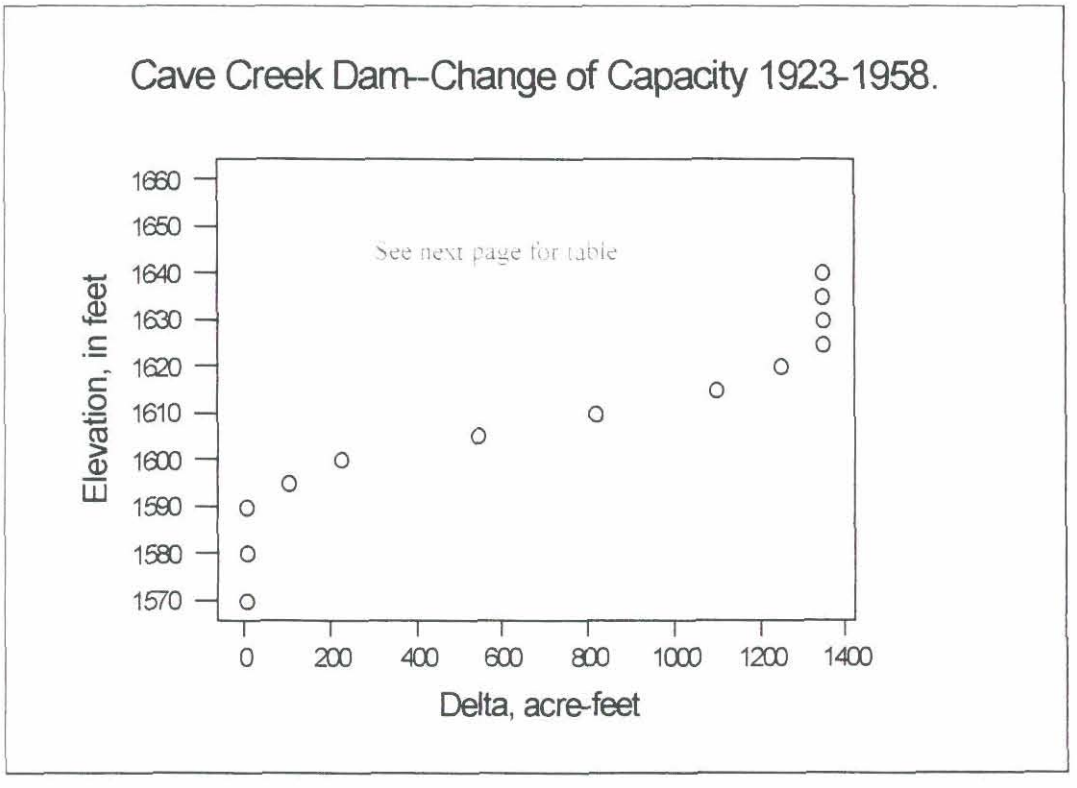
Consulting Hydrologist

July 13, 1999
(REVISED)

Capacity relations for Cave Ck and Cave Buttes Reservoirs

Relations obtained from Dallas Reigle of SRP June 1999(see attached)..





Capacity relations for Cave Ck and Cave Buttes Reservoirs (Cont.)

Data obtained from Dallas Reigle of SRP, Joe Tram of FCDMC and USGS, June 1999(See attached relations)..

TABLE OF CAPACITIES IN ACRE-FEET. C1923-Cave Ck Dam from curve for original conditions by SRP. C1958-Cave Creek Dam from table for 1958 survey by SRP. C1979G-Cave Buttes Dam from curve for 1979 *Gross Capacity* by CofE. C1979N-Cave Buttes Dam from curve for 1979 *Net Capacity* by CofE. delta-Difference between C1923 and C1958.

Elev	C1923	C1958	C1979G	C1979N	delta
1570	0	0	0	0	0
1580	0	0	1000	0	0
1590	0	0	1400	0	0
1595	100	0	1900	300	100
1600	220	0	2500	600	220
1605	600	60	3200	1150	540
1610	1150	330	4200	1800	820
1615	2000	900	5600	2500	1100
1620	3050	1800	7500	4000	1250
1625	4600	3250	9800	6300	1350
1630	6650	5300	13000	9400	1350
1635	9250	7900	17200	13000	1350
1640	12650	11300	21750	17500	1350
1645	16600 *		27500	23000 *	
1650	20400 *		34500	29300 *	
1655 *	*		42300	37500 *	
1660 *	*		52000	45630 *	

Trend analysis of channel surface sediment/debris samples along channel of Cave Creek between dam pool and Carefree Hwy.

The distribution of channel surface particle size along the channel was examined using simple linear regression. Data were furnished by Stantech (See Table on following page 5). Mile 24.8 is near the dam. More sophisticated trend detection methods were not used because the linear regression clearly shows there is no trend of the D90, D84, D50, D10, mean, maximum and minimum particle sizes (See pages 6-12). Because some viewers of the data may see a cyclic trend along the channel the components of trend were briefly examined for the D90 particles.

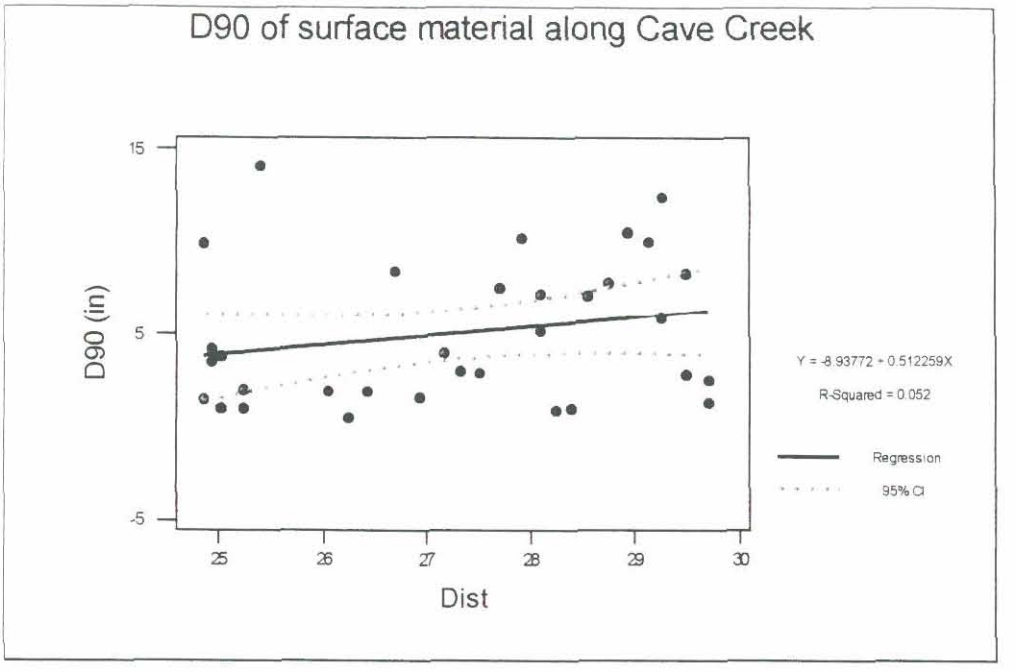
The decomposition of samples along the channel examines trend, cyclic and error components. This analysis is not precisely appropriate for this reach of Cave Creek but it provides some insight how the samples might seem to vary along the channel. This analysis is shown on page 13. Nearly all of the error (or variance of sample values) along the channel is associated with simple sample variance. There is no trend along the channel and there is no cyclic trend along the channel that can be explained by the model.

Thus, a trend of channel surface sediment size was not detected using statistical methods. A trend of material size may exist but it must be explained with other physical features (variables) such as channel geometry, tributary inflow and geomorphology.

Trend analysis of surface sediment/debris samples.

Table of channel sediment data firnished by S. Gerlach of Stantech

	D90 (in)	D84 (in)	D50 (in)	D16 (in)	D10 (in)	Mean Siz	Max (in)	Min (in)	Dist (mi)
E Right Ch	1.548	1.3180	0.59100	0.252000	0.0150000	0.97758	6.0000	0.007874	24.845
E Left Ch	9.900	7.2400	1.20000	0.591000	0.0350000	3.31558	16.8000	0.007874	24.845
D Right	4.260	3.5870	0.89500	0.004000	0.0040000	1.87062	7.8000	0.003937	24.919
D Left Ch	3.504	2.5100	0.59100	0.066000	0.0080000	1.23019	4.8000	0.007874	24.919
C Right	1.088	0.1250	0.06300	0.001000	0.0010000	0.29600	2.5000	0.000787	25.010
C Left Ch	3.800	3.0000	0.50000	0.071000	0.0630000	1.98300	13.0000	0.030000	25.010
B Right	2.050	1.4790	0.12500	0.062500	0.0007874	1.01300	12.0000	0.000787	25.233
B Left Ch	1.000	0.6720	0.12500	0.001000	0.0010000	0.61343	5.0000	0.000787	25.233
Channel A	14.100	6.0000	1.50000	0.064000	0.0590000	4.18904	20.0000	0.000787	25.388
P-13k	1.900	1.2510	0.12500	0.062500	0.0625000	1.55200	25.0000	0.000787	26.044
P-12k	0.500	0.4550	0.12500	0.006000	0.0010000	0.21300	1.5000	0.000787	26.239
P-11k	1.950	1.0360	0.12500	0.001000	0.0010000	0.53700	4.0000	0.000787	26.430
P-10k	8.400	5.3575	0.87500	0.062500	0.0625000	2.35024	14.0000	0.000787	26.696
P-9k	1.600	0.9895	0.00079	0.000787	0.0007874	4.50000	0.0008	0.541097	26.921
P-8k	4.000	3.5355	0.37500	0.000787	0.0007874	1.52947	9.0000	0.000787	27.169
P-7k	3.000	2.5000	0.25000	0.062500	0.0316437	1.09905	6.5000	0.000787	27.320
P-6k	2.900	2.2510	0.00079	0.000787	0.0007874	1.09287	11.0000	0.000787	27.502
P-5k	7.550	6.1715	0.25000	0.000787	0.0007874	2.64998	17.0000	0.000787	27.693
P-4k	10.200	9.1380	0.50000	0.000787	0.0007874	3.65814	14.0000	0.000787	27.913
P-3k Right	5.200	3.8220	0.25000	0.000787	0.0007874	1.84444	15.0000	0.000787	28.091
P-3k Left Side	7.250	4.4895	0.75039	0.000787	0.0007874	3.92539	36.0000	0.000787	28.091
P-2k	0.900	0.5000	0.12500	0.000787	0.0007874	0.27963	2.0000	0.000787	28.241
P-1k	1.050	0.5000	0.00079	0.000787	0.0007874	0.77856	11.0000	0.000787	28.390
Powerline Site	7.100	2.6525	0.18750	0.000787	0.0007874	1.77438	17.0000	0.000787	28.555
P+1000'	7.800	5.4600	1.50000	0.000787	0.0007874	2.89016	13.0000	0.000787	28.750
P+2000'	10.500	6.0145	0.12500	0.000787	0.0007874	3.30244	25.0000	0.000787	28.934
P+3000'	10.000	8.0500	0.25000	0.000787	0.0007874	2.75131	16.0000	0.000787	29.130
P+4000' Left	5.950	5.5000	0.75000	0.000787	0.0007874	3.58148	26.0000	0.000787	29.258
P+ 4000' Right	12.400	10.0145	1.00000	0.000787	0.0007874	4.28141	23.0000	0.000787	29.258
P+5000' Right	2.800	1.2740	0.25000	0.000787	0.0007874	1.24176	14.0000	0.000787	29.493
P+5000' Mid.	8.300	5.6755	0.25000	0.000787	0.0007874	1.99450	12.0000	0.000787	29.493
P+6000'Left n.	2.500	1.2750	0.06250	0.000787	0.0007874	1.32319	12.0000	0.000787	29.700
P+6000'Right .	1.300	1.0000	0.03000	0.000787	0.0007874	0.50355	3.0000	0.000787	29.700



Regression Analysis

The regression equation is
D90 (in) = - 8.9 + 0.512 Dist

Predictor	Coef	Stdev	t-ratio	p
Constant	-8.94	10.71	-0.83	0.411
Dist	0.5123	0.3919	1.31	0.201

s = 3.768 R-sq = 5.2% R-sq(adj) = 2.2%

Clearly there is no linear relation

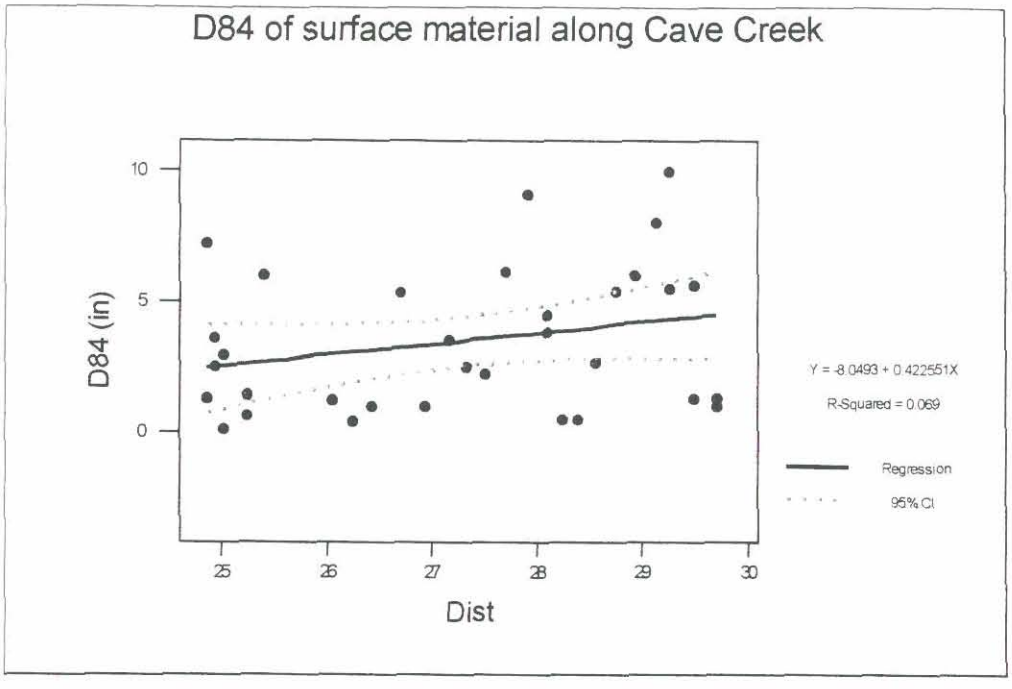
Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	1	24.26	24.26	1.71	0.201
Error	31	440.24	14.20		
Total	32	464.50			

Unusual Observations

Obs.	Dist	D90 (in)	Fit	Stdev.Fit	Residual	St.Resid
9	25.4	14.100	4.068	0.992	10.032	2.76R

R denotes an obs. with a large st. resid.



MTB > Regress 'D84 (in)' 1 'Dist';
SUBC> Constant.

Regression Analysis

The regression equation is
D84 (in) = - 8.05 + 0.423 Dist

Predictor	Coef	Stdev	t-ratio	p
Constant	-8.049	7.622	-1.06	0.299
Dist	0.4226	0.2788	1.52	0.140

s = 2.681 R-sq = 6.9% R-sq(adj) = 3.9%

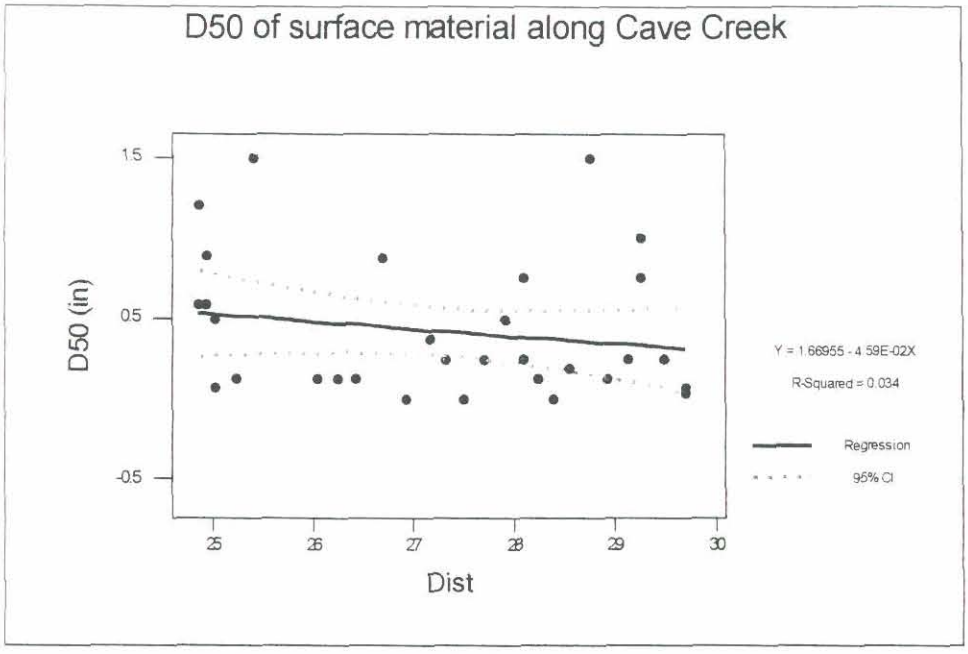
Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	1	16.508	16.508	2.30	0.140
Error	31	222.822	7.188		
Total	32	239.331			

Unusual Observations

Obs.	Dist	D84 (in)	Fit	Stdev.Fit	Residual	St.Resid
19	27.9	9.138	3.745	0.498	5.393	2.05R
29	29.3	10.014	4.314	0.721	5.701	2.21R

R denotes an obs. with a large st. resid.



Regression Analysis

The regression equation is
D50 (in) = 1.67 - 0.0459 Dist

Predictor	Coef	Stdev	t-ratio	p
Constant	1.670	1.206	1.38	0.176
Dist	-0.04592	0.04411	-1.04	0.306

s = 0.4242 R-sq = 3.4% R-sq(adj) = 0.3%

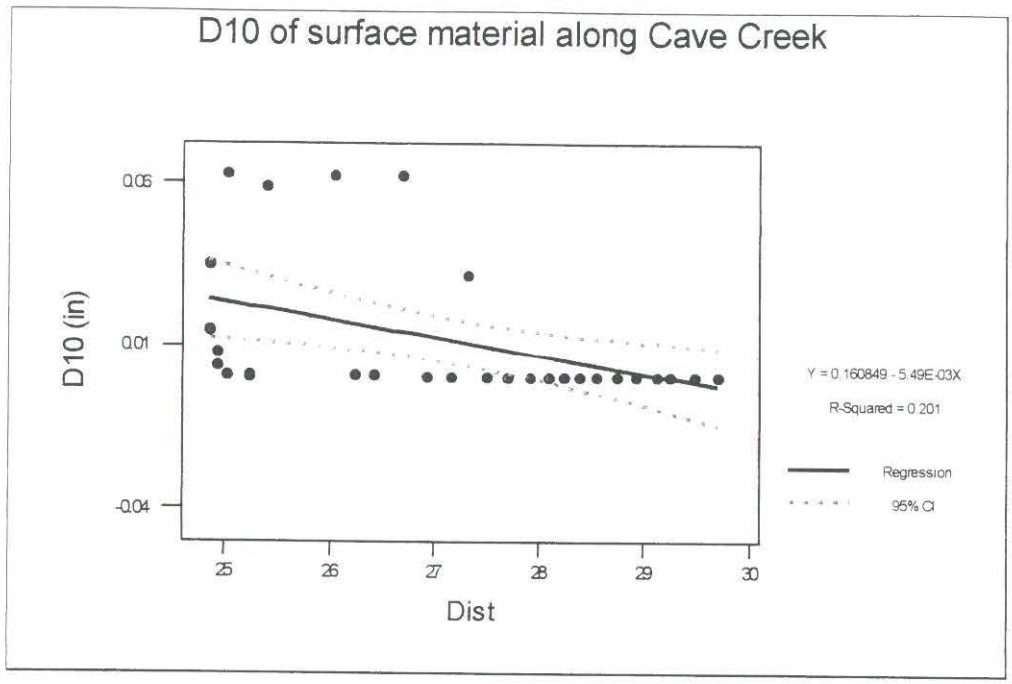
Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	1	0.1950	0.1950	1.08	0.306
Error	31	5.5775	0.1799		
Total	32	5.7724			

Unusual Observations

Obs.	Dist	D50 (in)	Fit	Stdev.Fit	Residual	St.Resid
9	25.4	1.5000	0.5037	0.1116	0.9963	2.43R
25	28.8	1.5000	0.3493	0.0981	1.1507	2.79R

R denotes an obs. with a large st. resid.



Regression Analysis

The regression equation is
D10 (in) = 0.161 - 0.00549 Dist

Predictor	Coef	Stdev	t-ratio	p
Constant	0.16085	0.05375	2.99	0.005
Dist	-0.005495	0.001966	-2.79	0.009

s = 0.01891 R-sq = 20.1% R-sq(adj) = 17.5%

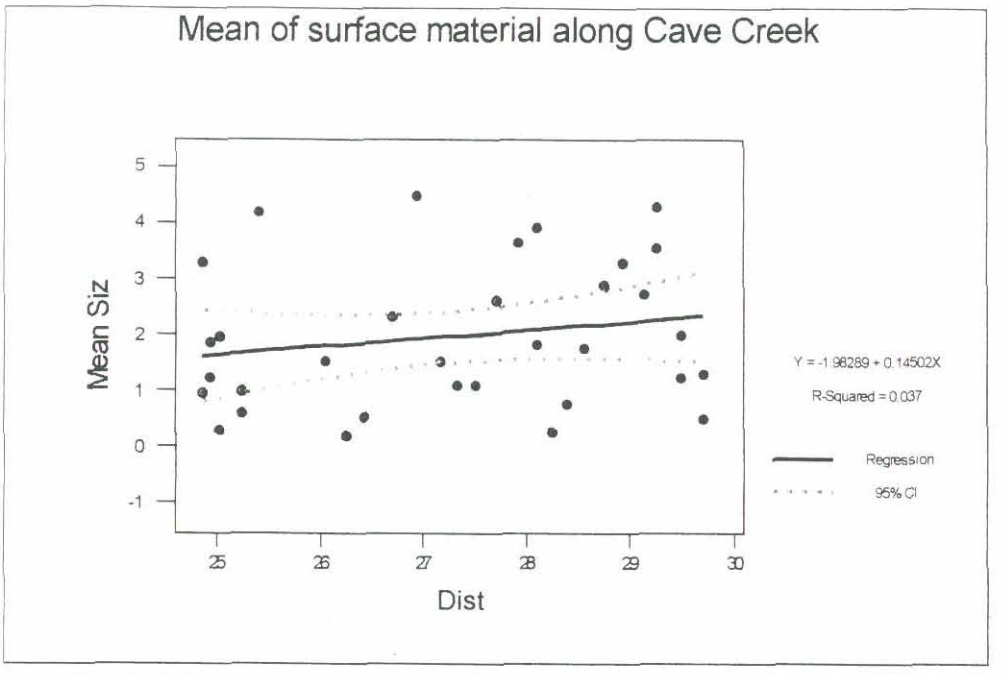
Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	1	0.0027916	0.0027916	7.81	0.009
Error	31	0.0110828	0.0003575		
Total	32	0.0138744			

Unusual Observations

Obs.	Dist	D10 (in)	Fit	Stdev.Fit	Residual	St.Resid
6	25.0	0.06300	0.02342	0.00555	0.03958	2.19R
9	25.4	0.05900	0.02135	0.00498	0.03765	2.06R
10	26.0	0.06250	0.01774	0.00410	0.04476	2.42R
13	26.7	0.06250	0.01416	0.00349	0.04834	2.60R

R denotes an obs. with a large st. resid.



Regression Analysis

The regression equation is
Mean Siz = - 1.98 + 0.145 Dist

Predictor	Coef	Stdev	t-ratio	p
Constant	-1.983	3.654	-0.54	0.591
Dist	0.1450	0.1337	1.08	0.286

s = 1.285 R-sq = 3.7% R-sq(adj) = 0.6%

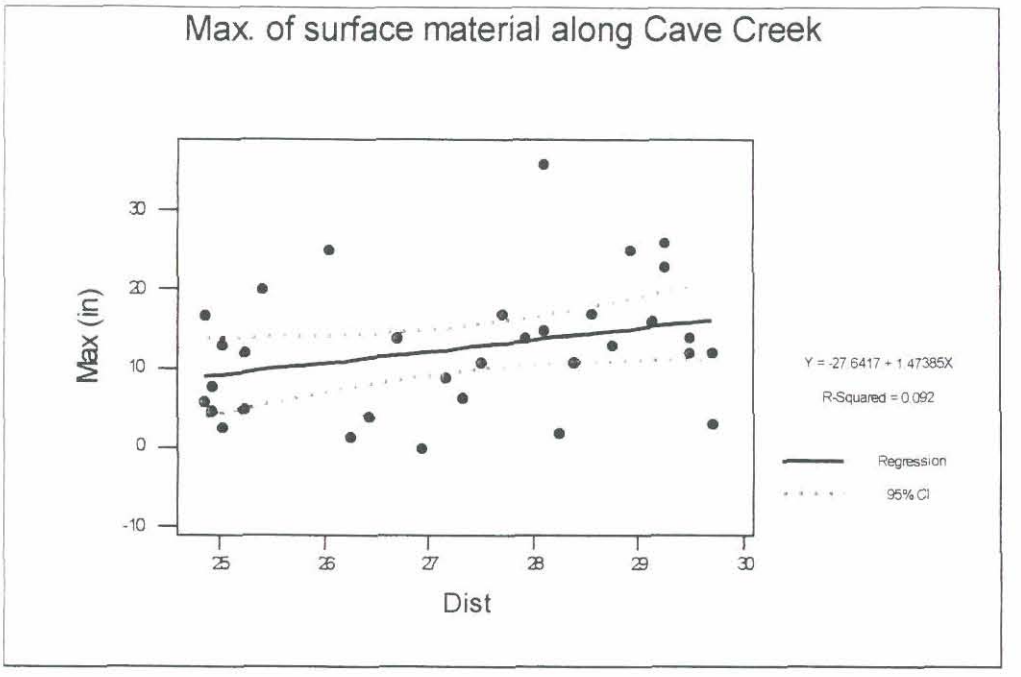
Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	1	1.944	1.944	1.18	0.286
Error	31	51.212	1.652		
Total	32	53.156			

Unusual Observations

Obs.	Dist	Mean Siz	Fit	Stdev.Fit	Residual	St.Resid
9	25.4	4.189	1.699	0.338	2.490	2.01R
14	26.9	4.500	1.921	0.229	2.579	2.04R

R denotes an obs. with a large st. resid.



Regression Analysis

The regression equation is
Max (in) = - 27.6 + 1.47 Dist

Predictor	Coef	Stdev	t-ratio	p
Constant	-27.64	22.72	-1.22	0.233
Dist	1.4739	0.8313	1.77	0.086

s = 7.993 R-sq = 9.2% R-sq(adj) = 6.3%

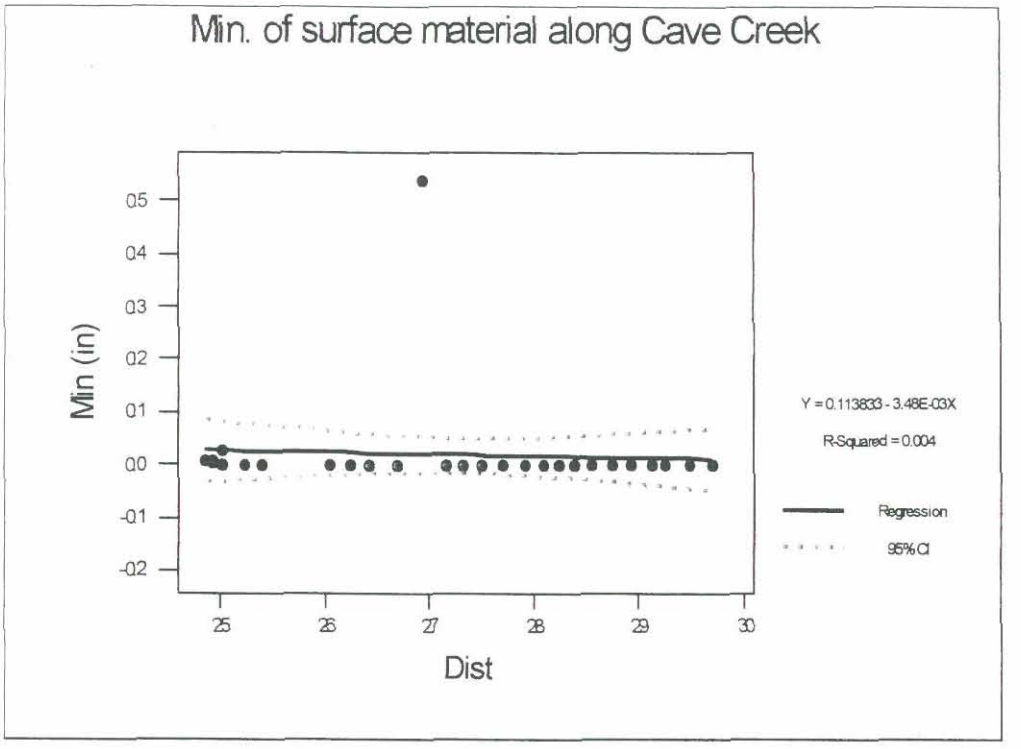
Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	1	200.84	200.84	3.14	0.086
Error	31	1980.58	63.89		
Total	32	2181.43			

Unusual Observations

Obs.	Dist	Max (in)	Fit	Stdev.Fit	Residual	St.Resid
21	28.1	36.00	13.76	1.54	22.24	2.84R

R denotes an obs. with a large st. resid.



Regression Analysis

The regression equation is
Min (in) = 0.114 - 0.00348 Dist

Predictor	Coef	Stdev	t-ratio	p
Constant	0.1138	0.2707	0.42	0.677
Dist	-0.003483	0.009904	-0.35	0.727

s = 0.09523 R-sq = 0.4% R-sq(adj) = 0.0%

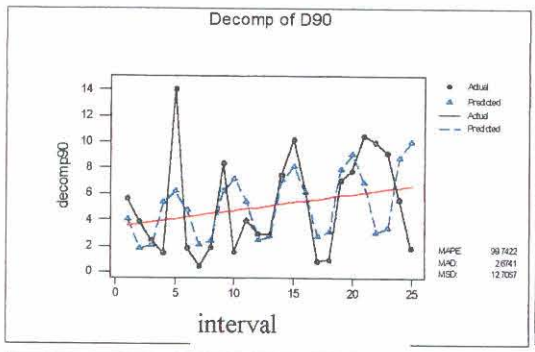
Analysis of Variance

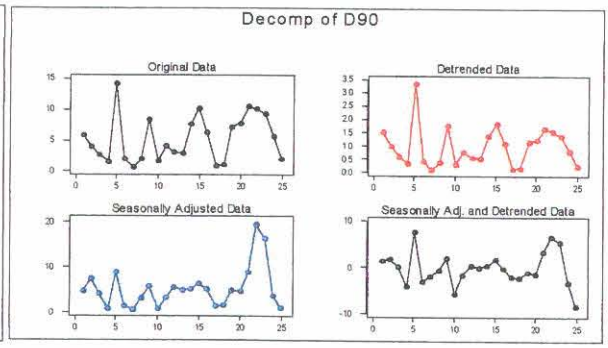
SOURCE	DF	SS	MS	F	p
Regression	1	0.001122	0.001122	0.12	0.727
Error	31	0.281137	0.009069		
Total	32	0.282259			

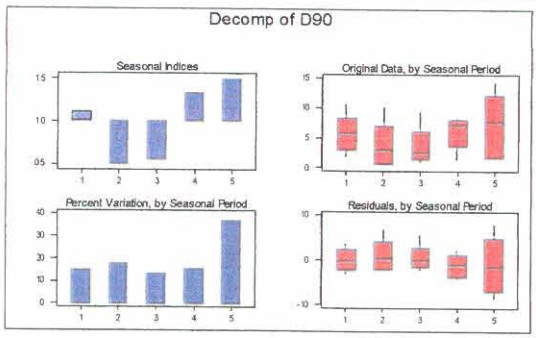
Unusual Observations

Obs.	Dist	Min (in)	Fit	Stdev.Fit	Residual	St.Resid
14	26.9	0.5411	0.0201	0.0170	0.5210	5.56R

R denotes an obs. with a large st. resid.







Source: Minitab Release 10Xtra for Windows, July 1995, Minitab Inc.

Series Decomposition
Data decomp90
Length 25.0000 NMissing 0

Trend Line Equation

Yt = 3.5447 + 0.127085*t

Seasonal Indices

Period	Index
1	1.11406
2	0.500661
3	0.547411
4	1.33916
5	1.49871

Accuracy of Model

MAPE:	99.7422	Very large % error
MAD:	2.6741	
MSD:	12.7067	

The above is mostly for your ammusement:
The above is a decomposition of the D90 surface material along the Cave Creek channel. Using assumed uniform intervals along the channel, a cyclic trend along the channel might be apparant to some viewers. Although a decomposition trend analysis is not really appropriate for this condition, it is performed to give a rough examination of the "wavy" appearance of D90 down the channel. There is little, if any, improvement in the est. of D90 resulting from the trend and cycle components as shown in plots in the upper right hand corner of this page.

Discussion of two USGS gages on Cave Creek above dam.

Runoff characteristics of Cave Creek and nearby watersheds

Runoff characteristics of Cave Creek are analyzed to answer the following:

1. How is the runoff at gages 09512380 and 09512300 related?
2. Can general runoff characteristics for the study reach be reliably estimated?

The following data are for USGS streamflow gages. E=mean basin elevation. P = mean annual precipitation of basin.

USGS gage	Area	MeanQ		E	P
	mi^2	ft^3/s	inches	feet	inches
09512280 Cave Ck	**72.8**	**8.03**	**1.50**	**4000**	**18.0**
09512300 Cave Ck	**121.0**	**4.08**	**0.70**	**3470**	**15.7**
09510200 Sycamore	**164.0**	**29.50**	**2.44**	**3820**	**21.2**
09508300 Wet Bot	**36.4**	**15.60**	**5.82**	**4810**	**25.0**
09513780 New River	**67.3**	**14.00**	**2.83**	**3970**	**20.0**
09513860 Skunk	**64.9**	**1.72**	**0.36**	**2180**	**12.2**
09513800 New River	**83.3**	**14.00**	**2.28**	**3600**	**19.5**

The following is a regression analysis of runoff for Cave Ck and nearby streams.

The regression equation used is

$$\text{MeanQ (inches)} = 4.99 - 0.770\,P + 0.032\,P^2$$

Predictor	Coef	Stdev	t-ratio	p
Constant	4.990	2.896	1.72	0.160
P	-0.7698	0.3186	-2.42	0.073
Psquare	0.031974	0.008556	3.74	0.020

s = 0.3861 R-sq = 97.0% R-sq(adj) = 95.4%

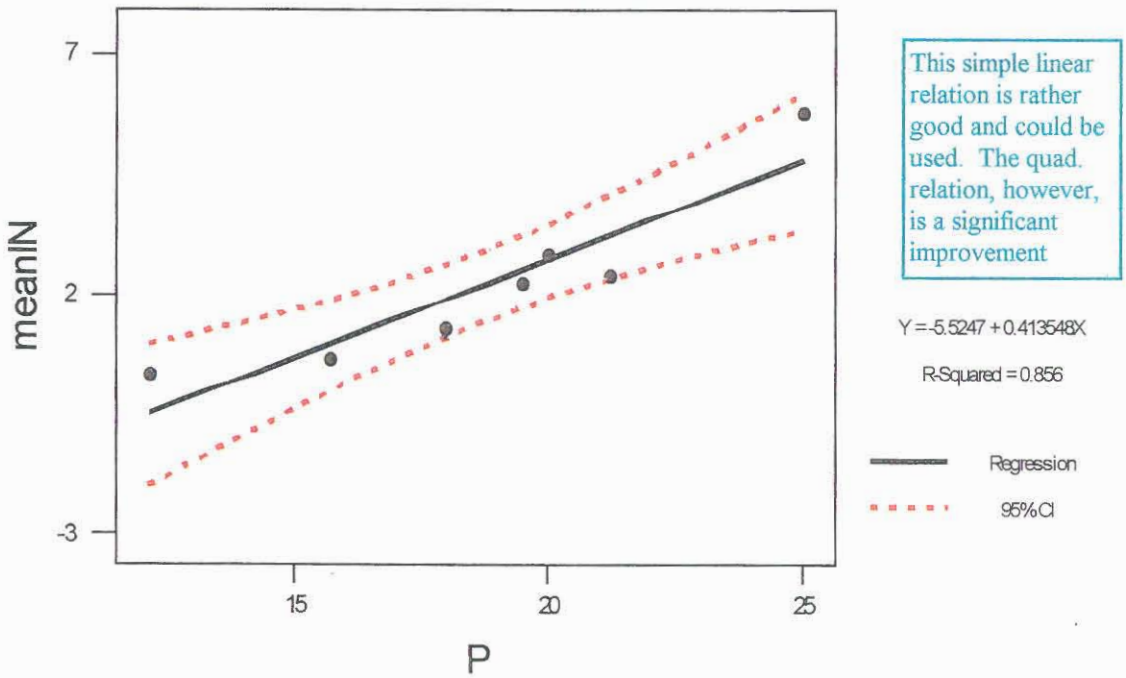
Analysis of Variance

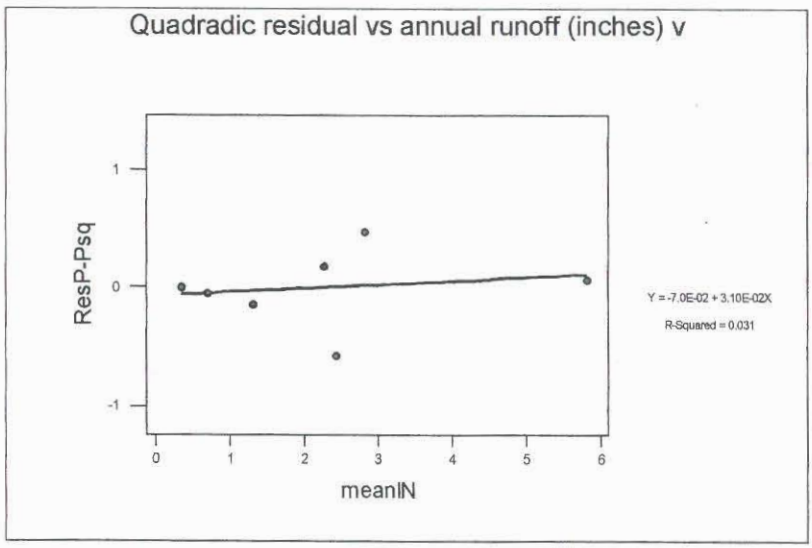
SOURCE	DF	SS	MS	F	p
Regression	2	19.0546	9.5273	63.93	0.001
Error	4	0.5962	0.1490		
Total	6	19.6508			

SOURCE	DF	SEQ SS
P	1	16.9730
Psquare	1	2.0816

This coef. of determination suggests the relation is very good. Clearly, the relation is surprisingly good considering that no adjustment for variable periods of record was made. For the Cave Creek reach below Carefree Hwy to the upper limits of the reservoir, a mean annual discharge of about 4.1 cfs is suggested. The mean annual precip(P) will not change much between Carefree Hwy and the upper end of the reservoir pool.
Also, the linear relation shown on the next page is pretty good.

Plot of runoff data showing linear relation between mean annual runoff and mean basin precipitation. The quadradic relation is not shown but the residual for the relation are shown below.



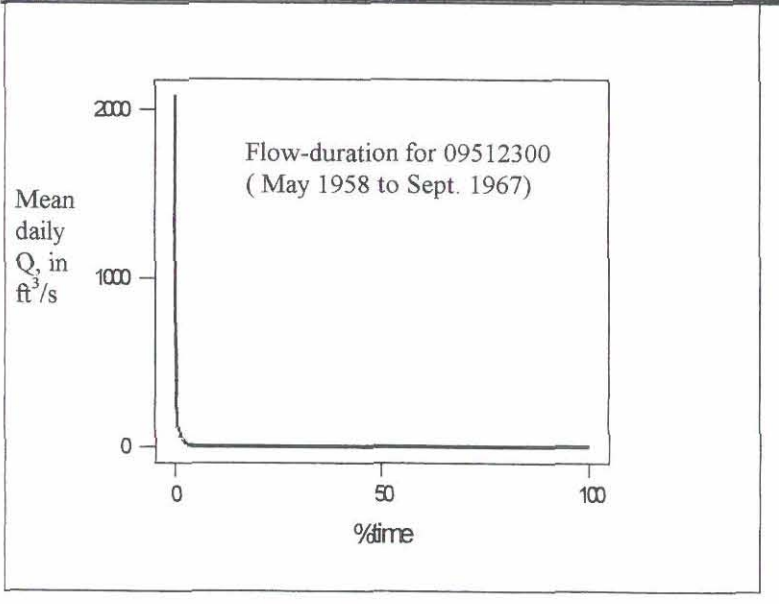


Clearly, there is a reliable relation between mean annual runoff, in inches, and mean annual precipitation of the basins. Thus, runoff characteristics are estimated at the upper end of the study reach of Cave Creek using streamflow data.

Discussion of two USGS gages on Cave Creek above dam (cont.)

Duration table of daily mean Q for station 09512300 for May 1958 to Sept.1967.

Q	% time	Q	% time	Q	% time	Q	% time
2080	0.031488	153	0.65605	65	1.40551	24	2.342
1180	0.062716	142	0.68727	60	1.43674	22	2.374
886	0.093943	123	0.71850	54	1.46797	20	2.530
770	0.125171	119	0.74973	52	1.49920	18	2.592
531	0.156399	112	0.78096	50	1.56165	16	2.623
500	0.187627	108	0.81218	49	1.59288	15	2.748
435	0.218855	107	0.87464	47	1.62411	13	2.904
421	0.250083	104	0.93710	45	1.71779	12	2.936
418	0.281311	101	0.96832	41	1.74902	11	2.998
402	0.312539	100	1.03078	40	1.81148	10	3.123
324	0.343767	97	1.09324	39	1.87393	9	3.154
286	0.374994	95	1.12446	36	1.90516	8	3.279
266	0.406222	92	1.15569	34	1.93639	7	3.342
246	0.437450	80	1.21815	33	1.96762	6	3.498
245	0.468678	75	1.24938	31	1.99884	5	3.779
194	0.499906	74	1.28060	30	2.15498	4	3.966
187	0.562362	71	1.31183	29	2.18621	3	3.997
184	0.593590	70	1.34306	27	2.21744	2	4.154
176	0.624817	67	1.37429	26	2.24867	1	4.550
						0	100.000



Comment: Unsure how this flow-duration information can be used because of the rather short record. Also, records do not include any very large floods. It clearly shows there is flow less than about 5 % of the time.

Runoff and sediment yield analysis

Area at USGS gage upstream of old dam (09512300) = 121 sq mile.
Area at Cave Creek Dam = 162 sq mile

Change in contents of Cave Ck Reservoir for 1923-1958 = 1350 acre-feet of sediment/debris where 1350 x 43560ft^2/acre = 58806000 ft^3 and divided by 35 years = 1680171 ft^3/year of debris into reservoir

Looking at sediment yield another way, 1350 ac-ft/162 mi^2 = 8.33 acre-ft/mi^2 and divided by 35 years = 0.238 acre-ft/mi^2/yr. This amount was increased by the CofE (1974) to 0.30 because, according to the CofE, it does not include debris production of the September 1970 flood. Apparently the CofE has capacity survey results that support the greater value of 0.30 acre-ft/mi^2/yr. The larger yield is not used in this analysis.

RUNOFF OF STORMS

Flood volume is generally related to the peak discharge of storms. Data from gaging stations in Arizona have been plotted by the U. S. Geological Survey and although data are widely scattered, there is a definite trend between flood volume and peak discharge. Relations for three groups of gaging stations have been defined. The gaging stations are in northern Arizona, southern Arizona (Aldridge and Condes, 1970) and in southeastern Arizona (Burkham, 1976). A forth relation for a single USGS stream gage 09512200 south of Phoenix was developed by Hjalmarson and Kemna (1991). The relations shown in the Figure on p. 19 are of the form

$$V = CQ_p^a$$

where

V = volume of runoff, in acre-feet,
C = coefficient,
Q_p = corresponding peak discharge, in ft^3/sec, and
a = exponent.

Mean annual runoff at 09512300 = 4.1ft^3/s =2,970 ac-ft (121 mi^2). Using the following peak discharge versus volume of runoff relation for average sites in Arizona

$$V = 0.021\ Q_p^{1.209}$$

where V = storm flood runoff, in ac-ft and Q_p = peak discharge of flood.

The prior relation is used to initally estimate the runoff volume of the 2 to 100-year floods as shown in the Table below (See 4th column for estimated storm volumes-note however that values in column 4 are for the final computation). The integration of the flow duration curve (discussed below) results in the constants (K_{RI}, column 5) when multiplied by the storm volume and totaled are equal to the estimated mean annual runoff (Column 6). The estimated mean annual runoff is 286 ac-ft versus the gaged amount of 2,970 ac-ft. Thus, the constant 0.021 was changed to 0.145 and the final estimates are shown in columns 4 and 7. The sum of the values in column 7 is equal to the mean annual runoff at USGS gage 09512300 (Area = 121 mi^2).

Recurrence Interval (yrs)	Peak Q (ft^3/s)	$Q^{1.209}$	Storm Vol. .145 $Q^{1.209}$ (ac-ft)	Constants from integration K_{RI}	Annual Q for K=.021 (Use total) (ac-ft)	Annual Q for K=.145 (Use total) (ac-ft)
2	1780	8507	1234.4	0.4000	71.456	493.77
5	4580	26668	3869.9	0.2000	112.005	773.98
10	7360	47321	6867.0	0.0800	79.500	549.36
25	12000	85454	12400.6	0.0400	71.781	496.02
50	16400	124665	18090.8	0.0155	40.579	280.41
100	21500	172949	25097.4	0.0150	54.479	376.46
TOTAL					429.800	2970.00

*First estimate from USGS regional relations. ** Adjusted based on gaged mean runoff at 09512300.

The flow duration curve was developed and integrated to compute the mean annual runoff as follows:

$$Q_{mean} = \int Q_t dP$$

where P is the probability of the flood volume = $1/t$
where Qt = storm volume at recurrence interval t, in years. Note: Qt is same as V on previous page except Qt is for a specific recurrence interval.

Using storm volumes for the 2-, 5-, 10, 25-, 50-, and 100-year floods the mean annual runoff is:

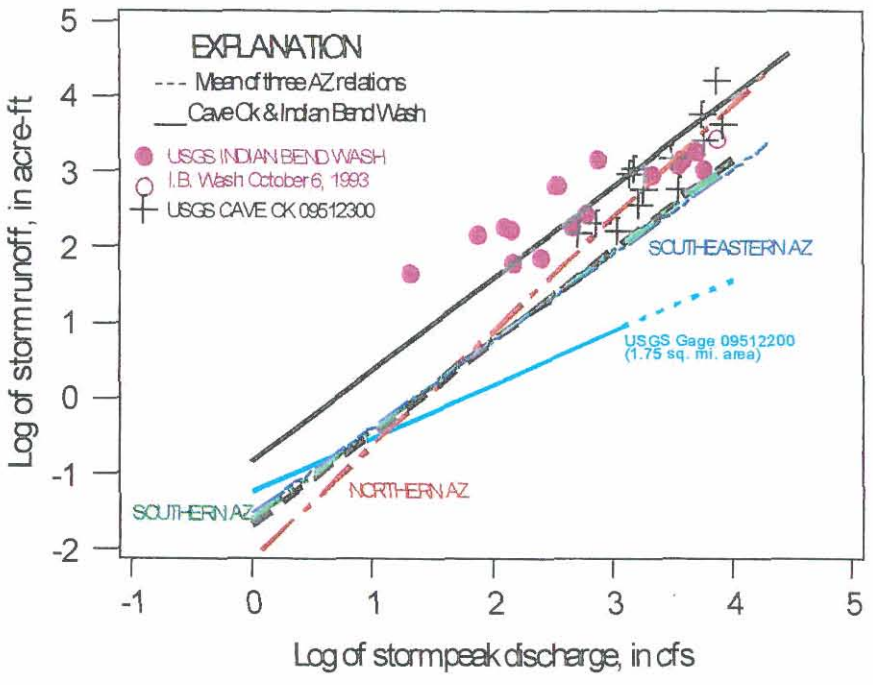
$$Qmean = 0.015Q_{100} + 0.0155Q_{50} + 0.04Q_{25} + 0.08Q_{10} + 0.2Q_5 + 0.4Q_2$$

And the results for Cave Ck gage 09512300 are given in the above table. The flow duration curve (runoff frequency curve) was next used to estimate the sediment yield for storms.

A convenient method of estimating the magnitude and frequency of flood peaks on gaged and ungaged watersheds in the arid southwestern United States is the USGS regional method developed by Thomas, Hjalmarson and Waltemeyer (1994). This method is used by many state agencies in the western United States and is recommended for flood plain management levels 1 and 2 of the recent Arizona State Standards Work Group (See Arizona State Standard 2-96). The 2-year to 100-year peak discharges were computed using this method and the values in column 2 of the prior table are from U. S. Geological Survey WRI 98-4225. The computed relation, as discussed of the previous page, follows:

$$V = 0.145\ Q_p^{\ 1.209}$$

This relation was checked using gaged peak discharge and runoff data for gage 09512300. These results and similar data for Indian Bend Wash, the adjoining watershed to the east, are shown in the following relation.



Plot of peak discharge and runoff volume for storms in Arizona

The above relation clearly suggests that storm runoff amounts in the Cave Creek area are greater than in much of AZ.

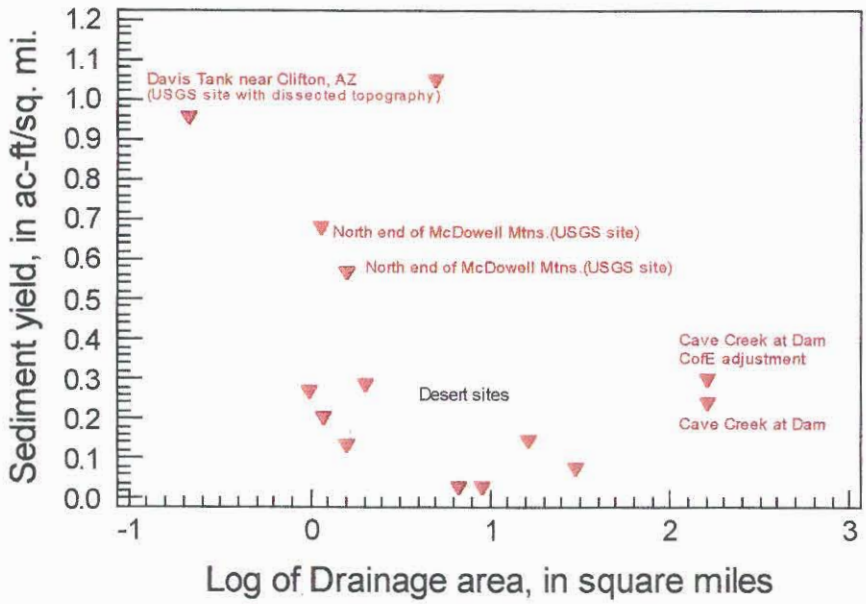
SEDIMENT YIELD OF STORMS.

Average annual sediment yield for 1923-1958 is 0.24 ac-ft based on the capacity relations for Cave Ck Dam. Most of the sediment yield typically is from slope wash or sheetflow (the wash load from watershed hillslopes). Gully erosion and mass movement typically is a small portion of the total load but this may not be the situation at Cave Ck. There is some evidence of headcutting along Cave Creek and major tributaries. Thus, major storms may have both headcut and remobilized deposited debris along channels during the period 1923-58. According to the Corps of Engineers (1974), however, great amounts of coarse material were transported to Cave Creek Reservoir during a large flood in 1970. This technique ignores this potential "debris type" flow and assumes sediment debris is proportional to the volume of storm runoff. The mean annual sediment yield is apportioned to the 2-year to 100-year storms by differentiating the flow-duration relation as previously described. This sediment load is assumed directly proportional to the amount of storm runoff (See Mabbutt (1977, p. 66) for a linear relation between runoff and sediment yield for a site in Israel). For storms, sediment yield from watershed hillslopes is assumed directly proportional to the amount of runoff.

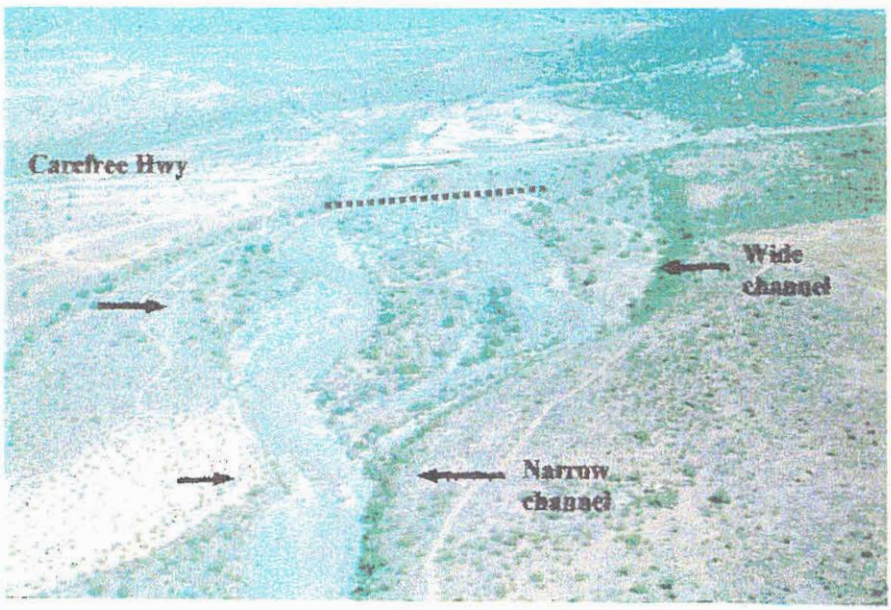
Sediment yield for storms is shown in the following table. The first four columns are from the previous table. Column 3 is the volume for the 2- 100-year floods. Column 5 is the apportioned sediment yield using column 4. The resulting storm sediment yield for gage 09512300 (121 mi2) is in column 6. The unit yield for storms for the study reach is given in column 7.

Recurrence Interval (yrs)	Peak Q (ft^3/s)	Vol. at 09512300 $145\ Q^{1.209}$ (ac-ft)	Annual Q Use Total Only (ac-ft)	Annual Sediment Yield (total only) (ac-ft)	Storm Sediment yield at 09512300 (ac-ft)	Storm Sediment Yield ($ac\text{-}ft/mi^2$)
2	1780	1230	493.77	4.8280	12.070	0.09975
5	4580	3870	773.98	7.5678	37.839	0.31272
10	7360	6867	549.36	5.3715	67.144	0.55491
25	12000	12400	496.02	4.8500	121.250	1.00207
50	16400	18090	280.41	2.7418	176.888	1.46188
100	21500	25100	376.46	3.6810	245.397	2.02807
TOTAL			2970.00	29.0400		

The above estimates of sediment yield for storms are based on the measured mean annual sediment yield at Cave Ck. Reservior and USGS streamflow data for Cave Ck and other streams in Arizona. The sediment yield for Cave Ck Dam is shown on the following figure.



Measurements of annual sediment yield in arid southwest U. S.



Photograph looking upstream at Cave Ck channel in 1989 (by Hjalmarson for FCDMC n-value study). The dashes denote the cross section for the n-value study. Some of the variation of surface particle size discussed previously is related to the changes in channel geometry along the channel. For example, channel width is highlighted here. The recent history of floods also will impact the surface particle size because small floods will deposite debris in wide areas and large floods will tend to remobilize the deposited debris.

Figures from USGS WRI 98-4040 of Cave Creek channel showing effects of remobilization of channel material by flow of January 8, 1993. This temporary storage of "yielded " sediment from smaller flows suggests that the sediment yield of storms may not be directly proportional to storm runoff as assumed in this analysis.

Figure 12. View from New River Road crossing looking upstream before the flow of January 8, 1993, Cave Creek above New River Road (site 7).

Figure 13. View from New River Road crossing looking upstream after the flow of January 8, 1993, Cave Creek above New River Road (site 7). Road crossing was washed out as a result of significant bedload transport during the flow.

Photographs of Cave Creek showing channel material. The first photo is from USGS Professional Paper 1584 and is of the main channel of Cave Ck below Cave Buttes Dam. Note the channel material is coarse. Finer material has been deposited in the reservoir upstream. The second photograph is of the main channel of Cave Ck at Carefree Highway shown on p. 21. Note the sand and silt partially covering the rounded cobbles and small boulders. A recent small flow that left the fine sediment.

Figure 7G. View from top of reach looking downstream, Cave Creek above Deer Valley Road. Rod indicates water-surface elevation for the peak flow of January 5, 1995.

Looking upstream during 1989. By Hjalmarson.

SUMMARY

This analysis is based on USGS and SRP basic hydrologic data for Cave Ck and surrounding sites. No adjustment for any nonstationarity of runoff and sediment yield was made. Also, no factors of safety are included for design. This analysis is rather simple and straightforward and is based on basic hydrologic data for the area. An error was found in the area for 0952280. The correct area is 72.8 mi^2 and not 82.7 mi^2. This analysis was redone to include this correction.

Capacity relations for Cave Creek Dam

Relation were obtained from SRP and the change in contents for 1923-58 associated with deposited sediment/debris is considered reliable. The data for the adjustment of the computed yield from 0.24 to 0.30 ac-ft/mi^2 by the CofE were not found. Although not discussed in this report, sediment yield methods show that lower yields are likely. Thus, a yield of 0.24 ac-ft/mi^2 is suggested.

Trend analysis of surface sediment/debris samples

No trend of the sampled channel surface material was found and none was expected based on the large variation of channel geometry along the reach. Inclusion of other physical parameters in a trend analysis may give different results.

The purpose of the surface samples is unclear and the technique of collecting the samples is concerning. Surface material is easily altered by wind movement of finer sediment. Also, small floods deposit fine material along major channels as shown in the bottom figure on the prior page. Larger flood remobilize channel material deposited by smaller floods as shown by the two photos on p. 22. There probably is armoring along the Cave Ck channel and much of the armoring is covered by finer sediment except shortly after major floods. Thus, it is unclear what the surface samples represent.

Discussion of two USGS gages on Cave Creek above dam

General runoff (page 15) appears to agree with runoff at other gages in the area. This general agreement between runoff of the two Cave Ck gages and the surrounding gages is important because the data for Cave Ck appears to represent runoff conditions in both time and space. There are no obvious time sampling problems with the Cave Ck sites or between the Cave Ck sites and the surrounding sites. This evaluation is rather gross but the data suggest there are no serious problems. Suggest the annual and storm runoff for gage 09512300 be used for the study reach. If considered necessary, a simple linear adjustment based on changes in drainage area might be made.

Sediment yield and runoff from storms

Runoff and sediment yield was estimated for the 2- to 100-year storms. The amount of these estimates is proportional to the mean annual runoff at gage 09512300 and the mean annual sediment yield at Cave Ck dam for 1923-1958 (See "Capacity..."). An assumption, based on records of streamflow for Cave Ck and the general area, is made that sediment deposited behind Cave Ck Dam was mostly from watershed hillslopes. In other words, little sediment from headcutting and channel erosion is assumed. With the absence of a major flood during 1923-58 this estimate seems reasonable especially in light of the CofE adjustment of the 0.24 ac-ft/year value. The Cof E made the adjustment for the 25-year flood of 12/19/67 and increased the sediment rate to 0.3 ac-ft/yr. Thus, storm values can be adjusted if this value or other annual values of mean runoff and sediment yield are used.

A likely weakness in the estimate of storm sediment/debris yield is the actual sediment yield is not directly proportional to storm runoff. A greater portion of the sediment/debris may be transported by the less frequent larger floods that by the smaller floods. Any non-linear relation between storm runoff and sediment yield (such as yield that is related to stream power) can be included in this analysis as briefly discussed later.

Perhaps the following will shed light on the analysis. First, refer to table on p. 20 that shows the volume of runoff for the 100-year flood (column 3) and the corresponding volume of sediment (column 6). These are for gage 09512300 with an area of 121 sq. mi. It is important to note that the sediment concentration is a constant 15,900 mil/liter for each storm using a porosity of 0.4 for the sediment (the weight of a cubic foot of the "dump truck" sediment is about 100 pounds). Any valid relation between concentration and discharge or stage may be used but for ephemeral streams such relations typically are poorly defined. Because there are no known reliable sediment ratings for Cave Ck, the simple assumption was made that average sediment concentration for the Q2-Q100 year storms is constant. Keeping in mind, however, that this is only for the wash load or sediment from hillslopes.

Sediment Yield Estimates: Sediment yield from sheetflow, the wash load typically from watershed hillslopes, are estimated for the average year. The RUSLE (1995) and Flaxman bulk parameter models are used with results compared to the measured sediment in Cave Creek Dam. As discussed previously, this wash load component of total sediment load is assumed directly proportional to the amount of storm runoff. The 1972 Flaxman and RUSLE models do not account for the general drcrease in the per unit sediment yield as watershed size increases. Also, these models generally are for smaller areas. The following results demonstrate why the measured sediment yield of 0.24 was used.

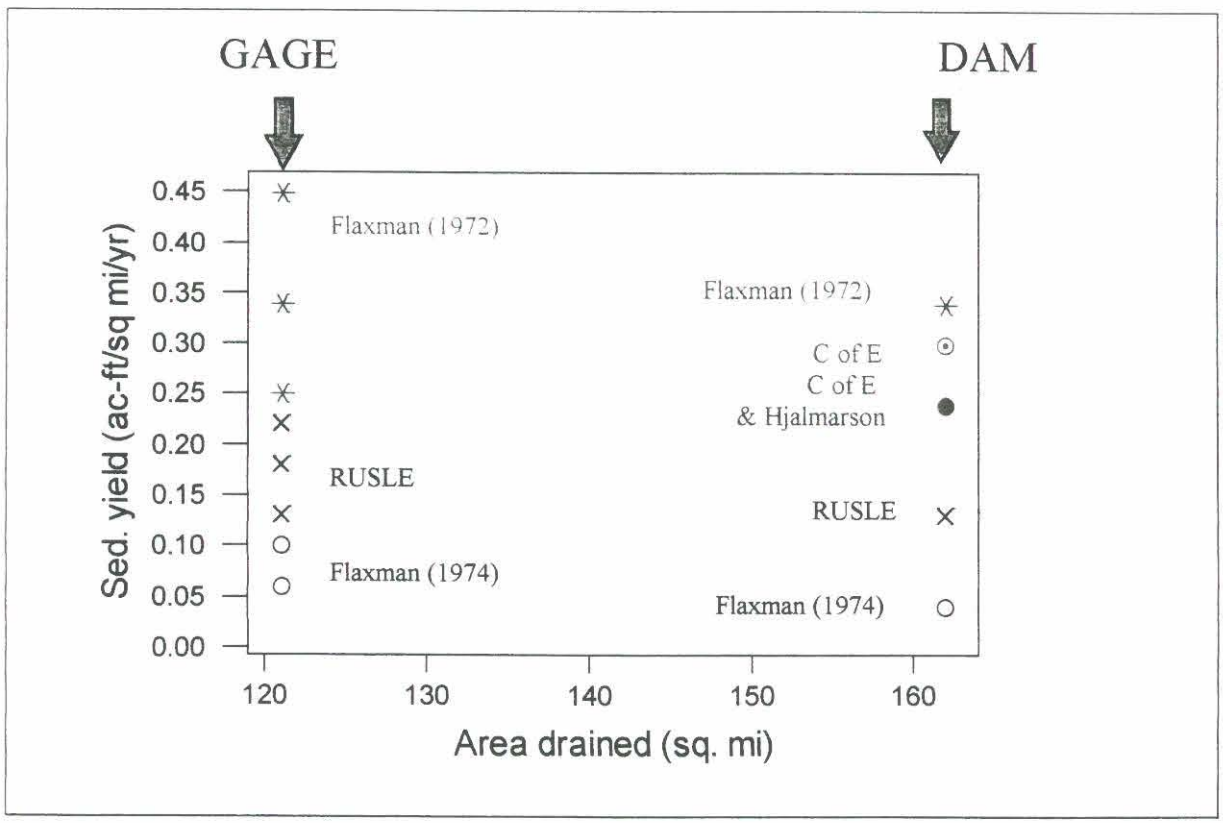
Flaxman: Estimated total average annual sediment yield for the Dam and gage 09512300 is shown in the Figure below. Flaxman (1972) gave 0.34 ac-ft/mi^2 for the Dam and a range of .25 to .45 at the gage. These values agree with the 0.24 and 0.30 values discussed previously. The 1974 Flaxman method gave much lower estimates of 0.04 and 0.05 ac-ft/mi^2 for the Dam and gage, respectively. For small areas the Flaxman (1974) method gave about 0.1 ac-ft/mi^2. This wide difference between the two methods is disturbing and the cause is unknown other than the fact that the drainage areas used for Cave Ck exceed those of Flaxman.

RUSLE: The revised universal soil loss equation (RUSLE) was used to estimate mean annual soil loss from hillslopes. The equation is: A = RKLSCP where A =average annual soil loss from sheet and rill erosion caused by overland flow, R =factor for climatic erosivity, K = factor for soil erodibility measured under standard condition, L = factor for slope length, S =factor for slope steepness, C = factor for cover (trees, grasses and cryptogamic crusts), and
P = factor for support practices.

These factors were determined mostly by the use of secondary information such as aerial photographs, soil survey reports and maps, topographic maps, and the RUSLE user guide. Estimates of the percent canopy and ground cover, slope lengths, and slope steepness generally were made by past field inspections and use of aerial photographs and topographic maps. An R factor of 40 was selected using the RUSLE user guide. Values of K and annual site production of vegetation, used for factor C, were determined from the NRCS soil survey by Camp (1986). Typical values are R = 40, K = 0.1, LS =1.5 to 2, C = 0.05 to 0.073 and P = 1. A sediment porosity of 0.4 (100 lbs/ft3) was used to convert the computed soil loss from tons to ac-ft. The results of the computations are shown below.

Summary: The wide scatter of estimated sediment yield shown below is the reason the measured value of 0.24 ac-ft/year was used. This amount may be high because some sediment from channel erosion and headcutting may be included. The RUSLE method gives about 0.15 ac-ft/mi^2 that can be considered a minimum. RUSLE is the most recent method by the USDA for estimating sediment yield.

Additional comments are given on the next page.



The Cof E adjusted sed yield of 0.30 is used in this simple example. For simplicity, the difference in the annual yields of .24 and .30 is assumed to result only from the 100-year flood. Thus, the total for column 5 is 0.30(121) = 36.3 and the difference (36.3-29.04) is added to the 100-year component. Thus, in column 5 for RI=100 years, the value is 3.68 +(36.3-29.04) = 10.94. The corresponding sediment yields for the 2-year to 50-year storms remain the same (column 6) but the sed. yield for the 100-year storm increased from 245 to 729 ac-ft.

You probably have noted that values of storm runoff in the table on p. 18 are based on the USGS flood freq. values and the mean Q on p. 14. Because the runoff for the Cave Ck gages (Table on p. 14 and Fig. on p. 15) is in agreement with the general runoff relation for the area, I felt we are justified in using the mean values for station 09512300. Thus, the values in Table 18 are justified. Lets be frank, we can easily include another mean Q but it might be hokus pokus. The storm sed. values in the table on p. 20 and the table below below are based on the storm runoff and the sed. yields on 0.24 and 0.30.

This entire analysis is tied together and any valid relation between sediment yield/discharge/concentration and storm runoff/discharge/stage can be included. Sediment concentration commonly increases with increasing storm discharge. For ephemeral streams, however, the concentration scatters greatly and can be as much for low discharges as for high discharges. Some Arizona streams with a large number of suspended sediment samples have no defined relation between water discharge and sediment concentration.

Bed material can be computed using transport capacity computations and added to the wash load. The wash load is considered to be between 0.15 and 0.24 ac-ft/mi^2 at Cave Ck Dam (162 mi^2).

Two floods appear to have a large amound of bed load from channel erosion. These were the approx. 25-yr flood on Sept. 19, 1967 and the approx. 40-year flood on Jan. 8, 1993. The Cof E reported sediment from the 1967 flood and the USGS documented a large amount of sediment removal by the 1993 flood as shown on p. 22. Results of bed material estimates for these floods and possibly a couple of other smaller floods may be interesting.

Recurrence Interval (yrs)	Peak Q (ft^3/s)	Vol. at 09512300 145 $Q^{1.209}$ (ac-ft)	Annual Q Use Total Only (ac-ft)	Annual Sediment Yield (total only) (ac-ft)	Storm Sediment yield at 09512300 (ac-ft)	Storm Sediment Yield (ac-ft/mi^2)
2	1780	1234.4	493.77	4.8280	12.070	0.09975
5	4580	3869.9	773.98	7.5678	37.839	0.31272
10	7360	6867.0	549.36	5.3715	67.144	0.55491
25	12000	12400.6	496.02	4.8500	121.250	1.00207
50	16400	18090.8	280.41	2.7418	176.888	1.46188
100	21500	25097.4	376.46	10.9400	729.333	6.02755
			2970.00	36.3000		

REFERENCES

Aldridge, B. N. and Condes, A, 1970, Flood hydrology of small drainage areas in Arizona-a progress report through June 1969: USGS Administrative Report, 43p.

Burkham, D. E., 1976, Flow from small watersheds adjacent to the study reach of the Gila River Phreatophyte project, Arizona: U. S. Geological Survey Professional Paper 655-I, 119p.

Camp, P.D.,1986, Soil survey of Aguila-Carefree area, parts of Maricopa and Pinal counties, Arizona: U.S. Soil Conservation Service Report, 306 p.

Gebert, W. A., Graczyk, D. J. and Krug, W. R., 1989, Average annual runoff in the United States, 1951-80: U. S. Geological Survey HA-710, 1 sheet.

Hjalmarson, H.W.,1994, Potential flood hazards and hydraulic characteristics of distributary-flow areas in Maricopa County, Arizona: U.S. Geological Survey Water-Resources Investigations Report 93-4169, 56 p.

Hjalmarson, H.W., 1991, Flood hydrology of arid basins in southwestern United States, in Kirby, W.H., and Tan, W.Y., eds., Proceedings of the United States-People's Republic of China Bilateral Symposium on Droughts and Arid-Region Hydrology, September 16-20, 1991, Tucson, Arizona: U.S. Geological Survey Open-File Report 91-244, p. 59-64.

Hjalmarson, H. W., 1988, Flood-hazard zonation in arid lands, Transportation Research Board of the National Research Council, Transportation Research Board Record 1201, p. 1-8.

Hjalmarson, H.W., and Kemna, S.P., 1991, Flood hazards of distributary-flow areas in southwestern Arizona: U.S. Geological Survey Water Resources Investigations Report 91-4171, 68 p.

Krug, W. R., Gebert, W. A. And Graczyk, D. J., 1989, Preparation of average annual runoff map of the United States, 1951-80: U. S. Geological Survey Open-File Report 87-535, 414 p.

Langbein, W. B., 1949, Annual runoff in the United States: U. S. Geological Survey Circular 52, 14 p.

Langbien, W. B., Hains, C. H. and Culler, R. C., 1951, Hydrology of stock-water reservoirs in Arizona: U.S. Geological Survey Circular 110, 18 p.

Leopold, L.B., Emmett, W.W. and Myrick, R.M.,1966, Channel and hillslope processes in a semiarid area New Mexico: U.S. Geological Survey Professional Paper 352-G, pp 193-253.

Mabbutt, J.A., 1977, Desert Landforms: The MIT Press, 340p.

Pacific Southwest Inter-Agency Committee, 1974, Erosion and sediment yield methods: Pacific Southwest Inter-Agency Committee, Report of the Water Management Subcommittee, 45 p.

Flaxman, E. M., 1972, Predicting sediment yield in Western United States: Proceedings of the American Society of Civil Engineers, Journal of the Hydraulics Division, HY 12, p. 2073-2085.

Flaxman, E. M., 1974, Progress report on development of sediment yield predictive equations: Soil Conservation Service, TSC Advisory ENG-PO-32, Portland, Oregon, 14p.

7207 BUFF
G 7207 GREEN TINT

Area - Capacity Table

Aug. 29, 1960
WDC.

Elev.	Area Acres.	Contents Acrefeet	
1600	(2.6) 0	0	Planimeter No 123A Results from
1610	64	330	Contour drawing of Cave Creek Dam
1620	233	1,820	(Topo Map Cave Creek Res. #B-184-1
1630	468	5,320	Revised 8-4-60)
1640	726	11,290	

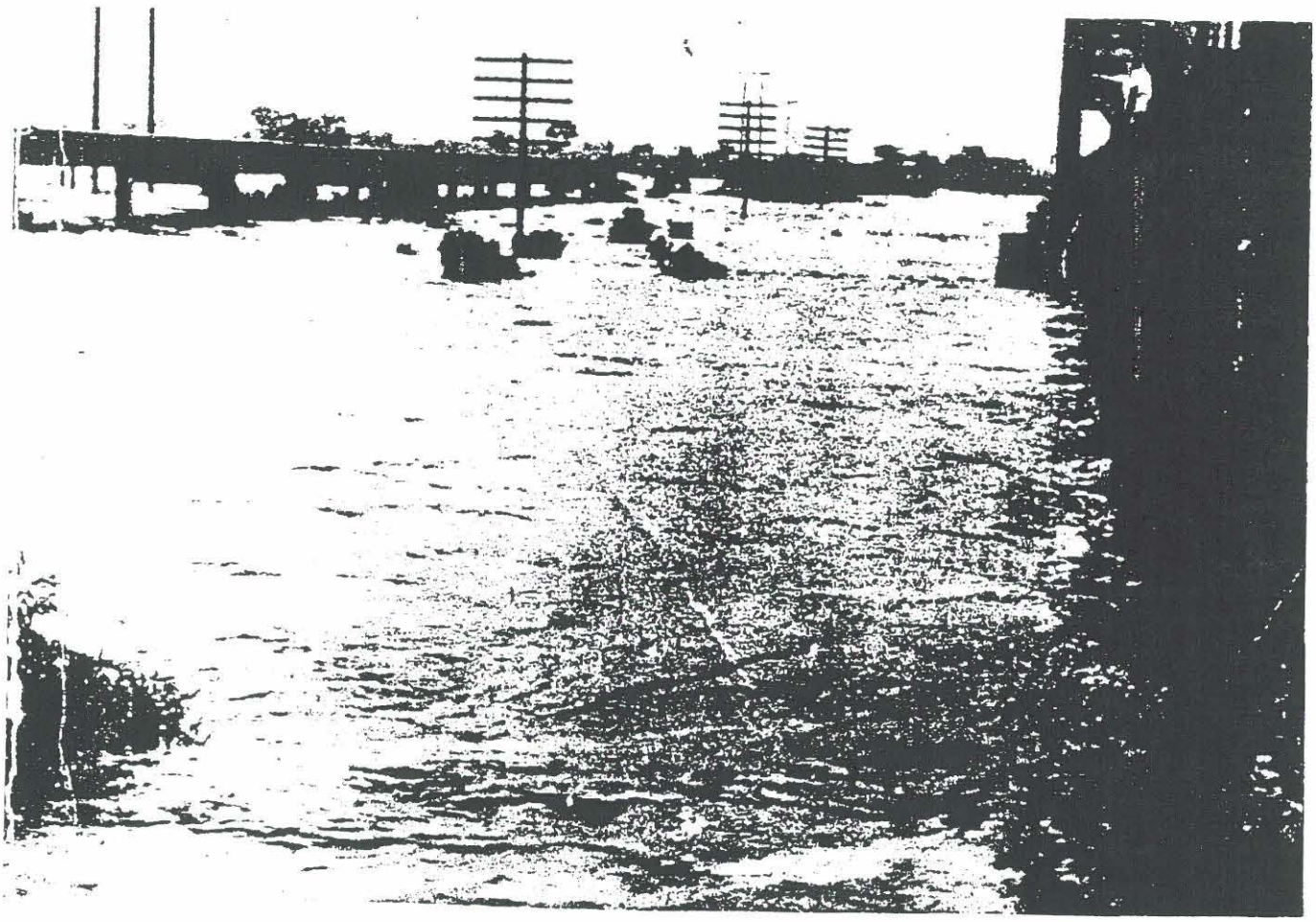
Elev.	Acre Feet
1600	0
1	2
2	6
3	17
4	35
5	60
6	95
7	140
8	190
9	255
1610	330
11	~~375~~ 415
12	~~500~~ 540
13	~~650~~ 630
14	~~750~~ 755
15	900
16	1050
17	1200
18	~~1450~~ 1400
19	~~1650~~ 1600
1620	1800
21	~~2100~~ 2050
22	~~2350~~ 2300
23	~~2650~~ 2600
24	~~2950~~ 2900
25	3250 ✓

Elev.	Acre Feet	
1626	3600 ✓	
27	~~4000~~	3950
28	~~4400~~	4350
29	4800	✓
1630	~~5200~~	✓
31	5750	✓
32	~~6150~~	6200
33	6750	✓
34	~~7300~~	7300
35	~~7800~~	7900
36	~~8400~~	8500
37	~~9000~~	9200
38	~~9700~~	9900
39	~~10400~~	10600
1640	11300 ✓	
41	~~12000~~	12200
42	~~12900~~	13000

GILA RIVER BASIN

NEW RIVER AND PHOENIX CITY STREAMS ARIZONA

DESIGN MEMORANDUM NO. 2
HYDROLOGY
PART 1



US Army Corps of Engineers

Los Angeles District

OCTOBER 1974

Cave Creek Dam

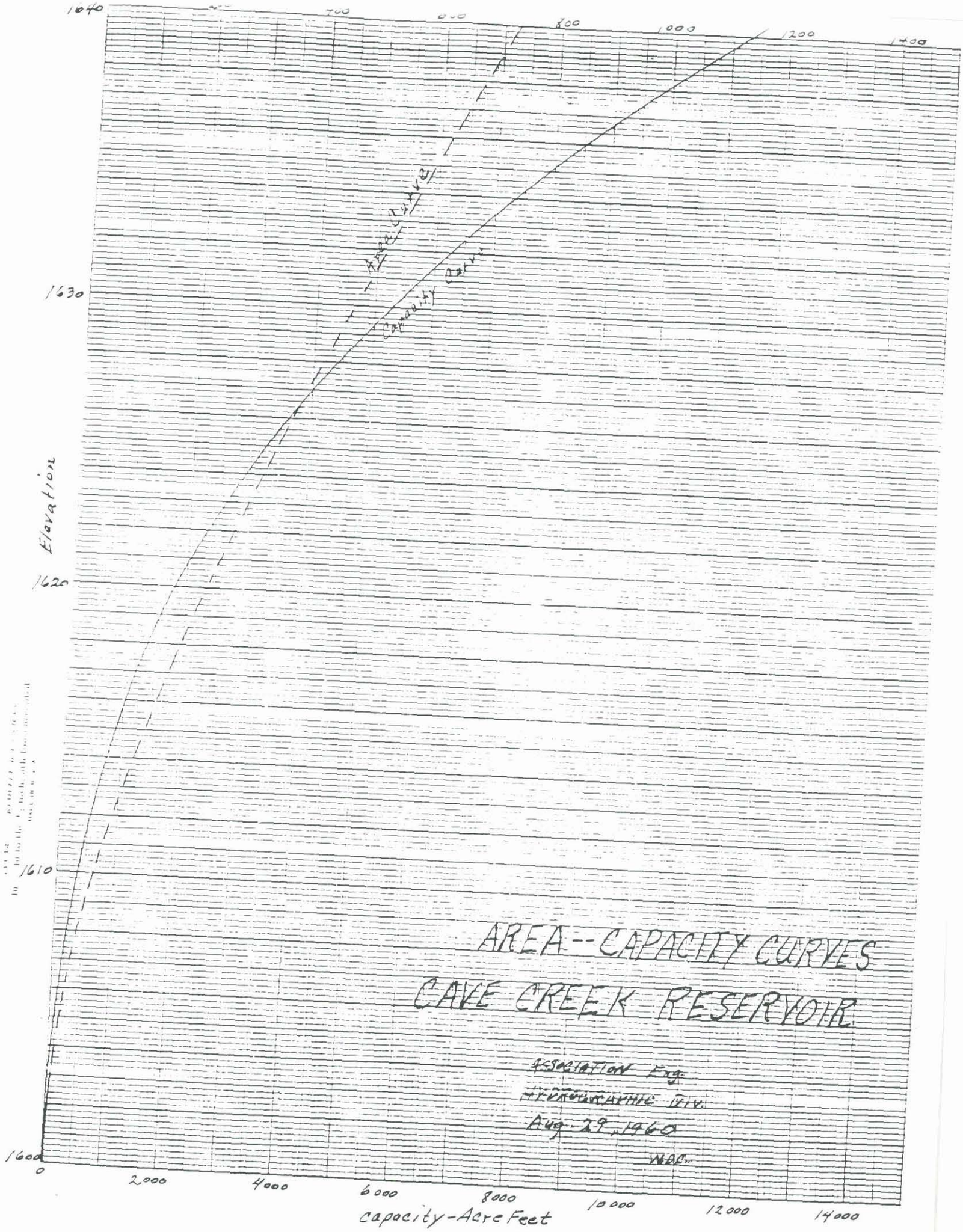
Capacity Table

Revised 8-4-60 from 1958 Field Survey

Topo Map -- Cave Creek Res #B-184-1

7207 BUFF G7207 GREEN TINT

Lake Elev.	Contents A.F.	Diff. Per Ft.	Lake Elev.	Contents A.F.	Diff. Per Ft.
1600	0		1621	2050	
		2			250
1601	2		1622	2300	
		4			300
1602	6		1623	2600	
		11			300
1603	17		1624	2900	
		18			350
1604	35		1625	3250	
		25			350
1605	60		1626	3600	
		35			350
1606	95		1627	3950	
		45			400
1607	140		1628	4350	
		50			450
1608	190		1629	4800	
		65			500
1609	255		1630	5300	
		75			450
1610	330		1631	5750	
		85			450
1611	415		1632	6200	
		105			550
1612	520		1633	6750	
		110			550
1613	630		1634	7300	
		125			600
1614	755		1635	7900	
		145			600
1615	900		1636	8500	
		150			700
1616	1050		1637	9200	
		150			700
1617	1200		1638	9900	
		200			700
1618	1400		1639	10600	
		200			700
1619	1600		1640	11300	
		200			900
1620	1800		1641	12200	
		250			800
1621	2050		1642	13000	


1640
1630
1620
1610
1600
Elevation
0
2000
4000
6000
8000
10000
12000
14000
capacity-Acre Feet
Area Curve
Capacity Curve
AREA--CAPACITY CURVES
CAVE CREEK RESERVOIR
ASSOCIATION Eng.
HYDROGRAPHIC DIV.
Aug. 29, 1960
WAC

Peterson, H. V., 1962, Hydrology of small watersheds in western states: U.S. Geological Survey Water-Supply Paper 1475-I, p. 217-356.

Phillips, J. D., 1990, Relative importance of factors influencing fluvial soil loss at the global scale: American Journal of Science, v. 290, p. 547-568.
Report 91-244, p. 59-64.

Phillips, J. V. and Ingersoll, T. L., 1998, Verification of roughness coefficients for selected natural and constructed stream channels in Arizona: U. S. Geological Survey Professional Paper 1584, 77 p

Phillips, J. V. and others, 1998, Method to estimate effects of flow-induced vegetation changes on channel conveyances of streams in Central Arizona: USGS WRI 98-4040, 43p.

Pope. G. L., Rigas, R. D., and Smith, C. F., 1998, Statistical Summaries of Streamflow Data and Characteristics of Drainage Basins for Selected Streamflow-Gaging Stations in Arizona Through Water Year 1996: U. S. Geological Survey Water-Resources Investigations Report 98-4225, 907 p.

Peterson, H. V., 1962, Hydrology of small watersheds in western states: U.S. Geological Survey Water-Supply Paper 1475-I, p. 217-356.

Phillips, J. D., 1990, Relative importance of factors influencing fluvial soil loss at the global scale: American Journal of Science, v. 290, p. 547-568.

Renard, K. G., Simanton, J. R., and Osborn, R. B., 1982, Applicability of the universal soil loss equation to semiarid rangeland conditions in the southwest: Proceedings of the 1974 meeting of Arizona section American Water Resources Association and the Hydrology section Arizona Academy of Science, in Hydrology and Water Resources in Arizona and the Southwest, p. 18-32.

Renard, K.G. and Stone, J.J., 1981, Sediment yield from small semiarid rangeland watersheds: : Proceedings of the Workshop on Estimating Erosion and Sediment Yield on Rangelands, Tucson, Arizona, U.S. Department of Agriculture, p.129-144.

Soil and Water Conservation Society, 1995, RUSLE user guide, Revised universal soil loss equation version 1.04, 145 p.

Toy, T.J. and Osterkamp, W. R., 1995, The applicability of RUSLE to geomorphic studies: Journal of Soil and Water Conservation, v. 50, no. 5, p. 498-503.

Thomas, B.E., Hjalmarson, H.W., and Waltemeyer, S.D., 1994, Methods for estimating magnitude and frequency of floods in the southwestern United States: U.S. Geological Survey Open-File Report 93-419, 211 p.

Thomsen, B.W., and Hjalmarson, H.W., 1991, Estimated Manning's roughness coefficients for stream channels and flood plains in Maricopa County, Arizona: Phoenix, Arizona, Flood Control District of Maricopa County report, 126 p.

U.S. Army Corps of Engineers, 1974, New River and Phoenix City Streams, Arizona-Design Memo. No. 2, Hydrology, part 1, U. S. Army Corps of Engineer District, Los Angeles, 51 p and plates.

Waters, S. D. ,1993. Storm report October 6, 1993: unpublished report of the Flood Control District of Maricopa County, 13 p.

DEDICATION CEREMONIES

for

CAVE BUTTES DAM
Flood Control Project

Friday, November 16, 1979

10:00 A.M.

BAND

MASTER OF CEREMONIES	Fred Koory, Jr. Board of Directors
INVOCATION	Dr. William O. Smith
PLEDGE OF ALLEGIANCE AND INTRODUCTION OF GUESTS	Fred Koory, Jr.
REMARKS	N. G. Delbridge, Jr. Brig. Gen., Corps of Engineers United States Army
REMARKS	Eldon Rudd U.S. House of Representatives
REMARKS	Margaret T. Hance Mayor, City of Phoenix
DEDICATION	
BENEDICTION	Dr. William O. Smith

MUSIC SELECTIONS

Cave Buttes Dam

Cave Buttes Dam is the second of four dams to be built as elements of a flood control project known as "Phoenix, Arizona, and Vicinity (including New River.)" It is designed to provide flood protection to the Phoenix metropolitan area by controlling floodwater flow from a 191 square mile drainage area in the largest amounts that hydrologists feel can reasonably be expected, up to 42,200 acre feet of water flowing to the reservoir at a peak rate of 54,000 cubic feet per second. This water will then pass through an ungated outlet in the dam at a controlled rate not exceeding 486 cubic feet per second. At this rate it will take 48 days to empty the reservoir after such a major flood.

Cave Buttes Dam is located on Cave Creek about 17 miles north of downtown Phoenix and seven-tenths of a mile downstream of the existing Cave Creek Dam. The project consists of the main dam structure, a detached spillway, three dikes, and an overlook structure. The dam is a rolled earthfill structure 2,275 feet long, rising 109 feet above streambed. It is 20 feet wide at the top and contains 2,526,000 cubic yards of earth.

The reservoir area behind the dam is 1,820 acres, with a capacity of 46,600 acre feet. All rights-of-way, relocations and relocation assistance to home owners was accomplished by the Flood Control District.

No permanent pool of water will be retained in the reservoir. Instead the dam and reservoir are designed to trap floodwater and store it only for as long as it takes to release it slowly and safely downstream. Reservoir capacity thus is restored to handle a future flood. The spillway is 510 feet wide at the crest and is located 2,000 feet west of the west abutment of the dam. Construction was completed in October 1979. The structures will be operated and maintained by the Flood Control District of Maricopa County.

PROJECT FEATURES

Type of Structure	Earthfill
Length	2,275 feet
Height	109 feet
Top Width	20 feet
Volume of Earth Used	2,526,000 cubic yards
Reservoir Capacity	46,600 acre feet
Reservoir Area	1,820 Acres
Drainage Area	191 square miles
Spillway Location	2,000 feet west of west abutment
Spillway Width	510 feet (at crest)

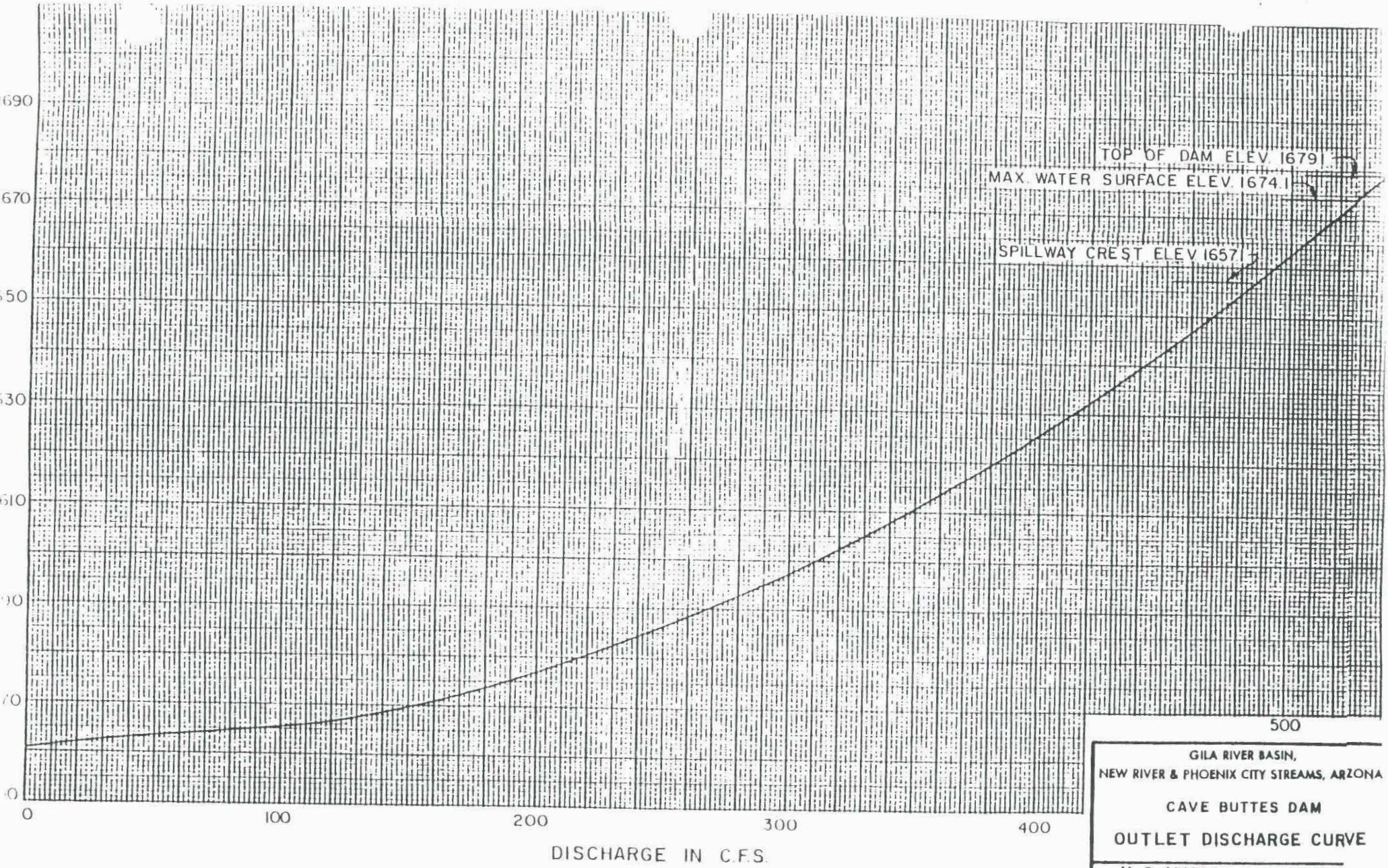
Dikes:	Material	Earth
	Number 1	935 feet long x 39 feet high
	Number 2	9,000 feet long x 55 feet high
	Number 3	3,245 feet long x 10 feet high
Costs:	Federal Cost	$9,418,840
	Flood Control District	$5,097,772
Designer:	Corps of Engineers Los Angeles District, United States Army	
Contractor:	Washington Construction Company Missoula, Montana	

CAVE CREEK DAM

The existing Cave Creek Dam was built locally in 1923 as a flood control structure after the 1921 floods which swept down Cave Creek, through the City of Phoenix, and flooded the State Capitol building. Since 1923 increased development in the area, coupled with new knowledge of the flood potential of Cave Creek, has established that the existing dam cannot provide the necessary degree of flood protection.

Cave Creek Dam was jointly financed by contributions of several public and private agencies and private individuals that totalled $556,982.39. Size of the structure was limited by this amount. It has served Phoenix and the immediate west Valley well for 54 years. Agencies contributing to the fund for old Cave Creek Dam were: the State of Arizona, Maricopa County, the City of Phoenix, the Salt River Valley Water User's Association, Standard Oil Company, Union Oil Company, Santa Fe Railroad Company, Greenwood Cemetery and Arizona Eastern Railway (now the Southern Pacific).

Although the old Cave Creek Dam is in the new Cave Buttes reservoir area, and will be temporarily inundated in the event of a major flood, it will be left in place because of its historic value. The dam has been nominated for inclusion in the National Register of Historic Places. Also within the reservoir area are indications of the ancient Hohokam Indian culture. The Corps of Engineers has carried out a careful archeological study of the area and excavated 11 sites to preserve their contents for future study.



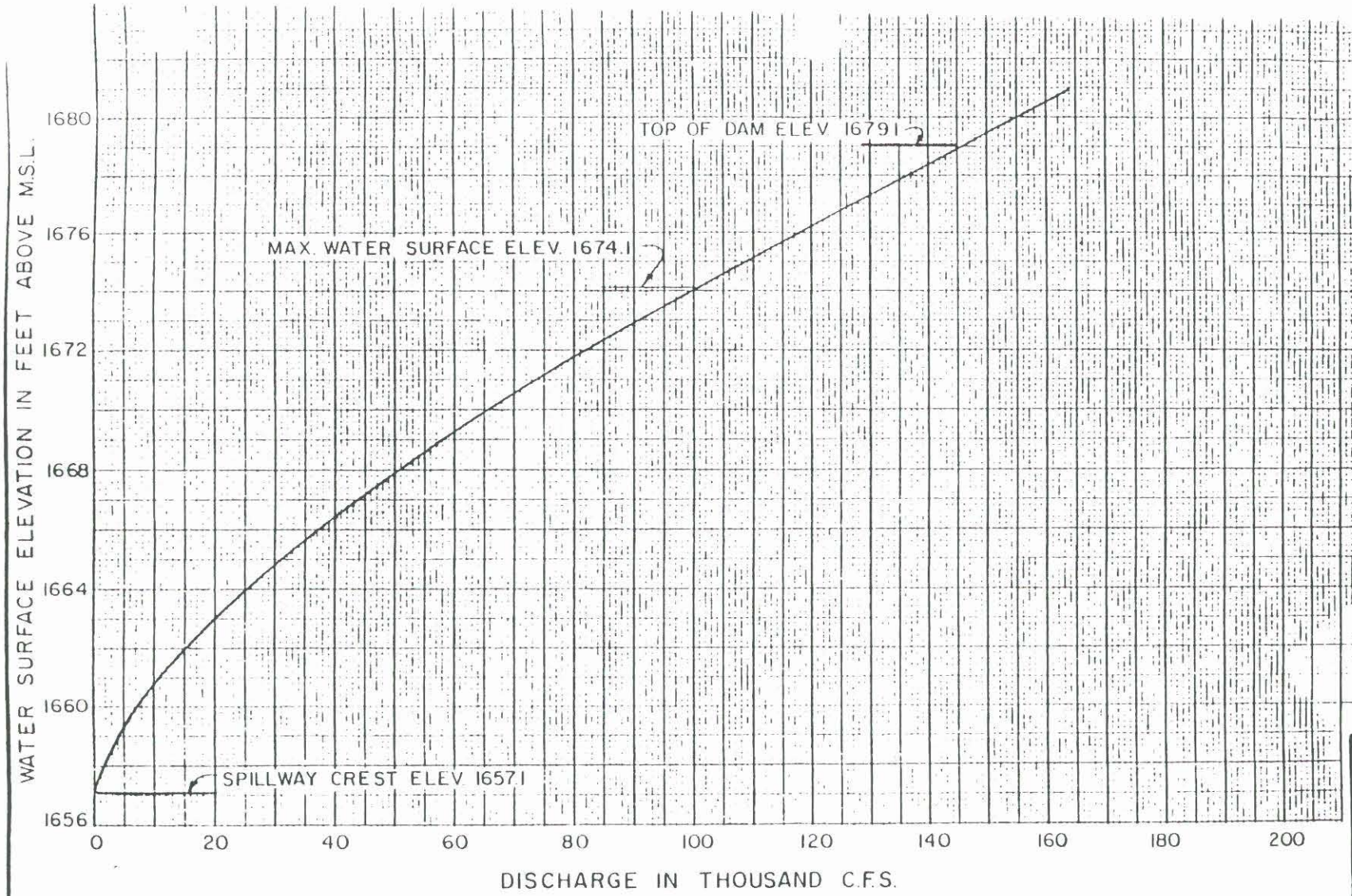
GILA RIVER BASIN,
NEW RIVER & PHOENIX CITY STREAMS, ARIZONA

CAVE BUTTES DAM

OUTLET DISCHARGE CURVE

U. S. ARMY ENGINEER DISTRIC
LOS ANGELES, CORPS OF ENGINE
TO ACCOMPANY REPORT DATED:

APPENDIX I FIGU



GILA RIVER BASIN,
NEW RIVER & PHOENIX CITY STREAMS,

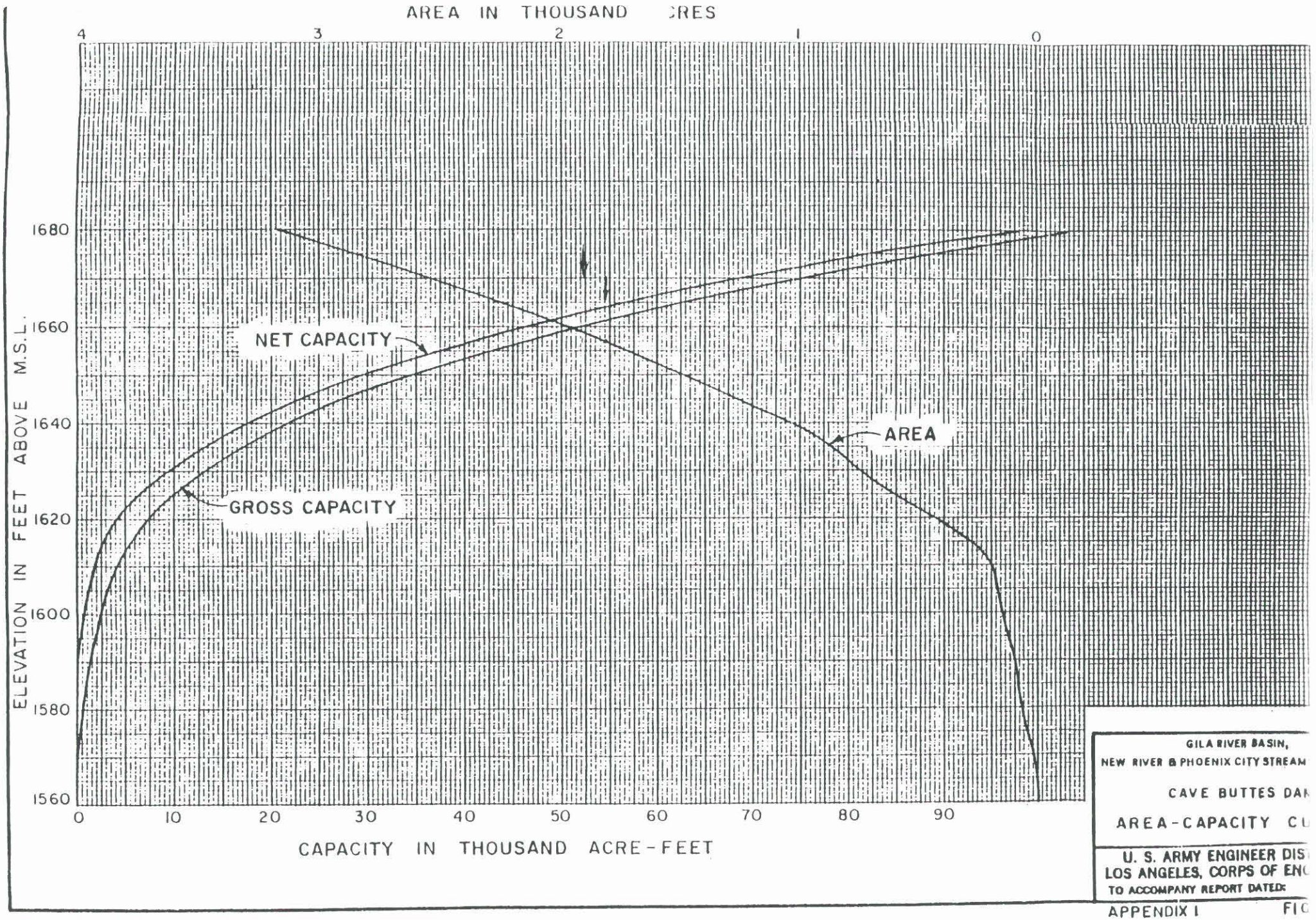
CAVE BUTTES DAM

SPILLWAY DISCHARGE C

U. S. ARMY ENGINEER DIST
LOS ANGELES, CORPS OF ENG
TO ACCOMPANY REPORT DATED:

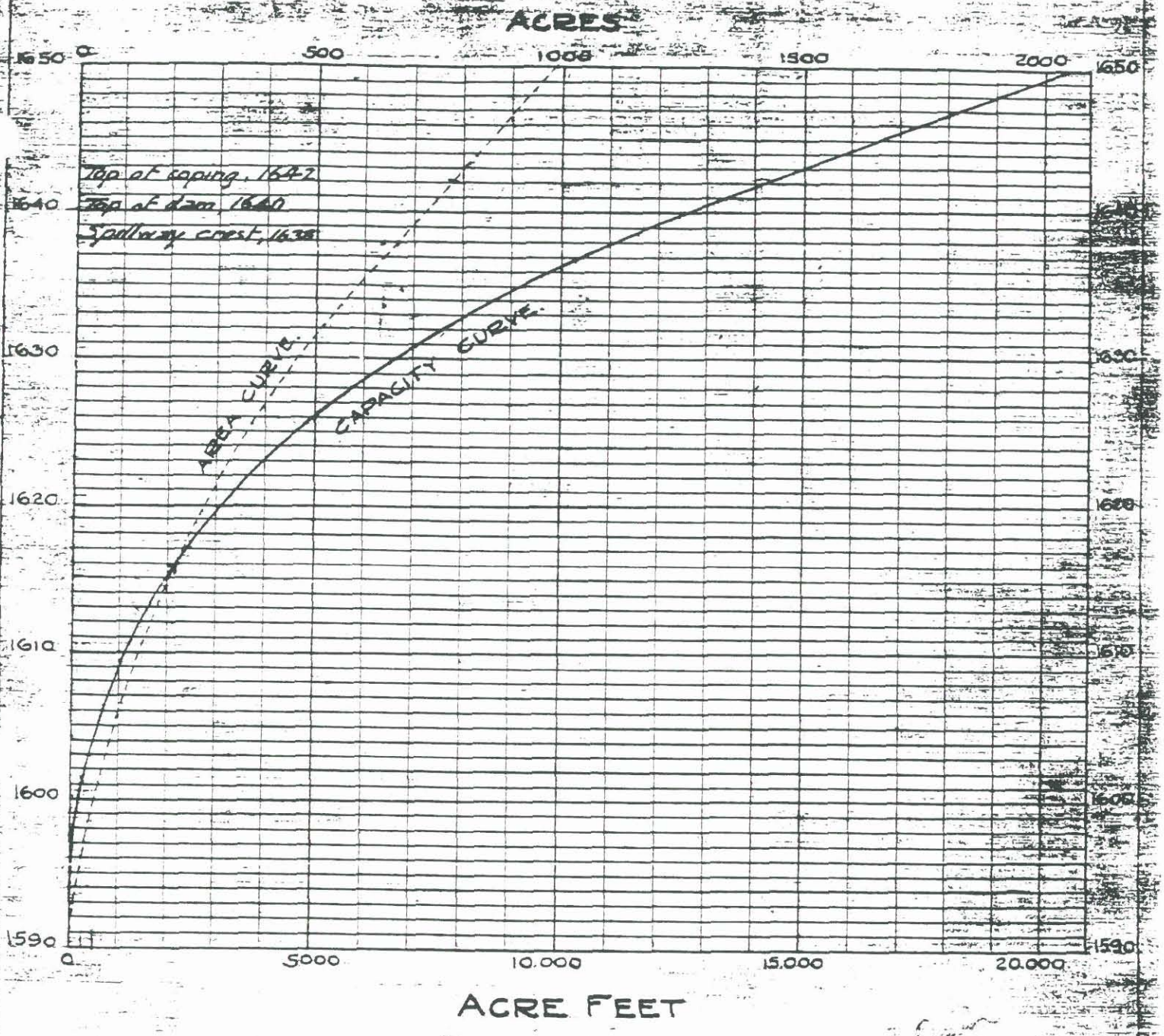
APPENDIX I

F



APPENDIX I FIG

1659' = 1820 acres



SALT RIVER VALLEY WATER USERS' ASSOCIATION
OPERATING SALT RIVER PROJECT
F.A. REID PRES. C.C. CRAGIN. GEN'L SUPT & CHIEF ENGR.

CAPACITY CURVE
CAVE CREEK RESERVOIR

C-1-1643

(3) Failure was assumed to occur after the dam had been overtopped for approximately 7.75 hours, or one time period prior to the point at which flow over the dam ceased. At this point, storage behind the dam was 12,470 acre-feet and the water surface was 52 feet above the bottom of the dam. Plate 61 shows the outflow hydrograph from the breached dam.

c. Routing of the outflow hydrograph was accomplished using the Muskingum routing technique. The Muskingum "X" value was set at zero which approximates a reservoir type routing. The stream channel used in flood routing from Cave Creek Dam to the Arizona Canal was deepened and widened from the present condition cross sectional shape to account for the effects of the 8-hour overtopping of the 500-year flood preceeding the dam failure. From the Arizona canal to the Salt River the cross-sectional shape of Cave Creek was assumed to remain unchanged by flood flows which occurred prior to the passage of the dam failure flood hydrograph. The presence of large amounts of impervious cover in conjunction with the fact that no defined channel exists provided the basis for the assumption that no significant change in channel cross sectional shape occurs in this reach. The 500-year flood values along Cave Creek, presented in table 12, were determined by the dam failure analysis outlined above.

VII – SEDIMENT PRODUCTION

7-01. The rate of sediment production in the study area was established from a determination of sediment deposited in Cave Creek Dam during a 47-year period (1923 to 1970). The sediment production rate was found to be 0.24 acre-feet per square mile per year. However, since the survey made in 1970 does not include debris produced during the September 1970 flood, the sediment production rate was increased to 0.30 acre-feet per square mile per year to compute sediment storage allowances at damsites. The 100-year sediment production for the proposed damsites is presented in table 14.

VIII – ADEQUACY OF DESIGN FLOODS AND SEDIMENT STORAGE

8-01. STANDARD PROJECT FLOOD. The standard project flood, as developed, is of a magnitude that would be exceeded only on rare occasions. Because of the lack of long term streamflow records, the adequacy of standard project flood is best determined from a comparison with an enveloping curve of peak discharges shown in plate 62 and table 15. The standard project floods generated at the damsites north of Phoenix are greater than the enveloping curve of observed peak flows in the region. Standard project flood peak discharges are on the order of 40 percent of the PMF peak discharges, which is reasonable for Phoenix and vicinity streams. SPF peak estimates reflect a recurrence interval of from 200 to 500 years in this region.

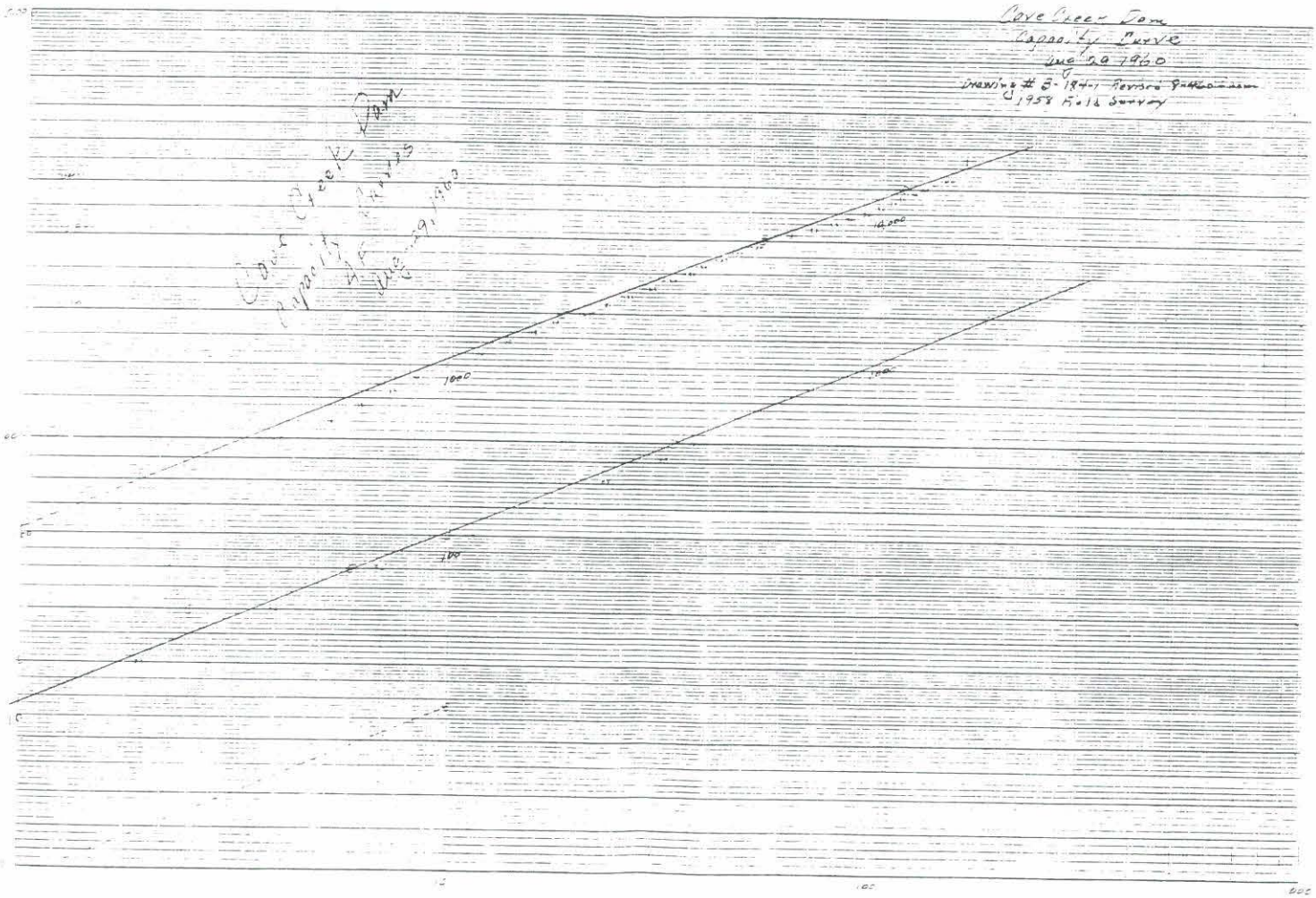
8-02. PROBABLE MAXIMUM FLOOD. The adequacy of probable maximum flood for the damsites is best indicated by the severity of the various hydrologic factors (storm magnitude, precipitation-intensity pattern, and loss rate) on which the flood estimate is based. The occurrence of any of these factors in the severity assumed would be infrequent, and obviously a flood resulting from the combination of all of these conditions would be very severe. An indication of the adequacy of probable maximum flood peak discharges is shown by the relatively high plotting positions on the enveloping curves of peak discharges shown on plate 62.

8-03. SEDIMENT STORAGE. The 100-year sediment storage, as developed, is reasonable for the proposed damsites in that the 0.3 acre-foot per square mile per year value was derived from a reservoir in the immediate study area.

TABLE 14

100-Year Sediment Production at Damsites

Dams	Drainage Area (sq. mi.)	100-Year Sediment Production (ac. - ft.)
Cave Buttes Dam	195	5900
Adobe Dam	75.6	2300
New River Dam	164	4900


Cave Creek Dam
Capacity Curve
June 30 1960
Drawing # 3-1941 Revised Sept 1958
1958 Field Survey
Cave Creek Dam
Capacity Curve
Dec 31 1963
10,000
1000
100

State 02 Arizona Reservoir Cave Creek

Stream Cave Creek Basin Gila River

Latitude (T.4N) 33°44' Longitude (R.3E) 112°03'

Geol. index No. 9-5123.50 Drainage area 161 sq. mi.

Total stor. 479 m.c.f. 11,000 a.f. Usable stor. 479 m.c.f. 11,000 a.f.

Dead stor. 0 m.c.f. 0 a.f. Controllable sur.area 680 ac

Storage ratio - - yrs. Basin index No. 9 NO

Dam completion date 1923 Crest length ~~1,640~~ 1,696 ft.

Reservoir established by - - - -

Uses: M-municipal, P-power, (F)-flood control, I-irrigation, D-domestic

Industrial, R-recreation, L-log driving, S-stock water.

Owner ~~Salt River Valley Water Users' Association~~ Joint ownership by local municipalities & private corporations for flood control.

Lat. & Long. on Indexed map 1 of Q-7 Phoenix

Dam type M.A. (Multiple Arch) Material volume Concrete 18,580 cu. yds.

Dam height 109 ft. Power capacity - - - - kw.

Usable stor. 479 m.c.f. 11,000 a.f. Surf. @ 1,638 ft.

Unusable stor. 0 m.c.f. 0 a.f. Surf. - - - -

Mean flow Unknown cfs in - - - - yrs. Date of initial filling Const.1922-23 (First water?)

Dead stor. elev. - - - - ft. Max. controllable elev. ~~1,640~~ 1,638 ft.

Flashboard elev. Coping 1,642 ft. during - - - -

References Reclamation table 12, A.E.Flood report on Gila River--Gillespie Dam to McDowell damsite (p.29)

28

GILA RIVER BASIN
NEW RIVER AND PHOENIX CITY STREAMS, ARIZONA

DESIGN MEMORANDUM NO. 3
GENERAL DESIGN MEMORANDUM – PHASE II

PROJECT DESIGN
PART 1

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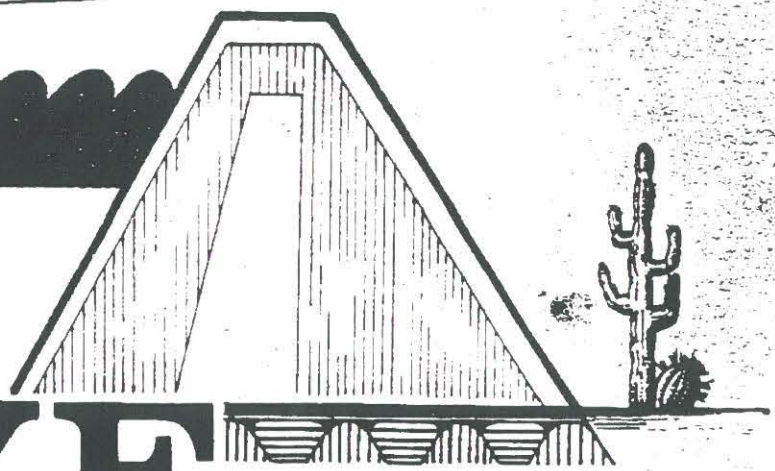

CAVE BUTTES DAM

(INCLUDING CAVE CREEK TO PEORIA AVENUE)

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

JULY 1976

DM-31

FILE COPY

Cave Creek is the prominent stream, with Apache Wash and Rowler Wash being the important tributaries. Cave Creek flows generally in a southwesterly direction from its waters to the proposed damsite, a distance of approximately 25 miles.

Project Formulation

1.06 The proposed Cave Buttes Dam is an integral unit of the flood control plan formulated and recommended in the phase I design memorandum. During project formulation, several alternative damsites were evaluated prior to the selection of the recommended site, 1.2 miles upstream of the project-document damsite.

1.07 Water-oriented recreation was also considered during phase I studies. Retention of a recreation lake behind the dam was found to be feasible and economically justified but local interests were unable to financially support the plan. A dry-land recreation concept was then developed and ultimately recommended. The construction of recreation facilities, however, is not programmed until the 1980's to be consonant with local planning.

1.08 The recommendations presented in the phase I design memorandum relative to Cave Buttes Dam were reviewed and the conclusions were reaffirmed. Cave Buttes Dam will be constructed at the site recommended in the phase I design memorandum.

Existing Cave Creek Dam

LOCATION

1.09 The existing Cave Creek Dam is located about 19 miles north of downtown Phoenix at the confluence of Apache Wash and Cave Creek. The dam controls runoff from a drainage area of about 175 square miles.

HISTORY

1.10 In August, 1921, a major flood occurred along the overflow area of Cave Creek and did a considerable amount of damage to properties in the City of Phoenix. As a result, local interests took immediate steps for prevention of a recurrence of such flooding. Construction of the dam was initiated in early 1922 and was completed in March 1923 at a cost of $556,000. The project was financed through a joint effort of the State of Arizona, Maricopa County, City of Phoenix and other local groups. The dam is located on public domain land.

DESCRIPTION

1.11 The existing dam is a reinforced-concrete structure with 38 arches and supporting buttresses spaced about 44 feet apart (see pl. 4). The crest of the dam is at elevation 1,642.0. The length is 1,692 feet with a maximum height of 52 feet above the existing ground surface at the downstream toe. The dam, as constructed, had a reservoir capacity of

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14,000 acre-feet at elevation 1,642.0. In April 1970, an aerial survey of the entire reser area was made. Based on the survey, the reservoir area was computed to be 830 surface a with a corresponding reservoir capacity at elevation 1,642,0 of 12,400 acre-feet.

1.12 A detached unlined spillway is located in a natural saddle about 4,800 feet east the left abutment of the existing dam. The spillway is irregular in cross section with lowest point at elevation 1,637.6. The width at elevation 1,640 is about 860 feet. It believed that no floodwater detained by the Cave Creek Dam ever reached this spillw elevation and discharged through the spillway.

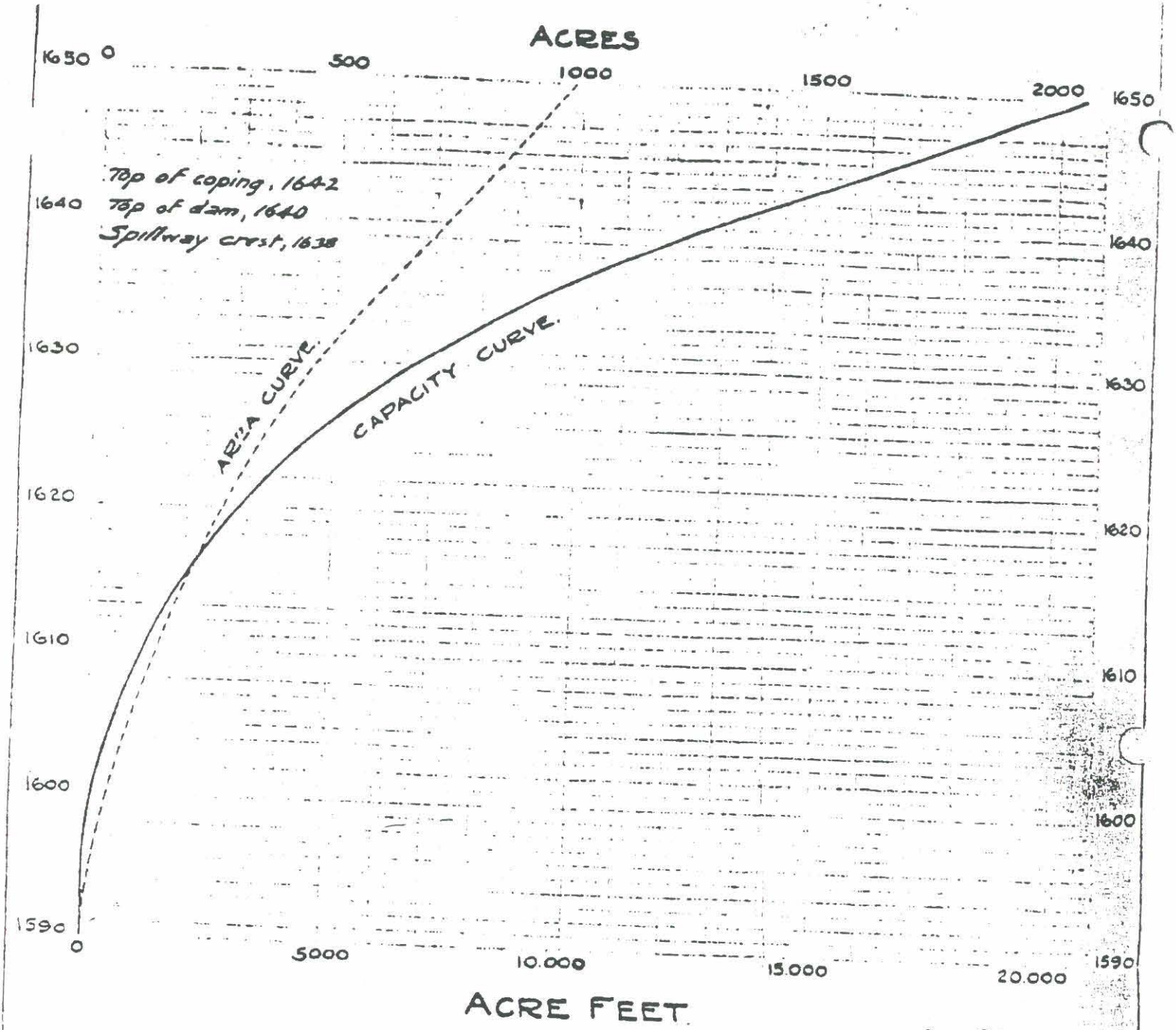
1.13 The outlet works of the existing dam consisted of three 4-by 4-foot openings, o ungated and two gated. The gated openings have been plugged with concrete. With t invert elevation at 1,580.6, the discharge through the remaining opening is estimated at 5C cfs (reservoir water surface at elevation 1,642). Downstream of the openings is rectangular-concrete channel about 80 feet long with wall heights of 8 feet and a width c 20 feet.

1.14 According to the latest hydrological analysis, it is concluded that the reservoi capacity behind the existing Cave Creek Dam could control floods having a frequency o occurrence of about 25 years. With the anticipated accumulation of an additional 5,70C acre-feet of sediment behind the dam over the next 100 years, the remaining capacity for flood control would be about 6,700 acre-feet. The effect of the existing dam on the proposed dam was analyzed in the phase I design memorandum.

1.15 Investigations relative to the safety of the existing concrete structure yielded the following information:

(a) Subsurface explorations by diamond core drilling in 1972 revealed that the bedrock underlying the existing Cave Creek Dam was both soft and hard tuffaceous agglomerate and schist. Foundation material underlying the buttresses and arches in the middle portion of the dam (arches 10 to 31) consist of a partially cemented gravel and weakly cemented tuffaceous agglomerate both of which are very erodible. These materials are overlain by streambed alluvium consisting of sand, gravel, cobbles and boulders. A detailed description of the explorations is presented in appendix 1.

(b) Overtopping of the dam which, according to studies, could occur during floods bearing occurrence frequencies exceeding approximately 25 years, would start the erosion process provided there is no stilling pool between the dam and the proposed Cave Buttes Dam. The best judgement is that a sustained overpour or accumulative periods of overpour could result in sufficient erosion of the bedrock from beneath the buttresses and arches to seriously weaken the foundation of the dam. Further, structural analysis indicates that the structure would be overstressed if the water surface should reach the dam crest. Under such a loading condition, severe damage to the upper part of the dam could result. Therefore, it is probable that some mode of failure of the Cave Creek Dam could occur during the life of the proposed Cave Buttes Dam.



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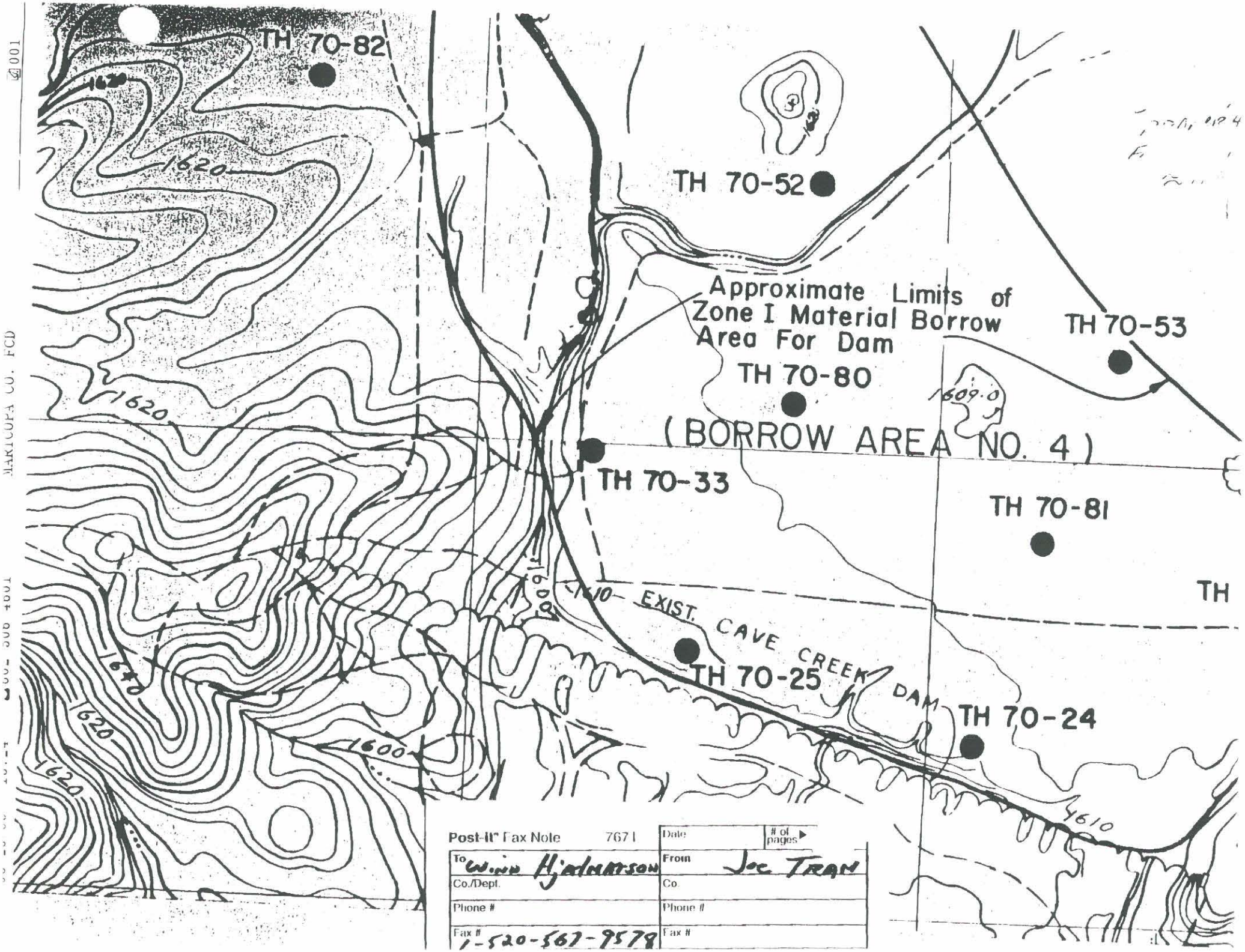
CAPACITY CURVE
GAVE CREEK RESERVOIR.

C-1-1603



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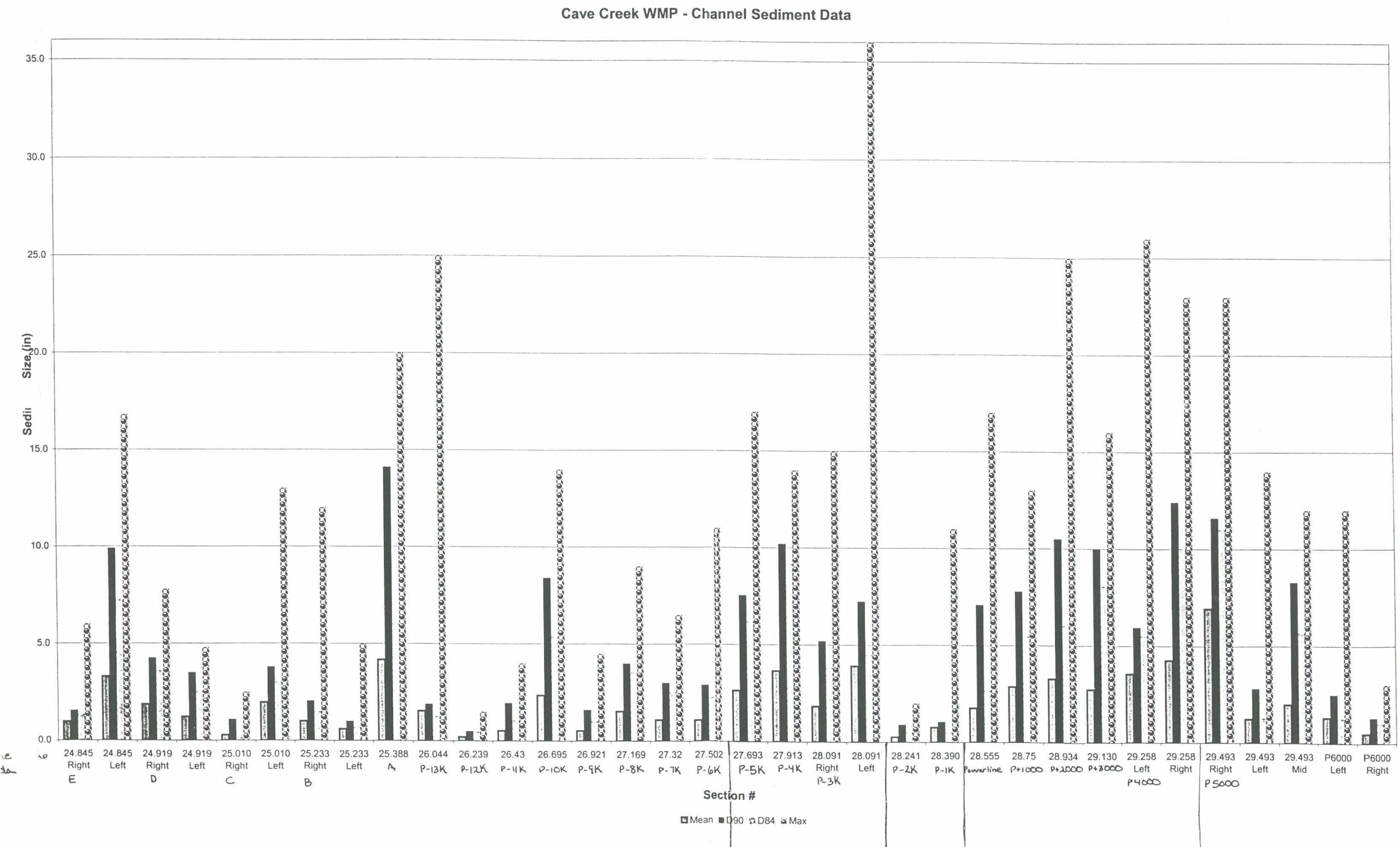
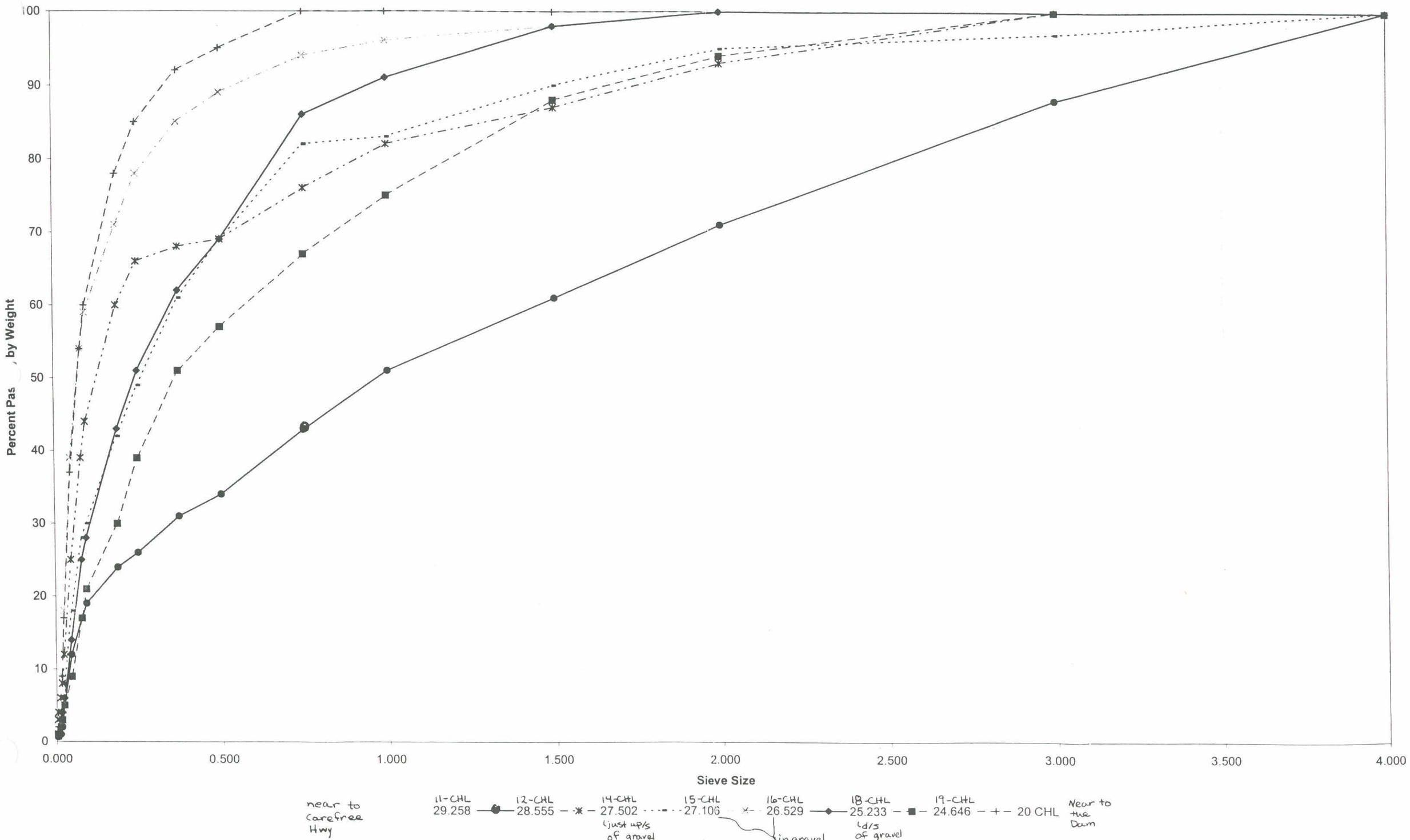
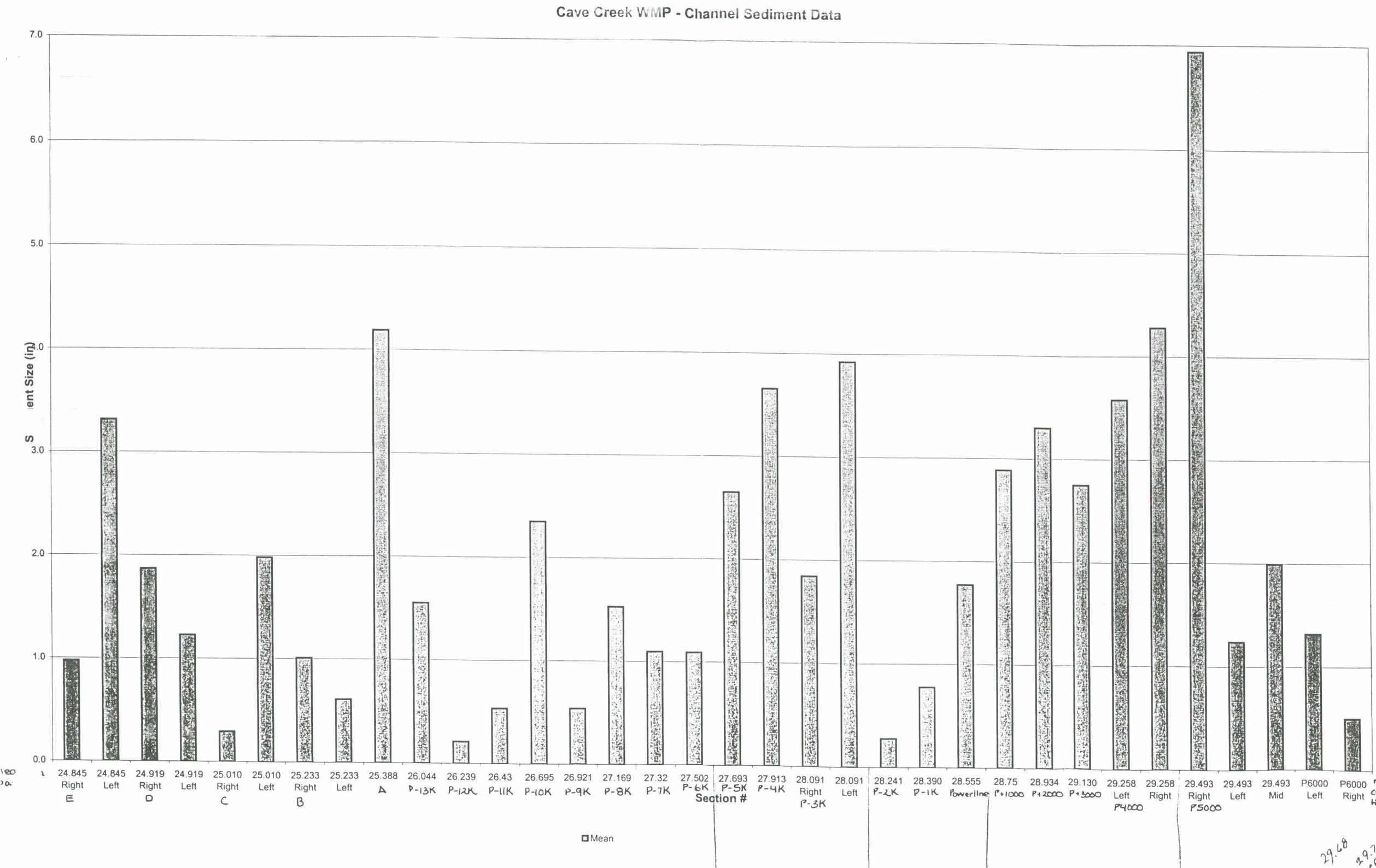

Cave Creek WMP - Channel Sediment Data
Sediment Size (in)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
24.845 Right E
24.845 Left
24.919 Right D
24.919 Left
25.010 Right C
25.010 Left
25.233 Right B
25.233 Left
25.388 A
26.044 P-13K
26.239 P-12K
26.43 P-11K
26.695 P-10K
26.921 P-9K
27.169 P-8K
27.32 P-7K
27.502 P-6K
27.693 P-5K
27.913 P-4K
28.091 Right P-3K
28.091 Left
28.241 P-2K
28.390 P-1K
28.555 Powerline
28.75 P+1000
28.934 P+2000
29.130 P+3000
29.258 Left P4000
29.258 Right
29.493 Right P5000
29.493 Left
29.493 Mid
P6000 Left
P6000 Right
Section #
Mean
D90
D84
Max

Cave Creek Wash Sieve Analysis

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Sediment Size (in)
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6.0
5.0
4.0
3.0
2.0
1.0
0.0
24.845 Right E
24.845 Left
24.919 Right D
24.919 Left
25.010 Right C
25.010 Left
25.233 Right B
25.233 Left
25.388 A
26.044 P-13K
26.239 P-12K
26.43 P-11K
26.695 P-10K
26.921 P-9K
27.169 P-8K
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27.693 P-5K
27.913 P-4K
28.091 Right P-3K
28.091 Left
28.241 P-2K
28.390 P-1K
28.555 Powerline
28.75 P+1000
28.934 P+2000
29.130 P+3000
29.258 Left P4000
29.258 Right
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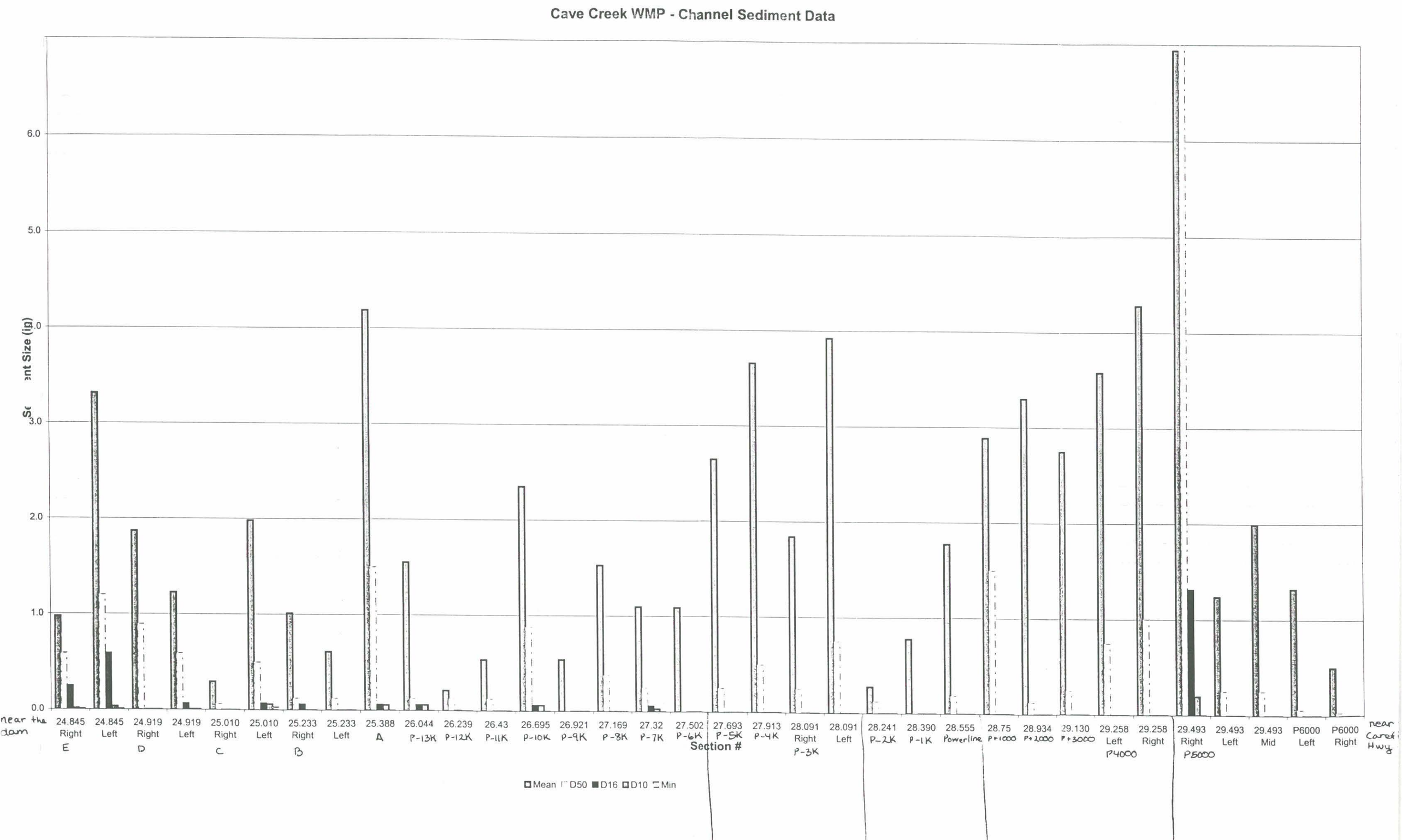
29.493 Mid
P6000 Left
P6000 Right
Section #
Mean


Cave Creek WMP - Channel Sediment Data
Sediment Size (in)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
near the dam
24.845 Right E
24.845 Left
24.919 Right D
24.919 Left
25.010 Right C
25.010 Left
25.233 Right B
25.233 Left
25.388 A
26.044 P-13K
26.239 P-12K
26.43 P-11K
26.695 P-10K
26.921 P-9K
27.169 P-8K
27.32 P-7K
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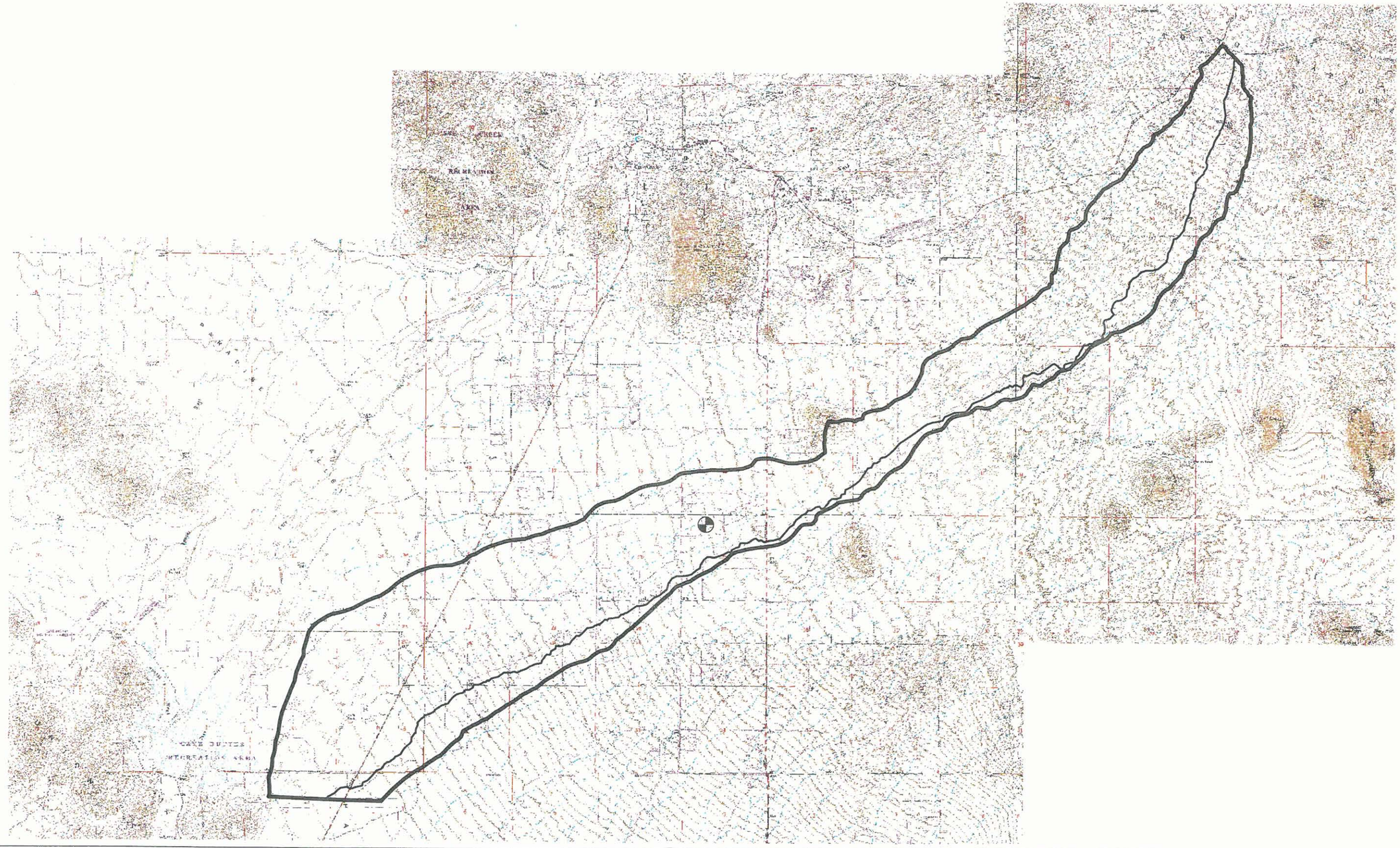
27.693 P-5K
27.913 P-4K
28.091 Right P-3K
28.091 Left
28.241 P-2K
28.390 P-1K
28.555 Powerline
28.75 P+1000
28.934 P+2000
29.130 P+3000
29.258 Left P4000
29.258 Right
29.493 Right P5000
29.493 Left
29.493 Mid
P6000 Left
P6000 Right
near Cave Creek Hwy
Section #
Mean D50 D16 D10 Min

APPENDIX C

HYDROLOGIC MODELING AND RESERVOIR ROUTING THROUGH CAVE BUTTES DAM



Legend

WATERSHED BOUNDARY
Tc FLOW PATH
BASIN CENTROID

0 6000′

SCALE: 1″ = 6000′

Stantec

Client/Project
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Figure No.
C-1

Title
WATERSHED MAP
10/8/99
82000077

Stantec

Project: Project Number:

Notes: Scale:

Page 1 of Page(s)

Computed By: Date: Checked By: Date:

CAVE BUTTES DAM INFLOW HYDROGRAPH

- ADDITIONAL DRAINAGE AREA = 16.96 SM
- RAINFALL
  - 100-YR, 24-HR DEPTH = 4.98 IN
  - SCS TYPE II RAINFALL DISTRIBUTION
  - AREA REDUCTION FACTOR
- EXISTING CONDITION RAINFALL LOSSES
  - SOILS

MAJOR MAP UNITS	% AREA	XKSAT IN/HR
33	25	0.23
61	15	0.15
90	15	0.39
96	15	0.07
98	20	0.37
	90%	

- BAREGROUND XKSAT = 0.21 IN/HR
- DTHETA DRY = 0.37
- PSIP = 5.25 IN
- VEGETATIVE COVER = 25%
- ADJUSTED XKSAT = 0.25 IN/HR
- SURFACE RETENTION = 0.35 IN

  - LAND USE
    - DEVELOPED AREA = 30%
      - MAJORITY IS ZONED RURAL-43 (VERY LOW DENSITY)
      - REMAINER IS ZONED R1-6 (MEDIUM DENSITY)
      - USE LOW DENSITY RESIDENTIAL
        - SURFACE RETENTION = 0.3 IN
        - RTIMP = 15%
        - VEGETATIVE COVER = 50%
        - DTHETA NORMAL = 0.25
  - AREA WEIGHTED PARAMETERS
    - IA = 0.34 IN
    - DTHETA = 0.37 *
    - PSIF = 5.25 IN
    - XKSAT = 0.25 IN/HR *
    - RTIMP = 5%

* ASSUME NATURAL VEGETATIVE COVER AND DTHETA DRY FOR DEVELOPED AREA

Stantec

Project: Project Number:

Notes: Scale:

Page 2 of Page(s)

Computed By: Date: Checked By: Date:

- UNIT HYDROGRAPH
  - DESERT/RANGELAND S-GRAPH
  - LAG
    - $C = 24 * K_n \Rightarrow (24)(0.025) = 0.6$
    - $m = 0.38$
    - $p = 0.5$
    - $L = 15.6^{MI}$
    - $L_{CA} = 6.2^{MI}$
    - $S = 106.4^{FT/MI}$ — High elev 3280, low elev 1620

    LAG = 1.4^{HRS}

- FUTURE CONDITION
  - LAND USE
    - DEVELOPED AREA = 70%
      - ASSUME AVERAGE LAND USE IS MEDIUM DENSITY RES.
        - SURFACE RETENTION = 0.25^{IN}
        - VEGETATION COVER = 50%
        - RTIMP = 30%
        - DTHETA NORMAL = 0.25

  - AREA WEIGHTED PARAMETERS
    - VEGETATION COVER = 42.5
    - IA = 0.28
    - DTHETA = 0.29
    - PSIF = 5.25
    - XKSAT = 0.29
    - RTIMP = 21%

```
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 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              MAY   1991           *
 *           VERSION 4.0.1E          *
 *     Lahey F77L-EM/32 version 5.01 *
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*    HYDROLOGIC ENGINEERING CENTER  *
*          609 SECOND STREET        *
*       DAVIS, CALIFORNIA 95616     *
*           (916) 551-1748          *
*                                   *
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X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID        Upper Cave Creek/Apache Wash Watercourse Master Plan  File:   EX-CBD.IH1
  2           ID           By: Stantec Consulting, Inc.                    Original: 07/12/99
  3           ID          For: Flood Control District of Maricopa County   Revised:
  4           ID
  5           ID        This is an existing condition model of the total inflow to Cave Buttes
  6           ID        Dam.  Inflow hydrographs for Cave Creek and Apache Wash are developed
  7           ID        from the following:
  8           ID
  9           ID        Cave Creek Watershed at Cave Buttes Dam
 10           ID           Combined HEC-1 models from:
 11           ID             1.  George V. Sabol Consulting Engineers FCD 95-28
 12           ID                 Cave Creek Watershed at the Carefree Highway
 13           ID                 Original model dated 06-17-96 by mcg
 14           ID                 GVSCE Project No. 84
 15           ID
 16           ID             2.  Willdan Associates FCD 95-30
 17           ID                 Cave Creek Watershed from Carefree Highway to Cave Buttes Dam
 18           ID                 Original model dated 11-29-96
 19           ID                 Willdan Project No. 08855
 20           ID
 21           ID        Model Basis:
 22           ID           100-year, 24-hr rainfall with SCS Type II distribution
 23           ID           Green & Ampt Loss Rate Method
 24           ID           NMIN = 5
 25           ID           Phoenix Mountain and Desert/Rangeland S-Graph
 26           ID           Clark Unit Hydrograph
 27           ID           Modified Puls channel storage routing
 28           ID           200 Scale 2' CI mapping of study reach by Aerial Mapping Company
 29           ID
 30           ID        Apache Wash Watershed at Cave Buttes Dam
 31           ID           Jerry Jones and Associates, Inc. FCD 89-66
 32           ID           Apache Wash Flood Insurance Study
 33           ID           Original model dated 2-15-89
 34           ID
 35           ID        Model Basis:
 36           ID           100-year, 24-hr rainfall with SCS Type IIA distribution
 37           ID           SCS Curve Number with RTIMP
 38           ID           NMIN = 10
 39           ID           SCS dimensionless unit hydrograph
 40           ID
 41           ID
 42           ID        The remaining portion of the Cave Buttes Dam watershed is modeled as a
 43           ID        single basin for existing conditions and is based on the following:
 44           ID           100-year, 24-hour rainfall with SCS Type II distribution
 45           ID           Green & Ampt Loss Rate Method
 46           ID           NMIN = 5
 47           ID           Phoenix Mountain and Desert/Rangeland S-Graph
 48           ID           USGS 7.5 Minutes Series Quadrangle Maps
 49           ID
              *
 50           IT       5                    900
 51           IO       5
 52           IN       5
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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 53          KK      CC
 54          KM          Inflow hydrograph at Cave Buttes Dam from Cave Creek
 55          BA  142.29
 56          QI       0       0       0       0       0       0       0       0       0       0
 57          QI       0       0       0       0       0       0       0       0       0       0
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 61          QI       3       3       3       3       4       4       4       5       5       5
 62          QI       6       6       7       7       8       9      10      11      12      14
 63          QI      16      19      23      27      31      36      41      47      57      65
 64          QI      73      80      87      95     103     112     120     127     133     139
 65          QI     143     148     152     156     159     163     167     170     174     178
 66          QI     182     185     189     193     197     202     206     211     215     220
 67          QI     225     230     235     240     246     251     257     262     269     276
 68          QI     288     300     310     320     330     340     349     358     367     376
 69          QI     385     393     402     411     420     429     438     448     457     468
 70          QI     480     495     516     548     599     677     798     983    1236    1571
 71          QI    1986    2348    2616    2818    3039    3337    3765    4423    5523    7397
 72          QI   10194   13584   18065   22749   26868   30589   33431   35438   36755   37564
 73          QI   37972   38066   37948   37677   37284   36795   36235   35610   34911   34140
 74          QI   33306   32418   31501   30573   29637   28715   27766   26774   25765   24767
 75          QI   23815   22962   22095   21218   20347   19503   18646   17914   17212   16499
 76          QI   15786   15114   14454   13850   13303   12774   12266   11753   11238   10744
 77          QI   10285    9877    9498    9154    8808    8462    8119    7785    7434    7113
 78          QI    6828    6574    6359    6170    5980    5788    5590    5389    5190    4997
 79          QI    4810    4631    4460    4304    4157    4020    3898    3793    3708    3635
 80          QI    3556    3469    3376    3278    3176    3075    2970    2862    2755    2648
 81          QI    2544    2442    2344    2251    2163    2084    2012    1943    1878    1814
 82          QI    1750    1687    1624    1558    1488    1407    1314    1188    1050     962
 83          QI     908     871     843     820     800     781     765     750     736     722
 84          QI     709     696     684     671     658     645     631     618     605     593
 85          QI     580     568     557     546     535     526     517     508     499     490
 86          QI     481     472     463     454     445     437     428     420     412     405
 87          QI     397     389     382     374     367     360     352     345     338     331
 88          QI     324     318     312     307     301     296     290     285     281     276
 89          QI     271     267     262     256     250     243     236     230     223     216
 90          QI     209     202     196     189     182     176     169     163     156     150
 91          QI     144     138     132     127     121     117     112     109     106     103
 92          QI     101      98      95      91      88      85      82      79      77      74
 93          QI      72      70      68      66      64      62      61      59      58      56
 94          QI      55      53      52      50      49      47      46      44      42      41
 95          QI      40      39      38      36      35      34      32      31      29      28
 96          QI      26      25      23      22      21      20      19      18      18      17
 97          QI      16      16      15      15      15      14      14      13      13      12
 98          QI      12      11      11      10      10       9       9       8       8       7
 99          QI       7       7       6       6       5       5       5       4       4       4
100          QI       3       3       3       3       2       2       2       2       2       2
101          QI       1       1       1       1       1       1       1       1       1       1
102          QI       1       0       0       0       0       0       0       0       0       0
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104          QI       0       0       0       0       0       0       0       0       0       0
105          QI       0       0       0       0       0       0       0       0       0       0
106          QI       0       0       0       0       0       0       0       0       0       0
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114          QI       0       0       0       0       0       0       0       0       0       0
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125          QI       0       0       0       0       0       0       0       0       0       0
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142        QI      0      0      0      0      0      0      0      0      0      0
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145        QI      0      0      0      0      0      0      0      0      0      0
146        IN     10
           *

147        KK     AW
148        KM        Inflow hydrograph to Cave Buttes Dam from Apache Wash
149        BA  30.64
150        QI      0      0      0      0      0      0      0      0      0      0
151        QI      0      0      0      0      0      0      0      0      0      0
152        QI      0      0      0      0      0      0      0      0      0      0
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155        QI      0      0      0      0      0      0      0      0      0      0
156        QI      0      0      0      0      0      0      0      7     26    565
157        QI   2113   4109   5040   4423   3597   2959   2707   2470   5358  13179
158        QI  17843  18413  17529  16388  17086  17290  15318  13326  11557  10033
159        QI   8737   7643   6724   5950   5299   4745   4265   3845   3486   3189
```



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LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

160        QI   2946   2739   2552   2377   2221   2088   1978   1888   1818   1764
161        QI   1716   1658   1589   1523   1468   1427   1395   1371   1355   1342
162        QI   1320   1284   1243   1296   1481   1659   1697   1584   1454   1342
163        QI   1244   1201   1265   1449   1679   1854   1983   2107   2227   2304
164        QI   2248   2096   1937   1807   1679   1544   1455   1528   1495   1385
165        QI   1261   1136   1024    929    849    781    723    675    633    595
166        QI    559    525    493    463    435    412    391    373    356    340
167        QI    324    308    290    271    252    233    216    199    184    169
168        QI      0      0      0      0      0      0      0      0      0      0
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187        QI      0      0      0      0      0      0      0      0      0      0
188        QI      0      0      0      0      0      0      0      0      0      0
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208        QI      0      0      0      0      0      0      0      0      0      0
209        QI      0      0      0      0      0      0      0      0      0      0
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212        QI      0      0      0      0      0      0      0      0      0      0
213        QI      0      0      0      0      0      0      0      0      0      0
214        QI      0      0      0      0      0      0      0      0      0      0
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LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

215        QI      0      0      0      0      0      0      0      0      0      0
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217        QI      0      0      0      0      0      0      0      0      0      0
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220        QI      0      0      0      0      0      0      0      0      0      0
221        QI      0      0      0      0      0      0      0      0      0      0
222        QI      0      0      0      0      0      0      0      0      0      0
223        QI      0      0      0      0      0      0      0      0      0      0
224        QI      0      0      0      0      0      0      0      0      0      0
225        QI      0      0      0      0      0      0      0      0      0      0
226        QI      0      0      0      0      0      0      0      0      0      0
```

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227        QI      0      0      0      0      0      0      0      0      0      0
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237        QI      0      0      0      0      0      0      0      0      0      0
238        QI      0      0      0      0      0      0      0      0      0      0
239        QI      0      0      0      0      0      0      0      0      0      0
240        IN      5
           *

241        KK    EAST
242        KM          Inflow hydrograph to Cave Buttes Dam from Apache Wash
243        BA   16.96
244        QI      0      0      0      0      0      1      1      2      3      3
245        QI      4      5      7      8      9     11     12     14     15     17
246        QI     18     19     20     21     22     23     24     24     25     25
247        QI     26     26     27     27     27     28     28     28     28     28
248        QI     29     29     29     29     29     29     29     30     30     30
249        QI     30     30     30     31     31     32     32     32     33     34
250        QI     34     35     35     36     36     36     37     37     37     38
251        QI     38     38     38     39     39     39     39     39     40     40
252        QI     40     41     41     42     42     43     43     44     44     45
253        QI     45     46     46     47     47     47     48     48     48     48
254        QI     49     49     50     50     51     52     53     54     55     57
255        QI     58     59     61     62     64     65     66     68     69     70
256        QI     71     72     74     75     76     78     79     81     83     85
257        QI     87     90     93     97    101    105    120    138    157    293
258        QI    448    616    865   1316   1872   2389   3105   3955   4884   5711
259        QI   6508   7218   7841   8366   8780   8996   9073   9036   8798   8426
260        QI   7943   7377   6765   6126   5554   5028   4555   4127   3732   3378
261        QI   3056   2757   2499   2255   2048   1874   1683   1537   1396   1263
262        QI   1126   1009    939    862    785    701    638    574    496    418
263        QI    339    329    324    318    316    314    312    308    303    298
264        QI    266    233    200    157    115     72     69     66     64     63
265        QI     62     60     60     59     58     57     56     55     54     53
266        QI     52     51     51     50     49     48     47     47     46     45
267        QI     45     44     44     44     43     43     43     42     42     42
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LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

268        QI     42     41     41     41     40     40     39     39     38     38
269        QI     37     37     36     36     35     35     34     34     33     33
270        QI     33     33     32     32     32     32     31     31     31     31
271        QI     31     31     31     31     31     31     30     30     30     30
272        QI     30     30     30     30     30     30     30     30     30     30
273        QI     29     29     28     28     27     26     25     23     22     21
274        QI     19     18     16     15     13     12     11     10      9      8
275        QI      7      6      6      5      5      4      4      3      3      3
276        QI      2      2      2      2      2      1      1      1      1      1
277        QI      1      1      1      1      0      0      0      0      0      0
278        QI      0      0      0      0      0      0      0      0      0      0
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305        QI      0      0      0      0      0      0      0      0      0      0
306        QI      0      0      0      0      0      0      0      0      0      0
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309        QI      0      0      0      0      0      0      0      0      0      0
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313        QI      0      0      0      0      0      0      0      0      0      0
314        QI      0      0      0      0      0      0      0      0      0      0
315        QI      0      0      0      0      0      0      0      0      0      0
```

```
          316          QI       0       0       0       0       0       0       0       0       0       0
          317          QI       0       0       0       0       0       0       0       0       0       0
          318          QI       0       0       0       0       0       0       0       0       0       0
          319          QI       0       0       0       0       0       0       0       0       0       0
          320          QI       0       0       0       0       0       0       0       0       0       0
          321          QI       0       0       0       0       0       0       0       0       0       0
          322          QI       0       0       0       0       0       0       0       0       0       0
1                                                HEC-1 INPUT                                                    PAGE  7

         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          323          QI       0       0       0       0       0       0       0       0       0       0
          324          QI       0       0       0       0       0       0       0       0       0       0
          325          QI       0       0       0       0       0       0       0       0       0       0
          326          QI       0       0       0       0       0       0       0       0       0       0
          327          QI       0       0       0       0       0       0       0       0       0       0
          328          QI       0       0       0       0       0       0       0       0       0       0
          329          QI       0       0       0       0       0       0       0       0       0       0
          330          QI       0       0       0       0       0       0       0       0       0       0
          331          QI       0       0       0       0       0       0       0       0       0       0
          332          QI       0       0       0       0       0       0       0       0       0       0
          333          QI       0       0       0       0       0       0       0       0       0       0
                       *

          334          KK   CBD-I
          335          KO       1                               21
          336          KM        Total inflow to Cave Buttes Dam
          337          HC       3
                       *

          338          KK   CBD-O
          339          KO       1
          340          RS       1    FLOW      -1
          341          SV       0     250     700    1100    1800    2600    4000    6300    9400   13000
          342          SV   17500   23000   29200   37000   46000
          343          SE  1560.7    1595    1600    1605    1610    1615    1620    1625    1630    1635
          344          SE    1640    1645    1650    1655    1660
          345          SQ       0     132     215     243     268     290     311     330     347     365
          346          SQ     381     398     413     428     442     455     468     481     493
          347          SE  1560.7    1570    1580    1585    1590    1595    1600    1605    1610    1615
          348          SE    1620    1625    1630    1635    1640    1645    1650    1655    1660
                       *
          349          ZZ
1*************************************                                          *************************************
*                                   *                                          *                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*                                          *   U.S. ARMY CORPS OF ENGINEERS    *
*              MAY   1991           *                                          *   HYDROLOGIC ENGINEERING CENTER   *
*           VERSION 4.0.1E          *                                          *         609 SECOND STREET         *
*     Lahey F77L-EM/32 version 5.01 *                                          *      DAVIS, CALIFORNIA 95616      *
*       Dodson & Associates, Inc.   *                                          *          (916) 551-1748           *
* RUN DATE  07/19/99  TIME  10:40:04 *                                          *                                   *
*************************************                                          *************************************
```

Upper Cave Creek/Apache Wash Watercourse Master Plan File: EX-CBD.IH1
By: Stantec Consulting, Inc. Original: 07/12/99
For: Flood Control District of Maricopa County Revised:

This is an existing condition model of the total inflow to Cave Buttes Dam. Inflow hydrographs for Cave Creek and Apache Wash are developed from the following:

Cave Creek Watershed at Cave Buttes Dam
Combined HEC-1 models from:

1. George V. Sabol Consulting Engineers FCD 95-28
   Cave Creek Watershed at the Carefree Highway
   Original model dated 06-17-96 by mcg
   GVSCE Project No. 84

2. Willdan Associates FCD 95-30
   Cave Creek Watershed from Carefree Highway to Cave Buttes Dam
   Original model dated 11-29-96
   Willdan Project No. 08855

Model Basis:
100-year, 24-hr rainfall with SCS Type II distribution
Green & Ampt Loss Rate Method
NMIN = 5
Phoenix Mountain and Desert/Rangeland S-Graph
Clark Unit Hydrograph
Modified Puls channel storage routing
200 Scale 2' CI mapping of study reach by Aerial Mapping Company

Apache Wash Watershed at Cave Buttes Dam
Jerry Jones and Associates, Inc. FCD 89-66
Apache Wash Flood Insurance Study
Original model dated 2-15-89

Model Basis:
100-year, 24-hr rainfall with SCS Type IIA distribution
SCS Curve Number with RTIMP
NMIN = 10

SCS dimensionless unit hydrograph

The remaining portion of the Cave Buttes Dam watershed is modeled as a single basin for existing conditions and is based on the following:
100-year, 24-hour rainfall with SCS Type II distribution
Green & Ampt Loss Rate Method
NMIN = 5
Phoenix Mountain and Desert/Rangeland S-Graph
USGS 7.5 Minutes Series Quadrangle Maps

```
51 IO        OUTPUT CONTROL VARIABLES
                   IPRNT          5  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                    NMIN          5  MINUTES IN COMPUTATION INTERVAL
                   IDATE     1    0  STARTING DATE
                   ITIME       0000  STARTING TIME
                      NQ        900  NUMBER OF HYDROGRAPH ORDINATES
                 NDDATE     4    0  ENDING DATE
                 NDTIME       0255  ENDING TIME
                   ICENT         19  CENTURY MARK

             COMPUTATION INTERVAL    0.08 HOURS
                  TOTAL TIME BASE   74.92 HOURS

       ENGLISH UNITS
            DRAINAGE AREA          SQUARE MILES
            PRECIPITATION DEPTH    INCHES
            LENGTH, ELEVATION      FEET
            FLOW                   CUBIC FEET PER SECOND
            STORAGE VOLUME         ACRE-FEET
            SURFACE AREA           ACRES
            TEMPERATURE            DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
334 KK      *    CBD-I   *
            *            *
            **************

335 KO       OUTPUT CONTROL VARIABLES
                   IPRNT          1  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE
                   IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                    IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                   ISAV1          1  PIRST ORDINATE PUNCHED OR SAVED
                   ISAV2        900  LAST ORDINATE PUNCHED OR SAVED
                  TIMINT      0.083  TIME INTERVAL IN HOURS

                        Total inflow to Cave Buttes Dam

337 HC       HYDROGRAPH COMBINATION
                   ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                          ***
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****

HYDROGRAPH AT STATION CBD-I
SUM OF 3 HYDROGRAPHS

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		1845	226	7392.	*	2		1330	451	1.	*	3		0815	676	0.
1		0005	2	0.	*	1		1850	227	7160.	*	2		1335	452	1.	*	3		0820	677	0.
1		0010	3	0.	*	1		1855	228	6932.	*	2		1340	453	1.	*	3		0825	678	0.
1		0015	4	0.	*	1		1900	229	6704.	*	2		1345	454	1.	*	3		0830	679	0.
1		0020	5	0.	*	1		1905	230	6490.	*	2		1350	455	1.	*	3		0835	680	0.
1		0025	6	1.	*	1		1910	231	6282.	*	2		1355	456	1.	*	3		0840	681	0.
1		0030	7	1.	*	1		1915	232	6086.	*	2		1400	457	1.	*	3		0845	682	0.
1		0035	8	2.	*	1		1920	233	5899.	*	2		1405	458	1.	*	3		0850	683	0.
1		0040	9	3.	*	1		1925	234	5731.	*	2		1410	459	1.	*	3		0855	684	0.
1		0045	10	3.	*	1		1930	235	5571.	*	2		1415	460	1.	*	3		0900	685	0.
1		0050	11	4.	*	1		1935	236	5426.	*	2		1420	461	1.	*	3		0905	686	0.
1		0055	12	5.	*	1		1940	237	5296.	*	2		1425	462	0.	*	3		0910	687	0.
1		0100	13	7.	*	1		1945	238	5184.	*	2		1430	463	0.	*	3		0915	688	0.
1		0105	14	8.	*	1		1950	239	5092.	*	2		1435	464	0.	*	3		0920	689	0.
1		0110	15	9.	*	1		1955	240	5008.	*	2		1440	465	0.	*	3		0925	690	0.
1		0115	16	11.	*	1		2000	241	4918.	*	2		1445	466	0.	*	3		0930	691	0.
1		0120	17	12.	*	1		2005	242	4812.	*	2		1450	467	0.	*	3		0935	692	0.
1		0125	18	14.	*	1		2010	243	4701.	*	2		1455	468	0.	*	3		0940	693	0.
1		0130	19	15.	*	1		2015	244	4583.	*	2		1500	469	0.	*	3		0945	694	0.
1		0135	20	17.	*	1		2020	245	4459.	*	2		1505	470	0.	*	3		0950	695	0.

1	0140	21	18.	*	1	2025	246	4385.	*	2	1510	471	0.	*	3	0955	696	0.
1	0145	22	19.	*	1	2030	247	4305.	*	2	1515	472	0.	*	3	1000	697	0.
1	0150	23	20.	*	1	2035	248	4290.	*	2	1520	473	0.	*	3	1005	698	0.
1	0155	24	21.	*	1	2040	249	4274.	*	2	1525	474	0.	*	3	1010	699	0.
1	0200	25	22.	*	1	2045	250	4256.	*	2	1530	475	0.	*	3	1015	700	0.
1	0205	26	23.	*	1	2050	251	4240.	*	2	1535	476	0.	*	3	1020	701	0.
1	0210	27	24.	*	1	2055	252	4157.	*	2	1540	477	0.	*	3	1025	702	0.
1	0215	28	24.	*	1	2100	253	4077.	*	2	1545	478	0.	*	3	1030	703	0.
1	0220	29	25.	*	1	2105	254	3928.	*	2	1550	479	0.	*	3	1035	704	0.
1	0225	30	25.	*	1	2110	255	3782.	*	2	1555	480	0.	*	3	1040	705	0.
1	0230	31	26.	*	1	2115	256	3638.	*	2	1600	481	0.	*	3	1045	706	0.
1	0235	32	26.	*	1	2120	257	3500.	*	2	1605	482	0.	*	3	1050	707	0.
1	0240	33	27.	*	1	2125	258	3375.	*	2	1610	483	0.	*	3	1055	708	0.
1	0245	34	28.	*	1	2130	259	3253.	*	2	1615	484	0.	*	3	1100	709	0.
1	0250	35	28.	*	1	2135	260	3140.	*	2	1620	485	0.	*	3	1105	710	0.
1	0255	36	29.	*	1	2140	261	3027.	*	2	1625	486	0.	*	3	1110	711	0.
1	0300	37	29.	*	1	2145	262	2943.	*	2	1630	487	0.	*	3	1115	712	0.
1	0305	38	29.	*	1	2150	263	2857.	*	2	1635	488	0.	*	3	1120	713	0.
1	0310	39	29.	*	1	2155	264	2823.	*	2	1640	489	0.	*	3	1125	714	0.
1	0315	40	29.	*	1	2200	265	2785.	*	2	1645	490	0.	*	3	1130	715	0.
1	0320	41	30.	*	1	2205	266	2796.	*	2	1650	491	0.	*	3	1135	716	0.
1	0325	42	30.	*	1	2210	267	2794.	*	2	1655	492	0.	*	3	1140	717	0.
1	0330	43	30.	*	1	2215	268	2783.	*	2	1700	493	0.	*	3	1145	718	0.
1	0335	44	31.	*	1	2220	269	2760.	*	2	1705	494	0.	*	3	1150	719	0.
1	0340	45	31.	*	1	2225	270	2760.	*	2	1710	495	0.	*	3	1155	720	0.
1	0345	46	31.	*	1	2230	271	2793.	*	2	1715	496	0.	*	3	1200	721	0.
1	0350	47	31.	*	1	2235	272	2821.	*	2	1720	497	0.	*	3	1205	722	0.
1	0355	48	32.	*	1	2240	273	2857.	*	2	1725	498	0.	*	3	1210	723	0.
1	0400	49	32.	*	1	2245	274	2896.	*	2	1730	499	0.	*	3	1215	724	0.
1	0405	50	33.	*	1	2250	275	2938.	*	2	1735	500	0.	*	3	1220	725	0.
1	0410	51	33.	*	1	2255	276	2979.	*	2	1740	501	0.	*	3	1225	726	0.
1	0415	52	33.	*	1	2300	277	3022.	*	2	1745	502	0.	*	3	1230	727	0.
1	0420	53	33.	*	1	2305	278	3046.	*	2	1750	503	0.	*	3	1235	728	0.
1	0425	54	34.	*	1	2310	279	3070.	*	2	1755	504	0.	*	3	1240	729	0.
1	0430	55	35.	*	1	2315	280	3028.	*	2	1800	505	0.	*	3	1245	730	0.
1	0435	56	36.	*	1	2320	281	2987.	*	2	1805	506	0.	*	3	1250	731	0.
1	0440	57	36.	*	1	2325	282	2898.	*	2	1810	507	0.	*	3	1255	732	0.
1	0445	58	37.	*	1	2330	283	2810.	*	2	1815	508	0.	*	3	1300	733	0.
1	0450	59	38.	*	1	2335	284	2718.	*	2	1820	509	0.	*	3	1305	734	0.
1	0455	60	39.	*	1	2340	285	2625.	*	2	1825	510	0.	*	3	1310	735	0.
1	0500	61	40.	*	1	2345	286	2547.	*	2	1830	511	0.	*	3	1315	736	0.
1	0505	62	41.	*	1	2350	287	2468.	*	2	1835	512	0.	*	3	1320	737	0.
1	0510	63	42.	*	1	2355	288	2391.	*	2	1840	513	0.	*	3	1325	738	0.
1	0515	64	43.	*	2	0000	289	2314.	*	2	1845	514	0.	*	3	1330	739	0.
1	0520	65	44.	*	2	0005	290	2235.	*	2	1850	515	0.	*	3	1335	740	0.
1	0525	66	45.	*	2	0010	291	2153.	*	2	1855	516	0.	*	3	1340	741	0.
1	0530	67	47.	*	2	0015	292	2097.	*	2	1900	517	0.	*	3	1345	742	0.
1	0535	68	48.	*	2	0020	293	2040.	*	2	1905	518	0.	*	3	1350	743	0.
1	0540	69	49.	*	2	0025	294	2066.	*	2	1910	519	0.	*	3	1355	744	0.
1	0545	70	52.	*	2	0030	295	2090.	*	2	1915	520	0.	*	3	1400	745	0.
1	0550	71	54.	*	2	0035	296	2064.	*	2	1920	521	0.	*	3	1405	746	0.
1	0555	72	57.	*	2	0040	297	2037.	*	2	1925	522	0.	*	3	1410	747	0.
1	0600	73	61.	*	2	0045	298	1971.	*	2	1930	523	0.	*	3	1415	748	0.
1	0605	74	66.	*	2	0050	299	1906.	*	2	1935	524	0.	*	3	1420	749	0.
1	0610	75	70.	*	2	0055	300	1834.	*	2	1940	525	0.	*	3	1425	750	0.
1	0615	76	75.	*	2	0100	301	1761.	*	2	1945	526	0.	*	3	1430	751	0.
1	0620	77	80.	*	2	0105	302	1689.	*	2	1950	527	0.	*	3	1435	752	0.
1	0625	78	86.	*	2	0110	303	1615.	*	2	1955	528	0.	*	3	1440	753	0.
1	0630	79	97.	*	2	0115	304	1549.	*	2	2000	529	0.	*	3	1445	754	0.
1	0635	80	105.	*	2	0120	305	1482.	*	2	2005	530	0.	*	3	1450	755	0.
1	0640	81	113.	*	2	0125	306	1426.	*	2	2010	531	0.	*	3	1455	756	0.
1	0645	82	121.	*	2	0130	307	1368.	*	2	2015	532	0.	*	3	1500	757	0.
1	0650	83	128.	*	2	0135	308	1319.	*	2	2020	533	0.	*	3	1505	758	0.
1	0655	84	137.	*	2	0140	309	1270.	*	2	2025	534	0.	*	3	1510	759	0.
1	0700	85	145.	*	2	0145	310	1228.	*	2	2030	535	0.	*	3	1515	760	0.
1	0705	86	155.	*	2	0150	311	1185.	*	2	2035	536	0.	*	3	1520	761	0.
1	0710	87	163.	*	2	0155	312	1147.	*	2	2040	537	0.	*	3	1525	762	0.
1	0715	88	171.	*	2	0200	313	1111.	*	2	2045	538	0.	*	3	1530	763	0.
1	0720	89	177.	*	2	0205	314	1078.	*	2	2050	539	0.	*	3	1535	764	0.
1	0725	90	184.	*	2	0210	315	1047.	*	2	2055	540	0.	*	3	1540	765	0.
1	0730	91	188.	*	2	0215	316	1018.	*	2	2100	541	0.	*	3	1545	766	0.
1	0735	92	194.	*	2	0220	317	989.	*	2	2105	542	0.	*	3	1550	767	0.
1	0740	93	198.	*	2	0225	318	962.	*	2	2110	543	0.	*	3	1555	768	0.
1	0745	94	203.	*	2	0230	319	936.	*	2	2115	544	0.	*	3	1600	769	0.
1	0750	95	206.	*	2	0235	320	911.	*	2	2120	545	0.	*	3	1605	770	0.
1	0755	96	210.	*	2	0240	321	885.	*	2	2125	546	0.	*	3	1610	771	0.
1	0800	97	215.	*	2	0245	322	862.	*	2	2130	547	0.	*	3	1615	772	0.
1	0805	98	218.	*	2	0250	323	839.	*	2	2135	548	0.	*	3	1620	773	0.
1	0810	99	222.	*	2	0255	324	818.	*	2	2140	549	0.	*	3	1625	774	0.
1	0815	100	226.	*	2	0300	325	796.	*	2	2145	550	0.	*	3	1630	775	0.
1	0820	101	231.	*	2	0305	326	775.	*	2	2150	551	0.	*	3	1635	776	0.
1	0825	102	234.	*	2	0310	327	754.	*	2	2155	552	0.	*	3	1640	777	0.
1	0830	103	239.	*	2	0315	328	735.	*	2	2200	553	0.	*	3	1645	778	0.
1	0835	104	243.	*	2	0320	329	717.	*	2	2205	554	0.	*	3	1650	779	0.
1	0840	105	248.	*	2	0325	330	701.	*	2	2210	555	0.	*	3	1655	780	0.
1	0845	106	254.	*	2	0330	331	684.	*	2	2215	556	0.	*	3	1700	781	0.
1	0850	107	259.	*	2	0335	332	670.	*	2	2220	557	0.	*	3	1705	782	0.
1	0855	108	265.	*	2	0340	333	654.	*	2	2225	558	0.	*	3	1710	783	0.
1	0900	109	270.	*	2	0345	334	639.	*	2	2230	559	0.	*	3	1715	784	0.
1	0905	110	277.	*	2	0350	335	623.	*	2	2235	560	0.	*	3	1720	785	0.
1	0910	111	283.	*	2	0355	336	608.	*	2	2240	561	0.	*	3	1725	786	0.
1	0915	112	289.	*	2	0400	337	592.	*	2	2245	562	0.	*	3	1730	787	0.
1	0920	113	296.	*	2	0405	338	578.	*	2	2250	563	0.	*	3	1735	788	0.
1	0925	114	302.	*	2	0410	339	563.	*	2	2255	564	0.	*	3	1740	789	0.
1	0930	115	310.	*	2	0415	340	548.	*	2	2300	565	0.	*	3	1745	790	0.

1	0935	116	316.	*	2	0420	341	533.	*	2	2305	566	0.	*	3	1750	791	0.
1	0940	117	323.	*	2	0425	342	518.	*	2	2310	567	0.	*	3	1755	792	0.
1	0945	118	330.	*	2	0430	343	504.	*	2	2315	568	0.	*	3	1800	793	0.
1	0950	119	338.	*	2	0435	344	488.	*	2	2320	569	0.	*	3	1805	794	0.
1	0955	120	346.	*	2	0440	345	472.	*	2	2325	570	0.	*	3	1810	795	0.
1	1000	121	359.	*	2	0445	346	457.	*	2	2330	571	0.	*	3	1815	796	0.
1	1005	122	372.	*	2	0450	347	440.	*	2	2335	572	0.	*	3	1820	797	0.
1	1010	123	384.	*	2	0455	348	425.	*	2	2340	573	0.	*	3	1825	798	0.
1	1015	124	395.	*	2	0500	349	408.	*	2	2345	574	0.	*	3	1830	799	0.
1	1020	125	406.	*	2	0505	350	393.	*	2	2350	575	0.	*	3	1835	800	0.
1	1025	126	418.	*	2	0510	351	377.	*	2	2355	576	0.	*	3	1840	801	0.
1	1030	127	428.	*	2	0515	352	363.	*	3	0000	577	0.	*	3	1845	802	0.
1	1035	128	439.	*	2	0520	353	348.	*	3	0005	578	0.	*	3	1850	803	0.
1	1040	129	450.	*	2	0525	354	335.	*	3	0010	579	0.	*	3	1855	804	0.
1	1045	130	461.	*	2	0530	355	320.	*	3	0015	580	0.	*	3	1900	805	0.
1	1050	131	472.	*	2	0535	356	309.	*	3	0020	581	0.	*	3	1905	806	0.
1	1055	132	483.	*	2	0540	357	296.	*	3	0025	582	0.	*	3	1910	807	0.
1	1100	133	495.	*	2	0545	358	286.	*	3	0030	583	0.	*	3	1915	808	0.
1	1105	134	512.	*	2	0550	359	275.	*	3	0035	584	0.	*	3	1920	809	0.
1	1110	135	528.	*	2	0555	360	188.	*	3	0040	585	0.	*	3	1925	810	0.
1	1115	136	551.	*	2	0600	361	101.	*	3	0045	586	0.	*	3	1930	811	0.
1	1120	137	584.	*	2	0605	362	98.	*	3	0050	587	0.	*	3	1935	812	0.
1	1125	138	882.	*	2	0610	363	95.	*	3	0055	588	0.	*	3	1940	813	0.
1	1130	139	1179.	*	2	0615	364	91.	*	3	0100	589	0.	*	3	1945	814	0.
1	1135	140	2100.	*	2	0620	365	88.	*	3	0105	590	0.	*	3	1950	815	0.
1	1140	141	3041.	*	2	0625	366	85.	*	3	0110	591	0.	*	3	1955	816	0.
1	1145	142	4222.	*	2	0630	367	82.	*	3	0115	592	0.	*	3	2000	817	0.
1	1150	143	5490.	*	2	0635	368	79.	*	3	0120	593	0.	*	3	2005	818	0.
1	1155	144	6439.	*	2	0640	369	77.	*	3	0125	594	0.	*	3	2010	819	0.
1	1200	145	7511.	*	2	0645	370	74.	*	3	0130	595	0.	*	3	2015	820	0.
1	1205	146	7798.	*	2	0650	371	72.	*	3	0135	596	0.	*	3	2020	821	0.
1	1210	147	8326.	*	2	0655	372	70.	*	3	0140	597	0.	*	3	2025	822	0.
1	1215	148	8948.	*	2	0700	373	68.	*	3	0145	598	0.	*	3	2030	823	0.
1	1220	149	9717.	*	2	0705	374	66.	*	3	0150	599	0.	*	3	2035	824	0.
1	1225	150	10560.	*	2	0710	375	64.	*	3	0155	600	0.	*	3	2040	825	0.
1	1230	151	11453.	*	2	0715	376	62.	*	3	0200	601	0.	*	3	2045	826	0.
1	1235	152	12399.	*	2	0720	377	61.	*	3	0205	602	0.	*	3	2050	827	0.
1	1240	153	13164.	*	2	0725	378	59.	*	3	0210	603	0.	*	3	2055	828	0.
1	1245	154	13773.	*	2	0730	379	58.	*	3	0215	604	0.	*	3	2100	829	0.
1	1250	155	14289.	*	2	0735	380	56.	*	3	0220	605	0.	*	3	2105	830	0.
1	1255	156	16247.	*	2	0740	381	55.	*	3	0225	606	0.	*	3	2110	831	0.
1	1300	157	18196.	*	2	0745	382	53.	*	3	0230	607	0.	*	3	2115	832	0.
1	1305	158	22728.	*	2	0750	383	52.	*	3	0235	608	0.	*	3	2120	833	0.
1	1310	159	27500.	*	2	0755	384	50.	*	3	0240	609	0.	*	3	2125	834	0.
1	1315	160	31334.	*	2	0800	385	49.	*	3	0245	610	0.	*	3	2130	835	0.
1	1320	161	35980.	*	2	0805	386	47.	*	3	0250	611	0.	*	3	2135	836	0.
1	1325	162	39089.	*	2	0810	387	46.	*	3	0255	612	0.	*	3	2140	837	0.
1	1330	163	43243.	*	2	0815	388	44.	*	3	0300	613	0.	*	3	2145	838	0.
1	1335	164	46846.	*	2	0820	389	42.	*	3	0305	614	0.	*	3	2150	839	0.
1	1340	165	49951.	*	2	0825	390	41.	*	3	0310	615	0.	*	3	2155	840	0.
1	1345	166	52576.	*	2	0830	391	40.	*	3	0315	616	0.	*	3	2200	841	0.
1	1350	167	54374.	*	2	0835	392	39.	*	3	0320	617	0.	*	3	2205	842	0.
1	1355	168	56302.	*	2	0840	393	38.	*	3	0325	618	0.	*	3	2210	843	0.
1	1400	169	57573.	*	2	0845	394	36.	*	3	0330	619	0.	*	3	2215	844	0.
1	1405	170	58130.	*	2	0850	395	35.	*	3	0335	620	0.	*	3	2220	845	0.
1	1410	171	58318.	*	2	0855	396	34.	*	3	0340	621	0.	*	3	2225	846	0.
1	1415	172	57127.	*	2	0900	397	32.	*	3	0345	622	0.	*	3	2230	847	0.
1	1420	173	55765.	*	2	0905	398	31.	*	3	0350	623	0.	*	3	2235	848	0.
1	1425	174	54254.	*	2	0910	399	29.	*	3	0355	624	0.	*	3	2240	849	0.
1	1430	175	52658.	*	2	0915	400	28.	*	3	0400	625	0.	*	3	2245	850	0.
1	1435	176	51111.	*	2	0920	401	26.	*	3	0405	626	0.	*	3	2250	851	0.
1	1440	177	49475.	*	2	0925	402	25.	*	3	0410	627	0.	*	3	2255	852	0.
1	1445	178	47942.	*	2	0930	403	23.	*	3	0415	628	0.	*	3	2300	853	0.
1	1450	179	46340.	*	2	0935	404	22.	*	3	0420	629	0.	*	3	2305	854	0.
1	1455	180	44788.	*	2	0940	405	21.	*	3	0425	630	0.	*	3	2310	855	0.
1	1500	181	43169.	*	2	0945	406	20.	*	3	0430	631	0.	*	3	2315	856	0.
1	1505	182	41617.	*	2	0950	407	19.	*	3	0435	632	0.	*	3	2320	857	0.
1	1510	183	40083.	*	2	0955	408	18.	*	3	0440	633	0.	*	3	2325	858	0.
1	1515	184	38619.	*	2	1000	409	18.	*	3	0445	634	0.	*	3	2330	859	0.
1	1520	185	37146.	*	2	1005	410	17.	*	3	0450	635	0.	*	3	2335	860	0.
1	1525	186	35753.	*	2	1010	411	16.	*	3	0455	636	0.	*	3	2340	861	0.
1	1530	187	34354.	*	2	1015	412	16.	*	3	0500	637	0.	*	3	2345	862	0.
1	1535	188	32973.	*	2	1020	413	15.	*	3	0505	638	0.	*	3	2350	863	0.
1	1540	189	31560.	*	2	1025	414	15.	*	3	0510	639	0.	*	3	2355	864	0.
1	1545	190	30207.	*	2	1030	415	15.	*	3	0515	640	0.	*	4	0000	865	0.
1	1550	191	28899.	*	2	1035	416	14.	*	3	0520	641	0.	*	4	0005	866	0.
1	1555	192	27796.	*	2	1040	417	14.	*	3	0525	642	0.	*	4	0010	867	0.
1	1600	193	26684.	*	2	1045	418	13.	*	3	0530	643	0.	*	4	0015	868	0.
1	1605	194	25591.	*	2	1050	419	13.	*	3	0535	644	0.	*	4	0020	869	0.
1	1610	195	24508.	*	2	1055	420	12.	*	3	0540	645	0.	*	4	0025	870	0.
1	1615	196	23483.	*	2	1100	421	12.	*	3	0545	646	0.	*	4	0030	871	0.
1	1620	197	22444.	*	2	1105	422	11.	*	3	0550	647	0.	*	4	0035	872	0.
1	1625	198	21560.	*	2	1110	423	11.	*	3	0555	648	0.	*	4	0040	873	0.
1	1630	199	20704.	*	2	1115	424	10.	*	3	0600	649	0.	*	4	0045	874	0.
1	1635	200	19865.	*	2	1120	425	10.	*	3	0605	650	0.	*	4	0050	875	0.
1	1640	201	18998.	*	2	1125	426	9.	*	3	0610	651	0.	*	4	0055	876	0.
1	1645	202	18190.	*	2	1130	427	9.	*	3	0615	652	0.	*	4	0100	877	0.
1	1650	203	17393.	*	2	1135	428	8.	*	3	0620	653	0.	*	4	0105	878	0.
1	1655	204	16653.	*	2	1140	429	8.	*	3	0625	654	0.	*	4	0110	879	0.
1	1700	205	15970.	*	2	1145	430	7.	*	3	0630	655	0.	*	4	0115	880	0.
1	1705	206	15311.	*	2	1150	431	7.	*	3	0635	656	0.	*	4	0120	881	0.
1	1710	207	14712.	*	2	1155	432	7.	*	3	0640	657	0.	*	4	0125	882	0.
1	1715	208	14118.	*	2	1200	433	6.	*	3	0645	658	0.	*	4	0130	883	0.
1	1720	209	13523.	*	2	1205	434	6.	*	3	0650	659	0.	*	4	0135	884	0.
1	1725	210	12962.	*	2	1210	435	5.	*	3	0655	660	0.	*	4	0140	885	0.

1	1730	211	12435.	*	2	1215	436	5.	*	3	0700	661	0.	*	4	0145	886	0.
1	1735	212	11970.	*	2	1220	437	5.	*	3	0705	662	0.	*	4	0150	887	0.
1	1740	213	11536.	*	2	1225	438	4.	*	3	0710	663	0.	*	4	0155	888	0.
1	1745	214	11146.	*	2	1230	439	4.	*	3	0715	664	0.	*	4	0200	889	0.
1	1750	215	10754.	*	2	1235	440	4.	*	3	0720	665	0.	*	4	0205	890	0.
1	1755	216	10372.	*	2	1240	441	3.	*	3	0725	666	0.	*	4	0210	891	0.
1	1800	217	9993.	*	2	1245	442	3.	*	3	0730	667	0.	*	4	0215	892	0.
1	1805	218	9631.	*	2	1250	443	3.	*	3	0735	668	0.	*	4	0220	893	0.
1	1810	219	9252.	*	2	1255	444	3.	*	3	0740	669	0.	*	4	0225	894	0.
1	1815	220	8906.	*	2	1300	445	2.	*	3	0745	670	0.	*	4	0230	895	0.
1	1820	221	8596.	*	2	1305	446	2.	*	3	0750	671	0.	*	4	0235	896	0.
1	1825	222	8312.	*	2	1310	447	2.	*	3	0755	672	0.	*	4	0240	897	0.
1	1830	223	8068.	*	2	1315	448	2.	*	3	0800	673	0.	*	4	0245	898	0.
1	1835	224	7844.	*	2	1320	449	2.	*	3	0805	674	0.	*	4	0250	899	0.
1	1840	225	7618.	*	2	1325	450	2.	*	3	0810	675	0.	*	4	0255	900	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	74.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 58318.	14.17		28945.	8755.	2924.	2810.
		(INCHES)	1.417	1.715	1.718	1.718
		(AC-FT)	14353.	17365.	17396.	17396.

CUMULATIVE AREA = 189.89 SQ MI

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              *            *
338 KK        *    CBD-O   *
              *            *
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339 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

340 RS          STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC      -1.00  INITIAL CONDITION
                          X       0.00  WORKING R AND D COEFFICIENT

341 SV            STORAGE        0.0     250.0     700.0    1100.0    1800.0    2600.0    4000.0    6300.0    9400.0   13000.0
                             17500.0   23000.0   29200.0   37000.0   46000.0

343 SE          ELEVATION     1560.70   1595.00   1600.00   1605.00   1610.00   1615.00   1620.00   1625.00   1630.00   1635.00
                              1640.00   1645.00   1650.00   1655.00   1660.00

345 SQ          DISCHARGE          0.      132.      215.      243.      268.      290.      311.      330.      347.      365.
                                 381.      398.      413.      428.      442.      455.      468.      481.      493.

347 SE          ELEVATION     1560.70   1570.00   1580.00   1585.00   1590.00   1595.00   1600.00   1605.00   1610.00   1615.00
                              1620.00   1625.00   1630.00   1635.00   1640.00   1645.00   1650.00   1655.00   1660.00
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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	67.78	140.67	177.11	213.56	250.00	700.00	1100.00	1800.00	2600.00
OUTFLOW	0.00	132.00	215.00	243.00	268.00	290.00	311.00	330.00	347.00	365.00
ELEVATION	1560.70	1570.00	1580.00	1585.00	1590.00	1595.00	1600.00	1605.00	1610.00	1615.00
STORAGE	4000.00	6300.00	9400.00	13000.00	17500.00	23000.00	29200.00	37000.00	46000.00	
OUTFLOW	381.00	398.00	413.00	428.00	442.00	455.00	468.00	481.00	493.00	
ELEVATION	1620.00	1625.00	1630.00	1635.00	1640.00	1645.00	1650.00	1655.00	1660.00	

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HYDROGRAPH AT STATION CBD-O

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	0.0	1560.7	*	2		0100	301	439.	16563.9	1639.0	*	3		0200	601	437.	15994.0	1638.3
1		0005	2	0.	0.0	1560.7	*	2		0105	302	439.	16572.7	1639.0	*	3		0205	602	437.	15991.0	1638.3
1		0010	3	0.	0.0	1560.7	*	2		0110	303	439.	16581.1	1639.0	*	3		0210	603	437.	15988.0	1638.3
1		0015	4	0.	0.0	1560.7	*	2		0115	304	439.	16588.9	1639.0	*	3		0215	604	437.	15984.9	1638.3
1		0020	5	0.	0.0	1560.7	*	2		0120	305	439.	16596.4	1639.0	*	3		0220	605	437.	15981.9	1638.3
1		0025	6	0.	0.0	1560.7	*	2		0125	306	439.	16603.3	1639.0	*	3		0225	606	437.	15978.9	1638.3
1		0030	7	0.	0.0	1560.7	*	2		0130	307	439.	16609.9	1639.0	*	3		0230	607	437.	15975.9	1638.3
1		0035	8	0.	0.0	1560.7	*	2		0135	308	439.	16616.2	1639.0	*	3		0235	608	437.	15972.9	1638.3
1		0040	9	0.	0.0	1560.7	*	2		0140	309	439.	16622.1	1639.0	*	3		0240	609	437.	15969.9	1638.3
1		0045	10	0.	0.1	1560.7	*	2		0145	310	439.	16627.6	1639.0	*	3		0245	610	437.	15966.9	1638.3

1	0050	11	0.	0.1	1560.7	*	2	0150	311	439.	16632.9	1639.0	*	3	0250	611	437.	15963.9	1638.3
1	0055	12	0.	0.1	1560.7	*	2	0155	312	439.	16637.9	1639.0	*	3	0255	612	437.	15960.9	1638.3
1	0100	13	0.	0.1	1560.7	*	2	0200	313	439.	16642.7	1639.0	*	3	0300	613	437.	15957.8	1638.3
1	0105	14	0.	0.2	1560.7	*	2	0205	314	439.	16647.2	1639.1	*	3	0305	614	437.	15954.8	1638.3
1	0110	15	0.	0.3	1560.7	*	2	0210	315	439.	16651.5	1639.1	*	3	0310	615	437.	15951.8	1638.3
1	0115	16	1.	0.3	1560.7	*	2	0215	316	439.	16655.6	1639.1	*	3	0315	616	437.	15948.8	1638.3
1	0120	17	1.	0.4	1560.8	*	2	0220	317	439.	16659.4	1639.1	*	3	0320	617	437.	15945.8	1638.3
1	0125	18	1.	0.5	1560.8	*	2	0225	318	439.	16663.1	1639.1	*	3	0325	618	437.	15942.8	1638.3
1	0130	19	1.	0.6	1560.8	*	2	0230	319	439.	16666.7	1639.1	*	3	0330	619	437.	15939.8	1638.3
1	0135	20	1.	0.7	1560.8	*	2	0235	320	439.	16670.0	1639.1	*	3	0335	620	437.	15936.8	1638.3
1	0140	21	2.	0.8	1560.8	*	2	0240	321	439.	16673.1	1639.1	*	3	0340	621	437.	15933.8	1638.3
1	0145	22	2.	0.9	1560.8	*	2	0245	322	439.	16676.1	1639.1	*	3	0345	622	437.	15930.7	1638.3
1	0150	23	2.	1.0	1560.8	*	2	0250	323	439.	16679.0	1639.1	*	3	0350	623	437.	15927.7	1638.3
1	0155	24	2.	1.1	1560.9	*	2	0255	324	439.	16681.6	1639.1	*	3	0355	624	437.	15924.7	1638.2
1	0200	25	2.	1.3	1560.9	*	2	0300	325	439.	16684.2	1639.1	*	3	0400	625	437.	15921.7	1638.2
1	0205	26	3.	1.4	1560.9	*	2	0305	326	439.	16686.6	1639.1	*	3	0405	626	437.	15918.7	1638.2
1	0210	27	3.	1.6	1560.9	*	2	0310	327	439.	16688.8	1639.1	*	3	0410	627	437.	15915.7	1638.2
1	0215	28	3.	1.7	1560.9	*	2	0315	328	439.	16690.9	1639.1	*	3	0415	628	437.	15912.7	1638.2
1	0220	29	4.	1.8	1561.0	*	2	0320	329	439.	16692.9	1639.1	*	3	0420	629	437.	15909.7	1638.2
1	0225	30	4.	2.0	1561.0	*	2	0325	330	439.	16694.7	1639.1	*	3	0425	630	437.	15906.7	1638.2
1	0230	31	4.	2.1	1561.0	*	2	0330	331	440.	16696.5	1639.1	*	3	0430	631	437.	15903.7	1638.2
1	0235	32	4.	2.3	1561.0	*	2	0335	332	440.	16698.1	1639.1	*	3	0435	632	437.	15900.6	1638.2
1	0240	33	5.	2.4	1561.0	*	2	0340	333	440.	16699.6	1639.1	*	3	0440	633	437.	15897.6	1638.2
1	0245	34	5.	2.6	1561.1	*	2	0345	334	440.	16701.1	1639.1	*	3	0445	634	437.	15894.6	1638.2
1	0250	35	5.	2.8	1561.1	*	2	0350	335	440.	16702.4	1639.1	*	3	0450	635	437.	15891.6	1638.2
1	0255	36	6.	2.9	1561.1	*	2	0355	336	440.	16703.6	1639.1	*	3	0455	636	437.	15888.6	1638.2
1	0300	37	6.	3.1	1561.1	*	2	0400	337	440.	16704.7	1639.1	*	3	0500	637	437.	15885.6	1638.2
1	0305	38	6.	3.2	1561.1	*	2	0405	338	440.	16705.7	1639.1	*	3	0505	638	437.	15882.6	1638.2
1	0310	39	7.	3.4	1561.2	*	2	0410	339	440.	16706.6	1639.1	*	3	0510	639	437.	15879.6	1638.2
1	0315	40	7.	3.5	1561.2	*	2	0415	340	440.	16707.4	1639.1	*	3	0515	640	437.	15876.6	1638.2
1	0320	41	7.	3.7	1561.2	*	2	0420	341	440.	16708.1	1639.1	*	3	0520	641	437.	15873.6	1638.2
1	0325	42	7.	3.8	1561.2	*	2	0425	342	440.	16708.7	1639.1	*	3	0525	642	437.	15870.5	1638.2
1	0330	43	8.	4.0	1561.2	*	2	0430	343	440.	16709.2	1639.1	*	3	0530	643	437.	15867.5	1638.2
1	0335	44	8.	4.2	1561.3	*	2	0435	344	440.	16709.6	1639.1	*	3	0535	644	437.	15864.5	1638.2
1	0340	45	8.	4.3	1561.3	*	2	0440	345	440.	16709.8	1639.1	*	3	0540	645	437.	15861.5	1638.2
1	0345	46	9.	4.5	1561.3	*	2	0445	346	440.	16710.0	1639.1	*	3	0545	646	437.	15858.5	1638.2
1	0350	47	9.	4.6	1561.3	*	2	0450	347	440.	16710.1	1639.1	*	3	0550	647	437.	15855.5	1638.2
1	0355	48	9.	4.8	1561.4	*	2	0455	348	440.	16710.0	1639.1	*	3	0555	648	437.	15852.5	1638.2
1	0400	49	10.	4.9	1561.4	*	2	0500	349	440.	16709.9	1639.1	*	3	0600	649	437.	15849.5	1638.2
1	0405	50	10.	5.1	1561.4	*	2	0505	350	440.	16709.6	1639.1	*	3	0605	650	437.	15846.5	1638.2
1	0410	51	10.	5.2	1561.4	*	2	0510	351	440.	16709.2	1639.1	*	3	0610	651	437.	15843.5	1638.2
1	0415	52	11.	5.4	1561.4	*	2	0515	352	440.	16708.7	1639.1	*	3	0615	652	437.	15840.5	1638.2
1	0420	53	11.	5.6	1561.5	*	2	0520	353	440.	16708.1	1639.1	*	3	0620	653	437.	15837.4	1638.2
1	0425	54	11.	5.7	1561.5	*	2	0525	354	440.	16707.5	1639.1	*	3	0625	654	437.	15834.4	1638.1
1	0430	55	11.	5.9	1561.5	*	2	0530	355	440.	16706.7	1639.1	*	3	0630	655	437.	15831.4	1638.1
1	0435	56	12.	6.0	1561.5	*	2	0535	356	440.	16705.8	1639.1	*	3	0635	656	437.	15828.4	1638.1
1	0440	57	12.	6.2	1561.6	*	2	0540	357	440.	16704.9	1639.1	*	3	0640	657	437.	15825.4	1638.1
1	0445	58	12.	6.4	1561.6	*	2	0545	358	440.	16703.9	1639.1	*	3	0645	658	437.	15822.4	1638.1
1	0450	59	13.	6.5	1561.6	*	2	0550	359	440.	16702.8	1639.1	*	3	0650	659	437.	15819.4	1638.1
1	0455	60	13.	6.7	1561.6	*	2	0555	360	440.	16701.3	1639.1	*	3	0655	660	437.	15816.4	1638.1
1	0500	61	13.	6.9	1561.6	*	2	0600	361	440.	16699.3	1639.1	*	3	0700	661	437.	15813.4	1638.1
1	0505	62	14.	7.1	1561.7	*	2	0605	362	440.	16697.0	1639.1	*	3	0705	662	437.	15810.4	1638.1
1	0510	63	14.	7.3	1561.7	*	2	0610	363	439.	16694.6	1639.1	*	3	0710	663	437.	15807.4	1638.1
1	0515	64	15.	7.5	1561.7	*	2	0615	364	439.	16692.2	1639.1	*	3	0715	664	437.	15804.4	1638.1
1	0520	65	15.	7.7	1561.8	*	2	0620	365	439.	16689.8	1639.1	*	3	0720	665	437.	15801.4	1638.1
1	0525	66	15.	7.9	1561.8	*	2	0625	366	439.	16687.4	1639.1	*	3	0725	666	437.	15798.3	1638.1
1	0530	67	16.	8.1	1561.8	*	2	0630	367	439.	16684.9	1639.1	*	3	0730	667	437.	15795.3	1638.1
1	0535	68	16.	8.3	1561.8	*	2	0635	368	439.	16682.4	1639.1	*	3	0735	668	437.	15792.3	1638.1
1	0540	69	17.	8.5	1561.9	*	2	0640	369	439.	16680.0	1639.1	*	3	0740	669	437.	15789.3	1638.1
1	0545	70	17.	8.7	1561.9	*	2	0645	370	439.	16677.4	1639.1	*	3	0745	670	437.	15786.3	1638.1
1	0550	71	18.	9.0	1561.9	*	2	0650	371	439.	16674.9	1639.1	*	3	0750	671	437.	15783.3	1638.1
1	0555	72	18.	9.3	1562.0	*	2	0655	372	439.	16672.4	1639.1	*	3	0755	672	437.	15780.3	1638.1
1	0600	73	19.	9.5	1562.0	*	2	0700	373	439.	16669.8	1639.1	*	3	0800	673	437.	15777.3	1638.1
1	0605	74	19.	9.8	1562.0	*	2	0705	374	439.	16667.3	1639.1	*	3	0805	674	437.	15774.3	1638.1
1	0610	75	20.	10.2	1562.1	*	2	0710	375	439.	16664.7	1639.1	*	3	0810	675	437.	15771.3	1638.1
1	0615	76	21.	10.5	1562.1	*	2	0715	376	439.	16662.1	1639.1	*	3	0815	676	437.	15768.3	1638.1
1	0620	77	21.	10.9	1562.2	*	2	0720	377	439.	16659.5	1639.1	*	3	0820	677	437.	15765.3	1638.1
1	0625	78	22.	11.3	1562.3	*	2	0725	378	439.	16656.9	1639.1	*	3	0825	678	437.	15762.3	1638.1
1	0630	79	23.	11.8	1562.3	*	2	0730	379	439.	16654.3	1639.1	*	3	0830	679	437.	15759.3	1638.1
1	0635	80	24.	12.4	1562.4	*	2	0735	380	439.	16651.6	1639.1	*	3	0835	680	437.	15756.2	1638.1
1	0640	81	25.	12.9	1562.5	*	2	0740	381	439.	16649.0	1639.1	*	3	0840	681	437.	15753.2	1638.1
1	0645	82	26.	13.6	1562.6	*	2	0745	382	439.	16646.3	1639.1	*	3	0845	682	437.	15750.2	1638.1
1	0650	83	28.	14.2	1562.7	*	2	0750	383	439.	16643.7	1639.0	*	3	0850	683	437.	15747.2	1638.1
1	0655	84	29.	15.0	1562.8	*	2	0755	384	439.	16641.0	1639.0	*	3	0855	684	437.	15744.2	1638.0
1	0700	85	31.	15.7	1562.9	*	2	0800	385	439.	16638.3	1639.0	*	3	0900	685	437.	15741.2	1638.0
1	0705	86	32.	16.5	1563.0	*	2	0805	386	439.	16635.6	1639.0	*	3	0905	686	437.	15738.2	1638.0
1	0710	87	34.	17.4	1563.1	*	2	0810	387	439.	16632.9	1639.0	*	3	0910	687	437.	15735.2	1638.0
1	0715	88	36.	18.3	1563.2	*	2	0815	388	439.	16630.2	1639.0	*	3	0915	688	437.	15732.2	1638.0
1	0720	89	38.	19.3	1563.3	*	2	0820	389	439.	16627.5	1639.0	*	3	0920	689	436.	15729.2	1638.0
1	0725	90	39.	20.2	1563.5	*	2	0825	390	439.	16624.7	1639.0	*	3	0925	690	436.	15726.2	1638.0
1	0730	91	41.	21.2	1563.6	*	2	0830	391	439.	16622.0	1639.0	*	3	0930	691	436.	15723.2	1638.0
1	0735	92	43.	22.3	1563.8	*	2	0835	392	439.	16619.2	1639.0	*	3	0935	692	436.	15720.2	1638.0
1	0740	93	45.	23.3	1563.9	*	2	0840	393	439.	16616.5	1639.0	*	3	0940	693	436.	15717.2	1638.0
1	0745	94	47.	24.4	1564.0	*	2	0845	394	439.	16613.7	1639.0	*	3	0945	694	436.	15714.2	1638.0
1	0750	95	50.	25.4	1564.2	*	2	0850	395	439.	16610.9	1639.0	*	3	0950	695	436.	15711.2	1638.0
1	0755	96	52.	26.5	1564.3	*	2	0855	396	439.	16608.1	1639.0	*	3	0955	696	436.	15708.1	1638.0
1	0800	97	54.	27.6	1564.5	*	2	0900	397	439.	16605.3	1639.0	*	3	1000	697	436.	15705.1	1638.0
1	0805	98	56.	28.7	1564.6	*	2	0905	398	439.	16602.5	1639.0	*	3	1005	698	436.	15702.1	1638.0
1	0810	99	58.	29.9	1564.8	*	2	0910	399	439.	16599.7	1639.0	*	3	1010	699	436.	15699.1	1638.0
1	0815	100	60.	31.0	1565.0	*	2	0915	400	439.	16596.9	1639.0	*	3	1015	700	436.	15696.1	1638.0
1	0820	101	63.	32.1	1565.1	*	2	0920	401	439.	16594.0	1639.0	*	3	1020	701	436.	15693.1	1638.0
1	0825	102	65.	33.3	1565.3	*	2	0925	402	439.	16591.2	1639.0	*	3	1025	702	436.	15690.1	1638.0
1	0830	103	67.	34.5	1565.4	*	2	0930	403	439.	16588.3	1639.0	*	3	1030	703	436.	15687.1	1638.0
1	0835	104	69.	35.7	1565.6	*	2	0935	404	439.	16585.5	1639.0	*	3	1035	704	436.	15684.1	1638.0
1	0840	105	72.	36.9	1565.8	*	2	0940	405	439.	16582.6	1639.0	*	3	1040	705	436.	15681.1	1638.0

1	0845	106	74.	38.1	1565.9	*	2	0945	406	439.	16579.7	1639.0	*	3	1045	706	436.	15678.1	1638.0
1	0850	107	77.	39.4	1566.1	*	2	0950	407	439.	16576.8	1639.0	*	3	1050	707	436.	15675.1	1638.0
1	0855	108	79.	40.6	1566.3	*	2	0955	408	439.	16573.9	1639.0	*	3	1055	708	436.	15672.1	1638.0
1	0900	109	82.	41.9	1566.4	*	2	1000	409	439.	16571.0	1639.0	*	3	1100	709	436.	15669.1	1638.0
1	0905	110	84.	43.2	1566.6	*	2	1005	410	439.	16568.1	1639.0	*	3	1105	710	436.	15666.1	1638.0
1	0910	111	87.	44.6	1566.8	*	2	1010	411	439.	16565.2	1639.0	*	3	1110	711	436.	15663.1	1638.0
1	0915	112	89.	45.9	1567.0	*	2	1015	412	439.	16562.3	1639.0	*	3	1115	712	436.	15660.1	1638.0
1	0920	113	92.	47.3	1567.2	*	2	1020	413	439.	16559.4	1639.0	*	3	1120	713	436.	15657.1	1638.0
1	0925	114	95.	48.7	1567.4	*	2	1025	414	439.	16556.4	1639.0	*	3	1125	714	436.	15654.1	1637.9
1	0930	115	98.	50.2	1567.6	*	2	1030	415	439.	16553.5	1638.9	*	3	1130	715	436.	15651.1	1637.9
1	0935	116	101.	51.6	1567.8	*	2	1035	416	439.	16550.6	1638.9	*	3	1135	716	436.	15648.0	1637.9
1	0940	117	103.	53.1	1568.0	*	2	1040	417	439.	16547.7	1638.9	*	3	1140	717	436.	15645.0	1637.9
1	0945	118	106.	54.7	1568.2	*	2	1045	418	439.	16544.7	1638.9	*	3	1145	718	436.	15642.0	1637.9
1	0950	119	109.	56.2	1568.4	*	2	1050	419	439.	16541.8	1638.9	*	3	1150	719	436.	15639.0	1637.9
1	0955	120	113.	57.8	1568.6	*	2	1055	420	439.	16538.9	1638.9	*	3	1155	720	436.	15636.0	1637.9
1	1000	121	116.	59.5	1568.9	*	2	1100	421	439.	16535.9	1638.9	*	3	1200	721	436.	15633.0	1637.9
1	1005	122	119.	61.2	1569.1	*	2	1105	422	439.	16533.0	1638.9	*	3	1205	722	436.	15630.0	1637.9
1	1010	123	123.	62.9	1569.3	*	2	1110	423	439.	16530.0	1638.9	*	3	1210	723	436.	15627.0	1637.9
1	1015	124	126.	64.8	1569.6	*	2	1115	424	439.	16527.1	1638.9	*	3	1215	724	436.	15624.0	1637.9
1	1020	125	130.	66.6	1569.8	*	2	1120	425	439.	16524.1	1638.9	*	3	1220	725	436.	15621.0	1637.9
1	1025	126	133.	68.6	1570.1	*	2	1125	426	439.	16521.2	1638.9	*	3	1225	726	436.	15618.0	1637.9
1	1030	127	135.	70.6	1570.4	*	2	1130	427	439.	16518.2	1638.9	*	3	1230	727	436.	15615.0	1637.9
1	1035	128	137.	72.6	1570.7	*	2	1135	428	439.	16515.2	1638.9	*	3	1235	728	436.	15612.0	1637.9
1	1040	129	140.	74.7	1571.0	*	2	1140	429	439.	16512.3	1638.9	*	3	1240	729	436.	15609.0	1637.9
1	1045	130	142.	76.9	1571.2	*	2	1145	430	439.	16509.3	1638.9	*	3	1245	730	436.	15606.0	1637.9
1	1050	131	145.	79.1	1571.6	*	2	1150	431	439.	16506.3	1638.9	*	3	1250	731	436.	15603.0	1637.9
1	1055	132	147.	81.4	1571.9	*	2	1155	432	439.	16503.4	1638.9	*	3	1255	732	436.	15600.0	1637.9
1	1100	133	150.	83.7	1572.2	*	2	1200	433	439.	16500.4	1638.9	*	3	1300	733	436.	15597.0	1637.9
1	1105	134	153.	86.2	1572.5	*	2	1205	434	439.	16497.4	1638.9	*	3	1305	734	436.	15594.0	1637.9
1	1110	135	156.	88.7	1572.9	*	2	1210	435	439.	16494.4	1638.9	*	3	1310	735	436.	15591.0	1637.9
1	1115	136	159.	91.3	1573.2	*	2	1215	436	439.	16491.4	1638.9	*	3	1315	736	436.	15588.0	1637.9
1	1120	137	162.	94.1	1573.6	*	2	1220	437	439.	16488.4	1638.9	*	3	1320	737	436.	15585.0	1637.9
1	1125	138	166.	98.0	1574.1	*	2	1225	438	439.	16485.4	1638.9	*	3	1325	738	436.	15582.0	1637.9
1	1130	139	173.	103.9	1575.0	*	2	1230	439	439.	16482.5	1638.9	*	3	1330	739	436.	15579.0	1637.9
1	1135	140	185.	114.0	1576.3	*	2	1235	440	439.	16479.5	1638.9	*	3	1335	740	436.	15576.0	1637.9
1	1140	141	203.	130.4	1578.6	*	2	1240	441	439.	16476.5	1638.9	*	3	1340	741	436.	15573.0	1637.9
1	1145	142	225.	153.9	1581.8	*	2	1245	442	439.	16473.5	1638.9	*	3	1345	742	436.	15570.0	1637.9
1	1150	143	249.	185.7	1586.2	*	2	1250	443	439.	16470.5	1638.9	*	3	1350	743	436.	15567.0	1637.9
1	1155	144	275.	225.0	1591.6	*	2	1255	444	439.	16467.5	1638.9	*	3	1355	744	436.	15563.9	1637.8
1	1200	145	291.	271.1	1595.2	*	2	1300	445	439.	16464.5	1638.8	*	3	1400	745	436.	15560.9	1637.8
1	1205	146	293.	321.8	1595.8	*	2	1305	446	439.	16461.4	1638.8	*	3	1405	746	436.	15557.9	1637.8
1	1210	147	296.	375.3	1596.4	*	2	1310	447	439.	16458.4	1638.8	*	3	1410	747	436.	15554.9	1637.8
1	1215	148	299.	432.7	1597.0	*	2	1315	448	439.	16455.4	1638.8	*	3	1415	748	436.	15551.9	1637.8
1	1220	149	301.	494.9	1597.7	*	2	1320	449	439.	16452.4	1638.8	*	3	1420	749	436.	15548.9	1637.8
1	1225	150	305.	562.7	1598.5	*	2	1325	450	439.	16449.4	1638.8	*	3	1425	750	436.	15545.9	1637.8
1	1230	151	308.	636.3	1599.3	*	2	1330	451	439.	16446.4	1638.8	*	3	1430	751	436.	15542.9	1637.8
1	1235	152	312.	716.3	1600.2	*	2	1335	452	439.	16443.4	1638.8	*	3	1435	752	436.	15539.9	1637.8
1	1240	153	316.	802.2	1601.3	*	2	1340	453	439.	16440.4	1638.8	*	3	1440	753	436.	15536.9	1637.8
1	1245	154	320.	892.8	1602.4	*	2	1345	454	439.	16437.4	1638.8	*	3	1445	754	436.	15533.9	1637.8
1	1250	155	325.	987.2	1603.6	*	2	1350	455	439.	16434.3	1638.8	*	3	1450	755	436.	15530.9	1637.8
1	1255	156	330.	1090.1	1604.9	*	2	1355	456	439.	16431.3	1638.8	*	3	1455	756	436.	15527.9	1637.8
1	1300	157	333.	1206.4	1605.8	*	2	1400	457	439.	16428.3	1638.8	*	3	1500	757	436.	15524.9	1637.8
1	1305	158	336.	1345.0	1606.8	*	2	1405	458	439.	16425.3	1638.8	*	3	1505	758	436.	15521.9	1637.8
1	1310	159	340.	1515.7	1608.0	*	2	1410	459	439.	16422.3	1638.8	*	3	1510	759	436.	15518.9	1637.8
1	1315	160	345.	1715.9	1609.4	*	2	1415	460	439.	16419.3	1638.8	*	3	1515	760	436.	15515.9	1637.8
1	1320	161	350.	1945.3	1610.9	*	2	1420	461	439.	16416.3	1638.8	*	3	1520	761	436.	15512.9	1637.8
1	1325	162	356.	2201.4	1612.5	*	2	1425	462	439.	16413.2	1638.8	*	3	1525	762	436.	15509.9	1637.8
1	1330	163	362.	2482.4	1614.3	*	2	1430	463	439.	16410.2	1638.8	*	3	1530	763	436.	15506.9	1637.8
1	1335	164	367.	2790.1	1615.7	*	2	1435	464	439.	16407.2	1638.8	*	3	1535	764	436.	15503.9	1637.8
1	1340	165	371.	3120.9	1616.9	*	2	1440	465	439.	16404.2	1638.8	*	3	1540	765	436.	15500.9	1637.8
1	1345	166	375.	3471.4	1618.1	*	2	1445	466	439.	16401.2	1638.8	*	3	1545	766	436.	15497.9	1637.8
1	1350	167	379.	3837.1	1619.4	*	2	1450	467	439.	16398.1	1638.8	*	3	1550	767	436.	15494.9	1637.8
1	1355	168	383.	4215.6	1620.5	*	2	1455	468	439.	16395.1	1638.8	*	3	1555	768	436.	15491.9	1637.8
1	1400	169	385.	4605.1	1621.3	*	2	1500	469	439.	16392.1	1638.8	*	3	1600	769	436.	15488.9	1637.8
1	1405	170	388.	5000.8	1622.2	*	2	1505	470	439.	16389.1	1638.8	*	3	1605	770	436.	15485.9	1637.8
1	1410	171	391.	5399.1	1623.0	*	2	1510	471	439.	16386.1	1638.8	*	3	1610	771	436.	15482.9	1637.8
1	1415	172	394.	5794.0	1623.9	*	2	1515	472	439.	16383.0	1638.8	*	3	1615	772	436.	15479.9	1637.8
1	1420	173	397.	6180.0	1624.7	*	2	1520	473	439.	16380.0	1638.8	*	3	1620	773	436.	15476.9	1637.8
1	1425	174	399.	6556.1	1625.4	*	2	1525	474	439.	16377.0	1638.8	*	3	1625	774	436.	15473.9	1637.7
1	1430	175	401.	6921.5	1626.0	*	2	1530	475	438.	16374.0	1638.7	*	3	1630	775	436.	15470.9	1637.7
1	1435	176	403.	7276.0	1626.6	*	2	1535	476	438.	16371.0	1638.7	*	3	1635	776	436.	15467.9	1637.7
1	1440	177	404.	7619.6	1627.1	*	2	1540	477	438.	16367.9	1638.7	*	3	1640	777	436.	15464.9	1637.7
1	1445	178	406.	7952.3	1627.7	*	2	1545	478	438.	16364.9	1638.7	*	3	1645	778	436.	15461.9	1637.7
1	1450	179	408.	8274.2	1628.2	*	2	1550	479	438.	16361.9	1638.7	*	3	1650	779	436.	15458.9	1637.7
1	1455	180	409.	8585.2	1628.7	*	2	1555	480	438.	16358.9	1638.7	*	3	1655	780	436.	15455.9	1637.7
1	1500	181	411.	8885.2	1629.2	*	2	1600	481	438.	16355.9	1638.7	*	3	1700	781	436.	15452.9	1637.7
1	1505	182	412.	9174.3	1629.6	*	2	1605	482	438.	16352.8	1638.7	*	3	1705	782	436.	15449.9	1637.7
1	1510	183	413.	9452.8	1630.1	*	2	1610	483	438.	16349.8	1638.7	*	3	1710	783	436.	15446.9	1637.7
1	1515	184	414.	9721.0	1630.4	*	2	1615	484	438.	16346.8	1638.7	*	3	1715	784	436.	15443.9	1637.7
1	1520	185	415.	9979.0	1630.8	*	2	1620	485	438.	16343.8	1638.7	*	3	1720	785	436.	15440.9	1637.7
1	1525	186	416.	10227.2	1631.1	*	2	1625	486	438.	16340.8	1638.7	*	3	1725	786	436.	15437.9	1637.7
1	1530	187	417.	10465.8	1631.5	*	2	1630	487	438.	16337.7	1638.7	*	3	1730	787	436.	15434.9	1637.7
1	1535	188	418.	10694.7	1631.8	*	2	1635	488	438.	16334.7	1638.7	*	3	1735	788	436.	15431.9	1637.7
1	1540	189	419.	10914.0	1632.1	*	2	1640	489	438.	16331.7	1638.7	*	3	1740	789	436.	15428.9	1637.7
1	1545	190	420.	11123.9	1632.4	*	2	1645	490	438.	16328.7	1638.7	*	3	1745	790	436.	15425.9	1637.7
1	1550	191	421.	11324.5	1632.7	*	2	1650	491	438.	16325.7	1638.7	*	3	1750	791	436.	15422.9	1637.7
1	1555	192	422.	11516.8	1632.9	*	2	1655	492	438.	16322.6	1638.7	*	3	1755	792	436.	15419.9	1637.7
1	1600	193	423.	11701.5	1633.2	*	2	1700	493	438.	16319.6	1638.7	*	3	1800	793	436.	15416.9	1637.7
1	1605	194	423.	11878.6	1633.4	*	2	1705	494	438.	16316.6	1638.7	*	3	1805	794	436.	15413.9	1637.7
1	1610	195	424.	12048.2	1633.7	*	2	1710	495	438.	16313.6	1638.7	*	3	1810	795	436.	15410.9	1637.7
1	1615	196	425.	12210.5	1633.9	*	2	1715	496	438.	16310.6	1638.7	*	3	1815	796	435.	15407.9	1637.7
1	1620	197	425.	12365.8	1634.1	*	2	1720	497	438.	16307.6	1638.7	*	3	1820	797	435.	15404.9	1637.7
1	1625	198	426.	12514.4	1634.3	*	2	1725	498	438.	16304.5	1638.7	*	3	1825	798	435.	15401.9	1637.7
1	1630	199	427.	12657.0	1634.5	*	2	1730	499	438.	16301.5	1638.7	*	3	1830	799	435.	15398.9	1637.7
1	1635	200	427.	12793.7	1634.7	*	2	1735	500	438.	16298.5	1638.7	*	3	1835	800	435.	15395.9	1637.7

	1640	201	428.	12924.6	1634.9 *	2
	1645	202	428.	13049.7	1635.1 *	2
1	1650	203	429.	13169.3	1635.2 *	2
1	1655	204	429.	13283.6	1635.3 *	2
1	1700	205	429.	13393.0	1635.4 *	2
1	1705	206	430.	13497.7	1635.6 *	2
1	1710	207	430.	13598.1	1635.7 *	2
1	1715	208	430.	13694.5	1635.8 *	2
1	1720	209	430.	13786.7	1635.9 *	2
1	1725	210	431.	13874.9	1636.0 *	2
1	1730	211	431.	13959.4	1636.1 *	2
1	1735	212	431.	14040.5	1636.2 *	2
1	1740	213	431.	14118.4	1636.2 *	2
1	1745	214	432.	14193.6	1636.3 *	2
1	1750	215	432.	14266.0	1636.4 *	2
1	1755	216	432.	14335.8	1636.5 *	2
1	1800	217	432.	14402.9	1636.6 *	2
1	1805	218	433.	14467.5	1636.6 *	2
1	1810	219	433.	14529.6	1636.7 *	2
1	1815	220	433.	14589.1	1636.8 *	2
1	1820	221	433.	14646.4	1636.8 *	2
1	1825	222	433.	14701.6	1636.9 *	2
1	1830	223	433.	14755.1	1637.0 *	2
1	1835	224	434.	14806.9	1637.0 *	2
1	1840	225	434.	14857.1	1637.1 *	2
1	1845	226	434.	14905.8	1637.1 *	2
1	1850	227	434.	14952.9	1637.2 *	2
1	1855	228	434.	14998.5	1637.2 *	2
1	1900	229	434.	15042.4	1637.3 *	2
1	1905	230	434.	15084.9	1637.3 *	2
1	1910	231	435.	15125.9	1637.4 *	2
1	1915	232	435.	15165.5	1637.4 *	2
1	1920	233	435.	15203.7	1637.4 *	2
1	1925	234	435.	15240.8	1637.5 *	2
1	1930	235	435.	15276.7	1637.5 *	2
1	1935	236	435.	15311.6	1637.6 *	2
1	1940	237	435.	15345.5	1637.6 *	2
1	1945	238	435.	15378.6	1637.6 *	2
1	1950	239	436.	15411.0	1637.7 *	2
1	1955	240	436.	15442.8	1637.7 *	2
1	2000	241	436.	15474.0	1637.7 *	2
1	2005	242	436.	15504.5	1637.8 *	2
1	2010	243	436.	15534.2	1637.8 *	2
1	2015	244	436.	15563.2	1637.8 *	2
1	2020	245	436.	15591.3	1637.9 *	2
1	2025	246	436.	15618.8	1637.9 *	2
1	2030	247	436.	15645.7	1637.9 *	2
1	2035	248	436.	15672.3	1638.0 *	2
1	2040	249	436.	15698.8	1638.0 *	2
1	2045	250	436.	15725.1	1638.0 *	2
1	2050	251	437.	15751.4	1638.1 *	2
1	2055	252	437.	15777.3	1638.1 *	2
1	2100	253	437.	15802.6	1638.1 *	2
1	2105	254	437.	15827.2	1638.1 *	2
1	2110	255	437.	15850.7	1638.2 *	2
1	2115	256	437.	15873.3	1638.2 *	2
1	2120	257	437.	15894.8	1638.2 *	2
1	2125	258	437.	15915.5	1638.2 *	2
1	2130	259	437.	15935.3	1638.3 *	2
1	2135	260	437.	15954.3	1638.3 *	2
1	2140	261	437.	15972.5	1638.3 *	2
1	2145	262	437.	15990.1	1638.3 *	2
1	2150	263	437.	16007.0	1638.3 *	2
1	2155	264	437.	16023.6	1638.4 *	2
1	2200	265	437.	16039.9	1638.4 *	2
1	2205	266	438.	16056.1	1638.4 *	2
1	2210	267	438.	16072.3	1638.4 *	2
1	2215	268	438.	16088.5	1638.4 *	2
1	2220	269	438.	16104.6	1638.4 *	2
1	2225	270	438.	16120.6	1638.5 *	2
1	2230	271	438.	16136.7	1638.5 *	2
1	2235	272	438.	16153.0	1638.5 *	2
1	2240	273	438.	16169.5	1638.5 *	2
1	2245	274	438.	16186.3	1638.5 *	2
1	2250	275	438.	16203.4	1638.6 *	2
1	2255	276	438.	16220.8	1638.6 *	2
1	2300	277	438.	16238.4	1638.6 *	3
1	2305	278	438.	16256.3	1638.6 *	3
1	2310	279	438.	16274.3	1638.6 *	3
1	2315	280	438.	16292.3	1638.7 *	3
1	2320	281	438.	16310.0	1638.7 *	3
1	2325	282	438.	16327.3	1638.7 *	3
1	2330	283	438.	16343.9	1638.7 *	3
1	2335	284	438.	16359.9	1638.7 *	3
1	2340	285	439.	16375.3	1638.8 *	3
1	2345	286	439.	16390.1	1638.8 *	3
1	2350	287	439.	16404.3	1638.8 *	3
1	2355	288	439.	16418.0	1638.8 *	3
2	0000	289	439.	16431.2	1638.8 *	3
2	0005	290	439.	16443.9	1638.8 *	3
2	0010	291	439.	16455.9	1638.8 *	3
2	0015	292	439.	16467.6	1638.9 *	3
2	0020	293	439.	16478.8	1638.9 *	3
2	0025	294	439.	16489.9	1638.9 *	3
2	0030	295	439.	16501.2	1638.9 *	3

1740	501	438.	16295.5	1638.7 *	3
1745	502	438.	16292.5	1638.7 *	3
1750	503	438.	16289.4	1638.7 *	3
1755	504	438.	16286.4	1638.7 *	3
1800	505	438.	16283.4	1638.6 *	3
1805	506	438.	16280.4	1638.6 *	3
1810	507	438.	16277.4	1638.6 *	3
1815	508	438.	16274.4	1638.6 *	3
1820	509	438.	16271.3	1638.6 *	3
1825	510	438.	16268.3	1638.6 *	3
1830	511	438.	16265.3	1638.6 *	3
1835	512	438.	16262.3	1638.6 *	3
1840	513	438.	16259.3	1638.6 *	3
1845	514	438.	16256.2	1638.6 *	3
1850	515	438.	16253.2	1638.6 *	3
1855	516	438.	16250.2	1638.6 *	3
1900	517	438.	16247.2	1638.6 *	3
1905	518	438.	16244.2	1638.6 *	3
1910	519	438.	16241.2	1638.6 *	3
1915	520	438.	16238.1	1638.6 *	3
1920	521	438.	16235.1	1638.6 *	3
1925	522	438.	16232.1	1638.6 *	3
1930	523	438.	16229.1	1638.6 *	3
1935	524	438.	16226.1	1638.6 *	3
1940	525	438.	16223.1	1638.6 *	3
1945	526	438.	16220.0	1638.6 *	3
1950	527	438.	16217.0	1638.6 *	3
1955	528	438.	16214.0	1638.6 *	3
2000	529	438.	16211.0	1638.6 *	3
2005	530	438.	16208.0	1638.6 *	3
2010	531	438.	16205.0	1638.6 *	3
2015	532	438.	16201.9	1638.6 *	3
2020	533	438.	16198.9	1638.6 *	3
2025	534	438.	16195.9	1638.6 *	3
2030	535	438.	16192.9	1638.5 *	3
2035	536	438.	16189.9	1638.5 *	3
2040	537	438.	16186.9	1638.5 *	3
2045	538	438.	16183.8	1638.5 *	3
2050	539	438.	16180.8	1638.5 *	3
2055	540	438.	16177.8	1638.5 *	3
2100	541	438.	16174.8	1638.5 *	3
2105	542	438.	16171.8	1638.5 *	3
2110	543	438.	16168.8	1638.5 *	3
2115	544	438.	16165.8	1638.5 *	3
2120	545	438.	16162.7	1638.5 *	3
2125	546	438.	16159.7	1638.5 *	3
2130	547	438.	16156.7	1638.5 *	3
2135	548	438.	16153.7	1638.5 *	3
2140	549	438.	16150.7	1638.5 *	3
2145	550	438.	16147.7	1638.5 *	3
2150	551	438.	16144.6	1638.5 *	3
2155	552	438.	16141.6	1638.5 *	3
2200	553	438.	16138.6	1638.5 *	3
2205	554	438.	16135.6	1638.5 *	3
2210	555	438.	16132.6	1638.5 *	3
2215	556	438.	16129.6	1638.5 *	3
2220	557	438.	16126.6	1638.5 *	3
2225	558	438.	16123.5	1638.5 *	3
2230	559	438.	16120.5	1638.5 *	3
2235	560	438.	16117.5	1638.5 *	3
2240	561	438.	16114.5	1638.5 *	3
2245	562	438.	16111.5	1638.5 *	3
2250	563	438.	16108.5	1638.5 *	3
2255	564	438.	16105.5	1638.5 *	3
2300	565	438.	16102.4	1638.4 *	4
2305	566	438.	16099.4	1638.4 *	4
2310	567	438.	16096.4	1638.4 *	4
2315	568	438.	16093.4	1638.4 *	4
2320	569	438.	16090.4	1638.4 *	4
2325	570	438.	16087.4	1638.4 *	4
2330	571	438.	16084.4	1638.4 *	4
2335	572	438.	16081.3	1638.4 *	4
2340	573	438.	16078.3	1638.4 *	4
2345	574	438.	16075.3	1638.4 *	4
2350	575	438.	16072.3	1638.4 *	4
2355	576	438.	16069.3	1638.4 *	4
0000	577	438.	16066.3	1638.4 *	.4
0005	578	438.	16063.3	1638.4 *	4
0010	579	438.	16060.3	1638.4 *	4
0015	580	438.	16057.2	1638.4 *	4
0020	581	438.	16054.2	1638.4 *	4
0025	582	437.	16051.2	1638.4 *	4
0030	583	437.	16048.2	1638.4 *	4
0035	584	437.	16045.2	1638.4 *	4
0040	585	437.	16042.2	1638.4 *	4
0045	586	437.	16039.2	1638.4 *	4
0050	587	437.	16036.1	1638.4 *	4
0055	588	437.	16033.1	1638.4 *	4
0100	589	437.	16030.1	1638.4 *	4
0105	590	437.	16027.1	1638.4 *	4
0110	591	437.	16024.1	1638.4 *	4
0115	592	437.	16021.1	1638.4 *	4
0120	593	437.	16018.1	1638.4 *	4
0125	594	437.	16015.1	1638.4 *	4
0130	595	437.	16012.0	1638.3 *	4

1840	801	435.	15392.9	1637.7
1845	802	435.	15389.9	1637.7
1850	803	435.	15386.9	1637.7
1855	804	435.	15383.9	1637.6
1900	805	435.	15380.9	1637.6
1905	806	435.	15377.9	1637.6
1910	807	435.	15374.9	1637.6
1915	808	435.	15371.9	1637.6
1920	809	435.	15368.9	1637.6
1925	810	435.	15365.9	1637.6
1930	811	435.	15362.9	1637.6
1935	812	435.	15359.9	1637.6
1940	813	435.	15356.9	1637.6
1945	814	435.	15353.9	1637.6
1950	815	435.	15350.9	1637.6
1955	816	435.	15347.9	1637.6
2000	817	435.	15344.9	1637.6
2005	818	435.	15341.9	1637.6
2010	819	435.	15338.9	1637.6
2015	820	435.	15335.9	1637.6
2020	821	435.	15332.9	1637.6
2025	822	435.	15329.9	1637.6
2030	823	435.	15326.9	1637.6
2035	824	435.	15323.9	1637.6
2040	825	435.	15321.0	1637.6
2045	826	435.	15318.0	1637.6
2050	827	435.	15315.0	1637.6
2055	828	435.	15312.0	1637.6
2100	829	435.	15309.0	1637.6
2105	830	435.	15306.0	1637.6
2110	831	435.	15303.0	1637.6
2115	832	435.	15300.0	1637.6
2120	833	435.	15297.0	1637.6
2125	834	435.	15294.0	1637.5
2130	835	435.	15291.0	1637.5
2135	836	435.	15288.0	1637.5
2140	837	435.	15285.0	1637.5
2145	838	435.	15282.0	1637.5
2150	839	435.	15279.0	1637.5
2155	840	435.	15276.0	1637.5
2200	841	435.	15273.0	1637.5
2205	842	435.	15270.0	1637.5
2210	843	435.	15267.0	1637.5
2215	844	435.	15264.0	1637.5
2220	845	435.	15261.0	1637.5
2225	846	435.	15258.0	1637.5
2230	847	435.	15255.0	1637.5
2235	848	435.	15252.0	1637.5
2240	849	435.	15249.0	1637.5
2245	850	435.	15246.0	1637.5
2250	851	435.	15243.0	1637.5
2255	852	435.	15240.0	1637.5
2300	853	435.	15237.0	1637.5
2305	854	435.	15234.1	1637.5
2310	855	435.	15231.1	1637.5
2315	856	435.	15228.1	1637.5
2320	857	435.	15225.1	1637.5
2325	858	435.	15222.1	1637.5
2330	859	435.	15219.1	1637.5
2335	860	435.	15216.1	1637.5
2340	861	435.	15213.1	1637.5
2345	862	435.	15210.1	1637.5
2350	863	435.	15207.1	1637.5
2355	864	435.	15204.1	1637.4
0000	865	435.	15201.1	1637.4
0005	866	435.	15198.1	1637.4
0010	867	435.	15195.1	1637.4
0015	868	435.	15192.1	1637.4
0020	869	435.	15189.1	1637.4
0025	870	435.	15186.1	1637.4
0030	871	435.	15183.1	1637.4
0035	872	435.	15180.1	1637.4
0040	873	435.	15177.1	1637.4
0045	874	435.	15174.2	1637.4
0050	875	435.	15171.2	1637.4
0055	876	435.	15168.2	1637.4
0100	877	435.	15165.2	1637.4
0105	878	435.	15162.2	1637.4
0110	879	435.	15159.2	1637.4
0115	880	435.	15156.2	1637.4
0120	881	435.	15153.2	1637.4
0125	882	435.	15150.2	1637.4
0130	883	435.	15147.2	1637.4
0135	884	435.	15144.2	1637.4
0140	885	435.	15141.2	1637.4
0145	886	435.	15138.2	1637.4
0150	887	435.	15135.2	1637.4
0155	888	435.	15132.2	1637.4
0200	889	435.	15129.2	1637.4
0205	890	435.	15126.3	1637.4
0210	891	435.	15123.3	1637.4
0215	892	435.	15120.3	1637.4
0220	893	435.	15117.3	1637.4
0225	894	435.	15114.3	1637.3
0230	895	435.	15111.3	1637.3

	0035 296	439.	16512.5	1638.9	*	3	0135 596	437.	16009.0	1638.3	*	4	0235 896	435.	15108.3	1637.3
	0040 297	439.	16523.6	1638.9	*	3	0140 597	437.	16006.0	1638.3	*	4	0240 897	435.	15105.3	1637.3
2	0045 298	439.	16534.3	1638.9	*	3	0145 598	437.	16003.0	1638.3	*	4	0245 898	435.	15102.3	1637.3
2	0050 299	439.	16544.7	1638.9	*	3	0150 599	437.	16000.0	1638.3	*	4	0250 899	435.	15099.3	1637.3
2	0055 300	439.	16554.5	1638.9	*	3	0155 600	437.	15997.0	1638.3	*	4	0255 900	435.	15096.3	1637.3
					*						*					

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	74.92-HR
+ (CFS)	(HR)	(CFS)				
+ 440.	28.75		439.	439.	386.	371.
		(INCHES)	0.022	0.086	0.227	0.227
		(AC-FT)	218.	870.	2299.	2300.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	74.92-HR
+ (AC-FT)	(HR)				
16710.	28.83	16686.	16467.	13275.	12758.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	74.92-HR
+ (FEET)	(HR)				
1639.12	28.83	1639.09	1638.85	1627.91	1625.30

CUMULATIVE AREA = 189.89 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	CC	38066.	14.25	19620.	5573.	1861.	142.29		
+	HYDROGRAPH AT	AW	18413.	13.50	7485.	2477.	826.	30.64		
	HYDROGRAPH AT	EAST	9073.	13.00	2720.	711.	237.	16.96		
+	3 COMBINED AT	CBD-I	58318.	14.17	28945.	8755.	2924.	189.89		
+	ROUTED TO	CBD-O	440.	28.75	439.	439.	386.	189.89	1639.12	28.83
+										

*** NORMAL END OF HEC-1 ***

ITEMIZED COST ESTIMATE

Tracs No: 191 GR 087 H 5037 01 L
Federal Reference No. Not Assigned
Project Name: US 191; I-10 to SR 266
Route: US 191
I-10 to US 191 Spur
MP 87.40 - MP 90.2

ITEM	UNIT	QUANTITY	UNIT PRICE	COST
ROADWAY EXCAVATION	CY	120,000	$ 5.00	$ 600,000
AGGREGATE BASE	CY	12,794	$ 25.00	$ 319,840
REMOVE ASPHALT CONCRETE	SY	38,960	$ 1.25	$ 48,700
REMOVE ASPHALT CONCRETE(MILLING)	SY	-	$ 2.00	$ -
ASPHALT CONCRETE (MISC STRUCT)	TONS	23,075	$ 50.00	$ 1,153,760
TACK COAT	TONS	23.9	$ 160.00	$ 3,820
CHIP SEAL	TONS	72	$ 90.00	$ 6,440
SAWCUT	LF	2,140	$ 1.00	$ 2,140
REMOVE OBJECT MARKERS	LSUM	1	$ 2,500.00	$ 2,500
REMOVE STRUCTURAL CONCRETE (HEADWALL)	EACH	9	$ 400.00	$ 3,600
STRUCTURAL CONCRETE	CY	984	$ 250.00	$ 245,890
REINFORCING STEEL	LBS	132,407	$ 0.60	$ 79,440
STRUCTURAL BACKFILL	CY	2,099	$ 15.00	$ 31,490
18" CMP	LF	-	$ 40.00	$ -
24" CMP	LF	402	$ 50.00	$ 20,100
30" CMP	LF	120	$ 55.00	$ 6,600
36" CMP	LF	90	$ 60.00	$ 5,400
42" CMP	LF	192	$ 65.00	$ 12,480
48" CMP	LF	0	$ 70.00	$ -
54" CMP	LF	0	$ 70.00	$ -
60" CMP	LF	85	$ 80.00	$ 6,800
HEAD WALL (42" CMP)	EACH	0	$ 3,000.00	$ -
HEAD WALL (54" CMP)	EACH	0	$ 3,000.00	$ -
HEAD WALL (60" CMP)	EACH	2	$ 3,000.00	$ 6,000
NEW BRIDGE (MONK DRAW)	LSUM	1	$250,000.00	$ 250,000
FLARED END SECTIONS	EACH	18	$ 500.00	$ 9,000
REMOVE AND SALVAGE GUARD RAIL	LF	500	$ 2.00	$ 1,000
RELOCATE DELINEATORS	EACH	100	$ 25.00	$ 2,500
NEW BARBED WIRE FENCE (R/W)	LF	30,500	$ 5.00	$ 152,500
CATTLE GUARD	EACH	3	$ 3,000.00	$ 9,000
THERMOPLASTIC STRIPING	LF	112,707	$ 0.25	$ 28,180
SIGNING	LSUM	1	$ 25,000.00	$ 25,000
SEEDING	ACRES	37	$ 2,000.00	$ 73,930
				$ 3,106,110
MAINTENANCE AND PROTECTION OF TRAFFIC (5%)				$ 155,306
MOBILIZATION (10%)				$ 310,611
DUST AND WATER PALLIATIVE (2%)				$ 62,122
QUALITY CONTROL (2%)				$ 62,122
CONSTRUCTION SURVEY (2%)				$ 62,122
EROSION CONTROL (1%)				$ 31,061
WATER/MOBILIZATION TOTAL				$ 683,344
CONSTRUCTION ENGINEERING & CONTINGENCIES (30%)				$ 931,833
TOTAL CONSTRUCTION COST				**$ 4,721,300**
RIGHT-OF-WAY ACQUISITION	ACRE	2	$ 5,000.00	**$ 10,000**
PRELIMINARY ENGINEERING (7.5%)				**$ 354,098**
PROJECT TOTAL				**$ 5,085,400**

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1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY   1991           *
*           VERSION 4.0.1E          *
*     Lahey F77L-EM/32 version 5.01 *
*       Dodson & Associates, Inc.   *
* RUN DATE  07/26/99  TIME  11:09:48 *
*************************************
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*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET         *
*      DAVIS, CALIFORNIA 95616      *
*          (916) 551-1748           *
*                                   *
*************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID        Upper Cave Creek/Apache Wash Watercourse Master Plan  File:EXCBD-10.IH1
  2           ID           By: Stantec Consulting, Inc.                  Original: 07/22/99
  3           ID         For: Flood Control District of Maricopa County   Revised:
  4           ID
  5           ID        This is an existing condition model of the total inflow to Cave Buttes
  6           ID        Dam.  Inflow hydrographs for Cave Creek and Apache Wash are developed
  7           ID        from the following:
  8           ID
  9           ID        Cave Creek Watershed at Cave Buttes Dam
 10           ID           Combined HEC-1 models from:
 11           ID             1.  George V. Sabol Consulting Engineers FCD 95-28
 12           ID                 Cave Creek Watershed at the Carefree Highway
 13           ID                 Original model dated 06-17-96 by mcg
 14           ID                 GVSCE Project No. 84
 15           ID
 16           ID             2.  Willdan Associates FCD 95-30
 17           ID                 Cave Creek Watershed from Carefree Highway to Cave Buttes Dam
 18           ID                 Original model dated 11-29-96
 19           ID                 Willdan Project No. 08855
 20           ID
 21           ID        Model Basis:
 22           ID           10-year, 24-hr rainfall with SCS Type II distribution
 23           ID           Green & Ampt Loss Rate Method
 24           ID           NMIN = 5
 25           ID           Phoenix Mountain and Desert/Rangeland S-Graph
 26           ID           Clark Unit Hydrograph
 27           ID           Modified Puls channel storage routing
 28           ID           200 Scale 2' CI mapping of study reach by Aerial Mapping Comp
 29           ID
 30           ID        Apache Wash Watershed at Cave Buttes Dam
 31           ID           Jerry Jones and Associates, Inc. FCD 89-66
 32           ID           Apache Wash Flood Insurance Study
 33           ID           Original model dated 2-15-89
 34           ID
 35           ID        Model Basis:
 36           ID           10-year, 24-hr rainfall with SCS Type IIA distribution
 37           ID           SCS Curve Number with RTIMP
 38           ID           NMIN = 10
 39           ID           SCS dimensionless unit hydrograph
 40           ID
 41           ID
 42           ID        The remaining portion of the Cave Buttes Dam watershed is modele
 43           ID        single basin for existing conditions and is based on the followi
 44           ID           10-year, 24-hour rainfall with SCS Type II distribution
 45           ID           Green & Ampt Loss Rate Method
 46           ID           NMIN = 5
 47           ID           Phoenix Mountain and Desert/Rangeland S-Graph
 48           ID           USGS 7.5 Minutes Series Quadrangle Maps
 49           ID
              *
 50           IT       5                    900
 51           IO       5
 52           IN       5
              *
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1 HEC-1 INPUT PAGE 2

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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```
 53          KK      CC
 54          KM        Inflow hydrograph at Cave Buttes Dam from Cave Creek
 55          BA  142.29
 56          QI       0       0       0       0       0       0       0       0       0       0
 57          QI       0       0       0       0       0       0       0       0       0       0
 58          QI       0       0       0       0       0       0       0       0       0       0
 59          QI       0       0       0       0       0       0       0       1       1       1
 60          QI       1       1       1       1       1       1       1       1       2       2
 61          QI       2       2       2       2       2       2       3       3       3       3
 62          QI       3       4       4       4       4       5       5       5       6       6
 63          QI       6       7       7       7       8       8       9      10      10      11
 64          QI      12      13      14      16      18      20      22      24      27      29
 65          QI      32      34      36      39      41      44      49      54      58      63
 66          QI      67      71      75      79      83      86      90      93      97     101
 67          QI     105     109     114     118     121     125     128     131     134     137
 68          QI     139     142     145     148     152     155     158     162     166     170
 69          QI     174     178     183     187     192     198     203     209     216     223
 70          QI     231     242     256     275     314     374     462     585     752     996
 71          QI    1295    1618    1924    2114    2224    2329    2470    2668    2943    3329
 72          QI    3856    4627    5784    7362    9128   10859   12568   14206   15624   16660
 73          QI   17372   17801   18019   18073   17992   17795   17507   17180   16851   16513
 74          QI   16166   15815   15477   15144   14824   14522   14240   13975   13727   13494
 75          QI   13262   13019   12764   12495   12227   11935   11626   11305   10973   10636
 76          QI   10302    9982    9683    9396    9108    8808    8500    8190    7882    7565
 77          QI    7241    6957    6696    6463    6263    6075    5877    5676    5466    5254
 78          QI    5044    4839    4641    4453    4281    4121    3976    3851    3747    3662
 79          QI    3580    3492    3398    3298    3196    3094    2991    2885    2779    2674
 80          QI    2572    2472    2375    2283    2196    2115    2043    1974    1909    1846
 81          QI    1783    1721    1658    1593    1524    1445    1350    1229    1089     975
 82          QI     903     857     825     799     777     757     739     722     706     690
 83          QI     674     658     641     624     607     590     574     558     543     530
 84          QI     517     505     493     481     468     457     445     434     423     413
 85          QI     403     393     384     375     367     359     351     344     337     330
 86          QI     324     318     313     309     304     300     296     292     288     284
 87          QI     281     277     274     270     267     263     258     253     248     243
 88          QI     238     233     228     223     218     213     207     202     197     191
 89          QI     186     181     175     170     164     159     153     148     142     137
 90          QI     131     126     121     117     113     110     107     104     101      99
 91          QI      96      93      90      87      84      81      78      75      73      71
 92          QI      69      67      65      64      62      61      59      58      56      55
 93          QI      53      52      50      49      47      46      44      43      41      40
 94          QI      39      38      37      35      34      32      31      29      28      26
 95          QI      25      24      22      21      20      19      18      18      17      16
 96          QI      16      15      15      15      14      14      13      13      12      12
 97          QI      11      11      10      10       9       9       8       8       7       7
 98          QI       7       6       6       5       5       5       4       4       4       3
 99          QI       3       3       3       2       2       2       2       2       2       1
100          QI       1       1       1       1       1       1       1       1       1       0
101          IN      10
             *
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

102          KK      AW
103          KM        Inflow hydrograph to Cave Buttes Dam from Apache Wash
104          BA   30.64
105          QI       0       0       0       0       0       0       0       0       0       0
106          QI       0       0       0       0       0       0       0       0       0       0
107          QI       0       0       0       0       0       0       0       0       0       0
108          QI       0       0       0       0       0       0       0       0       0       0
109          QI       0       0       0       0       0       0       0       0       0       0
110          QI       0       0       0       0       0       0       0       0       0       0
111          QI       0       0       0       0       0      35     244     696    1002     917
112          QI     766     652     512     391     336     430     419     394     357    1086
113          QI    1935    2659    3120    2946    2726    2471    2228    2077    2371    2529
114          QI    2316    2092    1888    1706    1544    1405    1286    1181    1087    1002
115          QI     927     862     805     755     712     676     645     614     583     554
116          QI     530     511     495     481     468     456     443     428     413     429
117          QI     483     534     540     500     457     424     395     371     356     353
118          QI     365     393     433     469     493     507     512     520     535     557
119          QI     593     616     592     552     511     477     452     428     397     363
120          QI     332     308     323     356     338     315     294     275     257     240
121          QI     224     209     196     183     172     161     151     142     133     125
122          QI     118     112     106     100       0
123          IN       5
             *

124          KK    EAST
125          KM        Inflow hydrograph to Cave Buttes Dam from Apache Wash
126          BA   16.96
127          QI       0       0       0       0       0       0       0       1       1       1
128          QI       1       1       2       2       2       3       3       4       4       4
129          QI       5       5       5       5       6       6       6       6       6       6
130          QI       7       7       7       7       7       7       7       7       7       7
131          QI       7       7       7       7       7       7       7       8       8       8
132          QI       8       8       8       8       8       8       8       8       8       9
133          QI       9       9       9       9       9       9       9       9       9      10
134          QI      10      10      10      10      10      10      10      10      10      10
135          QI      10      10      10      11      11      11      11      11      11      11
136          QI      11      12      12      12      12      12      12      12      12      12
137          QI      12      12      13      13      13      13      13      14      14      14
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 138          QI      15      15      15      16      16      16      17      17      17      18
 139          QI      18      18      19      19      19      20      20      20      21      21
 140          QI      22      23      23      24      25      26      30      35      39      73
 141          QI     112     154     216     329     468     597     776     989    1221    1428
 142          QI    1627    1805    1960    2092    2195    2249    2268    2259    2200    2107
 143          QI    1986    1844    1691    1532    1389    1257    1139    1032     933     845
 144          QI     764     689     625     564     512     469     421     384     349     316
 145          QI     282     252     235     216     196     175     160     144     124     105
 146          QI      85      82      81      80      79      79      78      77      76      75
 147          QI      67      58      50      39      29      18      17      17      16      16
 148          QI      16      15      15      15      15      14      14      14      14      13
 149          QI      13      13      13      13      12      12      12      12      12      11
 150          QI      11      11      11      11      11      11      11      11      11      11
 151          QI      11      10      10      10      10      10      10      10      10       0
              *
1                                          HEC-1 INPUT                                          PAGE  4

       LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 152          KK   CBD-I
 153          KO       1                                  21
 154          KM        Total inflow to Cave Buttes Dam
 155          HC       3
              *

 156          KK   CBD-O
 157          KO       1
 158          RS       1    FLOW      -1
 159          SV       0     250     700    1100    1800    2600    4000    6300    9400   13000
 160          SV   17500   23000   29200   37000   46000
 161          SE  1560.7    1595    1600    1605    1610    1615    1620    1625    1630    1635
 162          SE    1640    1645    1650    1655    1660
 163          SQ       0     132     215     243     268     290     311     330     347     365
 164          SQ     381     398     413     428     442     455     468     481     493
 165          SE  1560.7    1570    1580    1585    1590    1595    1600    1605    1610    1615
 166          SE    1620    1625    1630    1635    1640    1645    1650    1655    1660
              *
 167          ZZ
1*************************************                                  *************************************
*                                   *                                  *                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                *   U.S. ARMY CORPS OF ENGINEERS    *
*              MAY   1991           *                                  *   HYDROLOGIC ENGINEERING CENTER   *
*           VERSION 4.0.1E          *                                  *         609 SECOND STREET         *
*     Lahey F77L-EM/32 version 5.01 *                                  *      DAVIS, CALIFORNIA 95616      *
*       Dodson & Associates, Inc.   *                                  *         (916) 551-1748            *
* RUN DATE  07/26/99  TIME  11:09:48 *                                  *                                   *
*************************************                                  *************************************
```

Upper Cave Creek/Apache Wash Watercourse Master Plan File:EXCBD-10.IH1
By: Stantec Consulting, Inc. Original: 07/22/99
For: Flood Control District of Maricopa County Revised:

This is an existing condition model of the total inflow to Cave Buttes Dam. Inflow hydrographs for Cave Creek and Apache Wash are developed from the following:

Cave Creek Watershed at Cave Buttes Dam
Combined HEC-1 models from:

1. George V. Sabol Consulting Engineers FCD 95-28
   Cave Creek Watershed at the Carefree Highway
   Original model dated 06-17-96 by mcg
   GVSCE Project No. 84

2. Willdan Associates FCD 95-30
   Cave Creek Watershed from Carefree Highway to Cave Buttes Dam
   Original model dated 11-29-96
   Willdan Project No. 08855

Model Basis:
10-year, 24-hr rainfall with SCS Type II distribution
Green & Ampt Loss Rate Method
NMIN = 5
Phoenix Mountain and Desert/Rangeland S-Graph
Clark Unit Hydrograph
Modified Puls channel storage routing
200 Scale 2' CI mapping of study reach by Aerial Mapping Comp

Apache Wash Watershed at Cave Buttes Dam
Jerry Jones and Associates, Inc. FCD 89-66
Apache Wash Flood Insurance Study
Original model dated 2-15-89

Model Basis:
10-year, 24-hr rainfall with SCS Type IIA distribution
SCS Curve Number with RTIMP
NMIN = 10
SCS dimensionless unit hydrograph

The remaining portion of the Cave Buttes Dam watershed is modele

```
                    single basin for existing conditions and is based on the followi
                       10-year, 24-hour rainfall with SCS Type II distribution
                       Green & Ampt Loss Rate Method
                       NMIN = 5
                       Phoenix Mountain and Desert/Rangeland S-Graph
                       USGS 7.5 Minutes Series Quadrangle Maps


51 IO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT          HYDROGRAPH TIME DATA
                      NMIN          5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        900  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      4   0  ENDING DATE
                    NDTIME       0255  ENDING TIME
                     ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.08 HOURS
                   TOTAL TIME BASE   74.92 HOURS

        ENGLISH UNITS
             DRAINAGE AREA          SQUARE MILES
             PRECIPITATION DEPTH    INCHES
             LENGTH, ELEVATION      FEET
             FLOW                   CUBIC FEET PER SECOND
             STORAGE VOLUME         ACRE-FEET
             SURFACE AREA           ACRES
             TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
152 KK      *    CBD-I   *
            *            *
            **************

153 KO         OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        900  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.083  TIME INTERVAL IN HOURS

                         Total inflow to Cave Buttes Dam

155 HC         HYDROGRAPH COMBINATION
                     ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                  ***

*****************************************************************************************************************************************

                                  HYDROGRAPH AT STATION     CBD-I
                                       SUM OF  3 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		1845	226	4621.	2		1330	451	111.	3		0815	676	111.
1		0005	2	0.	1		1850	227	4469.	2		1335	452	111.	3		0820	677	111.
1		0010	3	0.	1		1855	228	4338.	2		1340	453	111.	3		0825	678	111.
1		0015	4	0.	1		1900	229	4227.	2		1345	454	111.	3		0830	679	111.
1		0020	5	0.	1		1905	230	4135.	2		1350	455	111.	3		0835	680	111.
1		0025	6	0.	1		1910	231	4047.	2		1355	456	111.	3		0840	681	111.
1		0030	7	0.	1		1915	232	3953.	2		1400	457	111.	3		0845	682	111.
1		0035	8	1.	1		1920	233	3852.	2		1405	458	111.	3		0850	683	111.
1		0040	9	1.	1		1925	234	3745.	2		1410	459	111.	3		0855	684	111.
1		0045	10	1.	1		1930	235	3635.	2		1415	460	111.	3		0900	685	111.
1		0050	11	1.	1		1935	236	3526.	2		1420	461	111.	3		0905	686	111.
1		0055	12	1.	1		1940	237	3415.	2		1425	462	111.	3		0910	687	111.
1		0100	13	2.	1		1945	238	3317.	2		1430	463	111.	3		0915	688	111.
1		0105	14	2.	1		1950	239	3219.	2		1435	464	111.	3		0920	689	111.
1		0110	15	2.	1		1955	240	3141.	2		1440	465	111.	3		0925	690	111.
1		0115	16	3.	1		2000	241	3066.	2		1445	466	111.	3		0930	691	111.
1		0120	17	3.	1		2005	242	2991.	2		1450	467	111.	3		0935	692	111.
1		0125	18	4.	1		2010	243	2919.	2		1455	468	111.	3		0940	693	111.
1		0130	19	4.	1		2015	244	2830.	2		1500	469	111.	3		0945	694	111.
1		0135	20	4.	1		2020	245	2746.	2		1505	470	111.	3		0950	695	111.
1		0140	21	5.	1		2025	246	2645.	2		1510	471	111.	3		0955	696	111.
1		0145	22	5.	1		2030	247	2553.	2		1515	472	111.	3		1000	697	111.
1		0150	23	5.	1		2035	248	2463.	2		1520	473	111.	3		1005	698	111.
1		0155	24	5.	1		2040	249	2376.	2		1525	474	111.	3		1010	699	111.

1	0200	25	6.	*	1	2045	250	2297.	*	2	1530	475	111.	*	3	1015	700	111.
1	0205	26	6.	*	1	2050	251	2217.	*	2	1535	476	111.	*	3	1020	701	111.
1	0210	27	6.	*	1	2055	252	2141.	*	2	1540	477	111.	*	3	1025	702	111.
1	0215	28	6.	*	1	2100	253	2063.	*	2	1545	478	111.	*	3	1030	703	111.
1	0220	29	6.	*	1	2105	254	1986.	*	2	1550	479	111.	*	3	1035	704	111.
1	0225	30	6.	*	1	2110	255	1905.	*	2	1555	480	111.	*	3	1040	705	111.
1	0230	31	7.	*	1	2115	256	1819.	*	2	1600	481	111.	*	3	1045	706	111.
1	0235	32	7.	*	1	2120	257	1716.	*	2	1605	482	111.	*	3	1050	707	111.
1	0240	33	7.	*	1	2125	258	1594.	*	2	1610	483	111.	*	3	1055	708	111.
1	0245	34	7.	*	1	2130	259	1452.	*	2	1615	484	111.	*	3	1100	709	111.
1	0250	35	7.	*	1	2135	260	1344.	*	2	1620	485	111.	*	3	1105	710	111.
1	0255	36	7.	*	1	2140	261	1278.	*	2	1625	486	111.	*	3	1110	711	111.
1	0300	37	7.	*	1	2145	262	1246.	*	2	1630	487	111.	*	3	1115	712	111.
1	0305	38	8.	*	1	2150	263	1228.	*	2	1635	488	111.	*	3	1120	713	111.
1	0310	39	8.	*	1	2155	264	1222.	*	2	1640	489	111.	*	3	1125	714	111.
1	0315	40	8.	*	1	2200	265	1220.	*	2	1645	490	111.	*	3	1130	715	111.
1	0320	41	8.	*	1	2205	266	1218.	*	2	1650	491	111.	*	3	1135	716	111.
1	0325	42	8.	*	1	2210	267	1218.	*	2	1655	492	111.	*	3	1140	717	111.
1	0330	43	8.	*	1	2215	268	1213.	*	2	1700	493	111.	*	3	1145	718	111.
1	0335	44	8.	*	1	2220	269	1209.	*	2	1705	494	111.	*	3	1150	719	111.
1	0340	45	8.	*	1	2225	270	1200.	*	2	1710	495	111.	*	3	1155	720	111.
1	0345	46	8.	*	1	2230	271	1191.	*	2	1715	496	111.	*	3	1200	721	111.
1	0350	47	8.	*	1	2235	272	1178.	*	2	1720	497	111.	*	3	1205	722	111.
1	0355	48	9.	*	1	2240	273	1163.	*	2	1725	498	111.	*	3	1210	723	111.
1	0400	49	10.	*	1	2245	274	1150.	*	2	1730	499	111.	*	3	1215	724	111.
1	0405	50	10.	*	1	2250	275	1137.	*	2	1735	500	111.	*	3	1220	725	111.
1	0410	51	10.	*	1	2255	276	1128.	*	2	1740	501	111.	*	3	1225	726	111.
1	0415	52	10.	*	1	2300	277	1119.	*	2	1745	502	111.	*	3	1230	727	111.
1	0420	53	10.	*	1	2305	278	1114.	*	2	1750	503	111.	*	3	1235	728	111.
1	0425	54	10.	*	1	2310	279	1110.	*	2	1755	504	111.	*	3	1240	729	111.
1	0430	55	10.	*	1	2315	280	1115.	*	2	1800	505	111.	*	3	1245	730	111.
1	0435	56	10.	*	1	2320	281	1120.	*	2	1805	506	111.	*	3	1250	731	111.
1	0440	57	11.	*	1	2325	282	1120.	*	2	1810	507	111.	*	3	1255	732	111.
1	0445	58	11.	*	1	2330	283	1119.	*	2	1815	508	111.	*	3	1300	733	111.
1	0450	59	11.	*	1	2335	284	1095.	*	2	1820	509	111.	*	3	1305	734	111.
1	0455	60	12.	*	1	2340	285	1070.	*	2	1825	510	111.	*	3	1310	735	111.
1	0500	61	12.	*	1	2345	286	1039.	*	2	1830	511	111.	*	3	1315	736	111.
1	0505	62	13.	*	1	2350	287	1007.	*	2	1835	512	111.	*	3	1320	737	111.
1	0510	63	13.	*	1	2355	288	976.	*	2	1840	513	111.	*	3	1325	738	111.
1	0515	64	13.	*	2	0000	289	944.	*	2	1845	514	111.	*	3	1330	739	111.
1	0520	65	13.	*	2	0005	290	917.	*	2	1850	515	111.	*	3	1335	740	111.
1	0525	66	14.	*	2	0010	291	890.	*	2	1855	516	111.	*	3	1340	741	111.
1	0530	67	14.	*	2	0015	292	868.	*	2	1900	517	111.	*	3	1345	742	111.
1	0535	68	14.	*	2	0020	293	846.	*	2	1905	518	111.	*	3	1350	743	111.
1	0540	69	15.	*	2	0025	294	825.	*	2	1910	519	111.	*	3	1355	744	111.
1	0545	70	16.	*	2	0030	295	805.	*	2	1915	520	111.	*	3	1400	745	111.
1	0550	71	16.	*	2	0035	296	782.	*	2	1920	521	111.	*	3	1405	746	111.
1	0555	72	17.	*	2	0040	297	758.	*	2	1925	522	111.	*	3	1410	747	111.
1	0600	73	17.	*	2	0045	298	734.	*	2	1930	523	111.	*	3	1415	748	111.
1	0605	74	17.	*	2	0050	299	710.	*	2	1935	524	111.	*	3	1420	749	111.
1	0610	75	18.	*	2	0055	300	688.	*	2	1940	525	111.	*	3	1425	750	111.
1	0615	76	18.	*	2	0100	301	666.	*	2	1945	526	111.	*	3	1430	751	111.
1	0620	77	19.	*	2	0105	302	648.	*	2	1950	527	111.	*	3	1435	752	111.
1	0625	78	20.	*	2	0110	303	631.	*	2	1955	528	111.	*	3	1440	753	111.
1	0630	79	20.	*	2	0115	304	635.	*	2	2000	529	111.	*	3	1445	754	111.
1	0635	80	21.	*	2	0120	305	637.	*	2	2005	530	111.	*	3	1450	755	111.
1	0640	81	22.	*	2	0125	306	650.	*	2	2010	531	111.	*	3	1455	756	111.
1	0645	82	23.	*	2	0130	307	662.	*	2	2015	532	111.	*	3	1500	757	111.
1	0650	83	24.	*	2	0135	308	649.	*	2	2020	533	111.	*	3	1505	758	111.
1	0655	84	27.	*	2	0140	309	636.	*	2	2025	534	111.	*	3	1510	759	111.
1	0700	85	29.	*	2	0145	310	621.	*	2	2030	535	111.	*	3	1515	760	111.
1	0705	86	31.	*	2	0150	311	606.	*	2	2035	536	111.	*	3	1520	761	111.
1	0710	87	33.	*	2	0155	312	592.	*	2	2040	537	111.	*	3	1525	762	111.
1	0715	88	35.	*	2	0200	313	578.	*	2	2045	538	111.	*	3	1530	763	111.
1	0720	89	38.	*	2	0205	314	565.	*	2	2050	539	111.	*	3	1535	764	111.
1	0725	90	40.	*	2	0210	315	552.	*	2	2055	540	111.	*	3	1540	765	111.
1	0730	91	43.	*	2	0215	316	539.	*	2	2100	541	111.	*	3	1545	766	111.
1	0735	92	46.	*	2	0220	317	525.	*	2	2105	542	111.	*	3	1550	767	111.
1	0740	93	48.	*	2	0225	318	512.	*	2	2110	543	111.	*	3	1555	768	111.
1	0745	94	51.	*	2	0230	319	498.	*	2	2115	544	111.	*	3	1600	769	111.
1	0750	95	53.	*	2	0235	320	485.	*	2	2120	545	111.	*	3	1605	770	111.
1	0755	96	56.	*	2	0240	321	472.	*	2	2125	546	111.	*	3	1610	771	111.
1	0800	97	61.	*	2	0245	322	460.	*	2	2130	547	111.	*	3	1615	772	111.
1	0805	98	66.	*	2	0250	323	447.	*	2	2135	548	111.	*	3	1620	773	111.
1	0810	99	70.	*	2	0255	324	436.	*	2	2140	549	111.	*	3	1625	774	111.
1	0815	100	75.	*	2	0300	325	424.	*	2	2145	550	111.	*	3	1630	775	111.
1	0820	101	79.	*	2	0305	326	413.	*	2	2150	551	111.	*	3	1635	776	111.
1	0825	102	83.	*	2	0310	327	400.	*	2	2155	552	111.	*	3	1640	777	111.
1	0830	103	88.	*	2	0315	328	390.	*	2	2200	553	111.	*	3	1645	778	111.
1	0835	104	92.	*	2	0320	329	379.	*	2	2205	554	111.	*	3	1650	779	111.
1	0840	105	96.	*	2	0325	330	368.	*	2	2210	555	111.	*	3	1655	780	111.
1	0845	106	99.	*	2	0330	331	357.	*	2	2215	556	111.	*	3	1700	781	111.
1	0850	107	103.	*	2	0335	332	347.	*	2	2220	557	111.	*	3	1705	782	111.
1	0855	108	107.	*	2	0340	333	336.	*	2	2225	558	111.	*	3	1710	783	111.
1	0900	109	111.	*	2	0345	334	327.	*	2	2230	559	111.	*	3	1715	784	111.
1	0905	110	115.	*	2	0350	335	316.	*	2	2235	560	111.	*	3	1720	785	111.
1	0910	111	120.	*	2	0355	336	307.	*	2	2240	561	111.	*	3	1725	786	111.
1	0915	112	124.	*	2	0400	337	296.	*	2	2245	562	111.	*	3	1730	787	111.
1	0920	113	129.	*	2	0405	338	287.	*	2	2250	563	111.	*	3	1735	788	111.
1	0925	114	134.	*	2	0410	339	277.	*	2	2255	564	111.	*	3	1740	789	111.
1	0930	115	137.	*	2	0415	340	269.	*	2	2300	565	111.	*	3	1745	790	111.
1	0935	116	141.	*	2	0420	341	259.	*	2	2305	566	111.	*	3	1750	791	111.
1	0940	117	145.	*	2	0425	342	251.	*	2	2310	567	111.	*	3	1755	792	111.
1	0945	118	148.	*	2	0430	343	243.	*	2	2315	568	111.	*	3	1800	793	111.
1	0950	119	151.	*	2	0435	344	236.	*	2	2320	569	111.	*	3	1805	794	111.

1	0955	120	155.	*	2	0440	345	229.	*	2	2325	570	111.	*	3	1810	795	111.
1	1000	121	157.	*	2	0445	346	223.	*	2	2330	571	111.	*	3	1815	796	111.
1	1005	122	160.	*	2	0450	347	217.	*	2	2335	572	111.	*	3	1820	797	111.
1	1010	123	164.	*	2	0455	348	214.	*	2	2340	573	111.	*	3	1825	798	111.
1	1015	124	167.	*	2	0500	349	211.	*	2	2345	574	111.	*	3	1830	799	111.
1	1020	125	171.	*	2	0505	350	209.	*	2	2350	575	111.	*	3	1835	800	111.
1	1025	126	175.	*	2	0510	351	206.	*	2	2355	576	111.	*	3	1840	801	111.
1	1030	127	178.	*	2	0515	352	203.	*	3	0000	577	111.	*	3	1845	802	111.
1	1035	128	182.	*	2	0520	353	200.	*	3	0005	578	111.	*	3	1850	803	111.
1	1040	129	187.	*	2	0525	354	197.	*	3	0010	579	111.	*	3	1855	804	111.
1	1045	130	209.	*	2	0530	355	194.	*	3	0015	580	111.	*	3	1900	805	111.
1	1050	131	231.	*	2	0535	356	191.	*	3	0020	581	111.	*	3	1905	806	111.
1	1055	132	341.	*	2	0540	357	188.	*	3	0025	582	111.	*	3	1910	807	111.
1	1100	133	450.	*	2	0545	358	185.	*	3	0030	583	111.	*	3	1915	808	111.
1	1105	134	681.	*	2	0550	359	183.	*	3	0035	584	111.	*	3	1920	809	111.
1	1110	135	913.	*	2	0555	360	181.	*	3	0040	585	111.	*	3	1925	810	111.
1	1115	136	1073.	*	2	0600	361	179.	*	3	0045	586	111.	*	3	1930	811	111.
1	1120	137	1235.	*	2	0605	362	177.	*	3	0050	587	111.	*	3	1935	812	111.
1	1125	138	1204.	*	2	0610	363	175.	*	3	0055	588	111.	*	3	1940	813	111.
1	1130	139	1172.	*	2	0615	364	174.	*	3	0100	589	111.	*	3	1945	814	111.
1	1135	140	1138.	*	2	0620	365	172.	*	3	0105	590	111.	*	3	1950	815	111.
1	1140	141	1109.	*	2	0625	366	171.	*	3	0110	591	111.	*	3	1955	816	111.
1	1145	142	1105.	*	2	0630	367	169.	*	3	0115	592	111.	*	3	2000	817	111.
1	1150	143	1124.	*	2	0635	368	168.	*	3	0120	593	111.	*	3	2005	818	111.
1	1155	144	1186.	*	2	0640	369	166.	*	3	0125	594	111.	*	3	2010	819	111.
1	1200	145	1294.	*	2	0645	370	165.	*	3	0130	595	111.	*	3	2015	820	111.
1	1205	146	1423.	*	2	0650	371	163.	*	3	0135	596	111.	*	3	2020	821	111.
1	1210	147	1629.	*	2	0655	372	162.	*	3	0140	597	111.	*	3	2025	822	111.
1	1215	148	1938.	*	2	0700	373	160.	*	3	0145	598	111.	*	3	2030	823	111.
1	1220	149	2309.	*	2	0705	374	159.	*	3	0150	599	111.	*	3	2035	824	111.
1	1225	150	2807.	*	2	0710	375	157.	*	3	0155	600	111.	*	3	2040	825	111.
1	1230	151	3352.	*	2	0715	376	156.	*	3	0200	601	111.	*	3	2045	826	111.
1	1235	152	3848.	*	2	0720	377	154.	*	3	0205	602	111.	*	3	2050	827	111.
1	1240	153	4303.	*	2	0725	378	153.	*	3	0210	603	111.	*	3	2055	828	111.
1	1245	154	4613.	*	2	0730	379	151.	*	3	0215	604	111.	*	3	2100	829	111.
1	1250	155	4813.	*	2	0735	380	150.	*	3	0220	605	111.	*	3	2105	830	111.
1	1255	156	4954.	*	2	0740	381	149.	*	3	0225	606	111.	*	3	2110	831	111.
1	1300	157	5095.	*	2	0745	382	148.	*	3	0230	607	111.	*	3	2115	832	111.
1	1305	158	5649.	*	2	0750	383	147.	*	3	0235	608	111.	*	3	2120	833	111.
1	1310	159	6229.	*	2	0755	384	145.	*	3	0240	609	111.	*	3	2125	834	111.
1	1315	160	6947.	*	2	0800	385	144.	*	3	0245	610	111.	*	3	2130	835	111.
1	1320	161	7777.	*	2	0805	386	142.	*	3	0250	611	111.	*	3	2135	836	111.
1	1325	162	8768.	*	2	0810	387	141.	*	3	0255	612	111.	*	3	2140	837	111.
1	1330	163	10134.	*	2	0815	388	139.	*	3	0300	613	111.	*	3	2145	838	111.
1	1335	164	11784.	*	2	0820	389	138.	*	3	0305	614	111.	*	3	2150	839	111.
1	1340	165	13637.	*	2	0825	390	136.	*	3	0310	615	111.	*	3	2155	840	111.
1	1345	166	15149.	*	2	0830	391	135.	*	3	0315	616	111.	*	3	2200	841	111.
1	1350	167	16653.	*	2	0835	392	134.	*	3	0320	617	111.	*	3	2205	842	111.
1	1355	168	18074.	*	2	0840	393	132.	*	3	0325	618	111.	*	3	2210	843	111.
1	1400	169	19283.	*	2	0845	394	131.	*	3	0330	619	111.	*	3	2215	844	111.
1	1405	170	20104.	*	2	0850	395	130.	*	3	0335	620	111.	*	3	2220	845	111.
1	1410	171	20607.	*	2	0855	396	129.	*	3	0340	621	111.	*	3	2225	846	111.
1	1415	172	20840.	*	2	0900	397	128.	*	3	0345	622	111.	*	3	2230	847	111.
1	1420	173	20872.	*	2	0905	398	128.	*	3	0350	623	111.	*	3	2235	848	111.
1	1425	174	20790.	*	2	0910	399	127.	*	3	0355	624	111.	*	3	2240	849	111.
1	1430	175	20581.	*	2	0915	400	126.	*	3	0400	625	111.	*	3	2245	850	111.
1	1435	176	20488.	*	2	0920	401	126.	*	3	0405	626	111.	*	3	2250	851	111.
1	1440	177	20299.	*	2	0925	402	125.	*	3	0410	627	111.	*	3	2255	852	111.
1	1445	178	20014.	*	2	0930	403	125.	*	3	0415	628	111.	*	3	2300	853	111.
1	1450	179	19729.	*	2	0935	404	125.	*	3	0420	629	111.	*	3	2305	854	111.
1	1455	180	19252.	*	2	0940	405	124.	*	3	0425	630	111.	*	3	2310	855	111.
1	1500	181	18764.	*	2	0945	406	124.	*	3	0430	631	111.	*	3	2315	856	111.
1	1505	182	18271.	*	2	0950	407	123.	*	3	0435	632	111.	*	3	2320	857	111.
1	1510	183	17804.	*	2	0955	408	123.	*	3	0440	633	111.	*	3	2325	858	111.
1	1515	184	17350.	*	2	1000	409	122.	*	3	0445	634	111.	*	3	2330	859	111.
1	1520	185	16908.	*	2	1005	410	122.	*	3	0450	635	111.	*	3	2335	860	111.
1	1525	186	16494.	*	2	1010	411	121.	*	3	0455	636	111.	*	3	2340	861	111.
1	1530	187	16106.	*	2	1015	412	121.	*	3	0500	637	111.	*	3	2345	862	111.
1	1535	188	15744.	*	2	1020	413	120.	*	3	0505	638	111.	*	3	2350	863	111.
1	1540	189	15395.	*	2	1025	414	120.	*	3	0510	639	111.	*	3	2355	864	111.
1	1545	190	15074.	*	2	1030	415	119.	*	3	0515	640	111.	*	4	0000	865	111.
1	1550	191	14752.	*	2	1035	416	119.	*	3	0520	641	111.	*	4	0005	866	111.
1	1555	192	14447.	*	2	1040	417	118.	*	3	0525	642	111.	*	4	0010	867	111.
1	1600	193	14131.	*	2	1045	418	118.	*	3	0530	643	111.	*	4	0015	868	111.
1	1605	194	13809.	*	2	1050	419	117.	*	3	0535	644	111.	*	4	0020	869	111.
1	1610	195	13487.	*	2	1055	420	117.	*	3	0540	645	111.	*	4	0025	870	111.
1	1615	196	13148.	*	2	1100	421	117.	*	3	0545	646	111.	*	4	0030	871	111.
1	1620	197	12791.	*	2	1105	422	116.	*	3	0550	647	111.	*	4	0035	872	111.
1	1625	198	12427.	*	2	1110	423	116.	*	3	0555	648	111.	*	4	0040	873	111.
1	1630	199	12051.	*	2	1115	424	115.	*	3	0600	649	111.	*	4	0045	874	111.
1	1635	200	11676.	*	2	1120	425	115.	*	3	0605	650	111.	*	4	0050	875	111.
1	1640	201	11296.	*	2	1125	426	115.	*	3	0610	651	111.	*	4	0055	876	111.
1	1645	202	10935.	*	2	1130	427	114.	*	3	0615	652	111.	*	4	0100	877	111.
1	1650	203	10595.	*	2	1135	428	114.	*	3	0620	653	111.	*	4	0105	878	111.
1	1655	204	10269.	*	2	1140	429	114.	*	3	0625	654	111.	*	4	0110	879	111.
1	1700	205	9942.	*	2	1145	430	113.	*	3	0630	655	111.	*	4	0115	880	111.
1	1705	206	9606.	*	2	1150	431	113.	*	3	0635	656	111.	*	4	0120	881	111.
1	1710	207	9272.	*	2	1155	432	113.	*	3	0640	657	111.	*	4	0125	882	111.
1	1715	208	8941.	*	2	1200	433	113.	*	3	0645	658	111.	*	4	0130	883	111.
1	1720	209	8610.	*	2	1205	434	112.	*	3	0650	659	111.	*	4	0135	884	111.
1	1725	210	8275.	*	2	1210	435	112.	*	3	0655	660	111.	*	4	0140	885	111.
1	1730	211	7933.	*	2	1215	436	112.	*	3	0700	661	111.	*	4	0145	886	111.
1	1735	212	7633.	*	2	1220	437	112.	*	3	0705	662	111.	*	4	0150	887	111.
1	1740	213	7356.	*	2	1225	438	112.	*	3	0710	663	111.	*	4	0155	888	111.
1	1745	214	7108.	*	2	1230	439	112.	*	3	0715	664	111.	*	4	0200	889	111.

1	1750	215	6892.	*	2	1235	440	111.	*	3	0720	665	111.	*	4	0205	890	111.
1	1755	216	6688.	*	2	1240	441	111.	*	3	0725	666	111.	*	4	0210	891	111.
1	1800	217	6474.	*	2	1245	442	111.	*	3	0730	667	111.	*	4	0215	892	111.
1	1805	218	6259.	*	2	1250	443	111.	*	3	0735	668	111.	*	4	0220	893	111.
1	1810	219	6034.	*	2	1255	444	111.	*	3	0740	669	111.	*	4	0225	894	111.
1	1815	220	5809.	*	2	1300	445	111.	*	3	0745	670	111.	*	4	0230	895	111.
1	1820	221	5587.	*	2	1305	446	111.	*	3	0750	671	111.	*	4	0235	896	111.
1	1825	222	5373.	*	2	1310	447	111.	*	3	0755	672	111.	*	4	0240	897	111.
1	1830	223	5165.	*	2	1315	448	111.	*	3	0800	673	111.	*	4	0245	898	111.
1	1835	224	4969.	*	2	1320	449	111.	*	3	0805	674	111.	*	4	0250	899	111.
1	1840	225	4788.	*	2	1325	450	111.	*	3	0810	675	111.	*	4	0255	900	111.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	74.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 20872.	14.33		12161.	3779.	1327.	1276.
		(INCHES)	0.595	0.740	0.780	0.780
		(AC-FT)	6030.	7496.	7898.	7899.

CUMULATIVE AREA = 189.89 SQ MI

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            *            *
156 KK      *    CBD-O   *
            *            *
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157 KO

OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

158 RS

STORAGE ROUTING

NSTPS	1	NUMBER OF SUBREACHES
ITYP	FLOW	TYPE OF INITIAL CONDITION
RSVRIC	-1.00	INITIAL CONDITION
X	0.00	WORKING R AND D COEFFICIENT

159 SV STORAGE	0.0	250.0	700.0	1100.0	1800.0	2600.0	4000.0	6300.0	9400.0	13000.0
	17500.0	23000.0	29200.0	37000.0	46000.0					
161 SE ELEVATION	1560.70	1595.00	1600.00	1605.00	1610.00	1615.00	1620.00	1625.00	1630.00	1635.00
	1640.00	1645.00	1650.00	1655.00	1660.00					
163 SQ DISCHARGE	0.	132.	215.	243.	268.	290.	311.	330.	347.	365.
	381.	398.	413.	428.	442.	455.	468.	481.	493.	
165 SE ELEVATION	1560.70	1570.00	1580.00	1585.00	1590.00	1595.00	1600.00	1605.00	1610.00	1615.00
	1620.00	1625.00	1630.00	1635.00	1640.00	1645.00	1650.00	1655.00	1660.00	

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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	67.78	140.67	177.11	213.56	250.00	700.00	1100.00	1800.00	2600.00
OUTFLOW	0.00	132.00	215.00	243.00	268.00	290.00	311.00	330.00	347.00	365.00
ELEVATION	1560.70	1570.00	1580.00	1585.00	1590.00	1595.00	1600.00	1605.00	1610.00	1615.00
STORAGE	4000.00	6300.00	9400.00	13000.00	17500.00	23000.00	29200.00	37000.00	46000.00	
OUTFLOW	381.00	398.00	413.00	428.00	442.00	455.00	468.00	481.00	493.00	
ELEVATION	1620.00	1625.00	1630.00	1635.00	1640.00	1645.00	1650.00	1655.00	1660.00	

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HYDROGRAPH AT STATION CBD-O

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	0.0	1560.7	*	2		0100	301	401.	6892.0	1626.0	*	3		0200	601	399.	6421.0	1625.2
1		0005	2	0.	0.0	1560.7	*	2		0105	302	401.	6893.7	1626.0	*	3		0205	602	399.	6419.0	1625.2
1		0010	3	0.	0.0	1560.7	*	2		0110	303	401.	6895.4	1626.0	*	3		0210	603	399.	6417.0	1625.2
1		0015	4	0.	0.0	1560.7	*	2		0115	304	401.	6897.0	1626.0	*	3		0215	604	399.	6415.0	1625.2
1		0020	5	0.	0.0	1560.7	*	2		0120	305	401.	6898.6	1626.0	*	3		0220	605	399.	6413.0	1625.2
1		0025	6	0.	0.0	1560.7	*	2		0125	306	401.	6900.3	1626.0	*	3		0225	606	399.	6411.1	1625.2
1		0030	7	0.	0.0	1560.7	*	2		0130	307	401.	6902.0	1626.0	*	3		0230	607	399.	6409.1	1625.2
1		0035	8	0.	0.0	1560.7	*	2		0135	308	401.	6903.8	1626.0	*	3		0235	608	399.	6407.1	1625.2
1		0040	9	0.	0.0	1560.7	*	2		0140	309	401.	6905.4	1626.0	*	3		0240	609	399.	6405.1	1625.2
1		0045	10	0.	0.0	1560.7	*	2		0145	310	401.	6907.0	1626.0	*	3		0245	610	398.	6403.1	1625.2
1		0050	11	0.	0.0	1560.7	*	2		0150	311	401.	6908.5	1626.0	*	3		0250	611	398.	6401.2	1625.2
1		0055	12	0.	0.0	1560.7	*	2		0155	312	401.	6909.8	1626.0	*	3		0255	612	398.	6399.2	1625.2
1		0100	13	0.	0.0	1560.7	*	2		0200	313	401.	6911.1	1626.0	*	3		0300	613	398.	6397.2	1625.2
1		0105	14	0.	0.1	1560.7	*	2		0205	314	401.	6912.3	1626.0	*	3		0305	614	398.	6395.2	1625.2

1	0110	15	0.	0.1	1560.7	*	2	0210	315	401.	6913.3	1626.0	*	3	0310	615	398.	6393.2	1625.2
1	0115	16	0.	0.1	1560.7	*	2	0215	316	401.	6914.3	1626.0	*	3	0315	616	398.	6391.3	1625.1
1	0120	17	0.	0.1	1560.7	*	2	0220	317	401.	6915.2	1626.0	*	3	0320	617	398.	6389.3	1625.1
1	0125	18	0.	0.1	1560.7	*	2	0225	318	401.	6916.1	1626.0	*	3	0325	618	398.	6387.3	1625.1
1	0130	19	0.	0.2	1560.7	*	2	0230	319	401.	6916.8	1626.0	*	3	0330	619	398.	6385.3	1625.1
1	0135	20	0.	0.2	1560.7	*	2	0235	320	401.	6917.4	1626.0	*	3	0335	620	398.	6383.3	1625.1
1	0140	21	0.	0.2	1560.7	*	2	0240	321	401.	6917.9	1626.0	*	3	0340	621	398.	6381.4	1625.1
1	0145	22	0.	0.2	1560.7	*	2	0245	322	401.	6918.4	1626.0	*	3	0345	622	398.	6379.4	1625.1
1	0150	23	1.	0.3	1560.7	*	2	0250	323	401.	6918.7	1626.0	*	3	0350	623	398.	6377.4	1625.1
1	0155	24	1.	0.3	1560.7	*	2	0255	324	401.	6919.0	1626.0	*	3	0355	624	398.	6375.4	1625.1
1	0200	25	1.	0.3	1560.7	*	2	0300	325	401.	6919.2	1626.0	*	3	0400	625	398.	6373.4	1625.1
1	0205	26	1.	0.4	1560.8	*	2	0305	326	401.	6919.3	1626.0	*	3	0405	626	398.	6371.5	1625.1
1	0210	27	1.	0.4	1560.8	*	2	0310	327	401.	6919.4	1626.0	*	3	0410	627	398.	6369.5	1625.1
1	0215	28	1.	0.4	1560.8	*	2	0315	328	401.	6919.3	1626.0	*	3	0415	628	398.	6367.5	1625.1
1	0220	29	1.	0.5	1560.8	*	2	0320	329	401.	6919.2	1626.0	*	3	0420	629	398.	6365.5	1625.1
1	0225	30	1.	0.5	1560.8	*	2	0325	330	401.	6919.0	1626.0	*	3	0425	630	398.	6363.5	1625.1
1	0230	31	1.	0.5	1560.8	*	2	0330	331	401.	6918.7	1626.0	*	3	0430	631	398.	6361.6	1625.1
1	0235	32	1.	0.6	1560.8	*	2	0335	332	401.	6918.4	1626.0	*	3	0435	632	398.	6359.6	1625.1
1	0240	33	1.	0.6	1560.8	*	2	0340	333	401.	6918.0	1626.0	*	3	0440	633	398.	6357.6	1625.1
1	0245	34	1.	0.7	1560.8	*	2	0345	334	401.	6917.5	1626.0	*	3	0445	634	398.	6355.6	1625.1
1	0250	35	1.	0.7	1560.8	*	2	0350	335	401.	6917.0	1626.0	*	3	0450	635	398.	6353.7	1625.1
1	0255	36	1.	0.7	1560.8	*	2	0355	336	401.	6916.3	1626.0	*	3	0455	636	398.	6351.7	1625.1
1	0300	37	2.	0.8	1560.8	*	2	0400	337	401.	6915.7	1626.0	*	3	0500	637	398.	6349.7	1625.1
1	0305	38	2.	0.8	1560.8	*	2	0405	338	401.	6914.9	1626.0	*	3	0505	638	398.	6347.7	1625.1
1	0310	39	2.	0.9	1560.8	*	2	0410	339	401.	6914.1	1626.0	*	3	0510	639	398.	6345.7	1625.1
1	0315	40	2.	0.9	1560.8	*	2	0415	340	401.	6913.2	1626.0	*	3	0515	640	398.	6343.8	1625.1
1	0320	41	2.	1.0	1560.8	*	2	0420	341	401.	6912.3	1626.0	*	3	0520	641	398.	6341.8	1625.1
1	0325	42	2.	1.0	1560.8	*	2	0425	342	401.	6911.3	1626.0	*	3	0525	642	398.	6339.8	1625.1
1	0330	43	2.	1.0	1560.8	*	2	0430	343	401.	6910.2	1626.0	*	3	0530	643	398.	6337.8	1625.1
1	0335	44	2.	1.1	1560.8	*	2	0435	344	401.	6909.1	1626.0	*	3	0535	644	398.	6335.8	1625.1
1	0340	45	2.	1.1	1560.9	*	2	0440	345	401.	6907.9	1626.0	*	3	0540	645	398.	6333.9	1625.1
1	0345	46	2.	1.2	1560.9	*	2	0445	346	401.	6906.7	1626.0	*	3	0545	646	398.	6331.9	1625.1
1	0350	47	2.	1.2	1560.9	*	2	0450	347	401.	6905.5	1626.0	*	3	0550	647	398.	6329.9	1625.0
1	0355	48	2.	1.2	1560.9	*	2	0455	348	401.	6904.2	1626.0	*	3	0555	648	398.	6327.9	1625.0
1	0400	49	3.	1.3	1560.9	*	2	0500	349	401.	6902.9	1626.0	*	3	0600	649	398.	6326.0	1625.0
1	0405	50	3.	1.3	1560.9	*	2	0505	350	401.	6901.6	1626.0	*	3	0605	650	398.	6324.0	1625.0
1	0410	51	3.	1.4	1560.9	*	2	0510	351	401.	6900.3	1626.0	*	3	0610	651	398.	6322.0	1625.0
1	0415	52	3.	1.4	1560.9	*	2	0515	352	401.	6898.9	1626.0	*	3	0615	652	398.	6320.0	1625.0
1	0420	53	3.	1.5	1560.9	*	2	0520	353	401.	6897.5	1626.0	*	3	0620	653	398.	6318.0	1625.0
1	0425	54	3.	1.5	1560.9	*	2	0525	354	401.	6896.1	1626.0	*	3	0625	654	398.	6316.1	1625.0
1	0430	55	3.	1.6	1560.9	*	2	0530	355	401.	6894.7	1626.0	*	3	0630	655	398.	6314.1	1625.0
1	0435	56	3.	1.6	1560.9	*	2	0535	356	401.	6893.3	1626.0	*	3	0635	656	398.	6312.1	1625.0
1	0440	57	3.	1.7	1560.9	*	2	0540	357	401.	6891.8	1626.0	*	3	0640	657	398.	6310.1	1625.0
1	0445	58	3.	1.7	1560.9	*	2	0545	358	401.	6890.3	1626.0	*	3	0645	658	398.	6308.2	1625.0
1	0450	59	3.	1.8	1560.9	*	2	0550	359	401.	6888.9	1625.9	*	3	0650	659	398.	6306.2	1625.0
1	0455	60	4.	1.8	1561.0	*	2	0555	360	401.	6887.3	1625.9	*	3	0655	660	398.	6304.2	1625.0
1	0500	61	4.	1.9	1561.0	*	2	0600	361	401.	6885.8	1625.9	*	3	0700	661	398.	6302.2	1625.0
1	0505	62	4.	2.0	1561.0	*	2	0605	362	401.	6884.3	1625.9	*	3	0705	662	398.	6300.3	1625.0
1	0510	63	4.	2.0	1561.0	*	2	0610	363	401.	6882.7	1625.9	*	3	0710	663	398.	6298.3	1625.0
1	0515	64	4.	2.1	1561.0	*	2	0615	364	401.	6881.2	1625.9	*	3	0715	664	398.	6296.3	1625.0
1	0520	65	4.	2.1	1561.0	*	2	0620	365	401.	6879.6	1625.9	*	3	0720	665	398.	6294.3	1625.0
1	0525	66	4.	2.2	1561.0	*	2	0625	366	401.	6878.0	1625.9	*	3	0725	666	398.	6292.4	1625.0
1	0530	67	4.	2.3	1561.0	*	2	0630	367	401.	6876.4	1625.9	*	3	0730	667	398.	6290.4	1625.0
1	0535	68	5.	2.3	1561.0	*	2	0635	368	401.	6874.8	1625.9	*	3	0735	668	398.	6288.4	1625.0
1	0540	69	5.	2.4	1561.0	*	2	0640	369	401.	6873.2	1625.9	*	3	0740	669	398.	6286.4	1625.0
1	0545	70	5.	2.5	1561.0	*	2	0645	370	401.	6871.6	1625.9	*	3	0745	670	398.	6284.4	1625.0
1	0550	71	5.	2.6	1561.1	*	2	0650	371	401.	6870.0	1625.9	*	3	0750	671	398.	6282.5	1625.0
1	0555	72	5.	2.6	1561.1	*	2	0655	372	401.	6868.3	1625.9	*	3	0755	672	398.	6280.5	1625.0
1	0600	73	5.	2.7	1561.1	*	2	0700	373	401.	6866.7	1625.9	*	3	0800	673	398.	6278.5	1625.0
1	0605	74	5.	2.8	1561.1	*	2	0705	374	401.	6865.0	1625.9	*	3	0805	674	398.	6276.5	1624.9
1	0610	75	6.	2.9	1561.1	*	2	0710	375	401.	6863.4	1625.9	*	3	0810	675	398.	6274.6	1624.9
1	0615	76	6.	3.0	1561.1	*	2	0715	376	401.	6861.7	1625.9	*	3	0815	676	398.	6272.6	1624.9
1	0620	77	6.	3.1	1561.1	*	2	0720	377	401.	6860.0	1625.9	*	3	0820	677	398.	6270.6	1624.9
1	0625	78	6.	3.1	1561.1	*	2	0725	378	401.	6858.3	1625.9	*	3	0825	678	398.	6268.6	1624.9
1	0630	79	6.	3.2	1561.1	*	2	0730	379	401.	6856.6	1625.9	*	3	0830	679	398.	6266.7	1624.9
1	0635	80	7.	3.3	1561.2	*	2	0735	380	401.	6854.9	1625.9	*	3	0835	680	398.	6264.7	1624.9
1	0640	81	7.	3.4	1561.2	*	2	0740	381	401.	6853.1	1625.9	*	3	0840	681	398.	6262.7	1624.9
1	0645	82	7.	3.5	1561.2	*	2	0745	382	401.	6851.4	1625.9	*	3	0845	682	398.	6260.7	1624.9
1	0650	83	7.	3.7	1561.2	*	2	0750	383	401.	6849.6	1625.9	*	3	0850	683	398.	6258.8	1624.9
1	0655	84	7.	3.8	1561.2	*	2	0755	384	401.	6847.9	1625.9	*	3	0855	684	398.	6256.8	1624.9
1	0700	85	8.	3.9	1561.2	*	2	0800	385	401.	6846.1	1625.9	*	3	0900	685	398.	6254.8	1624.9
1	0705	86	8.	4.1	1561.3	*	2	0805	386	401.	6844.3	1625.9	*	3	0905	686	398.	6252.8	1624.9
1	0710	87	8.	4.2	1561.3	*	2	0810	387	401.	6842.6	1625.9	*	3	0910	687	398.	6250.9	1624.9
1	0715	88	9.	4.4	1561.3	*	2	0815	388	401.	6840.8	1625.9	*	3	0915	688	398.	6248.9	1624.9
1	0720	89	9.	4.6	1561.3	*	2	0820	389	401.	6839.0	1625.9	*	3	0920	689	398.	6246.9	1624.9
1	0725	90	9.	4.8	1561.4	*	2	0825	390	401.	6837.1	1625.9	*	3	0925	690	398.	6245.0	1624.9
1	0730	91	10.	5.0	1561.4	*	2	0830	391	401.	6835.3	1625.9	*	3	0930	691	398.	6243.0	1624.9
1	0735	92	10.	5.3	1561.4	*	2	0835	392	401.	6833.5	1625.9	*	3	0935	692	398.	6241.0	1624.9
1	0740	93	11.	5.5	1561.5	*	2	0840	393	401.	6831.6	1625.9	*	3	0940	693	398.	6239.0	1624.9
1	0745	94	11.	5.8	1561.5	*	2	0845	394	401.	6829.8	1625.9	*	3	0945	694	398.	6237.1	1624.9
1	0750	95	12.	6.1	1561.5	*	2	0850	395	401.	6827.9	1625.9	*	3	0950	695	398.	6235.1	1624.9
1	0755	96	12.	6.4	1561.6	*	2	0855	396	401.	6826.1	1625.8	*	3	0955	696	398.	6233.1	1624.9
1	0800	97	13.	6.7	1561.6	*	2	0900	397	401.	6824.2	1625.8	*	3	1000	697	397.	6231.1	1624.9
1	0805	98	14.	7.0	1561.7	*	2	0905	398	401.	6822.3	1625.8	*	3	1005	698	397.	6229.2	1624.8
1	0810	99	14.	7.4	1561.7	*	2	0910	399	401.	6820.4	1625.8	*	3	1010	699	397.	6227.2	1624.8
1	0815	100	15.	7.8	1561.8	*	2	0915	400	401.	6818.5	1625.8	*	3	1015	700	397.	6225.2	1624.8
1	0820	101	16.	8.2	1561.8	*	2	0920	401	400.	6816.7	1625.8	*	3	1020	701	397.	6223.2	1624.8
1	0825	102	17.	8.7	1561.9	*	2	0925	402	400.	6814.8	1625.8	*	3	1025	702	397.	6221.3	1624.8
1	0830	103	18.	9.1	1562.0	*	2	0930	403	400.	6812.9	1625.8	*	3	1030	703	397.	6219.3	1624.8
1	0835	104	19.	9.6	1562.0	*	2	0935	404	400.	6811.0	1625.8	*	3	1035	704	397.	6217.3	1624.8
1	0840	105	20.	10.1	1562.1	*	2	0940	405	400.	6809.1	1625.8	*	3	1040	705	397.	6215.4	1624.8
1	0845	106	21.	10.7	1562.2	*	2	0945	406	400.	6807.2	1625.8	*	3	1045	706	397.	6213.4	1624.8
1	0850	107	22.	11.2	1562.2	*	2	0950	407	400.	6805.3	1625.8	*	3	1050	707	397.	6211.4	1624.8
1	0855	108	23.	11.8	1562.3	*	2	0955	408	400.	6803.3	1625.8	*	3	1055	708	397.	6209.4	1624.8
1	0900	109	24.	12.4	1562.4	*	2	1000	409	400.	6801.4	1625.8	*	3	1100	709	397.	6207.5	1624.8

1	0905	110	25.	13.0	1562.5	*	2	1005	410	400.	6799.5	1625.8	*	3	1105	710	397.	6205.5	1624.8
1	0910	111	27.	13.6	1562.6	*	2	1010	411	400.	6797.6	1625.8	*	3	1110	711	397.	6203.5	1624.8
1	0915	112	28.	14.3	1562.7	*	2	1015	412	400.	6795.7	1625.8	*	3	1115	712	397.	6201.6	1624.8
1	0920	113	29.	14.9	1562.8	*	2	1020	413	400.	6793.7	1625.8	*	3	1120	713	397.	6199.6	1624.8
1	0925	114	30.	15.6	1562.8	*	2	1025	414	400.	6791.8	1625.8	*	3	1125	714	397.	6197.6	1624.8
1	0930	115	32.	16.4	1562.9	*	2	1030	415	400.	6789.9	1625.8	*	3	1130	715	397.	6195.6	1624.8
1	0935	116	33.	17.1	1563.0	*	2	1035	416	400.	6787.9	1625.8	*	3	1135	716	397.	6193.7	1624.8
1	0940	117	35.	17.8	1563.1	*	2	1040	417	400.	6786.0	1625.8	*	3	1140	717	397.	6191.7	1624.8
1	0945	118	36.	18.6	1563.3	*	2	1045	418	400.	6784.1	1625.8	*	3	1145	718	397.	6189.7	1624.8
1	0950	119	38.	19.4	1563.4	*	2	1050	419	400.	6782.1	1625.8	*	3	1150	719	397.	6187.8	1624.8
1	0955	120	39.	20.2	1563.5	*	2	1055	420	400.	6780.2	1625.8	*	3	1155	720	397.	6185.8	1624.8
1	1000	121	41.	21.0	1563.6	*	2	1100	421	400.	6778.2	1625.8	*	3	1200	721	397.	6183.8	1624.7
1	1005	122	42.	21.8	1563.7	*	2	1105	422	400.	6776.2	1625.8	*	3	1205	722	397.	6181.8	1624.7
1	1010	123	44.	22.6	1563.8	*	2	1110	423	400.	6774.3	1625.8	*	3	1210	723	397.	6179.9	1624.7
1	1015	124	46.	23.4	1563.9	*	2	1115	424	400.	6772.3	1625.8	*	3	1215	724	397.	6177.9	1624.7
1	1020	125	47.	24.3	1564.0	*	2	1120	425	400.	6770.4	1625.8	*	3	1220	725	397.	6175.9	1624.7
1	1025	126	49.	25.1	1564.1	*	2	1125	426	400.	6768.4	1625.8	*	3	1225	726	397.	6174.0	1624.7
1	1030	127	51.	26.0	1564.3	*	2	1130	427	400.	6766.4	1625.8	*	3	1230	727	397.	6172.0	1624.7
1	1035	128	52.	26.9	1564.4	*	2	1135	428	400.	6764.5	1625.7	*	3	1235	728	397.	6170.0	1624.7
1	1040	129	54.	27.8	1564.5	*	2	1140	429	400.	6762.5	1625.7	*	3	1240	729	397.	6168.1	1624.7
1	1045	130	56.	28.8	1564.6	*	2	1145	430	400.	6760.5	1625.7	*	3	1245	730	397.	6166.1	1624.7
1	1050	131	58.	29.9	1564.8	*	2	1150	431	400.	6758.5	1625.7	*	3	1250	731	397.	6164.1	1624.7
1	1055	132	61.	31.5	1565.0	*	2	1155	432	400.	6756.6	1625.7	*	3	1255	732	397.	6162.1	1624.7
1	1100	133	66.	33.7	1565.3	*	2	1200	433	400.	6754.6	1625.7	*	3	1300	733	397.	6160.2	1624.7
1	1105	134	72.	37.2	1565.8	*	2	1205	434	400.	6752.6	1625.7	*	3	1305	734	397.	6158.2	1624.7
1	1110	135	82.	42.1	1566.5	*	2	1210	435	400.	6750.6	1625.7	*	3	1310	735	397.	6156.2	1624.7
1	1115	136	94.	48.3	1567.3	*	2	1215	436	400.	6748.6	1625.7	*	3	1315	736	397.	6154.3	1624.7
1	1120	137	108.	55.6	1568.3	*	2	1220	437	400.	6746.6	1625.7	*	3	1320	737	397.	6152.3	1624.7
1	1125	138	123.	63.2	1569.4	*	2	1225	438	400.	6744.7	1625.7	*	3	1325	738	397.	6150.3	1624.7
1	1130	139	135.	70.5	1570.4	*	2	1230	439	400.	6742.7	1625.7	*	3	1330	739	397.	6148.4	1624.7
1	1135	140	143.	77.5	1571.3	*	2	1235	440	400.	6740.7	1625.7	*	3	1335	740	397.	6146.4	1624.7
1	1140	141	151.	84.2	1572.3	*	2	1240	441	400.	6738.7	1625.7	*	3	1340	741	397.	6144.4	1624.7
1	1145	142	158.	90.8	1573.2	*	2	1245	442	400.	6736.7	1625.7	*	3	1345	742	397.	6142.5	1624.7
1	1150	143	166.	97.3	1574.1	*	2	1250	443	400.	6734.7	1625.7	*	3	1350	743	397.	6140.5	1624.7
1	1155	144	173.	104.1	1575.0	*	2	1255	444	400.	6732.7	1625.7	*	3	1355	744	397.	6138.5	1624.6
1	1200	145	182.	111.4	1576.0	*	2	1300	445	400.	6730.7	1625.7	*	3	1400	745	397.	6136.5	1624.6
1	1205	146	191.	119.5	1577.1	*	2	1305	446	400.	6728.7	1625.7	*	3	1405	746	397.	6134.6	1624.6
1	1210	147	201.	128.7	1578.4	*	2	1310	447	400.	6726.8	1625.7	*	3	1410	747	397.	6132.6	1624.6
1	1215	148	214.	139.5	1579.8	*	2	1315	448	400.	6724.8	1625.7	*	3	1415	748	397.	6130.6	1624.6
1	1220	149	224.	152.6	1581.6	*	2	1320	449	400.	6722.8	1625.7	*	3	1420	749	397.	6128.7	1624.6
1	1225	150	237.	168.7	1583.8	*	2	1325	450	400.	6720.8	1625.7	*	3	1425	750	397.	6126.7	1624.6
1	1230	151	251.	188.2	1586.5	*	2	1330	451	400.	6718.8	1625.7	*	3	1430	751	397.	6124.7	1624.6
1	1235	152	266.	211.2	1589.7	*	2	1335	452	400.	6716.8	1625.7	*	3	1435	752	397.	6122.8	1624.6
1	1240	153	282.	237.4	1593.3	*	2	1340	453	400.	6714.8	1625.7	*	3	1440	753	397.	6120.8	1624.6
1	1245	154	291.	266.1	1595.2	*	2	1345	454	400.	6712.8	1625.7	*	3	1445	754	397.	6118.8	1624.6
1	1250	155	292.	296.6	1595.5	*	2	1350	455	400.	6710.8	1625.7	*	3	1450	755	397.	6116.9	1624.6
1	1255	156	294.	328.2	1595.9	*	2	1355	456	400.	6708.8	1625.7	*	3	1455	756	397.	6114.9	1624.6
1	1300	157	295.	360.7	1596.2	*	2	1400	457	400.	6706.8	1625.7	*	3	1500	757	397.	6112.9	1624.6
1	1305	158	297.	395.7	1596.6	*	2	1405	458	400.	6704.9	1625.7	*	3	1505	758	397.	6111.0	1624.6
1	1310	159	299.	434.6	1597.1	*	2	1410	459	400.	6702.9	1625.6	*	3	1510	759	397.	6109.0	1624.6
1	1315	160	301.	477.9	1597.5	*	2	1415	460	400.	6700.9	1625.6	*	3	1515	760	397.	6107.0	1624.6
1	1320	161	303.	526.5	1598.1	*	2	1420	461	400.	6698.9	1625.6	*	3	1520	761	397.	6105.1	1624.6
1	1325	162	305.	581.4	1598.7	*	2	1425	462	400.	6696.9	1625.6	*	3	1525	762	397.	6103.1	1624.6
1	1330	163	308.	644.3	1599.4	*	2	1430	463	400.	6694.9	1625.6	*	3	1530	763	397.	6101.1	1624.6
1	1335	164	312.	717.7	1600.2	*	2	1435	464	400.	6692.9	1625.6	*	3	1535	764	397.	6099.2	1624.6
1	1340	165	316.	803.0	1601.3	*	2	1440	465	400.	6690.9	1625.6	*	3	1540	765	397.	6097.2	1624.6
1	1345	166	320.	900.0	1602.5	*	2	1445	466	400.	6688.9	1625.6	*	3	1545	766	396.	6095.2	1624.6
1	1350	167	326.	1007.3	1603.8	*	2	1450	467	400.	6686.9	1625.6	*	3	1550	767	396.	6093.3	1624.6
1	1355	168	331.	1124.6	1605.2	*	2	1455	468	400.	6685.0	1625.6	*	3	1555	768	396.	6091.3	1624.5
1	1400	169	334.	1250.9	1606.1	*	2	1500	469	400.	6683.0	1625.6	*	3	1600	769	396.	6089.3	1624.5
1	1405	170	337.	1384.3	1607.0	*	2	1505	470	400.	6681.0	1625.6	*	3	1605	770	396.	6087.4	1624.5
1	1410	171	340.	1522.1	1608.0	*	2	1510	471	400.	6679.0	1625.6	*	3	1610	771	396.	6085.4	1624.5
1	1415	172	344.	1662.5	1609.0	*	2	1515	472	400.	6677.0	1625.6	*	3	1615	772	396.	6083.4	1624.5
1	1420	173	347.	1803.7	1610.0	*	2	1520	473	400.	6675.0	1625.6	*	3	1620	773	396.	6081.5	1624.5
1	1425	174	350.	1944.8	1610.9	*	2	1525	474	400.	6673.0	1625.6	*	3	1625	774	396.	6079.5	1624.5
1	1430	175	353.	2084.8	1611.8	*	2	1530	475	400.	6671.0	1625.6	*	3	1630	775	396.	6077.5	1624.5
1	1435	176	357.	2223.8	1612.6	*	2	1535	476	400.	6669.0	1625.6	*	3	1635	776	396.	6075.6	1624.5
1	1440	177	360.	2361.8	1613.5	*	2	1540	477	400.	6667.1	1625.6	*	3	1640	777	396.	6073.6	1624.5
1	1445	178	363.	2498.1	1614.4	*	2	1545	478	400.	6665.1	1625.6	*	3	1645	778	396.	6071.6	1624.5
1	1450	179	365.	2632.5	1615.1	*	2	1550	479	400.	6663.1	1625.6	*	3	1650	779	396.	6069.7	1624.5
1	1455	180	367.	2764.2	1615.6	*	2	1555	480	400.	6661.1	1625.6	*	3	1655	780	396.	6067.7	1624.5
1	1500	181	368.	2892.6	1616.0	*	2	1600	481	400.	6659.1	1625.6	*	3	1700	781	396.	6065.8	1624.5
1	1505	182	370.	3017.6	1616.5	*	2	1605	482	400.	6657.1	1625.6	*	3	1705	782	396.	6063.8	1624.5
1	1510	183	371.	3139.2	1616.9	*	2	1610	483	400.	6655.1	1625.6	*	3	1710	783	396.	6061.8	1624.5
1	1515	184	373.	3257.7	1617.3	*	2	1615	484	400.	6653.1	1625.6	*	3	1715	784	396.	6059.9	1624.5
1	1520	185	374.	3373.1	1617.8	*	2	1620	485	400.	6651.1	1625.6	*	3	1720	785	396.	6057.9	1624.5
1	1525	186	375.	3485.6	1618.2	*	2	1625	486	400.	6649.2	1625.6	*	3	1725	786	396.	6055.9	1624.5
1	1530	187	376.	3595.2	1618.6	*	2	1630	487	400.	6647.2	1625.6	*	3	1730	787	396.	6054.0	1624.5
1	1535	188	378.	3702.3	1618.9	*	2	1635	488	400.	6645.2	1625.6	*	3	1735	788	396.	6052.0	1624.5
1	1540	189	379.	3806.9	1619.3	*	2	1640	489	400.	6643.2	1625.6	*	3	1740	789	396.	6050.0	1624.5
1	1545	190	380.	3909.2	1619.7	*	2	1645	490	400.	6641.2	1625.6	*	3	1745	790	396.	6048.1	1624.5
1	1550	191	381.	4009.3	1620.0	*	2	1650	491	400.	6639.2	1625.5	*	3	1750	791	396.	6046.1	1624.4
1	1555	192	382.	4107.2	1620.2	*	2	1655	492	400.	6637.2	1625.5	*	3	1755	792	396.	6044.1	1624.4
1	1600	193	383.	4203.0	1620.4	*	2	1700	493	400.	6635.2	1625.5	*	3	1800	793	396.	6042.2	1624.4
1	1605	194	383.	4296.6	1620.6	*	2	1705	494	400.	6633.3	1625.5	*	3	1805	794	396.	6040.2	1624.4
1	1610	195	384.	4387.9	1620.8	*	2	1710	495	400.	6631.3	1625.5	*	3	1810	795	396.	6038.3	1624.4
1	1615	196	385.	4477.0	1621.0	*	2	1715	496	400.	6629.3	1625.5	*	3	1815	796	396.	6036.3	1624.4
1	1620	197	385.	4563.7	1621.2	*	2	1720	497	400.	6627.3	1625.5	*	3	1820	797	396.	6034.3	1624.4
1	1625	198	386.	4647.9	1621.4	*	2	1725	498	400.	6625.3	1625.5	*	3	1825	798	396.	6032.4	1624.4
1	1630	199	386.	4729.5	1621.6	*	2	1730	499	400.	6623.3	1625.5	*	3	1830	799	396.	6030.4	1624.4
1	1635	200	387.	4808.5	1621.8	*	2	1735	500	400.	6621.3	1625.5	*	3	1835	800	396.	6028.4	1624.4
1	1640	201	388.	4885.0	1621.9	*	2	1740	501	400.	6619.3	1625.5	*	3	1840	801	396.	6026.5	1624.4
1	1645	202	388.	4958.9	1622.1	*	2	1745	502	400.	6617.4	1625.5	*	3	1845	802	396.	6024.5	1624.4
1	1650	203	389.	5030.3	1622.2	*	2	1750	503	400.	6615.4	1625.5	*	3	1850	803	396.	6022.6	1624.4
1	1655	204	389.	5099.5	1622.4	*	2	1755	504	400.	6613.4	1625.5	*	3	1855	804	396.	6020.6	1624.4

1	1700	205	390.	5166.4	1622.5	*	2	1800	505	400.	6611.4	1625.5	*	3	1900	805	396.	6018.6	1624.4
1	1705	206	390.	5231.0	1622.7	*	2	1805	506	399.	6609.4	1625.5	*	3	1905	806	396.	6016.7	1624.4
1	1710	207	391.	5293.3	1622.8	*	2	1810	507	399.	6607.4	1625.5	*	3	1910	807	396.	6014.7	1624.4
1	1715	208	391.	5353.4	1622.9	*	2	1815	508	399.	6605.4	1625.5	*	3	1915	808	396.	6012.7	1624.4
1	1720	209	391.	5411.1	1623.1	*	2	1820	509	399.	6603.4	1625.5	*	3	1920	809	396.	6010.8	1624.4
1	1725	210	392.	5466.6	1623.2	*	2	1825	510	399.	6601.5	1625.5	*	3	1925	810	396.	6008.8	1624.4
1	1730	211	392.	5519.7	1623.3	*	2	1830	511	399.	6599.5	1625.5	*	3	1930	811	396.	6006.9	1624.4
1	1735	212	393.	5570.6	1623.4	*	2	1835	512	399.	6597.5	1625.5	*	3	1935	812	396.	6004.9	1624.4
1	1740	213	393.	5619.5	1623.5	*	2	1840	513	399.	6595.5	1625.5	*	3	1940	813	396.	6002.9	1624.4
1	1745	214	393.	5666.6	1623.6	*	2	1845	514	399.	6593.5	1625.5	*	3	1945	814	396.	6001.0	1624.3
1	1750	215	394.	5712.1	1623.7	*	2	1850	515	399.	6591.5	1625.5	*	3	1950	815	396.	5999.0	1624.3
1	1755	216	394.	5756.1	1623.8	*	2	1855	516	399.	6589.5	1625.5	*	3	1955	816	396.	5997.1	1624.3
1	1800	217	394.	5798.7	1623.9	*	2	1900	517	399.	6587.6	1625.5	*	3	2000	817	396.	5995.1	1624.3
1	1805	218	395.	5839.9	1624.0	*	2	1905	518	399.	6585.6	1625.5	*	3	2005	818	396.	5993.1	1624.3
1	1810	219	395.	5879.5	1624.1	*	2	1910	519	399.	6583.6	1625.5	*	3	2010	819	396.	5991.2	1624.3
1	1815	220	395.	5917.5	1624.2	*	2	1915	520	399.	6581.6	1625.5	*	3	2015	820	396.	5989.2	1624.3
1	1820	221	395.	5954.1	1624.2	*	2	1920	521	399.	6579.6	1625.5	*	3	2020	821	396.	5987.2	1624.3
1	1825	222	396.	5989.1	1624.3	*	2	1925	522	399.	6577.6	1625.4	*	3	2025	822	396.	5985.3	1624.3
1	1830	223	396.	6022.6	1624.4	*	2	1930	523	399.	6575.6	1625.4	*	3	2030	823	396.	5983.3	1624.3
1	1835	224	396.	6054.8	1624.5	*	2	1935	524	399.	6573.7	1625.4	*	3	2035	824	396.	5981.4	1624.3
1	1840	225	396.	6085.7	1624.5	*	2	1940	525	399.	6571.7	1625.4	*	3	2040	825	396.	5979.4	1624.3
1	1845	226	397.	6115.3	1624.6	*	2	1945	526	399.	6569.7	1625.4	*	3	2045	826	396.	5977.4	1624.3
1	1850	227	397.	6143.9	1624.7	*	2	1950	527	399.	6567.7	1625.4	*	3	2050	827	396.	5975.5	1624.3
1	1855	228	397.	6171.5	1624.7	*	2	1955	528	399.	6565.7	1625.4	*	3	2055	828	396.	5973.5	1624.3
1	1900	229	397.	6198.3	1624.8	*	2	2000	529	399.	6563.7	1625.4	*	3	2100	829	396.	5971.6	1624.3
1	1905	230	397.	6224.3	1624.8	*	2	2005	530	399.	6561.7	1625.4	*	3	2105	830	396.	5969.6	1624.3
1	1910	231	398.	6249.7	1624.9	*	2	2010	531	399.	6559.8	1625.4	*	3	2110	831	396.	5967.6	1624.3
1	1915	232	398.	6274.6	1624.9	*	2	2015	532	399.	6557.8	1625.4	*	3	2115	832	396.	5965.7	1624.3
1	1920	233	398.	6298.7	1625.0	*	2	2020	533	399.	6555.8	1625.4	*	3	2120	833	396.	5963.7	1624.3
1	1925	234	398.	6322.1	1625.0	*	2	2025	534	399.	6553.8	1625.4	*	3	2125	834	396.	5961.8	1624.3
1	1930	235	398.	6344.8	1625.1	*	2	2030	535	399.	6551.8	1625.4	*	3	2130	835	395.	5959.8	1624.3
1	1935	236	398.	6366.7	1625.1	*	2	2035	536	399.	6549.8	1625.4	*	3	2135	836	395.	5957.8	1624.3
1	1940	237	398.	6387.8	1625.1	*	2	2040	537	399.	6547.8	1625.4	*	3	2140	837	395.	5955.9	1624.3
1	1945	238	399.	6408.3	1625.2	*	2	2045	538	399.	6545.9	1625.4	*	3	2145	838	395.	5953.9	1624.2
1	1950	239	399.	6428.0	1625.2	*	2	2050	539	399.	6543.9	1625.4	*	3	2150	839	395.	5952.0	1624.2
1	1955	240	399.	6447.2	1625.2	*	2	2055	540	399.	6541.9	1625.4	*	3	2155	840	395.	5950.0	1624.2
1	2000	241	399.	6465.8	1625.3	*	2	2100	541	399.	6539.9	1625.4	*	3	2200	841	395.	5948.1	1624.2
1	2005	242	399.	6483.9	1625.3	*	2	2105	542	399.	6537.9	1625.4	*	3	2205	842	395.	5946.1	1624.2
1	2010	243	399.	6501.5	1625.3	*	2	2110	543	399.	6535.9	1625.4	*	3	2210	843	395.	5944.1	1624.2
1	2015	244	399.	6518.6	1625.4	*	2	2115	544	399.	6534.0	1625.4	*	3	2215	844	395.	5942.2	1624.2
1	2020	245	399.	6535.0	1625.4	*	2	2120	545	399.	6532.0	1625.4	*	3	2220	845	395.	5940.2	1624.2
1	2025	246	399.	6550.9	1625.4	*	2	2125	546	399.	6530.0	1625.4	*	3	2225	846	395.	5938.3	1624.2
1	2030	247	399.	6566.0	1625.4	*	2	2130	547	399.	6528.0	1625.4	*	3	2230	847	395.	5936.3	1624.2
1	2035	248	399.	6580.5	1625.5	*	2	2135	548	399.	6526.0	1625.4	*	3	2235	848	395.	5934.3	1624.2
1	2040	249	399.	6594.4	1625.5	*	2	2140	549	399.	6524.0	1625.4	*	3	2240	849	395.	5932.4	1624.2
1	2045	250	399.	6607.8	1625.5	*	2	2145	550	399.	6522.1	1625.4	*	3	2245	850	395.	5930.4	1624.2
1	2050	251	400.	6620.6	1625.5	*	2	2150	551	399.	6520.1	1625.4	*	3	2250	851	395.	5928.5	1624.2
1	2055	252	400.	6632.8	1625.5	*	2	2155	552	399.	6518.1	1625.4	*	3	2255	852	395.	5926.5	1624.2
1	2100	253	400.	6644.5	1625.6	*	2	2200	553	399.	6516.1	1625.3	*	3	2300	853	395.	5924.6	1624.2
1	2105	254	400.	6655.7	1625.6	*	2	2205	554	399.	6514.1	1625.3	*	3	2305	854	395.	5922.6	1624.2
1	2110	255	400.	6666.4	1625.6	*	2	2210	555	399.	6512.1	1625.3	*	3	2310	855	395.	5920.6	1624.2
1	2115	256	400.	6676.4	1625.6	*	2	2215	556	399.	6510.1	1625.3	*	3	2315	856	395.	5918.7	1624.2
1	2120	257	400.	6685.9	1625.6	*	2	2220	557	399.	6508.2	1625.3	*	3	2320	857	395.	5916.7	1624.2
1	2125	258	400.	6694.5	1625.6	*	2	2225	558	399.	6506.2	1625.3	*	3	2325	858	395.	5914.8	1624.2
1	2130	259	400.	6702.2	1625.6	*	2	2230	559	399.	6504.2	1625.3	*	3	2330	859	395.	5912.8	1624.2
1	2135	260	400.	6709.1	1625.7	*	2	2235	560	399.	6502.2	1625.3	*	3	2335	860	395.	5910.9	1624.2
1	2140	261	400.	6715.4	1625.7	*	2	2240	561	399.	6500.2	1625.3	*	3	2340	861	395.	5908.9	1624.1
1	2145	262	400.	6721.3	1625.7	*	2	2245	562	399.	6498.2	1625.3	*	3	2345	862	395.	5906.9	1624.1
1	2150	263	400.	6727.1	1625.7	*	2	2250	563	399.	6496.3	1625.3	*	3	2350	863	395.	5905.0	1624.1
1	2155	264	400.	6732.8	1625.7	*	2	2255	564	399.	6494.3	1625.3	*	3	2355	864	395.	5903.0	1624.1
1	2200	265	400.	6738.4	1625.7	*	2	2300	565	399.	6492.3	1625.3	*	4	0000	865	395.	5901.1	1624.1
1	2205	266	400.	6744.1	1625.7	*	2	2305	566	399.	6490.3	1625.3	*	4	0005	866	395.	5899.1	1624.1
1	2210	267	400.	6749.7	1625.7	*	2	2310	567	399.	6488.3	1625.3	*	4	0010	867	395.	5897.2	1624.1
1	2215	268	400.	6755.3	1625.7	*	2	2315	568	399.	6486.3	1625.3	*	4	0015	868	395.	5895.2	1624.1
1	2220	269	400.	6760.9	1625.7	*	2	2320	569	399.	6484.4	1625.3	*	4	0020	869	395.	5893.3	1624.1
1	2225	270	400.	6766.4	1625.8	*	2	2325	570	399.	6482.4	1625.3	*	4	0025	870	395.	5891.3	1624.1
1	2230	271	400.	6771.9	1625.8	*	2	2330	571	399.	6480.4	1625.3	*	4	0030	871	395.	5889.3	1624.1
1	2235	272	400.	6777.3	1625.8	*	2	2335	572	399.	6478.4	1625.3	*	4	0035	872	395.	5887.4	1624.1
1	2240	273	400.	6782.6	1625.8	*	2	2340	573	399.	6476.4	1625.3	*	4	0040	873	395.	5885.4	1624.1
1	2245	274	400.	6787.8	1625.8	*	2	2345	574	399.	6474.5	1625.3	*	4	0045	874	395.	5883.5	1624.1
1	2250	275	400.	6792.9	1625.8	*	2	2350	575	399.	6472.5	1625.3	*	4	0050	875	395.	5881.5	1624.1
1	2255	276	400.	6798.0	1625.8	*	2	2355	576	399.	6470.5	1625.3	*	4	0055	876	395.	5879.6	1624.1
1	2300	277	400.	6803.0	1625.8	*	3	0000	577	399.	6468.5	1625.3	*	4	0100	877	395.	5877.6	1624.1
1	2305	278	400.	6807.9	1625.8	*	3	0005	578	399.	6466.5	1625.3	*	4	0105	878	395.	5875.7	1624.1
1	2310	279	400.	6812.8	1625.8	*	3	0010	579	399.	6464.5	1625.3	*	4	0110	879	395.	5873.7	1624.1
1	2315	280	401.	6817.7	1625.8	*	3	0015	580	399.	6462.6	1625.3	*	4	0115	880	395.	5871.7	1624.1
1	2320	281	401.	6822.6	1625.8	*	3	0020	581	399.	6460.6	1625.3	*	4	0120	881	395.	5869.8	1624.1
1	2325	282	401.	6827.6	1625.9	*	3	0025	582	399.	6458.6	1625.3	*	4	0125	882	395.	5867.8	1624.1
1	2330	283	401.	6832.5	1625.9	*	3	0030	583	399.	6456.6	1625.3	*	4	0130	883	395.	5865.9	1624.1
1	2335	284	401.	6837.4	1625.9	*	3	0035	584	399.	6454.6	1625.2	*	4	0135	884	395.	5863.9	1624.1
1	2340	285	401.	6842.1	1625.9	*	3	0040	585	399.	6452.7	1625.2	*	4	0140	885	395.	5862.0	1624.0
1	2345	286	401.	6846.6	1625.9	*	3	0045	586	399.	6450.7	1625.2	*	4	0145	886	395.	5860.0	1624.0
1	2350	287	401.	6850.9	1625.9	*	3	0050	587	399.	6448.7	1625.2	*	4	0150	887	395.	5858.1	1624.0
1	2355	288	401.	6854.9	1625.9	*	3	0055	588	399.	6446.7	1625.2	*	4	0155	888	395.	5856.1	1624.0
2	0000	289	401.	6858.8	1625.9	*	3	0100	589	399.	6444.7	1625.2	*	4	0200	889	395.	5854.2	1624.0
2	0005	290	401.	6862.4	1625.9	*	3	0105	590	399.	6442.7	1625.2	*	4	0205	890	395.	5852.2	1624.0
2	0010	291	401.	6865.9	1625.9	*	3	0110	591	399.	6440.8	1625.2	*	4	0210	891	395.	5850.2	1624.0
2	0015	292	401.	6869.2	1625.9	*	3	0115	592	399.	6438.8	1625.2	*	4	0215	892	395.	5848.3	1624.0
2	0020	293	401.	6872.3	1625.9	*	3	0120	593	399.	6436.8	1625.2	*	4	0220	893	395.	5846.3	1624.0
2	0025	294	401.	6875.3	1625.9	*	3	0125	594	399.	6434.8	1625.2	*	4	0225	894	395.	5844.4	1624.0
2	0030	295	401.	6878.2	1625.9	*	3	0130	595	399.	6432.8	1625.2	*	4	0230	895	395.	5842.4	1624.0
2	0035	296	401.	6880.9	1625.9	*	3	0135	596	399.	6430.9	1625.2	*	4	0235	896	395.	5840.5	1624.0
2	0040	297	401.	6883.4	1625.9	*	3	0140	597	399.	6428.9	1625.2	*	4	0240	897	395.	5838.5	1624.0
2	0045	298	401.	6885.8	1625.9	*	3	0145	598	399.	6426.9	1625.2	*	4	0245	898	395.	5836.6	1624.0
2	0050	299	401.	6888.0	1625.9	*	3	0150	599	399.	6424.9	1625.2	*	4	0250	899	395.	5834.6	1624.0

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  2     0055 300     401.   6890.1  1626.0 *  3     0155 600     399.   6422.9  1625.2 *  4     0255 900     395.   5832.7  1624.0
                                            *                                            *
 ***********************************************************************************************************************************

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR      74.92-HR
+   (CFS)       (HR)
                                   (CFS)
+     401.      27.08                   401.        400.        347.        334.
                              (INCHES)  0.020       0.078       0.204       0.204
                              (AC-FT)   199.        794.       2066.       2066.

 PEAK STORAGE   TIME                              MAXIMUM AVERAGE STORAGE
                                          6-HR       24-HR       72-HR      74.92-HR
+  (AC-FT)      (HR)
    6919.      27.17                   6904.       6771.       5325.       5117.

  PEAK STAGE    TIME                                MAXIMUM AVERAGE STAGE
                                          6-HR       24-HR       72-HR      74.92-HR
+   (FEET)      (HR)
  1626.00      27.17                  1625.97     1625.76     1616.06     1613.91

                              CUMULATIVE AREA =  189.89 SQ MI

1
                                                   RUNOFF SUMMARY
                                              FLOW IN CUBIC FEET PER SECOND
                                           TIME IN HOURS,  AREA IN SQUARE MILES

                                          PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM    TIME OF
          OPERATION        STATION       FLOW    PEAK                                           AREA      STAGE     MAX STAGE
+                                                            6-HOUR     24-HOUR     72-HOUR

          HYDROGRAPH AT
+                             CC        18073.   14.42      10339.      3031.       1012.     142.29

          HYDROGRAPH AT
+                             AW         3120.   13.67       1423.       580.        249.      30.64

          HYDROGRAPH AT
+                            EAST        2268.   13.00        680.       179.         66.      16.96

          3 COMBINED AT
+                           CBD-I       20872.   14.33      12161.      3779.       1327.     189.89

          ROUTED TO
+                           CBD-O         401.   27.08        401.       400.        347.     189.89
+                                                                                                        1626.00      27.17

*** NORMAL END OF HEC-1 ***
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1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY  1991               *
*            VERSION 4.0.1E            *
*     Lahey F77L-EM/32 version 5.01    *
*       Dodson & Associates, Inc.      *
*  RUN DATE  07/23/99  TIME  15:35:58  *
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*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET         *
*       DAVIS, CALIFORNIA 95616     *
*           (916) 551-1748          *
*                                   *
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                    HEC-1 INPUT                                    PAGE  1

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

    1           ID        Upper Cave Creek/Apache Wash Watercourse Master Plan  File: FUCBD100.IH1
    2           ID           By: Stantec Consulting, Inc.                  Original: 07/23/99
    3           ID         For: Flood Control District of Maricopa County   Revised:
    4           ID
    5           ID        This is a future condition model of the total inflow to Cave Buttes Dam
    6           ID        Inflow hydrographs for Cave Creek and Apache Wash are developed from the
    7           ID        following:
    8           ID
    9           ID        Cave Creek Watershed at Cave Buttes Dam
   10           ID           Combined HEC-1 models from:
   11           ID              1.  George V. Sabol Consulting Engineers FCD 95-28
   12           ID                  Cave Creek Watershed at the Carefree Highway
   13           ID                  Original model dated 06-17-96 by mcg
   14           ID                  GVSCE Project No. 84
   15           ID
   16           ID              2.  Willdan Associates FCD 95-30
   17           ID                  Cave Creek Watershed from Carefree Highway to Cave Buttes Dam
   18           ID                  Original model dated 11-29-96
   19           ID                  Willdan Project No. 08855
   20           ID
   21           ID        Model Basis:
   22           ID           100-year, 24-hr rainfall with SCS Type II distribution
   23           ID           Green & Ampt Loss Rate Method
   24           ID           NMIN = 5
   25           ID           Phoenix Mountain and Desert/Rangeland S-Graph
   26           ID           Clark Unit Hydrograph
   27           ID           Modified Puls channel storage routing
   28           ID           200 Scale 2' CI mapping of study reach by Aerial Mapping Company
   29           ID
   30           ID        Apache Wash Watershed at Cave Buttes Dam
   31           ID           Jerry Jones and Associates, Inc. FCD 89-66
   32           ID           Apache Wash Flood Insurance Study
   33           ID           Original model dated 2-15-89
   34           ID
   35           ID        Model Basis:
   36           ID           100-year, 24-hr rainfall with SCS Type IIA distribution
   37           ID           SCS Curve Number with RTIMP
   38           ID           NMIN = 10
   39           ID           SCS dimensionless unit hydrograph
   40           ID
   41           ID
   42           ID        The remaining portion of the Cave Buttes Dam watershed is modeled as a
   43           ID        single basin for existing conditions and is based on the following:
   44           ID           100-year, 24-hour rainfall with SCS Type II distribution
   45           ID           Green & Ampt Loss Rate Method
   46           ID           NMIN = 5
   47           ID           Phoenix Mountain and Desert/Rangeland S-Graph
   48           ID           USGS 7.5 Minutes Series Quadrangle Maps
   49           ID
                *
   50           IT       5                    900
   51           IO       5
   52           IN       5
                *
1                                    HEC-1 INPUT                                    PAGE  2

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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```
 53          KK      CC
 54          KM        Inflow hydrograph at Cave Buttes Dam from Cave Creek
 55          BA  142.29
 56          QI       0       0       0       0       0       0       0       0       0       1
 57          QI       1       1       2       2       2       3       3       3       4       4
 58          QI       5       5       6       6       7       7       8       8       9      10
 59          QI      10      11      12      12      13      13      14      15      15      16
 60          QI      17      17      18      19      20      22      24      26      28      31
 61          QI      34      37      40      44      49      54      59      64      71      82
 62          QI      93     104     117     132     150     168     184     198     211     222
 63          QI     232     241     250     258     266     274     282     290     297     305
 64          QI     316     327     337     346     354     362     369     377     386     394
 65          QI     403     411     420     428     436     444     451     458     465     472
 66          QI     478     485     491     498     505     511     518     526     533     540
 67          QI     548     556     565     574     584     596     607     618     630     642
 68          QI     654     667     680     693     707     721     735     750     766     783
 69          QI     801     818     836     855     875     897     922     950     981    1016
 70          QI    1056    1103    1161    1246    1372    1556    1808    2104    2451    2833
 71          QI    3202    3520    3812    4128    4514    5045    5798    7062    9134   11787
 72          QI   15207   19790   24372   28778   32750   35883   38162   39745   40696   41186
 73          QI   41338   41232   40921   40437   39807   39055   38209   37294   36341   35380
 74          QI   34375   33320   32229   31131   30053   29023   28016   26996   25982   24991
 75          QI   24047   23199   22365   21513   20662   19830   18996   18242   17554   16865
 76          QI   16169   15494   14840   14216   13659   13142   12626   12140   11634   11137
 77          QI   10664   10229    9844    9490    9160    8828    8496    8169    7850    7519
 78          QI    7207    6931    6682    6467    6281    6101    5915    5727    5532    5338
 79          QI    5148    4963    4786    4615    4453    4307    4165    4036    3921    3824
 80          QI    3745    3674    3597    3514    3424    3330    3232    3135    3037    2936
 81          QI    2835    2736    2638    2542    2450    2361    2277    2198    2127    2062
 82          QI    2001    1943    1887    1831    1776    1723    1671    1620    1569    1516
 83          QI    1458    1391    1312    1209    1108    1044    1003     974     950     930
 84          QI     911     893     877     863     849     837     826     815     805     795
 85          QI     784     774     763     751     740     728     718     707     695     684
 86          QI     672     661     650     638     627     616     605     594     583     572
 87          QI     561     551     542     532     522     512     501     490     478     466
 88          QI     454     441     429     416     403     391     379     367     356     346
 89          QI     337     328     320     311     303     295     289     282     276     270
 90          QI     263     256     248     239     231     222     214     206     197     189
 91          QI     181     174     166     159     151     144     138     131     126     120
 92          QI     116     112     109     106     103     100      97      94      91      88
 93          QI      85      82      79      77      75      72      70      68      66      64
 94          QI      62      61      59      57      55      53      51      49      47      45
 95          QI      44      42      41      39      38      37      35      33      32      30
 96          QI      29      27      26      24      23      22      20      19      19      18
 97          QI      17      17      16      16      15      15      14      14      13      13
 98          QI      12      12      11      11      10      10       9       9       8       8
 99          QI       7       7       6       6       6       5       5       4       4       4
100          QI       4       3       3       3       3       2       2       2       2       2
101          QI       1       1       1       1       1       1       1       1       1       1
102          QI       1       0
103          IN      10
             *
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1 HEC-1 INPUT PAGE 3

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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

104          KK      AW
105          KM        Inflow hydrograph to Cave Buttes Dam from Apache Wash
106          BA   30.64
107          QI       0       0       0       0       0       0       0       0       0       0
108          QI       0       0       0       0       0       0       0       0       0       0
109          QI       0       0       0       0       0       0       0       0       0       0
110          QI       0       0       0       0       0       0       0       1       2       3
111          QI       4       5       5       5       5       4       3       3       4       4
112          QI       5       6       6       6       6       5       6       7       8       9
113          QI       9      10      11      13      15      17      20      31      57     616
114          QI    2200    4251    5223    4619    3780    3178    2912    2624   10428   15170
115          QI   19038   19252   18217   17402   18591   17728   15609   13554   11739   10180
116          QI    8859    7745    6809    6024    5361    4799    4312    3886    3522    3221
117          QI    2974    2765    2576    2399    2241    2107    1996    1905    1834    1780
118          QI    1731    1673    1603    1536    1481    1440    1407    1383    1367    1354
119          QI    1332    1295    1254    1307    1492    1671    1710    1597    1466    1354
120          QI    1255    1212    1280    1469    1703    1879    2008    2132    2252    2328
121          QI    2266    2109    1947    1816    1685    1543    1437    1503    1497    1392
122          QI    1268    1142    1030     935     854     785     728     679     637     599
123          QI     563     528     496     465     438     414     393     375     358     342
124          QI     326     309     291     272     253     234     217     200     184       0
125          IN       5
             *

126          KK    EAST
127          KM        Inflow hydrograph to Cave Buttes Dam from East side area
128          BA      19
129          QI       0       0       0       0       0       0       0       0       1       1
130          QI       2       4       5       8      11      14      18      23      28      34
131          QI      39      46      52      58      64      70      75      80      85      89
132          QI      92      96      99     102     104     106     108     110     112     113
133          QI     115     116     117     118     119     119     120     121     121     122
134          QI     122     123     123     124     124     125     126     127     128     129
135          QI     131     132     134     136     139     141     143     145     147     149
136          QI     151     153     154     156     157     158     159     160     161     162
137          QI     163     164     164     165     167     168     170     171     173     175
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 138          QI     177     179     182     184     186     188     190     192     194     196
 139          QI     197     198     200     201     202     203     205     207     209     211
 140          QI     214     218     223     227     232     237     243     249     255     261
 141          QI     267     273     279     285     290     295     300     304     309     314
 142          QI     320     326     332     340     348     357     367     379     392     406
 143          QI     423     441     475     514     554     713     899    1102    1387    1878
 144          QI    2475    3034    3793    4685    5654    6519    7352    8092    8740    9287
 145          QI    9716    9939   10019    9979    9733    9349    8851    8267    7634    6972
 146          QI    6375    5824    5325    4870    4447    4067    3718    3393    3110    2841
 147          QI    2610    2414    2200    2033    1872    1720    1565    1432    1344    1251
 148          QI    1159    1060     985     909     820     731     643     624     611     598
 149          QI     589     580     572     561     550     539     502     464     427     380
 150          QI     333     286     280     273     267     263     258     254     250     246
 151          QI     242     238     234     230     227     223     220     216     213     209
 152          QI     206     203     199     196     194     191     188     186     184     183
 153          QI     181     180     179     178     176     175     174     173     172     171
 154          QI     169     167     166     164     162     159     157     155     153     150
 155          QI     148     146     144     142     141     139     138     137     136     135
1                                            HEC-1 INPUT                                          PAGE  4

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 156          QI     134     133     132     132     131     130     130     129     129     129
 157          QI     128     128     128     128     128     127     127     127     127     127
 158          QI     127     127     126     126     125     125     123     121     119     116
 159          QI     112     108     103      98      92       0
              *

 160          KK   CBD-I
 161          KO       1                                  21
 162          KM        Total inflow to Cave Buttes Dam
 163          HC       3
              *

 164          KK   CBD-O
 165          KO       1
 166          RS       1    FLOW      -1
 167          SV       0     250     700    1100    1800    2600    4000    6300    9400   13000
 168          SV   17500   23000   29200   37000   46000
 169          SE  1560.7    1595    1600    1605    1610    1615    1620    1625    1630    1635
 170          SE    1640    1645    1650    1655    1660
 171          SQ       0     132     215     243     268     290     311     330     347     365
 172          SQ     381     398     413     428     442     455     468     481     493
 173          SE  1560.7    1570    1580    1585    1590    1595    1600    1605    1610    1615
 174          SE    1620    1625    1630    1635    1640    1645    1650    1655    1660
              *
 175          ZZ
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*            MAY  1991              *
*          VERSION 4.0.1E           *
*     Lahey F77L-EM/32 version 5.01 *
*       Dodson & Associates, Inc.   *
*  RUN DATE  07/23/99  TIME  15:35:58 *
*************************************

*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS   *
*    HYDROLOGIC ENGINEERING CENTER  *
*          609 SECOND STREET        *
*        DAVIS, CALIFORNIA 95616    *
*           (916) 551-1748          *
*                                   *
*************************************
```

Upper Cave Creek/Apache Wash Watercourse Master Plan File: FUCBD100.IH1
By: Stantec Consulting, Inc. Original: 07/23/99
For: Flood Control District of Maricopa County Revised:

This is a future condition model of the total inflow to Cave Buttes Dam
Inflow hydrographs for Cave Creek and Apache Wash are developed from the
following:

Cave Creek Watershed at Cave Buttes Dam
Combined HEC-1 models from:

1. George V. Sabol Consulting Engineers FCD 95-28
   Cave Creek Watershed at the Carefree Highway
   Original model dated 06-17-96 by mcg
   GVSCE Project No. 84

2. Willdan Associates FCD 95-30
   Cave Creek Watershed from Carefree Highway to Cave Buttes Dam
   Original model dated 11-29-96
   Willdan Project No. 08855

Model Basis:
100-year, 24-hr rainfall with SCS Type II distribution
Green & Ampt Loss Rate Method
NMIN = 5
Phoenix Mountain and Desert/Rangeland S-Graph
Clark Unit Hydrograph
Modified Puls channel storage routing
200 Scale 2' CI mapping of study reach by Aerial Mapping Company

Apache Wash Watershed at Cave Buttes Dam
Jerry Jones and Associates, Inc. FCD 89-66
Apache Wash Flood Insurance Study
Original model dated 2-15-89

Model Basis:
100-year, 24-hr rainfall with SCS Type IIA distribution
SCS Curve Number with RTIMP
NMIN = 10
SCS dimensionless unit hydrograph

The remaining portion of the Cave Buttes Dam watershed is modeled as a single basin for existing conditions and is based on the following:
100-year, 24-hour rainfall with SCS Type II distribution
Green & Ampt Loss Rate Method
NMIN = 5
Phoenix Mountain and Desert/Rangeland S-Graph
USGS 7.5 Minutes Series Quadrangle Maps

```
 51 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         900  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      4    0  ENDING DATE
                     NDTIME        0255  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL    0.08 HOURS
                      TOTAL TIME BASE   74.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
160 KK      *    CBD-I   *
            *            *
            **************

161 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         900  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.083  TIME INTERVAL IN HOURS

                          Total inflow to Cave Buttes Dam

163 HC          HYDROGRAPH COMBINATION
                      ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                                  *
                                                  ***
*****************************************************************************************************************************
```

HYDROGRAPH AT STATION CBD-I
SUM OF 3 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		1845	226	7894.	2		1330	451	277.	3		0815	676	277.
1		0005	2	0.	1		1850	227	7671.	2		1335	452	277.	3		0820	677	277.
1		0010	3	0.	1		1855	228	7452.	2		1340	453	277.	3		0825	678	277.
1		0015	4	0.	1		1900	229	7226.	2		1345	454	277.	3		0830	679	277.
1		0020	5	0.	1		1905	230	7008.	2		1350	455	277.	3		0835	680	277.
1		0025	6	0.	1		1910	231	6794.	2		1355	456	277.	3		0840	681	277.
1		0030	7	0.	1		1915	232	6590.	2		1400	457	277.	3		0845	682	277.
1		0035	8	0.	1		1920	233	6392.	2		1405	458	277.	3		0850	683	277.
1		0040	9	1.	1		1925	234	6206.	2		1410	459	277.	3		0855	684	277.
1		0045	10	2.	1		1930	235	6030.	2		1415	460	277.	3		0900	685	277.
1		0050	11	3.	1		1935	236	5873.	2		1420	461	277.	3		0905	686	277.
1		0055	12	5.	1		1940	237	5720.	2		1425	462	277.	3		0910	687	277.
1		0100	13	7.	1		1945	238	5583.	2		1430	463	277.	3		0915	688	277.
1		0105	14	10.	1		1950	239	5459.	2		1435	464	277.	3		0920	689	277.
1		0110	15	13.	1		1955	240	5350.	2		1440	465	277.	3		0925	690	277.
1		0115	16	17.	1		2000	241	5258.	2		1445	466	277.	3		0930	691	277.

1	0120	17	21.	*	1	2005	242	5168.	*	2	1450	467	277.	*	3	0935	692	277.
1	0125	18	26.	*	1	2010	243	5071.	*	2	1455	468	277.	*	3	0940	693	277.
1	0130	19	32.	*	1	2015	244	4967.	*	2	1500	469	277.	*	3	0945	694	277.
1	0135	20	38.	*	1	2020	245	4854.	*	2	1505	470	277.	*	3	0950	695	277.
1	0140	21	44.	*	1	2025	246	4786.	*	2	1510	471	277.	*	3	0955	696	277.
1	0145	22	51.	*	1	2030	247	4713.	*	2	1515	472	277.	*	3	1000	697	277.
1	0150	23	58.	*	1	2035	248	4708.	*	2	1520	473	277.	*	3	1005	698	277.
1	0155	24	64.	*	1	2040	249	4701.	*	2	1525	474	277.	*	3	1010	699	277.
1	0200	25	71.	*	1	2045	250	4689.	*	2	1530	475	277.	*	3	1015	700	277.
1	0205	26	77.	*	1	2050	251	4675.	*	2	1535	476	277.	*	3	1020	701	277.
1	0210	27	83.	*	1	2055	252	4594.	*	2	1540	477	277.	*	3	1025	702	277.
1	0215	28	88.	*	1	2100	253	4514.	*	2	1545	478	277.	*	3	1030	703	277.
1	0220	29	94.	*	1	2105	254	4360.	*	2	1550	479	277.	*	3	1035	704	277.
1	0225	30	99.	*	1	2110	255	4209.	*	2	1555	480	277.	*	3	1040	705	277.
1	0230	31	102.	*	1	2115	256	4052.	*	2	1600	481	277.	*	3	1045	706	277.
1	0235	32	107.	*	1	2120	257	3900.	*	2	1605	482	277.	*	3	1050	707	277.
1	0240	33	111.	*	1	2125	258	3763.	*	2	1610	483	277.	*	3	1055	708	277.
1	0245	34	114.	*	1	2130	259	3634.	*	2	1615	484	277.	*	3	1100	709	277.
1	0250	35	117.	*	1	2135	260	3517.	*	2	1620	485	277.	*	3	1105	710	277.
1	0255	36	119.	*	1	2140	261	3404.	*	2	1625	486	277.	*	3	1110	711	277.
1	0300	37	122.	*	1	2145	262	3323.	*	2	1630	487	277.	*	3	1115	712	277.
1	0305	38	125.	*	1	2150	263	3243.	*	2	1635	488	277.	*	3	1120	713	277.
1	0310	39	127.	*	1	2155	264	3219.	*	2	1640	489	277.	*	3	1125	714	277.
1	0315	40	129.	*	1	2200	265	3197.	*	2	1645	490	277.	*	3	1130	715	277.
1	0320	41	132.	*	1	2205	266	3237.	*	2	1650	491	277.	*	3	1135	716	277.
1	0325	42	133.	*	1	2210	267	3278.	*	2	1655	492	277.	*	3	1140	717	277.
1	0330	43	135.	*	1	2215	268	3343.	*	2	1700	493	277.	*	3	1145	718	277.
1	0335	44	137.	*	1	2220	269	3408.	*	2	1705	494	277.	*	3	1150	719	277.
1	0340	45	139.	*	1	2225	270	3442.	*	2	1710	495	277.	*	3	1155	720	277.
1	0345	46	141.	*	1	2230	271	3471.	*	2	1715	496	277.	*	3	1200	721	277.
1	0350	47	144.	*	1	2235	272	3468.	*	2	1720	497	277.	*	3	1205	722	277.
1	0355	48	147.	*	1	2240	273	3452.	*	2	1725	498	277.	*	3	1210	723	277.
1	0400	49	149.	*	1	2245	274	3411.	*	2	1730	499	277.	*	3	1215	724	277.
1	0405	50	153.	*	1	2250	275	3371.	*	2	1735	500	277.	*	3	1220	725	277.
1	0410	51	156.	*	1	2255	276	3366.	*	2	1740	501	277.	*	3	1225	726	277.
1	0415	52	160.	*	1	2300	277	3385.	*	2	1745	502	277.	*	3	1230	727	277.
1	0420	53	163.	*	1	2305	278	3393.	*	2	1750	503	277.	*	3	1235	728	277.
1	0425	54	168.	*	1	2310	279	3407.	*	2	1755	504	277.	*	3	1240	729	277.
1	0430	55	173.	*	1	2315	280	3356.	*	2	1800	505	277.	*	3	1245	730	277.
1	0435	56	179.	*	1	2320	281	3305.	*	2	1805	506	277.	*	3	1250	731	277.
1	0440	57	185.	*	1	2325	282	3209.	*	2	1810	507	277.	*	3	1255	732	277.
1	0445	58	191.	*	1	2330	283	3114.	*	2	1815	508	277.	*	3	1300	733	277.
1	0450	59	199.	*	1	2335	284	3019.	*	2	1820	509	277.	*	3	1305	734	277.
1	0455	60	211.	*	1	2340	285	2924.	*	2	1825	510	277.	*	3	1310	735	277.
1	0500	61	224.	*	1	2345	286	2846.	*	2	1830	511	277.	*	3	1315	736	277.
1	0505	62	236.	*	1	2350	287	2769.	*	2	1835	512	277.	*	3	1320	737	277.
1	0510	63	251.	*	1	2355	288	2693.	*	2	1840	513	277.	*	3	1325	738	277.
1	0515	64	268.	*	2	0000	289	2617.	*	2	1845	514	277.	*	3	1330	739	277.
1	0520	65	289.	*	2	0005	290	2536.	*	2	1850	515	277.	*	3	1335	740	277.
1	0525	66	309.	*	2	0010	291	2454.	*	2	1855	516	277.	*	3	1340	741	277.
1	0530	67	327.	*	2	0015	292	2391.	*	2	1900	517	277.	*	3	1345	742	277.
1	0535	68	343.	*	2	0020	293	2326.	*	2	1905	518	277.	*	3	1350	743	277.
1	0540	69	358.	*	2	0025	294	2347.	*	2	1910	519	277.	*	3	1355	744	277.
1	0545	70	371.	*	2	0030	295	2368.	*	2	1915	520	277.	*	3	1400	745	277.
1	0550	71	383.	*	2	0035	296	2353.	*	2	1920	521	277.	*	3	1405	746	277.
1	0555	72	394.	*	2	0040	297	2338.	*	2	1925	522	277.	*	3	1410	747	277.
1	0600	73	404.	*	2	0045	298	2273.	*	2	1930	523	277.	*	3	1415	748	277.
1	0605	74	415.	*	2	0050	299	2206.	*	2	1935	524	277.	*	3	1420	749	277.
1	0610	75	424.	*	2	0055	300	2130.	*	2	1940	525	277.	*	3	1425	750	277.
1	0615	76	434.	*	2	0100	301	2052.	*	2	1945	526	277.	*	3	1430	751	277.
1	0620	77	443.	*	2	0105	302	1974.	*	2	1950	527	277.	*	3	1435	752	277.
1	0625	78	453.	*	2	0110	303	1895.	*	2	1955	528	277.	*	3	1440	753	277.
1	0630	79	461.	*	2	0115	304	1822.	*	2	2000	529	277.	*	3	1445	754	277.
1	0635	80	471.	*	2	0120	305	1749.	*	2	2005	530	277.	*	3	1450	755	277.
1	0640	81	483.	*	2	0125	306	1691.	*	2	2010	531	277.	*	3	1455	756	277.
1	0645	82	496.	*	2	0130	307	1632.	*	2	2015	532	277.	*	3	1500	757	277.
1	0650	83	506.	*	2	0135	308	1581.	*	2	2020	533	277.	*	3	1505	758	277.
1	0655	84	516.	*	2	0140	309	1529.	*	2	2025	534	277.	*	3	1510	759	277.
1	0700	85	526.	*	2	0145	310	1484.	*	2	2030	535	277.	*	3	1515	760	277.
1	0705	86	535.	*	2	0150	311	1438.	*	2	2035	536	277.	*	3	1520	761	277.
1	0710	87	544.	*	2	0155	312	1400.	*	2	2040	537	277.	*	3	1525	762	277.
1	0715	88	553.	*	2	0200	313	1362.	*	2	2045	538	277.	*	3	1530	763	277.
1	0720	89	564.	*	2	0205	314	1328.	*	2	2050	539	277.	*	3	1535	764	277.
1	0725	90	574.	*	2	0210	315	1293.	*	2	2055	540	277.	*	3	1540	765	277.
1	0730	91	584.	*	2	0215	316	1262.	*	2	2100	541	277.	*	3	1545	766	277.
1	0735	92	594.	*	2	0220	317	1230.	*	2	2105	542	277.	*	3	1550	767	277.
1	0740	93	605.	*	2	0225	318	1200.	*	2	2110	543	277.	*	3	1555	768	277.
1	0745	94	615.	*	2	0230	319	1169.	*	2	2115	544	277.	*	3	1600	769	277.
1	0750	95	625.	*	2	0235	320	1139.	*	2	2120	545	277.	*	3	1605	770	277.
1	0755	96	636.	*	2	0240	321	1109.	*	2	2125	546	277.	*	3	1610	771	277.
1	0800	97	645.	*	2	0245	322	1079.	*	2	2130	547	277.	*	3	1615	772	277.
1	0805	98	654.	*	2	0250	323	1049.	*	2	2135	548	277.	*	3	1620	773	277.
1	0810	99	663.	*	2	0255	324	1020.	*	2	2140	549	277.	*	3	1625	774	277.
1	0815	100	673.	*	2	0300	325	991.	*	2	2145	550	277.	*	3	1630	775	277.
1	0820	101	680.	*	2	0305	326	964.	*	2	2150	551	277.	*	3	1635	776	277.
1	0825	102	689.	*	2	0310	327	936.	*	2	2155	552	277.	*	3	1640	777	277.
1	0830	103	697.	*	2	0315	328	911.	*	2	2200	553	277.	*	3	1645	778	277.
1	0835	104	705.	*	2	0320	329	886.	*	2	2205	554	277.	*	3	1650	779	277.
1	0840	105	713.	*	2	0325	330	864.	*	2	2210	555	277.	*	3	1655	780	277.
1	0845	106	720.	*	2	0330	331	843.	*	2	2215	556	277.	*	3	1700	781	277.
1	0850	107	729.	*	2	0335	332	824.	*	2	2220	557	277.	*	3	1705	782	277.
1	0855	108	739.	*	2	0340	333	805.	*	2	2225	558	277.	*	3	1710	783	277.
1	0900	109	748.	*	2	0345	334	787.	*	2	2230	559	277.	*	3	1715	784	277.
1	0905	110	757.	*	2	0350	335	770.	*	2	2235	560	277.	*	3	1720	785	277.
1	0910	111	767.	*	2	0355	336	754.	*	2	2240	561	277.	*	3	1725	786	277.

1	0915	112	780.	*	2	0400	337	739.	*	2	2245	562	277.	*	3	1730	787	277.
1	0920	113	794.	*	2	0405	338	724.	*	2	2250	563	277.	*	3	1735	788	277.
1	0925	114	808.	*	2	0410	339	710.	*	2	2255	564	277.	*	3	1740	789	277.
1	0930	115	823.	*	2	0415	340	696.	*	2	2300	565	277.	*	3	1745	790	277.
1	0935	116	841.	*	2	0420	341	681.	*	2	2305	566	277.	*	3	1750	791	277.
1	0940	117	858.	*	2	0425	342	666.	*	2	2310	567	277.	*	3	1755	792	277.
1	0945	118	876.	*	2	0430	343	649.	*	2	2315	568	277.	*	3	1800	793	277.
1	0950	119	894.	*	2	0435	344	631.	*	2	2320	569	277.	*	3	1805	794	277.
1	0955	120	912.	*	2	0440	345	614.	*	2	2325	570	277.	*	3	1810	795	277.
1	1000	121	930.	*	2	0445	346	596.	*	2	2330	571	277.	*	3	1815	796	277.
1	1005	122	950.	*	2	0450	347	578.	*	2	2335	572	277.	*	3	1820	797	277.
1	1010	123	969.	*	2	0455	348	561.	*	2	2340	573	277.	*	3	1825	798	277.
1	1015	124	989.	*	2	0500	349	542.	*	2	2345	574	277.	*	3	1830	799	277.
1	1020	125	1008.	*	2	0505	350	525.	*	2	2350	575	277.	*	3	1835	800	277.
1	1025	126	1028.	*	2	0510	351	507.	*	2	2355	576	277.	*	3	1840	801	277.
1	1030	127	1048.	*	2	0515	352	492.	*	3	0000	577	277.	*	3	1845	802	277.
1	1035	128	1068.	*	2	0520	353	475.	*	3	0005	578	277.	*	3	1850	803	277.
1	1040	129	1090.	*	2	0525	354	460.	*	3	0010	579	277.	*	3	1855	804	277.
1	1045	130	1113.	*	2	0530	355	443.	*	3	0015	580	277.	*	3	1900	805	277.
1	1050	131	1138.	*	2	0535	356	428.	*	3	0020	581	277.	*	3	1905	806	277.
1	1055	132	1163.	*	2	0540	357	414.	*	3	0025	582	277.	*	3	1910	807	277.
1	1100	133	1188.	*	2	0545	358	407.	*	3	0030	583	277.	*	3	1915	808	277.
1	1105	134	1221.	*	2	0550	359	402.	*	3	0035	584	277.	*	3	1920	809	277.
1	1110	135	1254.	*	2	0555	360	396.	*	3	0040	585	277.	*	3	1925	810	277.
1	1115	136	1298.	*	2	0600	361	392.	*	3	0045	586	277.	*	3	1930	811	277.
1	1120	137	1346.	*	2	0605	362	388.	*	3	0050	587	277.	*	3	1935	812	277.
1	1125	138	1666.	*	2	0610	363	385.	*	3	0055	588	277.	*	3	1940	813	277.
1	1130	139	1989.	*	2	0615	364	382.	*	3	0100	589	277.	*	3	1945	814	277.
1	1135	140	2830.	*	2	0620	365	379.	*	3	0105	590	277.	*	3	1950	815	277.
1	1140	141	3679.	*	2	0625	366	376.	*	3	0110	591	277.	*	3	1955	816	277.
1	1145	142	4770.	*	2	0630	367	373.	*	3	0115	592	277.	*	3	2000	817	277.
1	1150	143	5887.	*	2	0635	368	370.	*	3	0120	593	277.	*	3	2005	818	277.
1	1155	144	6497.	*	2	0640	369	367.	*	3	0125	594	277.	*	3	2010	819	277.
1	1200	145	7149.	*	2	0645	370	364.	*	3	0130	595	277.	*	3	2015	820	277.
1	1205	146	7190.	*	2	0650	371	361.	*	3	0135	596	277.	*	3	2020	821	277.
1	1210	147	7326.	*	2	0655	372	358.	*	3	0140	597	277.	*	3	2025	822	277.
1	1215	148	7406.	*	2	0700	373	355.	*	3	0145	598	277.	*	3	2030	823	277.
1	1220	149	7618.	*	2	0705	374	353.	*	3	0150	599	277.	*	3	2035	824	277.
1	1225	150	8190.	*	2	0710	375	351.	*	3	0155	600	277.	*	3	2040	825	277.
1	1230	151	8855.	*	2	0715	376	348.	*	3	0200	601	277.	*	3	2045	826	277.
1	1235	152	9599.	*	2	0720	377	346.	*	3	0205	602	277.	*	3	2050	827	277.
1	1240	153	10517.	*	2	0725	378	344.	*	3	0210	603	277.	*	3	2055	828	277.
1	1245	154	11581.	*	2	0730	379	342.	*	3	0215	604	277.	*	3	2100	829	277.
1	1250	155	12792.	*	2	0735	380	340.	*	3	0220	605	277.	*	3	2105	830	277.
1	1255	156	18090.	*	2	0740	381	338.	*	3	0225	606	277.	*	3	2110	831	277.
1	1300	157	23578.	*	2	0745	382	337.	*	3	0230	607	277.	*	3	2115	832	277.
1	1305	158	27953.	*	2	0750	383	335.	*	3	0235	608	277.	*	3	2120	833	277.
1	1310	159	33044.	*	2	0755	384	333.	*	3	0240	609	277.	*	3	2125	834	277.
1	1315	160	38178.	*	2	0800	385	331.	*	3	0245	610	277.	*	3	2130	835	277.
1	1320	161	43961.	*	2	0805	386	329.	*	3	0250	611	277.	*	3	2135	836	277.
1	1325	162	48874.	*	2	0810	387	327.	*	3	0255	612	277.	*	3	2140	837	277.
1	1330	163	53643.	*	2	0815	388	325.	*	3	0300	613	277.	*	3	2145	838	277.
1	1335	164	57492.	*	2	0820	389	323.	*	3	0305	614	277.	*	3	2150	839	277.
1	1340	165	60700.	*	2	0825	390	321.	*	3	0310	615	277.	*	3	2155	840	277.
1	1345	166	63042.	*	2	0830	391	320.	*	3	0315	616	277.	*	3	2200	841	277.
1	1350	167	64415.	*	2	0835	392	318.	*	3	0320	617	277.	*	3	2205	842	277.
1	1355	168	66009.	*	2	0840	393	317.	*	3	0325	618	277.	*	3	2210	843	277.
1	1400	169	66921.	*	2	0845	394	315.	*	3	0330	619	277.	*	3	2215	844	277.
1	1405	170	66318.	*	2	0850	395	314.	*	3	0335	620	277.	*	3	2220	845	277.
1	1410	171	65441.	*	2	0855	396	313.	*	3	0340	621	277.	*	3	2225	846	277.
1	1415	172	63725.	*	2	0900	397	311.	*	3	0345	622	277.	*	3	2230	847	277.
1	1420	173	61855.	*	2	0905	398	309.	*	3	0350	623	277.	*	3	2235	848	277.
1	1425	174	59889.	*	2	0910	399	308.	*	3	0355	624	277.	*	3	2240	849	277.
1	1430	175	57808.	*	2	0915	400	306.	*	3	0400	625	277.	*	3	2245	850	277.
1	1435	176	55769.	*	2	0920	401	305.	*	3	0405	626	277.	*	3	2250	851	277.
1	1440	177	53666.	*	2	0925	402	303.	*	3	0410	627	277.	*	3	2255	852	277.
1	1445	178	51647.	*	2	0930	403	302.	*	3	0415	628	277.	*	3	2300	853	277.
1	1450	179	49631.	*	2	0935	404	300.	*	3	0420	629	277.	*	3	2305	854	277.
1	1455	180	47741.	*	2	0940	405	299.	*	3	0425	630	277.	*	3	2310	855	277.
1	1500	181	45844.	*	2	0945	406	298.	*	3	0430	631	277.	*	3	2315	856	277.
1	1505	182	44036.	*	2	0950	407	296.	*	3	0435	632	277.	*	3	2320	857	277.
1	1510	183	42174.	*	2	0955	408	295.	*	3	0440	633	277.	*	3	2325	858	277.
1	1515	184	40441.	*	2	1000	409	295.	*	3	0445	634	277.	*	3	2330	859	277.
1	1520	185	38734.	*	2	1005	410	294.	*	3	0450	635	277.	*	3	2335	860	277.
1	1525	186	37160.	*	2	1010	411	293.	*	3	0455	636	277.	*	3	2340	861	277.
1	1530	187	35605.	*	2	1015	412	293.	*	3	0500	637	277.	*	3	2345	862	277.
1	1535	188	34121.	*	2	1020	413	292.	*	3	0505	638	277.	*	3	2350	863	277.
1	1540	189	32687.	*	2	1025	414	292.	*	3	0510	639	277.	*	3	2355	864	277.
1	1545	190	31322.	*	2	1030	415	291.	*	3	0515	640	277.	*	4	0000	865	277.
1	1550	191	30005.	*	2	1035	416	291.	*	3	0520	641	277.	*	4	0005	866	277.
1	1555	192	28815.	*	2	1040	417	290.	*	3	0525	642	277.	*	4	0010	867	277.
1	1600	193	27662.	*	2	1045	418	290.	*	3	0530	643	277.	*	4	0015	868	277.
1	1605	194	26521.	*	2	1050	419	289.	*	3	0535	644	277.	*	4	0020	869	277.
1	1610	195	25368.	*	2	1055	420	289.	*	3	0540	645	277.	*	4	0025	870	277.
1	1615	196	24265.	*	2	1100	421	288.	*	3	0545	646	277.	*	4	0030	871	277.
1	1620	197	23161.	*	2	1105	422	288.	*	3	0550	647	277.	*	4	0035	872	277.
1	1625	198	22238.	*	2	1110	423	287.	*	3	0555	648	277.	*	4	0040	873	277.
1	1630	199	21386.	*	2	1115	424	287.	*	3	0600	649	277.	*	4	0045	874	277.
1	1635	200	20561.	*	2	1120	425	286.	*	3	0605	650	277.	*	4	0050	875	277.
1	1640	201	19732.	*	2	1125	426	286.	*	3	0610	651	277.	*	4	0055	876	277.
1	1645	202	18944.	*	2	1130	427	285.	*	3	0615	652	277.	*	4	0100	877	277.
1	1650	203	18177.	*	2	1135	428	285.	*	3	0620	653	277.	*	4	0105	878	277.
1	1655	204	17448.	*	2	1140	429	284.	*	3	0625	654	277.	*	4	0110	879	277.
1	1700	205	16785.	*	2	1145	430	284.	*	3	0630	655	277.	*	4	0115	880	277.
1	1705	206	16169.	*	2	1150	431	283.	*	3	0635	656	277.	*	4	0120	881	277.

1	1710	207	15527.	*	2	1155	432	283.	*	3	0640	657	277.	*	4	0125	882	277.
1	1715	208	14924.	*	2	1200	433	282.	*	3	0645	658	277.	*	4	0130	883	277.
1	1720	209	14302.	*	2	1205	434	282.	*	3	0650	659	277.	*	4	0135	884	277.
1	1725	210	13691.	*	2	1210	435	282.	*	3	0655	660	277.	*	4	0140	885	277.
1	1730	211	13104.	*	2	1215	436	281.	*	3	0700	661	277.	*	4	0145	886	277.
1	1735	212	12567.	*	2	1220	437	281.	*	3	0705	662	277.	*	4	0150	887	277.
1	1740	213	12120.	*	2	1225	438	280.	*	3	0710	663	277.	*	4	0155	888	277.
1	1745	214	11714.	*	2	1230	439	280.	*	3	0715	664	277.	*	4	0200	889	277.
1	1750	215	11332.	*	2	1235	440	280.	*	3	0720	665	277.	*	4	0205	890	277.
1	1755	216	10961.	*	2	1240	441	280.	*	3	0725	666	277.	*	4	0210	891	277.
1	1800	217	10588.	*	2	1245	442	279.	*	3	0730	667	277.	*	4	0215	892	277.
1	1805	218	10230.	*	2	1250	443	279.	*	3	0735	668	277.	*	4	0220	893	277.
1	1810	219	9880.	*	2	1255	444	279.	*	3	0740	669	277.	*	4	0225	894	277.
1	1815	220	9521.	*	2	1300	445	279.	*	3	0745	670	277.	*	4	0230	895	277.
1	1820	221	9180.	*	2	1305	446	278.	*	3	0750	671	277.	*	4	0235	896	277.
1	1825	222	8871.	*	2	1310	447	278.	*	3	0755	672	277.	*	4	0240	897	277.
1	1830	223	8589.	*	2	1315	448	278.	*	3	0800	673	277.	*	4	0245	898	277.
1	1835	224	8335.	*	2	1320	449	278.	*	3	0805	674	277.	*	4	0250	899	277.
1	1840	225	8111.	*	2	1325	450	278.	*	3	0810	675	277.	*	4	0255	900	277.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	74.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 66921.	14.00		31673.	9695.	3417.	3286.
		(INCHES)	1.534	1.879	1.986	1.987
		(AC-FT)	15706.	19230.	20332.	20343.

CUMULATIVE AREA = 191.93 SQ MI

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            *            *
 164 KK     *    CBD-O   *
            *            *
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 165 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

 166 RS          STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC      -1.00  INITIAL CONDITION
                          X       0.00 WORKING R AND D COEFFICIENT

 167 SV            STORAGE        0.0     250.0     700.0    1100.0    1800.0    2600.0    4000.0    6300.0    9400.0   13000.0
                                17500.0  23000.0   29200.0   37000.0   46000.0

 169 SE          ELEVATION     1560.70   1595.00   1600.00   1605.00   1610.00   1615.00   1620.00   1625.00   1630.00   1635.00
                               1640.00   1645.00   1650.00   1655.00   1660.00

 171 SQ          DISCHARGE         0.      132.      215.      243.      268.      290.      311.      330.      347.      365.
                                 381.      398.      413.      428.      442.      455.      468.      481.      493.

 173 SE          ELEVATION     1560.70   1570.00   1580.00   1585.00   1590.00   1595.00   1600.00   1605.00   1610.00   1615.00
                               1620.00   1625.00   1630.00   1635.00   1640.00   1645.00   1650.00   1655.00   1660.00

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                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE       0.00     67.78    140.67    177.11    213.56    250.00    700.00   1100.00   1800.00   2600.00
          OUTFLOW       0.00    132.00    215.00    243.00    268.00    290.00    311.00    330.00    347.00    365.00
        ELEVATION    1560.70   1570.00   1580.00   1585.00   1590.00   1595.00   1600.00   1605.00   1610.00   1615.00

          STORAGE    4000.00   6300.00   9400.00  13000.00  17500.00  23000.00  29200.00  37000.00  46000.00
          OUTFLOW     381.00    398.00    413.00    428.00    442.00    455.00    468.00    481.00    493.00
        ELEVATION    1620.00   1625.00   1630.00   1635.00   1640.00   1645.00   1650.00   1655.00   1660.00
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HYDROGRAPH AT STATION CBD-O

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	0.0	1560.7	*	2		0100	301	444.	18324.9	1640.8	*	3		0200	601	444.	18280.9	1640.7
1		0005	2	0.	0.0	1560.7	*	2		0105	302	444.	18335.7	1640.8	*	3		0205	602	444.	18279.8	1640.7
1		0010	3	0.	0.0	1560.7	*	2		0110	303	444.	18346.0	1640.8	*	3		0210	603	444.	18278.6	1640.7
1		0015	4	0.	0.0	1560.7	*	2		0115	304	444.	18355.8	1640.8	*	3		0215	604	444.	18277.5	1640.7
1		0020	5	0.	0.0	1560.7	*	2		0120	305	444.	18365.0	1640.8	*	3		0220	605	444.	18276.3	1640.7
1		0025	6	0.	0.0	1560.7	*	2		0125	306	444.	18373.8	1640.8	*	3		0225	606	444.	18275.2	1640.7

1	0030	7	0.	0.0	1560.7	*	2	0130	307	444.	18382.2	1640.8	*	3	0230	607	444.	18274.0	1640.7
1	0035	8	0.	0.0	1560.7	*	2	0135	308	444.	18390.2	1640.8	*	3	0235	608	444.	18272.9	1640.7
1	0040	9	0.	0.0	1560.7	*	2	0140	309	444.	18397.8	1640.8	*	3	0240	609	444.	18271.8	1640.7
1	0045	10	0.	0.0	1560.7	*	2	0145	310	444.	18405.1	1640.8	*	3	0245	610	444.	18270.6	1640.7
1	0050	11	0.	0.0	1560.7	*	2	0150	311	444.	18412.1	1640.8	*	3	0250	611	444.	18269.5	1640.7
1	0055	12	0.	0.1	1560.7	*	2	0155	312	444.	18418.8	1640.8	*	3	0255	612	444.	18268.3	1640.7
1	0100	13	0.	0.1	1560.7	*	2	0200	313	444.	18425.3	1640.8	*	3	0300	613	444.	18267.2	1640.7
1	0105	14	0.	0.2	1560.7	*	2	0205	314	444.	18431.5	1640.8	*	3	0305	614	444.	18266.0	1640.7
1	0110	15	0.	0.2	1560.7	*	2	0210	315	444.	18437.5	1640.9	*	3	0310	615	444.	18264.9	1640.7
1	0115	16	1.	0.3	1560.7	*	2	0215	316	444.	18443.2	1640.9	*	3	0315	616	444.	18263.7	1640.7
1	0120	17	1.	0.5	1560.8	*	2	0220	317	444.	18448.7	1640.9	*	3	0320	617	444.	18262.6	1640.7
1	0125	18	1.	0.6	1560.8	*	2	0225	318	444.	18454.0	1640.9	*	3	0325	618	444.	18261.4	1640.7
1	0130	19	2.	0.8	1560.8	*	2	0230	319	444.	18459.1	1640.9	*	3	0330	619	444.	18260.3	1640.7
1	0135	20	2.	1.0	1560.8	*	2	0235	320	444.	18464.0	1640.9	*	3	0335	620	444.	18259.1	1640.7
1	0140	21	3.	1.3	1560.9	*	2	0240	321	444.	18468.7	1640.9	*	3	0340	621	444.	18258.0	1640.7
1	0145	22	3.	1.6	1560.9	*	2	0245	322	444.	18473.2	1640.9	*	3	0345	622	444.	18256.8	1640.7
1	0150	23	4.	2.0	1561.0	*	2	0250	323	444.	18477.4	1640.9	*	3	0350	623	444.	18255.7	1640.7
1	0155	24	5.	2.3	1561.0	*	2	0255	324	444.	18481.5	1640.9	*	3	0355	624	444.	18254.5	1640.7
1	0200	25	5.	2.8	1561.1	*	2	0300	325	444.	18485.4	1640.9	*	3	0400	625	444.	18253.4	1640.7
1	0205	26	6.	3.2	1561.1	*	2	0305	326	444.	18489.0	1640.9	*	3	0405	626	444.	18252.2	1640.7
1	0210	27	7.	3.8	1561.2	*	2	0310	327	444.	18492.5	1640.9	*	3	0410	627	444.	18251.1	1640.7
1	0215	28	8.	4.3	1561.3	*	2	0315	328	444.	18495.8	1640.9	*	3	0415	628	444.	18249.9	1640.7
1	0220	29	9.	4.9	1561.4	*	2	0320	329	444.	18498.9	1640.9	*	3	0420	629	444.	18248.8	1640.7
1	0225	30	11.	5.4	1561.4	*	2	0325	330	444.	18501.9	1640.9	*	3	0425	630	444.	18247.6	1640.7
1	0230	31	12.	6.1	1561.5	*	2	0330	331	444.	18504.7	1640.9	*	3	0430	631	444.	18246.5	1640.7
1	0235	32	13.	6.7	1561.6	*	2	0335	332	444.	18507.4	1640.9	*	3	0435	632	444.	18245.3	1640.7
1	0240	33	14.	7.4	1561.7	*	2	0340	333	444.	18510.0	1640.9	*	3	0440	633	444.	18244.2	1640.7
1	0245	34	16.	8.0	1561.8	*	2	0345	334	444.	18512.4	1640.9	*	3	0445	634	444.	18243.0	1640.7
1	0250	35	17.	8.7	1561.9	*	2	0350	335	444.	18514.7	1640.9	*	3	0450	635	444.	18241.9	1640.7
1	0255	36	18.	9.4	1562.0	*	2	0355	336	444.	18516.9	1640.9	*	3	0455	636	444.	18240.7	1640.7
1	0300	37	20.	10.1	1562.1	*	2	0400	337	444.	18518.9	1640.9	*	3	0500	637	444.	18239.6	1640.7
1	0305	38	21.	10.8	1562.2	*	2	0405	338	444.	18520.9	1640.9	*	3	0505	638	444.	18238.4	1640.7
1	0310	39	22.	11.5	1562.3	*	2	0410	339	444.	18522.8	1640.9	*	3	0510	639	444.	18237.3	1640.7
1	0315	40	24.	12.2	1562.4	*	2	0415	340	444.	18524.6	1640.9	*	3	0515	640	444.	18236.2	1640.7
1	0320	41	25.	13.0	1562.5	*	2	0420	341	444.	18526.3	1640.9	*	3	0520	641	444.	18235.0	1640.7
1	0325	42	27.	13.7	1562.6	*	2	0425	342	444.	18527.8	1640.9	*	3	0525	642	444.	18233.9	1640.7
1	0330	43	28.	14.4	1562.7	*	2	0430	343	444.	18529.3	1640.9	*	3	0530	643	444.	18232.7	1640.7
1	0335	44	30.	15.2	1562.8	*	2	0435	344	444.	18530.6	1640.9	*	3	0535	644	444.	18231.6	1640.7
1	0340	45	31.	15.9	1562.9	*	2	0440	345	444.	18531.9	1640.9	*	3	0540	645	444.	18230.4	1640.7
1	0345	46	32.	16.7	1563.0	*	2	0445	346	444.	18533.0	1640.9	*	3	0545	646	444.	18229.3	1640.7
1	0350	47	34.	17.4	1563.1	*	2	0450	347	444.	18533.9	1640.9	*	3	0550	647	444.	18228.1	1640.7
1	0355	48	35.	18.2	1563.2	*	2	0455	348	444.	18534.8	1640.9	*	3	0555	648	444.	18227.0	1640.7
1	0400	49	37.	19.0	1563.3	*	2	0500	349	444.	18535.5	1640.9	*	3	0600	649	444.	18225.8	1640.7
1	0405	50	38.	19.7	1563.4	*	2	0505	350	444.	18536.2	1640.9	*	3	0605	650	444.	18224.7	1640.7
1	0410	51	40.	20.5	1563.5	*	2	0510	351	444.	18536.6	1640.9	*	3	0610	651	444.	18223.5	1640.7
1	0415	52	42.	21.3	1563.6	*	2	0515	352	444.	18537.0	1640.9	*	3	0615	652	444.	18222.4	1640.7
1	0420	53	43.	22.2	1563.7	*	2	0520	353	444.	18537.3	1640.9	*	3	0620	653	444.	18221.2	1640.7
1	0425	54	45.	23.0	1563.9	*	2	0525	354	444.	18537.4	1640.9	*	3	0625	654	444.	18220.1	1640.7
1	0430	55	46.	23.9	1564.0	*	2	0530	355	444.	18537.5	1640.9	*	3	0630	655	444.	18218.9	1640.7
1	0435	56	48.	24.7	1564.1	*	2	0535	356	444.	18537.4	1640.9	*	3	0635	656	444.	18217.8	1640.7
1	0440	57	50.	25.7	1564.2	*	2	0540	357	444.	18537.3	1640.9	*	3	0640	657	444.	18216.6	1640.7
1	0445	58	52.	26.6	1564.3	*	2	0545	358	444.	18537.0	1640.9	*	3	0645	658	444.	18215.5	1640.7
1	0450	59	54.	27.6	1564.5	*	2	0550	359	444.	18536.8	1640.9	*	3	0650	659	444.	18214.3	1640.6
1	0455	60	56.	28.6	1564.6	*	2	0555	360	444.	18536.4	1640.9	*	3	0655	660	444.	18213.2	1640.6
1	0500	61	58.	29.7	1564.8	*	2	0600	361	444.	18536.1	1640.9	*	3	0700	661	444.	18212.0	1640.6
1	0505	62	60.	30.9	1564.9	*	2	0605	362	444.	18535.7	1640.9	*	3	0705	662	444.	18210.9	1640.6
1	0510	63	63.	32.2	1565.1	*	2	0610	363	444.	18535.3	1640.9	*	3	0710	663	444.	18209.7	1640.6
1	0515	64	65.	33.5	1565.3	*	2	0615	364	444.	18534.9	1640.9	*	3	0715	664	444.	18208.6	1640.6
1	0520	65	68.	35.0	1565.5	*	2	0620	365	444.	18534.5	1640.9	*	3	0720	665	444.	18207.4	1640.6
1	0525	66	71.	36.5	1565.7	*	2	0625	366	444.	18534.0	1640.9	*	3	0725	666	444.	18206.3	1640.6
1	0530	67	74.	38.2	1565.9	*	2	0630	367	444.	18533.5	1640.9	*	3	0730	667	444.	18205.1	1640.6
1	0535	68	78.	40.0	1566.2	*	2	0635	368	444.	18533.0	1640.9	*	3	0735	668	444.	18204.0	1640.6
1	0540	69	82.	41.9	1566.4	*	2	0640	369	444.	18532.5	1640.9	*	3	0740	669	444.	18202.8	1640.6
1	0545	70	85.	43.8	1566.7	*	2	0645	370	444.	18531.9	1640.9	*	3	0745	670	444.	18201.7	1640.6
1	0550	71	89.	45.8	1567.0	*	2	0650	371	444.	18531.4	1640.9	*	3	0750	671	444.	18200.6	1640.6
1	0555	72	93.	47.9	1567.3	*	2	0655	372	444.	18530.8	1640.9	*	3	0755	672	444.	18199.4	1640.6
1	0600	73	97.	49.9	1567.6	*	2	0700	373	444.	18530.2	1640.9	*	3	0800	673	444.	18198.3	1640.6
1	0605	74	101.	52.1	1567.8	*	2	0705	374	444.	18529.6	1640.9	*	3	0805	674	444.	18197.1	1640.6
1	0610	75	106.	54.3	1568.1	*	2	0710	375	444.	18528.9	1640.9	*	3	0810	675	444.	18196.0	1640.6
1	0615	76	110.	56.5	1568.4	*	2	0715	376	444.	18528.3	1640.9	*	3	0815	676	444.	18194.8	1640.6
1	0620	77	114.	58.7	1568.8	*	2	0720	377	444.	18527.6	1640.9	*	3	0820	677	444.	18193.7	1640.6
1	0625	78	119.	61.0	1569.1	*	2	0725	378	444.	18526.9	1640.9	*	3	0825	678	444.	18192.5	1640.6
1	0630	79	123.	63.3	1569.4	*	2	0730	379	444.	18526.2	1640.9	*	3	0830	679	444.	18191.4	1640.6
1	0635	80	128.	65.6	1569.7	*	2	0735	380	444.	18525.5	1640.9	*	3	0835	680	444.	18190.2	1640.6
1	0640	81	132.	68.0	1570.0	*	2	0740	381	444.	18524.8	1640.9	*	3	0840	681	444.	18189.1	1640.6
1	0645	82	135.	70.5	1570.4	*	2	0745	382	444.	18524.0	1640.9	*	3	0845	682	444.	18187.9	1640.6
1	0650	83	138.	73.0	1570.7	*	2	0750	383	444.	18523.3	1640.9	*	3	0850	683	444.	18186.8	1640.6
1	0655	84	141.	75.6	1571.1	*	2	0755	384	444.	18522.5	1640.9	*	3	0855	684	444.	18185.6	1640.6
1	0700	85	144.	78.2	1571.4	*	2	0800	385	444.	18521.8	1640.9	*	3	0900	685	444.	18184.5	1640.6
1	0705	86	147.	80.8	1571.8	*	2	0805	386	444.	18521.0	1640.9	*	3	0905	686	444.	18183.3	1640.6
1	0710	87	150.	83.5	1572.2	*	2	0810	387	444.	18520.2	1640.9	*	3	0910	687	444.	18182.2	1640.6
1	0715	88	153.	86.2	1572.5	*	2	0815	388	444.	18519.4	1640.9	*	3	0915	688	444.	18181.0	1640.6
1	0720	89	156.	89.0	1572.9	*	2	0820	389	444.	18518.5	1640.9	*	3	0920	689	444.	18179.9	1640.6
1	0725	90	159.	91.9	1573.3	*	2	0825	390	444.	18517.7	1640.9	*	3	0925	690	444.	18178.7	1640.6
1	0730	91	163.	94.7	1573.7	*	2	0830	391	444.	18516.8	1640.9	*	3	0930	691	444.	18177.6	1640.6
1	0735	92	166.	97.7	1574.1	*	2	0835	392	444.	18516.0	1640.9	*	3	0935	692	444.	18176.4	1640.6
1	0740	93	169.	100.6	1574.5	*	2	0840	393	444.	18515.1	1640.9	*	3	0940	693	444.	18175.3	1640.6
1	0745	94	173.	103.6	1574.9	*	2	0845	394	444.	18514.2	1640.9	*	3	0945	694	444.	18174.2	1640.6
1	0750	95	176.	106.7	1575.3	*	2	0850	395	444.	18513.3	1640.9	*	3	0950	695	444.	18173.0	1640.6
1	0755	96	180.	109.8	1575.8	*	2	0855	396	444.	18512.4	1640.9	*	3	0955	696	444.	18171.9	1640.6
1	0800	97	183.	113.0	1576.2	*	2	0900	397	444.	18511.5	1640.9	*	3	1000	697	444.	18170.7	1640.6
1	0805	98	187.	116.2	1576.6	*	2	0905	398	444.	18510.6	1640.9	*	3	1005	698	444.	18169.6	1640.6
1	0810	99	191.	119.4	1577.1	*	2	0910	399	444.	18509.6	1640.9	*	3	1010	699	444.	18168.4	1640.6
1	0815	100	195.	122.7	1577.5	*	2	0915	400	444.	18508.7	1640.9	*	3	1015	700	444.	18167.3	1640.6
1	0820	101	198.	126.0	1578.0	*	2	0920	401	444.	18507.7	1640.9	*	3	1020	701	444.	18166.1	1640.6

1	0825	102	202.	129.3	1578.4	*	2	0925	402	444.	18506.8	1640.9	*	3	1025	702	444.	18165.0	1640.6
1	0830	103	206.	132.7	1578.9	*	2	0930	403	444.	18505.8	1640.9	*	3	1030	703	444.	18163.8	1640.6
1	0835	104	210.	136.1	1579.4	*	2	0935	404	444.	18504.8	1640.9	*	3	1035	704	444.	18162.7	1640.6
1	0840	105	214.	139.5	1579.8	*	2	0940	405	444.	18503.8	1640.9	*	3	1040	705	444.	18161.5	1640.6
1	0845	106	217.	143.0	1580.3	*	2	0945	406	444.	18502.8	1640.9	*	3	1045	706	444.	18160.4	1640.6
1	0850	107	219.	146.5	1580.8	*	2	0950	407	444.	18501.8	1640.9	*	3	1050	707	444.	18159.3	1640.6
1	0855	108	222.	150.0	1581.3	*	2	0955	408	444.	18500.8	1640.9	*	3	1055	708	444.	18158.1	1640.6
1	0900	109	225.	153.6	1581.8	*	2	1000	409	444.	18499.7	1640.9	*	3	1100	709	444.	18157.0	1640.6
1	0905	110	228.	157.2	1582.3	*	2	1005	410	444.	18498.7	1640.9	*	3	1105	710	444.	18155.8	1640.6
1	0910	111	231.	160.9	1582.8	*	2	1010	411	444.	18497.7	1640.9	*	3	1110	711	444.	18154.7	1640.6
1	0915	112	233.	164.6	1583.3	*	2	1015	412	444.	18496.6	1640.9	*	3	1115	712	444.	18153.5	1640.6
1	0920	113	236.	168.4	1583.8	*	2	1020	413	444.	18495.6	1640.9	*	3	1120	713	444.	18152.4	1640.6
1	0925	114	239.	172.3	1584.3	*	2	1025	414	444.	18494.5	1640.9	*	3	1125	714	444.	18151.2	1640.6
1	0930	115	242.	176.2	1584.9	*	2	1030	415	444.	18493.5	1640.9	*	3	1130	715	444.	18150.1	1640.6
1	0935	116	245.	180.3	1585.4	*	2	1035	416	444.	18492.4	1640.9	*	3	1135	716	444.	18148.9	1640.6
1	0940	117	248.	184.4	1586.0	*	2	1040	417	444.	18491.4	1640.9	*	3	1140	717	444.	18147.8	1640.6
1	0945	118	251.	188.7	1586.6	*	2	1045	418	444.	18490.3	1640.9	*	3	1145	718	444.	18146.6	1640.6
1	0950	119	254.	193.0	1587.2	*	2	1050	419	444.	18489.2	1640.9	*	3	1150	719	444.	18145.5	1640.6
1	0955	120	257.	197.5	1587.8	*	2	1055	420	444.	18488.2	1640.9	*	3	1155	720	444.	18144.3	1640.6
1	1000	121	260.	202.1	1588.4	*	2	1100	421	444.	18487.1	1640.9	*	3	1200	721	444.	18143.2	1640.6
1	1005	122	263.	206.7	1589.1	*	2	1105	422	444.	18486.0	1640.9	*	3	1205	722	444.	18142.0	1640.6
1	1010	123	267.	211.5	1589.7	*	2	1110	423	444.	18484.9	1640.9	*	3	1210	723	444.	18140.9	1640.6
1	1015	124	270.	216.4	1590.4	*	2	1115	424	444.	18483.8	1640.9	*	3	1215	724	444.	18139.8	1640.6
1	1020	125	273.	221.4	1591.1	*	2	1120	425	444.	18482.8	1640.9	*	3	1220	725	444.	18138.6	1640.6
1	1025	126	276.	226.5	1591.8	*	2	1125	426	444.	18481.7	1640.9	*	3	1225	726	444.	18137.5	1640.6
1	1030	127	279.	231.8	1592.5	*	2	1130	427	444.	18480.6	1640.9	*	3	1230	727	444.	18136.3	1640.6
1	1035	128	282.	237.1	1593.2	*	2	1135	428	444.	18479.5	1640.9	*	3	1235	728	444.	18135.2	1640.6
1	1040	129	286.	242.6	1594.0	*	2	1140	429	444.	18478.4	1640.9	*	3	1240	729	443.	18134.0	1640.6
1	1045	130	289.	248.2	1594.8	*	2	1145	430	444.	18477.3	1640.9	*	3	1245	730	443.	18132.9	1640.6
1	1050	131	290.	254.0	1595.0	*	2	1150	431	444.	18476.2	1640.9	*	3	1250	731	443.	18131.7	1640.6
1	1055	132	290.	259.9	1595.1	*	2	1155	432	444.	18475.1	1640.9	*	3	1255	732	443.	18130.6	1640.6
1	1100	133	291.	266.0	1595.2	*	2	1200	433	444.	18473.9	1640.9	*	3	1300	733	443.	18129.4	1640.6
1	1105	134	291.	272.3	1595.2	*	2	1205	434	444.	18472.8	1640.9	*	3	1305	734	443.	18128.3	1640.6
1	1110	135	291.	278.8	1595.3	*	2	1210	435	444.	18471.7	1640.9	*	3	1310	735	443.	18127.1	1640.6
1	1115	136	292.	285.6	1595.4	*	2	1215	436	444.	18470.6	1640.9	*	3	1315	736	443.	18126.0	1640.6
1	1120	137	292.	292.7	1595.5	*	2	1220	437	444.	18469.5	1640.9	*	3	1320	737	443.	18124.8	1640.6
1	1125	138	292.	301.0	1595.6	*	2	1225	438	444.	18468.3	1640.9	*	3	1325	738	443.	18123.7	1640.6
1	1130	139	293.	311.6	1595.7	*	2	1230	439	444.	18467.2	1640.9	*	3	1330	739	443.	18122.6	1640.6
1	1135	140	294.	326.2	1595.8	*	2	1235	440	444.	18466.1	1640.9	*	3	1335	740	443.	18121.4	1640.6
1	1140	141	295.	346.5	1596.1	*	2	1240	441	444.	18464.9	1640.9	*	3	1340	741	443.	18120.3	1640.6
1	1145	142	296.	373.6	1596.4	*	2	1245	442	444.	18463.8	1640.9	*	3	1345	742	443.	18119.1	1640.6
1	1150	143	297.	408.3	1596.8	*	2	1250	443	444.	18462.7	1640.9	*	3	1350	743	443.	18118.0	1640.6
1	1155	144	299.	448.9	1597.2	*	2	1255	444	444.	18461.5	1640.9	*	3	1355	744	443.	18116.8	1640.6
1	1200	145	301.	493.8	1597.7	*	2	1300	445	444.	18460.4	1640.9	*	3	1400	745	443.	18115.7	1640.6
1	1205	146	304.	541.1	1598.2	*	2	1305	446	444.	18459.3	1640.9	*	3	1405	746	443.	18114.5	1640.6
1	1210	147	306.	589.0	1598.8	*	2	1310	447	444.	18458.1	1640.9	*	3	1410	747	443.	18113.4	1640.6
1	1215	148	308.	637.6	1599.3	*	2	1315	448	444.	18457.0	1640.9	*	3	1415	748	443.	18112.2	1640.6
1	1220	149	310.	687.2	1599.9	*	2	1320	449	444.	18455.8	1640.9	*	3	1420	749	443.	18111.1	1640.6
1	1225	150	313.	739.5	1600.5	*	2	1325	450	444.	18454.7	1640.9	*	3	1425	750	443.	18109.9	1640.6
1	1230	151	316.	796.0	1601.2	*	2	1330	451	444.	18453.5	1640.9	*	3	1430	751	443.	18108.8	1640.6
1	1235	152	318.	857.4	1602.0	*	2	1335	452	444.	18452.4	1640.9	*	3	1435	752	443.	18107.6	1640.6
1	1240	153	322.	924.4	1602.8	*	2	1340	453	444.	18451.2	1640.9	*	3	1440	753	443.	18106.5	1640.6
1	1245	154	325.	998.3	1603.7	*	2	1345	454	444.	18450.1	1640.9	*	3	1445	754	443.	18105.4	1640.6
1	1250	155	329.	1080.0	1604.7	*	2	1350	455	444.	18448.9	1640.9	*	3	1450	755	443.	18104.2	1640.5
1	1255	156	332.	1184.0	1605.6	*	2	1355	456	444.	18447.8	1640.9	*	3	1455	756	443.	18103.1	1640.5
1	1300	157	335.	1325.2	1606.6	*	2	1400	457	444.	18446.6	1640.9	*	3	1500	757	443.	18101.9	1640.5
1	1305	158	340.	1500.3	1607.9	*	2	1405	458	444.	18445.5	1640.9	*	3	1505	758	443.	18100.8	1640.5
1	1310	159	345.	1708.0	1609.3	*	2	1410	459	444.	18444.3	1640.9	*	3	1510	759	443.	18099.6	1640.5
1	1315	160	350.	1950.9	1610.9	*	2	1415	460	444.	18443.2	1640.9	*	3	1515	760	443.	18098.5	1640.5
1	1320	161	357.	2231.3	1612.7	*	2	1420	461	444.	18442.0	1640.9	*	3	1520	761	443.	18097.3	1640.5
1	1325	162	364.	2548.5	1614.7	*	2	1425	462	444.	18440.9	1640.9	*	3	1525	762	443.	18096.2	1640.5
1	1330	163	368.	2899.0	1616.1	*	2	1430	463	444.	18439.7	1640.9	*	3	1530	763	443.	18095.0	1640.5
1	1335	164	373.	3279.1	1617.4	*	2	1435	464	444.	18438.6	1640.9	*	3	1535	764	443.	18093.9	1640.5
1	1340	165	377.	3683.6	1618.9	*	2	1440	465	444.	18437.4	1640.9	*	3	1540	765	443.	18092.7	1640.5
1	1345	166	382.	4107.0	1620.2	*	2	1445	466	444.	18436.2	1640.9	*	3	1545	766	443.	18091.6	1640.5
1	1350	167	385.	4543.3	1621.2	*	2	1450	467	444.	18435.1	1640.9	*	3	1550	767	443.	18090.4	1640.5
1	1355	168	388.	4989.8	1622.2	*	2	1455	468	444.	18433.9	1640.8	*	3	1555	768	443.	18089.3	1640.5
1	1400	169	392.	5444.8	1623.1	*	2	1500	469	444.	18432.8	1640.8	*	3	1600	769	443.	18088.2	1640.5
1	1405	170	395.	5900.9	1624.1	*	2	1505	470	444.	18431.6	1640.8	*	3	1605	770	443.	18087.0	1640.5
1	1410	171	398.	6351.9	1625.1	*	2	1510	471	444.	18430.5	1640.8	*	3	1610	771	443.	18085.9	1640.5
1	1415	172	400.	6793.9	1625.8	*	2	1515	472	444.	18429.3	1640.8	*	3	1615	772	443.	18084.7	1640.5
1	1420	173	402.	7223.6	1626.5	*	2	1520	473	444.	18428.2	1640.8	*	3	1620	773	443.	18083.6	1640.5
1	1425	174	404.	7640.1	1627.2	*	2	1525	474	444.	18427.0	1640.8	*	3	1625	774	443.	18082.4	1640.5
1	1430	175	406.	8042.6	1627.8	*	2	1530	475	444.	18425.9	1640.8	*	3	1630	775	443.	18081.3	1640.5
1	1435	176	408.	8430.9	1628.4	*	2	1535	476	444.	18424.7	1640.8	*	3	1635	776	443.	18080.1	1640.5
1	1440	177	410.	8804.9	1629.0	*	2	1540	477	444.	18423.6	1640.8	*	3	1640	777	443.	18079.0	1640.5
1	1445	178	412.	9164.7	1629.6	*	2	1545	478	444.	18422.4	1640.8	*	3	1645	778	443.	18077.8	1640.5
1	1450	179	413.	9510.6	1630.2	*	2	1550	479	444.	18421.3	1640.8	*	3	1650	779	443.	18076.7	1640.5
1	1455	180	415.	9843.1	1630.6	*	2	1555	480	444.	18420.1	1640.8	*	3	1655	780	443.	18075.6	1640.5
1	1500	181	416.	10162.5	1631.1	*	2	1600	481	444.	18419.0	1640.8	*	3	1700	781	443.	18074.4	1640.5
1	1505	182	417.	10469.1	1631.5	*	2	1605	482	444.	18417.8	1640.8	*	3	1705	782	443.	18073.3	1640.5
1	1510	183	419.	10763.1	1631.9	*	2	1610	483	444.	18416.7	1640.8	*	3	1710	783	443.	18072.1	1640.5
1	1515	184	420.	11044.7	1632.3	*	2	1615	484	444.	18415.5	1640.8	*	3	1715	784	443.	18071.0	1640.5
1	1520	185	421.	11314.4	1632.7	*	2	1620	485	444.	18414.4	1640.8	*	3	1720	785	443.	18069.8	1640.5
1	1525	186	422.	11572.9	1633.0	*	2	1625	486	444.	18413.2	1640.8	*	3	1725	786	443.	18068.7	1640.5
1	1530	187	423.	11820.5	1633.4	*	2	1630	487	444.	18412.1	1640.8	*	3	1730	787	443.	18067.5	1640.5
1	1535	188	424.	12057.7	1633.7	*	2	1635	488	444.	18410.9	1640.8	*	3	1735	788	443.	18066.4	1640.5
1	1540	189	425.	12284.8	1634.0	*	2	1640	489	444.	18409.8	1640.8	*	3	1740	789	443.	18065.2	1640.5
1	1545	190	426.	12502.3	1634.3	*	2	1645	490	444.	18408.6	1640.8	*	3	1745	790	443.	18064.1	1640.5
1	1550	191	427.	12710.6	1634.6	*	2	1650	491	444.	18407.4	1640.8	*	3	1750	791	443.	18063.0	1640.5
1	1555	192	428.	12910.2	1634.9	*	2	1655	492	444.	18406.3	1640.8	*	3	1755	792	443.	18061.8	1640.5
1	1600	193	428.	13101.7	1635.1	*	2	1700	493	444.	18405.1	1640.8	*	3	1800	793	443.	18060.7	1640.5
1	1605	194	429.	13285.3	1635.3	*	2	1705	494	444.	18404.0	1640.8	*	3	1805	794	443.	18059.5	1640.5
1	1610	195	429.	13461.0	1635.5	*	2	1710	495	444.	18402.8	1640.8	*	3	1810	795	443.	18058.4	1640.5
1	1615	196	430.	13629.0	1635.7	*	2	1715	496	444.	18401.7	1640.8	*	3	1815	796	443.	18057.2	1640.5

1	1620	197	430.	13789.3	1635.9	*	2	1720	497	444.	18400.5	1640.8	*	3	1820	797	443.	18056.1	1640.5
1	1625	198	431.	13942.7	1636.0	*	2	1725	498	444.	18399.4	1640.8	*	3	1825	798	443.	18054.9	1640.5
1	1630	199	431.	14090.0	1636.2	*	2	1730	499	444.	18398.2	1640.8	*	3	1830	799	443.	18053.8	1640.5
1	1635	200	432.	14231.4	1636.4	*	2	1735	500	444.	18397.1	1640.8	*	3	1835	800	443.	18052.7	1640.5
1	1640	201	432.	14367.2	1636.5	*	2	1740	501	444.	18395.9	1640.8	*	3	1840	801	443.	18051.5	1640.5
1	1645	202	433.	14497.4	1636.7	*	2	1745	502	444.	18394.8	1640.8	*	3	1845	802	443.	18050.4	1640.5
1	1650	203	433.	14622.3	1636.8	*	2	1750	503	444.	18393.6	1640.8	*	3	1850	803	443.	18049.2	1640.5
1	1655	204	433.	14741.9	1636.9	*	2	1755	504	444.	18392.5	1640.8	*	3	1855	804	443.	18048.1	1640.5
1	1700	205	434.	14856.8	1637.1	*	2	1800	505	444.	18391.3	1640.8	*	3	1900	805	443.	18046.9	1640.5
1	1705	206	434.	14967.3	1637.2	*	2	1805	506	444.	18390.2	1640.8	*	3	1905	806	443.	18045.8	1640.5
1	1710	207	434.	15073.5	1637.3	*	2	1810	507	444.	18389.0	1640.8	*	3	1910	807	443.	18044.6	1640.5
1	1715	208	435.	15175.3	1637.4	*	2	1815	508	444.	18387.9	1640.8	*	3	1915	808	443.	18043.5	1640.5
1	1720	209	435.	15273.0	1637.5	*	2	1820	509	444.	18386.7	1640.8	*	3	1920	809	443.	18042.3	1640.5
1	1725	210	435.	15366.4	1637.6	*	2	1825	510	444.	18385.6	1640.8	*	3	1925	810	443.	18041.2	1640.5
1	1730	211	436.	15455.7	1637.7	*	2	1830	511	444.	18384.4	1640.8	*	3	1930	811	443.	18040.1	1640.5
1	1735	212	436.	15541.1	1637.8	*	2	1835	512	444.	18383.3	1640.8	*	3	1935	812	443.	18038.9	1640.5
1	1740	213	436.	15623.1	1637.9	*	2	1840	513	444.	18382.1	1640.8	*	3	1940	813	443.	18037.8	1640.5
1	1745	214	436.	15702.1	1638.0	*	2	1845	514	444.	18381.0	1640.8	*	3	1945	814	443.	18036.6	1640.5
1	1750	215	437.	15778.5	1638.1	*	2	1850	515	444.	18379.8	1640.8	*	3	1950	815	443.	18035.5	1640.5
1	1755	216	437.	15852.2	1638.2	*	2	1855	516	444.	18378.7	1640.8	*	3	1955	816	443.	18034.3	1640.5
1	1800	217	437.	15923.4	1638.2	*	2	1900	517	444.	18377.5	1640.8	*	3	2000	817	443.	18033.2	1640.5
1	1805	218	437.	15992.1	1638.3	*	2	1905	518	444.	18376.4	1640.8	*	3	2005	818	443.	18032.0	1640.5
1	1810	219	438.	16058.3	1638.4	*	2	1910	519	444.	18375.2	1640.8	*	3	2010	819	443.	18030.9	1640.5
1	1815	220	438.	16122.1	1638.5	*	2	1915	520	444.	18374.1	1640.8	*	3	2015	820	443.	18029.8	1640.5
1	1820	221	438.	16183.5	1638.5	*	2	1920	521	444.	18372.9	1640.8	*	3	2020	821	443.	18028.6	1640.5
1	1825	222	438.	16242.7	1638.6	*	2	1925	522	444.	18371.8	1640.8	*	3	2025	822	443.	18027.5	1640.5
1	1830	223	438.	16299.8	1638.7	*	2	1930	523	444.	18370.6	1640.8	*	3	2030	823	443.	18026.3	1640.5
1	1835	224	438.	16355.0	1638.7	*	2	1935	524	444.	18369.5	1640.8	*	3	2035	824	443.	18025.2	1640.5
1	1840	225	439.	16408.6	1638.8	*	2	1940	525	444.	18368.3	1640.8	*	3	2040	825	443.	18024.0	1640.5
1	1845	226	439.	16460.7	1638.8	*	2	1945	526	444.	18367.2	1640.8	*	3	2045	826	443.	18022.9	1640.5
1	1850	227	439.	16511.3	1638.9	*	2	1950	527	444.	18366.0	1640.8	*	3	2050	827	443.	18021.7	1640.5
1	1855	228	439.	16560.3	1639.0	*	2	1955	528	444.	18364.9	1640.8	*	3	2055	828	443.	18020.6	1640.5
1	1900	229	439.	16607.9	1639.0	*	2	2000	529	444.	18363.7	1640.8	*	3	2100	829	443.	18019.4	1640.5
1	1905	230	439.	16653.9	1639.1	*	2	2005	530	444.	18362.6	1640.8	*	3	2105	830	443.	18018.3	1640.5
1	1910	231	440.	16698.4	1639.1	*	2	2010	531	444.	18361.4	1640.8	*	3	2110	831	443.	18017.2	1640.5
1	1915	232	440.	16741.4	1639.2	*	2	2015	532	444.	18360.3	1640.8	*	3	2115	832	443.	18016.0	1640.5
1	1920	233	440.	16783.1	1639.2	*	2	2020	533	444.	18359.1	1640.8	*	3	2120	833	443.	18014.9	1640.5
1	1925	234	440.	16823.4	1639.2	*	2	2025	534	444.	18358.0	1640.8	*	3	2125	834	443.	18013.7	1640.5
1	1930	235	440.	16862.5	1639.3	*	2	2030	535	444.	18356.8	1640.8	*	3	2130	835	443.	18012.6	1640.5
1	1935	236	440.	16900.5	1639.3	*	2	2035	536	444.	18355.7	1640.8	*	3	2135	836	443.	18011.4	1640.5
1	1940	237	440.	16937.4	1639.4	*	2	2040	537	444.	18354.5	1640.8	*	3	2140	837	443.	18010.3	1640.5
1	1945	238	440.	16973.3	1639.4	*	2	2045	538	444.	18353.4	1640.8	*	3	2145	838	443.	18009.1	1640.5
1	1950	239	440.	17008.3	1639.5	*	2	2050	539	444.	18352.2	1640.8	*	3	2150	839	443.	18008.0	1640.5
1	1955	240	441.	17042.5	1639.5	*	2	2055	540	444.	18351.1	1640.8	*	3	2155	840	443.	18006.9	1640.5
1	2000	241	441.	17075.9	1639.5	*	2	2100	541	444.	18349.9	1640.8	*	3	2200	841	443.	18005.7	1640.5
1	2005	242	441.	17108.8	1639.6	*	2	2105	542	444.	18348.8	1640.8	*	3	2205	842	443.	18004.6	1640.5
1	2010	243	441.	17141.0	1639.6	*	2	2110	543	444.	18347.6	1640.8	*	3	2210	843	443.	18003.4	1640.5
1	2015	244	441.	17172.6	1639.6	*	2	2115	544	444.	18346.5	1640.8	*	3	2215	844	443.	18002.3	1640.5
1	2020	245	441.	17203.3	1639.7	*	2	2120	545	444.	18345.3	1640.8	*	3	2220	845	443.	18001.1	1640.5
1	2025	246	441.	17233.5	1639.7	*	2	2125	546	444.	18344.2	1640.8	*	3	2225	846	443.	18000.0	1640.5
1	2030	247	441.	17263.2	1639.7	*	2	2130	547	444.	18343.0	1640.8	*	3	2230	847	443.	17998.8	1640.5
1	2035	248	441.	17292.6	1639.8	*	2	2135	548	444.	18341.9	1640.8	*	3	2235	848	443.	17997.7	1640.5
1	2040	249	441.	17321.9	1639.8	*	2	2140	549	444.	18340.7	1640.8	*	3	2240	849	443.	17996.5	1640.5
1	2045	250	442.	17351.2	1639.8	*	2	2145	550	444.	18339.6	1640.8	*	3	2245	850	443.	17995.4	1640.5
1	2050	251	442.	17380.4	1639.9	*	2	2150	551	444.	18338.4	1640.8	*	3	2250	851	443.	17994.3	1640.4
1	2055	252	442.	17409.3	1639.9	*	2	2155	552	444.	18337.3	1640.8	*	3	2255	852	443.	17993.1	1640.4
1	2100	253	442.	17437.6	1639.9	*	2	2200	553	444.	18336.1	1640.8	*	3	2300	853	443.	17992.0	1640.4
1	2105	254	442.	17465.1	1640.0	*	2	2205	554	444.	18335.0	1640.8	*	3	2305	854	443.	17990.8	1640.4
1	2110	255	442.	17491.6	1640.0	*	2	2210	555	444.	18333.8	1640.8	*	3	2310	855	443.	17989.7	1640.4
1	2115	256	442.	17517.0	1640.0	*	2	2215	556	444.	18332.7	1640.8	*	3	2315	856	443.	17988.5	1640.4
1	2120	257	442.	17541.3	1640.0	*	2	2220	557	444.	18331.5	1640.8	*	3	2320	857	443.	17987.4	1640.4
1	2125	258	442.	17564.7	1640.1	*	2	2225	558	444.	18330.4	1640.8	*	3	2325	858	443.	17986.2	1640.4
1	2130	259	442.	17587.1	1640.1	*	2	2230	559	444.	18329.2	1640.8	*	3	2330	859	443.	17985.1	1640.4
1	2135	260	442.	17608.7	1640.1	*	2	2235	560	444.	18328.1	1640.8	*	3	2335	860	443.	17984.0	1640.4
1	2140	261	442.	17629.5	1640.1	*	2	2240	561	444.	18326.9	1640.8	*	3	2340	861	443.	17982.8	1640.4
1	2145	262	442.	17649.6	1640.1	*	2	2245	562	444.	18325.8	1640.8	*	3	2345	862	443.	17981.7	1640.4
1	2150	263	442.	17669.1	1640.2	*	2	2250	563	444.	18324.6	1640.7	*	3	2350	863	443.	17980.5	1640.4
1	2155	264	442.	17688.3	1640.2	*	2	2255	564	444.	18323.5	1640.7	*	3	2355	864	443.	17979.4	1640.4
1	2200	265	442.	17707.4	1640.2	*	2	2300	565	444.	18322.3	1640.7	*	4	0000	865	443.	17978.2	1640.4
1	2205	266	443.	17726.5	1640.2	*	2	2305	566	444.	18321.2	1640.7	*	4	0005	866	443.	17977.1	1640.4
1	2210	267	443.	17745.9	1640.2	*	2	2310	567	444.	18320.0	1640.7	*	4	0010	867	443.	17975.9	1640.4
1	2215	268	443.	17765.6	1640.2	*	2	2315	568	444.	18318.9	1640.7	*	4	0015	868	443.	17974.8	1640.4
1	2220	269	443.	17785.8	1640.3	*	2	2320	569	444.	18317.7	1640.7	*	4	0020	869	443.	17973.7	1640.4
1	2225	270	443.	17806.4	1640.3	*	2	2325	570	444.	18316.6	1640.7	*	4	0025	870	443.	17972.5	1640.4
1	2230	271	443.	17827.1	1640.3	*	2	2330	571	444.	18315.4	1640.7	*	4	0030	871	443.	17971.4	1640.4
1	2235	272	443.	17848.0	1640.3	*	2	2335	572	444.	18314.3	1640.7	*	4	0035	872	443.	17970.2	1640.4
1	2240	273	443.	17868.7	1640.3	*	2	2340	573	444.	18313.1	1640.7	*	4	0040	873	443.	17969.1	1640.4
1	2245	274	443.	17889.3	1640.4	*	2	2345	574	444.	18312.0	1640.7	*	4	0045	874	443.	17967.9	1640.4
1	2250	275	443.	17909.6	1640.4	*	2	2350	575	444.	18310.8	1640.7	*	4	0050	875	443.	17966.8	1640.4
1	2255	276	443.	17929.8	1640.4	*	2	2355	576	444.	18309.7	1640.7	*	4	0055	876	443.	17965.6	1640.4
1	2300	277	443.	17950.0	1640.4	*	3	0000	577	444.	18308.5	1640.7	*	4	0100	877	443.	17964.5	1640.4
1	2305	278	443.	17970.3	1640.4	*	3	0005	578	444.	18307.4	1640.7	*	4	0105	878	443.	17963.4	1640.4
1	2310	279	443.	17990.6	1640.4	*	3	0010	579	444.	18306.2	1640.7	*	4	0110	879	443.	17962.2	1640.4
1	2315	280	443.	18010.9	1640.5	*	3	0015	580	444.	18305.1	1640.7	*	4	0115	880	443.	17961.1	1640.4
1	2320	281	443.	18030.7	1640.5	*	3	0020	581	444.	18303.9	1640.7	*	4	0120	881	443.	17959.9	1640.4
1	2325	282	443.	18050.1	1640.5	*	3	0025	582	444.	18302.8	1640.7	*	4	0125	882	443.	17958.8	1640.4
1	2330	283	443.	18068.8	1640.5	*	3	0030	583	444.	18301.6	1640.7	*	4	0130	883	443.	17957.6	1640.4
1	2335	284	443.	18086.9	1640.5	*	3	0035	584	444.	18300.5	1640.7	*	4	0135	884	443.	17956.5	1640.4
1	2340	285	443.	18104.3	1640.5	*	3	0040	585	444.	18299.3	1640.7	*	4	0140	885	443.	17955.4	1640.4
1	2345	286	443.	18121.1	1640.6	*	3	0045	586	444.	18298.2	1640.7	*	4	0145	886	443.	17954.2	1640.4
1	2350	287	444.	18137.4	1640.6	*	3	0050	587	444.	18297.0	1640.7	*	4	0150	887	443.	17953.1	1640.4
1	2355	288	444.	18153.2	1640.6	*	3	0055	588	444.	18295.9	1640.7	*	4	0155	888	443.	17951.9	1640.4
2	0000	289	444.	18168.4	1640.6	*	3	0100	589	444.	18294.7	1640.7	*	4	0200	889	443.	17950.8	1640.4
2	0005	290	444.	18183.1	1640.6	*	3	0105	590	444.	18293.6	1640.7	*	4	0205	890	443.	17949.6	1640.4
2	0010	291	444.	18197.2	1640.6	*	3	0110	591	444.	18292.4	1640.7	*	4	0210	891	443.	17948.5	1640.4

2	0015	292	444.	18210.8	1640.6	*	3	0115	592	444.	18291.3	1640.7	*	4	0215	892	443.	17947.4	1640.4
2	0020	293	444.	18224.0	1640.7	*	3	0120	593	444.	18290.1	1640.7	*	4	0220	893	443.	17946.2	1640.4
2	0025	294	444.	18237.1	1640.7	*	3	0125	594	444.	18289.0	1640.7	*	4	0225	894	443.	17945.1	1640.4
2	0030	295	444.	18250.2	1640.7	*	3	0130	595	444.	18287.8	1640.7	*	4	0230	895	443.	17943.9	1640.4
2	0035	296	444.	18263.4	1640.7	*	3	0135	596	444.	18286.7	1640.7	*	4	0235	896	443.	17942.8	1640.4
2	0040	297	444.	18276.5	1640.7	*	3	0140	597	444.	18285.5	1640.7	*	4	0240	897	443.	17941.6	1640.4
2	0045	298	444.	18289.4	1640.7	*	3	0145	598	444.	18284.4	1640.7	*	4	0245	898	443.	17940.5	1640.4
2	0050	299	444.	18301.7	1640.7	*	3	0150	599	444.	18283.2	1640.7	*	4	0250	899	443.	17939.4	1640.4
2	0055	300	444.	18313.6	1640.7	*	3	0155	600	444.	18282.1	1640.7	*	4	0255	900	443.	17938.2	1640.4
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	74.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 444.	29.33		444.	444.	404.	388.
		(INCHES)	0.022	0.086	0.235	0.235
		(AC-FT)	220.	881.	2403.	2404.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	74.92-HR
+ (AC-FT)	(HR)				
18537.	29.50	18525.	18436.	15116.	14527.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	74.92-HR
+ (FEET)	(HR)				
1640.94	29.42	1640.93	1640.85	1631.22	1628.48

CUMULATIVE AREA = 191.93 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	CC	41338.	14.17	21059.	6163.	2061.	142.29		
+	HYDROGRAPH AT	AW	19252.	13.50	7922.	2633.	979.	30.64		
+	HYDROGRAPH AT	EAST	10019.	13.50	3264.	945.	376.	19.00		
+	3 COMBINED AT	CBD-I	66921.	14.00	31673.	9695.	3417.	191.93		
+	ROUTED TO	CBD-O	444.	29.33	444.	444.	404.	191.93		
+									1640.94	29.42

*** NORMAL END OF HEC-1 ***

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1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY  1991               *
*            VERSION 4.0.1E            *
*     Lahey F77L-EM/32 version 5.01    *
*       Dodson & Associates, Inc.      *
* RUN DATE  07/26/99  TIME  11:08:13   *
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****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*          (916) 551-1748              *
*                                      *
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X     X  XXXXXXX   XXXXX            X
X     X  X        X     X          XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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1                                    HEC-1 INPUT                                                    PAGE  1

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

    1           ID        Upper Cave Creek/Apache Wash Watercourse Master Plan  File:   FUCBD-10.I
    2           ID           By: Stantec Consulting, Inc.                    Original: 07/22/99
    3           ID         For: Flood Control District of Maricopa County   Revised:
    4           ID
    5           ID        This is a future condition model of the total inflow to Cave Buttes Dam
    6           ID        Inflow hydrographs for Cave Creek and Apache Wash are developed from the
    7           ID        following:
    8           ID
    9           ID        Cave Creek Watershed at Cave Buttes Dam
   10           ID           Combined HEC-1 models from:
   11           ID             1.  George V. Sabol Consulting Engineers FCD 95-28
   12           ID                 Cave Creek Watershed at the Carefree Highway
   13           ID                 Original model dated 06-17-96 by mcg
   14           ID                 GVSCE Project No. 84
   15           ID
   16           ID             2.  Willdan Associates FCD 95-30
   17           ID                 Cave Creek Watershed from Carefree Highway to Cave Buttes Dam
   18           ID                 Original model dated 11-29-96
   19           ID                 Willdan Project No. 08855
   20           ID
   21           ID        Model Basis:
   22           ID           10-year, 24-hr rainfall with SCS Type II distribution
   23           ID           Green & Ampt Loss Rate Method
   24           ID           NMIN = 5
   25           ID           Phoenix Mountain and Desert/Rangeland S-Graph
   26           ID           Clark Unit Hydrograph
   27           ID           Modified Puls channel storage routing
   28           ID           200 Scale 2' CI mapping of study reach by Aerial Mapping Company
   29           ID
   30           ID        Apache Wash Watershed at Cave Buttes Dam
   31           ID           Jerry Jones and Associates, Inc. FCD 89-66
   32           ID           Apache Wash Flood Insurance Study
   33           ID           Original model dated 2-15-89
   34           ID
   35           ID        Model Basis:
   36           ID           10-year, 24-hr rainfall with SCS Type IIA distribution
   37           ID           SCS Curve Number with RTIMP
   38           ID           NMIN = 10
   39           ID           SCS dimensionless unit hydrograph
   40           ID
   41           ID
   42           ID        The remaining portion of the Cave Buttes Dam watershed is modeled as a
   43           ID        single basin for existing conditions and is based on the following:
   44           ID           10-year, 24-hour rainfall with SCS Type II distribution
   45           ID           Green & Ampt Loss Rate Method
   46           ID           NMIN = 5
   47           ID           Phoenix Mountain and Desert/Rangeland S-Graph
   48           ID           USGS 7.5 Minutes Series Quadrangle Maps
   49           ID
                *
   50           IT      5                900
   51           IO      5
   52           IN      5
                *
1                                    HEC-1 INPUT                                                    PAGE  2

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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 53          KK      CC
 54          KM        Inflow hydrograph at Cave Buttes Dam from Cave Creek
 55          BA  142.29
 56          QI       0       0       0       0       0       0       0       0       0       0
 57          QI       1       1       1       1       2       2       2       2       2       3
 58          QI       3       3       3       4       4       4       5       5       6       6
 59          QI       6       7       7       8       8       9       9      10      10      11
 60          QI      12      12      13      13      14      15      15      16      17      18
 61          QI      19      20      21      23      25      28      30      33      36      39
 62          QI      42      45      49      52      56      59      63      67      73      79
 63          QI      85      91      98     105     112     121     130     141     151     161
 64          QI     169     176     183     189     194     199     203     207     211     215
 65          QI     219     223     226     230     234     237     241     245     248     252
 66          QI     256     260     264     268     272     276     281     285     290     294
 67          QI     299     304     311     318     325     333     340     347     354     361
 68          QI     368     376     384     393     403     413     424     435     446     458
 69          QI     469     481     493     506     519     532     547     562     578     598
 70          QI     623     654     694     754     855    1021    1250    1535    1862    2191
 71          QI    2459    2649    2803    2970    3171    3415    3709    4089    4604    5334
 72          QI    6422    7904    9637   11417   13276   15210   16953   18364   19404   20133
 73          QI   20561   20753   20756   20596   20305   19913   19423   18895   18363   17856
 74          QI   17366   16881   16415   15979   15579   15212   14868   14548   14248   13966
 75          QI   13701   13445   13184   12913   12627   12340   12035   11714   11380   11037
 76          QI   10692   10351   10025    9717    9424    9133    8833    8529    8223    7919
 77          QI    7607    7288    7007    6748    6513    6309    6119    5924    5728    5524
 78          QI    5318    5115    4917    4725    4541    4370    4213    4067    3936    3823
 79          QI    3730    3649    3564    3475    3381    3285    3188    3093    2995    2897
 80          QI    2799    2702    2607    2515    2425    2339    2256    2179    2109    2043
 81          QI    1981    1921    1863    1805    1749    1693    1637    1579    1519    1452
 82          QI    1376    1286    1171    1061     985     934     898     871     849     830
 83          QI     813     798     782     768     753     738     723     709     695     680
 84          QI     665     650     636     622     608     595     582     570     559     549
 85          QI     540     531     521     512     503     494     485     476     468     459
 86          QI     451     443     435     428     420     412     405     397     390     383
 87          QI     375     368     361     355     348     342     336     330     324     318
 88          QI     311     305     298     292     287     281     277     271     265     259
 89          QI     252     245     238     231     224     217     209     202     195     188
 90          QI     181     173     166     160     153     146     140     134     128     123
 91          QI     118     115     111     108     105     102     100      97      94      91
 92          QI      88      86      83      81      78      76      74      72      70      68
 93          QI      66      64      62      60      58      56      54      52      50      48
 94          QI      46      44      42      41      40      38      37      35      33      32
 95          QI      30      28      27      25      24      23      21      20      19      18
 96          QI      18      17      16      16      15      15      14      14      13      13
 97          QI      12      12      11      11      10      10       9       9       8       8
 98          QI       7       7       7       6       6       5       5       5       4       4
 99          QI       4       4       3       3       3       3       2       2       2       2
100          QI       2       2       1       1       1       1       1       1       1       0
101          IN      10
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1 HEC-1 INPUT PAGE 3

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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

102          KK      AW
103          KM        Inflow hydrograph to Cave Buttes Dam from Apache Wash
104          BA   30.64
105          QI       0       0       0       0       0       0       0       0       0       0
106          QI       0       0       0       0       0       0       0       0       0       0
107          QI       0       0       0       0       0       0       0       0       0       0
108          QI       0       0       0       0       0       0       0       1       1       2
109          QI       3       3       4       4       3       3       2       2       2       3
110          QI       4       4       4       4       4       4       4       5       5       5
111          QI       5       6       7       9      10      12      13      16      22     262
112          QI    1069    2287    2950    2651    2189    1811    1482    1451    1369    4100
113          QI    6962    9299   10355   10042    9249    8562    8913    9236    8345    7346
114          QI    6449    5674    5009    4441    3955    3538    3174    2854    2579    2348
115          QI    2157    1995    1850    1716    1597    1494    1406    1329    1268    1220
116          QI    1179    1137    1090    1045    1007     976     948     924     904     888
117          QI     869     847     826     866     987    1098    1113    1030     941     874
118          QI     816     776     777     832     935    1052    1141    1199    1254    1317
119          QI    1382    1417    1366    1268    1171    1098    1041     967     889     827
120          QI     877     885     814     741     676     619     570     529     493     462
121          QI     434     406     380     356     333     311     292     275     259     245
122          QI     233     222     211     202     193     183     172     162     151       0
123          IN       5
             *

124          KK    EAST
125          KM
126          BA      19
127          QI       0       0       0       0       0       0       0       0       0       0
128          QI       1       1       1       2       3       4       5       6       7       9
129          QI      10      12      13      15      16      18      19      20      21      22
130          QI      23      24      25      26      26      27      27      28      28      28
131          QI      29      29      29      30      30      30      30      30      30      31
132          QI      31      31      31      31      31      31      32      32      32      32
133          QI      33      33      34      34      35      35      36      36      37      37
134          QI      38      38      39      39      39      40      40      40      40      41
135          QI      41      41      41      41      42      42      43      43      43      44
136          QI      44      45      46      46      47      47      48      48      49      49
137          QI      49      50      50      50      51      51      51      52      52      53
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 138          QI     54     55     56     57     58     59     61     62     64     65
 139          QI     67     68     70     71     73     74     75     76     77     79
 140          QI     80     82     83     85     87     89     92     95     98    102
 141          QI    106    110    119    129    139    178    225    276    347    470
 142          QI    619    759    948   1171   1414   1630   1838   2023   2185   2322
 143          QI   2429   2485   2505   2495   2433   2337   2213   2067   1909   1743
 144          QI   1594   1456   1331   1218   1112   1017    930    848    778    710
 145          QI    653    604    550    508    468    430    391    358    336    313
 146          QI    290    265    246    227    205    183    161    156    153    150
 147          QI    147    145    143    140    138    135    126    116    107     95
 148          QI     83     72     70     68     67     66     65     64     63     62
 149          QI     61     60     59     58     57     56     55     54     53     52
 150          QI     52     51     50     49     49     48     47     47     46     46
 151          QI     45     45     45     45     44     44     44     43     43     43
 152          QI     42     42     42     41     41     40     39     39     38     38
 153          QI     37     37     36     36     35     35     35     34     34     34
1                                          HEC-1 INPUT                                          PAGE  4

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 154          QI     34     33     33     33     33     33     33     32     32     32
 155          QI     32     32     32     32     32     32     32     32     32     32
 156          QI     32     32     32     32     31     31     31     30     30     29
 157          QI     28     27     26     25     23      0
              *

 158          KK   CBD-I
 159          KO      1                                 21
 160          KM       Total inflow to Cave Buttes Dam
 161          HC      3
              *

 162          KK   CBD-O
 163          KO      1
 164          RS      1    FLOW     -1
 165          SV      0     250    700   1100   1800   2600   4000   6300   9400  13000
 166          SV  17500   23000  29200  37000  46000
 167          SE 1560.7    1595   1600   1605   1610   1615   1620   1625   1630   1635
 168          SE   1640    1645   1650   1655   1660
 169          SQ      0     132    215    243    268    290    311    330    347    365
 170          SQ    381     398    413    428    442    455    468    481    493
 171          SE 1560.7    1570   1580   1585   1590   1595   1600   1605   1610   1615
 172          SE   1620    1625   1630   1635   1640   1645   1650   1655   1660
              *
 173          ZZ
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE (HEC-1)*
*             MAY  1991             *
*          VERSION 4.0.1E           *
*     Lahey F77L-EM/32 version 5.01 *
*       Dodson & Associates, Inc.   *
* RUN DATE  07/26/99  TIME  11:08:13*
*************************************

*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*          609 SECOND STREET        *
*       DAVIS, CALIFORNIA 95616     *
*          (916) 551-1748           *
*                                   *
*************************************
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Upper Cave Creek/Apache Wash Watercourse Master Plan File: FUCBD-10.I
By: Stantec Consulting, Inc. Original: 07/22/99
For: Flood Control District of Maricopa County Revised:

This is a future condition model of the total inflow to Cave Buttes Dam
Inflow hydrographs for Cave Creek and Apache Wash are developed from the
following:

Cave Creek Watershed at Cave Buttes Dam
Combined HEC-1 models from:

1. George V. Sabol Consulting Engineers FCD 95-28
   Cave Creek Watershed at the Carefree Highway
   Original model dated 06-17-96 by mcg
   GVSCE Project No. 84

2. Willdan Associates FCD 95-30
   Cave Creek Watershed from Carefree Highway to Cave Buttes Dam
   Original model dated 11-29-96
   Willdan Project No. 08855

Model Basis:
10-year, 24-hr rainfall with SCS Type II distribution
Green & Ampt Loss Rate Method
NMIN = 5
Phoenix Mountain and Desert/Rangeland S-Graph
Clark Unit Hydrograph
Modified Puls channel storage routing
200 Scale 2' CI mapping of study reach by Aerial Mapping Company

Apache Wash Watershed at Cave Buttes Dam
Jerry Jones and Associates, Inc. FCD 89-66
Apache Wash Flood Insurance Study
Original model dated 2-15-89

Model Basis:
10-year, 24-hr rainfall with SCS Type IIA distribution

SCS Curve Number with RTIMP
NMIN = 10
SCS dimensionless unit hydrograph

The remaining portion of the Cave Buttes Dam watershed is modeled as a single basin for existing conditions and is based on the following:
10-year, 24-hour rainfall with SCS Type II distribution
Green & Ampt Loss Rate Method
NMIN = 5
Phoenix Mountain and Desert/Rangeland S-Graph
USGS 7.5 Minutes Series Quadrangle Maps

```
 51 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         900  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      4    0  ENDING DATE
                     NDTIME        0255  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL    0.08 HOURS
                      TOTAL TIME BASE   74.92 HOURS

         ENGLISH UNITS
              DRAINAGE AREA          SQUARE MILES
              PRECIPITATION DEPTH    INCHES
              LENGTH, ELEVATION      FEET
              FLOW                   CUBIC FEET PER SECOND
              STORAGE VOLUME         ACRE-FEET
              SURFACE AREA           ACRES
              TEMPERATURE            DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 158 KK     *     CBD-I  *
            *            *
            **************

 159 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         900  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.083  TIME INTERVAL IN HOURS

                              Total inflow to Cave Buttes Dam

 161 HC          HYDROGRAPH COMBINATION
                      ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    ***
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****

HYDROGRAPH AT STATION CBD-I
SUM OF 3 HYDROGRAPHS

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		1845	226	5494.	*	2		1330	451	175.	*	3		0815	676	175.
1		0005	2	0.	*	1		1850	227	5313.	*	2		1335	452	175.	*	3		0820	677	175.
1		0010	3	0.	*	1		1855	228	5147.	*	2		1340	453	175.	*	3		0825	678	175.
1		0015	4	0.	*	1		1900	229	4996.	*	2		1345	454	175.	*	3		0830	679	175.
1		0020	5	0.	*	1		1905	230	4867.	*	2		1350	455	175.	*	3		0835	680	175.
1		0025	6	0.	*	1		1910	231	4758.	*	2		1355	456	175.	*	3		0840	681	175.
1		0030	7	0.	*	1		1915	232	4662.	*	2		1400	457	175.	*	3		0845	682	175.
1		0035	8	0.	*	1		1920	233	4562.	*	2		1405	458	175.	*	3		0850	683	175.
1		0040	9	0.	*	1		1925	234	4460.	*	2		1410	459	175.	*	3		0855	684	175.
1		0045	10	0.	*	1		1930	235	4354.	*	2		1415	460	175.	*	3		0900	685	175.
1		0050	11	2.	*	1		1935	236	4247.	*	2		1420	461	175.	*	3		0905	686	175.
1		0055	12	2.	*	1		1940	237	4139.	*	2		1425	462	175.	*	3		0910	687	175.
1		0100	13	2.	*	1		1945	238	4036.	*	2		1430	463	175.	*	3		0915	688	175.
1		0105	14	3.	*	1		1950	239	3929.	*	2		1435	464	175.	*	3		0920	689	175.
1		0110	15	5.	*	1		1955	240	3822.	*	2		1440	465	175.	*	3		0925	690	175.
1		0115	16	6.	*	1		2000	241	3713.	*	2		1445	466	175.	*	3		0930	691	175.
1		0120	17	7.	*	1		2005	242	3605.	*	2		1450	467	175.	*	3		0935	692	175.
1		0125	18	8.	*	1		2010	243	3499.	*	2		1455	468	175.	*	3		0940	693	175.

1	0130	19	9.	*	1	2015	244	3397.	*	2	1500	469	175.	*	3	0945	694	175.
1	0135	20	12.	*	1	2020	245	3295.	*	2	1505	470	175.	*	3	0950	695	175.
1	0140	21	13.	*	1	2025	246	3229.	*	2	1510	471	175.	*	3	0955	696	175.
1	0145	22	15.	*	1	2030	247	3166.	*	2	1515	472	175.	*	3	1000	697	175.
1	0150	23	16.	*	1	2035	248	3149.	*	2	1520	473	175.	*	3	1005	698	175.
1	0155	24	19.	*	1	2040	249	3139.	*	2	1525	474	175.	*	3	1010	699	175.
1	0200	25	20.	*	1	2045	250	3129.	*	2	1530	475	175.	*	3	1015	700	175.
1	0205	26	22.	*	1	2050	251	3121.	*	2	1535	476	175.	*	3	1020	701	175.
1	0210	27	24.	*	1	2055	252	3069.	*	2	1540	477	175.	*	3	1025	702	175.
1	0215	28	25.	*	1	2100	253	3018.	*	2	1545	478	175.	*	3	1030	703	175.
1	0220	29	27.	*	1	2105	254	2918.	*	2	1550	479	175.	*	3	1035	704	175.
1	0225	30	28.	*	1	2110	255	2820.	*	2	1555	480	175.	*	3	1040	705	175.
1	0230	31	29.	*	1	2115	256	2719.	*	2	1600	481	175.	*	3	1045	706	175.
1	0235	32	31.	*	1	2120	257	2617.	*	2	1605	482	175.	*	3	1050	707	175.
1	0240	33	32.	*	1	2125	258	2526.	*	2	1610	483	175.	*	3	1055	708	175.
1	0245	34	34.	*	1	2130	259	2431.	*	2	1615	484	175.	*	3	1100	709	175.
1	0250	35	34.	*	1	2135	260	2335.	*	2	1620	485	175.	*	3	1105	710	175.
1	0255	36	36.	*	1	2140	261	2229.	*	2	1625	486	175.	*	3	1110	711	175.
1	0300	37	36.	*	1	2145	262	2119.	*	2	1630	487	175.	*	3	1115	712	175.
1	0305	38	38.	*	1	2150	263	1983.	*	2	1635	488	175.	*	3	1120	713	175.
1	0310	39	38.	*	1	2155	264	1874.	*	2	1640	489	175.	*	3	1125	714	175.
1	0315	40	39.	*	1	2200	265	1797.	*	2	1645	490	175.	*	3	1130	715	175.
1	0320	41	41.	*	1	2205	266	1774.	*	2	1650	491	175.	*	3	1135	716	175.
1	0325	42	41.	*	1	2210	267	1765.	*	2	1655	492	175.	*	3	1140	717	175.
1	0330	43	42.	*	1	2215	268	1789.	*	2	1700	493	175.	*	3	1145	718	175.
1	0335	44	43.	*	1	2220	269	1818.	*	2	1705	494	175.	*	3	1150	719	175.
1	0340	45	44.	*	1	2225	270	1858.	*	2	1710	495	175.	*	3	1155	720	175.
1	0345	46	45.	*	1	2230	271	1899.	*	2	1715	496	175.	*	3	1200	721	175.
1	0350	47	45.	*	1	2235	272	1928.	*	2	1720	497	175.	*	3	1205	722	175.
1	0355	48	46.	*	1	2240	273	1956.	*	2	1725	498	175.	*	3	1210	723	175.
1	0400	49	47.	*	1	2245	274	1971.	*	2	1730	499	175.	*	3	1215	724	175.
1	0405	50	49.	*	1	2250	275	1985.	*	2	1735	500	175.	*	3	1220	725	175.
1	0410	51	50.	*	1	2255	276	1998.	*	2	1740	501	175.	*	3	1225	726	175.
1	0415	52	51.	*	1	2300	277	2010.	*	2	1745	502	175.	*	3	1230	727	175.
1	0420	53	52.	*	1	2305	278	2027.	*	2	1750	503	175.	*	3	1235	728	175.
1	0425	54	54.	*	1	2310	279	2044.	*	2	1755	504	175.	*	3	1240	729	175.
1	0430	55	56.	*	1	2315	280	2062.	*	2	1800	505	175.	*	3	1245	730	175.
1	0435	56	59.	*	1	2320	281	2079.	*	2	1805	506	175.	*	3	1250	731	175.
1	0440	57	62.	*	1	2325	282	2082.	*	2	1810	507	175.	*	3	1255	732	175.
1	0445	58	65.	*	1	2330	283	2085.	*	2	1815	508	175.	*	3	1300	733	175.
1	0450	59	68.	*	1	2335	284	2046.	*	2	1820	509	175.	*	3	1305	734	175.
1	0455	60	71.	*	1	2340	285	2006.	*	2	1825	510	175.	*	3	1310	735	175.
1	0500	61	75.	*	1	2345	286	1944.	*	2	1830	511	175.	*	3	1315	736	175.
1	0505	62	78.	*	1	2350	287	1882.	*	2	1835	512	175.	*	3	1320	737	175.
1	0510	63	83.	*	1	2355	288	1822.	*	2	1840	513	175.	*	3	1325	738	175.
1	0515	64	86.	*	2	0000	289	1762.	*	2	1845	514	175.	*	3	1330	739	175.
1	0520	65	91.	*	2	0005	290	1716.	*	2	1850	515	175.	*	3	1335	740	175.
1	0525	66	94.	*	2	0010	291	1670.	*	2	1855	516	175.	*	3	1340	741	175.
1	0530	67	99.	*	2	0015	292	1633.	*	2	1900	517	175.	*	3	1345	742	175.
1	0535	68	103.	*	2	0020	293	1594.	*	2	1905	518	175.	*	3	1350	743	175.
1	0540	69	110.	*	2	0025	294	1548.	*	2	1910	519	175.	*	3	1355	744	175.
1	0545	70	116.	*	2	0030	295	1501.	*	2	1915	520	175.	*	3	1400	745	175.
1	0550	71	123.	*	2	0035	296	1453.	*	2	1920	521	175.	*	3	1405	746	175.
1	0555	72	129.	*	2	0040	297	1405.	*	2	1925	522	175.	*	3	1410	747	175.
1	0600	73	137.	*	2	0045	298	1364.	*	2	1930	523	175.	*	3	1415	748	175.
1	0605	74	145.	*	2	0050	299	1325.	*	2	1935	524	175.	*	3	1420	749	175.
1	0610	75	152.	*	2	0055	300	1340.	*	2	1940	525	175.	*	3	1425	750	175.
1	0615	76	162.	*	2	0100	301	1356.	*	2	1945	526	175.	*	3	1430	751	175.
1	0620	77	171.	*	2	0105	302	1351.	*	2	1950	527	175.	*	3	1435	752	175.
1	0625	78	183.	*	2	0110	303	1346.	*	2	1955	528	175.	*	3	1440	753	175.
1	0630	79	193.	*	2	0115	304	1303.	*	2	2000	529	175.	*	3	1445	754	175.
1	0635	80	205.	*	2	0120	305	1257.	*	2	2005	530	175.	*	3	1450	755	175.
1	0640	81	213.	*	2	0125	306	1213.	*	2	2010	531	175.	*	3	1455	756	175.
1	0645	82	220.	*	2	0130	307	1169.	*	2	2015	532	175.	*	3	1500	757	175.
1	0650	83	227.	*	2	0135	308	1129.	*	2	2020	533	175.	*	3	1505	758	175.
1	0655	84	234.	*	2	0140	309	1089.	*	2	2025	534	175.	*	3	1510	759	175.
1	0700	85	240.	*	2	0145	310	1054.	*	2	2030	535	175.	*	3	1515	760	175.
1	0705	86	245.	*	2	0150	311	1017.	*	2	2035	536	175.	*	3	1520	761	175.
1	0710	87	250.	*	2	0155	312	986.	*	2	2040	537	175.	*	3	1525	762	175.
1	0715	88	254.	*	2	0200	313	954.	*	2	2045	538	175.	*	3	1530	763	175.
1	0720	89	257.	*	2	0205	314	928.	*	2	2050	539	175.	*	3	1535	764	175.
1	0725	90	262.	*	2	0210	315	900.	*	2	2055	540	175.	*	3	1540	765	175.
1	0730	91	266.	*	2	0215	316	876.	*	2	2100	541	175.	*	3	1545	766	175.
1	0735	92	271.	*	2	0220	317	852.	*	2	2105	542	175.	*	3	1550	767	175.
1	0740	93	274.	*	2	0225	318	831.	*	2	2110	543	175.	*	3	1555	768	175.
1	0745	94	278.	*	2	0230	319	809.	*	2	2115	544	175.	*	3	1600	769	175.
1	0750	95	283.	*	2	0235	320	789.	*	2	2120	545	175.	*	3	1605	770	175.
1	0755	96	286.	*	2	0240	321	768.	*	2	2125	546	175.	*	3	1610	771	175.
1	0800	97	291.	*	2	0245	322	748.	*	2	2130	547	175.	*	3	1615	772	175.
1	0805	98	296.	*	2	0250	323	727.	*	2	2135	548	175.	*	3	1620	773	175.
1	0810	99	300.	*	2	0255	324	708.	*	2	2140	549	175.	*	3	1625	774	175.
1	0815	100	305.	*	2	0300	325	690.	*	2	2145	550	175.	*	3	1630	775	175.
1	0820	101	309.	*	2	0305	326	672.	*	2	2150	551	175.	*	3	1635	776	175.
1	0825	102	314.	*	2	0310	327	656.	*	2	2155	552	175.	*	3	1640	777	175.
1	0830	103	318.	*	2	0315	328	639.	*	2	2200	553	175.	*	3	1645	778	175.
1	0835	104	322.	*	2	0320	329	621.	*	2	2205	554	175.	*	3	1650	779	175.
1	0840	105	327.	*	2	0325	330	604.	*	2	2210	555	175.	*	3	1655	780	175.
1	0845	106	331.	*	2	0330	331	586.	*	2	2215	556	175.	*	3	1700	781	175.
1	0850	107	336.	*	2	0335	332	570.	*	2	2220	557	175.	*	3	1705	782	175.
1	0855	108	341.	*	2	0340	333	553.	*	2	2225	558	175.	*	3	1710	783	175.
1	0900	109	346.	*	2	0345	334	538.	*	2	2230	559	175.	*	3	1715	784	175.
1	0905	110	351.	*	2	0350	335	522.	*	2	2235	560	175.	*	3	1720	785	175.
1	0910	111	357.	*	2	0355	336	507.	*	2	2240	561	175.	*	3	1725	786	175.
1	0915	112	363.	*	2	0400	337	491.	*	2	2245	562	175.	*	3	1730	787	175.
1	0920	113	371.	*	2	0405	338	477.	*	2	2250	563	175.	*	3	1735	788	175.

1	0925	114	380.	*	2	0410	339	463.	*	2	2255	564	175.	*	3	1740	789	175.
1	0930	115	388.	*	2	0415	340	450.	*	2	2300	565	175.	*	3	1745	790	175.
1	0935	116	397.	*	2	0420	341	437.	*	2	2305	566	175.	*	3	1750	791	175.
1	0940	117	406.	*	2	0425	342	424.	*	2	2310	567	175.	*	3	1755	792	175.
1	0945	118	414.	*	2	0430	343	411.	*	2	2315	568	175.	*	3	1800	793	175.
1	0950	119	423.	*	2	0435	344	400.	*	2	2320	569	175.	*	3	1805	794	175.
1	0955	120	431.	*	2	0440	345	387.	*	2	2325	570	175.	*	3	1810	795	175.
1	1000	121	440.	*	2	0445	346	376.	*	2	2330	571	175.	*	3	1815	796	175.
1	1005	122	450.	*	2	0450	347	365.	*	2	2335	572	175.	*	3	1820	797	175.
1	1010	123	460.	*	2	0455	348	355.	*	2	2340	573	175.	*	3	1825	798	175.
1	1015	124	471.	*	2	0500	349	344.	*	2	2345	574	175.	*	3	1830	799	175.
1	1020	125	483.	*	2	0505	350	334.	*	2	2350	575	175.	*	3	1835	800	175.
1	1025	126	495.	*	2	0510	351	324.	*	2	2355	576	175.	*	3	1840	801	175.
1	1030	127	508.	*	2	0515	352	316.	*	3	0000	577	175.	*	3	1845	802	175.
1	1035	128	521.	*	2	0520	353	306.	*	3	0005	578	175.	*	3	1850	803	175.
1	1040	129	533.	*	2	0525	354	298.	*	3	0010	579	175.	*	3	1855	804	175.
1	1045	130	548.	*	2	0530	355	290.	*	3	0015	580	175.	*	3	1900	805	175.
1	1050	131	561.	*	2	0535	356	282.	*	3	0020	581	175.	*	3	1905	806	175.
1	1055	132	576.	*	2	0540	357	274.	*	3	0025	582	175.	*	3	1910	807	175.
1	1100	133	589.	*	2	0545	358	271.	*	3	0030	583	175.	*	3	1915	808	175.
1	1105	134	606.	*	2	0550	359	268.	*	3	0035	584	175.	*	3	1920	809	175.
1	1110	135	622.	*	2	0555	360	265.	*	3	0040	585	175.	*	3	1925	810	175.
1	1115	136	640.	*	2	0600	361	262.	*	3	0045	586	175.	*	3	1930	811	175.
1	1120	137	661.	*	2	0605	362	260.	*	3	0050	587	175.	*	3	1935	812	175.
1	1125	138	799.	*	2	0610	363	257.	*	3	0055	588	175.	*	3	1940	813	175.
1	1130	139	938.	*	2	0615	364	255.	*	3	0100	589	175.	*	3	1945	814	175.
1	1135	140	1366.	*	2	0620	365	252.	*	3	0105	590	175.	*	3	1950	815	175.
1	1140	141	1798.	*	2	0625	366	250.	*	3	0110	591	175.	*	3	1955	816	175.
1	1145	142	2442.	*	2	0630	367	248.	*	3	0115	592	175.	*	3	2000	817	175.
1	1150	143	3100.	*	2	0635	368	246.	*	3	0120	593	175.	*	3	2005	818	175.
1	1155	144	3502.	*	2	0640	369	244.	*	3	0125	594	175.	*	3	2010	819	175.
1	1200	145	3944.	*	2	0645	370	242.	*	3	0130	595	175.	*	3	2015	820	175.
1	1205	146	4000.	*	2	0650	371	240.	*	3	0135	596	175.	*	3	2020	821	175.
1	1210	147	4126.	*	2	0655	372	238.	*	3	0140	597	175.	*	3	2025	822	175.
1	1215	148	4231.	*	2	0700	373	236.	*	3	0145	598	175.	*	3	2030	823	175.
1	1220	149	4398.	*	2	0705	374	234.	*	3	0150	599	175.	*	3	2035	824	175.
1	1225	150	4661.	*	2	0710	375	232.	*	3	0155	600	175.	*	3	2040	825	175.
1	1230	151	4889.	*	2	0715	376	230.	*	3	0200	601	175.	*	3	2045	826	175.
1	1235	152	5055.	*	2	0720	377	228.	*	3	0205	602	175.	*	3	2050	827	175.
1	1240	153	5233.	*	2	0725	378	226.	*	3	0210	603	175.	*	3	2055	828	175.
1	1245	154	5608.	*	2	0730	379	224.	*	3	0215	604	175.	*	3	2100	829	175.
1	1250	155	6036.	*	2	0735	380	222.	*	3	0220	605	175.	*	3	2105	830	175.
1	1255	156	6455.	*	2	0740	381	220.	*	3	0225	606	175.	*	3	2110	831	175.
1	1300	157	6916.	*	2	0745	382	218.	*	3	0230	607	175.	*	3	2115	832	175.
1	1305	158	8847.	*	2	0750	383	216.	*	3	0235	608	175.	*	3	2120	833	175.
1	1310	159	10889.	*	2	0755	384	215.	*	3	0240	609	175.	*	3	2125	834	175.
1	1315	160	13187.	*	2	0800	385	214.	*	3	0245	610	175.	*	3	2130	835	175.
1	1320	161	15813.	*	2	0805	386	212.	*	3	0250	611	175.	*	3	2135	836	175.
1	1325	162	18520.	*	2	0810	387	211.	*	3	0255	612	175.	*	3	2140	837	175.
1	1330	163	21441.	*	2	0815	388	209.	*	3	0300	613	175.	*	3	2145	838	175.
1	1335	164	23739.	*	2	0820	389	207.	*	3	0305	614	175.	*	3	2150	839	175.
1	1340	165	26064.	*	2	0825	390	206.	*	3	0310	615	175.	*	3	2155	840	175.
1	1345	166	27746.	*	2	0830	391	204.	*	3	0315	616	175.	*	3	2200	841	175.
1	1350	167	29208.	*	2	0835	392	202.	*	3	0320	617	175.	*	3	2205	842	175.
1	1355	168	30077.	*	2	0840	393	201.	*	3	0325	618	175.	*	3	2210	843	175.
1	1400	169	30562.	*	2	0845	394	199.	*	3	0330	619	175.	*	3	2215	844	175.
1	1405	170	30782.	*	2	0850	395	198.	*	3	0335	620	175.	*	3	2220	845	175.
1	1410	171	30717.	*	2	0855	396	197.	*	3	0340	621	175.	*	3	2225	846	175.
1	1415	172	30947.	*	2	0900	397	195.	*	3	0345	622	175.	*	3	2230	847	175.
1	1420	173	31000.	*	2	0905	398	194.	*	3	0350	623	175.	*	3	2235	848	175.
1	1425	174	30889.	*	2	0910	399	193.	*	3	0355	624	175.	*	3	2240	849	175.
1	1430	175	30653.	*	2	0915	400	192.	*	3	0400	625	175.	*	3	2245	850	175.
1	1435	176	29721.	*	2	0920	401	192.	*	3	0405	626	175.	*	3	2250	851	175.
1	1440	177	28698.	*	2	0925	402	191.	*	3	0410	627	175.	*	3	2255	852	175.
1	1445	178	27589.	*	2	0930	403	190.	*	3	0415	628	175.	*	3	2300	853	175.
1	1450	179	26487.	*	2	0935	404	190.	*	3	0420	629	175.	*	3	2305	854	175.
1	1455	180	25464.	*	2	0940	405	189.	*	3	0425	630	175.	*	3	2310	855	175.
1	1500	181	24468.	*	2	0945	406	189.	*	3	0430	631	175.	*	3	2315	856	175.
1	1505	182	23547.	*	2	0950	407	188.	*	3	0435	632	175.	*	3	2320	857	175.
1	1510	183	22639.	*	2	0955	408	188.	*	3	0440	633	175.	*	3	2325	858	175.
1	1515	184	21829.	*	2	1000	409	187.	*	3	0445	634	175.	*	3	2330	859	175.
1	1520	185	21056.	*	2	1005	410	187.	*	3	0450	635	175.	*	3	2335	860	175.
1	1525	186	20367.	*	2	1010	411	186.	*	3	0455	636	175.	*	3	2340	861	175.
1	1530	187	19700.	*	2	1015	412	186.	*	3	0500	637	175.	*	3	2345	862	175.
1	1535	188	19104.	*	2	1020	413	185.	*	3	0505	638	175.	*	3	2350	863	175.
1	1540	189	18539.	*	2	1025	414	185.	*	3	0510	639	175.	*	3	2355	864	175.
1	1545	190	18026.	*	2	1030	415	184.	*	3	0515	640	175.	*	4	0000	865	175.
1	1550	191	17529.	*	2	1035	416	184.	*	3	0520	641	175.	*	4	0005	866	175.
1	1555	192	17066.	*	2	1040	417	183.	*	3	0525	642	175.	*	4	0010	867	175.
1	1600	193	16604.	*	2	1045	418	183.	*	3	0530	643	175.	*	4	0015	868	175.
1	1605	194	16154.	*	2	1050	419	182.	*	3	0535	644	175.	*	4	0020	869	175.
1	1610	195	15686.	*	2	1055	420	182.	*	3	0540	645	175.	*	4	0025	870	175.
1	1615	196	15240.	*	2	1100	421	181.	*	3	0545	646	175.	*	4	0030	871	175.
1	1620	197	14775.	*	2	1105	422	181.	*	3	0550	647	175.	*	4	0035	872	175.
1	1625	198	14334.	*	2	1110	423	181.	*	3	0555	648	175.	*	4	0040	873	175.
1	1630	199	13881.	*	2	1115	424	180.	*	3	0600	649	175.	*	4	0045	874	175.
1	1635	200	13440.	*	2	1120	425	180.	*	3	0605	650	175.	*	4	0050	875	175.
1	1640	201	12996.	*	2	1125	426	179.	*	3	0610	651	175.	*	4	0055	876	175.
1	1645	202	12572.	*	2	1130	427	179.	*	3	0615	652	175.	*	4	0100	877	175.
1	1650	203	12163.	*	2	1135	428	179.	*	3	0620	653	175.	*	4	0105	878	175.
1	1655	204	11780.	*	2	1140	429	178.	*	3	0625	654	175.	*	4	0110	879	175.
1	1700	205	11412.	*	2	1145	430	178.	*	3	0630	655	175.	*	4	0115	880	175.
1	1705	206	11051.	*	2	1150	431	178.	*	3	0635	656	175.	*	4	0120	881	175.
1	1710	207	10675.	*	2	1155	432	178.	*	3	0640	657	175.	*	4	0125	882	175.
1	1715	208	10302.	*	2	1200	433	177.	*	3	0645	658	175.	*	4	0130	883	175.

1	1720	209	9927.	*	2	1205	434	177.	*	3	0650	659	175.	*	4	0135	884	175.
1	1725	210	9560.	*	2	1210	435	177.	*	3	0655	660	175.	*	4	0140	885	175.
1	1730	211	9184.	*	2	1215	436	177.	*	3	0700	661	175.	*	4	0145	886	175.
1	1735	212	8810.	*	2	1220	437	176.	*	3	0705	662	175.	*	4	0150	887	175.
1	1740	213	8483.	*	2	1225	438	176.	*	3	0710	663	175.	*	4	0155	888	175.
1	1745	214	8184.	*	2	1230	439	176.	*	3	0715	664	175.	*	4	0200	889	175.
1	1750	215	7909.	*	2	1235	440	176.	*	3	0720	665	175.	*	4	0205	890	175.
1	1755	216	7674.	*	2	1240	441	176.	*	3	0725	666	175.	*	4	0210	891	175.
1	1800	217	7452.	*	2	1245	442	176.	*	3	0730	667	175.	*	4	0215	892	175.
1	1805	218	7232.	*	2	1250	443	175.	*	3	0735	668	175.	*	4	0220	893	175.
1	1810	219	7011.	*	2	1255	444	175.	*	3	0740	669	175.	*	4	0225	894	175.
1	1815	220	6786.	*	2	1300	445	175.	*	3	0745	670	175.	*	4	0230	895	175.
1	1820	221	6558.	*	2	1305	446	175.	*	3	0750	671	175.	*	4	0235	896	175.
1	1825	222	6333.	*	2	1310	447	175.	*	3	0755	672	175.	*	4	0240	897	175.
1	1830	223	6113.	*	2	1315	448	175.	*	3	0800	673	175.	*	4	0245	898	175.
1	1835	224	5897.	*	2	1320	449	175.	*	3	0805	674	175.	*	4	0250	899	175.
1	1840	225	5688.	*	2	1325	450	175.	*	3	0810	675	175.	*	4	0255	900	175.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	74.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 31000.	14.33		16524.	5246.	1862.	1790.
		(INCHES)	0.800	1.016	1.083	1.083
		(AC-FT)	8194.	10404.	11081.	11084.

CUMULATIVE AREA = 191.93 SQ MI

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162 KK      *    CBD-O   *
            *            *
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163 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

164 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       FLOW  TYPE OF INITIAL CONDITION
                    RSVRIC      -1.00  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT

165 SV            STORAGE        0.0     250.0     700.0    1100.0    1800.0    2600.0    4000.0    6300.0    9400.0   13000.0
                            17500.0   23000.0   29200.0   37000.0   46000.0

167 SE          ELEVATION    1560.70   1595.00   1600.00   1605.00   1610.00   1615.00   1620.00   1625.00   1630.00   1635.00
                             1640.00   1645.00   1650.00   1655.00   1660.00

169 SQ          DISCHARGE         0.      132.      215.      243.      268.      290.      311.      330.      347.      365.
                                381.      398.      413.      428.      442.      455.      468.      481.      493.

171 SE          ELEVATION    1560.70   1570.00   1580.00   1585.00   1590.00   1595.00   1600.00   1605.00   1610.00   1615.00
                             1620.00   1625.00   1630.00   1635.00   1640.00   1645.00   1650.00   1655.00   1660.00
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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	67.78	140.67	177.11	213.56	250.00	700.00	1100.00	1800.00	2600.00
OUTFLOW	0.00	132.00	215.00	243.00	268.00	290.00	311.00	330.00	347.00	365.00
ELEVATION	1560.70	1570.00	1580.00	1585.00	1590.00	1595.00	1600.00	1605.00	1610.00	1615.00
STORAGE	4000.00	6300.00	9400.00	13000.00	17500.00	23000.00	29200.00	37000.00	46000.00	
OUTFLOW	381.00	398.00	413.00	428.00	442.00	455.00	468.00	481.00	493.00	
ELEVATION	1620.00	1625.00	1630.00	1635.00	1640.00	1645.00	1650.00	1655.00	1660.00	

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HYDROGRAPH AT STATION CBD-O

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	0.0	1560.7	*	2		0100	301	414.	9664.1	1630.4	*	3		0200	601	413.	9384.4	1630.0
1		0005	2	0.	0.0	1560.7	*	2		0105	302	414.	9670.6	1630.4	*	3		0205	602	413.	9382.8	1630.0
1		0010	3	0.	0.0	1560.7	*	2		0110	303	414.	9677.0	1630.4	*	3		0210	603	413.	9381.1	1630.0
1		0015	4	0.	0.0	1560.7	*	2		0115	304	414.	9683.3	1630.4	*	3		0215	604	413.	9379.5	1630.0
1		0020	5	0.	0.0	1560.7	*	2		0120	305	414.	9689.2	1630.4	*	3		0220	605	413.	9377.8	1630.0
1		0025	6	0.	0.0	1560.7	*	2		0125	306	414.	9694.9	1630.4	*	3		0225	606	413.	9376.2	1630.0
1		0030	7	0.	0.0	1560.7	*	2		0130	307	414.	9700.2	1630.4	*	3		0230	607	413.	9374.6	1630.0
1		0035	8	0.	0.0	1560.7	*	2		0135	308	414.	9705.3	1630.4	*	3		0235	608	413.	9372.9	1630.0

1	0040	9	0.	0.0	1560.7	*	2	0140	309	414.	9710.1	1630.4	*	3	0240	609	413.	9371.3	1630.0
1	0045	10	0.	0.0	1560.7	*	2	0145	310	414.	9714.6	1630.4	*	3	0245	610	413.	9369.7	1630.0
1	0050	11	0.	0.0	1560.7	*	2	0150	311	414.	9718.9	1630.4	*	3	0250	611	413.	9368.0	1629.9
1	0055	12	0.	0.0	1560.7	*	2	0155	312	414.	9722.9	1630.4	*	3	0255	612	413.	9366.4	1629.9
1	0100	13	0.	0.0	1560.7	*	2	0200	313	414.	9726.7	1630.5	*	3	0300	613	413.	9364.7	1629.9
1	0105	14	0.	0.1	1560.7	*	2	0205	314	414.	9730.4	1630.5	*	3	0305	614	413.	9363.1	1629.9
1	0110	15	0.	0.1	1560.7	*	2	0210	315	414.	9733.8	1630.5	*	3	0310	615	413.	9361.5	1629.9
1	0115	16	0.	0.1	1560.7	*	2	0215	316	414.	9737.1	1630.5	*	3	0315	616	413.	9359.8	1629.9
1	0120	17	0.	0.2	1560.7	*	2	0220	317	414.	9740.2	1630.5	*	3	0320	617	413.	9358.2	1629.9
1	0125	18	0.	0.2	1560.7	*	2	0225	318	414.	9743.1	1630.5	*	3	0325	618	413.	9356.5	1629.9
1	0130	19	1.	0.3	1560.7	*	2	0230	319	414.	9745.9	1630.5	*	3	0330	619	413.	9354.9	1629.9
1	0135	20	1.	0.3	1560.7	*	2	0235	320	414.	9748.6	1630.5	*	3	0335	620	413.	9353.3	1629.9
1	0140	21	1.	0.4	1560.8	*	2	0240	321	414.	9751.1	1630.5	*	3	0340	621	413.	9351.6	1629.9
1	0145	22	1.	0.5	1560.8	*	2	0245	322	414.	9753.4	1630.5	*	3	0345	622	413.	9350.0	1629.9
1	0150	23	1.	0.6	1560.8	*	2	0250	323	414.	9755.6	1630.5	*	3	0350	623	413.	9348.4	1629.9
1	0155	24	1.	0.7	1560.8	*	2	0255	324	414.	9757.7	1630.5	*	3	0355	624	413.	9346.7	1629.9
1	0200	25	2.	0.8	1560.8	*	2	0300	325	414.	9759.7	1630.5	*	3	0400	625	413.	9345.1	1629.9
1	0205	26	2.	1.0	1560.8	*	2	0305	326	415.	9761.5	1630.5	*	3	0405	626	413.	9343.4	1629.9
1	0210	27	2.	1.1	1560.9	*	2	0310	327	415.	9763.2	1630.5	*	3	0410	627	413.	9341.8	1629.9
1	0215	28	2.	1.3	1560.9	*	2	0315	328	415.	9764.9	1630.5	*	3	0415	628	413.	9340.2	1629.9
1	0220	29	3.	1.4	1560.9	*	2	0320	329	415.	9766.3	1630.5	*	3	0420	629	413.	9338.5	1629.9
1	0225	30	3.	1.6	1560.9	*	2	0325	330	415.	9767.7	1630.5	*	3	0425	630	413.	9336.9	1629.9
1	0230	31	3.	1.8	1560.9	*	2	0330	331	415.	9768.9	1630.5	*	3	0430	631	413.	9335.3	1629.9
1	0235	32	4.	2.0	1561.0	*	2	0335	332	415.	9770.1	1630.5	*	3	0435	632	413.	9333.6	1629.9
1	0240	33	4.	2.1	1561.0	*	2	0340	333	415.	9771.1	1630.5	*	3	0440	633	413.	9332.0	1629.9
1	0245	34	5.	2.3	1561.0	*	2	0345	334	415.	9772.0	1630.5	*	3	0445	634	413.	9330.4	1629.9
1	0250	35	5.	2.5	1561.0	*	2	0350	335	415.	9772.8	1630.5	*	3	0450	635	413.	9328.7	1629.9
1	0255	36	5.	2.7	1561.1	*	2	0355	336	415.	9773.5	1630.5	*	3	0455	636	413.	9327.1	1629.9
1	0300	37	6.	3.0	1561.1	*	2	0400	337	415.	9774.0	1630.5	*	3	0500	637	413.	9325.4	1629.9
1	0305	38	6.	3.2	1561.1	*	2	0405	338	415.	9774.5	1630.5	*	3	0505	638	413.	9323.8	1629.9
1	0310	39	7.	3.4	1561.2	*	2	0410	339	415.	9774.9	1630.5	*	3	0510	639	413.	9322.2	1629.9
1	0315	40	7.	3.6	1561.2	*	2	0415	340	415.	9775.2	1630.5	*	3	0515	640	413.	9320.5	1629.9
1	0320	41	7.	3.8	1561.2	*	2	0420	341	415.	9775.4	1630.5	*	3	0520	641	413.	9318.9	1629.9
1	0325	42	8.	4.1	1561.3	*	2	0425	342	415.	9775.5	1630.5	*	3	0525	642	413.	9317.3	1629.9
1	0330	43	8.	4.3	1561.3	*	2	0430	343	415.	9775.5	1630.5	*	3	0530	643	413.	9315.6	1629.9
1	0335	44	9.	4.5	1561.3	*	2	0435	344	415.	9775.4	1630.5	*	3	0535	644	413.	9314.0	1629.9
1	0340	45	9.	4.8	1561.4	*	2	0440	345	415.	9775.3	1630.5	*	3	0540	645	413.	9312.4	1629.9
1	0345	46	10.	5.0	1561.4	*	2	0445	346	415.	9775.1	1630.5	*	3	0545	646	413.	9310.7	1629.9
1	0350	47	10.	5.2	1561.4	*	2	0450	347	415.	9774.8	1630.5	*	3	0550	647	413.	9309.1	1629.9
1	0355	48	11.	5.5	1561.5	*	2	0455	348	415.	9774.4	1630.5	*	3	0555	648	413.	9307.4	1629.9
1	0400	49	11.	5.7	1561.5	*	2	0500	349	415.	9773.9	1630.5	*	3	0600	649	413.	9305.8	1629.8
1	0405	50	12.	6.0	1561.5	*	2	0505	350	415.	9773.4	1630.5	*	3	0605	650	413.	9304.2	1629.8
1	0410	51	12.	6.2	1561.6	*	2	0510	351	415.	9772.8	1630.5	*	3	0610	651	413.	9302.5	1629.8
1	0415	52	13.	6.5	1561.6	*	2	0515	352	415.	9772.2	1630.5	*	3	0615	652	413.	9300.9	1629.8
1	0420	53	13.	6.8	1561.6	*	2	0520	353	415.	9771.5	1630.5	*	3	0620	653	413.	9299.3	1629.8
1	0425	54	14.	7.0	1561.7	*	2	0525	354	415.	9770.7	1630.5	*	3	0625	654	413.	9297.6	1629.8
1	0430	55	14.	7.3	1561.7	*	2	0530	355	415.	9769.9	1630.5	*	3	0630	655	412.	9296.0	1629.8
1	0435	56	15.	7.6	1561.7	*	2	0535	356	415.	9769.0	1630.5	*	3	0635	656	412.	9294.4	1629.8
1	0440	57	15.	7.9	1561.8	*	2	0540	357	415.	9768.0	1630.5	*	3	0640	657	412.	9292.7	1629.8
1	0445	58	16.	8.3	1561.8	*	2	0545	358	415.	9767.1	1630.5	*	3	0645	658	412.	9291.1	1629.8
1	0450	59	17.	8.6	1561.9	*	2	0550	359	415.	9766.1	1630.5	*	3	0650	659	412.	9289.4	1629.8
1	0455	60	17.	9.0	1561.9	*	2	0555	360	415.	9765.0	1630.5	*	3	0655	660	412.	9287.8	1629.8
1	0500	61	18.	9.3	1562.0	*	2	0600	361	415.	9764.0	1630.5	*	3	0700	661	412.	9286.2	1629.8
1	0505	62	19.	9.7	1562.0	*	2	0605	362	415.	9762.9	1630.5	*	3	0705	662	412.	9284.5	1629.8
1	0510	63	20.	10.2	1562.1	*	2	0610	363	415.	9761.9	1630.5	*	3	0710	663	412.	9282.9	1629.8
1	0515	64	21.	10.6	1562.2	*	2	0615	364	415.	9760.8	1630.5	*	3	0715	664	412.	9281.3	1629.8
1	0520	65	22.	11.1	1562.2	*	2	0620	365	414.	9759.7	1630.5	*	3	0720	665	412.	9279.6	1629.8
1	0525	66	23.	11.6	1562.3	*	2	0625	366	414.	9758.5	1630.5	*	3	0725	666	412.	9278.0	1629.8
1	0530	67	23.	12.1	1562.4	*	2	0630	367	414.	9757.4	1630.5	*	3	0730	667	412.	9276.4	1629.8
1	0535	68	25.	12.6	1562.4	*	2	0635	368	414.	9756.2	1630.5	*	3	0735	668	412.	9274.7	1629.8
1	0540	69	26.	13.2	1562.5	*	2	0640	369	414.	9755.1	1630.5	*	3	0740	669	412.	9273.1	1629.8
1	0545	70	27.	13.8	1562.6	*	2	0645	370	414.	9753.9	1630.5	*	3	0745	670	412.	9271.5	1629.8
1	0550	71	28.	14.4	1562.7	*	2	0650	371	414.	9752.7	1630.5	*	3	0750	671	412.	9269.8	1629.8
1	0555	72	29.	15.1	1562.8	*	2	0655	372	414.	9751.5	1630.5	*	3	0755	672	412.	9268.2	1629.8
1	0600	73	31.	15.8	1562.9	*	2	0700	373	414.	9750.3	1630.5	*	3	0800	673	412.	9266.6	1629.8
1	0605	74	32.	16.5	1563.0	*	2	0705	374	414.	9749.0	1630.5	*	3	0805	674	412.	9264.9	1629.8
1	0610	75	34.	17.3	1563.1	*	2	0710	375	414.	9747.8	1630.5	*	3	0810	675	412.	9263.3	1629.8
1	0615	76	35.	18.2	1563.2	*	2	0715	376	414.	9746.5	1630.5	*	3	0815	676	412.	9261.7	1629.8
1	0620	77	37.	19.1	1563.3	*	2	0720	377	414.	9745.2	1630.5	*	3	0820	677	412.	9260.0	1629.8
1	0625	78	39.	20.0	1563.4	*	2	0725	378	414.	9744.0	1630.5	*	3	0825	678	412.	9258.4	1629.8
1	0630	79	41.	21.0	1563.6	*	2	0730	379	414.	9742.6	1630.5	*	3	0830	679	412.	9256.8	1629.8
1	0635	80	43.	22.1	1563.7	*	2	0735	380	414.	9741.3	1630.5	*	3	0835	680	412.	9255.1	1629.8
1	0640	81	45.	23.2	1563.9	*	2	0740	381	414.	9740.0	1630.5	*	3	0840	681	412.	9253.5	1629.8
1	0645	82	48.	24.4	1564.0	*	2	0745	382	414.	9738.7	1630.5	*	3	0845	682	412.	9251.8	1629.8
1	0650	83	50.	25.6	1564.2	*	2	0750	383	414.	9737.3	1630.5	*	3	0850	683	412.	9250.2	1629.8
1	0655	84	52.	26.8	1564.4	*	2	0755	384	414.	9735.9	1630.5	*	3	0855	684	412.	9248.6	1629.8
1	0700	85	55.	28.1	1564.6	*	2	0800	385	414.	9734.5	1630.5	*	3	0900	685	412.	9246.9	1629.8
1	0705	86	57.	29.4	1564.7	*	2	0805	386	414.	9733.2	1630.5	*	3	0905	686	412.	9245.3	1629.8
1	0710	87	60.	30.7	1564.9	*	2	0810	387	414.	9731.8	1630.5	*	3	0910	687	412.	9243.7	1629.7
1	0715	88	62.	32.0	1565.1	*	2	0815	388	414.	9730.4	1630.5	*	3	0915	688	412.	9242.0	1629.7
1	0720	89	65.	33.3	1565.3	*	2	0820	389	414.	9728.9	1630.5	*	3	0920	689	412.	9240.4	1629.7
1	0725	90	67.	34.7	1565.5	*	2	0825	390	414.	9727.5	1630.5	*	3	0925	690	412.	9238.8	1629.7
1	0730	91	70.	36.0	1565.6	*	2	0830	391	414.	9726.1	1630.5	*	3	0930	691	412.	9237.1	1629.7
1	0735	92	73.	37.4	1565.8	*	2	0835	392	414.	9724.6	1630.5	*	3	0935	692	412.	9235.5	1629.7
1	0740	93	75.	38.7	1566.0	*	2	0840	393	414.	9723.1	1630.4	*	3	0940	693	412.	9233.9	1629.7
1	0745	94	78.	40.1	1566.2	*	2	0845	394	414.	9721.7	1630.4	*	3	0945	694	412.	9232.2	1629.7
1	0750	95	81.	41.5	1566.4	*	2	0850	395	414.	9720.2	1630.4	*	3	0950	695	412.	9230.6	1629.7
1	0755	96	83.	42.9	1566.6	*	2	0855	396	414.	9718.7	1630.4	*	3	0955	696	412.	9229.0	1629.7
1	0800	97	86.	44.3	1566.8	*	2	0900	397	414.	9717.2	1630.4	*	3	1000	697	412.	9227.3	1629.7
1	0805	98	89.	45.7	1567.0	*	2	0905	398	414.	9715.7	1630.4	*	3	1005	698	412.	9225.7	1629.7
1	0810	99	92.	47.1	1567.2	*	2	0910	399	414.	9714.1	1630.4	*	3	1010	699	412.	9224.1	1629.7
1	0815	100	95.	48.6	1567.4	*	2	0915	400	414.	9712.6	1630.4	*	3	1015	700	412.	9222.4	1629.7
1	0820	101	97.	50.0	1567.6	*	2	0920	401	414.	9711.1	1630.4	*	3	1020	701	412.	9220.8	1629.7
1	0825	102	100.	51.5	1567.8	*	2	0925	402	414.	9709.5	1630.4	*	3	1025	702	412.	9219.2	1629.7
1	0830	103	103.	53.0	1568.0	*	2	0930	403	414.	9708.0	1630.4	*	3	1030	703	412.	9217.5	1629.7

1	0835	104	106.	54.4	1568.2	*	2	0935	404	414.	9706.5	1630.4	*	3	1035	704	412.	9215.9	1629.7
1	0840	105	109.	55.9	1568.4	*	2	0940	405	414.	9704.9	1630.4	*	3	1040	705	412.	9214.3	1629.7
1	0845	106	112.	57.4	1568.6	*	2	0945	406	414.	9703.4	1630.4	*	3	1045	706	412.	9212.6	1629.7
1	0850	107	115.	59.0	1568.8	*	2	0950	407	414.	9701.8	1630.4	*	3	1050	707	412.	9211.0	1629.7
1	0855	108	118.	60.5	1569.0	*	2	0955	408	414.	9700.3	1630.4	*	3	1055	708	412.	9209.4	1629.7
1	0900	109	121.	62.0	1569.2	*	2	1000	409	414.	9698.7	1630.4	*	3	1100	709	412.	9207.7	1629.7
1	0905	110	124.	63.6	1569.4	*	2	1005	410	414.	9697.1	1630.4	*	3	1105	710	412.	9206.1	1629.7
1	0910	111	127.	65.2	1569.6	*	2	1010	411	414.	9695.6	1630.4	*	3	1110	711	412.	9204.5	1629.7
1	0915	112	130.	66.8	1569.9	*	2	1015	412	414.	9694.0	1630.4	*	3	1115	712	412.	9202.8	1629.7
1	0920	113	133.	68.4	1570.1	*	2	1020	413	414.	9692.4	1630.4	*	3	1120	713	412.	9201.2	1629.7
1	0925	114	135.	70.0	1570.3	*	2	1025	414	414.	9690.8	1630.4	*	3	1125	714	412.	9199.6	1629.7
1	0930	115	137.	71.8	1570.5	*	2	1030	415	414.	9689.2	1630.4	*	3	1130	715	412.	9198.0	1629.7
1	0935	116	139.	73.5	1570.8	*	2	1035	416	414.	9687.7	1630.4	*	3	1135	716	412.	9196.3	1629.7
1	0940	117	141.	75.3	1571.0	*	2	1040	417	414.	9686.1	1630.4	*	3	1140	717	412.	9194.7	1629.7
1	0945	118	143.	77.2	1571.3	*	2	1045	418	414.	9684.5	1630.4	*	3	1145	718	412.	9193.1	1629.7
1	0950	119	145.	79.1	1571.5	*	2	1050	419	414.	9682.9	1630.4	*	3	1150	719	412.	9191.4	1629.7
1	0955	120	147.	81.0	1571.8	*	2	1055	420	414.	9681.3	1630.4	*	3	1155	720	412.	9189.8	1629.7
1	1000	121	149.	83.0	1572.1	*	2	1100	421	414.	9679.7	1630.4	*	3	1200	721	412.	9188.2	1629.7
1	1005	122	152.	85.0	1572.4	*	2	1105	422	414.	9678.1	1630.4	*	3	1205	722	412.	9186.5	1629.7
1	1010	123	154.	87.1	1572.6	*	2	1110	423	414.	9676.5	1630.4	*	3	1210	723	412.	9184.9	1629.7
1	1015	124	156.	89.2	1572.9	*	2	1115	424	414.	9674.9	1630.4	*	3	1215	724	412.	9183.3	1629.7
1	1020	125	159.	91.4	1573.2	*	2	1120	425	414.	9673.3	1630.4	*	3	1220	725	412.	9181.6	1629.6
1	1025	126	161.	93.7	1573.6	*	2	1125	426	414.	9671.6	1630.4	*	3	1225	726	412.	9180.0	1629.6
1	1030	127	164.	96.0	1573.9	*	2	1130	427	414.	9670.0	1630.4	*	3	1230	727	412.	9178.4	1629.6
1	1035	128	167.	98.4	1574.2	*	2	1135	428	414.	9668.4	1630.4	*	3	1235	728	412.	9176.7	1629.6
1	1040	129	170.	100.9	1574.5	*	2	1140	429	414.	9666.8	1630.4	*	3	1240	729	412.	9175.1	1629.6
1	1045	130	173.	103.4	1574.9	*	2	1145	430	414.	9665.1	1630.4	*	3	1245	730	412.	9173.5	1629.6
1	1050	131	176.	106.0	1575.2	*	2	1150	431	414.	9663.5	1630.4	*	3	1250	731	412.	9171.8	1629.6
1	1055	132	179.	108.7	1575.6	*	2	1155	432	414.	9661.9	1630.4	*	3	1255	732	412.	9170.2	1629.6
1	1100	133	182.	111.5	1576.0	*	2	1200	433	414.	9660.3	1630.4	*	3	1300	733	412.	9168.6	1629.6
1	1105	134	185.	114.4	1576.4	*	2	1205	434	414.	9658.6	1630.4	*	3	1305	734	412.	9166.9	1629.6
1	1110	135	188.	117.3	1576.8	*	2	1210	435	414.	9657.0	1630.4	*	3	1310	735	412.	9165.3	1629.6
1	1115	136	192.	120.3	1577.2	*	2	1215	436	414.	9655.4	1630.4	*	3	1315	736	412.	9163.7	1629.6
1	1120	137	195.	123.5	1577.6	*	2	1220	437	414.	9653.7	1630.4	*	3	1320	737	412.	9162.1	1629.6
1	1125	138	200.	127.1	1578.1	*	2	1225	438	414.	9652.1	1630.4	*	3	1325	738	412.	9160.4	1629.6
1	1130	139	205.	131.7	1578.8	*	2	1230	439	414.	9650.5	1630.3	*	3	1330	739	412.	9158.8	1629.6
1	1135	140	212.	138.2	1579.7	*	2	1235	440	414.	9648.8	1630.3	*	3	1335	740	412.	9157.2	1629.6
1	1140	141	220.	147.6	1581.0	*	2	1240	441	414.	9647.2	1630.3	*	3	1340	741	412.	9155.5	1629.6
1	1145	142	230.	160.7	1582.7	*	2	1245	442	414.	9645.5	1630.3	*	3	1345	742	412.	9153.9	1629.6
1	1150	143	244.	178.1	1585.1	*	2	1250	443	414.	9643.9	1630.3	*	3	1350	743	412.	9152.3	1629.6
1	1155	144	258.	199.1	1588.0	*	2	1255	444	414.	9642.2	1630.3	*	3	1355	744	412.	9150.6	1629.6
1	1200	145	274.	222.9	1591.3	*	2	1300	445	414.	9640.6	1630.3	*	3	1400	745	412.	9149.0	1629.6
1	1205	146	289.	248.4	1594.8	*	2	1305	446	414.	9639.0	1630.3	*	3	1405	746	412.	9147.4	1629.6
1	1210	147	291.	274.3	1595.3	*	2	1310	447	414.	9637.3	1630.3	*	3	1410	747	412.	9145.7	1629.6
1	1215	148	292.	301.1	1595.6	*	2	1315	448	414.	9635.7	1630.3	*	3	1415	748	412.	9144.1	1629.6
1	1220	149	294.	328.8	1595.9	*	2	1320	449	414.	9634.0	1630.3	*	3	1420	749	412.	9142.5	1629.6
1	1225	150	295.	358.0	1596.2	*	2	1325	450	414.	9632.4	1630.3	*	3	1425	750	412.	9140.9	1629.6
1	1230	151	296.	388.8	1596.5	*	2	1330	451	414.	9630.7	1630.3	*	3	1430	751	412.	9139.2	1629.6
1	1235	152	298.	421.0	1596.9	*	2	1335	452	414.	9629.1	1630.3	*	3	1435	752	412.	9137.6	1629.6
1	1240	153	300.	454.4	1597.3	*	2	1340	453	414.	9627.4	1630.3	*	3	1440	753	412.	9136.0	1629.6
1	1245	154	301.	489.6	1597.7	*	2	1345	454	414.	9625.8	1630.3	*	3	1445	754	412.	9134.3	1629.6
1	1250	155	303.	527.7	1598.1	*	2	1350	455	414.	9624.1	1630.3	*	3	1450	755	412.	9132.7	1629.6
1	1255	156	305.	568.6	1598.5	*	2	1355	456	414.	9622.5	1630.3	*	3	1455	756	412.	9131.1	1629.6
1	1300	157	307.	612.5	1599.0	*	2	1400	457	414.	9620.9	1630.3	*	3	1500	757	412.	9129.4	1629.6
1	1305	158	309.	664.7	1599.6	*	2	1405	458	414.	9619.2	1630.3	*	3	1505	758	412.	9127.8	1629.6
1	1310	159	312.	730.5	1600.4	*	2	1410	459	414.	9617.6	1630.3	*	3	1510	759	412.	9126.2	1629.6
1	1315	160	316.	811.2	1601.4	*	2	1415	460	414.	9615.9	1630.3	*	3	1515	760	412.	9124.5	1629.6
1	1320	161	321.	908.9	1602.6	*	2	1420	461	414.	9614.3	1630.3	*	3	1520	761	412.	9122.9	1629.6
1	1325	162	326.	1024.9	1604.1	*	2	1425	462	414.	9612.6	1630.3	*	3	1525	762	412.	9121.3	1629.6
1	1330	163	331.	1160.2	1605.4	*	2	1430	463	414.	9611.0	1630.3	*	3	1530	763	412.	9119.7	1629.5
1	1335	164	335.	1313.5	1606.5	*	2	1435	464	414.	9609.3	1630.3	*	3	1535	764	412.	9118.0	1629.5
1	1340	165	339.	1482.7	1607.7	*	2	1440	465	414.	9607.7	1630.3	*	3	1540	765	412.	9116.4	1629.5
1	1345	166	344.	1665.6	1609.0	*	2	1445	466	414.	9606.0	1630.3	*	3	1545	766	412.	9114.8	1629.5
1	1350	167	348.	1859.4	1610.4	*	2	1450	467	414.	9604.4	1630.3	*	3	1550	767	412.	9113.1	1629.5
1	1355	168	353.	2061.1	1611.6	*	2	1455	468	414.	9602.8	1630.3	*	3	1555	768	412.	9111.5	1629.5
1	1400	169	358.	2267.5	1612.9	*	2	1500	469	414.	9601.1	1630.3	*	3	1600	769	412.	9109.9	1629.5
1	1405	170	362.	2476.2	1614.2	*	2	1505	470	414.	9599.5	1630.3	*	3	1605	770	412.	9108.3	1629.5
1	1410	171	366.	2685.5	1615.3	*	2	1510	471	414.	9597.8	1630.3	*	3	1610	771	412.	9106.6	1629.5
1	1415	172	368.	2895.3	1616.1	*	2	1515	472	414.	9596.2	1630.3	*	3	1615	772	412.	9105.0	1629.5
1	1420	173	371.	3106.1	1616.8	*	2	1520	473	414.	9594.5	1630.3	*	3	1620	773	412.	9103.4	1629.5
1	1425	174	373.	3316.6	1617.6	*	2	1525	474	414.	9592.9	1630.3	*	3	1625	774	412.	9101.7	1629.5
1	1430	175	376.	3526.0	1618.3	*	2	1530	475	414.	9591.2	1630.3	*	3	1630	775	412.	9100.1	1629.5
1	1435	176	378.	3731.3	1619.0	*	2	1535	476	414.	9589.6	1630.3	*	3	1635	776	412.	9098.5	1629.5
1	1440	177	380.	3929.8	1619.7	*	2	1540	477	414.	9588.0	1630.3	*	3	1640	777	412.	9096.8	1629.5
1	1445	178	382.	4121.0	1620.3	*	2	1545	478	414.	9586.3	1630.3	*	3	1645	778	412.	9095.2	1629.5
1	1450	179	383.	4304.6	1620.7	*	2	1550	479	414.	9584.7	1630.3	*	3	1650	779	412.	9093.6	1629.5
1	1455	180	385.	4480.9	1621.0	*	2	1555	480	414.	9583.0	1630.3	*	3	1655	780	412.	9092.0	1629.5
1	1500	181	386.	4650.1	1621.4	*	2	1600	481	414.	9581.4	1630.3	*	3	1700	781	412.	9090.3	1629.5
1	1505	182	387.	4812.8	1621.8	*	2	1605	482	414.	9579.7	1630.2	*	3	1705	782	411.	9088.7	1629.5
1	1510	183	388.	4969.2	1622.1	*	2	1610	483	414.	9578.1	1630.2	*	3	1710	783	411.	9087.1	1629.5
1	1515	184	389.	5119.6	1622.4	*	2	1615	484	414.	9576.4	1630.2	*	3	1715	784	411.	9085.4	1629.5
1	1520	185	390.	5264.6	1622.7	*	2	1620	485	414.	9574.8	1630.2	*	3	1720	785	411.	9083.8	1629.5
1	1525	186	391.	5404.6	1623.1	*	2	1625	486	414.	9573.2	1630.2	*	3	1725	786	411.	9082.2	1629.5
1	1530	187	392.	5539.9	1623.3	*	2	1630	487	414.	9571.5	1630.2	*	3	1730	787	411.	9080.6	1629.5
1	1535	188	393.	5670.8	1623.6	*	2	1635	488	414.	9569.9	1630.2	*	3	1735	788	411.	9078.9	1629.5
1	1540	189	394.	5797.7	1623.9	*	2	1640	489	414.	9568.2	1630.2	*	3	1740	789	411.	9077.3	1629.5
1	1545	190	395.	5920.9	1624.2	*	2	1645	490	414.	9566.6	1630.2	*	3	1745	790	411.	9075.7	1629.5
1	1550	191	396.	6040.6	1624.4	*	2	1650	491	414.	9564.9	1630.2	*	3	1750	791	411.	9074.0	1629.5
1	1555	192	397.	6157.0	1624.7	*	2	1655	492	414.	9563.3	1630.2	*	3	1755	792	411.	9072.4	1629.5
1	1600	193	398.	6270.2	1624.9	*	2	1700	493	414.	9561.6	1630.2	*	3	1800	793	411.	9070.8	1629.5
1	1605	194	398.	6380.2	1625.1	*	2	1705	494	414.	9560.0	1630.2	*	3	1805	794	411.	9069.2	1629.5
1	1610	195	399.	6487.1	1625.3	*	2	1710	495	414.	9558.4	1630.2	*	3	1810	795	411.	9067.5	1629.5
1	1615	196	399.	6590.9	1625.5	*	2	1715	496	414.	9556.7	1630.2	*	3	1815	796	411.	9065.9	1629.5
1	1620	197	400.	6691.5	1625.6	*	2	1720	497	414.	9555.1	1630.2	*	3	1820	797	411.	9064.3	1629.5
1	1625	198	400.	6789.0	1625.8	*	2	1725	498	414.	9553.4	1630.2	*	3	1825	798	411.	9062.6	1629.5

1	1630	199	401.	6883.4	1625.9	*	2	1730	499	414.	9551.8	1630.2	*	3	1830	799	411.	9061.0	1629.5
1	1635	200	401.	6974.7	1626.1	*	2	1735	500	414.	9550.1	1630.2	*	3	1835	800	411.	9059.4	1629.5
1	1640	201	402.	7063.0	1626.2	*	2	1740	501	414.	9548.5	1630.2	*	3	1840	801	411.	9057.8	1629.4
1	1645	202	402.	7148.2	1626.4	*	2	1745	502	414.	9546.9	1630.2	*	3	1845	802	411.	9056.1	1629.4
1	1650	203	403.	7230.6	1626.5	*	2	1750	503	414.	9545.2	1630.2	*	3	1850	803	411.	9054.5	1629.4
1	1655	204	403.	7310.3	1626.6	*	2	1755	504	414.	9543.6	1630.2	*	3	1855	804	411.	9052.9	1629.4
1	1700	205	403.	7387.4	1626.8	*	2	1800	505	414.	9541.9	1630.2	*	3	1900	805	411.	9051.3	1629.4
1	1705	206	404.	7462.0	1626.9	*	2	1805	506	414.	9540.3	1630.2	*	3	1905	806	411.	9049.6	1629.4
1	1710	207	404.	7534.0	1627.0	*	2	1810	507	414.	9538.6	1630.2	*	3	1910	807	411.	9048.0	1629.4
1	1715	208	404.	7603.4	1627.1	*	2	1815	508	414.	9537.0	1630.2	*	3	1915	808	411.	9046.4	1629.4
1	1720	209	405.	7670.3	1627.2	*	2	1820	509	414.	9535.4	1630.2	*	3	1920	809	411.	9044.7	1629.4
1	1725	210	405.	7734.6	1627.3	*	2	1825	510	414.	9533.7	1630.2	*	3	1925	810	411.	9043.1	1629.4
1	1730	211	405.	7796.4	1627.4	*	2	1830	511	414.	9532.1	1630.2	*	3	1930	811	411.	9041.5	1629.4
1	1735	212	406.	7855.6	1627.5	*	2	1835	512	414.	9530.4	1630.2	*	3	1935	812	411.	9039.9	1629.4
1	1740	213	406.	7912.3	1627.6	*	2	1840	513	414.	9528.8	1630.2	*	3	1940	813	411.	9038.2	1629.4
1	1745	214	406.	7966.9	1627.7	*	2	1845	514	414.	9527.1	1630.2	*	3	1945	814	411.	9036.6	1629.4
1	1750	215	406.	8019.5	1627.8	*	2	1850	515	414.	9525.5	1630.2	*	3	1950	815	411.	9035.0	1629.4
1	1755	216	407.	8070.4	1627.9	*	2	1855	516	414.	9523.9	1630.2	*	3	1955	816	411.	9033.4	1629.4
1	1800	217	407.	8119.7	1627.9	*	2	1900	517	414.	9522.2	1630.2	*	3	2000	817	411.	9031.7	1629.4
1	1805	218	407.	8167.4	1628.0	*	2	1905	518	414.	9520.6	1630.2	*	3	2005	818	411.	9030.1	1629.4
1	1810	219	407.	8213.7	1628.1	*	2	1910	519	413.	9518.9	1630.2	*	3	2010	819	411.	9028.5	1629.4
1	1815	220	407.	8258.4	1628.2	*	2	1915	520	413.	9517.3	1630.2	*	3	2015	820	411.	9026.8	1629.4
1	1820	221	408.	8301.5	1628.2	*	2	1920	521	413.	9515.6	1630.2	*	3	2020	821	411.	9025.2	1629.4
1	1825	222	408.	8343.1	1628.3	*	2	1925	522	413.	9514.0	1630.2	*	3	2025	822	411.	9023.6	1629.4
1	1830	223	408.	8383.1	1628.4	*	2	1930	523	413.	9512.4	1630.2	*	3	2030	823	411.	9022.0	1629.4
1	1835	224	408.	8421.7	1628.4	*	2	1935	524	413.	9510.7	1630.2	*	3	2035	824	411.	9020.3	1629.4
1	1840	225	408.	8458.8	1628.5	*	2	1940	525	413.	9509.1	1630.2	*	3	2040	825	411.	9018.7	1629.4
1	1845	226	409.	8494.5	1628.5	*	2	1945	526	413.	9507.4	1630.1	*	3	2045	826	411.	9017.1	1629.4
1	1850	227	409.	8528.9	1628.6	*	2	1950	527	413.	9505.8	1630.1	*	3	2050	827	411.	9015.5	1629.4
1	1855	228	409.	8562.1	1628.6	*	2	1955	528	413.	9504.1	1630.1	*	3	2055	828	411.	9013.8	1629.4
1	1900	229	409.	8594.2	1628.7	*	2	2000	529	413.	9502.5	1630.1	*	3	2100	829	411.	9012.2	1629.4
1	1905	230	409.	8625.3	1628.8	*	2	2005	530	413.	9500.9	1630.1	*	3	2105	830	411.	9010.6	1629.4
1	1910	231	409.	8655.6	1628.8	*	2	2010	531	413.	9499.2	1630.1	*	3	2110	831	411.	9009.0	1629.4
1	1915	232	410.	8685.3	1628.8	*	2	2015	532	413.	9497.6	1630.1	*	3	2115	832	411.	9007.3	1629.4
1	1920	233	410.	8714.2	1628.9	*	2	2020	533	413.	9495.9	1630.1	*	3	2120	833	411.	9005.7	1629.4
1	1925	234	410.	8742.4	1628.9	*	2	2025	534	413.	9494.3	1630.1	*	3	2125	834	411.	9004.1	1629.4
1	1930	235	410.	8770.0	1629.0	*	2	2030	535	413.	9492.7	1630.1	*	3	2130	835	411.	9002.5	1629.4
1	1935	236	410.	8796.8	1629.0	*	2	2035	536	413.	9491.0	1630.1	*	3	2135	836	411.	9000.8	1629.4
1	1940	237	410.	8822.8	1629.1	*	2	2040	537	413.	9489.4	1630.1	*	3	2140	837	411.	8999.2	1629.4
1	1945	238	410.	8848.1	1629.1	*	2	2045	538	413.	9487.7	1630.1	*	3	2145	838	411.	8997.6	1629.4
1	1950	239	410.	8872.7	1629.1	*	2	2050	539	413.	9486.1	1630.1	*	3	2150	839	411.	8996.0	1629.3
1	1955	240	411.	8896.6	1629.2	*	2	2055	540	413.	9484.4	1630.1	*	3	2155	840	411.	8994.3	1629.3
1	2000	241	411.	8919.7	1629.2	*	2	2100	541	413.	9482.8	1630.1	*	3	2200	841	411.	8992.7	1629.3
1	2005	242	411.	8942.1	1629.3	*	2	2105	542	413.	9481.2	1630.1	*	3	2205	842	411.	8991.1	1629.3
1	2010	243	411.	8963.7	1629.3	*	2	2110	543	413.	9479.5	1630.1	*	3	2210	843	411.	8989.5	1629.3
1	2015	244	411.	8984.6	1629.3	*	2	2115	544	413.	9477.9	1630.1	*	3	2215	844	411.	8987.8	1629.3
1	2020	245	411.	9004.9	1629.4	*	2	2120	545	413.	9476.2	1630.1	*	3	2220	845	411.	8986.2	1629.3
1	2025	246	411.	9024.5	1629.4	*	2	2125	546	413.	9474.6	1630.1	*	3	2225	846	411.	8984.6	1629.3
1	2030	247	411.	9043.7	1629.4	*	2	2130	547	413.	9473.0	1630.1	*	3	2230	847	411.	8982.9	1629.3
1	2035	248	411.	9062.6	1629.5	*	2	2135	548	413.	9471.3	1630.1	*	3	2235	848	411.	8981.3	1629.3
1	2040	249	411.	9081.4	1629.5	*	2	2140	549	413.	9469.7	1630.1	*	3	2240	849	411.	8979.7	1629.3
1	2045	250	412.	9100.2	1629.5	*	2	2145	550	413.	9468.0	1630.1	*	3	2245	850	411.	8978.1	1629.3
1	2050	251	412.	9118.8	1629.5	*	2	2150	551	413.	9466.4	1630.1	*	3	2250	851	411.	8976.4	1629.3
1	2055	252	412.	9137.3	1629.6	*	2	2155	552	413.	9464.7	1630.1	*	3	2255	852	411.	8974.8	1629.3
1	2100	253	412.	9155.4	1629.6	*	2	2200	553	413.	9463.1	1630.1	*	3	2300	853	411.	8973.2	1629.3
1	2105	254	412.	9173.0	1629.6	*	2	2205	554	413.	9461.5	1630.1	*	3	2305	854	411.	8971.6	1629.3
1	2110	255	412.	9190.0	1629.7	*	2	2210	555	413.	9459.8	1630.1	*	3	2310	855	411.	8969.9	1629.3
1	2115	256	412.	9206.2	1629.7	*	2	2215	556	413.	9458.2	1630.1	*	3	2315	856	411.	8968.3	1629.3
1	2120	257	412.	9221.7	1629.7	*	2	2220	557	413.	9456.5	1630.1	*	3	2320	857	411.	8966.7	1629.3
1	2125	258	412.	9236.6	1629.7	*	2	2225	558	413.	9454.9	1630.1	*	3	2325	858	411.	8965.1	1629.3
1	2130	259	412.	9250.8	1629.8	*	2	2230	559	413.	9453.3	1630.1	*	3	2330	859	411.	8963.5	1629.3
1	2135	260	412.	9264.4	1629.8	*	2	2235	560	413.	9451.6	1630.1	*	3	2335	860	411.	8961.8	1629.3
1	2140	261	412.	9277.3	1629.8	*	2	2240	561	413.	9450.0	1630.1	*	3	2340	861	411.	8960.2	1629.3
1	2145	262	412.	9289.4	1629.8	*	2	2245	562	413.	9448.3	1630.1	*	3	2345	862	411.	8958.6	1629.3
1	2150	263	413.	9300.7	1629.8	*	2	2250	563	413.	9446.7	1630.1	*	3	2350	863	411.	8957.0	1629.3
1	2155	264	413.	9311.1	1629.9	*	2	2255	564	413.	9445.1	1630.1	*	3	2355	864	411.	8955.3	1629.3
1	2200	265	413.	9320.9	1629.9	*	2	2300	565	413.	9443.4	1630.1	*	4	0000	865	411.	8953.7	1629.3
1	2205	266	413.	9330.4	1629.9	*	2	2305	566	413.	9441.8	1630.1	*	4	0005	866	411.	8952.1	1629.3
1	2210	267	413.	9339.7	1629.9	*	2	2310	567	413.	9440.1	1630.1	*	4	0010	867	411.	8950.5	1629.3
1	2215	268	413.	9349.1	1629.9	*	2	2315	568	413.	9438.5	1630.1	*	4	0015	868	411.	8948.8	1629.3
1	2220	269	413.	9358.7	1629.9	*	2	2320	569	413.	9436.9	1630.1	*	4	0020	869	411.	8947.2	1629.3
1	2225	270	413.	9368.5	1629.9	*	2	2325	570	413.	9435.2	1630.0	*	4	0025	870	411.	8945.6	1629.3
1	2230	271	413.	9378.6	1630.0	*	2	2330	571	413.	9433.6	1630.0	*	4	0030	871	411.	8944.0	1629.3
1	2235	272	413.	9388.9	1630.0	*	2	2335	572	413.	9431.9	1630.0	*	4	0035	872	411.	8942.3	1629.3
1	2240	273	413.	9399.5	1630.0	*	2	2340	573	413.	9430.3	1630.0	*	4	0040	873	411.	8940.7	1629.3
1	2245	274	413.	9410.1	1630.0	*	2	2345	574	413.	9428.7	1630.0	*	4	0045	874	411.	8939.1	1629.3
1	2250	275	413.	9420.9	1630.0	*	2	2350	575	413.	9427.0	1630.0	*	4	0050	875	411.	8937.5	1629.3
1	2255	276	413.	9431.8	1630.0	*	2	2355	576	413.	9425.4	1630.0	*	4	0055	876	411.	8935.8	1629.3
1	2300	277	413.	9442.7	1630.1	*	3	0000	577	413.	9423.7	1630.0	*	4	0100	877	411.	8934.2	1629.2
1	2305	278	413.	9453.8	1630.1	*	3	0005	578	413.	9422.1	1630.0	*	4	0105	878	411.	8932.6	1629.2
1	2310	279	413.	9465.0	1630.1	*	3	0010	579	413.	9420.5	1630.0	*	4	0110	879	411.	8931.0	1629.2
1	2315	280	413.	9476.3	1630.1	*	3	0015	580	413.	9418.8	1630.0	*	4	0115	880	411.	8929.3	1629.2
1	2320	281	413.	9487.7	1630.1	*	3	0020	581	413.	9417.2	1630.0	*	4	0120	881	411.	8927.7	1629.2
1	2325	282	413.	9499.2	1630.1	*	3	0025	582	413.	9415.5	1630.0	*	4	0125	882	411.	8926.1	1629.2
1	2330	283	413.	9510.7	1630.2	*	3	0030	583	413.	9413.9	1630.0	*	4	0130	883	411.	8924.5	1629.2
1	2335	284	414.	9522.0	1630.2	*	3	0035	584	413.	9412.3	1630.0	*	4	0135	884	411.	8922.9	1629.2
1	2340	285	414.	9533.1	1630.2	*	3	0040	585	413.	9410.6	1630.0	*	4	0140	885	411.	8921.2	1629.2
1	2345	286	414.	9543.9	1630.2	*	3	0045	586	413.	9409.0	1630.0	*	4	0145	886	411.	8919.6	1629.2
1	2350	287	414.	9554.2	1630.2	*	3	0050	587	413.	9407.3	1630.0	*	4	0150	887	411.	8918.0	1629.2
1	2355	288	414.	9564.1	1630.2	*	3	0055	588	413.	9405.7	1630.0	*	4	0155	888	411.	8916.4	1629.2
2	0000	289	414.	9573.6	1630.2	*	3	0100	589	413.	9404.1	1630.0	*	4	0200	889	411.	8914.7	1629.2
2	0005	290	414.	9582.7	1630.3	*	3	0105	590	413.	9402.4	1630.0	*	4	0205	890	411.	8913.1	1629.2
2	0010	291	414.	9591.5	1630.3	*	3	0110	591	413.	9400.8	1630.0	*	4	0210	891	411.	8911.5	1629.2
2	0015	292	414.	9600.1	1630.3	*	3	0115	592	413.	9399.1	1630.0	*	4	0215	892	411.	8909.9	1629.2
2	0020	293	414.	9608.3	1630.3	*	3	0120	593	413.	9397.5	1630.0	*	4	0220	893	411.	8908.2	1629.2

2	0025	294	414.	9616.3	1630.3	*	3	0125	594	413.	9395.9	1630.0	*	4	0225	894	411.	8906.6	1629.2
2	0030	295	414.	9623.9	1630.3	*	3	0130	595	413.	9394.2	1630.0	*	4	0230	895	411.	8905.0	1629.2
2	0035	296	414.	9631.3	1630.3	*	3	0135	596	413.	9392.6	1630.0	*	4	0235	896	411.	8903.4	1629.2
2	0040	297	414.	9638.3	1630.3	*	3	0140	597	413.	9391.0	1630.0	*	4	0240	897	411.	8901.8	1629.2
2	0045	298	414.	9644.9	1630.3	*	3	0145	598	413.	9389.3	1630.0	*	4	0245	898	411.	8900.1	1629.2
2	0050	299	414.	9651.3	1630.3	*	3	0150	599	413.	9387.7	1630.0	*	4	0250	899	411.	8898.5	1629.2
2	0055	300	414.	9657.7	1630.4	*	3	0155	600	413.	9386.0	1630.0	*	4	0255	900	411.	8896.9	1629.2
						*							*						

****

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	74.92-HR
+		(CFS)				
+ 415.	28.42		414.	414.	368.	353.
		(INCHES)	0.020	0.080	0.214	0.214
		(AC-FT)	206.	821.	2187.	2187.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	74.92-HR
+					
9776.	28.50	9760.	9635.	7747.	7446.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	74.92-HR
+					
1630.52	28.50	1630.50	1630.33	1620.86	1618.53

CUMULATIVE AREA = 191.93 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	CC	20756.	14.33	11504.	3486.	1167.	142.29		
+	HYDROGRAPH AT	AW	10355.	13.67	4463.	1554.	601.	30.64		
+	HYDROGRAPH AT	EAST	2505.	13.50	816.	236.	94.	19.00		
+	3 COMBINED AT	CBD-I	31000.	14.33	16524.	5246.	1862.	191.93		
+	ROUTED TO	CBD-O	415.	28.42	414.	414.	368.	191.93		
+									1630.52	28.50

*** NORMAL END OF HEC-1 ***

APPENDIX D

METHODOLOGY FOR MODIFICATIONS TO HEC-RAS FILES FOR USE WITH HEC-6

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: March 8, 1999

TO: File

FROM: Jon Fuller, P.E.

RE: Adjusting HEC-RAS Models for Geomorphic Assessments

CC: Tom Loomis/ ASL

HEC-RAS models prepared for Flood Insurance Studies can be used to generate hydraulic data for use in geomorphic assessments and channel stability studies. Hydraulic data typically required for geomorphic assessments include topwidth, channel velocity, hydraulic depth, hydraulic radius, channel area.

Purpose & Objective

Definition of the left and right bank stations is critical to obtaining accurate hydraulic data.

Assessments of river stability and geomorphic principles are based on concepts of bankfull discharge. Therefore it is necessary to distinguish channel characteristics and processes from overbank processes.

When using hydraulic models, it is necessary to distinguish areas where sediment moves as bed-material load (i.e., channels, subject to both scour and deposition) from areas where sediment moves primarily as wash load or suspended load (i.e., overbanks, primarily subject to deposition). If overbanks are included in the channel area, channel velocity and hydraulic depth will be underestimated, resulting in low estimates of sediment transport capacity and/or potential erosion.

Physical Characteristics Of Channel Banks

The Corps of Engineers, in identifying the ordinary high-water mark, uses the following characteristics:

- Vegetation – a change from terrestrial to aquatic vegetation, or the onset of terrestrial vegetation often occurs at the ordinary high-water mark.

- Soils – a change in soil characteristics from undifferentiated, poorly developed soils to more well-developed soils with distinct profiles often occurs at the at ordinary high-water mark. This change is caused by frequent scour and fill occurring in the channel that prevent soil formation.

- Topography – a break in slope often occurs at the ordinary high-water mark.

The ordinary high-water mark, as defined by the Corps of Engineers, is analogous to a geomorphic definition of the top of the channel bank. Therefore, the Corps' definition can be applied to help define the location of the channel stations used for HEC-RAS modeling. However, the following modifications are required to apply these definitions to streams in Arizona and the arid west:

Vegetation. On ephemeral and intermittent streams, vegetation in the channels may not be that different from vegetation in or above the floodplain. However, the following guidelines are suggested:

1. Areas swept clean of vegetation. The areas of highest velocity during high flows will be periodically swept clear of vegetation. Therefore, the channel will either lack vegetation, or will be populated with very young, fast growing vegetation. An inspection of the streams flood history, either from gauge records or field evidence, should be made to determine whether high flows have occurred in the recent past. If no large flows have occurred in the recent past, vegetation will encroach on the channel and will tend to obscure the true location that should be defined for the channel banks.
2. Bank vegetation. A swath of dense vegetation often lines the banks of ephemeral and intermittent channels. In southern and central Arizona, this vegetation generally consists of mesquite, palo verde, ironwood, and brushy plants, but may also include cactus species such as sahauro. This vegetation is usually distinct in type as well as density compared to both the vegetation in the channel and the vegetation in the floodplain.
3. Age of vegetation. The relative age of the bank vegetation can be used to assess the frequency and/or the age of the most recent channel changes.
4. Avulsions. If the main channel location is subject to frequent avulsive changes, the true channel bank locations may be well outside the area defined by existing bank vegetation. The potential for avulsive channel changes can be assessed by a field inspection and by comparison of historical aerial photographs.

Soils. Soil characteristics

1. Sediment size. Overbank areas are primarily subject to deposition, and thus generally are composed of accretive layers of fine grained sediment, or have a mantle of more recently deposited fine grained materials. Areas subject to channel processes typically are underlain by coarser sediments.
2. Imbrication. Coarse channel sediments are often imbricated, an alignment of clasts in the direction of movement.
3. Profile development. Areas outside the channel generally have remained undisturbed for longer periods of time, and hence have had time to develop soil horizons, surface pavements, and other features of soil development. Surface characteristics that may indicate subsurface soil profile development include desert varish, desert pavement, reddening of surface layers.
4. Bank cuts. Soil profiles can often be observed in cut banks. Features that indicate soil profile development that can be observed in cut banks include: carbonate layers

(caliche), clay accumulation (soil texture), reddening of soil layers, and soil structure (ped formation).

Topography. Most large stream systems consist of compound channels with one or more terraces that reflect different levels of flooding and inundation. Inundation of these terraces corresponds to different flow frequencies – larger floods are required to inundate the highest terraces.

Flood Frequency

Relate to terrace levels.

Channel forming discharge. Begs the question – how can the channel forming discharge be determined unless the channel hydraulics are first estimated? To estimate channel hydraulics, one needs to define the bank stations.

Sediment size. If the channel is armored, and the banks are resistant, it is unlikely the channel forming discharge is a frequent event (Q2 or less).

Bankfull discharge. Rosgen-type definitions of bankfull discharge are irrelevant for erosion hazard studies. Bankfull discharges that refer to a 2-year or more frequent discharge may be relevant for a micro-channel formed within a compound channel, but have little impact on river stability assessments in central and southern Arizona. Such a limited scope of analysis ignores the important role of floods on shaping channels and in causing lateral movement and bank erosion. For entrenched river systems, or for erosion hazard assessments, bankfull refers to the well-defined banks subject to erosion during floods.

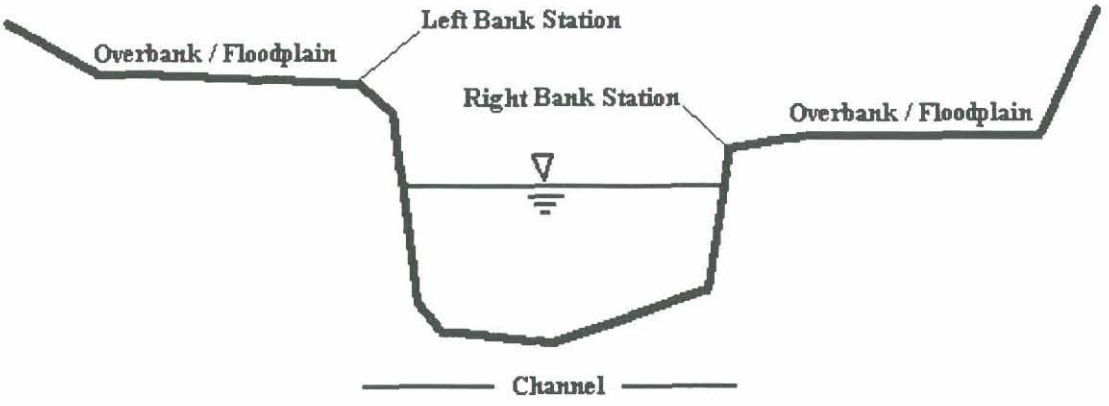
Bank Station. The flood frequency should be high enough to reach an erosive velocity (> 3-5 ft/sec), and high enough to flow against the banks.

Other guidelines:

1. Consistency between cross sections. Wide fluctuations in channel width, as defined by the bank stations, should be avoided. Channel characteristics generally change gradually on natural streams.
2.

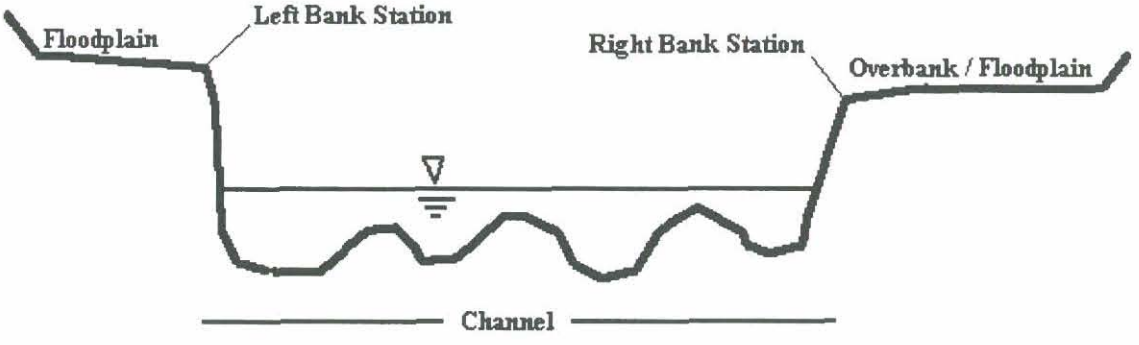
Bank Definitions for Specific Channel Types:

Single Channels

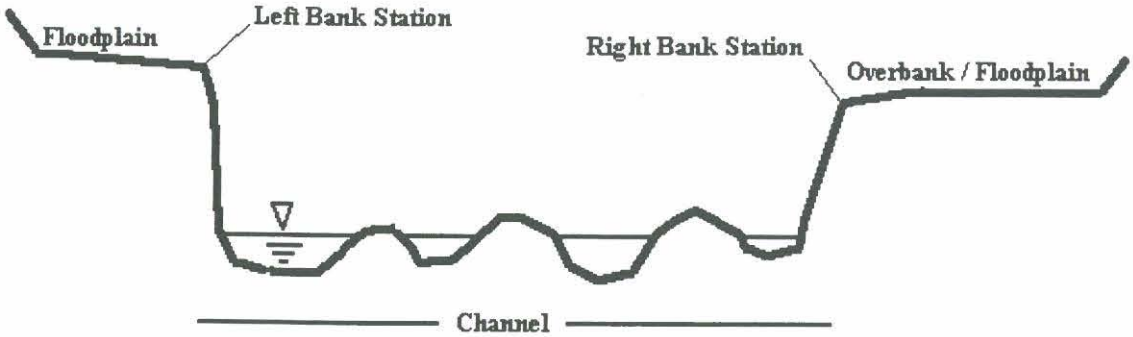


Multiple Channels

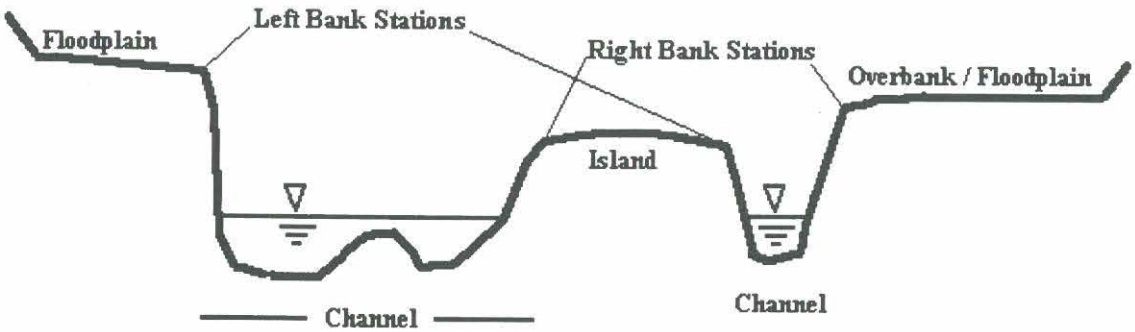
Scenario #1 – Multiple Channel Where Islands Inundated by Flows



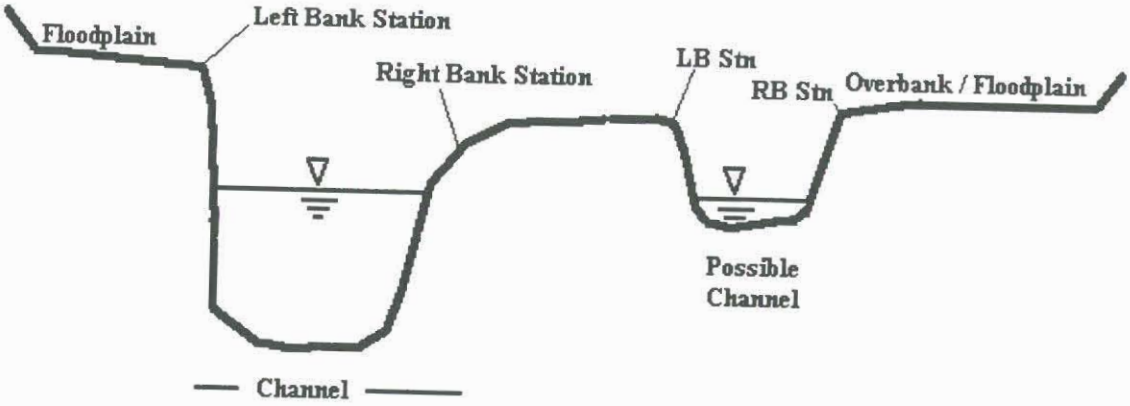
Scenario #2a – Multiple Channel Where Islands Not Inundated by Flows: Small Islands



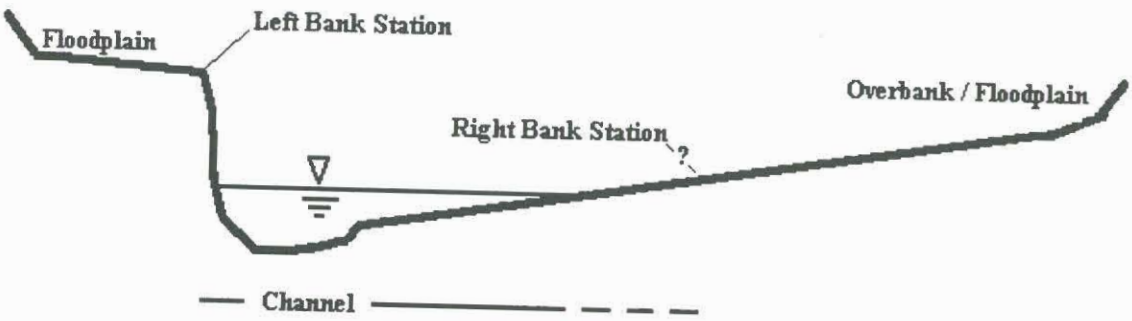
Scenario #2b - Multiple Channel Where Islands Not Inundated by Flows: Large Islands



Perched Channels

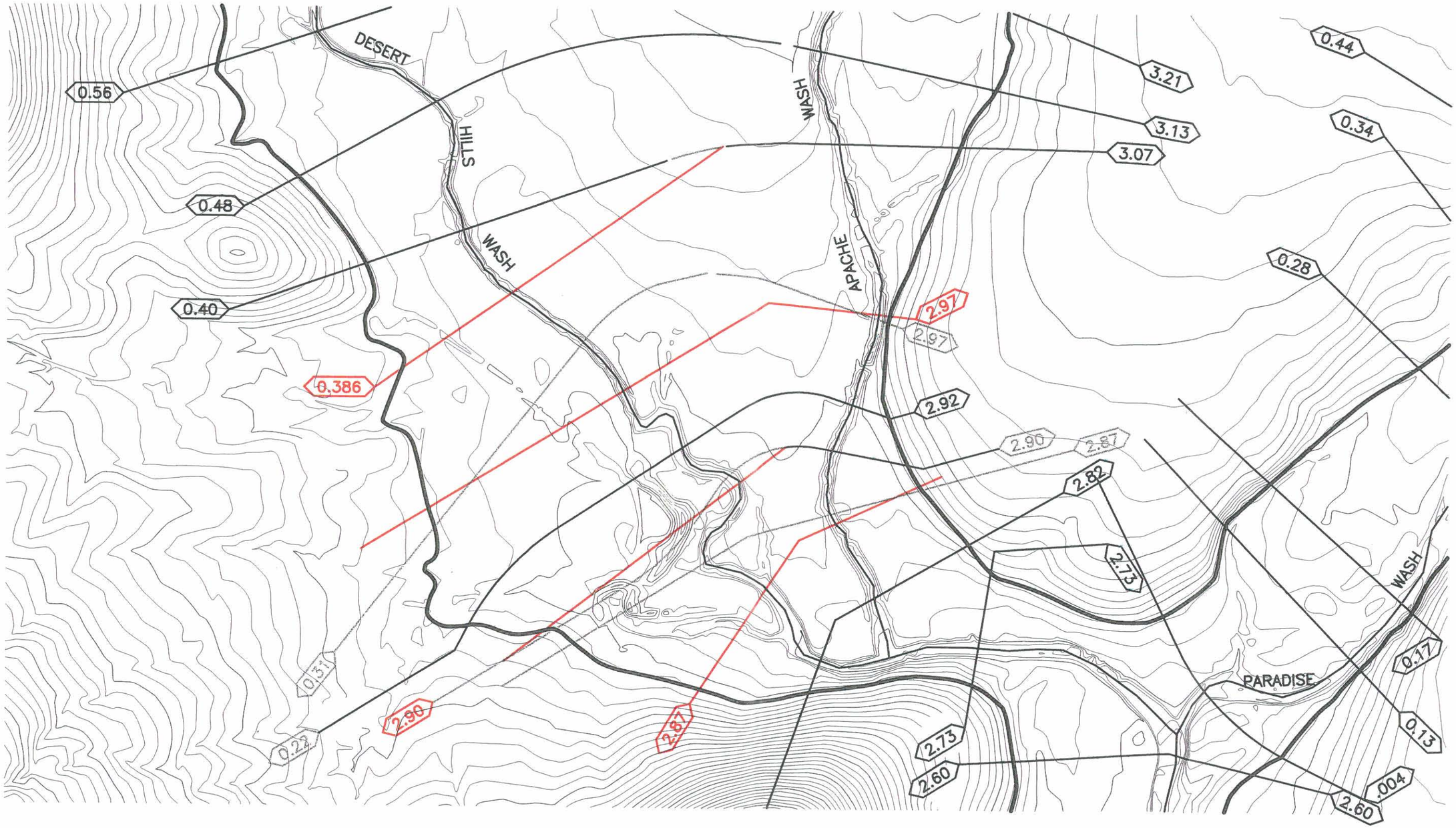


Channels With Poorly Defined Banks



APPENDIX E

DETAILED MODIFICATION TO HEC-RAS FILES FOR USE WITH HEC-6



Legend

HYDRAULIC BASELINE	
FDS CROSS SECTION	0.40
REVISED FDS CROSS SECTION	2.87
NEW FDS CROSS SECTION	2.87
EXISTING FLOODPLAIN BOUNDARY	

0 300' 600' 900'

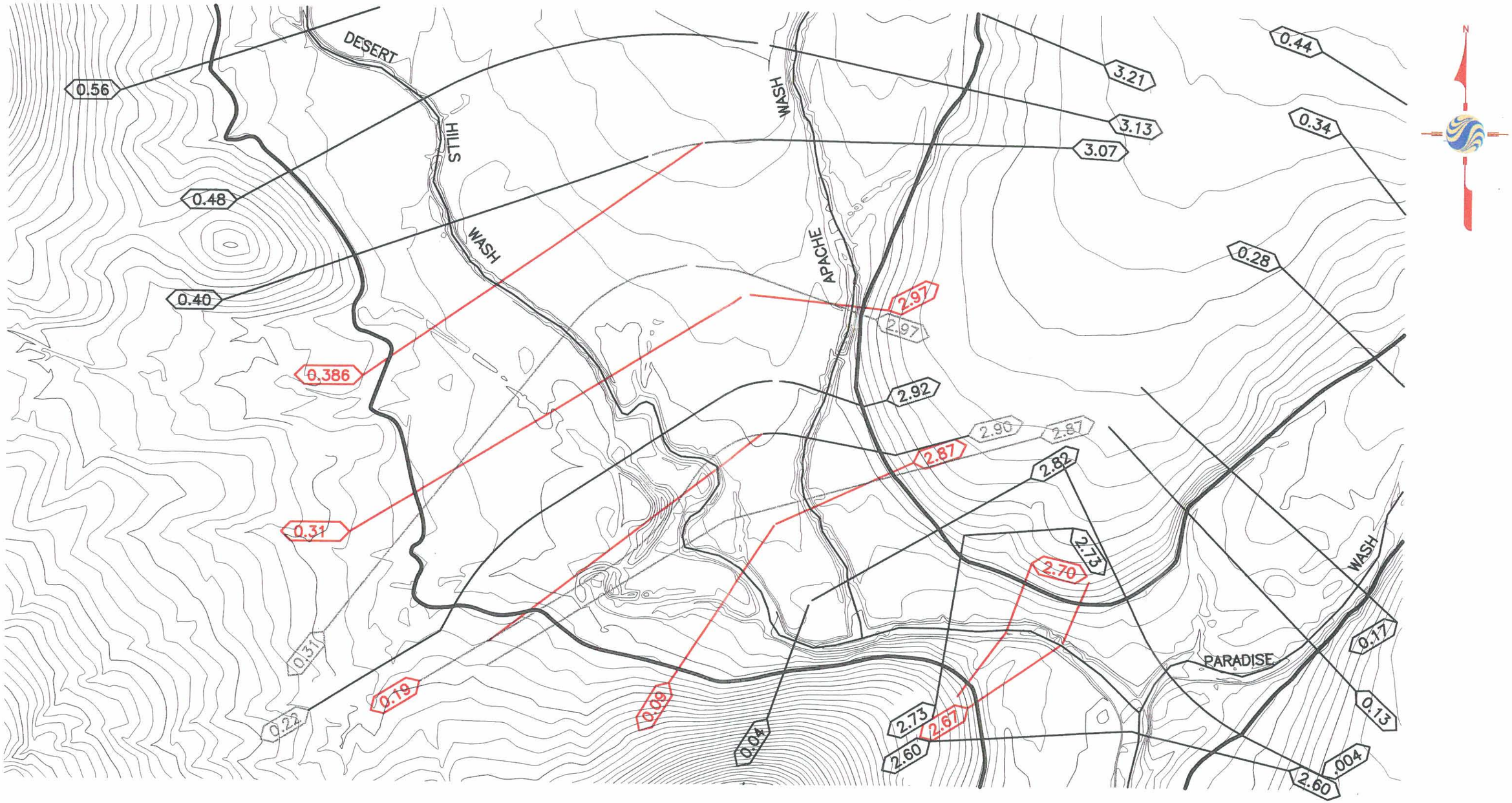
SCALE: 1" = 300'

Stantec

Client/Project
FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
CAVE CREEK WMP

Figure No.
E-1

Title
REVISED CROSS SECTIONAL ALIGNMENTS
1/07/2000
28900077



Legend

HYDRAULIC BASELINE	
FDS CROSS SECTION	0.40
REVISED FDS CROSS SECTION	2.87
NEW FDS CROSS SECTION	2.87
EXISTING FLOODPLAIN BOUNDARY	

0 300' 600' 900'

SCALE: 1" = 300'

Stantec

Client/Project
FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
CAVE CREEK WMP

Figure No.
E-2

Title
REVISED CROSS SECTIONAL ALIGNMENTS
1/07/2000
28900077

Table E-1

Manning's n-values for the Cave Creek FDS

N-values 1, 2 and 3 are for the left overbank, channel and right overbank unless the horizontal variation of n-values option is used. Up to 13 n-values are used to described the roughness characteristics of the watercourse.

	Manning's n-values												
River Sta	n #1	n #2	n #3	n #4	n #5	n #6	n #7	n #8	n #9	n #10	n #11	n #12	n #13
31.910	0.070	0.045	0.070	---	---	---	---	---	---	---	---	---	---
31.870	0.055	0.055	0.050	---	---	---	---	---	---	---	---	---	---
31.820	0.055	0.055	0.050	---	---	---	---	---	---	---	---	---	---
31.750	0.055	0.055	0.050	---	---	---	---	---	---	---	---	---	---
31.630	0.055	0.055	0.050	---	---	---	---	---	---	---	---	---	---
31.540	0.055	0.055	0.050	---	---	---	---	---	---	---	---	---	---
31.450	0.055	0.055	0.050	---	---	---	---	---	---	---	---	---	---
31.340	0.055	0.055	0.050	---	---	---	---	---	---	---	---	---	---
31.250	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
31.170	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
31.140	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
31.050	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
30.960	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
30.850	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
30.750	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
30.650	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
30.520	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
30.420	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
30.280	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
30.200	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
30.100	0.055	0.050	0.055	---	---	---	---	---	---	---	---	---	---
29.850	0.060	0.035	0.060	---	---	---	---	---	---	---	---	---	---
29.770	0.060	0.045	0.035	0.045	0.060	---	---	---	---	---	---	---	---
29.720	0.060	0.045	0.035	0.060	---	---	---	---	---	---	---	---	---
29.715							Bridge						
29.710	0.060	0.045	0.060	---	---	---	---	---	---	---	---	---	---
29.663	0.060	0.035	0.025	0.030	0.080	0.060	---	---	---	---	---	---	---
29.601	0.060	0.035	0.025	0.060	0.030	0.120	0.060	---	---	---	---	---	---

Table E-1

Manning's n-values for the Cave Creek FDS

N-values 1, 2 and 3 are for the left overbank, channel and right overbank unless the horizontal variation of n-values option is used. Up to 13 n-values are used to described the roughness characteristics of the watercourse.

	Manning's n-values												
River Sta	n #1	n #2	n #3	n #4	n #5	n #6	n #7	n #8	n #9	n #10	n #11	n #12	n #13
29.538	0.060	0.025	0.080	0.028	0.065	0.060	---	---	---	---	---	---	---
29.493	0.065	0.080	0.040	0.060	0.033	0.060	0.025	0.080	0.025	0.080	0.060	---	---
29.387	0.060	0.040	0.120	0.050	0.025	0.050	0.120	0.060	---	---	---	---	---
29.351	0.060	0.040	0.120	0.050	0.045	0.070	0.120	0.060	---	---	---	---	---
29.258	0.060	0.120	0.035	0.080	0.060	---	---	---	---	---	---	---	---
29.130	0.060	0.060	0.040	0.045	0.043	0.060	---	---	---	---	---	---	---
29.012	0.060	0.035	0.025	0.040	0.045	0.050	0.060	---		---	---	---	---
28.934	0.060	0.120	0.040	0.025	0.080	0.060	---	---	---	---	---	---	---
28.847	0.060	0.120	0.035	0.120	0.040	0.060	---	---	---	---	---	---	---
28.750	0.060	0.120	0.033	0.050	0.060	0.060	---	---	---	---	---	---	---
28.657	0.060	0.080	0.033	0.120	0.025	0.120	0.060	0.080	0.060	---	---	---	---
28.555	0.060	0.035	0.025	0.080	0.060	0.080	---	---	---	---	---	---	---
28.462	0.060	0.080	0.025	0.120	0.080	0.060	---	---	---	---	---	---	---
28.390	0.060	0.120	0.025	0.120	0.030	0.120	---	---	---	---	---	---	---
28.326	0.060	0.120	0.025	0.120	0.060	0.120	0.080	---	---	---	---	---	---
28.241	0.060	0.120	0.025	0.028	0.080	0.060	0.120	0.080	---	---	---	---	---
28.157	0.060	0.120	0.040	0.035	0.025	0.035	0.120	0.060	---	---	---	---	---
28.091	0.060	0.030	0.040	0.120	0.080	0.040	0.060	0.120	0.060	---	---	---	---
28.023	0.030	0.040	0.120	0.080	0.040	0.060	0.120	0.060	---	---	---	---	---
27.913	0.060	0.030	0.033	0.080	0.025	0.060	0.120	0.060	---	---	---	---	---
27.797	0.060	0.033	0.040	0.050	0.070	0.120	0.060	---	---	---	---	---	---
27.693	0.060	0.020	0.040	0.120	0.080	0.120	0.060	---	---	---	---	---	---
27.604	0.060	0.080	0.038	0.080	0.070	0.120	0.060	---	---	---	---	---	---
27.502	0.060	0.120	0.035	0.040	0.080	0.040	0.080	0.120	0.080	---	---	---	---
27.417	0.060	0.120	0.080	0.035	0.060	0.120	0.060	---	---	---	---	---	---
27.366	0.120	0.060	0.035	0.060	0.120	0.060	---	---	---	---	---	---	---
27.320	0.060	0.120	0.080	0.025	0.040	0.025	0.080	---	---	---	---	---	---
27.265	0.080	0.025	0.080	0.025	0.030	0.060	0.080	0.060	---	---	---	---	---

Table E-1

Manning's n-values for the Cave Creek FDS

N-values 1, 2 and 3 are for the left overbank, channel and right overbank unless the horizontal variation of n-values option is used. Up to 13 n-values are used to described the roughness characteristics of the watercourse.

	Manning's n-values												
River Sta	n #1	n #2	n #3	n #4	n #5	n #6	n #7	n #8	n #9	n #10	n #11	n #12	n #13
27.226	0.035	0.060	0.035	0.025	0.035	0.060	0.035	0.060	0.080	---	---	---	---
27.169	0.025	0.050	0.038	0.080	0.060	---	---	---	---	---	---	---	---
27.106	0.060	0.038	0.033	0.060	0.040	0.080	---	---	---	---	---	---	---
27.008	0.038	0.080	0.060	0.030	0.080	---	---	---	---	---	---	---	---
26.921	0.050	0.060	0.080	0.085	---	---	---	---	---	---	---	---	---
26.845	0.060	0.035	0.060	0.025	0.035	0.030	0.080	0.120	---	---	---	---	---
26.775	0.080	0.120	0.025	0.030	0.035	0.080	---	---	---	---	---	---	---
26.695	0.060	0.120	0.025	0.035	0.025	0.035	0.025	0.060	0.025	0.060	0.035	0.080	---
26.623	0.080	0.120	0.035	0.060	0.038	0.025	0.080	---	---	---	---	---	---
26.529	0.080	0.060	0.035	0.025	0.035	0.025	0.080	---	---	---	---	---	---
26.430	0.060	0.080	0.040	0.035	0.060	0.025	0.080	---	---	---	---	---	---
26.335	0.060	0.022	0.065	0.080	0.060	---	---	---	---	---	---	---	---
26.239	0.060	0.022	0.025	0.060	0.035	0.025	0.060	0.025	0.080	0.120	0.080	0.120	0.080
26.137	0.060	0.022	0.035	0.022	0.060	0.025	0.080	0.060	0.080	0.120	0.080	---	---
26.044	0.060	0.022	0.025	0.030	0.022	0.120	---	---	---	---	---	---	---
25.919	0.080	0.065	0.045	0.120	0.035	0.080	0.035	0.080	0.025	0.080	---	---	---
25.843	0.022	0.080	0.040	0.120	0.035	0.120	0.035	0.080	0.025	0.080	---	---	---
25.750	0.080	0.025	0.120	0.040	0.120	0.035	0.025	0.120	0.080	---	---	---	---
25.699	0.080	0.022	0.025	0.120	0.025	0.120	---	---	---	---	---	---	---
25.644	0.030	0.025	0.080	0.025	0.080	0.038	0.025	0.120	---	---	---	---	---
25.580	0.025	0.080	0.035	0.120	0.038	0.025	0.080	---	---	---	---	---	---
25.519	0.025	0.120	0.038	0.080	---	---	---	---	---	---	---	---	---
25.458	0.025	0.035	0.080	---	---	---	---	---	---	---	---	---	---
25.388	0.080	0.035	0.120	---	---	---	---	---	---	---	---	---	---
25.326	0.080	0.060	0.080	0.035	0.120	---	---	---	---	---	---	---	---
25.233	0.080	0.025	0.035	0.120	---	---	---	---	---	---	---	---	---
25.180	0.080	0.025	0.120	---	---	---	---	---	---	---	---	---	---
25.099	0.080	0.025	0.120	---	---	---	---	---	---	---	---	---	---

Table E-1

Manning's n-values for the Cave Creek FDS

N-values 1, 2 and 3 are for the left overbank, channel and right overbank unless the horizontal variation of n-values option is used. Up to 13 n-values are used to described the roughness characteristics of the watercourse.

	Manning's n-values												
River Sta	n #1	n #2	n #3	n #4	n #5	n #6	n #7	n #8	n #9	n #10	n #11	n #12	n #13
25.010	0.080	0.035	0.080	0.035	0.080	---	---	---	---	---	---	---	---
24.919	0.120	0.035	0.120	0.035	0.120	---	---	---	---	---	---	---	---
24.845	0.120	0.035	0.120	0.035	0.120	---	---	---	---	---	---	---	---
24.752	0.120	0.035	0.120	0.035	0.120	---	---	---	---	---	---	---	---
24.646	0.120	0.035	0.120	0.035	0.120	---	---	---	---	---	---	---	---
24.525	0.120	---	---	---	---	---	---	---	---	---	---	---	---

Table E-2

Comparison of weighted Manning's n-values and bank station locations for Cave Creek

River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
31.910	CC FDS	9968.0	10025.9	0.045	0.070	0.070	0.060
31.910	Ex100-WMP	9933.0	10050.7	0.044	0.060	0.070	0.053
31.870	CC FDS	9938.9	10007.4	0.055	0.055	0.050	0.054
31.870	Ex100-WMP	9848.6	10017.7	0.044	---	0.070	0.046
31.820	CC FDS	9861.7	10000.0	0.055	0.055	0.050	0.054
31.820	Ex100-WMP	9839.4	10046.1	0.044	0.070	0.070	0.051
31.750	CC FDS	9936.0	10016.0	0.055	0.055	0.050	0.054
31.750	Ex100-WMP	9797.4	10027.6	0.044	0.070	0.070	0.048
31.630	CC FDS	9972.7	10037.0	0.055	0.055	0.050	0.052
31.630	Ex100-WMP	9961.1	10153.9	0.044	0.070	0.060	0.051
31.540	CC FDS	9928.9	10073.6	0.055	0.055	0.050	0.052
31.540	Ex100-WMP	9916.0	10182.8	0.044	0.070	0.060	0.049
31.450	CC FDS	9927.1	10009.4	0.055	0.055	0.050	0.052
31.450	Ex100-WMP	9850.0	10031.0	0.044	0.070	0.060	0.051
31.340	CC FDS	9949.9	10027.2	0.055	0.055	0.050	0.051
31.340	Ex100-WMP	9930.2	10137.5	0.044	0.070	0.060	0.053
31.250	CC FDS	9881.1	10031.4	0.050	0.055	0.055	0.053
31.250	Ex100-WMP	9783.9	10041.9	0.044	0.070	0.060	0.049
31.170	CC FDS	9965.1	10054.8	0.050	0.055	0.055	0.054
31.170	Ex100-WMP	9852.5	10210.3	0.044	0.070	0.060	0.049
31.140	CC FDS	9965.8	10026.5	0.050	0.055	0.055	0.053
31.140	Ex100-WMP	9926.4	10146.3	0.044	0.070	0.060	0.052
31.050	CC FDS	9934.2	10000.0	0.050	0.055	0.055	0.054
31.050	Ex100-WMP	9886.0	10109.5	0.044	0.070	0.060	0.052
30.960	CC FDS	9973.8	10048.6	0.050	0.055	0.055	0.054
30.960	Ex100-WMP	9925.5	10145.6	0.044	0.070	0.060	0.053
30.850	CC FDS	9912.4	10018.4	0.050	0.055	0.055	0.053
30.850	Ex100-WMP	9889.7	10051.3	0.044	0.070	0.060	0.052
30.750	CC FDS	9963.4	10050.3	0.050	0.055	0.055	0.054
30.750	Ex100-WMP	9857.1	10184.4	0.044	0.070	---	0.048

Table E-2

Comparison of weighted Manning's n-values and bank station locations for Cave Creek

River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
30.650	CC FDS	9943.8	10019.6	0.050	0.055	0.055	0.053
30.650	Ex100-WMP	9909.4	10027.8	0.044	0.060	0.070	0.051
30.520	CC FDS	9983.4	10061.8	0.050	0.055	0.055	0.054
30.520	Ex100-WMP	9826.1	10401.4	0.044	0.060	---	0.046
30.420	CC FDS	9970.3	10052.9	0.050	0.055	0.055	0.054
30.420	Ex100-WMP	9957.5	10487.8	0.044	0.060	---	0.047
30.280	CC FDS	9908.6	10014.5	0.050	0.055	0.055	0.052
30.280	Ex100-WMP	9881.7	10033.5	0.044	0.060	---	0.049
30.200	CC FDS	9927.7	10093.2	0.050	0.055	0.055	0.052
30.200	Ex100-WMP	9900.1	10132.3	0.044	0.060	---	0.050
30.100	CC FDS	9935.6	10010.8	0.050	0.055	0.055	0.053
30.100	Ex100-WMP	9817.8	10037.9	0.036	0.060	---	0.048
29.850	CC FDS	9945.1	10029.3	0.035	0.060	0.060	0.046
29.850	Ex100-WMP	9924.1	10043.7	0.036	0.070	0.070	0.046
29.770	CC FDS	9754.0	10051.1	0.037	---	---	0.037
29.770	Ex100-WMP	9764.6	10051.1	0.036	---	---	0.036
29.720	CC FDS	9593.2	9956.5	0.042	---	---	0.042
29.720	Ex100-WMP	9593.2	9956.5	0.036	---	---	0.036
29.715				Bridge			
29.710	CC FDS	9715.0	10064.0	0.047	---	---	0.047
29.710	Ex100-WMP	9715.0	10064.0	0.040	---	---	0.040
29.663	CC FDS	9615.1	10201.4	0.061	0.060	---	0.061
29.663	Ex100-WMP	9803.9	10194.6	0.044	0.070	---	0.045
29.601	CC FDS	9286.8	10084.7	0.052	0.060	---	0.052
29.601	Ex100-WMP	9679.0	10060.2	0.044	0.070	---	0.045
29.538	CC FDS	9041.5	10085.4	0.034			0.034
29.538	Ex100-WMP	9400.2	10034.4	0.050	0.070	0.070	0.050
29.493	CC FDS	9184.2	10047.8	0.054	---	0.080	0.055
29.493	Ex100-WMP	9336.2	10047.8	0.050	0.070	0.070	0.051

Table E-2

Comparison of weighted Manning's n-values and bank station locations for Cave Creek

River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
29.387	CC FDS	9481.0	10302.4	0.044	---	0.120	0.044
29.387	Ex100-WMP	9481.0	10107.4	0.050	---	0.070	0.052
29.351	CC FDS	9684.3	10342.3	0.072	---	0.117	0.072
29.351	Ex100-WMP	9684.3	10150.2	0.050	---	0.070	0.052
29.258	CC FDS	9781.3	10051.4	0.041	---	0.080	0.041
29.258	Ex100-WMP	9781.3	10051.4	0.044	---	---	0.044
29.130	CC FDS	9960.7	10331.6	0.044	---	0.045	0.045
29.130	Ex100-WMP	9960.7	10106.7	0.036	---	0.070	0.044
29.012	CC FDS	9922.8	10091.3	0.033	---	0.043	0.036
29.012	Ex100-WMP	9922.8	10091.3	0.036	---	0.070	0.044
28.934	CC FDS	9824.7	10054.9	0.068	---	0.035	0.052
28.934	Ex100-WMP	9824.7	10054.9	0.036	---	0.070	0.043
28.847	CC FDS	9881.1	10076.9	0.048	---	0.051	0.049
28.847	Ex100-WMP	9881.1	10076.9	0.036	---	0.070	0.043
28.750	CC FDS	9866.8	10129.0	0.065	---	0.060	0.063
28.750	Ex100-WMP	9866.8	10129.0	0.036	---	0.070	0.039
28.657	CC FDS	9910.1	10197.0	0.092	---	0.060	0.079
28.657	Ex100-WMP	9933.6	10197.0	0.036	---	0.070	0.039
28.555	CC FDS	9869.9	10111.4	0.046	---	0.060	0.050
28.555	Ex100-WMP	9919.4	10111.4	0.036	---	0.070	0.042
28.462	CC FDS	9871.7	10061.2	0.073	---	0.080	0.076
28.462	Ex100-WMP	9871.7	10061.2	0.036	---	0.070	0.043
28.390	CC FDS	9819.6	10063.6	0.081	---	0.043	0.058
28.390	Ex100-WMP	9863.1	10063.6	0.036	---	0.070	0.045
28.326	CC FDS	9689.6	10076.3	0.067	---	0.071	0.069
28.326	Ex100-WMP	9817.5	10050.1	0.036	---	0.070	0.043
28.241	CC FDS	9757.5	10050.5	0.029	0.027	0.095	0.037
28.241	Ex100-WMP	9639.9	10050.5	0.044	---	0.070	0.049
28.157	CC FDS	9942.0	10073.0	0.029	0.041	0.073	0.040

Table E-2

Comparison of weighted Manning's n-values and bank station locations for Cave Creek

River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
28.157	Ex100-WMP	9591.2	10055.2	0.044	---	0.070	0.048
28.091	CC FDS	9900.2	10121.5	0.044	0.059	0.118	0.055
28.091	Ex100-WMP	9641.3	10160.5	0.044	---	0.070	0.047
28.023	CC FDS	9892.3	10073.4	0.058	0.042	0.095	0.056
28.023	Ex100-WMP	9770.0	10077.1	0.044	---	0.070	0.048
27.913	CC FDS	9944.2	10240.4	0.057	---	0.077	0.062
27.913	Ex100-WMP	9944.2	10240.4	0.036	---	---	0.036
27.797	CC FDS	9955.5	10158.3	0.045	---	0.081	0.056
27.797	Ex100-WMP	9969.0	10158.3	0.036	---	0.070	0.045
27.693	CC FDS	9961.1	10195.8	0.092	---	0.092	0.092
27.693	Ex100-WMP	9961.1	10195.8	0.036	---	0.070	0.043
27.604	CC FDS	9740.2	10014.4	0.043	---	0.089	0.046
27.604	Ex100-WMP	9740.2	10014.4	0.036	---	0.070	0.038
27.502	CC FDS	9853.5	10150.4	0.059	---	0.074	0.063
27.502	Ex100-WMP	9947.5	10150.4	0.036	---	0.070	0.044
27.417	CC FDS	9751.0	10200.8	0.036	---	0.097	0.045
27.417	Ex100-WMP	9942.8	10200.8	0.044	0.070	0.060	0.048
27.366	CC FDS	9658.5	10110.1	0.057	---	0.083	0.063
27.366	Ex100-WMP	9737.6	10110.1	0.044	---	0.060	0.048
27.320	CC FDS	9907.5	10072.3	0.036	0.080	0.080	0.049
27.320	Ex100-WMP	9907.5	10072.3	0.044	0.070	0.060	0.049
27.265	CC FDS	9900.0	10337.0	0.040	---	0.068	0.052
27.265	Ex100-WMP	9900.0	10164.2	0.044	---	0.060	0.050
27.226	CC FDS	9928.4	10380.0	0.043	---	0.078	0.045
27.226	Ex100-WMP	9928.4	10380.0	0.044	---	0.060	0.045
27.169	CC FDS	9850.9	10395.0	0.040	---	0.080	0.042
27.169	Ex100-WMP	9850.9	10395.0	0.044	---	0.060	0.045
27.106	CC FDS	9730.7	10275.3	0.053	---	0.080	0.054
27.106	Ex100-WMP	9730.7	10275.3	0.044	---	0.060	0.044

Table E-2

Comparison of weighted Manning's n-values and bank station locations for Cave Creek

River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
27.008	CC FDS	9657.3	10164.0	0.054	---	0.080	0.054
27.008	Ex100-WMP	9677.5	10164.0	0.044	---	0.060	0.044
26.921	CC FDS	9712.1	10149.0	0.057	---	0.085	0.058
26.921	Ex100-WMP	9712.1	10149.0	0.044	---	0.060	0.044
26.845	CC FDS	9657.8	10020.1	0.042	0.035	0.035	0.041
26.845	Ex100-WMP	9657.8	10020.1	0.044	---	0.060	0.046
26.775	CC FDS	9914.0	10229.0	0.028	0.086	0.080	0.032
26.775	Ex100-WMP	9914.0	10229.0	0.044	---	0.060	0.047
26.695	CC FDS	9881.3	10055.4	0.035	0.025	0.040	0.035
26.695	Ex100-WMP	9772.8	10055.4	0.044	---	0.060	0.049
26.623	CC FDS	9626.5	10128.4	0.053	---	0.080	0.055
26.623	Ex100-WMP	9626.5	10128.4	0.044	---	0.060	0.045
26.529	CC FDS	9764.3	10169.7	0.028	---	0.080	0.032
26.529	Ex100-WMP	9764.3	10177.6	0.044	---	0.060	0.046
26.430	CC FDS	9749.0	10284.7	0.041	---	0.080	0.044
26.430	Ex100-WMP	9770.0	10353.7	0.044	---	0.060	0.045
26.335	CC FDS	9615.6	10262.9	0.061	---	0.079	0.065
26.335	Ex100-WMP	9635.0	10333.4	0.044	---	0.060	0.046
26.239	CC FDS	9889.9	10111.9	0.046	---	0.062	0.059
26.239	Ex100-WMP	9925.0	10279.3	0.044	---	0.060	0.054
26.137	CC FDS	9963.1	10079.0	0.030	---	0.059	0.052
26.137	Ex100-WMP	9975.0	10296.6	0.044	---	0.060	0.051
26.044	CC FDS	9889.6	10076.8	0.027	---	0.111	0.077
26.044	Ex100-WMP	9926.0	10076.8	0.044	---	0.060	0.056
25.919	CC FDS	9857.9	10039.1	0.045	0.068	0.038	0.041
25.919	Ex100-WMP	9857.9	10046.9	0.044	---	0.060	0.053
25.843	CC FDS	9882.4	10077.6	0.045	0.049	0.041	0.043
25.843	Ex100-WMP	9891.5	10077.6	0.044	0.070	0.060	0.053
25.750	CC FDS	9925.3	10061.9	0.089	0.112	0.048	0.064
25.750	Ex100-WMP	9925.3	10085.9	0.044	0.070	0.060	0.057

Table E-2

Comparison of weighted Manning's n-values and bank station locations for Cave Creek

River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
25.699	CC FDS	9886.9	10033.0	0.025	0.106	0.058	0.044
25.699	Ex100-WMP	9886.9	10033.0	0.044	0.070	0.060	0.052
25.644	CC FDS	9908.8	10030.5	0.046	0.049	0.055	0.050
25.644	Ex100-WMP	9908.8	10061.5	0.044	0.070	0.060	0.054
25.580	CC FDS	9974.4	10089.0	0.061	0.057	0.043	0.049
25.580	Ex100-WMP	9974.4	10121.5	0.044	0.070	0.060	0.058
25.519	CC FDS	9970.0	10058.9	0.038	0.042	0.076	0.058
25.519	Ex100-WMP	9946.0	10101.0	0.044	0.070	0.060	0.059
25.458	CC FDS	9942.1	10008.7	0.080	0.057	0.080	0.073
25.458	Ex100-WMP	9916.8	10067.1	0.044	0.070	0.060	0.059
25.388	CC FDS	9467.9	9606.3	0.040	0.080	0.120	0.078
25.388	Ex100-WMP	9467.9	9644.5	0.044	0.070	0.060	0.054
25.326	CC FDS	9335.1	9497.8	0.037	0.080	0.120	0.072
25.326	Ex100-WMP	9335.1	9497.8	0.044	0.070	0.060	0.054
25.233	CC FDS	9228.6	9383.8	0.039	0.064	0.120	0.082
25.233	Ex100-WMP	9274.5	9383.8	0.044	0.070	0.060	0.057
25.180	CC FDS	9213.5	9387.0	0.033	0.080	0.120	0.072
25.180	Ex100-WMP	9213.5	9413.7	0.044	0.070	0.060	0.056
25.099	CC FDS	9346.0	9430.5	0.025	0.080	0.120	0.071
25.099	Ex100-WMP	9327.5	9490.1	0.044	0.070	0.060	0.058
25.010	CC FDS	8823.5	9223.1	0.052	0.080	0.065	0.058
25.010	Ex100-WMP	8823.5	9248.1	0.044	0.070	0.060	0.049
24.919	CC FDS	8494.5	8709.6	0.054	0.120	0.102	0.086
24.919	Ex100-WMP	8494.5	8709.6	0.044	---	0.060	0.055
24.845	CC FDS	8674.4	8785.7	0.069	0.120	0.104	0.096
24.845	Ex100-WMP	8674.4	8792.8	0.044	---	0.060	0.055
24.752	CC FDS	8895.7	8997.0	0.035	0.120	0.060	0.055
24.752	Ex100-WMP	8835.7	8997.0	0.044	0.070	0.060	0.056
24.646	CC FDS	9580.0	9745.6	0.120	0.115	0.063	0.089

Table E-2

Comparison of weighted Manning's n-values and bank station locations for Cave Creek

River Station	Plan	Bank Stations		Conveyance Weighted Mannings			Total Weighted Manning's
		Left	Right	Channel	Overbank	Overbank	
24.646	Ex100-WMP	9580.0	9745.6	0.044	0.070	0.060	0.055
24.525	CC FDS	9860.5	10009.0	0.120	0.120	0.120	0.120
24.525	Ex100-WMP	9860.5	10093.3	0.044	0.070	0.060	0.060

Table E-3

Comparison of ineffective flow areas and levees for Cave Creek

River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
31.910	CC FDS	9673.09	10179.84	---	---
31.910	Ex100-WMP	9661.22	10206.01	1959.7	1961.3
31.870	CC FDS	9649.41	10178.31	---	---
31.870	Ex100-WMP	9849.51	10185.64	1966.2	1959.6
31.820	CC FDS	9654.34	10303.89	---	---
31.820	Ex100-WMP	9652.25	10361.02	1963.3	1959.4
31.750	CC FDS	9568.59	10385.58	---	---
31.750	Ex100-WMP	9569.68	10353.90	1954.0	1953.0
31.630	CC FDS	9764.43	10626.71	---	---
31.630	Ex100-WMP	9764.44	10626.21	1947.3	1948.2
31.540	CC FDS	9912.51	10819.62	---	---
31.540	Ex100-WMP	9912.38	10875.79	1946.7	1944.2
31.450	CC FDS	9848.80	10879.71	---	---
31.450	Ex100-WMP	9849.20	10878.11	1944.6	1941.1
31.340	CC FDS	9779.07	10552.94	---	---
31.340	Ex100-WMP	9772.60	10555.00	1937.1	1936.5
31.250	CC FDS	9423.10	10475.52	---	---
31.250	Ex100-WMP	9750.00	10475.75	1934.1	1930.5
31.170	CC FDS	9509.78	10519.91	---	---
31.170	Ex100-WMP	9653.30	10519.60	---	---
31.140	CC FDS	9619.62	10659.79	---	---
31.140	Ex100-WMP	9619.98	10660.21	---	---
31.050	CC FDS	9883.29	10906.55	---	---
31.050	Ex100-WMP	9883.15	10906.80	---	---
30.960	CC FDS	9856.25	10791.21	---	---
30.960	Ex100-WMP	9855.21	10792.14	---	---
30.850	CC FDS	9699.80	10497.66	---	---
30.850	Ex100-WMP	9695.77	10497.79	1915.0	1912.0
30.750	CC FDS	9524.14	10181.95	---	---
30.750	Ex100-WMP	9517.45	10182.12	---	---

Table E-3

Comparison of ineffective flow areas and levees for Cave Creek

River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
30.650	CC FDS	9239.94	10027.52	---	---
30.650	Ex100-WMP	9230.33	10029.83	1904.4	1910.2
30.520	CC FDS	9292.92	10395.13	---	---
30.520	Ex100-WMP	9293.27	10394.74	---	---
30.420	CC FDS	9523.15	10474.99	---	---
30.420	Ex100-WMP	9523.44	10474.43	1895.2	---
30.280	CC FDS	9156.42	10030.47	---	---
30.280	Ex100-WMP	9155.20	10031.05	---	---
30.200	CC FDS	8982.87	10111.03	---	---
30.200	Ex100-WMP	8982.28	10111.48	---	---
30.100	CC FDS	8743.75	10021.87	---	---
30.100	Ex100-WMP	8742.49	10022.56	---	---
29.850	CC FDS	9407.42	10043.51	---	---
29.850	Ex100-WMP	9398.46	10049.24	---	---
29.770	CC FDS	9769.47	10041.04	---	---
29.770	Ex100-WMP	9769.30	10041.17	1870.5	1872.7
29.720	CC FDS	9616.34	9892.87	---	---
29.720	Ex100-WMP	9614.97	9894.80	1876.0	1876.1
29.715			Bridge		
29.710	CC FDS	9739.15	10050.00	---	---
29.710	Ex100-WMP	9744.80	10046.57	1871.2	1871.0
29.663	CC FDS	9230.37	10180.93	---	---
29.663	Ex100-WMP	9237.51	10176.96	1862.5	1869.1
29.601	CC FDS	9144.63	10048.03	---	---
29.601	Ex100-WMP	9145.67	10047.47	1859.4	1867.1
29.538	CC FDS	9089.13	10048.42	---	---
29.538	Ex100-WMP	9087.51	10052.86	1854.4	1854.1
29.493	CC FDS	9189.68	10131.88	---	---
29.493	Ex100-WMP	9190.02	10131.04	1850.7	1850.8

Table E-3

Comparison of ineffective flow areas and levees for Cave Creek

River Station	Plan	Ineffective Flow Area Stations		Levee Elevations	
		Left	Right	Left	Right
29.387	CC FDS	9485.67	10487.20	---	---
29.387	Ex100-WMP	9486.20	10294.23	---	1850.7
29.351	CC FDS	9685.25	10570.83	---	---
29.351	Ex100-WMP	9686.09	10300.73	---	1849.2
29.258	CC FDS	9794.52	10501.23	---	---
29.258	Ex100-WMP	9793.92	10048.28	---	1844.5
29.130	CC FDS	9971.70	10937.97	---	---
29.130	Ex100-WMP	9971.27	10558.30	---	---
29.012	CC FDS	9940.75	10839.81	---	---
29.012	Ex100-WMP	9939.95	10842.66	1850.0	1827.5
28.934	CC FDS	9857.36	10897.66	---	---
28.934	Ex100-WMP	9856.89	10900.71	1851.1	1826.8
28.847	CC FDS	9911.63	10831.00	---	---
28.847	Ex100-WMP	9911.11	10832.91	1847.0	1821.4
28.750	CC FDS	9899.43	10764.90	---	---
28.750	Ex100-WMP	9902.41	10774.98	1844.3	1819.7
28.657	CC FDS	9948.29	10677.10	---	---
28.657	Ex100-WMP	9950.16	10656.00	1839.5	1816.7
28.555	CC FDS	9944.51	10783.33	---	---
28.555	Ex100-WMP	9944.03	10791.71	1833.2	1810.0
28.462	CC FDS	9892.20	10874.06	---	---
28.462	Ex100-WMP	9892.78	10862.30	1827.9	1805.6
28.390	CC FDS	9879.92	10799.97	---	---
28.390	Ex100-WMP	9880.92	10796.29	1815.7	1802.7
28.326	CC FDS	9834.88	10918.45	---	---
28.326	Ex100-WMP	9835.49	10883.90	1809.8	1801.8
28.241	CC FDS	9663.80	10772.44	---	---
28.241	Ex100-WMP	9677.48	10771.66	1808.3	1796.6
28.157	CC FDS	9623.55	11021.71	---	---

Table E-3

Comparison of ineffective flow areas and levees for Cave Creek

River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
28.157	Ex100-WMP	9624.06	11015.86	1807.0	1792.0
28.091	CC FDS	9666.75	10915.87	---	---
28.091	Ex100-WMP	9666.95	10908.85	1811.7	1789.6
28.023	CC FDS	9772.31	11023.36	---	---
28.023	Ex100-WMP	9772.09	11088.48	1792.7	1785.2
27.913	CC FDS	9969.74	11386.99	---	---
27.913	Ex100-WMP	9972.24	10234.89	1800.8	1782.1
27.797	CC FDS	9976.80	11413.51	---	---
27.797	Ex100-WMP	9977.19	11405.87	1785.7	1776.1
27.693	CC FDS	9979.25	11276.02	---	---
27.693	Ex100-WMP	9980.13	11259.47	1791.7	1771.7
27.604	CC FDS	9772.78	10876.22	---	---
27.604	Ex100-WMP	9774.81	10870.03	1786.6	1765.2
27.502	CC FDS	9960.85	11008.97	---	---
27.502	Ex100-WMP	9960.23	11014.83	1773.7	1762.5
27.417	CC FDS	9879.19	11080.21	---	---
27.417	Ex100-WMP	9881.17	11078.54	1756.8	1755.0
27.366	CC FDS	9738.19	11136.78	---	---
27.366	Ex100-WMP	9738.28	11136.54	1755.9	1750.0
27.320	CC FDS	9694.23	11141.36	---	---
27.320	Ex100-WMP	9830.88	11136.07	1749.8	1750.0
27.265	CC FDS	9919.93	11169.70	---	---
27.265	Ex100-WMP	9925.49	11169.15	1750.2	1749.0
27.226	CC FDS	9929.02	11084.12	---	---
27.226	Ex100-WMP	9928.64	11074.22	1743.7	1740.0
27.169	CC FDS	9870.32	10986.20	---	---
27.169	Ex100-WMP	9870.00	10986.71	1753.5	1740.0
27.106	CC FDS	9771.38	10849.51	---	---
27.106	Ex100-WMP	9773.37	10845.00	1755.7	1736.8

Table E-3

Comparison of ineffective flow areas and levees for Cave Creek

River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
27.008	CC FDS	9697.25	10796.37	---	---
27.008	Ex100-WMP	9699.17	10793.24	---	---
26.921	CC FDS	9726.28	10895.02	---	---
26.921	Ex100-WMP	9726.53	10894.67	---	---
26.845	CC FDS	9618.29	11264.80	---	---
26.845	Ex100-WMP	9668.03	11264.99	---	1721.3
26.775	CC FDS	9801.37	11588.19	---	---
26.775	Ex100-WMP	9914.92	11590.14	---	1718.7
26.695	CC FDS	9609.86	11501.78	---	---
26.695	Ex100-WMP	9779.00	11501.28	---	---
26.623	CC FDS	9641.08	11190.27	---	---
26.623	Ex100-WMP	9641.78	11188.91	---	1709.9
26.529	CC FDS	9791.68	11117.39	---	---
26.529	Ex100-WMP	9790.41	11143.65	---	1706.7
26.430	CC FDS	9781.14	11310.04	---	---
26.430	Ex100-WMP	9779.18	11227.66	---	1702.3
26.335	CC FDS	9640.37	11466.17	---	---
26.335	Ex100-WMP	9640.99	11464.43	---	1700.6
26.239	CC FDS	9929.96	11822.89	---	---
26.239	Ex100-WMP	9929.87	11825.15	---	1696.3
26.137	CC FDS	9987.98	11927.52	---	---
26.137	Ex100-WMP	9988.61	11879.54	---	1692.5
26.044	CC FDS	9933.91	11906.47	---	---
26.044	Ex100-WMP	9934.22	11864.07	---	1691.1
25.919	CC FDS	9692.63	11334.97	---	---
25.919	Ex100-WMP	9867.43	11362.29	---	1684.5
25.843	CC FDS	9626.84	11308.36	---	---
25.843	Ex100-WMP	9659.06	11312.47	1685.8	1680.3
25.750	CC FDS	9576.26	11223.75	---	---
25.750	Ex100-WMP	9576.10	11225.91	1682.0	1677.9

Table E-3

Comparison of ineffective flow areas and levees for Cave Creek

River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
25.699	CC FDS	9581.00	11104.43	---	---
25.699	Ex100-WMP	9629.18	11103.91	1676.7	1676.7
25.644	CC FDS	9539.50	11050.43	---	---
25.644	Ex100-WMP	9538.80	11065.45	1676.6	1675.2
25.580	CC FDS	9638.79	11011.31	---	---
25.580	Ex100-WMP	9637.35	11019.75	1674.1	1673.7
25.519	CC FDS	9570.48	10991.95	---	---
25.519	Ex100-WMP	9569.06	10991.52	1672.4	1672.2
25.458	CC FDS	9584.47	10987.93	---	---
25.458	Ex100-WMP	9600.52	10985.98	---	1669.1
25.388	CC FDS	9226.22	10723.20	---	---
25.388	Ex100-WMP	9241.59	10710.17	---	1663.8
25.326	CC FDS	9178.68	10522.22	---	---
25.326	Ex100-WMP	9187.58	10517.60	1661.5	1661.1
25.233	CC FDS	8662.27	10461.46	---	---
25.233	Ex100-WMP	8698.97	10456.04	1659.1	1656.0
25.180	CC FDS	8692.98	10502.04	---	---
25.180	Ex100-WMP	8948.41	10479.87	---	1655.1
25.099	CC FDS	8628.30	10316.17	---	---
25.099	Ex100-WMP	8772.49	10303.38	---	1650.8
25.010	CC FDS	8641.08	10035.15	---	---
25.010	Ex100-WMP	8665.22	10033.17	---	1643.9
24.919	CC FDS	8104.03	10006.66	---	---
24.919	Ex100-WMP	8559.17	10005.98	1650.4	1643.6
24.845	CC FDS	8307.79	10061.40	---	---
24.845	Ex100-WMP	8680.25	10055.95	1646.7	1640.1
24.752	CC FDS	8736.07	10185.35	---	---
24.752	Ex100-WMP	8729.65	10187.96	1635.3	1635.2
24.646	CC FDS	8802.39	11065.46	---	---

Table E-3

Comparison of ineffective flow areas and levees for Cave Creek

River		Ineffective Flow Area Stations		Levee Elevations	
Station	Plan	Left	Right	Left	Right
24.646	Ex100-WMP	9430.00	10968.30	1630.5	1630.5
24.525	CC FDS	8856.13	11431.54	---	---
24.525	Ex100-WMP	9300.00	11409.02	1628.1	1628.1

Table E-4

Comparison of hydraulic results for Cave Creek

River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
31.910	CC FDS	31400	1953.30	1966.96	1965.66	1968.86	0.0071	15.6	3626	507	0.75	7.2
31.910	Ex100-WMP	31400	1953.30	1969.87	1965.19	1970.69	0.0021	9.1	5158	545	0.42	9.5
31.870	CC FDS	31400	1953.60	1965.43	1964.04	1967.07	0.0081	12.6	3220	506	0.65	6.4
31.870	Ex100-WMP	31400	1953.60	1965.70	1965.70	1969.63	0.0108	16.5	2274	336	0.90	6.8
31.820	CC FDS	31400	1952.70	1962.31	1962.24	1964.58	0.0140	14.0	2769	633	0.82	4.4
31.820	Ex100-WMP	31400	1952.70	1963.31	1963.31	1965.33	0.0079	12.8	3441	698	0.75	4.9
31.750	CC FDS	31400	1946.50	1958.16	1957.75	1959.83	0.0112	13.0	3222	817	0.73	3.9
31.750	Ex100-WMP	31400	1946.50	1957.90	1957.41	1960.72	0.0113	14.4	3014	784	0.89	3.8
31.630	CC FDS	31400	1940.50	1952.28	1951.24	1953.51	0.0075	11.8	3775	777	0.62	4.9
31.630	Ex100-WMP	31400	1940.50	1952.28	1951.70	1954.03	0.0083	12.6	3688	776	0.77	4.8
31.540	CC FDS	31400	1940.10	1948.39	1947.58	1949.74	0.0099	10.7	3452	863	0.67	4.0
31.540	Ex100-WMP	31400	1940.10	1948.46	1946.73	1950.12	0.0092	11.8	3542	925	0.78	3.8
31.450	CC FDS	31400	1933.30	1944.79	1943.44	1945.73	0.0064	9.3	4243	964	0.55	4.4
31.450	Ex100-WMP	31400	1933.10	1944.73	1944.17	1946.12	0.0071	11.7	4176	958	0.70	4.4
31.340	CC FDS	31400	1931.50	1939.91	1938.84	1941.10	0.0092	9.9	3685	774	0.64	4.8
31.340	Ex100-WMP	31400	1931.50	1940.28	1939.19	1941.52	0.0080	10.9	3991	782	0.73	5.1
31.250	CC FDS	31400	1925.90	1935.02	1934.61	1936.33	0.0121	11.5	3658	1038	0.79	3.5
31.250	Ex100-WMP	31400	1925.40	1935.16	1934.94	1937.02	0.0119	12.6	3299	1054	0.88	4.6
31.170	CC FDS	31400	1921.70	1931.34	1930.28	1932.30	0.0071	10.8	4342	1010	0.64	4.3
31.170	Ex100-WMP	31400	1920.80	1931.25	1930.53	1932.61	0.0083	10.4	3857	1009	0.73	4.5

Table E-4

Comparison of hydraulic results for Cave Creek

River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
31.140	CC FDS	31400	1917.80	1929.44	1929.44	1931.03	0.0110	14.9	3747	1040	0.81	3.6
31.140	Ex100-WMP	31400	1917.80	1929.59	1929.43	1931.13	0.0116	12.3	3908	1040	0.87	3.8
31.050	CC FDS	31400	1917.10	1925.45	1924.58	1926.43	0.0091	11.2	4184	1023	0.70	4.1
31.050	Ex100-WMP	31400	1917.10	1925.55	1924.99	1926.69	0.0091	10.9	4301	1024	0.77	4.2
30.960	CC FDS	31400	1912.30	1921.96	1920.56	1922.80	0.0062	10.1	4561	935	0.60	4.9
30.960	Ex100-WMP	31400	1912.30	1922.24	1920.77	1923.07	0.0057	9.2	4874	937	0.62	5.2
30.850	CC FDS	33800	1907.50	1917.31	1916.18	1918.72	0.0084	11.6	3766	798	0.69	4.7
30.850	Ex100-WMP	33800	1907.50	1917.41	1915.44	1919.06	0.0094	12.9	3861	802	0.81	4.8
30.750	CC FDS	33800	1902.40	1913.83	1911.73	1914.90	0.0049	10.1	4430	658	0.54	6.7
30.750	Ex100-WMP	33800	1901.00	1913.94	1911.64	1915.14	0.0040	9.4	4491	665	0.54	6.8
30.650	CC FDS	33800	1897.20	1909.80	1909.62	1911.73	0.0098	15.0	3518	788	0.78	4.5
30.650	Ex100-WMP	33800	1897.20	1910.35	1910.35	1912.41	0.0088	14.7	3919	799	0.80	4.9
30.520	CC FDS	33800	1893.50	1902.20	1902.14	1903.74	0.0136	14.2	3834	1102	0.87	3.5
30.520	Ex100-WMP	33800	1893.50	1902.10	1902.10	1903.75	0.0129	10.9	3697	1101	0.87	3.4
30.420	CC FDS	33800	1887.80	1897.33	1895.80	1898.18	0.0061	9.4	4878	952	0.58	5.1
30.420	Ex100-WMP	33800	1885.80	1897.21	1895.87	1898.17	0.0054	8.5	4752	951	0.59	5.0
30.280	CC FDS	33800	1877.10	1891.62	1891.62	1893.67	0.0083	14.4	3804	874	0.72	4.4
30.280	Ex100-WMP	33800	1877.10	1892.13	1892.13	1894.16	0.0066	13.5	4115	876	0.71	4.7
30.200	CC FDS	33800	1875.20	1885.55	1885.55	1887.25	0.0112	13.0	3900	1089	0.79	3.6

Table E-4

Comparison of hydraulic results for Cave Creek

River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
30.200	Ex100-WMP	33800	1875.20	1885.81	1885.81	1887.57	0.0091	12.8	4251	1108	0.79	3.8
30.100	CC FDS	33800	1867.40	1880.25	1878.65	1881.31	0.0056	11.4	4555	1076	0.59	4.2
30.100	Ex100-WMP	33800	1867.40	1880.92	1878.70	1882.10	0.0050	11.5	5302	1238	0.71	4.3
29.850	CC FDS	33800	1857.70	1871.82	1871.82	1874.64	0.0053	17.3	3718	636	0.84	5.9
29.850	Ex100-WMP	33800	1857.70	1872.88	1872.88	1875.71	0.0055	15.9	3853	651	0.79	5.9
29.770	CC FDS	33800	1857.20	1868.36	1866.55	1871.00	0.0053	13.0	2594	779	0.74	9.6
29.770	Ex100-WMP	33800	1857.20	1868.44	1867.01	1871.27	0.0057	13.5	2502	272	0.78	9.2
29.720	CC FDS	33800	1855.00	1867.35	1865.20	1869.77	0.0060	12.5	2705	277	0.70	9.8
29.720	Ex100-WMP	33800	1855.00	1867.64	1865.49	1870.03	0.0045	12.4	2723	280	0.70	9.7
29.715		Bridge										
29.710	CC FDS	33800	1853.90	1865.50	1863.43	1867.74	0.0078	12.0	2815	311	0.70	9.1
29.710	Ex100-WMP	33800	1853.90	1864.17	1863.53	1867.28	0.0093	14.2	2389	302	0.89	7.9
29.663	CC FDS	33800	1850.90	1864.38	1861.60	1865.28	0.0086	8.0	4641	1541	0.54	4.9
29.663	Ex100-WMP	33800	1850.90	1863.01	1861.56	1864.93	0.0074	11.3	3446	875	0.72	3.9
29.601	CC FDS	33800	1849.90	1859.85	1859.32	1861.44	0.0169	10.2	3371	777	0.84	4.3
29.601	Ex100-WMP	33800	1849.90	1859.52	1859.52	1861.92	0.0113	12.8	3116	757	0.87	4.1
29.538	CC FDS	33800	1845.50	1855.00	1855.00	1857.03	0.0095	11.4	2957	736	1.01	4.0
29.538	Ex100-WMP	33800	1845.50	1855.29	1855.01	1857.15	0.0170	11.0	3173	766	0.88	4.1
29.493	CC FDS	33800	1843.40	1852.91	1851.58	1853.84	0.0097	7.8	4449	942	0.62	4.7

Table E-4

Comparison of hydraulic results for Cave Creek

River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
29.493	Ex100-WMP	33800	1843.40	1852.76	1851.64	1853.82	0.0087	8.4	4323	941	0.64	4.6
29.387	CC FDS	33800	1838.80	1849.61	1846.70	1850.25	0.0028	6.4	5269	849	0.45	6.2
29.387	Ex100-WMP	33800	1838.80	1849.08	1846.76	1849.89	0.0051	7.5	4889	808	0.51	6.1
29.351	CC FDS	33800	1835.90	1848.80	1844.95	1849.49	0.0066	6.7	5126	710	0.42	7.2
29.351	Ex100-WMP	33800	1835.90	1848.01	1845.11	1848.94	0.0047	8.1	4556	615	0.50	7.4
29.258	CC FDS	33800	1828.70	1842.59	1841.29	1845.71	0.0080	14.2	2394	293	0.81	8.2
29.258	Ex100-WMP	33800	1828.70	1843.05	1841.32	1845.88	0.0079	13.5	2501	254	0.76	9.8
29.130	CC FDS	33800	1821.00	1837.34	1836.92	1839.29	0.0094	11.7	3226	744	0.78	4.3
29.130	Ex100-WMP	33800	1821.00	1838.04	1838.04	1841.10	0.0057	15.8	3516	792	0.79	6.0
29.012	CC FDS	33800	1818.70	1832.98	1832.98	1835.24	0.0041	14.0	3643	899	0.73	4.1
29.012	Ex100-WMP	33800	1818.70	1833.74	1833.74	1836.19	0.0045	14.2	4307	903	0.72	4.8
28.934	CC FDS	33800	1815.50	1829.49	1828.78	1830.63	0.0084	9.0	3966	1040	0.51	3.8
28.934	Ex100-WMP	33800	1815.50	1829.80	1829.80	1832.11	0.0051	13.6	4287	1044	0.75	4.1
28.847	CC FDS	33800	1811.90	1825.52	1825.21	1827.18	0.0063	12.1	3960	919	0.64	4.3
28.847	Ex100-WMP	33800	1811.90	1825.89	1825.89	1828.29	0.0045	13.9	4268	922	0.72	4.6
28.750	CC FDS	33800	1808.30	1822.93	1820.98	1823.84	0.0060	8.8	4884	865	0.46	5.6
28.750	Ex100-WMP	33800	1808.30	1820.98	1820.98	1823.84	0.0060	14.2	3344	829	0.81	4.0
28.657	CC FDS	33800	1800.50	1819.89	1816.90	1820.57	0.0074	6.9	5126	729	0.36	7.0
28.657	Ex100-WMP	33800	1800.50	1817.38	1817.30	1820.04	0.0061	13.7	3301	706	0.80	4.7

Table E-4

Comparison of hydraulic results for Cave Creek

River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
28.555	CC FDS	33800	1799.40	1814.13	1814.13	1816.42	0.0074	13.6	3617	839	0.71	4.3
28.555	Ex100-WMP	33800	1799.40	1814.52	1814.52	1817.14	0.0046	14.2	3933	848	0.73	4.6
28.462	CC FDS	33800	1794.80	1810.15	1809.18	1811.34	0.0102	10.5	4799	982	0.53	4.9
28.462	Ex100-WMP	33800	1794.80	1809.64	1809.64	1812.05	0.0045	13.9	4276	970	0.72	4.4
28.390	CC FDS	33800	1792.80	1807.21	1805.66	1808.00	0.0068	7.0	4763	920	0.38	5.2
28.390	Ex100-WMP	33800	1792.80	1806.71	1806.71	1808.96	0.0055	13.8	4292	915	0.77	4.7
28.326	CC FDS	33800	1791.30	1803.94	1803.13	1805.05	0.0116	10.0	4589	1084	0.60	4.2
28.326	Ex100-WMP	33800	1791.30	1803.73	1803.73	1805.92	0.0055	13.3	4343	1048	0.77	4.1
28.241	CC FDS	33800	1789.90	1799.11	1799.11	1801.29	0.0045	13.0	4191	1109	0.86	3.8
28.241	Ex100-WMP	33800	1789.90	1799.03	1799.03	1800.81	0.0107	11.8	4010	1094	0.83	3.7
28.157	CC FDS	33800	1782.60	1794.11	1794.11	1796.04	0.0049	14.5	4316	1161	0.89	3.7
28.157	Ex100-WMP	33800	1782.60	1793.91	1793.37	1795.47	0.0090	10.8	4151	1131	0.76	3.7
28.091	CC FDS	33800	1780.80	1790.54	1790.04	1792.52	0.0110	13.1	3758	886	0.87	4.2
28.091	Ex100-WMP	33800	1780.80	1790.37	1789.69	1792.08	0.0102	11.0	3689	864	0.80	4.3
28.023	CC FDS	33800	1772.50	1787.35	1786.43	1789.21	0.0075	9.6	4096	1034	0.56	4.0
28.023	Ex100-WMP	33800	1772.50	1787.86	1785.77	1789.25	0.0048	10.1	4739	1160	0.58	4.1
27.913	CC FDS	33800	1763.10	1783.54	1782.75	1784.70	0.0072	9.8	5199	1417	0.56	3.7
27.913	Ex100-WMP	33800	1763.10	1781.86	1781.35	1785.50	0.0084	15.3	2207	263	0.93	8.4
27.797	CC FDS	33800	1760.60	1779.37	1778.89	1780.88	0.0053	11.6	5465	1433	0.61	3.8
27.797	Ex100-WMP	33800	1760.60	1779.05	1779.05	1781.06	0.0046	13.1	4966	1384	0.71	3.6

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Comparison of hydraulic results for Cave Creek

River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
27.693	CC FDS	33800	1756.30	1775.19	1774.08	1776.25	0.0185	9.8	4690	1172	0.55	4.0
27.693	Ex100-WMP	33800	1756.30	1774.38	1774.38	1776.88	0.0066	14.1	3974	1030	0.83	3.9
27.604	CC FDS	33800	1754.20	1768.46	1766.56	1770.58	0.0052	12.1	3540	629	0.65	5.6
27.604	Ex100-WMP	33800	1754.20	1767.33	1766.66	1770.18	0.0056	13.9	2907	510	0.78	5.7
27.502	CC FDS	33800	1748.80	1764.39	1764.39	1766.27	0.0123	12.7	4071	1048	0.71	3.9
27.502	Ex100-WMP	33800	1748.80	1764.82	1764.82	1767.00	0.0048	13.3	4480	1055	0.73	4.3
27.417	CC FDS	33800	1744.80	1757.52	1757.52	1759.99	0.0068	13.6	3635	773	0.93	4.7
27.417	Ex100-WMP	33800	1744.80	1757.03	1757.03	1759.35	0.0115	13.6	3277	703	0.88	4.7
27.366	CC FDS	33800	1742.30	1755.30	1751.96	1755.90	0.0036	7.0	6506	1254	0.40	5.2
27.366	Ex100-WMP	33800	1742.30	1755.20	1751.63	1755.87	0.0024	7.3	6385	1204	0.41	5.3
27.320	CC FDS	33800	1740.30	1752.37	1752.37	1754.67	0.0059	14.4	4457	1284	0.79	3.5
27.320	Ex100-WMP	33800	1740.30	1751.35	1751.17	1754.63	0.0146	17.0	3132	976	1.01	3.2
27.265	CC FDS	33800	1735.70	1749.27	1749.27	1750.66	0.0082	11.5	4306	1042	0.79	4.1
27.265	Ex100-WMP	33800	1735.70	1749.01	1749.01	1750.61	0.0102	12.2	4040	979	0.81	4.1
27.226	CC FDS	33800	1734.80	1743.36	1742.96	1745.49	0.0113	12.1	3139	666	0.87	4.7
27.226	Ex100-WMP	33800	1734.80	1743.57	1742.98	1745.58	0.0109	11.8	3195	660	0.84	4.8
27.169	CC FDS	33800	1732.10	1741.42	1739.82	1742.78	0.0052	9.6	3879	686	0.65	5.7
27.169	Ex100-WMP	33800	1732.10	1741.62	1740.01	1742.86	0.0057	9.2	4018	704	0.62	5.7
27.106	CC FDS	33800	1725.70	1738.74	1737.64	1740.37	0.0119	10.4	3466	703	0.73	4.9

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Comparison of hydraulic results for Cave Creek

River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
27.106	Ex100-WMP	33800	1725.70	1737.91	1737.70	1740.14	0.0131	12.1	2922	625	0.90	4.7
27.008	CC FDS	33800	1723.00	1734.46	1731.55	1735.60	0.0059	8.6	4109	729	0.53	5.6
27.008	Ex100-WMP	33800	1723.00	1733.39	1731.57	1734.92	0.0062	10.0	3446	523	0.65	6.6
26.921	CC FDS	33800	1720.20	1731.13	1729.13	1732.66	0.0094	10.0	3579	609	0.63	5.9
26.921	Ex100-WMP	33800	1720.20	1730.99	1729.02	1732.53	0.0058	10.0	3552	588	0.63	6.0
26.845	CC FDS	36800	1717.00	1727.74	1726.42	1729.36	0.0060	10.7	3690	781	0.67	4.7
26.845	Ex100-WMP	36700	1717.00	1727.81	1726.30	1729.71	0.0075	11.6	3663	765	0.72	4.8
26.775	CC FDS	36800	1712.70	1723.98	1723.98	1727.14	0.0051	14.9	3271	652	0.94	5.0
26.775	Ex100-WMP	36700	1712.70	1725.12	1723.74	1726.99	0.0070	11.8	3894	752	0.70	5.2
26.695	CC FDS	36800	1709.50	1720.67	1720.67	1722.92	0.0066	13.7	3301	731	0.84	4.5
26.695	Ex100-WMP	36700	1709.50	1720.43	1720.43	1722.92	0.0138	14.3	3266	625	0.95	5.2
26.623	CC FDS	36800	1703.90	1716.40	1713.28	1717.36	0.0048	8.1	5107	843	0.49	6.1
26.623	Ex100-WMP	36700	1703.90	1716.15	1713.04	1717.28	0.0039	8.8	4767	826	0.53	5.8
26.529	CC FDS	36800	1702.60	1711.52	1711.52	1714.46	0.0061	14.2	3076	621	0.98	5.0
26.529	Ex100-WMP	36700	1702.60	1711.90	1711.30	1714.24	0.0117	12.9	3282	666	0.88	4.9
26.430	CC FDS	36800	1697.50	1707.80	1706.58	1709.36	0.0067	10.4	4056	829	0.71	4.9
26.430	Ex100-WMP	36700	1697.50	1707.36	1706.11	1708.92	0.0079	10.4	3942	771	0.72	5.1
26.335	CC FDS	36800	1695.60	1705.42	1702.99	1706.01	0.0056	6.7	6729	1544	0.44	4.4
26.335	Ex100-WMP	36700	1695.60	1704.80	1702.78	1705.62	0.0045	7.7	5813	1421	0.54	4.1

Table E-4

Comparison of hydraulic results for Cave Creek

River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
26.239	CC FDS	36800	1692.80	1701.54	1700.74	1702.24	0.0107	8.9	5675	1803	0.75	3.2
26.239	Ex100-WMP	36700	1692.80	1701.66	1701.10	1702.41	0.0104	9.1	5900	1852	0.77	3.2
26.137	CC FDS	36800	1685.70	1698.79	1697.66	1699.62	0.0038	12.5	7197	1870	0.73	3.9
26.137	Ex100-WMP	36700	1685.70	1698.11	1697.50	1699.08	0.0070	10.0	6129	1839	0.67	3.3
26.044	CC FDS	36800	1684.30	1695.38	1695.38	1697.10	0.0073	16.0	7677	1973	1.09	3.9
26.044	Ex100-WMP	36700	1684.30	1695.08	1693.79	1695.64	0.0067	9.2	7051	1930	0.65	3.7
25.919	CC FDS	36800	1678.40	1689.05	1689.05	1690.49	0.0106	11.3	3983	1419	0.80	2.8
25.919	Ex100-WMP	36700	1678.40	1689.94	1689.79	1691.39	0.0122	13.2	4976	1495	0.89	3.3
25.843	CC FDS	36800	1673.50	1685.97	1685.25	1686.88	0.0056	9.4	5072	1620	0.64	3.1
25.843	Ex100-WMP	36700	1673.50	1686.58	1686.10	1687.68	0.0083	11.6	5763	1653	0.75	3.5
25.750	CC FDS	36800	1671.60	1684.91	1682.59	1685.37	0.0042	4.8	7473	1647	0.27	4.5
25.750	Ex100-WMP	36700	1671.60	1685.01	1683.09	1685.59	0.0041	9.0	7557	1650	0.54	4.6
25.699	CC FDS	36800	1669.40	1682.57	1682.57	1684.34	0.0023	13.7	6774	1523	0.73	4.5
25.699	Ex100-WMP	36700	1669.40	1682.52	1682.52	1684.09	0.0064	13.0	5585	1475	0.70	3.8
25.644	CC FDS	36800	1669.80	1678.48	1678.48	1679.90	0.0102	12.6	4351	1385	0.80	3.1
25.644	Ex100-WMP	36700	1669.80	1679.96	1679.96	1681.41	0.0098	13.3	5300	1527	0.83	3.5
25.580	CC FDS	36800	1668.90	1676.34	1674.98	1677.03	0.0055	6.0	5558	1358	0.43	4.1
25.580	Ex100-WMP	36700	1668.90	1677.00	1675.98	1677.79	0.0083	10.5	5889	1382	0.73	4.3
25.519	CC FDS	36800	1668.30	1674.72	1673.32	1675.38	0.0054	9.0	6580	1421	0.68	4.6
25.519	Ex100-WMP	36700	1668.30	1674.46	1673.23	1675.14	0.0094	8.8	5853	1422	0.74	4.1

Table E-4

Comparison of hydraulic results for Cave Creek

River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
25.458	CC FDS	36800	1665.50	1673.22	1670.33	1673.57	0.0044	4.5	8079	1376	0.30	5.9
25.458	Ex100-WMP	36700	1665.50	1672.08	1670.30	1672.63	0.0062	8.0	6545	1385	0.62	4.7
25.388	CC FDS	36800	1656.60	1669.29	1669.29	1671.18	0.0093	15.5	6676	1479	0.94	4.5
25.388	Ex100-WMP	36700	1656.60	1668.25	1668.16	1669.58	0.0110	12.7	5114	1469	0.86	3.5
25.326	CC FDS	36800	1653.00	1665.26	1665.26	1667.42	0.0092	15.6	6100	1344	0.97	4.5
25.326	Ex100-WMP	36700	1653.00	1664.68	1664.29	1665.85	0.0091	12.1	5307	1330	0.79	4.0
25.233	CC FDS	38200	1647.30	1661.83	1661.01	1662.76	0.0067	12.3	8382	1799	0.83	4.7
25.233	Ex100-WMP	38100	1647.30	1660.75	1659.98	1661.58	0.0079	11.2	6438	1757	0.71	3.7
25.180	CC FDS	38200	1647.70	1659.89	1659.04	1661.23	0.0049	13.0	8123	1662	0.80	4.9
25.180	Ex100-WMP	38100	1647.70	1659.39	1657.49	1660.02	0.0051	9.0	7080	1531	0.59	4.6
25.099	CC FDS	38200	1646.00	1656.69	1656.69	1658.82	0.0056	18.8	7924	1688	1.11	4.7
25.099	Ex100-WMP	38100	1646.00	1655.04	1654.67	1656.41	0.0184	13.7	4847	1485	1.06	3.3
25.010	CC FDS	38200	1640.20	1650.85	1648.02	1651.44	0.0035	7.2	7209	1394	0.43	5.2
25.010	Ex100-WMP	38100	1640.20	1649.79	1648.31	1650.75	0.0047	8.9	5890	1286	0.57	4.6
24.919	CC FDS	38200	1634.90	1648.67	1646.75	1649.27	0.0055	9.5	8812	1775	0.59	5.0
24.919	Ex100-WMP	38100	1634.90	1647.73	1646.62	1648.31	0.0045	8.9	7177	1447	0.55	5.0
24.845	CC FDS	38200	1635.30	1645.98	1644.37	1646.59	0.0114	9.9	7534	1690	0.57	4.5
24.845	Ex100-WMP	38100	1635.30	1644.61	1644.48	1645.90	0.0115	13.7	5211	1376	0.88	3.8
24.752	CC FDS	38200	1629.20	1639.84	1639.57	1641.44	0.0091	15.6	5282	1410	1.00	3.7

Table E-4

Comparison of hydraulic results for Cave Creek

River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
24.752	Ex100-WMP	38100	1629.20	1640.73	1639.35	1641.43	0.0059	9.7	6634	1458	0.63	4.6
24.646	CC FDS	38200	1626.00	1636.38	1634.59	1636.68	0.0069	4.0	9128	2246	0.25	4.1
24.646	Ex100-WMP	38100	1626.00	1636.06	1635.99	1637.44	0.0104	13.0	5401	2158	0.84	3.5
24.525	CC FDS	38200	1622.00	1633.13	1627.96	1633.23	0.0030	2.8	15473	2566	0.17	6.0
24.525	Ex100-WMP	38100	1623.90	1632.39	1629.36	1632.68	0.0030	6.2	9720	2542	0.44	4.6

Table E-5

Manning's n-values for the Apache Wash FIS

N-values 1, 2 and 3 are for the left overbank, channel and right overbank unless the horizontal variation of n-values option is used. Up to 5 n-values are used to described the roughness characteristics of

		Manning's n-values				
River	River Sta	n #1	n #2	n #3	n #4	n #5
Apache	8.02	0.100	0.055	0.100	---	---
	7.98	0.100	0.055	0.100	---	---
	7.89	0.100	0.055	0.100	---	---
	7.84	0.100	0.055	0.100	---	---
	7.74	0.100	0.055	0.100	---	---
	7.65	0.100	0.055	0.100	---	---
	7.55	0.100	0.055	0.100	---	---
	7.46	0.100	0.055	0.100	---	---
	7.36	0.100	0.055	0.100	---	---
	7.28	0.100	0.055	0.100	---	---
	7.17	0.090	0.055	0.090	---	---
	7.08	0.090	0.055	0.090	---	---
	6.98	0.080	0.055	0.080	---	---
	6.90	0.080	0.055	0.080	---	---
	6.80	0.070	0.055	0.070	---	---
	6.71	0.070	0.055	0.070	---	---
	6.63	0.065	0.060	0.065	---	---
	6.58	0.065	0.050	0.065	---	---
	6.50	0.065	0.050	0.065	---	---
	6.43	0.065	0.050	0.065	---	---
	6.32	0.065	0.060	0.065	---	---
	6.25	0.065	0.050	0.065	---	---
	6.16	0.065	0.060	0.065	---	---
	6.09	0.065	0.050	0.065	---	---
	6.01	0.065	0.050	0.065	---	---
	5.92	0.065	0.050	0.065	---	---
	5.83	0.065	0.050	0.065	---	---
	5.76	0.065	0.050	0.065	---	---
	5.66	0.065	0.050	0.065	---	---
	5.64	0.065	0.045	0.065	---	---
	5.57	0.065	0.050	0.065	---	---
	5.48	0.065	0.050	0.065	---	---
	5.38	0.065	0.050	0.065	---	---
	5.31	0.065	0.060	0.065	---	---
	5.21	0.065	0.050	0.065	---	---
	5.15	0.060	0.050	0.065	---	---
	5.09	0.060	0.050	0.065	---	---
	5.03	0.065	0.060	0.065	---	---
	4.96	0.065	0.060	0.065	---	---
	4.90	0.050	0.050	0.050	---	---
	4.82	0.065	0.050	0.065	---	---
	4.78	0.065	0.050	0.065	---	---

Table E-5

Manning's n-values for the Apache Wash FIS

N-values 1, 2 and 3 are for the left overbank, channel and right overbank unless the horizontal variation of n-values option is used. Up to 5 n-values are used to described the roughness characteristics of

		Manning's n-values				
River	River Sta	n #1	n #2	n #3	n #4	n #5
	4.74	0.065	0.050	0.065	---	---
	4.65	0.080	0.075	0.080	---	---
	4.60	0.065	0.050	0.065	---	---
	4.58	0.065	0.050	0.065	---	---
	4.58			Culvert		
	4.56	0.065	0.050	0.065	---	---
	4.49	0.065	0.050	0.065	---	---
	4.40	0.065	0.050	0.065	---	---
	4.31	0.065	0.050	0.065	---	---
	4.23	0.065	0.050	0.065	---	---
	4.22	0.065	0.050	0.065	---	---
	4.11	0.065	0.050	0.065	---	---
	4.05	0.065	0.050	0.065	---	---
	3.96	0.065	0.050	0.065	---	---
	3.86	0.065	0.050	0.065	---	---
	3.78	0.065	0.050	0.065	---	---
	3.75	0.065	0.050	0.065	---	---
	3.65	0.065	0.050	0.065	---	---
	3.60	0.065	0.050	0.065	---	---
	3.52	0.065	0.050	0.065	---	---
	3.48	0.065	0.050	0.065	---	---
	3.40	0.065	0.050	0.065	---	---
	3.32	0.065	0.050	0.065	---	---
	3.21	0.065	0.050	0.065	---	---
	3.13	0.065	0.050	0.065	---	---
	3.07	0.065	0.050	0.065	---	---
	2.97	0.065	0.050	0.065	20.000	20.000
	2.92	0.065	0.050	0.065	0.050	0.065
	2.90	0.065	0.050	0.065	0.050	0.065
	2.87	0.065	0.050	0.065	0.050	0.065
	2.82	0.065	0.050	0.065	0.050	0.065
	2.73	0.065	0.050	0.065	---	---
	2.60	0.070	0.055	0.070	---	---
	2.52	0.070	0.055	0.070	---	---
	2.47	0.070	0.055	0.070	---	---
	2.40	0.070	0.055	0.070	---	---
	2.33	0.070	0.055	0.070	---	---
	2.24	0.070	0.055	0.070	---	---
	2.17	0.070	0.055	0.070	---	---
	2.08	0.070	0.055	0.070	---	---
	2.00	0.070	0.055	0.070	---	---
	1.88	0.070	0.055	0.070	---	---

Table E-5

Manning's n-values for the Apache Wash FIS

N-values 1, 2 and 3 are for the left overbank, channel and right overbank unless the horizontal variation of n-values option is used. Up to 5 n-values are used to described the roughness characteristics of

		Manning's n-values				
River	River Sta	n #1	n #2	n #3	n #4	n #5
	1.85	0.070	0.055	0.070	---	---
	1.81	0.070	0.055	0.070	---	---
	1.75	0.070	0.055	0.070	---	---
	1.66	0.070	0.055	0.070	---	---
	1.60	0.070	0.055	0.070	---	---
	1.56	0.070	0.055	0.070	---	---
	1.47	0.070	0.055	0.070	---	---
	1.37	0.070	0.055	0.070	---	---
	1.27	0.070	0.060	0.070	---	---
	1.18	0.070	0.060	0.070	---	---
	1.09	0.070	0.045	0.070	---	---
	0.99	0.070	0.055	0.070	---	---
	0.84	0.070	0.070	0.070	---	---
	0.75	0.070	0.055	0.070	---	---
	0.71	0.070	0.055	0.070	---	---
	0.63	0.070	0.055	0.070	---	---
	0.54	0.070	0.055	0.070	---	---
	0.43	0.070	0.055	0.070	---	---
	0.33	0.070	0.055	0.070	---	---
	0.20	0.070	0.055	0.070	---	---
Desert Hills	0.99	0.065	0.050	0.065	---	---
	0.90	0.065	0.050	0.065	---	---
	0.81	0.065	0.050	0.065	---	---
	0.72	0.065	0.050	0.065	---	---
	0.64	0.065	0.050	0.065	---	---
	0.56	0.065	0.050	0.065	---	---
	0.48	0.065	0.050	0.065	---	---
	0.40	0.065	0.050	0.065	---	---
	0.31	20.000	0.065	0.050	0.065	---
	0.22	0.065	0.050	0.065	0.050	0.065
Paradise	2.23	0.065	0.050	0.065	---	---
	2.14	0.065	0.050	0.065	---	---
	2.07	0.065	0.050	0.065	---	---
	2.00	0.065	0.050	0.065	---	---
	1.92	0.065	0.050	0.065	---	---
	1.83	0.065	0.050	0.065	---	---
	1.75	0.065	0.050	0.065	---	---
	1.65	0.080	0.050	0.065	0.050	0.065
	1.54	0.070	0.050	0.065	---	---
	1.46	0.070	0.055	0.070	---	---
	1.37	0.070	0.055	0.070	---	---
	1.27	0.070	0.055	0.070	---	---

Table E-5

Manning's n-values for the Apache Wash FIS

N-values 1, 2 and 3 are for the left overbank, channel and right overbank unless the horizontal variation of n-values option is used. Up to 5 n-values are used to described the roughness characteristics of

		Manning's n-values				
River	River Sta	n #1	n #2	n #3	n #4	n #5
	1.21	0.070	0.055	0.070	---	---
	1.12	0.070	0.055	0.070	---	---
	1.04	0.070	0.055	0.070	---	---
	0.95	0.070	0.055	0.070	---	---
	0.89	0.070	0.055	0.070	---	---
	0.80	0.070	0.055	0.070	---	---
	0.72	0.070	0.055	0.070	---	---
	0.62	0.070	0.055	0.070	---	---
	0.53	0.070	0.055	0.070	---	---
	0.44	0.070	0.055	0.070	---	---
	0.34	0.070	0.055	0.070	---	---
	0.28	0.070	0.055	0.070	---	---
	0.17	0.070	0.055	0.070	---	---
	0.13	0.070	0.055	0.070	---	---
	0.04	0.070	0.055	0.070	---	---

Table E-6

Comparison of weighted Manning's n-values and bank station locations for Apache Wash

River	River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
Apache	8.02	AW FDS	9977.0	10037.0	0.055	0.100	0.100	0.072
	8.02	Ex100-WMP	9977.0	10037.0	0.030	0.055	0.055	0.040
	7.98	AW FDS	9982.0	10017.0	0.055	0.100	0.100	0.085
	7.98	Ex100-WMP	9975.0	10039.0	0.030	0.055	0.055	0.042
	7.89	AW FDS	9978.0	10020.0	0.055	0.100	0.100	0.082
	7.89	Ex100-WMP	9983.0	10054.0	0.030	0.055	0.055	0.039
	7.84	AW FDS	9984.0	10025.0	0.055	0.100	0.100	0.083
	7.84	Ex100-WMP	9984.0	10025.0	0.030	0.055	0.055	0.044
	7.74	AW FDS	9981.0	10010.0	0.055	0.100	0.100	0.089
	7.74	Ex100-WMP	9983.7	10035.2	0.030	0.055	0.055	0.044
	7.65	AW FDS	9977.4	10022.6	0.055	0.100	0.100	0.082
	7.65	Ex100-WMP	9977.4	10022.6	0.030	0.055	0.055	0.043
	7.55	AW FDS	9970.1	10024.5	0.055	0.100	0.100	0.077
	7.55	Ex100-WMP	9970.1	10028.2	0.030	0.055	0.055	0.040
	7.46	AW FDS	9969.5	10051.3	0.055	0.100	0.100	0.068
	7.46	Ex100-WMP	9969.5	10051.3	0.030	0.055	0.055	0.036
	7.36	AW FDS	9949.3	10053.3	0.055	0.100	---	0.066
	7.36	Ex100-WMP	9949.3	10023.5	0.030	0.055	0.055	0.037
	7.28	AW FDS	9972.2	10047.2	0.055	0.100	---	0.086
	7.28	Ex100-WMP	9988.7	10010.2	0.030	0.055	0.055	0.051
	7.17	AW FDS	9960.1	10043.9	0.055	0.090	0.090	0.057
	7.17	Ex100-WMP	9978.8	10024.2	0.030	0.055	0.055	0.035
	7.08	AW FDS	9953.1	10021.9	0.055	0.090	0.090	0.059
	7.08	Ex100-WMP	9953.1	10021.9	0.030	0.055	0.055	0.032
	6.98	AW FDS	9976.0	10031.6	0.055	0.080	0.080	0.065
	6.98	Ex100-WMP	9976.0	10031.6	0.030	0.055	0.055	0.038
	6.90	AW FDS	9987.4	10026.9	0.055	0.080	---	0.070
	6.90	Ex100-WMP	9954.2	10017.4	0.030	0.055	0.055	0.038
	6.80	AW FDS	9976.6	10028.4	0.055	0.070	0.070	0.064
	6.80	Ex100-WMP	9976.6	10016.5	0.030	0.055	0.055	0.042

Table E-6

Comparison of weighted Manning's n-values and bank station locations for Apache Wash

River	River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
	6.71	AW FDS	9960.0	10025.0	0.055	---	0.070	0.060
	6.71	Ex100-WMP	9981.6	10025.0	0.030	0.055	0.055	0.036
	6.63	AW FDS	9976.9	10021.8	0.060	---	0.065	0.062
	6.63	Ex100-WMP	9985.9	10021.8	0.030	0.055	0.055	0.040
	6.58	AW FDS	9950.1	10022.8	0.050	0.065	0.065	0.055
	6.58	Ex100-WMP	9965.1	10022.8	0.030	0.055	0.055	0.037
	6.50	AW FDS	9987.5	10019.8	0.050	0.065	0.065	0.059
	6.50	Ex100-WMP	9947.5	10071.5	0.030	0.055	0.055	0.034
	6.43	AW FDS	9970.0	10020.0	0.050	0.065	0.065	0.060
	6.43	Ex100-WMP	9925.0	10030.0	0.030	0.055	0.055	0.038
	6.32	AW FDS	9951.2	10020.2	0.060	---	0.065	0.062
	6.32	Ex100-WMP	9971.0	10020.2	0.030	0.055	0.055	0.038
	6.25	AW FDS	9961.8	10045.4	0.050	0.065	0.065	0.058
	6.25	Ex100-WMP	9961.8	10045.4	0.030	0.055	0.055	0.039
	6.16	AW FDS	9961.2	10039.6	0.060	---	0.065	0.063
	6.16	Ex100-WMP	9977.7	10050.6	0.030	0.055	0.055	0.040
	6.09	AW FDS	9935.0	10070.0	0.050	0.065	0.065	0.055
	6.09	Ex100-WMP	9935.0	10070.0	0.030	0.055	0.055	0.035
	6.01	AW FDS	9955.0	10020.0	0.050	0.065	0.065	0.058
	6.01	Ex100-WMP	9920.0	10035.0	0.030	0.055	0.055	0.038
	5.92	AW FDS	9948.3	10024.3	0.050	0.065	0.065	0.060
	5.92	Ex100-WMP	9948.3	10024.3	0.030	0.055	0.055	0.044
	5.83	AW FDS	9960.0	10030.0	0.050	0.065	0.065	0.058
	5.83	Ex100-WMP	9960.0	10030.0	0.030	0.055	0.055	0.041
	5.76	AW FDS	9968.6	10043.1	0.050	0.065	0.065	0.058
	5.76	Ex100-WMP	9968.6	10043.1	0.030	0.055	0.055	0.040
	5.66	AW FDS	9980.0	10030.0	0.050	0.065	0.065	0.058
	5.66	Ex100-WMP	9980.0	10030.0	0.030	0.055	0.055	0.041
	5.64	AW FDS	9955.0	10170.0	0.045	0.065	0.065	0.050

Table E-6

Comparison of weighted Manning's n-values and bank station locations for Apache Wash

River	River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
	5.64	Ex100-WMP	9955.0	10170.0	0.030	0.055	0.055	0.035
	5.57	AW FDS	9977.0	10035.0	0.050	0.065	0.065	0.059
	5.57	Ex100-WMP	9977.0	10035.0	0.030	0.055	0.055	0.042
	5.48	AW FDS	9978.4	10044.1	0.050	0.065	0.065	0.058
	5.48	Ex100-WMP	9978.4	10044.1	0.030	0.055	0.055	0.041
	5.38	AW FDS	9985.0	10015.0	0.050	0.065	0.065	0.061
	5.38	Ex100-WMP	9985.0	10015.0	0.030	0.055	0.055	0.046
	5.31	AW FDS	9887.8	10061.1	0.060	0.065	0.065	0.062
	5.31	Ex100-WMP	9988.2	10044.5	0.030	0.055	0.055	0.045
	5.21	AW FDS	9970.0	10030.0	0.050	0.065	0.065	0.060
	5.21	Ex100-WMP	9970.0	10030.0	0.030	0.055	0.055	0.044
	5.15	AW FDS	9978.0	10025.0	0.050	0.060	0.065	0.060
	5.15	Ex100-WMP	9978.0	10025.0	0.030	0.055	0.055	0.045
	5.09	AW FDS	9970.0	10025.0	0.050	0.060	0.065	0.060
	5.09	Ex100-WMP	9970.0	10025.0	0.030	0.055	0.055	0.049
	5.03	AW FDS	9975.1	10012.3	0.060	0.065	0.065	0.064
	5.03	Ex100-WMP	9975.1	10012.3	0.030	0.055	0.055	0.049
	4.96	AW FDS	9974.2	10011.0	0.060	0.065	0.065	0.064
	4.96	Ex100-WMP	9974.2	10011.0	0.030	0.055	0.055	0.050
	4.90	AW FDS	9940.0	10018.0	0.050	0.050	0.050	0.050
	4.90	Ex100-WMP	9966.0	10032.0	0.030	0.055	0.055	0.045
	4.82	AW FDS	9975.0	10009.4	0.050	0.065	0.065	0.063
	4.82	Ex100-WMP	9875.2	10009.4	0.030	0.055	0.055	0.042
	4.78	AW FDS	9964.9	10021.4	0.050	---	0.065	0.063
	4.78	Ex100-WMP	9964.9	10021.4	0.030	---	0.055	0.051
	4.74	AW FDS	9960.3	10029.0	0.050	0.065	0.065	0.062
	4.74	Ex100-WMP	9960.3	10029.0	0.030	---	0.055	0.047
	4.65	AW FDS	9982.5	10094.0	0.075	0.080	0.080	0.078
	4.65	Ex100-WMP	9982.5	10094.0	0.030	0.055	0.055	0.041

Table E-6

Comparison of weighted Manning's n-values and bank station locations for Apache Wash

River	River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
	4.60	AW FDS	9971.4	10016.0	0.050	0.065	0.065	0.062
	4.60	Ex100-WMP	9971.4	10016.0	0.030	0.055	0.055	0.049
	4.58	AW FDS	9983.0	10016.0	0.050	0.065	0.065	0.063
	4.58	Ex100-WMP	9983.0	10016.0	0.030	0.055	0.055	0.049
	4.58				Culvert			
	4.56	AW FDS	9960.0	10150.0	0.050	0.065	---	0.050
	4.56	Ex100-WMP	9975.0	10115.0	0.030	0.055	0.055	0.033
	4.49	AW FDS	9954.9	10053.6	0.050	0.065	0.065	0.052
	4.49	Ex100-WMP	9954.9	10053.6	0.030	0.055	0.055	0.033
	4.40	AW FDS	9990.0	10030.0	0.050	0.065	0.065	0.059
	4.40	Ex100-WMP	9990.0	10030.0	0.030	0.055	0.055	0.042
	4.31	AW FDS	9980.5	10019.8	0.050	0.065	0.065	0.057
	4.31	Ex100-WMP	9980.5	10019.8	0.030	0.055	0.055	0.042
	4.23	AW FDS	9980.2	10030.2	0.050	0.065	0.065	0.060
	4.23	Ex100-WMP	9980.2	10030.2	0.030	0.055	0.055	0.044
	4.22	AW FDS	9975.0	10030.0	0.050	0.065	0.065	0.061
	4.22	Ex100-WMP	9975.0	10030.0	0.030	0.055	0.055	0.045
	4.11	AW FDS	9978.5	10019.7	0.050	0.065	0.065	0.057
	4.11	Ex100-WMP	9978.5	10107.8	0.030	0.055	0.055	0.033
	4.05	AW FDS	9960.0	10025.0	0.050	---	0.065	0.060
	4.05	Ex100-WMP	9981.9	10025.0	0.030	0.055	0.055	0.044
	3.96	AW FDS	9882.9	10057.5	0.050	0.065	0.065	0.054
	3.96	Ex100-WMP	9882.9	10057.5	0.030	0.055	0.055	0.034
	3.86	AW FDS	9980.7	10048.5	0.050	0.065	0.065	0.058
	3.86	Ex100-WMP	9980.7	10048.5	0.030	0.055	0.055	0.039
	3.78	AW FDS	9978.4	10060.7	0.050	0.065	0.065	0.057
	3.78	Ex100-WMP	9978.4	10060.7	0.030	---	0.055	0.038
	3.75	AW FDS	9975.0	10020.0	0.050	0.065	0.065	0.060
	3.75	Ex100-WMP	9982.7	10020.0	0.030	0.055	0.055	0.044

Table E-6

Comparison of weighted Manning's n-values and bank station locations for Apache Wash

River	River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
	3.65	AW FDS	9970.0	10015.0	0.050	0.065	0.065	0.060
	3.65	Ex100-WMP	9970.0	10015.0	0.030	0.055	0.055	0.043
	3.60	AW FDS	9979.9	10014.0	0.050	0.065	0.065	0.061
	3.60	Ex100-WMP	9979.9	10014.0	0.030	0.055	0.055	0.045
	3.52	AW FDS	9982.0	10017.1	0.050	0.065	0.065	0.059
	3.52	Ex100-WMP	9982.0	10017.1	0.030	0.055	0.055	0.044
	3.48	AW FDS	9985.4	10018.8	0.050	0.065	0.065	0.061
	3.48	Ex100-WMP	9985.4	10018.8	0.030	0.055	0.055	0.045
	3.40	AW FDS	9985.0	10030.0	0.050	0.065	0.065	0.060
	3.40	Ex100-WMP	9984.0	10031.0	0.030	0.055	0.055	0.044
	3.32	AW FDS	9955.2	10020.2	0.050	0.065	0.065	0.060
	3.32	Ex100-WMP	9955.2	10020.2	0.030	0.055	0.055	0.044
	3.21	AW FDS	9965.0	10130.0	0.050	0.065	0.065	0.055
	3.21	Ex100-WMP	9965.0	10029.1	0.030	0.055	0.055	0.043
	3.13	AW FDS	9978.4	10027.9	0.050	0.065	0.065	0.059
	3.13	Ex100-WMP	9978.4	10027.9	0.030	0.055	0.055	0.043
	3.07	AW FDS	9980.0	10028.1	0.050	0.065	0.065	0.061
	3.07	Ex100-WMP	9980.0	10028.1	0.030	0.055	0.055	0.043
	2.97	AW FDS	9000.0	9065.0	0.05	0.065	0.576	0.296
	2.97	Ex100-WMP	9980.0	11098.0	0.049	0.055	0.055	0.050
	2.92	AW FDS	9410.0	9465.0	0.05	0.065	0.059	0.058
	2.92	Ex100-WMP	9970.0	10660.0	0.048	0.055	0.055	0.050
	2.90	AW FDS	9645.0	9685.0	0.050	0.065	0.057	0.057
	2.90	Ex100-WMP	9978.0	10469.0	0.037	0.055	0.055	0.044
	2.87	AW FDS	9522.9	9620.0	0.050	0.065	0.056	0.056
	2.87	Ex100-WMP	9979.0	10485.0	0.036	0.055	0.055	0.039
	2.82	AW FDS	9710.0	9765.0	0.050	0.065	0.057	0.058
	2.82	Ex100-WMP	9978.0	10294.0	0.043	0.055	0.055	0.047
	2.73	AW FDS	9971.9	10036.4	0.050	0.065	0.065	0.057
	2.73	Ex100-WMP	9971.9	10036.4	0.030	0.055	0.055	0.038

Table E-6

Comparison of weighted Manning's n-values and bank station locations for Apache Wash

River	River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
	2.60	AW FDS	9945.0	10030.0	0.055	0.070	0.070	0.064
	2.60	Ex100-WMP	9945.0	10028.9	0.030	0.055	0.055	0.040
	2.52	AW FDS	9957.6	10028.8	0.055	0.070	0.070	0.065
	2.52	Ex100-WMP	9957.6	10028.8	0.030	0.055	0.055	0.042
	2.47	AW FDS	9962.3	10027.8	0.055	0.070	0.070	0.064
	2.47	Ex100-WMP	9962.3	10027.8	0.030	0.055	0.055	0.041
	2.40	AW FDS	9980.0	10020.0	0.055	0.070	0.070	0.065
	2.40	Ex100-WMP	9940.0	10024.1	0.030	0.055	0.055	0.037
	2.33	AW FDS	9945.0	10030.0	0.055	0.070	0.070	0.060
	2.33	Ex100-WMP	9945.0	10030.0	0.030	0.055	0.055	0.036
	2.24	AW FDS	9939.6	10055.4	0.055	0.070	0.070	0.060
	2.24	Ex100-WMP	9939.6	10055.4	0.030	0.055	0.055	0.036
	2.17	AW FDS	9948.2	10055.9	0.055	0.070	0.070	0.064
	2.17	Ex100-WMP	9948.2	10055.9	0.030	0.055	0.055	0.041
	2.08	AW FDS	9971.0	10080.5	0.055	0.070	0.070	0.066
	2.08	Ex100-WMP	9971.0	10080.5	0.030	0.055	0.055	0.045
	2.00	AW FDS	9980.0	10050.0	0.055	0.070	0.070	0.066
	2.00	Ex100-WMP	9980.0	10115.0	0.030	0.055	0.055	0.042
	1.88	AW FDS	9975.0	10025.0	0.055	0.070	0.070	0.066
	1.88	Ex100-WMP	9950.0	10040.0	0.030	0.055	0.055	0.041
	1.85	AW FDS	9915.8	10064.9	0.055	0.070	0.070	0.062
	1.85	Ex100-WMP	9955.0	10041.5	0.030	0.055	0.055	0.042
	1.81	AW FDS	9965.7	10060.7	0.055	0.070	0.070	0.063
	1.81	Ex100-WMP	9971.1	10031.0	0.030	0.055	0.055	0.044
	1.75	AW FDS	9970.1	10072.3	0.055	0.070	0.070	0.061
	1.75	Ex100-WMP	9970.1	10072.3	0.030	0.055	0.055	0.037
	1.66	AW FDS	9952.1	10034.0	0.055	0.070	0.070	0.064
	1.66	Ex100-WMP	9952.1	10034.0	0.030	0.055	0.055	0.040
	1.60	AW FDS	9959.7	10016.9	0.055	0.070	0.070	0.064

Table E-6

Comparison of weighted Manning's n-values and bank station locations for Apache Wash

River	River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
	1.60	Ex100-WMP	9959.7	10016.9	0.030	0.055	0.055	0.042
	1.56	AW FDS	9951.4	10028.6	0.055	0.070	0.070	0.063
	1.56	Ex100-WMP	9951.4	10028.6	0.030	0.055	0.055	0.041
	1.47	AW FDS	9964.4	10032.4	0.055	0.070	0.070	0.064
	1.47	Ex100-WMP	9964.4	10032.4	0.030	0.055	0.055	0.040
	1.37	AW FDS	9932.1	10030.2	0.055	0.070	0.070	0.063
	1.37	Ex100-WMP	9932.1	10030.2	0.030	0.055	0.055	0.040
	1.27	AW FDS	9937.3	10031.3	0.060	0.070	0.070	0.066
	1.27	Ex100-WMP	9917.0	10020.0	0.030	0.055	0.055	0.038
	1.18	AW FDS	9937.4	10028.9	0.060	0.070	0.070	0.066
	1.18	Ex100-WMP	9947.0	10030.0	0.030	0.055	0.055	0.039
	1.09	AW FDS	9960.5	10039.1	0.045	0.070	0.070	0.054
	1.09	Ex100-WMP	9968.0	10034.0	0.030	0.055	0.055	0.046
	0.99	AW FDS	9969.7	10026.0	0.055	0.070	0.070	0.068
	0.99	Ex100-WMP	9969.7	10026.0	0.030	0.055	0.055	0.050
	0.84	AW FDS	9975.0	10030.0	0.070	0.070	0.070	0.070
	0.84	Ex100-WMP	9975.0	10030.0	0.030	0.055	0.055	0.044
	0.75	AW FDS	9943.8	10027.7	0.055	0.070	0.070	0.064
	0.75	Ex100-WMP	9943.8	10027.7	0.030	0.055	0.055	0.043
	0.71	AW FDS	9973.9	10070.6	0.055	0.070	0.070	0.062
	0.71	Ex100-WMP	9973.9	10029.6	0.030	0.055	0.055	0.043
	0.63	AW FDS	9967.3	10044.1	0.055	0.070	0.070	0.065
	0.63	Ex100-WMP	9967.3	10044.1	0.030	0.055	0.055	0.043
	0.54	AW FDS	9965.0	10027.0	0.055	0.070	0.070	0.065
	0.54	Ex100-WMP	9965.0	10027.0	0.030	0.055	0.055	0.044
	0.43	AW FDS	9950.0	10035.0	0.055	0.070	0.070	0.064
	0.43	Ex100-WMP	9940.0	10050.0	0.030	0.055	0.055	0.041
	0.33	AW FDS	9920.0	10090.0	0.055	0.070	0.070	0.060
	0.33	Ex100-WMP	9945.8	10090.0	0.030	0.055	0.055	0.036

Table E-6

Comparison of weighted Manning's n-values and bank station locations for Apache Wash

River	River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
	0.20	AW FDS	9967.7	10039.4	0.055	0.070	0.070	0.063
	0.20	Ex100-WMP	9967.7	10039.4	0.030	0.055	0.055	0.039
Desert Hills	0.99	AW FDS	9988.2	10012.7	0.050	0.065	0.065	0.063
	0.99	Ex100-WMP	9988.2	10012.7	0.030	0.055	0.055	0.050
	0.90	AW FDS	9996.5	10017.6	0.050	0.065	0.065	0.063
	0.90	Ex100-WMP	9996.5	10017.6	0.030	0.055	0.055	0.050
	0.81	AW FDS	9983.6	10018.0	0.050	0.065	0.065	0.063
	0.81	Ex100-WMP	9983.6	10018.0	0.030	0.055	0.055	0.049
	0.72	AW FDS	9986.7	10016.5	0.050	0.065	0.065	0.063
	0.72	Ex100-WMP	9986.7	10016.5	0.030	0.055	0.055	0.050
	0.64	AW FDS	9977.8	10018.1	0.050	0.065	0.065	0.063
	0.64	Ex100-WMP	9977.8	10018.1	0.030	0.055	0.055	0.049
	0.56	AW FDS	9986.9	10019.5	0.050	0.065	0.065	0.063
	0.56	Ex100-WMP	9986.9	10019.5	0.030	0.055	0.055	0.050
	0.48	AW FDS	9980.0	10013.0	0.050	0.065	0.065	0.063
	0.48	Ex100-WMP	9980.0	10013.0	0.030	0.055	0.055	0.050
	0.40	AW FDS	9966.6	10021.8	0.050	0.065	0.065	0.061
	0.40	Ex100-WMP	9966.6	10021.8	0.030	0.055	0.055	0.047
	0.39	AW FDS			N/A			
	0.39	Ex100-WMP	9982.0	10014.0	0.030	0.055	0.055	0.049
	0.31	AW FDS	9984.0	10018.7	0.050	0.111	0.065	0.074
	0.31	Ex100-WMP			N/A			
	0.22	AW FDS	9410.0	9465.0	0.050	0.065	0.059	0.058
	0.22	Ex100-WMP			N/A			
Paradise	2.23	AW FDS	9979.4	10023.1	0.050	0.065	0.065	0.057
	2.23	Ex100-WMP	9979.4	10023.1	0.030	0.055	0.055	0.040
	2.14	AW FDS	9979.0	10025.8	0.050	0.065	0.065	0.061
	2.14	Ex100-WMP	9979.0	10025.8	0.030	0.055	0.055	0.047
	2.07	AW FDS	9969.0	10060.0	0.050	0.065	0.065	0.061
	2.07	Ex100-WMP	9969.0	10060.0	0.030	0.055	0.055	0.046

Table E-6

Comparison of weighted Manning's n-values and bank station locations for Apache Wash

River	River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
	2.00	AW FDS	9983.5	10022.3	0.050	0.065	0.065	0.057
	2.00	Ex100-WMP	9983.5	10022.3	0.030	0.055	0.055	0.042
	1.92	AW FDS	9945.0	10015.0	0.050	0.065	0.065	0.055
	1.92	Ex100-WMP	9935.0	10025.0	0.030	0.055	0.055	0.035
	1.83	AW FDS	9983.7	10039.0	0.050	0.065	0.065	0.058
	1.83	Ex100-WMP	9983.7	10039.0	0.030	0.055	0.055	0.041
	1.75	AW FDS	9964.4	10022.9	0.050	0.065	0.065	0.059
	1.75	Ex100-WMP	9964.4	10022.9	0.030	0.055	0.055	0.042
	1.65	AW FDS	9986.3	10010.9	0.050	0.050	0.054	0.052
	1.65	Ex100-WMP	9971.0	10020.0	0.030	0.055	0.055	0.042
	1.54	AW FDS	9986.0	10020.2	0.050	0.070	0.052	0.052
	1.54	Ex100-WMP	9986.0	10020.2	0.030	0.055	0.030	0.030
	1.46	AW FDS	9973.0	10038.6	0.055	0.070	0.070	0.063
	1.46	Ex100-WMP	9973.0	10038.6	0.030	0.055	0.055	0.040
	1.37	AW FDS	9958.9	9983.9	0.055	0.070	0.070	0.067
	1.37	Ex100-WMP	9958.9	10020.5	0.030	0.055	0.055	0.039
	1.27	AW FDS	9969.1	10057.7	0.055	0.070	0.070	0.059
	1.27	Ex100-WMP	9969.1	10057.7	0.030	0.055	0.055	0.035
	1.21	AW FDS	9973.7	10035.4	0.055	0.070	0.070	0.065
	1.21	Ex100-WMP	9983.1	10020.6	0.030	0.055	0.055	0.044
	1.12	AW FDS	9943.5	10023.3	0.055	0.070	0.070	0.061
	1.12	Ex100-WMP	9943.5	10023.3	0.030	0.055	0.055	0.039
	1.04	AW FDS	9985.5	10029.1	0.055	0.070	0.070	0.067
	1.04	Ex100-WMP	9985.5	10029.1	0.030	0.055	0.055	0.047
	0.95	AW FDS	9984.5	10070.2	0.055	0.070	0.070	0.060
	0.95	Ex100-WMP	9984.5	10070.2	0.030	0.055	0.055	0.035
	0.89	AW FDS	9981.0	10077.3	0.055	0.070	0.070	0.061
	0.89	Ex100-WMP	9981.0	10021.7	0.030	0.055	0.055	0.042
	0.80	AW FDS	9982.1	10020.7	0.055	0.070	0.070	0.066

Table E-6

Comparison of weighted Manning's n-values and bank station locations for Apache Wash

River	River Station	Plan	Bank Stations Left	Bank Stations Right	Conveyance Weighted Mannings Channel	Conveyance Weighted Mannings Overbank	Conveyance Weighted Mannings Overbank	Total Weighted Manning's
	0.80	Ex100-WMP	9982.1	10020.7	0.030	0.055	0.055	0.047
	0.72	AW FDS	9983.3	10020.8	0.055	0.070	0.070	0.067
	0.72	Ex100-WMP	9978.0	10018.0	0.030	0.055	0.055	0.050
	0.62	AW FDS	9965.6	10027.3	0.055	0.070	0.070	0.064
	0.62	Ex100-WMP	9967.0	10031.0	0.030	0.055	0.055	0.036
	0.53	AW FDS	9970.8	10023.2	0.055	0.070	0.070	0.064
	0.53	Ex100-WMP	9976.0	10028.0	0.030	0.055	0.055	0.042
	0.44	AW FDS	9992.5	10032.1	0.055	0.070	0.070	0.067
	0.44	Ex100-WMP	9992.5	10028.3	0.030	0.055	0.055	0.049
	0.34	AW FDS	9969.8	10073.3	0.055	0.070	0.070	0.065
	0.34	Ex100-WMP	9969.8	10014.8	0.030	0.055	0.055	0.048
	0.28	AW FDS	9985.5	10035.1	0.055	0.070	0.070	0.065
	0.28	Ex100-WMP	9974.0	10038.0	0.030	0.055	0.055	0.041
	0.17	AW FDS	9967.2	10084.2	0.055	0.070	0.070	0.060
	0.17	Ex100-WMP	9974.5	10022.7	0.030	0.055	0.055	0.041
	0.13	AW FDS	9978.4	10047.5	0.055	0.070	0.070	0.064
	0.13	Ex100-WMP	9978.4	10047.5	0.030	0.055	0.055	0.040
	0.04	AW FDS	9922.5	10032.2	0.055	0.070	0.070	0.062
	0.04	Ex100-WMP	9970.2	10032.2	0.030	0.055	0.055	0.042

Table E-7

Comparison of ineffective flow areas and levees for Apache Wash

River	River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
Apache	8.02	AW FDS	9686.9	10111.0	---	---
	8.02	Ex100-WMP	9686.9	10111.0	---	---
	7.98	AW FDS	9575.3	10114.1	---	---
	7.98	Ex100-WMP	9605.8	10103.4	---	---
	7.89	AW FDS	9760.1	10244.6	---	---
	7.89	Ex100-WMP	9762.5	10232.1	---	---
	7.84	AW FDS	9827.1	10224.5	---	---
	7.84	Ex100-WMP	9834.8	10213.7	---	---
	7.74	AW FDS	9747.5	10130.9	---	---
	7.74	Ex100-WMP	9750.0	10129.4	---	---
	7.65	AW FDS	9788.2	10125.9	---	---
	7.65	Ex100-WMP	9793.5	10114.9	---	---
	7.55	AW FDS	9912.8	10174.1	---	---
	7.55	Ex100-WMP	9916.9	10170.7	---	---
	7.46	AW FDS	9844.7	10137.3	---	---
	7.46	Ex100-WMP	9870.1	10129.3	---	---
	7.36	AW FDS	9739.4	10040.6	---	---
	7.36	Ex100-WMP	9738.7	10041.0	---	---
	7.28	AW FDS	9718.4	10043.0	---	---
	7.28	Ex100-WMP	9725.7	10039.4	---	---
	7.17	AW FDS	9950.7	10098.2	---	---
	7.17	Ex100-WMP	9952.4	10092.3	---	---
	7.08	AW FDS	9926.3	10066.1	---	---
	7.08	Ex100-WMP	9930.3	10059.2	---	---
	6.98	AW FDS	9727.2	10097.6	---	---
	6.98	Ex100-WMP	9731.6	10093.1	---	---
	6.90	AW FDS	9608.8	10024.2	---	---
	6.90	Ex100-WMP	9607.7	10024.7	---	---
	6.80	AW FDS	9666.2	10038.3	---	---
	6.80	Ex100-WMP	9675.1	10032.9	---	---

Table E-7

Comparison of ineffective flow areas and levees for Apache Wash

River	River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
	6.71	AW FDS	9964.4	10261.6	---	---
	6.71	Ex100-WMP	9970.0	10225.0	---	---
	6.63	AW FDS	9981.0	10283.0	---	---
	6.63	Ex100-WMP	9979.4	10296.8	---	---
	6.58	AW FDS	9911.3	10266.5	---	---
	6.58	Ex100-WMP	9913.0	10264.6	---	---
	6.50	AW FDS	9717.5	10103.5	---	---
	6.50	Ex100-WMP	9720.4	10097.6	---	---
	6.43	AW FDS	9668.9	10099.0	---	---
	6.43	Ex100-WMP	9677.4	10053.7	---	---
	6.32	AW FDS	9955.5	10370.9	---	---
	6.32	Ex100-WMP	9953.8	10386.4	---	---
	6.25	AW FDS	9939.1	10465.7	---	---
	6.25	Ex100-WMP	9943.3	10459.8	---	---
	6.16	AW FDS	9973.8	10337.7	---	---
	6.16	Ex100-WMP	9972.8	10342.6	---	---
	6.09	AW FDS	9831.4	10372.4	---	---
	6.09	Ex100-WMP	9867.1	10355.7	---	---
	6.01	AW FDS	9875.0	10278.0	---	---
	6.01	Ex100-WMP	9884.8	10274.1	---	---
	5.92	AW FDS	9784.6	10339.5	---	---
	5.92	Ex100-WMP	9864.2	10333.8	---	---
	5.83	AW FDS	9554.7	10136.2	---	---
	5.83	Ex100-WMP	9713.2	10137.5	---	---
	5.76	AW FDS	9666.9	10129.0	---	---
	5.76	Ex100-WMP	9677.7	10122.1	---	---
	5.66	AW FDS	9596.2	10206.2	---	---
	5.66	Ex100-WMP	9806.3	10166.7	---	---
	5.64	AW FDS	9761.4	10383.3	---	---

Table E-7

Comparison of ineffective flow areas and levees for Apache Wash

River	River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
	5.64	Ex100-WMP	9783.0	10357.4	---	---
	5.57	AW FDS	9533.7	10159.7	---	---
	5.57	Ex100-WMP	9554.1	10144.4	---	---
	5.48	AW FDS	9760.7	10513.2	---	---
	5.48	Ex100-WMP	9757.7	10522.8	---	---
	5.38	AW FDS	9347.7	10354.6	---	---
	5.38	Ex100-WMP	9848.7	10353.8	---	---
	5.31	AW FDS	9465.6	10499.6	---	---
	5.31	Ex100-WMP	9464.8	10502.2	---	---
	5.21	AW FDS	9740.3	10452.3	---	---
	5.21	Ex100-WMP	9752.2	10436.6	---	1840.0
	5.15	AW FDS	9952.1	10516.2	---	---
	5.15	Ex100-WMP	9952.7	10515.7	---	1836.0
	5.09	AW FDS	9499.3	10512.6	---	---
	5.09	Ex100-WMP	9507.1	10473.9	---	1834.0
	5.03	AW FDS	9601.7	10580.2	---	---
	5.03	Ex100-WMP	9610.2	10554.1	---	1830.0
	4.96	AW FDS	9723.4	10658.6	---	---
	4.96	Ex100-WMP	9716.2	10672.7	---	1826.0
	4.90	AW FDS	9790.6	10461.1	---	---
	4.90	Ex100-WMP	9842.9	10418.2	1824.0	1824.0
	4.82	AW FDS	9818.1	10453.5	---	---
	4.82	Ex100-WMP	9830.5	10435.5	1820.0	1822.0
	4.78	AW FDS	9966.7	10630.3	---	---
	4.78	Ex100-WMP	9970.9	10607.6	---	1816.0
	4.74	AW FDS	9825.3	10700.0	---	---
	4.74	Ex100-WMP	9962.1	10700.0	---	---
	4.65	AW FDS	9813.9	10360.0	---	---
	4.65	Ex100-WMP	9782.5	10360.0	---	---

Table E-7

Comparison of ineffective flow areas and levees for Apache Wash

River	River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
	4.60	AW FDS	9837.5	10500.2	---	---
	4.60	Ex100-WMP	9847.3	10500.2	---	---
	4.58	AW FDS	9691.4	10500.0	---	---
	4.58	Ex100-WMP	9719.5	10500.0	---	---
	4.58		Culvert			
	4.56	AW FDS	9950.0	10050.0	---	---
	4.56	Ex100-WMP	9915.0	10240.0	---	---
	4.49	AW FDS	9906.0	10202.9	---	---
	4.49	Ex100-WMP	9906.1	10202.2	---	---
	4.40	AW FDS	9933.9	10259.1	---	---
	4.40	Ex100-WMP	9939.9	10210.5	---	---
	4.31	AW FDS	9762.3	10131.7	---	---
	4.31	Ex100-WMP	9728.9	10150.6	---	---
	4.23	AW FDS	9658.9	10101.0	---	---
	4.23	Ex100-WMP	9668.5	10095.1	---	---
	4.22	AW FDS	9593.1	10092.4	---	---
	4.22	Ex100-WMP	9612.5	10067.5	---	---
	4.11	AW FDS	9974.5	10296.3	---	---
	4.11	Ex100-WMP	9974.4	10306.0	---	---
	4.05	AW FDS	9965.5	10302.6	---	---
	4.05	Ex100-WMP	9968.8	10262.9	---	---
	3.96	AW FDS	9875.1	10613.9	---	---
	3.96	Ex100-WMP	9878.9	10581.4	---	---
	3.86	AW FDS	9791.1	10403.3	---	---
	3.86	Ex100-WMP	9829.6	10369.8	---	---
	3.78	AW FDS	9715.9	10616.3	---	---
	3.78	Ex100-WMP	9978.5	10345.4	---	---
	3.75	AW FDS	9679.7	10852.4	---	---
	3.75	Ex100-WMP	9672.8	10855.2	---	---

Table E-7

Comparison of ineffective flow areas and levees for Apache Wash

River	River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
	3.65	AW FDS	9410.2	10366.4	---	---
	3.65	Ex100-WMP	9431.4	10327.0	---	---
	3.60	AW FDS	9441.5	10289.3	---	---
	3.60	Ex100-WMP	9468.7	10256.4	---	---
	3.52	AW FDS	9681.7	10514.0	---	---
	3.52	Ex100-WMP	9676.0	10574.7	---	---
	3.48	AW FDS	9631.5	10546.3	---	---
	3.48	Ex100-WMP	9629.5	10558.3	---	---
	3.40	AW FDS	9496.9	10646.9	---	---
	3.40	Ex100-WMP	9492.6	10472.3	---	---
	3.32	AW FDS	9623.6	10783.3	---	---
	3.32	Ex100-WMP	9626.1	10748.1	---	---
	3.21	AW FDS	9623.7	10390.0	---	---
	3.21	Ex100-WMP	9619.8	10390.0	---	---
	3.13	AW FDS	9461.1	10100.0	---	---
	3.13	Ex100-WMP	9473.9	10100.0	---	---
	3.07	AW FDS	9629.1	10180.4	---	---
	3.07	Ex100-WMP	9637.1	10180.4	---	---
	2.97	AW FDS	8995.4	10718.1	---	---
	2.97	Ex100-WMP	9974.88	11464.82	---	---
	2.92	AW FDS	9325.48	10831.37	---	---
	2.92	Ex100-WMP	9896.66	11412.01	---	---
	2.90	AW FDS	9447.08	10703.79	---	---
	2.90	Ex100-WMP	9786.55	11027.77	---	---
	2.87	AW FDS	9311.14	10472.13	---	---
	2.87	Ex100-WMP	9734.18	10668.91	---	---
	2.82	AW FDS	9405.24	10100.84	---	---
	2.82	Ex100-WMP	9680.15	10369.91	---	---
	2.73	AW FDS	9766.56	10119.31	---	---
	2.73	Ex100-WMP	9784.55	10103.84	---	---

Table E-7

Comparison of ineffective flow areas and levees for Apache Wash

River	River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
	2.60	AW FDS	9752.13	10461.48	---	---
	2.60	Ex100-WMP	9771.36	10447.13	---	---
	2.52	AW FDS	9831.42	10429.36	---	---
	2.52	Ex100-WMP	9852.44	10408.00	---	---
	2.47	AW FDS	9924.93	10358.01	---	---
	2.47	Ex100-WMP	9944.62	10345.84	---	---
	2.40	AW FDS	9796.45	10047.45	---	---
	2.40	Ex100-WMP	9800.92	10043.98	---	---
	2.33	AW FDS	9798.64	10042.19	---	---
	2.33	Ex100-WMP	9809.91	10040.37	---	---
	2.24	AW FDS	9792.74	10194.99	---	---
	2.24	Ex100-WMP	9806.90	10181.09	---	---
	2.17	AW FDS	9811.48	10465.41	---	---
	2.17	Ex100-WMP	9823.56	10438.87	---	---
	2.08	AW FDS	9966.50	10750.82	---	---
	2.08	Ex100-WMP	9968.34	10730.16	---	---
	2.00	AW FDS	9966.08	10819.97	---	---
	2.00	Ex100-WMP	9968.07	10812.39	---	---
	1.88	AW FDS	9769.92	10481.18	---	---
	1.88	Ex100-WMP	9773.60	10467.69	---	---
	1.85	AW FDS	9818.68	10453.45	---	---
	1.85	Ex100-WMP	9823.38	10438.84	---	---
	1.81	AW FDS	9946.17	10477.49	---	---
	1.81	Ex100-WMP	9948.52	10465.80	---	---
	1.75	AW FDS	9952.41	10486.37	---	---
	1.75	Ex100-WMP	9955.15	10442.90	---	---
	1.66	AW FDS	9771.28	10287.30	---	---
	1.66	Ex100-WMP	9800.33	10265.06	---	---
	1.60	AW FDS	9427.76	10051.07	---	---

Table E-7

Comparison of ineffective flow areas and levees for Apache Wash

River	River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
	1.60	Ex100-WMP	9445.48	10033.75	---	---
	1.56	AW FDS	9452.97	10058.93	---	---
	1.56	Ex100-WMP	9468.63	10051.63	---	---
	1.47	AW FDS	9487.80	10090.11	---	---
	1.47	Ex100-WMP	9490.27	10088.79	---	---
	1.37	AW FDS	9498.53	10052.84	---	---
	1.37	Ex100-WMP	9525.91	10049.03	---	---
	1.27	AW FDS	9776.14	10480.17	---	---
	1.27	Ex100-WMP	9802.30	10350.18	---	---
	1.18	AW FDS	9829.84	11460.78	---	---
	1.18	Ex100-WMP	9876.39	10853.09	---	---
	1.09	AW FDS	9925.77	11159.09	---	---
	1.09	Ex100-WMP	9925.97	11621.14	---	---
	0.99	AW FDS	9929.98	11798.81	---	---
	0.99	Ex100-WMP	9934.12	11799.92	---	---
	0.84	AW FDS	9863.08	11059.26	---	---
	0.84	Ex100-WMP	9884.25	10455.86	---	---
	0.75	AW FDS	9442.37	10522.73	---	---
	0.75	Ex100-WMP	9460.21	10507.41	---	---
	0.71	AW FDS	9433.12	10193.44	---	---
	0.71	Ex100-WMP	9450.49	10188.08	---	---
	0.63	AW FDS	9237.30	10236.15	---	---
	0.63	Ex100-WMP	9268.59	10210.15	---	---
	0.54	AW FDS	9692.01	10582.13	---	---
	0.54	Ex100-WMP	9730.36	10568.82	---	---
	0.43	AW FDS	9754.87	10607.56	---	---
	0.43	Ex100-WMP	9872.36	10548.82	---	---
	0.33	AW FDS	9633.18	10343.05	---	---
	0.33	Ex100-WMP	9665.10	10290.64	---	---

Table E-7

Comparison of ineffective flow areas and levees for Apache Wash

River	River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
	0.20	AW FDS	9288.52	10191.79	---	---
	0.20	Ex100-WMP	9389.74	10185.17	---	---
Desert Hills	0.99	AW FDS	9490.3	10551.7	---	---
	0.99	Ex100-WMP	9524.5	10533.2	---	---
	0.90	AW FDS	9728.5	10606.2	---	---
	0.90	Ex100-WMP	9738.2	10555.5	---	---
	0.81	AW FDS	9735.3	10664.3	---	---
	0.81	Ex100-WMP	9745.1	10635.3	---	---
	0.72	AW FDS	9671.0	10705.8	---	---
	0.72	Ex100-WMP	9716.1	10672.3	---	---
	0.64	AW FDS	9427.1	10512.7	---	---
	0.64	Ex100-WMP	9474.1	10483.2	---	---
	0.56	AW FDS	9063.1	10312.1	---	---
	0.56	Ex100-WMP	9168.8	10296.9	---	---
	0.48	AW FDS	9441.5	10468.6	---	---
	0.48	Ex100-WMP	9469.6	10461.8	---	---
	0.40	AW FDS	9362.0	10296.9	---	---
	0.40	Ex100-WMP	9411.1	10288.8	---	---
	0.39	AW FDS		N/A		
	0.39	Ex100-WMP	9479.6	10430.3	---	---
	0.31	AW FDS	8999.2	10695.2	---	---
	0.31	Ex100-WMP		N/A		
	0.22	AW FDS	9325.7	10831.1	---	---
	0.22	Ex100-WMP		N/A		
Paradise	2.23	AW FDS	9934.8	10517.7	---	---
	2.23	Ex100-WMP	9932.9	10528.7	---	---
	2.14	AW FDS	9965.6	10665.9	---	---
	2.14	Ex100-WMP	9965.6	10666.3	---	---
	2.07	AW FDS	9955.8	10735.7	---	---
	2.07	Ex100-WMP	9960.6	10710.7	---	---

Table E-7

Comparison of ineffective flow areas and levees for Apache Wash

River	River Station	Plan	Ineffective Flow Area Stations Left	Ineffective Flow Area Stations Right	Levee Elevations Left	Levee Elevations Right
	2.00	AW FDS	9966.4	10465.6	---	---
	2.00	Ex100-WMP	9963.0	10601.0	---	---
	1.92	AW FDS	9928.5	10366.0	---	---
	1.92	Ex100-WMP	9929.8	10361.0	---	---
	1.83	AW FDS	9966.5	10405.1	---	---
	1.83	Ex100-WMP	9966.2	10406.1	---	---
	1.75	AW FDS	9936.0	10349.7	---	---
	1.75	Ex100-WMP	9937.6	10349.2	---	---
	1.65	AW FDS	9917.2	10566.5	---	---
	1.65	Ex100-WMP	9912.8	10273.0	---	---
	1.54	AW FDS	9878.8	10510.3	---	---
	1.54	Ex100-WMP	9968.5	10495.7	---	---
	1.46	AW FDS	9451.4	10299.3	---	---
	1.46	Ex100-WMP	9454.9	10295.7	1792	---
	1.37	AW FDS	9395.6	10243.5	---	---
	1.37	Ex100-WMP	9810.3	10068.5	---	---
	1.27	AW FDS	9536.0	10182.0	---	---
	1.27	Ex100-WMP	9569.8	10180.1	---	---
	1.21	AW FDS	9425.9	10167.8	---	---
	1.21	Ex100-WMP	9430.7	10131.0	---	---
	1.12	AW FDS	9341.7	10031.6	---	---
	1.12	Ex100-WMP	9340.7	10032.2	---	---
	1.04	AW FDS	9437.3	10063.4	---	---
	1.04	Ex100-WMP	9480.5	10050.8	---	---
	0.95	AW FDS	9615.6	10213.5	---	---
	0.95	Ex100-WMP	9630.5	10202.5	---	---
	0.89	AW FDS	9591.0	10254.4	---	---
	0.89	Ex100-WMP	9591.8	10252.9	---	---
	0.80	AW FDS	9626.4	10302.7	---	---

Table E-7

Comparison of ineffective flow areas and levees for Apache Wash

River	River Station	Plan	Ineffective Flow Area Stations		Levee Elevations	
			Left	Right	Left	Right
	0.80	Ex100-WMP	9621.7	10305.5	---	---
	0.72	AW FDS	9448.4	10085.2	---	---
	0.72	Ex100-WMP	9418.5	10115.6	---	---
	0.62	AW FDS	9597.0	10237.1	---	---
	0.62	Ex100-WMP	9665.1	10084.0	---	---
	0.53	AW FDS	9584.1	10110.3	---	---
	0.53	Ex100-WMP	9619.9	10110.3	---	---
	0.44	AW FDS	9619.8	10167.8	---	---
	0.44	Ex100-WMP	9633.0	10166.0	---	---
	0.34	AW FDS	9768.7	10328.8	---	---
	0.34	Ex100-WMP	9783.9	10317.9	---	---
	0.28	AW FDS	9788.9	10257.6	---	---
	0.28	Ex100-WMP	9779.0	10245.5	---	---
	0.17	AW FDS	9959.5	10533.4	---	---
	0.17	Ex100-WMP	9960.0	10533.1	---	---
	0.13	AW FDS	9959.6	10551.0	---	---
	0.13	Ex100-WMP	9960.4	10548.4	---	---
	0.04	AW FDS	9701.1	10268.6	---	---
	0.04	Ex100-WMP	9703.3	10266.7	---	---

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
Apache	8.02	AW FDS	7187	1985.1	1992.6	1992.6	1993.9	0.0159	11.6	1225	424	0.81	2.9
	8.02	Ex100-WMP	7187	1985.1	1992.6	1992.6	1993.9	0.0048	11.7	1224	424	0.82	2.9
	7.98	AW FDS	7187	1981.8	1989.8	1989.0	1990.4	0.0093	9.7	1809	539	0.63	3.4
	7.98	Ex100-WMP	7187	1981.8	1988.8	1988.8	1990.0	0.0062	11.5	1266	498	0.90	2.5
	7.89	AW FDS	7187	1977.0	1985.0	1984.4	1985.8	0.0131	10.5	1482	484	0.73	3.1
	7.89	Ex100-WMP	7187	1977.0	1984.4	1984.4	1985.8	0.0051	11.4	1143	470	0.83	2.4
	7.84	AW FDS	7187	1974.4	1982.1	1981.0	1982.7	0.0095	9.5	1580	397	0.64	4.0
	7.84	Ex100-WMP	7187	1974.4	1981.0	1981.0	1982.3	0.0068	13.1	1156	379	0.96	3.1
	7.74	AW FDS	7187	1969.1	1975.3	1974.6	1976.0	0.0189	11.4	1336	383	0.86	3.5
	7.74	Ex100-WMP	7187	1969.1	1974.8	1974.8	1976.1	0.0083	12.7	1114	379	1.03	2.9
	7.65	AW FDS	7187	1961.8	1969.7	1968.2	1970.4	0.0085	9.1	1499	338	0.60	4.4
	7.65	Ex100-WMP	7187	1961.8	1968.6	1968.6	1970.1	0.0069	13.2	1042	321	0.96	3.2
	7.55	AW FDS	7187	1956.7	1964.1	1963.0	1965.1	0.0127	10.5	1169	261	0.73	4.5
	7.55	Ex100-WMP	7187	1956.7	1963.6	1963.6	1965.4	0.0068	13.1	924	254	0.96	3.6
	7.46	AW FDS	7187	1951.5	1959.1	1957.7	1960.0	0.0085	9.0	1242	293	0.60	4.3
	7.46	Ex100-WMP	7187	1951.5	1957.7	1957.7	1959.6	0.0062	12.3	865	259	0.92	3.3
	7.36	AW FDS	7187	1944.5	1952.1	1952.1	1953.6	0.0199	11.4	963	301	0.88	3.2
	7.36	Ex100-WMP	7187	1944.5	1952.2	1952.2	1953.8	0.0053	11.8	994	302	0.85	3.3
	7.28	AW FDS	7187	1940.8	1949.0	1945.5	1949.3	0.0047	5.7	1888	325	0.43	5.8
	7.28	Ex100-WMP	7187	1940.8	1948.1	1945.4	1948.5	0.0022	8.3	1681	314	0.56	5.4

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	7.17	AW FDS	7187	1934.0	1944.0	1942.4	1945.5	0.0095	10.3	806	147	0.65	5.5
	7.17	Ex100-WMP	7187	1934.0	1943.2	1943.2	1946.1	0.0052	14.9	702	140	0.89	5.0
	7.08	AW FDS	7187	1929.0	1937.9	1937.0	1939.9	0.0129	12.0	741	140	0.76	5.3
	7.08	Ex100-WMP	7187	1929.0	1937.0	1937.0	1939.8	0.0062	14.0	621	129	0.94	4.8
	6.98	AW FDS	7187	1924.0	1933.6	1932.8	1934.4	0.0077	9.4	1354	370	0.58	3.7
	6.98	Ex100-WMP	7187	1924.0	1933.0	1933.0	1934.6	0.0041	12.0	1136	362	0.77	3.1
	6.90	AW FDS	7187	1920.0	1928.3	1927.8	1929.5	0.0194	12.5	1149	415	0.87	2.8
	6.90	Ex100-WMP	7187	1920.0	1928.7	1928.7	1930.0	0.0043	11.3	1224	417	0.77	2.9
	6.80	AW FDS	7187	1914.0	1923.5	1922.1	1924.0	0.0063	7.7	1481	372	0.51	4.0
	6.80	Ex100-WMP	7187	1914.0	1922.7	1922.7	1924.1	0.0049	12.9	1192	358	0.83	3.3
	6.71	AW FDS	7187	1907.5	1919.1	1918.4	1920.2	0.0089	9.9	1106	297	0.61	3.7
	6.71	Ex100-WMP	7187	1907.5	1918.8	1918.8	1920.8	0.0033	12.8	997	255	0.72	3.9
	6.63	AW FDS	7187	1905.0	1914.4	1914.4	1915.8	0.0163	11.7	962	302	0.73	3.2
	6.63	Ex100-WMP	7187	1905.0	1915.0	1915.0	1916.8	0.0038	13.2	1152	317	0.76	3.6
	6.58	AW FDS	7187	1902.0	1911.0	1910.6	1912.1	0.0086	9.7	1141	355	0.66	3.2
	6.58	Ex100-WMP	7187	1902.0	1910.9	1910.9	1912.6	0.0043	12.1	1100	352	0.79	3.1
	6.50	AW FDS	7187	1899.0	1906.2	1906.2	1907.4	0.0140	12.7	1098	386	0.85	2.8
	6.50	Ex100-WMP	7187	1899.0	1905.9	1905.9	1907.3	0.0059	10.5	994	377	0.86	2.6
	6.43	AW FDS	7187	1896.5	1903.5	1902.3	1904.0	0.0061	8.1	1490	430	0.56	3.5

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	6.43	Ex100-WMP	7187	1896.5	1902.3	1902.3	1903.7	0.0070	10.9	1034	376	0.93	2.8
	6.32	AW FDS	7187	1890.0	1898.7	1898.7	1899.9	0.0158	10.5	1066	415	0.73	2.6
	6.32	Ex100-WMP	7187	1890.0	1899.2	1899.2	1900.7	0.0036	11.9	1269	433	0.73	2.9
	6.25	AW FDS	7187	1888.0	1895.0	1894.3	1895.6	0.0064	7.5	1567	527	0.55	3.0
	6.25	Ex100-WMP	7187	1888.0	1894.5	1894.5	1895.7	0.0052	10.6	1291	517	0.82	2.5
	6.16	AW FDS	7187	1883.0	1889.4	1889.4	1890.6	0.0242	10.8	955	364	0.87	2.6
	6.16	Ex100-WMP	7187	1883.0	1889.8	1889.8	1891.1	0.0067	11.7	1088	370	0.92	2.9
	6.09	AW FDS	7187	1879.5	1885.6	1884.5	1886.0	0.0052	6.5	1603	541	0.50	3.0
	6.09	Ex100-WMP	7187	1879.5	1884.6	1884.6	1885.9	0.0056	9.9	1113	489	0.83	2.3
	6.01	AW FDS	7213	1875.5	1881.8	1881.4	1882.7	0.0116	9.8	1182	403	0.74	2.9
	6.01	Ex100-WMP	7213	1875.5	1881.4	1881.4	1882.7	0.0079	10.8	1026	389	0.97	2.6
	5.92	AW FDS	7213	1870.2	1876.5	1875.6	1877.1	0.0105	7.7	1396	555	0.67	2.5
	5.92	Ex100-WMP	7213	1870.2	1875.8	1875.8	1877.1	0.0128	12.5	1028	452	1.20	2.3
	5.83	AW FDS	7213	1865.5	1871.6	1871.4	1872.5	0.0131	9.8	1222	510	0.78	2.4
	5.83	Ex100-WMP	7213	1865.5	1871.8	1871.8	1873.0	0.0063	11.5	1170	424	0.91	2.8
	5.76	AW FDS	7213	1862.0	1868.5	1867.6	1869.0	0.0065	7.8	1498	462	0.57	3.2
	5.76	Ex100-WMP	7213	1862.0	1867.8	1867.8	1869.1	0.0058	11.3	1203	444	0.87	2.7
	5.66	AW FDS	7213	1854.0	1862.5	1862.5	1863.6	0.0186	12.0	1183	610	0.92	1.9
	5.66	Ex100-WMP	7213	1854.0	1861.9	1861.9	1864.3	0.0126	16.1	890	360	1.26	2.5

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	5.64	AW FDS	7213	1855.0	1860.2	1858.6	1860.6	0.0033	5.3	1854	622	0.43	3.0
	5.64	Ex100-WMP	7213	1855.0	1859.8	1858.6	1860.3	0.0023	6.3	1624	574	0.53	2.8
	5.57	AW FDS	7213	1850.0	1857.9	1857.4	1858.6	0.0103	9.5	1257	554	0.70	2.3
	5.57	Ex100-WMP	7213	1850.0	1857.6	1857.6	1859.0	0.0065	12.2	1137	513	0.92	2.2
	5.48	AW FDS	7213	1846.0	1853.5	1853.4	1854.2	0.0101	9.4	1514	752	0.70	2.0
	5.48	Ex100-WMP	7213	1846.0	1853.6	1853.6	1854.6	0.0044	10.4	1624	765	0.77	2.1
	5.38	AW FDS	7213	1841.0	1849.0	1848.2	1849.5	0.0083	9.3	1747	825	0.64	2.1
	5.38	Ex100-WMP	7213	1841.0	1849.0	1849.0	1850.3	0.0069	14.1	1289	505	0.97	2.6
	5.31	AW FDS	7213	1838.0	1845.6	1845.2	1846.0	0.0098	6.2	1789	1034	0.54	1.7
	5.31	Ex100-WMP	7213	1838.0	1845.6	1845.6	1846.4	0.0056	10.5	1804	1037	0.84	1.7
	5.21	AW FDS	7213	1834.0	1840.8	1840.3	1841.3	0.0093	8.2	1639	712	0.65	2.3
	5.21	Ex100-WMP	7213	1834.0	1840.6	1840.6	1841.5	0.0069	11.3	1464	684	0.93	2.1
	5.15	AW FDS	7213	1830.0	1837.6	1837.2	1838.2	0.0112	9.3	1416	564	0.71	2.5
	5.15	Ex100-WMP	7213	1830.0	1837.5	1837.5	1838.5	0.0063	11.7	1404	563	0.90	2.5
	5.09	AW FDS	7213	1830.0	1834.5	1833.5	1834.7	0.0082	6.0	1970	1013	0.58	1.9
	5.09	Ex100-WMP	7213	1830.0	1834.2	1834.0	1834.7	0.0079	9.4	1748	967	0.93	1.8
	5.03	AW FDS	7213	1826.0	1831.6	1830.9	1831.8	0.0109	6.5	1872	979	0.57	1.9
	5.03	Ex100-WMP	7213	1826.0	1831.2	1831.2	1831.9	0.0105	12.0	1575	944	1.09	1.7
	4.96	AW FDS	7213	1822.0	1827.9	1827.1	1828.1	0.0108	6.2	1859	935	0.56	2.0
	4.96	Ex100-WMP	7213	1822.0	1828.0	1827.5	1828.4	0.0049	8.9	2051	956	0.76	2.1

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	4.90	AW FDS	7213	1822.0	1824.7	1824.1	1825.2	0.0123	5.9	1361	671	0.67	2.0
	4.90	Ex100-WMP	7213	1820.0	1824.2	1824.2	1825.9	0.0224	15.1	985	575	1.55	1.7
	4.82	AW FDS	7213	1818.0	1822.3	1821.6	1822.8	0.0149	8.6	1436	635	0.79	2.3
	4.82	Ex100-WMP	7213	1818.0	1822.0	1822.0	1822.9	0.0092	9.6	1264	605	1.00	2.1
	4.78	AW FDS	7213	1813.0	1817.8	1816.4	1818.0	0.0068	4.8	1875	664	0.50	2.8
	4.78	Ex100-WMP	7213	1813.0	1817.4	1816.9	1817.8	0.0091	9.2	1471	637	0.98	2.3
	4.74	AW FDS	6928	1810.0	1816.6	1815.6	1816.8	0.0056	5.4	2020	875	0.49	2.3
	4.74	Ex100-WMP	7213	1810.0	1815.8	1815.8	1816.6	0.0109	10.9	1403	738	1.09	1.9
	4.65	AW FDS	6053	1806.0	1810.3	1810.0	1811.1	0.0436	8.7	962	546	0.88	1.8
	4.65	Ex100-WMP	7213	1806.0	1810.8	1810.8	1811.9	0.0079	10.3	1254	578	0.96	2.2
	4.60	AW FDS	5873	1802.0	1809.9	1807.0	1810.0	0.0011	3.3	2813	663	0.23	4.2
	4.60	Ex100-WMP	7213	1802.0	1809.4	1806.0	1809.7	0.0015	6.2	2476	653	0.45	3.8
	4.58	AW FDS	5739	1801.3	1809.9	1808.8	1809.9	0.0008	3.2	3240	809	0.20	4.0
	4.58	Ex100-WMP	7213	1801.3	1809.3	1808.0	1809.5	0.0012	6.3	2814	781	0.39	3.6
	4.58	0	Culvert	0.0	0.0	0.0	0.0	0.0000	0.0	0	0	0.00	0.0
	4.56	AW FDS	5347	1799.0	1806.3	1805.2	1807.8	0.0106	10.0	547	277	0.72	5.5
	4.56	Ex100-WMP	7213	1799.0	1808.0	1808.0	1808.5	0.0010	5.9	1600	325	0.38	4.9
	4.49	AW FDS	5347	1796.0	1803.4	1802.5	1804.3	0.0076	8.2	853	297	0.61	2.9
	4.49	Ex100-WMP	7213	1796.0	1803.4	1803.4	1805.3	0.0055	11.6	851	296	0.86	2.9

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	4.40	AW FDS	5347	1792.3	1800.8	1799.2	1801.3	0.0054	7.9	1156	325	0.53	3.6
	4.40	Ex100-WMP	7213	1792.3	1800.0	1800.0	1802.1	0.0086	15.2	914	271	1.08	3.4
	4.31	AW FDS	5347	1788.0	1796.3	1796.3	1797.5	0.0116	11.3	889	369	0.76	2.4
	4.31	Ex100-WMP	7213	1788.0	1797.3	1797.3	1798.7	0.0043	12.5	1309	422	0.79	3.1
	4.23	AW FDS	5347	1786.0	1792.8	1791.4	1793.1	0.0056	6.7	1315	442	0.51	3.0
	4.23	Ex100-WMP	7213	1786.0	1792.5	1792.3	1793.7	0.0071	12.1	1207	427	0.95	2.8
	4.22	AW FDS	5347	1785.5	1792.1	1790.6	1792.3	0.0045	5.7	1484	499	0.45	3.0
	4.22	Ex100-WMP	7213	1785.5	1791.4	1791.3	1792.5	0.0094	12.4	1154	455	1.06	2.5
	4.11	AW FDS	5347	1782.0	1788.6	1788.6	1789.7	0.0138	11.3	830	322	0.81	2.6
	4.11	Ex100-WMP	7213	1782.0	1788.8	1788.8	1790.4	0.0062	10.7	906	332	0.88	2.7
	4.05	AW FDS	5347	1779.0	1786.5	1784.6	1786.8	0.0046	6.0	1287	337	0.46	3.8
	4.05	Ex100-WMP	7213	1779.0	1785.6	1785.6	1787.2	0.0082	13.8	1001	294	1.04	3.4
	3.96	AW FDS	7213	1774.0	1782.5	1782.2	1783.2	0.0098	7.5	1411	739	0.65	1.9
	3.96	Ex100-WMP	7213	1774.0	1782.3	1782.3	1783.3	0.0055	9.0	1227	702	0.81	1.8
	3.86	AW FDS	7213	1770.0	1778.5	1777.5	1779.1	0.0069	8.3	1564	612	0.58	2.6
	3.86	Ex100-WMP	7213	1770.0	1777.8	1777.8	1779.2	0.0058	11.8	1173	490	0.87	2.4
	3.78	AW FDS	7534	1766.0	1774.7	1773.8	1775.5	0.0097	9.1	1572	900	0.68	1.8
	3.78	Ex100-WMP	7534	1766.0	1774.0	1774.0	1775.8	0.0085	12.9	991	367	1.03	2.7
	3.75	AW FDS	7534	1764.0	1773.1	1772.9	1773.7	0.0090	9.2	1849	970	0.65	1.9

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	3.75	Ex100-WMP	7534	1764.0	1773.4	1773.4	1774.2	0.0030	10.8	2121	990	0.66	2.1
	3.65	AW FDS	7534	1762.0	1769.9	1768.5	1770.4	0.0047	7.7	1949	702	0.50	2.8
	3.65	Ex100-WMP	7534	1762.0	1769.3	1769.0	1770.3	0.0044	11.6	1518	589	0.79	2.6
	3.60	AW FDS	7534	1760.0	1768.7	1767.8	1769.1	0.0047	7.9	2169	848	0.50	2.6
	3.60	Ex100-WMP	7534	1760.0	1768.1	1768.1	1769.2	0.0043	12.1	1742	788	0.78	2.2
	3.52	AW FDS	7534	1756.0	1765.3	1765.3	1766.1	0.0090	10.9	1697	832	0.68	2.0
	3.52	Ex100-WMP	7534	1756.0	1765.6	1765.6	1766.6	0.0035	11.6	1979	899	0.71	2.2
	3.48	AW FDS	7534	1756.0	1763.6	1763.3	1764.1	0.0086	9.7	1868	915	0.65	2.0
	3.48	Ex100-WMP	7534	1755.0	1763.6	1763.6	1764.5	0.0042	11.8	1949	929	0.77	2.1
	3.40	AW FDS	7534	1752.0	1760.2	1757.9	1760.7	0.0079	9.0	2024	1150	0.63	1.8
	3.40	Ex100-WMP	7534	1752.0	1760.0	1760.0	1761.0	0.0043	11.2	1913	980	0.78	2.0
	3.32	AW FDS	7534	1750.0	1756.5	1755.9	1756.9	0.0080	7.8	1913	1103	0.61	1.7
	3.32	Ex100-WMP	7534	1750.0	1756.3	1756.3	1757.1	0.0053	10.4	1752	1031	0.82	1.7
	3.21	AW FDS	7534	1746.0	1752.4	1751.7	1752.9	0.0067	6.7	1693	766	0.55	2.2
	3.21	Ex100-WMP	7534	1746.0	1752.6	1752.6	1753.5	0.0052	10.6	1664	770	0.82	2.2
	3.13	AW FDS	7534	1742.0	1750.5	1749.8	1751.0	0.0061	8.2	1772	639	0.55	2.8
	3.13	Ex100-WMP	7534	1742.0	1750.2	1750.2	1751.3	0.0047	11.4	1550	626	0.80	2.5
	3.07	AW FDS	7534	1742.0	1749.5	1748.1	1749.8	0.0036	6.6	2048	551	0.43	3.7
	3.07	Ex100-WMP	7534	1741.0	1748.4	1748.4	1749.5	0.0048	11.8	1479	543	0.82	2.7

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	2.97	AW FDS	7534	1738.0	1744.9	1744.9	1746.0	0.0161	11.4	5408	1723	0.87	3.1
	2.97	Ex100-WMP	13541.00	1736.0	1743.7	1742.2	1743.9	0.0042	3.8	3768.00	1490.0	0.41	2.5
	2.92	AW FDS	7534	1735.0	1743.2	1740.4	1743.3	0.0008	2.7	4673	1506	0.19	3.1
	2.92	Ex100-WMP	13541.00	1734.0	1742.7	1741.0	1742.9	0.0035	4.0	3989.00	1515.0	0.39	2.6
	2.90	AW FDS	13541.00	1733.5	1742.8	1740.6	1743.0	0.0021	5.4	4346.00	1205.0	0.33	3.6
	2.90	Ex100-WMP	13541.00	1734.0	1742.4	1740.2	1742.6	0.0013	3.8	4569.00	1194.0	0.32	3.8
	2.87	AW FDS	13541.00	1734.0	1742.6	1738.7	1742.7	0.0010	3.3	5273.00	1161.0	0.23	4.5
	2.87	Ex100-WMP	13541.00	1732.0	1742.2	1738.8	1742.4	0.0007	3.7	4484.00	935.0	0.26	4.8
	2.82	AW FDS	13541.00	1731.0	1742.0	1738.2	1742.2	0.0014	4.5	4152.00	696.0	0.28	6.0
	2.82	Ex100-WMP	13541.00	1730.0	1742.0	1737.9	1742.2	0.0009	3.8	4291.00	690.0	0.25	6.2
	2.73	AW FDS	13541.00	1728.0	1739.4	1737.8	1740.5	0.0061	11.0	1947.00	353.0	0.60	5.5
	2.73	Ex100-WMP	13541.00	1728.0	1738.2	1738.2	1740.8	0.0050	15.3	1548.00	319.0	0.89	4.9
	2.60	AW FDS	17136.00	1724.0	1735.9	1733.9	1736.4	0.0040	8.0	3642.00	709.0	0.44	5.1
	2.60	Ex100-WMP	17136.00	1724.0	1734.8	1734.8	1736.6	0.0040	13.5	2610.00	676.0	0.78	3.9
	2.52	AW FDS	17136.00	1722.0	1734.5	1731.2	1734.9	0.0028	7.3	3887.00	598.0	0.37	6.5
	2.52	Ex100-WMP	17136.00	1721.0	1733.1	1731.6	1734.2	0.0022	11.3	3088.00	556.0	0.60	5.6
	2.47	AW FDS	17136.00	1720.0	1733.6	1730.1	1734.2	0.0032	8.0	3279.00	433.0	0.40	7.6
	2.47	Ex100-WMP	17136.00	1720.0	1731.2	1730.9	1733.3	0.0044	15.0	2170.00	401.0	0.84	5.4
	2.40	AW FDS	17136.00	1718.0	1731.4	1727.5	1732.5	0.0051	10.9	2339.00	251.0	0.52	9.3
	2.40	Ex100-WMP	17136.00	1718.0	1729.9	1727.8	1731.9	0.0027	13.0	1953.00	243.0	0.68	8.0

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	2.33	AW FDS	17136.00	1717.0	1728.1	1726.5	1730.1	0.0102	12.8	1755.00	244.0	0.70	7.2
	2.33	Ex100-WMP	17136.00	1717.0	1726.9	1726.9	1730.4	0.0061	16.8	1470.00	230.0	0.98	6.4
	2.24	AW FDS	17136.00	1714.0	1724.5	1723.0	1725.7	0.0082	10.6	2260.00	402.0	0.62	5.6
	2.24	Ex100-WMP	17136.00	1714.0	1723.3	1723.3	1725.8	0.0056	14.5	1790.00	374.0	0.92	4.8
	2.17	AW FDS	17136.00	1714.0	1721.9	1720.4	1722.6	0.0075	8.9	2969.00	654.0	0.57	4.5
	2.17	Ex100-WMP	17136.00	1714.0	1720.9	1720.8	1722.6	0.0063	13.7	2324.00	615.0	0.95	3.8
	2.08	AW FDS	17136.00	1710.0	1718.3	1716.8	1718.9	0.0103	8.4	3002.00	784.0	0.63	3.8
	2.08	Ex100-WMP	17136.00	1710.0	1717.3	1716.8	1718.9	0.0112	14.2	2291.00	762.0	1.17	3.0
	2.00	AW FDS	17136.00	1708.5	1715.2	1714.2	1715.8	0.0092	9.1	3216.00	854.0	0.62	3.8
	2.00	Ex100-WMP	17136.00	1708.5	1714.6	1714.6	1716.0	0.0063	12.3	2659.00	844.0	0.92	3.2
	1.88	AW FDS	17136.00	1702.1	1712.9	1711.4	1713.5	0.0051	9.1	3508.00	711.0	0.50	4.9
	1.88	Ex100-WMP	17136.00	1702.1	1711.6	1711.6	1713.3	0.0048	13.5	2594.00	694.0	0.85	3.7
	1.85	AW FDS	17136.00	1700.0	1712.1	1709.6	1712.6	0.0034	6.8	3652.00	635.0	0.40	5.8
	1.85	Ex100-WMP	17136.00	1700.0	1711.0	1710.2	1712.2	0.0028	11.5	2975.00	615.0	0.66	4.8
	1.81	AW FDS	17136.00	1700.0	1711.4	1708.7	1711.9	0.0039	7.8	3313.00	531.0	0.44	6.2
	1.81	Ex100-WMP	17136.00	1700.0	1710.5	1709.4	1711.7	0.0030	12.6	2851.00	517.0	0.70	5.5
	1.75	AW FDS	17136.00	1698.0	1709.5	1708.0	1710.6	0.0063	9.9	2696.00	534.0	0.55	5.1
	1.75	Ex100-WMP	17136.00	1698.0	1708.4	1708.4	1710.6	0.0044	13.9	2096.00	488.0	0.82	4.3
	1.66	AW FDS	17136	1696.0	1706.7	1704.1	1707.4	0.0057	9.1	2879	516	0.52	5.6

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	1.66	Ex100-WMP	17136	1696.0	1705.4	1705.4	1707.7	0.0058	15.2	2049	465	0.94	4.4
	1.60	AW FDS	17136	1692.0	1705.3	1703.7	1706.0	0.0050	9.7	3240	623	0.50	5.2
	1.60	Ex100-WMP	17136	1692.0	1704.2	1704.2	1706.1	0.0041	15.0	2566	588	0.82	4.4
	1.56	AW FDS	17136	1692.0	1704.0	1702.8	1704.9	0.0068	10.0	2893	606	0.56	4.8
	1.56	Ex100-WMP	17136	1692.0	1703.3	1703.3	1705.2	0.0044	14.1	2456	583	0.82	4.2
	1.47	AW FDS	17136	1690.0	1701.3	1699.7	1702.0	0.0060	9.8	3024	602	0.54	5.0
	1.47	Ex100-WMP	17136	1690.0	1701.2	1701.2	1703.2	0.0040	14.6	2504	599	0.80	4.2
	1.37	AW FDS	17136	1688.0	1697.8	1696.4	1698.7	0.0077	9.8	2712	554	0.59	4.9
	1.37	Ex100-WMP	17136	1688.0	1696.8	1696.8	1698.9	0.0058	14.2	2183	523	0.92	4.2
	1.27	AW FDS	17136	1684.0	1695.3	1692.5	1695.8	0.0047	7.9	3501	704	0.44	5.0
	1.27	Ex100-WMP	17136	1684.0	1693.3	1693.0	1695.3	0.0043	13.5	2282	548	0.82	4.2
	1.18	AW FDS	17136	1680.0	1694.4	1689.8	1694.6	0.0015	5.3	6811	1631	0.26	4.2
	1.18	Ex100-WMP	17136	1680.0	1691.9	1691.9	1693.5	0.0028	12.6	3149	977	0.68	3.2
	1.09	AW FDS	17136	1680.0	1686.4	1686.0	1692.2	0.0482	23.6	1682	1233	1.71	1.4
	1.09	Ex100-WMP	17136	1680.0	1688.0	1688.0	1689.0	0.0040	12.3	4156	1695	0.78	2.5
	0.99	AW FDS	17136	1678.0	1684.5	1683.0	1684.7	0.0056	6.8	5183	1869	0.48	2.8
	0.99	Ex100-WMP	17136	1678.0	1684.6	1683.4	1685.0	0.0032	9.5	5107	1866	0.66	2.7
	0.84	AW FDS	17136	1670.0	1679.6	1677.6	1680.2	0.0089	8.8	3181	859	0.51	3.7
	0.84	Ex100-WMP	17136	1670.0	1677.9	1677.9	1680.7	0.0098	18.8	1900	535	1.20	3.6

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	0.75	AW FDS	17136	1666.0	1677.2	1675.7	1677.7	0.0040	7.8	4279	1080	0.44	4.0
	0.75	Ex100-WMP	17136	1666.0	1676.9	1676.1	1677.8	0.0023	10.5	3893	1047	0.60	3.7
	0.71	AW FDS	17136	1664.0	1675.6	1674.7	1676.5	0.0067	10.0	3024	760	0.56	4.0
	0.71	Ex100-WMP	17136	1664.0	1675.3	1675.3	1677.1	0.0041	14.8	2795	738	0.81	3.8
	0.63	AW FDS	17136	1664.0	1673.2	1671.8	1673.8	0.0067	9.1	3616	999	0.55	3.6
	0.63	Ex100-WMP	17136	1664.0	1672.6	1672.6	1674.0	0.0048	13.4	3013	942	0.85	3.2
	0.54	AW FDS	17136	1660.0	1669.2	1668.2	1670.1	0.0094	10.9	3097	890	0.65	3.5
	0.54	Ex100-WMP	17136	1660.0	1668.9	1668.9	1670.6	0.0055	14.8	2817	838	0.90	3.4
	0.43	AW FDS	17136	1655.0	1665.7	1664.0	1666.3	0.0055	8.6	3473	853	0.50	4.1
	0.43	Ex100-WMP	17136	1655.0	1664.3	1664.2	1666.0	0.0056	13.2	2428	676	0.89	3.6
	0.33	AW FDS	17136	1652.2	1663.1	1660.9	1663.8	0.0052	7.9	3156	710	0.48	4.5
	0.33	Ex100-WMP	17136	1652.2	1661.5	1661.4	1663.5	0.0048	12.8	2111	626	0.84	3.4
	0.20	AW FDS	17136	1646.0	1660.0	1658.8	1660.8	0.0050	9.8	3534	903	0.50	3.9
	0.20	Ex100-WMP	17136	1646.0	1659.1	1659.1	1661.1	0.0033	13.8	2817	795	0.73	3.5
Desert Hills	0.99	AW FDS	10259	1748	1758.0	1756.0	1758.1	0.0031	6.1	3504	1061	0.37	3.3
	0.99	Ex100-WMP	10259	1748	1757.5	1756.6	1757.9	0.0029	9.5	3043	1009	0.59	3.0
	0.90	AW FDS	10259	1748	1756.1	1754.5	1756.3	0.0047	7.7	2829	878	0.49	3.2
	0.90	Ex100-WMP	10259	1748	1755.5	1754.9	1756.2	0.0048	12.4	2377	817	0.82	2.9
	0.81	AW FDS	10259	1746	1753.8	1752.4	1754.0	0.0047	6.8	2896	929	0.46	3.1
	0.81	Ex100-WMP	10259	1746	1753.4	1752.7	1753.9	0.0043	10.4	2532	890	0.73	2.8

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	0.72	AW FDS	10259	1744	1751.5	1749.8	1751.8	0.0057	7.4	2822	1035	0.51	2.7
	0.72	Ex100-WMP	10259	1744	1751.0	1750.6	1751.6	0.0061	12.2	2308	956	0.88	2.4
	0.64	AW FDS	10259	1742	1749.9	1748.4	1750.1	0.0039	6.3	3243	1086	0.44	3.0
	0.64	Ex100-WMP	10259	1742	1749.4	1748.8	1749.9	0.0041	10.4	2656	1009	0.74	2.6
	0.56	AW FDS	10259	1740	1748.7	1746.9	1748.9	0.0030	6.1	3700	1249	0.39	3.0
	0.56	Ex100-WMP	10259	1740	1748.2	1747.2	1748.6	0.0030	9.7	3088	1128	0.64	2.7
	0.48	AW FDS	10259	1740	1747.6	1745.5	1747.8	0.0025	5.5	3646	1027	0.36	3.6
	0.48	Ex100-WMP	10259	1740	1747.3	1745.9	1747.5	0.0022	8.3	3265	992	0.56	3.3
	0.40	AW FDS	10259	1738	1746.3	1744.7	1746.6	0.0044	6.8	2900	935	0.47	3.1
	0.40	Ex100-WMP	10259	1738	1745.9	1745.1	1746.5	0.0035	9.7	2581	878	0.69	2.9
	0.39	AW FDS						N/A					
	0.39	Ex100-WMP	10259	1738	1745.1	1743.8	1745.6	0.0035	10.4	2747	951	0.70	2.9
	0.31	AW FDS	10259	1736	1744.2	1742.9	1744.4	0.0044	6.7	4098	1696	0.46	2.4
	0.31	Ex100-WMP						N/A					
	0.22	AW FDS	10259	1735	1743.2	1740.9	1743.3	0.0014	3.7	4659	1505	0.27	3.1
	0.22	Ex100-WMP						N/A					
Paradise	2.23	AW FDS	4179	1826	1832.5	1832.5	1833.3	0.0087	9.0	978	583	0.65	1.7
	2.23	Ex100-WMP	4179	1826	1832.7	1832.7	1833.6	0.0035	9.6	1070	596	0.69	1.8
	2.14	AW FDS	4179	1824	1827.1	1826.9	1827.5	0.0148	7.7	1039	700	0.77	1.5

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	2.14	Ex100-WMP	4179	1824	1827.1	1827.1	1827.7	0.0084	9.7	1050	701	0.97	1.5
	2.07	AW FDS	4179	1821	1823.9	1823.1	1824.1	0.0054	4.2	1501	780	0.45	1.9
	2.07	Ex100-WMP	4179	1821	1823.2	1823.2	1823.8	0.0125	8.6	959	750	1.09	1.3
	2	AW FDS	4179	1814	1819.9	1819.9	1820.9	0.0145	10.8	799	499	0.83	1.6
	2	Ex100-WMP	4179	1814	1820.5	1820.5	1821.3	0.0034	9.4	1171	638	0.68	1.8
	1.92	AW FDS	4179	1810	1815.3	1815.1	1815.9	0.0082	7.8	898	438	0.61	2.1
	1.92	Ex100-WMP	4179	1810	1815.1	1815.1	1816.0	0.0049	8.9	788	431	0.77	1.8
	1.83	AW FDS	4179	1806	1810.9	1810.7	1811.5	0.0119	8.4	872	439	0.72	2.0
	1.83	Ex100-WMP	4179	1806	1811.0	1811.0	1811.8	0.0058	9.8	883	440	0.84	2.0
	1.75	AW FDS	4179	1800	1805.4	1805.1	1805.9	0.0129	8.1	843	414	0.74	2.0
	1.75	Ex100-WMP	4179	1800	1805.3	1805.3	1806.2	0.0074	10.1	815	412	0.92	2.0
	1.65	AW FDS	4179	1796	1799.6	1799.2	1800.0	0.0106	7.2	868	551	0.67	1.6
	1.65	Ex100-WMP	4179	1796	1800.7	1800.7	1801.7	0.0066	10.5	796	360	0.90	2.2
	1.54	AW FDS	5763	1790	1794.8	1793.7	1795.2	0.0071	6.6	1207	631	0.56	1.9
	1.54	Ex100-WMP	5763	1790	1794.0	1793.8	1795.2	0.0122	12.7	768	527	1.18	1.5
	1.46	AW FDS	5763	1786	1792.2	1791.4	1792.6	0.0059	6.8	1706	848	0.49	2.0
	1.46	Ex100-WMP	5763	1786	1792.0	1792.0	1792.8	0.0033	9.1	1516	841	0.67	1.8
	1.37	AW FDS	5763	1782	1789.6	1787.4	1789.9	0.0053	7.0	1760	724	0.47	2.4
	1.37	Ex100-WMP	5763	1782	1787.9	1787.9	1789.6	0.0081	12.5	766	258	1.01	3.0

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	1.27	AW FDS	5763	1778	1785.2	1785.0	1786.0	0.0096	8.4	1132	646	0.62	1.8
	1.27	Ex100-WMP	5763	1778	1785.0	1785.0	1786.2	0.0038	9.6	1038	610	0.71	1.7
	1.21	AW FDS	5763	1776	1783.0	1781.8	1783.2	0.0046	5.7	1883	742	0.42	2.5
	1.21	Ex100-WMP	5763	1776	1782.0	1782.0	1783.1	0.0060	12.0	1220	663	0.89	1.8
	1.12	AW FDS	5763	1772	1778.6	1778.6	1779.5	0.0165	9.5	1023	529	0.78	1.9
	1.12	Ex100-WMP	5763	1772	1778.8	1778.8	1779.8	0.0052	10.0	1120	541	0.81	2.1
	1.04	AW FDS	5763	1770	1776.4	1774.5	1776.5	0.0031	4.9	2044	626	0.35	3.3
	1.04	Ex100-WMP	5763	1770	1775.5	1773.9	1776.0	0.0035	8.5	1537	570	0.67	2.7
	0.95	AW FDS	5763	1766	1773.5	1773.1	1774.1	0.0079	7.7	1259	598	0.56	2.1
	0.95	Ex100-WMP	5763	1766	1773.2	1773.2	1774.3	0.0039	9.6	1081	572	0.72	1.9
	0.89	AW FDS	5763	1764	1771.7	1771.0	1772.1	0.0056	6.4	1537	663	0.47	2.3
	0.89	Ex100-WMP	5763	1764	1771.7	1771.7	1772.6	0.0037	10.6	1407	661	0.71	2.1
	0.8	AW FDS	5763	1762	1766.8	1766.7	1767.4	0.0182	9.7	1192	676	0.81	1.8
	0.8	Ex100-WMP	5763	1762	1766.9	1766.9	1767.7	0.0070	11.2	1311	684	0.93	1.9
	0.72	AW FDS	5763	1758	1763.0	1761.9	1763.3	0.0061	5.9	1691	637	0.48	2.7
	0.72	Ex100-WMP	5763	1758	1762.4	1762.4	1763.2	0.0084	11.4	1210	612	1.00	2.0
	0.62	AW FDS	5763	1754	1759.7	1757.8	1760.1	0.0087	7.6	1404	640	0.58	2.2
	0.62	Ex100-WMP	5763	1754	1759.7	1759.7	1760.6	0.0043	9.8	1317	645	0.75	2.0
	0.53	AW FDS	5763	1750	1755.9	1755.1	1756.3	0.0086	7.8	1341	526	0.58	2.6
	0.53	Ex100-WMP	5763	1750	1755.4	1755.4	1756.5	0.0060	11.3	1114	490	0.88	2.3

Table E-8

Comparison of hydraulic results for Apache Wash

River	River Station	Plan	Discharge cfs	Minimum Channel Elev. feet	W.S.E.L. feet	Critical W.S.E.L. feet	E.G. Elev. feet	E.G. Slope ft/ft	Channel Velocity fps	Flow Area sq. feet	Top Width feet	Channel Froude No.	Hydraulic Depth feet
	0.44	AW FDS	5763	1746	1751.6	1750.6	1751.9	0.0091	6.5	1421	548	0.57	2.6
	0.44	Ex100-WMP	5763	1746	1751.2	1750.8	1751.8	0.0063	9.9	1284	533	0.87	2.4
	0.34	AW FDS	5763	1744	1748.3	1746.8	1748.5	0.0050	4.6	1693	560	0.42	3.0
	0.34	Ex100-WMP	5763	1744	1747.2	1747.2	1748.0	0.0120	11.7	1055	534	1.16	2.0
	0.28	AW FDS	5763	1738	1743.7	1743.4	1744.4	0.0155	9.1	1081	469	0.76	2.3
	0.28	Ex100-WMP	5763	1738	1744.1	1744.1	1745.2	0.0067	10.9	997	467	0.91	2.1
	0.17	AW FDS	5763	1732	1739.3	1738.7	1739.8	0.0065	6.5	1373	574	0.50	2.4
	0.17	Ex100-WMP	5763	1732	1739.2	1739.2	1740.2	0.0034	10.2	1330	573	0.70	2.3
	0.13	AW FDS	5763	1732	1738.0	1737.3	1738.4	0.0062	6.6	1529	591	0.50	2.6
	0.13	Ex100-WMP	5763	1732	1737.5	1737.5	1738.4	0.0047	9.8	1246	588	0.78	2.1
	0.04	AW FDS	5763	1726	1737.1	1733.6	1737.2	0.0011	3.5	2502	567	0.22	4.4
	0.04	Ex100-WMP	5763	1726	1736.9	1733.9	1737.1	0.0005	5.1	2455	563	0.29	4.4

APPENDIX F

Final HEC-RAS Base Model Output

APPENDIX F.1

Cave Creek FDS Model

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HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Upper Cave Creek and Apache Wash WMP
Project File : Cavecrk.prj
Run Date and Time: 8/20/99 3:49:04 PM

Project in English units

Project Description:
Upper Cave Creek and Apache Wash Watercourse Master Plan

For Cave Creek
above Cave Buttes Dam
by Stantec Consulting Inc. for the Flood Control
District of Maricopa County
FCD:

March 1999

PLAN DATA

Plan Title: Cave Creek FDS
Plan File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.p01

Geometry Title: Base Geometry (imported from FDS models)
Geometry File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.g01

Flow Title : Existing condition 100-year, 24-hour
Flow File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.f01

Plan Summary Information:
Number of: Cross Sections = 142 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 1

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 at all cross sections
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Program Selects Appropriate method
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
24.525	PF#2	0	0	0
24.646	PF#2	0	0	0
24.752	PF#2	0	0	0
24.845	PF#2	0	0	0
24.919	PF#2	0	0	0
25.01	PF#2	0	0	0
25.099	PF#2	0	0	0
25.18	PF#2	0	0	0
25.233	PF#2	1	8750	10400
25.326	PF#2	1	9180	10260
25.388	PF#2	1	9330	10450
25.458	PF#2	1	9581	10830
25.519	PF#2	1	9571	10750
25.58	PF#2	1	9639	10790
25.644	PF#2	1	9540	10760
25.699	PF#2	1	9583.8	10789.8
25.75	PF#2	1	9578	10950
25.843	PF#2	1	9627	11100

25.919	PF#2	1	9693	11150
26.044	PF#2	1	9934	11270
26.137	PF#2	1	9988	11210
26.239	PF#2	1	9931	11050
26.335	PF#2	1	9641	10650
26.43	PF#2	1	9781.12	10750
26.529	PF#2	1	9791.21	10650
26.623	PF#2	1	9641.05	10600
26.695	PF#2	1	9810.17	10920
26.775	PF#2	1	9800.99	10950
26.845	PF#2	1	9618.23	10700
26.921	PF#2	1	9726.09	10450
27.008	PF#2	1	9696.87	10400
27.106	PF#2	1	9771.98	10600
27.169	PF#2	1	9869.83	10770
27.226	PF#2	1	9929.17	10930
27.265	PF#2	1	9959.8	11000
27.32	PF#2	1	9694.13	11000
27.366	PF#2	1	9738.63	11000
27.417	PF#2	1	9878.99	10890
27.502	PF#2	1	9960.71	10600
27.604	PF#2	1	9772.54	10415
27.693	PF#2	1	9980.25	10480
27.797	PF#2	1	9976.19	10605
27.913	PF#2	1	9970.17	10450
28.023	PF#2	1	9772.23	10225
28.091	PF#2	1	9666.86	10145
28.157	PF#2	1	9623.6	10175
28.241	PF#2	1	9663.83	10265
28.326	PF#2	1	9836.34	10435
28.39	PF#2	1	9879.53	10530
28.462	PF#2	1	9892.28	10475
28.555	PF#2	1	9944.6	10450
28.657	PF#2	1	9948.21	10450
28.75	PF#2	1	9899.35	10550
28.847	PF#2	1	9911.57	10560
28.934	PF#2	1	9857.38	10510
29.012	PF#2	1	9940.76	10590
29.13	PF#2	1	9971.96	10650
29.258	PF#2	1	9794.05	10550
29.351	PF#2	1	9695	10400
29.387	PF#2	1	9570	10303
29.493	PF#2	1	9300	10160
29.538	PF#2	1	9300	10120
29.601	PF#2	1	9500	10060
29.663	PF#2	1	9650	10100
29.71	PF#2	1	9733	10033
29.715	PF#2	0		
29.72	PF#2	0		
29.77	PF#2	0		
29.85	PF#2	1	9448.5	10043.5
30.1	PF#2	1	9312.74	10022.59
30.2	PF#2	1	9405.25	10111.27
30.28	PF#2	1	9454.46	10030.37
30.42	PF#2	1	9630.32	10401.71
30.52	PF#2	1	9600.24	10300.97
30.65	PF#2	1	9587.94	10027.52
30.75	PF#2	1	9610.74	10162.09
30.85	PF#2	1	9912.4	10461.24
30.96	PF#2	1	9963.15	10706.14
31.05	PF#2	1	9934.2	10807.35
31.14	PF#2	1	9815.06	10606.14
31.17	PF#2	1	9683.7	10462.51
31.25	PF#2	1	9790.47	10387.38
31.34	PF#2	1	9949.9	10498.12
31.45	PF#2	1	9881.84	10506.3
31.54	PF#2	1	9928.9	10544.54
31.63	PF#2	1	9783.92	10440.3
31.75	PF#2	1	9721.77	10070.68
31.82	PF#2	1	9697.75	10037.6
31.87	PF#2	1	9701.03	10053.91
31.91	PF#2	1	9728.84	10052.71
31.98	PF#2	1	9714.66	10067.69
32.07	PF#2	1	9658.71	10052.73
32.15	PF#2	1	9489.68	10026.79
32.24	PF#2	1	9639.33	10025.71
32.33	PF#2	1	9762.3	10133.79
32.44	PF#2	1	9702.48	10201.41
32.49	PF#2	1	9685.98	10177.58
32.52	PF#2	1	9667.33	10227.32
32.62	PF#2	1	9780.39	10078.75
32.7	PF#2	1	9713.9	10015.97
32.8	PF#2	1	9808.83	10118.98
32.9	PF#2	1	9730.75	10044.51
32.99	PF#2	1	9795.91	10179.91
33.08	PF#2	1	9748.86	10110.26
33.17	PF#2	1	9801.23	10110.11
33.26	PF#2	1	9865.75	10162.31
33.36	PF#2	1	9929.39	10204.17
33.46	PF#2	1	9892.51	10173.02
33.56	PF#2	1	9961.19	10148.89
33.67	PF#2	1	9974.09	10087.27
33.77	PF#2	1	9849.5	10049.61
33.89	PF#2	1	9902.01	10140.46
33.98	PF#2	1	9965.57	10422.98

34.08	PF#2	1	9961.5910324.41
34.19	PF#2	1	9968.9210298.18
34.27	PF#2	1	9904.2 10062.8
34.36	PF#2	1	9588.6710029.56
34.45	PF#2	1	9720.6310139.88
34.54	PF#2	1	9758.6910201.86
34.63	PF#2	1	9775.8510116.79
34.73	PF#2	1	9777.0310047.61
34.83	PF#2	1	9679.2510078.21
34.88	PF#2	1	9780.45 10081.7
34.92	PF#2	1	9717.2110069.59
35.01	PF#2	1	9731.210098.31
35.09	PF#2	1	9765.51 10124.8
35.15	PF#2	1	9831.6310242.72
35.18	PF#2	1	9832.0910325.31
35.24	PF#2	1	9901.6710494.38
35.28	PF#2	1	9919.2810535.77
35.37	PF#2	1	9971.7610413.88
35.47	PF#2	1	9744.4310148.84
35.54	PF#2	1	9655.4410015.71
35590	PF#2	1	9596.810031.41
35690	PF#2	1	9755.33 10208.3
35770	PF#2	1	9805.57 10190.8
35870	PF#2	1	9928.56 10219.8
35960	PF#2	1	9729.72 10054.2
36060	PF#2	1	9672.86 10048.3
36180	PF#2	1	9957.1 10144
36230	PF#2	1	9969 10226.9
36310	PF#2	1	9868.28 10042.3
36400	PF#2	1	9876.4 10100.2

FLOW DATA

Flow Title: Existing condition 100-year, 24-hour
Flow File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.f01

Flow Data (cfs)

River	Reach	RS	PF#1	PF#2
RIVER-1	Reach-1	36400	28271	28271
RIVER-1	Reach-1	36310	28319	28319
RIVER-1	Reach-1	35690	28338	28338
RIVER-1	Reach-1	35.54	23200	23200
RIVER-1	Reach-1	34.92	23400	23400
RIVER-1	Reach-1	33.77	24000	24000
RIVER-1	Reach-1	33.56	24400	24400
RIVER-1	Reach-1	33.46	24700	24700
RIVER-1	Reach-1	33.26	30900	30900
RIVER-1	Reach-1	32.8	31200	31200
RIVER-1	Reach-1	32.49	31300	31300
RIVER-1	Reach-1	31.91	31400	31400
RIVER-1	Reach-1	30.85	33800	33800
RIVER-1	Reach-1	29.012	33800	33800
RIVER-1	Reach-1	26.845	36800	36800
RIVER-1	Reach-1	25.233	38200	38200

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF#1		Normal S = .003
RIVER-1	Reach-1	PF#2		Normal S = .003

GEOMETRY DATA

Geometry Title: Base Geometry (imported from FDS models)
Geometry File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.g01

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 36400

INPUT
Description:
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9837.8	2228.67	9876.4	2194.47	9900.8	2190.27	9928.8	2192.77	9963.1	2193.57
10000	2189.47	10047.9	2188.87	10073.8	2188.77	10085.3	2195.37	10123.6	2198.57
10201.9	2202.97	10223.1	2204.57	10266.5	2215.57				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9837.8	.065	9876.4	.065	10085.3	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9876.4	10085.3	510	480	490	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 36310

```
INPUT
Description:
Station Elevation Data     num=       16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9792.2 2205.67  9826.5 2194.17  9844.9 2192.07  9857.1 2191.17  9871.1 2184.37
  9882.2 2183.77  9908.1 2186.07  9940.9 2187.67    9953 2187.07    9965 2184.87
  9970.2 2179.37   10000 2179.37 10027.1 2184.27 10045.5 2185.47   10104 2227.27
 10113.1 2227.97

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9792.2    .065    9965    .045 10027.1    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9965 10027.1               350     420     430             .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 36230

INPUT
Description:
Station Elevation Data     num=       20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9917 2198.17  9927.9 2196.67  9958.2 2185.47    9969 2182.37  9979.9 2178.07
  9994.9 2174.97   10000 2174.87 10005.7 2177.07 10027.6 2176.57 10054.6 2180.57
 10062.6 2181.27 10082.7 2179.37 10098.2 2177.07 10130.4 2179.77 10158.1 2184.27
 10180.4 2183.97   10249 2182.27 10273.2 2185.77 10286.9 2192.57 10335.2 2227.77

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9917    .065    9969     .06 10130.4    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9969 10130.4               240     260     250             .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 36180

INPUT
Description:
Station Elevation Data     num=       22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9846 2201.97  9863.1 2200.57  9875.8 2199.17  9907.2 2180.47  9934.3 2180.07
  9944.4 2179.47  9957.1 2174.27  9973.8 2172.97   10000 2171.77 10011.3 2171.87
 10020.8 2174.67 10037.5 2174.57 10051.4 2176.27 10080.7 2175.97 10106.6 2171.17
 10127.2 2169.97   10144 2179.17 10173.6 2194.57 10198.7 2204.37 10228.7 2211.97
   10257 2222.67   10276 2228.57

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9846    .065  9957.1     .06   10144    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         9957.1   10144               580     630     630             .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 36060

INPUT
Description:
Station Elevation Data     num=       22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9405.7 2191.47  9435.6 2179.77  9501.1 2177.87  9552.2 2174.07  9585.6 2173.77
    9718 2173.47  9786.7 2171.97  9836.8 2171.47  9851.7 2171.77    9866 2174.97
  9876.3 2172.97  9886.6 2172.87  9914.1 2170.97  9957.6 2167.67  9970.2 2162.27
  9997.2 2160.97   10000 2160.87 10027.2 2163.87 10048.3 2169.97 10062.9 2194.07
 10081.5 2199.17 10091.8 2201.27

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9405.7    .065  9957.6    .035 10048.3    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         9957.6 10048.3               560     580     560             .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 35960

INPUT
Description:
Station Elevation Data     num=       21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9536.6 2194.47  9560.9 2179.27  9581.7 2172.17  9601.2 2170.57  9637.4 2171.67
  9730.1 2171.57  9778.9 2170.27  9827.3 2169.37  9891.1 2170.97  9910.4 2170.87
  9925.5 2172.47  9929.7 2167.27    9956 2164.57  9971.3 2160.47  9983.2 2162.37
   10000 2159.77   10038 2161.47 10054.2 2166.17 10067.5 2174.67 10093.2 2193.27
 10098.6 2194.07

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9536.6    .065  9929.7    .035 10054.2    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         9929.7 10054.2               450     480     450             .1       .3
```

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 35870

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9639	2201.27	9681.8	2171.37	9697.1	2171.37	9706.8	2166.67	9757.3	2166.37
9814.7	2168.87	9863.8	2168.27	9934	2165.27	9968	2164.77	9983.3	2157.57
10000	2157.87	10054.9	2158.77	10085	2160.47	10120.8	2162.87	10132.7	2162.97
10199.7	2162.27	10227.1	2162.67	10260.7	2167.67	10295.1	2181.77		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9639	.065	9968	.045	10120.8	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9968	10120.8	520	530	520	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 35770

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9633.5	2182.07	9659.3	2165.77	9681.6	2160.67	9716.2	2160.07	9752.1	2161.77
9772.7	2161.77	9793.5	2159.67	9861.7	2160.77	9922.8	2161.67	9931.1	2161.67
9949.6	2153.67	9984.7	2154.17	10000	2153.87	10023.9	2153.27	10042.7	2154.87
10092.1	2157.17	10124.4	2158.87	10167.8	2157.27	10204	2154.67	10216.5	2164.97
10245.1	2184.67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9633.5	.065	9931.1	.045	10092.1	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9931.1	10092.1	450	450	450	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 35690

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9549.8	2178.87	9571.8	2160.17	9605.2	2157.27	9639.6	2155.27	9703.8	2155.77
9734.9	2156.77	9768.1	2154.87	9804.5	2158.37	9931.6	2159.47	9937	2159.77
9952.2	2148.17	9971.8	2146.27	10000	2146.17	10031.8	2147.37	10050	2149.27
10140.7	2153.27	10171.5	2151.87	10203.6	2149.87	10228.2	2150.97	10240.7	2170.07
10260.7	2180.97								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9549.8	.06	9937	.045	10050	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9937	10050	460	530	470	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 35590

Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9355.2	2175.97	9383.2	2152.77	9422.1	2153.57	9489	2154.07	9565.5	2151.27
9596.8	2150.07	9612.8	2147.77	9644.1	2149.97	9674.1	2152.07	9698.4	2151.57
9739.3	2148.97	9801.8	2150.47	9856.1	2151.47	9901.6	2150.57	9916	2147.17
9932.1	2146.87	9941.3	2143.27	9974.3	2142.77	10000	2140.37	10013.4	2139.57
10031.4	2147.67	10068.4	2179.07	10076.3	2183.07				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9355.2	.06	9932.1	.045	10031.4	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9932.1	10031.4	430	460	440	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 35.54

INPUT

Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9398.1	2192.1	9408.5	2188.6	9417.3	2183.5	9426.1	2178.6	9433.1	2174.6
9439.5	2158.9	9452	2155.3	9455.7	2154.1	9479.1	2151.9	9495.8	2151.4
9502.2	2151.8	9512.9	2151.6	9538.1	2151.5	9564.4	2150.4	9571.3	2150.2
9580.5	2149.1	9584.1	2148.5	9587.8	2148.1	9601.6	2147.3	9606.1	2146.4
9606.5	2146.1	9635.4	2146.8	9655.1	2146.4	9693.5	2147.3	9696.8	2147.8
9705.6	2147.9	9714.2	2147.3	9751.3	2147.4	9763	2147.9	9776.1	2147.7
9795.6	2147.8	9804.6	2147.8	9818.9	2147.7	9830.5	2146.8	9851.9	2143.4
9856.1	2143.1	9862.2	2142.8	9883.3	2146.3	9886	2146.4	9898.8	2146.3
9901.9	2146.7	9905.9	2146.2	9911.9	2145.7	9916.7	2145.9	9923.7	2146
9932.1	2144.6	9941.6	2142	9946.8	2139.7	9948.9	2140.4	9955.4	2140.3

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  9966.5  2139.6  9972.9  2138.7  9981.5  2138.2  9989.4  2138.6   10000  2138.1
 10005.4  2138.7 10008.2  2138.5 10015.7  2139.5 10017.2  2140.2 10019.7  2140.6
 10022.3  2143.2 10023.8  2149.6   10025  2151.3 10026.8  2152.4 10029.4  2153.4
 10031.2  2154.4 10032.5    2155 10033.4  2156.1   10034  2156.5 10036.6  2158.7
 10038.8    2160 10040.9    2161   10043  2161.6 10048.2    2165 10049.8  2165.7
   10052  2167.1 10058.5  2170.1 10060.7  2171.1 10080.8    2173 10095.4  2174.1
   10123  2176.6 10138.3  2177.9 10207.1  2192.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9398.1    .065  9966.5     .06 10015.7    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9966.5 10015.7               400     388     400              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 35.47

INPUT

Station Elevation Data     num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9617.7  2178.8  9624.4    2176  9637.3  2174.1  9645.2    2166  9663.2  2166.7
  9703.2  2143.1  9725.1  2138.4  9736.9  2141.8  9750.5  2141.4  9763.8  2143.7
  9831.2  2144.1  9833.4  2142.8  9850.6  2142.7  9867.2  2142.6  9923.8  2143.1
  9961.2  2138.1  9969.3  2135.9   10000  2135.5 10020.8  2135.7 10037.9  2137.6
 10042.6  2137.4 10097.9  2142.5 10114.5  2142.5 10168.8  2142.2 10185.9    2142
 10205.4  2142.9 10234.9  2144.5 10267.4  2160.3 10290.3  2163.2 10297.1  2160.8
 10336.1  2176.6

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9617.7    .065  9961.2     .06 10042.6    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9961.2 10042.6               500     540     500              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 35.37

INPUT
Description:
Station Elevation Data     num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9898.9  2180.3  9954.5  2165.5  9984.4  2126.2   10000  2126.2 10011.3  2127.5
 10016.4  2129.4 10036.8  2131.6 10049.8  2129.5 10095.1  2130.8 10108.5  2134.7
 10146.9  2136.1   10161  2137.8 10214.6  2137.3 10256.6  2136.4 10285.6  2136.8
   10294  2135.4   10308  2137.6 10315.3  2135.6 10326.8  2138.3 10358.3  2138.8
 10372.3  2139.9 10424.8    2139 10525.7  2138.9 10540.7  2143.2 10589.6  2143.9
 10600.9  2142.8 10625.8  2142.5 10682.9  2146.4 10713.9  2153.4 10763.1  2182.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9898.9    .065  9984.4     .06 10095.1    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9984.4 10095.1               485     485     480              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 35.28

INPUT
Description:
Station Elevation Data     num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9858.9  2169.6  9895.6  2163.6  9930.4  2126.6  9971.2  2125.6  9982.6  2124.1
   10000  2123.7 10000.2    2124 10014.3  2124.3 10020.7  2126.9 10054.5  2133.5
 10091.1  2134.5 10101.2  2134.2 10111.3  2135.6   10206  2137.9 10257.4  2138.3
 10339.8  2138.4 10424.6  2137.3 10471.3    2137 10489.9  2135.1 10529.7  2135.4
 10563.9  2137.2 10588.3  2137.5 10626.5  2136.1 10669.9  2138.4 10739.9    2159

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9858.9    .065  9930.4     .06 10014.3    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9930.4 10014.3               180     181     180              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 35.24

INPUT

Station Elevation Data     num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9743    2170  9806.3  2162.8  9886.8  2153.1  9911.5  2125.1  9951.6  2126.2
  9981.1  2123.4   10000  2123.5 10005.3  2125.2 10017.5  2123.5 10048.8  2130.6
 10064.2  2132.7 10072.7  2131.3 10079.7  2135.4 10108.9  2133.8 10171.6    2136
 10249.4  2135.7 10293.9  2135.9 10301.3  2135.5 10318.8  2136.7 10379.5  2136.1
 10381.6    2143 10395.8  2143.4 10396.7  2135.5 10461.2  2133.5 10500.5  2133.1
 10540.2  2134.4 10568.9  2136.2 10591.9    2137 10592.4  2154.7   10630  2153.3
   10641  2144.4   10669  2145.5 10690.9  2148.3 10720.6  2158.3

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

9743	.065	9911.5	.06	10017.5	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9911.5	10017.5	310	311	330	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 *RS: 35.18*

INPUT
Description: Cross Section 35.18 located just south of Cahava Ranch Rd.

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9725.8	2153.7	9756.9	2153	9798.7	2128.4	9833.4	2125	9874.8	2124.4
9883.6	2122.4	9892.5	2122.2	9907.3	2123.6	9958.3	2121.5	9997.7	2119.9
10000	2119.6	10011.7	2120	10025.4	2129.8	10103	2126.4	10145.5	2126.3
10166.6	2129.7	10177	2129.9	10181.6	2129.1	10191.4	2129.1	10212.3	2132.4
10247.2	2133	10276	2131.6	10360.5	2127.5	10371.6	2128.4	10385.9	2129.5
10403.9	2129.6	10406.3	2140.7	10444.3	2140.1	10447.8	2133.9	10452.9	2140.7
10501.1	2159.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9725.8	.065	9883.6	.06	10011.7	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9883.6	10011.7	190	189	190	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 35.15

INPUT

Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9591.5	2157.4	9619.4	2153.2	9634.4	2145.9	9642.8	2147.7	9656.8	2145.4
9659.5	2145	9670.9	2149.1	9681.8	2145.8	9692.9	2137.6	9705.7	2137.6
9708	2128.8	9714.3	2126.7	9717.1	2137.7	9727.8	2137.4	9731.9	2126.3
9760.6	2127.3	9847.7	2124.7	9856	2121.9	9879.8	2122.4	9908.7	2122.3
9921.4	2119.7	9944	2119.3	9964.2	2121.4	9991.6	2117.3	10000	2117.5
10009.1	2118.3	10038.9	2127.5	10079.4	2126.7	10081.1	2138.2	10156.9	2140
10159.5	2124.9	10249	2126.2	10265.5	2123.9	10300.1	2127.2	10326.6	2127.9
10336.9	2129.9	10417.8	2156.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9591.5	.065	9908.7	.06	10009.1	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9908.7	10009.1	280	281	260	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 35.09

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9468.4	2169.9	9491.6	2166.9	9509.9	2164.4	9518	2162.6	9528.2	2158.4
9537.3	2147.3	9543	2146.9	9548	2146.6	9553.3	2144.1	9571.3	2132.5
9581.1	2128.7	9590.2	2127.2	9616	2125.8	9626.8	2125.1	9641.8	2125.5
9673.1	2125	9683.5	2125.1	9699.6	2125.4	9710.4	2125.5	9717.1	2123.6
9726.3	2121.2	9734.7	2120.8	9754.7	2121.6	9760.7	2122.5	9776.8	2123.1
9804.8	2122.9	9815	2123.8	9825.7	2122.7	9834.2	2122.1	9838.5	2123.1
9846.6	2123.3	9855.1	2122.4	9873.3	2118.1	9884.3	2115	9890.6	2115.7
9907.7	2118.8	9914.8	2119.2	9930.5	2119	9939.6	2117.6	9947.7	2115.8
9966.5	2115.3	9979.5	2114.5	10000	2114.4	10013.2	2114.5	10027.1	2123.7
10116.7	2123.5	10152.6	2123	10172	2120.7	10236.4	2126.2	10256	2126.6
10303.9	2130.9	10407.1	2168.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9468.4	.065	9884.3	.06	10013.2	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9884.3	10013.2	470	467	470	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 35.01

INPUT

Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9513.4	2165.4	9525.4	2163.6	9601.4	2119.4	9646.9	2116.9	9654.3	2118.6
9665.6	2118.5	9675.5	2119.7	9689.6	2119.2	9704	2115.6	9733.1	2115.2
9758	2118.7	9789.4	2118.1	9877.6	2117.5	9911.4	2117.9	9972	2118.4
9999.2	2109.9	10000	2109.9	10065.8	2112	10098.3	2115.8	10118.1	2120.7
10192	2122.7	10253.4	2125.5	10347.8	2150.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
  9513.4    .065    9972      .06 10098.3    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9972 10098.3               480     481     480              .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 34.92

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9561.4  2148.1  9570.9  2145.4  9589.1  2145.2  9644.8  2130.4  9670.6  2112.6
  9688.7    2112  9751.8  2111.9  9754.3  2111.7  9769.2  2112.1  9784.5  2113.3
  9791.7  2112.9  9833.2  2112.7  9859.1  2112.2    9905  2112.7  9921.9  2109.4
   10000  2107.9 10018.6  2107.9 10041.2  2108.6 10056.2    2109 10063.7  2111.2
 10077.8  2108.2 10090.4  2112.1 10103.4  2114.5 10114.1  2116.5 10132.3  2116.9
 10151.2  2118.7 10161.9  2120.1 10170.3  2120.1 10170.3  2120.9 10180.8  2124.7
 10195.9  2129.3 10228.2  2142.9 10243.4  2147.7 10252.7  2151.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9561.4    .065  9921.9     .06 10056.2    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9921.9 10056.2               200     207     200              .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 34.88

INPUT
Description:
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9522  2150.8  9588.2  2135.4  9601.1  2130.7  9616.8  2130.3    9645  2125.2
    9645  2123.3  9659.5  2122.1  9667.5  2121.6  9682.5  2121.5  9709.5  2110.1
  9729.7  2110.7  9749.8  2111.7  9760.6  2111.7  9773.7  2110.3  9792.2  2109.2
  9794.8  2108.9  9818.1  2108.3  9828.9    2108  9846.8  2110.4  9855.9  2110.8
  9883.9    2111  9885.1    2122  9916.5  2122.1  9918.9    2111  9943.6  2110.5
  9950.3  2108.2  9958.6  2107.2  9968.4  2105.4  9980.3  2102.8  9989.4  2103.3
   10000  2103.5 10011.2  2103.5 10012.5  2103.6 10028.6  2103.7 10046.3  2105.8
 10084.2  2108.2 10097.9  2106.8 10112.8  2112.5   10140  2116.2 10218.8  2145.4
   10238  2147.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9522    .065  9968.4     .06 10046.3    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9968.4 10046.3               250     262     270              .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 34.83

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9574.5  2120.5  9581.3  2120.4  9582.6  2132.9  9590.5  2133.6  9600.1  2120.2
  9631.8    2120    9638  2118.8  9654.5  2108.8    9665  2104.7  9673.4  2104.7
  9711.7  2105.8  9731.6  2106.8  9772.2  2106.8  9783.9  2106.5  9795.6  2108.6
    9807  2107.6  9832.2  2108.1  9867.5  2107.5    9892    2107  9928.7  2107.3
  9944.5    2106    9959  2102.8  9969.3  2100.6    9982  2100.2   10000  2100.2
 10001.1  2100.4 10028.2  2101.1 10041.9  2106.7 10050.2  2107.4 10053.9  2105.1
   10070    2105 10089.3  2103.9 10098.5  2109.9 10110.2  2110.5 10137.5  2111.2
 10155.8  2117.5   10162  2120.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9574.5    .065    9959     .06 10028.2    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9959 10028.2               510     509     510              .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 34.73

INPUT

Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9536.8  2128.2  9573.3  2122.7  9611.9  2108.9    9690  2103.1  9773.6  2099.9
  9780.3    2101  9827.3  2101.8    9841  2102.7  9852.9  2102.2  9922.3    2102
  9952.8  2097.5  9977.3  2096.4  9987.6  2095.3   10000  2095.3 10012.6  2095.5
 10020.1  2096.7 10047.6  2096.9 10082.3  2117.1 10111.7  2117.7 10138.9  2119.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9536.8    .065  9952.8     .06 10047.6    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9952.8 10047.6               520     510     480              .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 34.63
```

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9659	2134.2	9715.5	2104.8	9763.9	2091.1	9786.7	2092.9	9827	2091
9868.7	2093	9878.1	2094.6	9927.5	2095.4	9939.3	2091.3	9949.2	2093.7
9977.7	2093.8	10000	2089.3	10017.2	2092.3	10085.8	2094	10107.7	2092.6
10117.4	2092.5	10125.6	2094.3	10141.1	2093.2	10163.4	2108.2	10185	2111.7
10204.5	2111.8	10209.2	2113	10296.2	2115.4	10310.6	2120.5	10348.9	2127.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9659	.075	9977.7	.07	10017.2	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9977.7	10017.2	480	483	480	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 34.54

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9634.7	2136	9644.2	2133.5	9675	2129.9	9717.2	2105.6	9741.8	2084.2
9758.5	2087.4	9769.9	2086.2	9779.8	2087.6	9786.8	2088.7	9832.3	2089.7
9848.4	2090.8	9923.7	2091.9	9961	2092.5	10000	2084.1	10009.8	2084.5
10016.3	2086.9	10032.2	2088.1	10051.4	2090.1	10086.3	2089.4	10100.4	2091.7
10162.2	2089.9	10188.3	2086.5	10218.6	2087.2	10231.8	2098.1	10245.6	2104.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9634.7	.075	10000	.07	10032.2	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
10000	10032.2	520	494	480	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 34.45

INPUT

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9563.5	2126.6	9593	2125	9650	2090.8	9658.5	2084.6	9688.1	2085.1
9706.5	2084.4	9775.1	2083.7	9789.6	2081.6	9801.1	2083.8	9820.8	2081.2
9868.8	2086.6	9968.4	2089.3	10000	2082.9	10002.6	2082.3	10010.8	2080.7
10018.2	2080.9	10026.4	2082.9	10055.8	2082.3	10082.5	2080.4	10089.1	2080.9
10092.2	2082.3	10105.4	2083.6	10110.5	2085.1	10130.8	2080.2	10141.6	2081
10182.6	2088.2	10236.6	2106.9	10250.9	2107.8	10257	2108.5	10261.7	2108.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9563.5	.075	10000	.07	10026.4	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
10000	10026.4	440	461	460	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 34.36

INPUT

Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9496.9	2111.4	9560.7	2083.9	9565.3	2079.1	9579.4	2076.8	9625.2	2079.4
9650.5	2078.6	9677.3	2081.4	9717.4	2082.4	9733.6	2081.2	9772.2	2081
9784.3	2080.4	9793	2080.8	9804.6	2079.5	9822.3	2080.8	9831	2079.6
9862.4	2081.9	9885.3	2077.2	9892.2	2079.7	9911.5	2078.9	9917	2080.4
9949.2	2078.4	10000	2069.7	10002.8	2070	10016.7	2072.6	10026.4	2076.7
10064.7	2080.7	10112.8	2096.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9496.9	.065	9949.2	.055	10016.7	.075

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9949.2	10016.7	490	484	460	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 34.27

INPUT

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9718.4	2090.2	9735.9	2087.8	9751.9	2087.1	9816.9	2088.4	9820.3	2089.1
9864.4	2088.5	9904.2	2076.9	9929.6	2065.9	9949.7	2069.8	9982.4	2070.2
10000	2069.4	10045.4	2069.4	10061.9	2072.8	10104.5	2076.2	10145.3	2077.3
10198	2090.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9718.4	.065	9904.2	.055	9949.7	.075

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9904.2	9949.7	410	415	430	.3	.5

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 34.19

INPUT

Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9415.5	2119.4	9481.4	2119.2	9550.4	2118.6	9581.4	2118.4	9619	2117
9660.1	2113.4	9686.7	2109.3	9705.8	2106	9713.3	2105.1	9753.8	2097.4
9761.8	2095.2	9780.5	2091.9	9788.9	2090.4	9803.1	2087.6	9812.7	2084.5
9821.9	2082.6	9826.5	2081.6	9839.9	2080.2	9848.7	2078.9	9872.4	2078.4
9881.8	2078.2	9897.1	2078.5	9932.1	2077.7	9936.8	2076.9	9941.7	2076.5
9961.2	2065.1	9967	2065.2	9976	2063.9	9980.1	2060.1	9986	2060.2
9989.6	2059.9	9994.3	2058.7	9997.1	2057.6	10000	2056.5	10003.2	2057.8
10005.5	2058.6	10009.4	2060.4	10012.3	2060.7	10015.9	2063.8	10027.8	2064.2
10044.6	2066.5	10050.2	2067.1	10065	2067	10070.2	2066.6	10078.2	2067.2
10092.1	2067.2	10101.3	2069.8	10112.1	2070	10117.2	2069.7	10123.1	2069.9
10129.2	2070.6	10138.1	2070.1	10142.9	2070.3	10147.1	2070.4	10152.5	2071
10156.6	2070.3	10159.8	2070.1	10170.5	2071	10177.4	2070.8	10179	2070.3
10180.9	2070.3	10185.8	2070.3	10190.9	2071.3	10196.1	2071.2	10200.8	2070.2
10202.1	2071	10209.4	2071.4	10220.1	2071.2	10227.2	2070.2	10230.1	2070.5
10238	2071.1	10254.2	2068.4	10260.4	2068.5	10269.8	2069.5	10274.4	2070.4
10282	2070.4	10288.3	2070.8	10293.5	2071	10298.9	2070.5	10306.8	2070.6
10313.1	2071.1	10320.4	2069.6	10329.6	2069.7	10342.1	2071.4	10348.7	2070.3
10358.4	2072.8	10358.9	2100.7	10474.7	2169.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9415.5	.065	9976	.055	10015.9	.075

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9976	10015.9	570	572	570	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 34.08

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9781.3	2089.7	9810	2081.7	9837	2072.4	9857.8	2070.4	9881	2069.2
9918.2	2067.9	9932.7	2067	9946.4	2064.4	9952.3	2061.3	9956.8	2061.4
9961.1	2060.6	9963.2	2058.3	9984.2	2058	10000	2058.5	10007.5	2058.5
10007.5	2058.2	10043.9	2058.9	10049.7	2060	10061.7	2061	10069.6	2062.9
10080.6	2061.8	10099.3	2066.4	10151	2067.7	10177.8	2063.7	10196.8	2064.9
10204.5	2062.7	10228.1	2063.2	10249.9	2066.4	10295.3	2064	10306.2	2064.9
10316.6	2063.7	10335.8	2064.4	10351	2062.1	10416	2092.3		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9781.3	.07	9963.2	.055	10043.9	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9963.2	10043.9	540	544	540	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 33.98

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9836.9	2082.1	9842	2089.4	9867.5	2089.4	9868.3	2078.7	9886.3	2078.3
9913.1	2075.1	9923.6	2074	9936.6	2069	9956.3	2053.6	9965.2	2053.3
9975.9	2054	9984.5	2052.5	9992.5	2050.9	9999.9	2051.5	10000	2051.1
10013.5	2051.7	10025.4	2055	10054.5	2052.4	10073.1	2052.9	10082.4	2055.7
10092.5	2055.4	10101.3	2059.8	10125.9	2063	10137.9	2063	10171.8	2063.8
10198.7	2064.9	10212.3	2064.3	10228.3	2063.6	10238.8	2060.4	10254.9	2057.8
10268.1	2058.1	10289.6	2059.6	10320	2060.6	10335.4	2062	10335.4	2061.7
10358.8	2060.8	10378.3	2059.1	10407.5	2055.4	10418.6	2056.4	10442.3	2058.8
10461.8	2059.5	10496	2077.9	10533.3	2094.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9836.9	.07	9975.9	.055	10073.1	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.9	10073.1	490	494	430	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 33.89

INPUT

Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9784.3	2070.2	9806.6	2067.7	9869.8	2064.5	9912.5	2049	9973.6	2049.5
10000	2048.3	10006	2048.4	10015	2047.5	10036.9	2054	10081.4	2053.6
10092.3	2052.8	10108.2	2049.1	10117.5	2054	10157.2	2057.1	10209	2087.5

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
  9784.3     .07  9912.5    .055   10015     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9912.5   10015               620     606     580              .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 33.77

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9681.4  2069.9  9725.8    2067  9766.3  2066.3  9879.3  2045.1  9890.5  2041.2
    9900  2041.1  9904.2  2042.6  9911.9  2041.7    9919    2044  9974.8  2043.4
   10000  2040.9 10007.5  2040.9 10011.5  2039.3 10021.4    2040 10042.4  2043.3
 10076.3  2065.6 10089.4  2067.7 10091.4  2067.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9681.4     .07  9974.8    .055 10042.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9974.8 10042.4               530     552     550              .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 33.67

INPUT

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9824  2068.3  9876.9  2062.4  9938.9  2055.7  9976.8  2038.1    9987  2038.1
   10000  2035.7 10005.4  2035.7 10046.4  2036.1 10058.6  2037.6 10078.2  2042.7
 10087.3  2041.1 10102.2  2047.4 10180.3    2068 10181.9  2068.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9824     .07  9976.8    .055 10058.6     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9976.8 10058.6               600     585     580              .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 33.56

INPUT

Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9700.4  2072.3  9801.7  2050.8  9929.6  2049.4  9962.7  2027.5  9977.2  2026.9
  9991.4  2024.9   10000    2025 10013.1  2025.6 10027.1  2031.4 10066.7  2032.2
 10086.2  2037.9 10111.5  2039.5 10148.1  2038.4 10163.2  2036.3 10173.3  2036.7
   10188  2043.9 10197.6  2042.8 10219.9  2044.6 10266.6  2053.9 10282.5  2055.9
 10314.2  2056.4   10366  2058.7 10384.6  2059.9 10423.7  2061.3 10496.6  2067.3
 10522.5  2067.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9700.4     .07  9962.7    .055 10013.1     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9962.7 10013.1               520     510     510              .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 33.46

INPUT

Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9672  2057.9  9680.3  2055.4    9736  2038.3  9834.1  2037.1  9904.1    2036
  9920.6  2031.3  9936.2  2030.1  9948.9  2027.4  9982.3  2024.1   10000  2024.9
 10015.9  2024.9 10033.9    2027 10053.2  2027.5   10070  2028.8 10084.3  2032.7
 10106.3  2035.1 10142.4  2034.3 10160.2  2032.6 10175.9  2033.8 10182.3  2032.8
 10199.9  2033.5 10270.2  2046.7 10320.4  2052.3 10336.9  2052.4 10349.5    2056

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9672     .07  9948.9    .055 10033.9     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9948.9 10033.9               500     503     500              .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 33.36

INPUT

Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9854  2076.4  9873.3  2076.3  9875.7    2055  9880.3  2055.3  9907.3  2050.3
  9946.7  2022.7  9962.7    2021  9991.3    2021  9994.1    2021   10000  2020.6
 10014.8  2020.5 10021.8  2022.4 10041.7  2024.8 10056.2  2024.2 10066.7  2021.2
 10075.2  2021.3 10097.8  2028.6 10146.8  2028.6 10178.3  2027.3 10202.2  2025.7
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 10234.1  2039.1 10306.4  2047.3 10336.3  2052.4 10336.3  2052.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9854     .07  9946.7    .055 10021.8     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9946.7 10021.8               550     550     550              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 33.26

INPUT
Description:
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9758.2  2045.4  9827.6  2042.3  9858.9  2036.1    9872  2024.3  9888.1  2024.6
  9901.2  2026.4  9920.2  2026.2  9937.6  2023.4  9946.4  2020.4  9953.3  2021.9
    9988  2018.2   10000  2017.7 10024.6  2018.5 10044.9  2019.3 10116.6  2017.9
 10130.2  2019.1 10154.7  2019.8 10179.5  2022.8 10187.9  2029.5 10231.4  2046.5
 10233.1  2046.6

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9758.2     .07    9988    .055 10044.9     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9988 10044.9               480     481     500              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 33.17

INPUT
Description:
Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9705  2040.4  9716.1  2038.1    9760  2018.4  9772.3  2018.3  9778.9    2019
  9817.6  2023.8  9838.2    2025  9865.9  2023.9  9916.1  2017.3  9930.5  2019.7
    9942  2015.2  9966.8  2013.9  9983.4  2011.5   10000  2011.4 10038.7  2011.3
 10059.2  2013.9 10070.4  2013.9 10078.5  2012.6 10097.7  2012.4 10110.5  2015.7
 10123.1  2015.9 10136.1  2024.9 10179.9    2039

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9705     .07  9983.4    .055 10038.7     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9983.4 10038.7               490     475     475              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 33.08

INPUT

Station Elevation Data     num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9365.6  2049.4  9428.2  2045.7  9445.3    2045  9459.2  2047.4  9476.9  2046.5
    9508  2041.8    9526  2040.7  9551.5  2041.7  9609.3  2035.1  9663.6  2019.4
  9687.9  2016.8    9732  2014.7  9772.1  2015.1  9804.1  2014.2  9823.3  2013.2
  9858.3  2014.1  9908.2  2012.8  9939.8  2011.9   10000  2012.2 10071.1  2012.1
 10127.2  2012.8 10154.4  2017.6 10157.7  2022.8 10209.1    2034 10235.2  2034.3
 10263.8  2047.3

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9365.6     .07  9939.8    .055 10071.1     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9939.8 10071.1               480     472     450              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 32.99

INPUT
Description:
Station Elevation Data     num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9655  2039.4  9684.9  2036.6  9767.9  2006.9    9779  2009.5    9801  2008.5
  9809.6  2010.2  9828.6  2009.3  9840.8  2006.3  9850.3  2006.4  9863.7  2009.7
  9915.3  2011.1    9929  2009.3  9937.1  2006.5   10000  2005.8 10000.5  2005.6
 10041.7  2006.9 10082.2  2006.8 10086.7  2008.5 10096.8  2007.3 10104.6  2008.9
 10115.4  2009.4 10123.7  2008.4 10138.3  2008.5 10154.9  2006.8 10164.9  2005.5
 10179.1  2006.2 10198.8  2007.3 10234.1  2017.1 10253.8  2017.2 10276.6  2018.9
 10293.5  2026.9 10336.8  2028.1 10385.1  2031.1 10410.4  2036.2

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9655     .07  9937.1    .055 10041.7     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9937.1 10041.7               400     460     480              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 32.9
```

INPUT

Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9672.1	2016.1	9684.9	2014.8	9709.1	2006.4	9717.1	2001	9753.9	2000.7
9763.4	2003.7	9771.4	2003.7	9782.4	2005.5	9802.1	2004.3	9813.5	2002.3
9835.5	2004.9	9904.9	2005.7	9939.9	2004.6	9972.7	2003.3	10000	1995.3
10012.5	1995.3	10044.5	2006.1	10068.3	2007.8	10080.8	2008	10092.3	2008.9
10092.6	2008.8	10153.7	2021.6	10177.1	2021.1	10191.3	2022.4	10200.6	2023
10223.3	2028.4	10232.7	2028.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9672.1	.07	9972.7	.055	10044.5	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9972.7	10044.5	580	523	520	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 32.8

INPUT

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9371	2020.1	9396.6	2014.7	9433.4	2014.3	9448.5	2015.5	9486.9	2014.3
9511.1	2012.3	9520.8	2011	9533.3	2012.3	9565	2011.4	9571.1	2010.7
9624	2010.1	9644.1	2011	9653.4	2010.5	9689	2007.3	9753.1	2004.8
9789.8	2004.3	9793.7	2003.3	9800.4	2003.9	9820.7	2004.1	9843.2	2002.6
9899.7	2001.7	9913.6	1998.3	9923.4	2001.6	9940.1	2000.9	9951	1994.5
10000	1992.2	10021.8	1992.3	10042.7	1996.2	10083.6	1996.5	10098.9	1993.8
10114.5	1993.3	10164.5	2018	10202.7	2019.1	10220.3	2017	10237.5	2017.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9371	.07	9951	.055	10021.8	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9951	10021.8	540	539	540	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 32.7

INPUT

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9592.8	2005.1	9614.9	1999.4	9695.4	1998.7	9760.2	1998.8	9770.5	2000.9
9778.7	1999.2	9800	1999.7	9814.4	1996.6	9836.2	1996	9897.9	1995.3
9933.5	1987.8	9997.5	1986.7	10000	1986.5	10013.8	1992.4	10034	1995.8
10066.4	2009.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9592.8	.07	9933.5	.045	10000	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9933.5	10000	450	435	430	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 32.62

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9417.3	2009	9452.7	2008.2	9496.5	2005.1	9565.9	2004.3	9601.5	2000.8
9626	1995.1	9689.1	1994.5	9797.5	1993.9	9806.3	1993.4	9816.6	1994.5
9863.4	1994.2	9895.5	1991.8	9918.1	1990	9956.3	1986.8	9959.6	1985.5
10000	1985.6	10058.4	1986.7	10075.4	1991.1	10090.3	1992.3	10116.2	1988.8
10147.6	1997	10197.5	2000.1	10215.7	2000.4	10261	2003.4	10286	2006
10325.1	2005.5	10394	2005.1	10425.3	2010.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9417.3	.07	9956.3	.045	10058.4	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9956.3	10058.4	500	516	550	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 32.52

INPUT

Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9557.4	2001.1	9562.4	2000.6	9591.3	1992.9	9647.8	1991.4	9698.9	1990.7
9777.5	1990.4	9848	1989.5	9858.6	1990.6	9874.9	1990	9888.6	1985.7
9909.1	1984.3	9917.6	1982.4	9956.9	1982.8	10000	1982.7	10001.3	1982.6
10003.3	1982.1	10031.8	1982.7	10045.1	1983.7	10054.8	1988	10063.3	1987.1
10078	1989.9	10108.7	1990.2	10115.5	1989	10136.8	1989.4	10145	1988.5
10191.9	1987.9	10206.6	1989.6	10231.2	1988.9	10286.5	1998.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9557.4	.07	9917.6	.045	10045.1	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9917.6	10045.1	190	187	170	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 32.49

INPUT

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9513.3	2001.5	9545.3	2002	9589.5	1999.7	9622.5	1988	9676.9	1987.9
9728.4	1987.7	9735	1987.7	9735.3	1997.7	9808	1997.7	9808.3	1987.6
9823.1	1987.8	9832.2	1986.4	9846.9	1986.7	9862.1	1988	9916.5	1988.6
9929.9	1980.9	9941.4	1981.6	9946.7	1980.9	10000	1980.5	10012.2	1980.8
10034.3	1982.5	10044.4	1981.1	10071.9	1981.9	10083.5	1983	10092.2	1985.3
10106.8	1985	10118.9	1988.1	10135.5	1985.9	10145.4	1987.6	10156	1986.9
10200.4	1988.6	10205	1986.2	10211.3	1987.3	10215.9	1986.2	10232.2	1990.3
10253.9	1989.6	10259.5	1990	10283.3	1992	10292.8	1994	10338.5	1996

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9513.3	.07	9929.9	.045	10012.2	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9929.9	10012.2	250	247	220	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 32.44

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9354.4	2009.2	9404.1	2008.1	9418.3	2007.4	9441.6	2007.2	9486	2004.7
9521.6	2004.2	9526.3	2004.7	9572.6	2003.6	9608.1	2000.2	9652.6	1983.5
9727.9	1985.3	9770.9	1985.9	9791.9	1984.5	9800.2	1985.2	9824.5	1985.5
9828.9	1985.1	9836.1	1985.2	9883.4	1985.8	9935.3	1986.5	9939.1	1983.6
9958	1982.3	9973.7	1977.5	10000	1977.5	10018.9	1978.2	10039.1	1980.6
10056.8	1978.6	10088.2	1979.3	10095.6	1981.6	10106.4	1981.3	10125.2	1983.2
10151.8	1983.7	10162.5	1985.2	10170.8	1983.7	10234.9	1984.9	10239.7	1984
10246.9	1983.7	10289.2	1991.2	10312	1991.8	10384.5	1998.1	10420.6	1999.3
10448.6	2003.2	10464.8	2003.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9354.4	.07	9973.7	.045	10018.9	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9973.7	10018.9	580	576	570	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 32.33

INPUT

Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9642.9	1993.3	9658.4	1992.5	9679.3	1987.8	9698.3	1984.4	9711.3	1983.5
9724.8	1979.9	9740.2	1979.9	9750.1	1979.8	9757.4	1977.8	9760.3	1977.9
9767.1	1979.5	9777.5	1979	9805	1980.1	9833	1980.5	9840.5	1981.1
9853.4	1980.9	9870.4	1981.3	9884.8	1981	9893.5	1979.9	9900.3	1981.1
9907.7	1980.8	9927.6	1981.2	9938.4	1980.8	9940.6	1977.8	9947.9	1974.8
9957	1973.4	9963.9	1973.5	9970.4	1973.2	9982.4	1973	9990.6	1972.7
10000	1972.5	10011.8	1972.6	10025.5	1973.4	10046.9	1973	10055.1	1974.1
10072	1974.4	10088.3	1980.2	10097.8	1978.8	10117.7	1979.4	10126.2	1977.4
10132.6	1978.1	10144.8	1976.6	10184.5	1985.4	10189.4	1984.4	10225.7	1985.9
10276.7	1986.4	10348.4	1988.5	10395.5	1989.1	10409.1	1989.5	10419.2	1989.1
10447.1	1991	10453.2	1991.9	10460.9	1993.7	10467.4	1995.2	10473.7	1998.2
10484.8	2001.9	10488.3	2004.6	10499.3	2006.6	10517	2010.9	10523.7	2013.2
10532.2	2016.3	10532.8	2016.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9642.9	.07	9947.9	.045	10055.1	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9947.9	10055.1	470	471	480	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 32.24

INPUT

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9478.7	1990	9498.6	1988.1	9517	1989.7	9542.7	1987	9593.8	1974.1
9603.9	1976.8	9622	1975.2	9627.6	1976.6	9662.3	1977.1	9674	1975.8
9681.2	1976.5	9707	1976.3	9729	1976.9	9753.8	1977.1	9806.7	1977.5
9813.1	1976.9	9822.2	1977.3	9838.4	1977.3	9847.3	1976.3	9859.2	1977.7
9895.5	1976.5	9918.5	1970.1	9939	1970.3	9962.1	1969.5	9998.7	1969.5
10000	1969.1	10014.1	1968.5	10025.7	1968.4	10050.4	1978.4	10067.7	1978.4
10100.5	1981.7	10131.9	1982.7	10137.3	1981.2	10141.9	1981.1	10146.5	1982

10188.7	1983.4	10199	1982.8	10284.8	1985.7	10314.4	1959.2	10346.2	1999.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9478.7	.07	9962.1	.045	10025.7	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9962.1	10025.7	460	470	470	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 32.15

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9350.6	1989.9	9398.7	1986.9	9415.9	1984.2	9457.2	1968.8	9470.8	1972.1
9492.2	1969.9	9500.2	1972.8	9545.5	1974.4	9581.7	1973.2	9588.3	1972.5
9639.9	1973.8	9680.1	1971.5	9697.2	1972.5	9704.7	1972	9712.8	1972.8
9752.4	1972.7	9759.9	1973.3	9818.6	1974	9825.4	1973.2	9838.7	1974.2
9874.7	1973.3	9887	1968.7	9967.5	1963.7	10000	1963.7	10009.8	1965.8
10012.5	1968.6	10043.3	1974.1	10060.1	1975.1	10075.3	1974.4	10081.5	1973.6
10085.5	1973.9	10090.9	1975	10133.2	1976.1	10152	1976.5	10184.5	1978
10196	1980.7	10214.2	1980.7	10261.3	1988.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9350.6	.07	9967.5	.045	10009.8	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9967.5	10009.8	440	415	420	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 32.07

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9489.5	1981.2	9506.5	1981.9	9529.9	1982.9	9563.1	1983.3	9596.1	1981.4
9609.2	1977.8	9627.7	1967.5	9636.6	1966.3	9666.9	1967.3	9716.2	1969.3
9734.9	1970.4	9755.7	1968.9	9795.3	1970.1	9850	1970.7	9861.2	1968.5
9872.8	1966.7	9879.9	1962.8	9893.6	1970.4	9899.6	1968.3	9916.1	1968
9939.1	1966.6	9948.6	1965.3	9968.3	1962.3	9982.7	1959.8	10000	1960.1
10008.1	1960.3	10028.3	1961	10047.5	1963.7	10058.8	1965.6	10069	1968.3
10088.2	1971.5	10103.7	1972.7	10153.2	1973.5	10183.1	1978.8	10204	1984.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9489.5	.07	9968.3	.045	10028.3	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9968.3	10028.3	535	496	495	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.98

INPUT

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9386.7	1977.4	9455.2	1978.4	9508.8	1978.2	9544.1	1978.6	9607.2	1978.2
9639.5	1977	9645.9	1974.6	9680.2	1973	9687.2	1971.6	9706.4	1958.7
9733.7	1959.7	9741.7	1960.5	9753.9	1962.8	9765.7	1963.8	9785.6	1962.6
9826.4	1964.6	9898.8	1966.1	9937.7	1965	9948.6	1958.8	9958.4	1956.5
9979.9	1956.5	10000	1956.5	10013.9	1957.7	10034.1	1959.4	10052.6	1958.7
10066.3	1961	10078.2	1963	10091.7	1966.1	10114.2	1968.2	10120	1968.1
10133.8	1967.9	10142.5	1969	10166.5	1971.1	10181.8	1975.5	10198.7	1975.3
10211.4	1976.2	10220.6	1975.8	10236.3	1977	10244.4	1980.3		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9386.7	.07	9958.4	.045	10013.9	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9958.4	10013.9	400	380	380	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.91

INPUT

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9345.6	1976.6	9358.7	1976.6	9374.7	1974.8	9435.3	1972.1	9476	1971.2
9500.1	1969.6	9562.8	1971.2	9622.1	1970.8	9636.6	1972	9656.6	1971
9686.4	1963.7	9704.8	1959.7	9716.5	1960.1	9720.7	1958.7	9730.6	1961.5
9740.5	1960.3	9793.6	1959.1	9812.1	1957.7	9816.1	1956	9828	1956
9842.6	1959.3	9856.4	1961.4	9879.9	1958.9	9894.2	1959.2	9914.2	1959.2
9933	1959.7	9940	1959	9949.2	1956	9968	1954.5	9982.5	1954
10000	1953.3	10025.9	1953.4	10025.9	1953.5	10050.7	1961.3	10078.7	1962.7
10084.7	1962.6	10106	1963.8	10139	1964.8	10170.4	1966	10188.1	1967.8
10199.5	1968.7	10207.3	1970.1	10222.6	1973.4	10230.9	1976.9	10243	1977.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9345.6	.07	9968	.045	10025.9	.07

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
9968	10025.9	240	208	210	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.87

INPUT

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9334	1977.9	9338.7	1977.5	9412.3	1975.9	9429.6	1975.8	9440.8	1975.1
9549.4	1971	9622.9	1969.3	9640.8	1968.8	9667.9	1955.8	9681.8	1954.9
9690.9	1956.6	9720.3	1957.2	9781.8	1957.2	9801	1957.1	9810.2	1956.7
9828.3	1963.5	9839.4	1963.3	9861.7	1953.4	9901.8	1953.4	9938.9	1953.2
10000	1952.7	10017.6	1956.1	10035	1957	10046.1	1959.4	10068.7	1959
10077.7	1961.5	10084.5	1960.7	10108.5	1961.3	10154.5	1961.4	10172.2	1961.1
10255.5	1961.9	10327.1	1962.5	10369.1	1963.5	10384.7	1964.2	10402	1965.9
10410.2	1967	10436.1	1976.2	10481	1992.9				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9334	.055	9861.7	.055	10000	.05

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
9861.7	10000	360	361	370	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.75

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9357.2	1973.9	9401	1972.1	9427	1972.2	9465.7	1971.5	9482.8	1970.7
9497.3	1970.5	9517.5	1969.6	9535	1968.6	9569.1	1958	9580	1956.1
9600.1	1955.6	9620.2	1955.1	9640.7	1955.2	9671	1955.2	9699.4	1955.2
9797.4	1954	9807.2	1951	9817	1951.4	9830.1	1947.9	9838.9	1947.8
9849.4	1947.7	9874.7	1951.2	9893.5	1951.4	9936	1950.8	9965.9	1948
9988.6	1946.5	9994.7	1946.9	10000	1947.2	10016	1951.4	10027.6	1953
10055.5	1953.5	10095.7	1954	10148.4	1957.1	10176.9	1957.3	10201.8	1957.5
10202.3	1957.4	10265.2	1957.5	10341.9	1957.8	10415.1	1958.4	10486.4	1959.7
10533.3	1960.5	10567.4	1961.2	10582.5	1964.1	10604.2	1976.2	10610.4	1976.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9357.2	.055	9936	.055	10016	.05

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
9936	10016	680	647	650	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.63

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9486	1965.9	9514.4	1963.3	9537	1961.5	9573	1960.4	9621.6	1958.6
9678.4	1958.7	9697	1959.6	9730.5	1959.6	9746.7	1958.1	9772.3	1949.7
9784.7	1946.2	9790.7	1946.2	9798.9	1949	9843.2	1948.9	9868.4	1948.3
9876.6	1944.8	9884.3	1947.5	9917.9	1947.6	9928.5	1946.4	9961.1	1947.3
9972.7	1942.5	9988.2	1940.5	10000	1940.6	10001.6	1940.7	10023.2	1940.7
10037	1941.7	10056.6	1944.7	10070.9	1945.2	10102.8	1945.1	10113.1	1944.7
10125.9	1946.9	10153.9	1948.2	10190.6	1948.6	10229.8	1947.5	10260.8	1947.3
10312.4	1947	10336.4	1946.3	10337.3	1947.6	10346	1947.7	10361.7	1950.5
10392.2	1949.2	10414.1	1948.8	10424.8	1946.3	10444.7	1948.2	10460.1	1951.7
10492.2	1952.9	10511.8	1952.8	10540	1952.1	10555	1952.4	10593.1	1952.2
10675.7	1952.4	10701.9	1956.7	10708.4	1956.6	10719.5	1955.2	10734.4	1953.6
10796.3	1953.2	10875.6	1953.9	10943.5	1954.5	10978.6	1955.5	11012.1	1956.7
11068.9	1956.7	11116.6	1960.1	11132	1964.7	11135.4	1966.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9486	.055	9972.7	.055	10037	.05

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
9972.7	10037	450	453	430	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.54

INPUT
Description:
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9679.3	1961.2	9720.5	1960.4	9734.8	1959.1	9767.8	1955.3	9792.3	1952.7
9815.2	1950.7	9827	1951	9840.9	1948.5	9866.8	1952.2	9887.5	1953.3
9903.1	1953.1	9928.9	1940.2	9945.4	1940.1	9977.3	1940.2	10000	1940.3
10041.5	1941.1	10050.6	1940.6	10073.6	1940.7	10094	1942	10112.1	1941.9
10138.9	1942.1	10155.4	1942.2	10165.5	1944.3	10182.8	1946.3	10201.5	1945.8
10229.8	1946.2	10266.6	1946.9	10296.7	1946.7	10320.8	1944.2	10335.4	1945
10361.1	1944.8	10368.2	1943.4	10400	1941.6	10407.2	1940.6	10429.9	1940.7

10439	1941.7	10456.4	1941.5	10470	1945	10481.4	1946.2	10490.5	1946
10514.6	1943.2	10525	1945.2	10538.9	1941.4	10556	1948	10565.9	1948.9
10611.6	1948.3	10647	1947.9	10681.6	1947.6	10740.1	1947.4	10772.5	1948
10778	1946.8	10783.6	1947.9	10820	1948.4	10875.2	1948.4	10907.6	1951.6
10932.1	1952	10948.1	1951.9	10970.9	1948.8	11007	1948.8	11074	1949.4
11152	1950.2	11179	1950.6	11191	1951.9	11214.6	1954.5	11237.4	1961.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9679.3	.055	9928.9	.055	10073.6	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9928.9	10073.6	475	484	475	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.45

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9593.4	1951.3	9608.3	1951.1	9633	1950.8	9686.7	1951.2	9717	1951.8
9752.2	1952.3	9794.4	1951.3	9819.3	1947.8	9827.8	1948.9	9836.9	1946.7
9850	1944.6	9861.9	1933.4	9869.7	1933.1	9885.4	1933.7	9905.9	1937.6
9927.1	1938.3	9964.4	1936.2	9983.8	1935.2	9993.3	1933.6	10000	1933.3
10008.5	1933.3	10009.4	1933.8	10031	1941.1	10073.8	1941	10110.3	1941
10145.4	1940.3	10163.5	1939.8	10168.6	1939.1	10186.5	1941.7	10204.8	1941.5
10230.5	1939.5	10250.8	1939.5	10270.7	1938.2	10293.2	1937.5	10327.6	1938.3
10334.1	1938.7	10346.9	1942.7	10385.9	1942.5	10399.4	1941.7	10439	1937.4
10462.8	1939.3	10480.5	1941.9	10521.6	1941.8	10537.7	1940.8	10548.4	1942
10567.9	1942	10608.9	1942.1	10642	1942.4	10694.7	1945.4	10736.6	1945.2
10772.4	1944.2	10791.9	1944.1	10798.3	1943.2	10804.4	1943.9	10813.1	1944
10840.1	1944	10862.6	1944.1	10879.9	1944.8	10899.7	1949.7	10911.8	1955.6
10914.5	1957.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9593.4	.055	9927.1	.055	10009.4	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9927.1	10009.4	590	592	620	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.34

INPUT

Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9664.3	1943.7	9718.8	1943.4	9793	1939.1	9862.7	1937.3	9930.2	1937.1
9935.3	1935.5	9949.9	1933.3	10000	1931.5	10027.2	1933.2	10104.9	1934.1
10113.8	1933.1	10116.6	1932.9	10126.5	1935.4	10137.5	1936.5	10146.5	1935.1
10157	1934.7	10166	1932.9	10178	1932.1	10184.4	1932.9	10196.8	1936.1
10210.6	1936.6	10248.8	1936.5	10254.7	1936	10322.1	1935.9	10332.9	1935.1
10365.4	1935.1	10379.2	1932.4	10391.1	1932.8	10394.9	1931.5	10412.7	1931.9
10417	1934.9	10429.2	1935.8	10471.2	1935.2	10485.5	1935.9	10497.1	1935.8
10509.7	1934.5	10532.2	1933.7	10540.5	1933.8	10545.2	1934.1	10573.6	1955.4
10590.5	1959.4	10613.5	1968.5	10631.3	1972.9	10638.7	1972.3	10644.8	1973.8
10668.5	1976.6	10691.3	1980.9	10738.1	1986.1	10779.5	1989.5	10790.8	1989.3
10807.6	1991.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9664.3	.055	9949.9	.055	10027.2	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9949.9	10027.2	450	474	450	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.25

INPUT

Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9148.7	1951.6	9191.9	1950.7	9235.1	1949.2	9259.5	1948.1	9266.4	1946.6
9276.1	1948.3	9290.3	1945.8	9314.9	1944.3	9336.4	1941.9	9352	1940.1
9373.1	1938.6	9395.2	1936.9	9406.7	1936.4	9423.4	1935	9428	1935
9443.4	1935.2	9455.8	1933.5	9478	1932.7	9501.1	1932.3	9505.3	1931.6
9509.8	1932.3	9528.7	1932.8	9546.8	1932.9	9565	1932.5	9570.8	1931.7
9591.6	1932.8	9610.1	1933.2	9655.8	1934.5	9676.8	1934.5	9701	1934.9
9746.6	1934.9	9783.9	1934.1	9798.6	1926	9809	1925.5	9818.8	1925.4
9828.6	1928.3	9837.7	1929.5	9857.7	1930.7	9867.3	1931	9881.1	1931.1
9937.9	1928.7	9978.9	1927.2	9992.1	1926	9998.1	1926	10000	1926.1
10008.2	1925.9	10019.5	1927.4	10031.4	1931.4	10041.9	1932.1	10070.2	1932
10095.4	1931.1	10102	1931	10114	1930.7	10132.1	1928.7	10149.7	1930.9
10161.2	1929.9	10181.8	1931.8	10190.3	1931.8	10215.9	1932.1	10261.6	1932.1
10286.1	1931.9	10318.8	1931.3	10340.5	1932.6	10366.6	1932.7	10388.8	1931.9
10413.5	1931.8	10430.7	1931.3	10443.2	1929	10452.1	1928.6	10466	1929.3
10515.4	1959								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9148.7	.055	9881.1	.05	10031.4	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9881.1	10031.4	400	432	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.17

INPUT

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9276.7	1946.7	9297.9	1947.1	9332.3	1946.2	9364.7	1945.1	9393.8	1943.9
9423.7	1941.9	9454.5	1940.2	9466.6	1938.9	9479.1	1938	9491.6	1936.3
9506	1932	9521.4	1929.3	9545.1	1928.2	9557.8	1926.9	9562.9	1928
9579.7	1928.1	9634.1	1929.3	9653.3	1929.5	9726.8	1928.9	9786.7	1929
9825.3	1929.9	9852.5	1931.1	9871.9	1922.6	9888.2	1922.6	9897.9	1920.8
9911	1921.3	9918.2	1924.7	9936.1	1924.7	9965.1	1923.2	10000	1921.7
10001.5	1921.7	10054.8	1923.1	10062.1	1923.8	10080.5	1926.2	10099.2	1926.9
10124.8	1927.8	10152.6	1926.8	10182.8	1928.2	10210.3	1930.9	10228.1	1928.3
10247.7	1926.1	10279.7	1924.7	10302.1	1928.2	10328.3	1928.8	10367.3	1928.5
10402.1	1928	10441.8	1926.3	10469.9	1924.6	10497	1925.2	10536.2	1935.7
10560.4	1941.3	10589.2	1945.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9276.7	.055	9965.1	.05	10054.8	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9965.1	10054.8	130	162	130	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.14

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9402.7	1946.4	9434	1945.9	9488.8	1943.4	9535.4	1940.4	9567.5	1937.7
9585.1	1936.6	9604.8	1932.6	9617.8	1929.8	9630.5	1927.3	9636.3	1928
9669.3	1927.7	9692.5	1927.8	9713	1927.9	9756.8	1927.5	9801.2	1926.6
9847	1926.6	9879.8	1927.5	9908.3	1928.2	9926.4	1928.7	9939.6	1922.6
9947.4	1921.1	9965.8	1920.2	9973.5	1919	9983.1	1919.2	10000	1917.8
10010.3	1918.4	10026.5	1920.5	10045.6	1924.5	10071.7	1925.6	10108.7	1926.9
10146.3	1928.3	10165.5	1928.3	10175.7	1928	10200.1	1926.5	10211.8	1925.2
10216.9	1923.6	10228.2	1923.6	10244.9	1922.4	10260.3	1927.1	10283.8	1928
10333.2	1927.9	10349.7	1926.4	10374	1927.2	10391.8	1926.2	10409.7	1925.9
10420.3	1924.3	10437	1923.7	10478.4	1926.1	10521.1	1925.7	10538.5	1925.7
10563.6	1926	10576.4	1926.4	10583.9	1922.6	10593.2	1924.5	10604.4	1924.1
10631.6	1924	10648.6	1925.6	10664.9	1931.2	10690.6	1939.2	10736.3	1942.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9402.7	.055	9965.8	.05	10026.5	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9965.8	10026.5	500	467	350	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.05

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9739.6	1935.3	9752	1935	9786	1936	9827.6	1937.6	9860.3	1938
9874.9	1932	9891.8	1918.8	9913.5	1918.9	9925.9	1920.4	9934.2	1918.3
9959.6	1917.1	9981.5	1917.8	10000	1917.8	10017.7	1918.1	10031.9	1919.2
10043.6	1920.9	10072.9	1920.4	10087.3	1921.7	10103.6	1922.6	10109.5	1923
10135.9	1922.9	10144.8	1921.9	10184.5	1922.2	10203.3	1921.3	10234	1923.4
10256.6	1923.4	10289	1922.9	10317.1	1923.9	10318.2	1923.8	10374.4	1923.3
10391.5	1922.2	10406	1923.4	10427.9	1921.5	10450.6	1921.6	10476.8	1924.3
10506.7	1924.3	10573.2	1922.6	10624	1921.7	10643	1921.8	10662.9	1920.7
10673.1	1919.2	10689.1	1920.8	10706.9	1920.3	10715	1917.2	10722.6	1916.9
10745	1921.9	10764.6	1921.7	10790.9	1921.3	10806.3	1919	10836.8	1920.1
10849.3	1920	10866.4	1918	10887.8	1917.4	10913.9	1928.6	10928.2	1930.4
10944	1931.4	10972.9	1934.4	10993.6	1934.2	10997	1934.3	10998.8	1934.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9739.6	.055	9934.2	.05	10000	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9934.2	10000	470	494	460	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.96

INPUT

Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9751.6	1925.2	9775.5	1925.7	9808	1925.6	9841.1	1926	9870	1918.3
9883.8	1918.3	9901.3	1919.6	9925.5	1918.1	9943.8	1914.4	9973.8	1913.9
9986.9	1913	10000	1912.3	10026.1	1912.5	10032	1914.1	10040.4	1913.5
10048.6	1913.3	10068	1917.1	10108.6	1917.3	10126.3	1918.4	10145.6	1919.6
10178.2	1919.1	10215	1918	10251.6	1917.6	10288.4	1914.8	10300.7	1916.8

10314.7	1917.5	10337.5	1917.7	10354.8	1915.9	10368.2	1913.7	10381	1915.1
10408.4	1917.8	10420.6	1917	10463.2	1919.4	10491.4	1920.1	10495	1919.9
10517.7	1920.5	10535.8	1920.3	10566.8	1919.1	10590.8	1919.3	10602.1	1917.5
10612.3	1916.8	10626.6	1916.6	10646.3	1912	10653.8	1912.4	10665.1	1915.2
10676.9	1916.8	10689.9	1917.3	10727	1916.6	10740.6	1916.5	10749.9	1914.6
10758.8	1914.1	10771.1	1915.9	10798.3	1924.1	10824.3	1924.4	10858.1	1925.6
10892.7	1926.6	10930.4	1928.3	10957.5	1929.3	10973.4	1930	10996.2	1932.5
11014.3	1934.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9751.6	.055	9973.8	.05	10048.6	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9973.8	10048.6	550	541	570	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.85

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9373	1931.6	9383.2	1931.8	9398.3	1931.4	9424	1930.2	9445.6	1928.4
9464	1926.5	9481.2	1924.1	9495.7	1921.3	9525.8	1919.3	9554.5	1919.8
9596.5	1919.4	9645.1	1918.6	9696.1	1917.4	9729.2	1916.6	9804.9	1916
9834	1915.8	9835.9	1915.8	9863.9	1915.6	9889.7	1915	9901.4	1912.1
9912.4	1908.2	9928.9	1909.4	9950.5	1908.5	9972.9	1909.1	10000	1907.5
10018.4	1907.9	10051.3	1914.3	10090.2	1914.5	10129.5	1915.2	10148.9	1915.3
10185.9	1915.5	10222.7	1914.7	10246.4	1910.5	10276.3	1913.3	10294.3	1913.9
10316.8	1914.1	10327	1911.5	10361	1910.9	10370.8	1909.4	10385.6	1908.6
10407.2	1910.2	10436.5	1907.9	10442.7	1905.6	10463.4	1906.5	10474.8	1905.3
10484.7	1907.4	10503.4	1921.7	10526.5	1921.2	10568.1	1918.8	10585.7	1918
10613.5	1918.5	10626.5	1919.5	10650.1	1920.7	10681.7	1923.9	10702.1	1925.4
10743.6	1926.7	10752.7	1927.9	10770.8	1929.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9373	.055	9912.4	.05	10018.4	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9912.4	10018.4	525	569	570	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.75

INPUT

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9200.2	1925.5	9236.3	1925.3	9280.6	1924.6	9299.3	1918.1	9316.1	1915.8
9339.6	1915.2	9376.8	1914.8	9417.3	1914.4	9491	1914.4	9531.6	1913.7
9560.3	1909.8	9621.7	1909.6	9660.3	1908.9	9712.4	1909.4	9755.1	1909.2
9793.8	1909.1	9820.7	1909.1	9847.5	1908.7	9857.1	1909.7	9869.1	1909.4
9885.3	1906.2	9912.3	1907.2	9935	1906.7	9963.4	1904.1	9982.7	1902.6
9993.3	1902.5	10000	1902.4	10050.3	1903.8	10096.8	1903	10116.3	1901
10126.1	1903.4	10142.7	1903.2	10165.8	1902.8	10184.4	1915.5	10241.8	1916.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9200.2	.055	9963.4	.05	10050.3	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9963.4	10050.3	475	486	450	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.65

INPUT

Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9139.6	1918.4	9166.4	1918.4	9181.6	1917.6	9190	1916.6	9206.9	1913
9224.3	1910.7	9241.6	1909.7	9273	1909.3	9297.7	1908.9	9329.1	1908
9365	1907.8	9386.1	1907.1	9395.1	1907.6	9414.4	1907.6	9430.3	1907.9
9448.3	1908.6	9465.2	1908.9	9483	1908.4	9506	1908.7	9526.3	1908
9548	1906.7	9563.6	1906.8	9601.3	1906.3	9627.1	1905.9	9654.8	1905.5
9691.5	1905.5	9715.1	1905.8	9732.3	1906.1	9743.9	1906.2	9760	1900
9771.6	1901.9	9779.1	1902.1	9791.3	1900.6	9799.1	1901.6	9813	1903.2
9833.8	1904.1	9871	1903	9891.8	1904.2	9909.4	1904.4	9919.7	1902.4
9933.9	1901.8	9943.8	1898.6	9971.6	1899	9988.4	1898.3	9995.5	1897.2
10000	1897.3	10019.6	1898.2	10027.8	1910.2	10041.2	1911.2	10070.7	1911.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9139.6	.055	9943.8	.05	10019.6	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9943.8	10019.6	700	696	650	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.52

INPUT
Description:

Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9225.3	1912.5	9249.4	1911.6	9265.3	1909.9	9283.8	1904.7	9298	1900.8
9312.1	1900	9317.2	1900.7	9342	1900.5	9401.2	1900.8	9431.3	1900.4
9463	1900.9	9498.9	1900.8	9566.3	1900.4	9630.3	1899.9	9637.4	1898.8
9649.8	1900	9696.8	1900.1	9721.3	1899.9	9744.6	1899.1	9748	1897.8
9757.6	1899.3	9771	1899.2	9785.1	1899.6	9791.1	1898.4	9811.3	1900.4
9826.1	1900.9	9851.7	1900	9872.3	1898.1	9876.3	1894.7	9887.7	1894.9
9902.1	1895	9914	1897.4	9933.1	1898.2	9965	1896.5	9983.4	1893.6
10000	1893.8	10021	1894.3	10049.4	1893.5	10061.8	1894	10068.7	1894.9
10095.2	1898.8	10107.9	1898.9	10132.4	1898.9	10161.8	1898.1	10213.6	1899
10221.1	1899	10242.8	1898.8	10260.3	1897.4	10275.9	1896.9	10291	1893.8
10300.9	1894.4	10323.3	1900.1	10340.6	1899.8	10361.4	1898.7	10366.8	1896.7
10383.8	1899.3	10401.4	1903.8	10420.5	1904.8	10440.2	1905.3	10499.1	1906.2
10532.2	1907.2	10552.2	1908.4	10577.7	1909.5	10598.8	1912.5	10618.9	1914.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9225.3	.055	9983.4	.05	10061.8	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.4	10061.8	600	560	500	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.42

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9331.9	1907.9	9422.1	1907.4	9476.5	1907	9501.6	1906.6	9533	1893.1
9568.7	1893.6	9613.1	1892.9	9621.6	1891.9	9631.9	1892.9	9666.7	1892.9
9714.6	1894.3	9733.5	1894.8	9755.5	1894.8	9800.7	1894.6	9854.8	1895.2
9868	1892.9	9893.2	1893.9	9900.4	1893.6	9907.3	1890.9	9918.4	1890.6
9931.2	1895.4	9957.5	1895.6	9970.3	1890.3	9999.9	1887.8	10000	1888.1
10037.1	1889.6	10052.9	1890.3	10080.7	1892.7	10102.6	1892.4	10123.6	1891.7
10145.5	1891.1	10159.9	1885.8	10186.9	1889	10200.7	1889.8	10211.4	1892.1
10239.2	1890.7	10258.2	1888.3	10277.2	1893	10320.1	1892.4	10362.3	1889.9
10390.2	1889.7	10402.9	1891.4	10438.6	1890.9	10443	1890.9	10455.4	1893.1
10487.8	1900.1	10552.6	1901.5	10607.2	1902.3	10632.8	1903.6	10663.6	1907.6
10683.8	1910.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9331.9	.055	9970.3	.05	10052.9	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9970.3	10052.9	500	713	650	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.28

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8939.5	1903.3	9041.8	1902.9	9088.5	1902.9	9120.6	1902.4	9132.4	1901.6
9162.5	1889.1	9171.2	1887.8	9181.6	1889.5	9200.7	1888.4	9222.8	1889.3
9250.8	1889.4	9258.1	1888.4	9264.4	1890	9292.2	1889.7	9302.2	1885.8
9316.4	1890.1	9337	1889.7	9351.6	1890.2	9372.3	1889.3	9388.9	1888.4
9396.9	1887	9406.9	1886.6	9427.9	1888	9442.8	1888.6	9470	1887.8
9480.9	1886.1	9491.8	1889.3	9507.6	1889.4	9529.7	1889.8	9550.4	1890.2
9595.4	1889.5	9616.6	1889.6	9631.3	1887.7	9649	1887	9679.4	1889.5
9694.4	1888.6	9704.9	1886.6	9717.5	1889.5	9732.1	1890.4	9751.7	1890
9775.3	1888.7	9814	1888	9833.6	1885.9	9864.5	1885.2	9881.7	1885.2
9895.3	1884.3	9908.6	1881.8	9934.5	1880.9	9947.3	1879.7	9978.3	1878.3
9989.9	1877.8	10000	1877.8	10008.3	1877.1	10014.5	1877.5	10033.5	1894.3
10052	1894.2	10082.3	1893.4	10109.9	1893.3	10160.5	1894.4	10190.2	1895.5
10226.7	1896.8	10240.5	1898.6	10255.3	1898.8	10274.9	1900.6		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8939.5	.055	9908.6	.05	10014.5	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9908.6	10014.5	550	421	430	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.2

INPUT

Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8838.6	1898	8918.9	1897.7	8955.2	1897.8	8990	1882.4	9006.7	1882.3
9026.6	1880.4	9036.8	1881.9	9055.2	1882	9073.3	1883.7	9087.5	1885
9107	1885.1	9146.3	1884.1	9156	1884.8	9163.5	1884.6	9170.8	1881.8
9184	1881.9	9194.2	1883.3	9204	1882.7	9235.3	1882	9246.9	1882.4
9262.4	1882.3	9272.2	1883.5	9292.3	1884.4	9312.7	1883.6	9324.9	1884
9337.9	1881.6	9347.9	1881.1	9366	1882.5	9381.9	1882.6	9390.1	1886.1
9418.6	1885.7	9444.1	1885.3	9457.3	1884.4	9490	1883	9504.1	1883.8
9523.8	1883.3	9544.2	1882.6	9564.4	1883.4	9590.9	1882	9616.7	1883.3
9641.3	1883.5	9663.9	1879.3	9669.6	1879.5	9684.6	1882.3	9695.5	1882.8
9707	1881.9	9714.1	1879.8	9731.2	1879.9	9741.7	1882.8	9753.1	1883
9796	1883.3	9822.3	1884.1	9859	1883.7	9887.8	1882.9	9900.1	1882.8

9927.7	1876.5	9939.7	1875.8	9976.9	1877	10000	1876.1	10000.6	1876.4
10021.2	1877.9	10045.5	1878.8	10069.8	1878.2	10086	1876	10093.2	1875.2
10132.3	1897.9	10165.4	1899.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8838.6	.055	9927.7	.05	10093.2	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9927.7	10093.2	535	537	545	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.1

INPUT
Description:
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8677.7	1891.1	8723.4	1891	8748.2	1877.9	8752.9	1876.5	8761.6	1876.7
8768.6	1876.3	8769.6	1875.4	8775.4	1875.5	8780	1876	8784.7	1877.6
8810.6	1878	8825.4	1880.1	8835.2	1880.5	8853	1878.9	8859.3	1878.7
8871.3	1879.6	8893.2	1879.8	8898.7	1878.8	8919.7	1879.2	8949	1879.6
8960.2	1880.2	8969	1879.8	8976.6	1879.8	8981.3	1879.2	8985.8	1879
8991.6	1880.1	9014.6	1879.7	9024.5	1878.5	9044.7	1878.9	9052.4	1879.9
9074.7	1880.2	9091.5	1879.6	9099.2	1880.3	9129.6	1880.2	9149.6	1879.9
9155.3	1880.3	9201.4	1880.8	9227.8	1880.9	9243.7	1876.8	9255.3	1876.3
9276.4	1874.4	9307.4	1874.2	9329.9	1872.2	9342	1872.1	9355.7	1873.5
9390	1876.3	9392.9	1873.5	9404	1871.8	9420.7	1873.1	9425.8	1874.2
9428.7	1876.8	9441.3	1878.7	9466.4	1877.8	9482.9	1877.8	9496.3	1880.2
9512.7	1881.2	9529.5	1880.1	9533.3	1878.9	9544.7	1877	9559.8	1877.4
9578.4	1878.1	9589.9	1879.3	9614.6	1877.1	9616.6	1874	9633.8	1874.7
9643.6	1871.3	9667.4	1872.3	9672.6	1871.1	9693.9	1870.2	9702.5	1870.3
9710.4	1870.2	9713.9	1870.2	9717.8	1870.5	9722.8	1872.1	9730.9	1873.4
9755.3	1874.4	9768.6	1874.7	9784.4	1882.1	9788.6	1880.6	9817.8	1881.3
9831.9	1880.8	9848.5	1880.6	9860.4	1879.2	9872.6	1875.7	9880.1	1875
9891.8	1874	9935.6	1873	9949.8	1868.2	10000	1867.4	10010.8	1869.6
10037.3	1895.1	10037.9	1895.1	10060.7	1896.7	10112.5	1900	10131	1898.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8677.7	.055	9935.6	.05	10010.8	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9935.6	10010.8	1100	1304	1325	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.85

INPUT

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9386	1874.2	9406.8	1872	9413.5	1870	9438.9	1868	9481	1868
9504.5	1868	9513	1866	9540	1861.6	9546.7	1862	9560.2	1862.3
9575.4	1862	9587.2	1862	9609.1	1870	9646.3	1870.4	9735.6	1868
9757.6	1868	9924.1	1866	9938.5	1864	9945.1	1860	10015.9	1857.7
10029.3	1858	10043.7	1872	10081.4	1878	10127.5	1880	10216.4	1881
10379	1881	10480	1880	10677	1879.5	10789	1892	10929	1899

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9386	.06	9945.1	.035	10029.3	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.1	10029.3	400	400	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.77

INPUT

Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9195	1874	9222	1872	9240	1866	9317.8	1865.3	9340.9	1864.7
9364.1	1864.3	9384.2	1864.3	9408	1863.8	9431.7	1863.5	9449	1863
9466.8	1862.2	9475.2	1862.2	9490.2	1863.5	9505.3	1863.7	9522.1	1863.7
9551.4	1863	9569	1861.9	9588.5	1862.1	9603.5	1862	9622.2	1861.5
9640.6	1861.5	9655.1	1861.5	9676.4	1861.8	9689.2	1862.3	9698.9	1862.6
9707.3	1862.8	9720	1863.6	9724.1	1864.1	9736.3	1867.1	9745.8	1870
9754	1890.6	9759.7	1870.5	9764.6	1870.5	9772.8	1866.9	9782.5	1861.7
9792.9	1857.2	9802	1858.2	9809.5	1858.2	9816.4	1857.9	9826.1	1859
9835.1	1859.3	9844.1	1859.5	9852.3	1859.7	9862.1	1859.7	9869.9	1859.7
9875.9	1859.5	9886.4	1858.5	9898.8	1858.2	9911.3	1857.6	9924.8	1857.4
9935.5	1857.3	10000	1857.3	10011.1	1857.3	10018.8	1857.5	10021.8	1857.9
10024.3	1858.4	10033.6	1864.1	10042.5	1869.2	10051.1	1872.7	10060.7	1872.9
10073.5	1873.3	10084	1873.2	10141.5	1871.8	10152.9	1872.1	10160.1	1872.1
10169.7	1872.6	10179.7	1872.8	10189.5	1872.8	10200.2	1872.6	10209.2	1872.5
10217.2	1872.6	10222.4	1872.2	10229.1	1872.4	10234.9	1872.4	10240.7	1872.7
10247.2	1872.8	10252.6	1872.7	10339.8	1873.4	10437.7	1872.7	10477.4	1873.2
10499.1	1873.4	10526.5	1873.2	10551.5	1873.2	10650.6	1873.3	10671.9	1873.8
10686.9	1873.5	10698.8	1873.5	10710.3	1873.5	10717.7	1873.5	10725.7	1873.1
10729.2	1872.2	10733.1	1872.8	10736.3	1873.3	10745.4	1873.5	10756.2	1873.9
10763.7	1874.6	10787	1877.6						

Manning's n Values num= 5

```
     Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val
    9195     .06  9764.6    .045  9792.9    .035 10024.3    .045 10051.1     .06

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9754 10051.1              50     200     550              .3       .5
 Ineffective Flow     num=        2
    Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9195    9754  1890.6 10051.1   10787  1872.7

 CROSS SECTION           RIVER: RIVER-1
 REACH: Reach-1             RS: 29.72

 INPUT

 Station Elevation Data    num=      96
      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   8869.7    18819061.187  1875.29215.525  1872.29252.761  1871.69289.997  1871.7
 9314.096  1872.2 9341.85  1871.89372.907  1872.8 9396.05    1874 9421.28  1873.7
 9454.601  1873.29487.226  1873.79524.462  1874.59559.088  1875.69576.923  1875.9
 9593.191    18769595.541  1875.49600.675    18749606.067  1871.49610.853  1869.9
  9623.12  1864.29639.302  1856.19647.132  1857.19660.008  1857.39670.274  1857.6
 9677.061  1858.4 9680.54  1857.99686.456  1856.29692.197  1857.69697.505  1857.8
 9702.812  1858.69706.553  1858.79712.121  1857.19717.341  1857.49722.647  1857.8
 9729.695  1857.89734.566  1857.59740.482  1857.49751.271  1856.7 9762.93  1857.3
   9774.5  1856.79795.555  1856.19819.392    18569830.702  1856.19837.401    1856
 9844.361  1856.19853.061    18559862.544  1855.5 9866.72    18569872.027  1856.1
 9885.425  1862.89895.082  1868.79899.954  1870.3 9906.74  1873.49913.439  1874.8
 9922.835  1875.29940.845  1875.99956.504  1876.110290.06  1870.710311.73  1870.7
 10335.04  1870.5 10361.4  1870.110385.67  1870.110420.74    187010455.19  1869.9
 10487.12  1869.810516.52  1870.210547.93  1870.410582.73  1870.410614.14  1870.1
 10643.02  1870.710675.21  1870.810708.27  1871.110740.72  1871.110765.52  1871.7
 10813.28  1871.410858.26  1871.910890.71  1872.110920.03  1872.610944.74  1872.8
 10966.75  1873.410998.24  1872.811030.69  1873.111066.97  1873.211105.69  1873.3
  11137.7  1873.311182.51  1873.311222.27  1873.311263.24  1873.511297.17    1874
 11336.85  1874.311364.42  1874.311386.96  1874.3 11416.1  1874.811442.29  1874.8
 11468.65    1875

 Manning's n Values        num=       4
      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val
   8869.7     .069702.812    .045 9762.93    .03510290.06     .06

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9593.1919956.504              127     127     127              .1       .3
 Ineffective Flow     num=        2
    Sta L   Sta R    Elev   Sta L   Sta R    Elev
   8869.79593.191    18809956.50411468.65    1880

 BRIDGE                  RIVER: RIVER-1
 REACH: Reach-1             RS: 29.715

 INPUT
 Description: Bridge #1

 Distance from Upstream XS =       10
 Deck/Roadway Width        =      117
 Weir Coefficient          =      2.6
 Bridge Deck/Roadway Skew  =
 Upstream  Deck/Roadway Coordinates
     num=        7
      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
 9542.061  1877.4    18729559.061 1880.24 1872.239646.561 1880.86 1872.85
 9734.061  1881.1 1873.099821.561 1880.95 1872.949909.061 1880.42 1872.41
 9926.061  1877.6    1872

 Upstream Bridge Cross Section Data
 Station Elevation Data    num=      96
      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   8869.7    18819061.187  1875.29215.525  1872.29252.761  1871.69289.997  1871.7
 9314.096  1872.2 9341.85  1871.89372.907  1872.8 9396.05    1874 9421.28  1873.7
 9454.601  1873.29487.226  1873.79524.462  1874.59559.088  1875.69576.923  1875.9
 9593.191    18769595.541  1875.49600.675    18749606.067  1871.49610.853  1869.9
  9623.12  1864.29639.302  1856.19647.132  1857.19660.008  1857.39670.274  1857.6
 9677.061  1858.4 9680.54  1857.99686.456  1856.29692.197  1857.69697.505  1857.8
 9702.812  1858.69706.553  1858.79712.121  1857.19717.341  1857.49722.647  1857.8
 9729.695  1857.89734.566  1857.59740.482  1857.49751.271  1856.7 9762.93  1857.3
   9774.5  1856.79795.555  1856.19819.392    18569830.702  1856.19837.401    1856
 9844.361  1856.19853.061    18559862.544  1855.5 9866.72    18569872.027  1856.1
 9885.425  1862.89895.082  1868.79899.954  1870.3 9906.74  1873.49913.439  1874.8
 9922.835  1875.29940.845  1875.99956.504  1876.110290.06  1870.710311.73  1870.7
 10335.04  1870.5 10361.4  1870.110385.67  1870.110420.74    187010455.19  1869.9
 10487.12  1869.810516.52  1870.210547.93  1870.410582.73  1870.410614.14  1870.1
 10643.02  1870.710675.21  1870.810708.27  1871.110740.72  1871.110765.52  1871.7
 10813.28  1871.410858.26  1871.910890.71  1872.110920.03  1872.610944.74  1872.8
 10966.75  1873.410998.24  1872.811030.69  1873.111066.97  1873.211105.69  1873.3
  11137.7  1873.311182.51  1873.311222.27  1873.311263.24  1873.511297.17    1874
 11336.85  1874.311364.42  1874.311386.96  1874.3 11416.1  1874.811442.29  1874.8
 11468.65    1875

 Manning's n Values        num=       4
      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val
   8869.7     .069702.812    .045 9762.93    .03510290.06     .06

 Bank Sta: Left   Right    Coeff Contr.   Expan.
        9593.1919956.504              .1       .3
 Ineffective Flow     num=        2
```

```
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  8869.79593.191    18809956.50411468.65    1880

Downstream  Deck/Roadway Coordinates
    num=        9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9695 1876.13    1870  9702.5 1876.15    1870  9719.5 1878.87 1870.83
  9782.5 1879.06 1871.02    9870 1879.13 1871.09  9957.5 1879.02 1870.98
   10045 1878.71 1870.67   10069 1878.62 1870.56   10086 1875.88    1870

Downstream Bridge Cross Section Data
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9609    1872    9715  1871.2    9754    1862    9764    1860    9772    1858
    9788    1856    9801  1854.5    9827    1856    9835  1856.1    9844    1856
    9858  1854.9    9865    1856    9891  1856.5    9910    1856    9976    1854
    9981    1854    9988  1854.1    9995    1854   10000  1853.9   10008    1854
   10023    1855   10064 1870.95   10200    1872

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9609     .06    9754    .045   10023     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9715   10064          .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9609    9715    1890   10064   10200    1890

Upstream Embankment side slope              =         horiz. to 1.0 vertical
Downstream Embankment side slope            =         horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =
Elevation at which weir flow begins         =  1879.8
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream=9646.561    Downstream=  9800.5
Upstream     num=       2
    Width   Elev    Width   Elev
       4    1854       4    1874
Downstream     num=       2
    Width   Elev    Width   Elev
       4    1853       4    1874

Pier Data
Pier Station     Upstream=9734.061    Downstream=    9888
Upstream     num=       2
    Width   Elev    Width   Elev
       4    1854       4    1874
Downstream     num=       2
    Width   Elev    Width   Elev
       4    1853       4    1874

Pier Data
Pier Station     Upstream=9821.561    Downstream=  9975.5
Upstream     num=       2
    Width   Elev    Width   Elev
       4    1854       4    1873
Downstream     num=       2
    Width   Elev    Width   Elev
       4    1853       4    1873

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =    1.33
       Yarnell                 KVal =    1.05
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

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

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.71

INPUT
Description: SECTION NO. BM (SECTION BN MOVED 50' (DWNSTREAM TO FRONT OF
             BRIDGE) - Stantech adjusted channel geometry and reach lengths
             (July 1998) to account for additional 2-lane bridge.  Channel
             geometry is based on 1996 topography and bridge data and does not
             reflect current or future conditions.
```

Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9609	1872	9715	1871.2	9754	1862	9764	1860	9772	1858
9788	1856	9801	1854.5	9827	1856	9835	1856.1	9844	1856
9858	1854.9	9865	1856	9891	1856.5	9910	1856	9976	1854
9981	1854	9988	1854.1	9995	1854	10000	1853.9	10008	1854
10023	1855	10064	1870.95	10200	1872				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9609	.06	9754	.045	10023	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9715	10064	533	233	73	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
9609	9715	1890	10064	10200	1890

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.663

INPUT

Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8459.7	1896.6	8493.7	1895.3	8547.8	1892.4	8607.3	1887	8644.3	1883.6
8701.8	1880.2	8748.6	1876.7	8771	1878	8817.6	1878.1	8850.5	1878.2
8922.5	1876.5	8974.4	1876.6	9031.2	1876.7	9069.8	1876.6	9105.9	1876.1
9166	1874.6	9201.1	1872.5	9233.9	1863.4	9246.8	1862.8	9249.5	1861.7
9260.3	1862.7	9285.2	1863.9	9323.9	1863.9	9357.9	1862.6	9384.7	1861.5
9410.2	1861.4	9415.8	1859.9	9422.9	1861.1	9440.6	1861.9	9468.3	1862
9496.9	1860.9	9538	1860.7	9590.4	1861.5	9615.1	1862.3	9670.5	1862.6
9768	1862.3	9803.9	1862.5	9827.7	1851.7	9840.5	1850.9	9860.9	1850.9
9874.4	1855.7	9897.3	1856	9915.3	1855.5	9942.7	1853.8	9955.8	1854
9975.1	1853.5	10000	1853.7	10025.2	1852.9	10051.5	1857.5	10075.7	1857.6
10106.8	1856.9	10159	1856.8	10194.6	1869.1	10201.4	1889.3	10267.8	1868.3
10357.1	1867	10470.9	1866.3	10617.8	1865.3	10698.7	1864.6	10792.8	1863.6
10866.7	1863	10916.7	1862.8	11013.8	1862.3	11096	1862.2	11189.3	1861.1
11221.1	1860.8	11253.5	1861.2	11281.8	1861.8	11330.4	1866.3	11375.2	1870.2
11405.3	1872.3	11430	1875.3	11475	1877.9	11503.5	1879.5	11597.5	1879.9
11621.1	1880.1								

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8459.7	.06	9803.9	.035	9860.9	.025	9897.3	.03	9955.8	.08
10159	.06								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9615.1	10201.4	330	330	330	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
8459.7	9615.1	1862.3	10201.4	11621.1	1889.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.601

INPUT

Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8309.6	1899.6	8336.2	1895.8	8388.7	1895.1	8506.6	1892.6	8591.9	1890
8627	1889	8677.8	1888.1	8680.1	1887.8	8715.4	1886.3	8756	1883.1
8788.7	1880.1	8844.2	1875.3	8892.4	1873.3	8918	1871.6	8927.3	1870.1
8950.7	1866.9	8978.9	1869.8	8992.6	1871.3	9020	1872	9067.4	1873.3
9099.7	1872.9	9117.8	1868.4	9156.4	1856.1	9183.7	1859	9210.1	1860
9257.3	1861.3	9286.8	1861.4	9337.3	1859.7	9385.8	1857.8	9431.3	1857.6
9472.7	1856.4	9515.2	1856.9	9628.9	1858.9	9679	1859.4	9695.4	1858.5
9710.3	1850.7	9734.3	1849.9	9784.6	1851.2	9797.7	1852.1	9832.4	1854.3
9848.1	1854.8	9885.6	1853.5	9929.9	1851.5	9960.4	1851.1	10000	1851
10019	1852.2	10035.2	1857.7	10046.6	1859	10060.2	1867.1	10084.7	1867.9
10148	1868.6	10212.3	1866.9	10279.4	1865.8	10368.3	1865.6	10464	1864.9
10530.9	1864.5	10576.9	1864.4						

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8309.6	.06	9679	.035	9734.3	.025	9832.4	.06	9885.6	.03
10019	.12	10084.7	.06						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9286.8	10084.7	370	330	330	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.538

INPUT

Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8246	1902	8311.8	1900.8	8455	1900.5	8561.6	1898.6	8661.5	1897.7
8741.1	1897	8799.7	1897.4	8821.4	1896.9	8859.6	1887.7	8880	1883.8
8939.9	1881.4	8990.7	1877.1	9016	1873	9041.5	1869.7	9096.6	1852.7
9109.2	1854.5	9115.6	1856.5	9129.7	1855.8	9160.4	1855	9182.2	1856.2
9231.6	1856.6	9294.3	1856.8	9331.2	1855.1	9372.5	1853.7	9376.2	1850.6
9382.6	1854.1	9400.2	1854.4	9419.1	1848.9	9441.4	1850.1	9480.9	1851.4

9528	1851.9	9545	1851.1	9586.2	1849.7	9625.5	1850.4	9667	1850.7
9703.9	1850.1	9733.9	1852.7	9774.5	1851	9838.1	1851.2	9871.5	1850.5
9915.1	1850.9	9948.9	1848.7	9970.4	1848.7	9990.7	1847.4	10000	1845.5
10016.1	1848.1	10034.4	1854.1	10071.6	1856.5	10085.4	1857.7	10113.1	1865.2
10131.5	1865.3	10177.4	1865.3	10268	1864.7	10334	1863.8	10394.5	1862.6
10495	1862.5	10617.9	1861.7	10708.3	1860.6	10789.8	1859.7	10853.2	1858.7
10924.4	1859.1	10984.3	1860.2	11013.8	1860.9	11042.8	1865.4	11071	1870.4
11095.6	1873.7								

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8246	.06	9545	.025	9838.1	.08	9948.9	.028	10016.1	.065
10268	.06								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9041.5	10085.4	270	240	230	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.493

INPUT

Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9149.8	1874.4	9184.2	1855.3	9195.2	1850.5	9301.4	1850.5	9318.7	1850.3
9328.7	1850.8	9336.2	1850.7	9357.2	1846.3	9369.9	1843.9	9375.9	1843.9
9381.2	1845.3	9386	1843.4	9398.2	1843.5	9402.5	1844.2	9410.6	1843.8
9421.7	1845.6	9428	1845.7	9442.5	1848	9450.2	1848.1	9459.5	1847.9
9471.8	1847.4	9480	1845.8	9486.4	1846.6	9503.9	1847.6	9515.6	1847.9
9523.9	1847.4	9534.1	1848.2	9543.7	1849.3	9563.8	1849.5	9572.1	1850.7
9582.2	1850.8	9618.4	1850.6	9647.1	1847.2	9657.9	1846.8	9664.4	1846.6
9669.9	1847.2	9679.3	1846.1	9696.8	1849.6	9711.8	1848.9	9717	1848.6
9732.5	1849.3	9747.1	1848.9	9758.6	1846.3	9765.8	1845.5	9772	1845.4
9786	1847	9807.2	1849.1	9819.2	1849.2	9831.7	1847.5	9838.8	1847.3
9852.3	1847.5	9868.6	1845.8	9877.5	1845.9	9885.7	1844.4	9896.5	1844.5
9905.8	1847.2	9907	1847.6	9915.7	1847.9	9951.2	1847.8	9989.8	1845.4
10000	1845.2	10018	1844.8	10024.4	1845.6	10038.6	1850.7	10047.8	1850.8
10063.5	1850.3	10071.1	1850.7	10089.3	1850.9	10099.8	1849.2	10106.4	1848.8
10109.9	1849.1	10142.8	1854.8	10156.3	1855.2	10167.1	1854.4	10187.9	1853.8
10195	1853.4	10201.6	1853.7	10210.2	1855.5	10225.6	1860.2	10240.3	1862.6
10249.4	1863	10329.4	1862.6	10374.5	1862.3	10418.7	1862	10438.9	1861.8
10489.3	1860.9	10521.3	1860	10566.4	1860	10614.5	1859.3	10709.5	1859.1
10746.9	1858.8	10900.5	1858.3	10975.4	1857.1	10979.4	1856.3	10986.4	1857.2
11076.5	1857.6	11156.1	1864.2						

Manning's n Values num= 11

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9149.8	.065	9195.2	.08	9357.2	.04	9442.5	.06	9618.4	.033
9786	.06	9831.7	.025	9905.8	.08	9951.2	.025	10024.4	.08
10195	.06								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9184.2	10047.8	610	560	520	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.387

INPUT

Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8940.4	1881.1	9010.2	1881.1	9106.7	1880.7	9199.1	1879.8	9279	1878.3
9311.3	1877.3	9384.2	1875.4	9440.1	1872.1	9481	1854.2	9493.6	1841.8
9511.4	1841.9	9527.3	1844.7	9552.5	1844.5	9575.8	1839.3	9604.6	1840.8
9627.7	1839.1	9645.2	1840.2	9667.5	1844.3	9682.9	1845	9722.4	1842.2
9732	1839.9	9742.2	1841.8	9749.9	1839.7	9757.7	1840.9	9778.9	1847.4
9822.3	1847.6	9845.5	1843.7	9863.2	1845	9906.2	1844.6	9921.9	1842.7
9960.2	1839.7	9986.9	1838.8	10000	1839.8	10037	1839.3	10066.4	1838.9
10082	1843.9	10107.4	1845.2	10128.4	1844.2	10146.8	1845	10179.3	1843.4
10240.2	1845.8	10277.7	1845.8	10302.4	1850.7	10351.2	1850.5	10398.2	1850.5
10434.3	1850.2	10467.4	1848.9	10486.8	1849.5	10517.6	1857.7	10543.3	1858.8
10586.4	1859.2	10698.3	1858.3	10743.2	1859	10806.2	1858.8	10864.4	1858.1
10934.6	1856.6	10983.5	1856.1	11098.5	1855.6	11148.5	1855.6	11182.7	1855
11220.3	1855	11282.9	1854.3	11304.9	1854.9	11347.2	1855.2	11400.1	1856.3
11417.6	1857.4	11440	1860.6	11462.5	1864.5	11488.2	1868.8	11511.3	1871.4
11568.9	1876.3	11612	1877.5	11673.1	1878.3				

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8940.4	.06	9575.8	.04	9645.2	.12	9749.9	.05	9960.2	.025
10037	.05	10302.4	.12	10486.8	.06				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9481	10302.4	190	190	200	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.351

INPUT

Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9017	1879.3	9080.8	1878.9	9185.5	1878.8	9229.9	1878.6	9305.6	1877.8
9400.7	1875.7	9483.5	1873.2	9537.5	1871.1	9598.8	1867.6	9622.6	1865.5
9651.1	1864	9668.9	1858.9	9684.3	1849.7	9698.1	1836.7	9722.5	1839.1

9741.4	1838.9	9747.3	1836.7	9758.1	1836.8	9768.6	1838.3	9795.9	1841.6
9818.1	1839.9	9839	1839.5	9861.3	1842.7	9879.5	1845.3	9898	1839
9912.1	1841	9924.3	1841.4	9957.8	1842.3	9979.9	1838.9	10000	1835.9
10027.2	1836.7	10064	1838	10092.9	1841.9	10150.2	1842	10186.7	1840.3
10213	1842.3	10230.5	1840.9	10250	1841.3	10277.5	1845.9	10296.9	1847.8
10317	1848.9	10342.3	1849.3	10371.3	1849.2	10418.4	1848.8	10471.2	1849.3
10503.3	1848.5	10544.6	1847.1	10566	1847.7	10595.3	1854.4	10636.1	1855.1
10683.1	1855.9	10767.8	1856.4	10854.4	1857.3	10922.5	1856.9	11006	1856.4
11077.9	1855.5	11126.1	1854.8	11200.5	1854.5	11262.7	1854.1	11334.4	1853.9
11391.9	1853.6	11423.7	1853.5	11431	1852	11453.7	1852.4	11481.8	1853.5
11506.1	1854.1	11549.3	1857.2	11591.6	1864.5	11621.8	1870.4	11647.9	1873.2
11693.3	1875.5	11761.7	1876.8	11835.3	1876.9				

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9017	.06	9698.1	.04	9758.1	.12	9861.3	.05	9979.9	.045
10064	.07	10296.9	.12	10566	.06				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9684.3	10342.3	500	490	490	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.258

INPUT

Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9241.8	1873.9	9318.1	1873.4	9410.4	1871.6	9464.7	1870.5	9525.6	1868.8
9587.6	1866.6	9622.2	1864.7	9668.5	1862.5	9680.4	1860.8	9716.2	1858.5
9743.4	1856.4	9781.3	1852.7	9805.1	1834.5	9824.7	1831.9	9842.8	1828.7
9857.3	1831.8	9870.6	1832.7	9915.5	1834.1	9954.2	1833.1	10000	1831.2
10016.4	1832.3	10026.1	1832.7	10051.4	1844.5	10107.4	1844.3	10169.9	1844.4
10230.7	1844.3	10274.3	1843.9	10318.2	1844.5	10378.2	1843.7	10417.3	1843.3
10451.7	1842.7	10494.3	1842.2	10508.4	1843	10543.7	1851.4	10566	1853
10613.6	1853	10630.2	1852.7	10687.7	1852.3	10733.6	1852.4	10778	1851.6
10844.1	1850.2	10883.2	1849.9	10916	1849.8	10972.7	1851.1	11018.7	1852.4
11055.7	1852	11104.4	1851.9	11149.5	1851.9	11198.7	1851.9	11267.8	1852.4
11322.3	1850.9	11350.2	1849.9	11384.1	1849.3	11433	1849.8	11470.6	1850
11500.7	1850.3	11530.8	1849.9	11542.8	1849.9	11549.2	1849.2	11554	1849.9
11578.5	1850.3	11624.4	1852.8	11659	1859	11692.5	1863.8	11719.4	1867.6
11759.5	1870.6	11813.6	1872.3	11900	1872.8				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9241.8	.06	9781.3	.12	9805.1	.035	10051.4	.08	10508.4	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9781.3	10051.4	710	705	710	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.13

INPUT

Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9922	1860.7	9932.8	1859.7	9946.5	1858.5	9953.2	1857.6	9960.7	1855
9979.7	1824.5	9987.1	1821	9994.6	1821.6	10000	1821.6	10010.5	1821.5
10015.3	1822.1	10020.7	1823	10027.6	1824.1	10037.5	1825.2	10046.3	1826.2
10055.7	1827.7	10091.4	1827.9	10098.6	1829.1	10106.7	1831.5	10331.6	1834.5
10356.3	1834.2	10375.7	1833.9	10392	1834.1	10416.2	1833.9	10428.2	1834
10435.7	1833.8	10440.7	1833.4	10483.6	1835.9	10490.9	1835.9	10502.3	1835.1
10508.1	1834.8	10518.6	1835.4	10530.9	1836.2	10545.3	1837.1	10559.2	1838.1
10574.2	1838.9	10592.4	1839.2	10612.5	1839.3	10733.7	1838.3	10808.3	1836.4
10832.6	1836.4	10843	1835.9	10902.5	1837.2	10914.3	1836.9	10928.5	1836.9
10941.4	1837.5	10946.7	1837.6	10954.1	1839.3	10961.6	1841.4	10971.2	1842.7
10987	1843.4	11036.3	1843.9	11045.1	1844.4	11055.3	1845.1	11069.4	1845.8
11084	1846.3	11101.9	1846.6	11115.9	1846.8	11135.2	1846.7	11156.6	1846.6
11186.4	1845.6	11212.9	1845.2	11236	1844.8	11248.7	1844.7	11261.8	1844.5
11268	1843.7	11272.8	1844.3	11329.8	1845.1	11336.3	1844.7	11340.1	1844.3
11342.8	1844.2	11344.5	1844.1	11347.2	1844.5	11352.7	1845.1	11370.5	1845.1
11393.3	1845.3	11418.5	1845.6	11607.3	1845.6	11630.4	1845.1	11653	1844.8
11667.4	1844.3	11678.5	1844	11685.3	1843.4	11691.1	1844	11698.4	1844.6
11713.9	1844.3	11895.5	1845.1	11908.1	1845.1	12059	1861.5		

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9922	.06	9960.7	.06	9987.1	.04	10106.7	.045	10574.2	.043
10843	.06								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9960.7	10331.6	590	595	600	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.012

INPUT

Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9249.5	1861.5	9434.7	1861.1	9558.6	1860.3	9644.3	1859.5	9730.2	1858.7
9773.6	1857.9	9797.9	1857.6	9854.2	1855.9	9889.9	1853.7	9922.8	1850
9955.5	1819	9982.8	1818.9	10000	1818.7	10021.5	1820.8	10031.4	1820.6
10041.2	1822.8	10066.9	1822.6	10091.3	1827.5	10113.2	1828.5	10169.3	1828.1

10186.8	1828.1	10196.3	1827	10220.1	1828.8	10250.7	1828.6	10267.4	1827.9
10303.6	1828.5	10341	1829.6	10363.8	1829.7	10376.4	1830.3	10413.9	1830.2
10452	1831	10486.7	1831.4	10517.5	1832.7	10558.9	1832.8	10609.7	1832.5
10660.3	1831.5	10714.5	1831.6	10742.1	1831.2	10788.3	1830.7	10817.3	1831.2
10835	1831.7	10861.6	1838.8	10903.7	1839.1	10965.6	1838.3	11038.2	1838.1
11080.5	1838.1	11114	1838.3	11155.5	1838.3	11193	1839.1	11263	1839.5
11336.9	1839.5	11379.8	1839.9	11423.9	1840.4	11487.3	1840.3	11549.5	1841.1
11608.9	1840.7	11652.8	1838.8	11691.4	1838.8	11744.2	1839.9	11787.2	1841
11825.9	1841.2	11830.9	1841.1	11879.8	1841.7	11924.8	1842.8	11941.6	1843.4
11980.7	1845.8	12015.8	1848	12048.3	1850.4	12081	1852.3	12115.5	1853.8
12146.5	1854.8								

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9249.5	.06	9922.8	.035	9955.5	.025	10021.5	.04	10267.4	.045
10452	.05	10861.6	.06						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9922.8	10091.3	400	410	420	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.934

INPUT

Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9244.7	1859.3	9403.1	1858.8	9479.7	1858.2	9530.3	1858.2	9605	1856.7
9665	1856.9	9704.5	1855.3	9742.1	1854	9795.5	1853	9824.7	1851.1
9864.6	1824.7	9894.9	1823.9	9914.2	1820.4	9923.4	1819.2	9934.8	1819.1
9940.2	1816.6	9967.7	1815.9	9979.6	1815.7	10000	1815.5	10007.5	1817.3
10022.2	1817.6	10035.2	1819.8	10054.9	1826.8	10096.7	1828	10137.5	1827.9
10161.6	1827	10183.8	1825.9	10214.6	1826.4	10239.3	1825.4	10254.6	1824.2
10268.1	1824.2	10286.9	1824.7	10298.7	1823.9	10324.5	1824.1	10353	1827.5
10391.2	1828.5	10425.6	1829.3	10455.1	1829	10502.7	1827.8	10545.1	1827.4
10578.5	1827.6	10632.1	1826.4	10687	1826.1	10744.9	1827.3	10796.6	1827.9
10818.8	1828.1	10851.6	1827.5	10868.7	1827	10873	1826.9	10900.6	1829.8
10947	1830.5	11009.4	1831.1	11091.4	1831.1	11166.8	1831.8	11210.9	1832.4
11261.7	1832.2	11306.7	1832.5	11356	1832.8	11396.3	1833	11439.9	1831.7
11478	1832.2	11503.1	1832.9	11546.5	1832.7	11615.1	1832.7	11645.8	1833.4
11686.2	1834.1	11716.5	1834.2	11763.4	1834.4	11811.5	1834.5	11858.1	1835.4
11881.1	1836	11953.1	1837	11984.1	1838	12015.5	1838.8	12051.4	1839.9
12081.6	1841	12115.9	1841.7	12164.1	1843.7	12195.6	1844.7	12218	1845.1
12226.3	1845.1	12265.6	1845.5	12301.4	1846.1	12337.4	1846.7		

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9244.7	.06	9824.7	.12	9914.2	.04	10054.9	.025	10353	.08
10873	.06								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9824.7	10054.9	410	460	470	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.847

INPUT

Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9277.4	1854.9	9424.8	1853.9	9484.7	1853.4	9546	1853.2	9639.3	1852.9
9677.8	1852.6	9732.7	1851.9	9759.7	1851	9791.8	1850.6	9846.5	1849.6
9867.2	1848.5	9881.1	1847	9927.3	1814.5	9952.1	1813.5	9978.2	1811.9
10000	1812	10041.6	1812.5	10076.9	1821.4	10110.6	1821.2	10147.8	1820.5
10162.1	1818.4	10179.8	1820.8	10200.5	1824.9	10242.3	1825.3	10284.1	1825
10343.6	1824.4	10403.2	1824.5	10447.7	1823.5	10492.8	1822.7	10553.5	1821.8
10574.2	1821.8	10617.2	1822.3	10650.1	1822.8	10692.5	1822.5	10726.3	1820
10757.2	1821.3	10780.5	1821.3	10789.3	1820	10814	1822.3	10837.2	1826.7
10862.2	1828.2	10897.8	1827.1	10934.3	1827	10969.2	1826.9	11013.3	1826.9
11071	1827	11157.2	1827.8	11206.2	1827.8	11259.1	1827.5	11315.6	1827.4
11371.4	1827.3	11446.2	1827.4	11491.7	1827.4	11538.1	1827.2	11575.5	1826.8
11637.6	1827.3	11709.7	1828.8	11793.4	1828.8	11825	1830.1	11849.1	1831.6
11886.5	1833	11912	1834	11937.1	1835.1	11965.3	1835.7	11992.4	1836.4
12028.3	1837.1	12100.2	1838	12169.1	1838.3	12216.4	1838.8		

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9277.4	.06	9846.5	.12	9927.3	.035	10076.9	.12	10200.5	.04
10814	.06								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9881.1	10076.9	520	510	500	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.75

INPUT

Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9132	1850	9198.5	1849.6	9263.4	1849.5	9342.6	1849.9	9419.3	1849.9
9493.9	1849.1	9569.7	1848.9	9624	1848.6	9657.7	1848.7	9717.2	1848
9756.2	1847.4	9790.5	1846.6	9828.5	1845.5	9866.8	1844.3	9915.2	1812.6
9936.1	1812.5	9952	1809.4	9972.2	1808.3	10000	1808.5	10033.3	1808.9
10041.9	1809.5	10053.6	1811.1	10066.5	1811.1	10078.9	1815.4	10101.5	1814

10113.1	1816	10129	1819.7	10171.9	1821.3	10239.1	1821.2	10292.1	1820.2
10343.7	1820.4	10410.1	1819.8	10481.8	1818.3	10539.4	1817.7	10579.2	1818.1
10623.4	1818	10650.9	1817.4	10669	1817.8	10722.5	1817.5	10728.4	1816.2
10735.6	1818	10749.8	1818.7	10773	1825.2	10820.5	1825.1	10892.7	1824
10991.1	1824.3	11079.1	1823.6	11133.8	1823.9	11186.1	1824.2	11232.6	1824
11275.2	1824.4	11305.7	1825.2	11323.2	1825.2	11347.8	1824.8	11380.9	1823.7
11432.7	1823.8	11468	1824.2	11516.8	1824.5	11582.5	1824	11623.4	1824.8
11672.9	1825.2	11735.5	1825.5	11776.9	1827.1	11792.3	1828.8	11821.7	1830.5
11859.6	1832.3	11887.5	1833.1	11917.8	1833.6	11955.7	1834.4	11994.9	1834.9
12049.4	1835.7	12094.7	1836.1	12130.7	1836.2	12174.3	1836.4	12230	1836.8
12264	1837.1								

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9132	.06	9866.8	.12	9952	.033	10041.9	.05	10129	.06
10773	.06								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9866.8	10129	500	490	470	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.657

INPUT

Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9341.9	1844.2	9435.8	1844.6	9541.4	1844.6	9656.8	1844.3	9731.3	1844
9807	1843.3	9878.5	1842.5	9910.1	1841.5	9933.6	1839.5	9961.9	1801.7
9986.1	1800.5	10000	1800.6	10009.7	1802.1	10034.1	1805	10053.9	1806.9
10069.1	1808.6	10089.5	1813.2	10113	1812.3	10124.3	1810.2	10130	1809.6
10142.8	1809.6	10162	1812.9	10179	1814.9	10197	1816.7	10224.3	1816.8
10271	1816	10327.9	1815.5	10385.1	1814	10440.2	1814.2	10514.2	1814.4
10561.8	1814.5	10595.8	1814.6	10603.4	1814.5	10609.3	1812.6	10614.1	1814.6
10640.6	1815.4	10650.2	1816.7	10660.4	1818.3	10678.3	1820	10726.4	1821.4
10770.3	1821.8	10826.5	1821.9	10877.4	1822.3	10932.5	1821.9	10988.6	1821.7
11032.4	1821.9	11040.7	1821.8	11067.7	1821.4	11092.8	1821.8	11143.1	1821.5
11188.8	1821.7	11264	1823.3	11321.1	1823.2	11380.8	1822.6	11423.5	1822.6
11476.7	1821.4	11511.1	1821	11548.1	1821.4	11590	1821.4	11622.5	1822.4
11657.4	1822.5	11708.5	1823.3	11736.1	1825.3	11753	1826.4	11776.9	1828.1
11808.3	1829.4	11851.2	1830.5	11894.3	1831.6	11930.8	1832.4	11970.8	1833.1
12037.8	1834	12088.7	1835.1	12150.1	1835.1	12222.4	1835.4	12238	1835.5
12254.7	1835.6								

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9341.9	.06	9910.1	.08	9961.9	.033	10009.7	.12	10124.3	.025
10162	.12	10197	.06	10678.3	.08	11622.5	.06		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9910.1	10197	550	540	540	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.555

INPUT

Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9172.7	1837.8	9282.2	1838.4	9371.7	1838.7	9470.3	1838.5	9493.7	1838.1
9538.3	1838.6	9590.2	1838	9604.1	1838.7	9643.4	1838.2	9692.8	1838.1
9730.9	1838	9762.9	1837.6	9815.2	1837	9855.6	1836	9863.9	1834.9
9869.9	1835.9	9874.8	1835.2	9903.7	1834.1	9919.4	1833.2	9922.4	1832.5
9929.9	1818.5	9940.2	1817.6	9961.8	1800.2	9983.5	1800.1	10000	1799.4
10032.9	1799.4	10049.5	1801	10059.2	1801	10096.4	1809.1	10111.4	1810
10126.6	1809.8	10139.6	1809.1	10175.4	1809	10223.1	1811.3	10250.6	1811.1
10283	1811.4	10330.2	1811.2	10355.8	1810.6	10399.9	1810.2	10403.9	1809.1
10409.5	1810.7	10438.4	1810.6	10470.4	1811.2	10526.5	1812	10551.1	1812.8
10563.6	1813	10579.7	1813.1	10607.8	1813	10653.4	1813.2	10691.4	1812.6
10728.4	1813.5	10760.7	1813.5	10780.8	1813.9	10797.4	1815.4	10824.9	1816.4
10857.4	1816.9	10871	1817.2	10932	1817.7	11005.7	1818.1	11057.7	1818.2
11115.2	1818.4	11150.5	1818.3	11182.4	1818.3	11342.9	1817.9	11398.8	1817.1
11435.5	1816	11470	1817	11502.3	1817.4	11511.5	1817.4	11571.2	1818.3
11589.2	1818.5	11607.4	1819.3	11623.5	1820.5	11636.2	1821.7	11643.4	1823.1
11651.5	1823.6	11661.2	1823.7	11676.4	1824.9	11704.2	1825.2	11756.9	1826.6
11772.3	1827.1	11789.8	1827.4	11812.2	1827.8	11840.6	1828.2	11880	1828.5
11898.6	1829	11912.8	1828.9	11930	1829.2	11939.5	1829.4	11962.3	1829.4
11986.5	1829.7	12017.7	1830.2	12046.1	1830	12065.8	1830.2	12079.2	1830.2

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9172.7	.06	9869.9	.035	9961.8	.025	10059.2	.08	10111.4	.06
10871	.08								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9869.9	10111.4	490	490	500	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.462

INPUT

Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9149.9	1833.2	9290.1	1833.2	9501.6	1834	9695.7	1832.4	9871.7	1827.9

9909.8	1794.9	10000	1794.8	10034.2	1803.6	10061.2	1805.6	10068	1804.4
10078	1805.3	10175.8	1806.6	10271.3	1805.8	10284	1805.7	10450	1807.1
10463.4	1807.2	10524.9	1808.6	10599.5	1807.4	10674	1805.1	10678.5	1803.9
10682.2	1805.3	10721.5	1805.3	10727.3	1804.3	10732.4	1805.1	10776.4	1808.1
10847.3	1809	10922	1812.2	11030.5	1812.7	11185.9	1812.2	11205.6	1811.7
11215.6	1812.5	11317.2	1812.6	11404.3	1814.1	11476.1	1815	11558.8	1819.3
11659	1821.8	11740.1	1823.2						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9149.9	.06	9871.7	.08	9909.8	.025	10000	.12	10061.2	.08
10922	.06								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9871.7	10061.2	380	380	380	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.39

INPUT

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9380	1830.5	9576.1	1828.9	9677.9	1826.7	9819.6	1821.5	9863.1	1815.7
9907.7	1793.2	9924.1	1793.4	9961.5	1793.9	10000	1792.8	10013.4	1800.1
10063.6	1802.7	10104.8	1802.5	10139.1	1805	10177.8	1804	10316.5	1803
10382.7	1802.6	10449.1	1803	10520.6	1803.8	10603	1804	10705.5	1802
10711	1800.7	10716.7	1802.4	10767.7	1802.8	10800.6	1807.3	10917.5	1809.4
11054.7	1809.5	11060.9	1808.4	11066.1	1809.2	11175.1	1809.6	11281.1	1810.8
11284.7	1811.5	11364.3	1812	11470	1816.4	11637.3	1819.8	11762.5	1820.5

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9380	.06	9819.6	.12	9907.7	.025	10000	.12	10139.1	.03
10603	.12								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9819.6	10063.6	350	340	340	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.326

INPUT

Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9390.9	1826.3	9547.9	1824.3	9640.4	1823.1	9689.6	1822.4	9817.5	1809.8
9861.7	1794.9	9937.3	1792.4	10000	1791.3	10050.1	1801.8	10076.3	1802
10184.8	1801.5	10186.2	1801.1	10195.5	1801.9	10252.1	1801.4	10306.4	1802.1
10388.6	1799.1	10404.1	1799.6	10476.5	1799.1	10599	1800.3	10683.7	1799.1
10698.3	1799	10731.3	1800.9	10770.4	1800.8	10806.2	1803.6	10872.4	1803.5
10890.6	1803	10955.7	1805.2	11057.2	1806.2	11208.6	1807.9	11340.5	1810.2
11379.7	1812.8	11486.4	1813.9	11604.6	1815.1	11642.2	1815.1	11730.1	1816.4
11818.3	1818.1	11945.3	1820.5						

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9390.9	.06	9689.6	.12	9861.7	.025	10000	.12	10050.1	.06
10599	.12	10890.6	.08						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9689.6	10076.3	440	450	470	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.241

INPUT

Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9221.7	1822.3	9318.5	1821	9426.6	1821	9480.2	1821.9	9576.4	1818.1
9639.9	1808.3	9678.9	1793.3	9692.2	1795.4	9741.5	1795.8	9757.5	1795
9762.7	1794.5	9785.6	1793.6	9819.4	1793.6	9830.9	1791.7	9858	1789.9
9876.8	1791.1	9926.9	1790.7	10000	1790	10028	1795.7	10050.5	1796.6
10063.2	1795.7	10223	1797.2	10225.7	1797	10234	1797	10301.6	1798.6
10415.7	1797.7	10531.3	1797	10566	1797.1	10615.4	1794.2	10624.7	1791.9
10652	1794.1	10662.7	1793.8	10675.3	1792.1	10702.3	1795.8	10754.1	1797.3
10794.7	1801.3	10837.5	1802.6	10880.1	1802.5	10980.9	1801.9	11104.8	1803.2
11135.2	1803.7	11251.1	1805	11386.2	1804.9	11391.6	1804.1	11396.5	1805.4
11429.3	1806.9	11456.4	1809.4	11470.4	1809.6				

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9221.7	.06	9480.2	.12	9678.9	.025	9830.9	.028	10000	.08
10223	.06	10531.3	.12	10794.7	.08				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9757.5	10050.5	400	440	490	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.157

INPUT

Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9137.7	1819	9290.3	1818.4	9474.2	1815.2	9547.3	1814	9591.2	1807
9646.4	1785	9667.1	1784.5	9679.6	1786.4	9689.6	1786.5	9711.2	1788.9
9722.3	1788.2	9789.6	1788.8	9804.4	1790.5	9831.6	1791	9866.2	1791.1
9893	1788.7	9942	1788.5	9970.6	1786.6	10000	1782.6	10043.2	1782.8
10055.2	1792	10073	1792.3	10102	1791	10110.2	1790.2	10121.6	1790.9
10139	1792.5	10222.1	1793.7	10322	1795.6	10374.2	1796.2	10485.5	1794
10581.9	1792.9	10712	1792	10720.5	1791.2	10824.2	1790.2	10837.6	1785.6
10842.6	1785.7	10847.8	1790.2	10859.3	1789.8	10865.9	1787.4	10897.9	1792.5
10924	1790.9	10932.4	1789.4	10939.7	1791.3	11027.4	1794.3	11060.5	1796
11145.9	1796.4	11285.8	1796.3	11405.2	1796.8	11552.6	1797.9	11574.2	1800
11585	1800.3	11598.7	1801	11614	1801.8	11630.3	1802.6	11648.8	1802.7
11667.8	1803.1	11687	1803.2	11706.3	1803.4	11729.2	1803.4	11747.8	1803.6
11768.9	1803.9	11789.2	1804.3	11811.1	1804.4	11827.5	1804.8	11850.4	1804.7
11874.5	1804.7	11890.2	1805	11911.4	1805	11932.1	1805.2	11964.2	1805.4
11988.4	1805.3	12014.8	1805.4	12044.1	1805.7	12068.9	1805.7	12094	1805.9
12121.4	1806.1	12157	1806.3	12176.3	1806.5	12197.9	1806.8	12221.5	1806.9
12244.2	1807.1	12280.3	1807.6	12284.8	1807.2	12291.8	1807.2	12296.7	1807.8
12303.9	1807.9								

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9137.7	.06	9547.3	.12	9646.4	.04	9942	.035	10000	.025
10073	.035	10720.5	.12	11060.5	.06				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9942	10073	340	350	370	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.091

INPUT

Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9414.3	1815.4	9641.3	1811.7	9676.9	1782.1	9726.3	1781.9	9742.3	1786.5
9856.7	1786.6	9879.7	1785.3	9900.2	1786.5	9967.4	1785.1	9978.8	1782.5
10000	1780.8	10010.4	1780.9	10050.9	1782.1	10083.3	1783.7	10108.3	1781.7
10121.5	1789.6	10160.5	1792.1	10223.1	1792.6	10229.4	1791.8	10238.5	1791.9
10307.6	1792.9	10457.3	1791.1	10591.5	1789.3	10748.9	1787.6	10778.3	1786.6
10797.4	1782.5	10809.4	1782.9	10822.1	1786.6	10850.7	1786.5	10876.8	1789.6
11005.3	1792.7	11117.2	1793.1	11229.1	1792.3	11377.9	1792.6	11520.3	1792
11698.5	1792.3	11701.2	1791.9	11707.8	1791.8	11860.8	1795.2	11901.4	1796.4
12045.9	1798.4	12165.3	1799.7	12168.4	1799.4	12176.1	1799.4	12178.9	1799.9
12215.6	1800.5	12234.3	1800.6	12247.6	1801.4	12261.9	1801.8	12275.8	1802.1
12293.5	1802.5	12320.1	1802.7	12364.5	1802.9	12396.7	1803.3	12429.4	1803.8
12457.5	1804.1	12460.1	1804.2						

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9414.3	.06	9641.3	.03	9676.9	.04	9726.3	.12	9856.7	.08
9978.8	.04	10121.5	.06	10591.5	.12	11005.3	.06		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9900.2	10121.5	330	360	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.023

INPUT

Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9763.9	1806.7	9777.6	1775.2	9787.1	1776.2	9799.2	1775.2	9806.4	1775
9813	1774.3	9821.4	1775.2	9826.9	1776.6	9833.7	1778.9	9837.5	1779.2
9842.9	1780.7	9853.2	1781.5	9866.6	1781.5	9880.7	1782.4	9892.3	1782.9
9901.9	1782.8	9937.4	1782.1	9958.7	1781	9970.3	1773.7	9983.2	1773.2
9991.2	1773.2	9995.9	1773.1	10000	1772.5	10006.6	1773.7	10023.8	1775.1
10039.3	1777.1	10057	1778	10067	1778.8	10073.4	1784	10077.1	1785.2
10111.8	1785.2	10157.6	1786.6	10172	1787.8	10200.9	1787.2	10258.3	1789.7
10270.8	1789.5	10302.2	1789.6	10378.7	1787.7	10387.9	1788.2	10404.2	1786.2
10410.8	1786.9	10416.1	1785.9	10421.4	1786.9	10426.3	1787.3	10446.6	1787.2
10545.4	1785.5	10574.6	1784.3	10591.6	1784.6	10604.2	1784.3	10617.2	1784.5
10629.4	1785.1	10642.1	1785.1	10662.6	1783.1	10684.8	1784.3	10699	1781.9
10706.3	1781.8	10709.9	1780.7	10712.2	1780.7	10731.9	1783.4	10757.3	1782.8
10778.7	1783.1	10811.5	1785.4	10825.3	1785.5	10870.5	1786.8	10919.8	1786.8
10952	1786.6	10978.6	1786.7	11033.3	1787.5	11063.4	1787.6	11082.5	1787.8
11115.5	1788.9	11153	1788.5	11217.6	1789				

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9763.9	.03	9777.6	.04	9866.6	.12	9892.3	.08	9958.7	.04
10057	.06	10591.6	.12	10811.5	.06				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9892.3	10073.4	600	580	580	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.913

INPUT

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9714.1	1800.7	9717.8	1800.6	9722.5	1799.2	9868.7	1803.2	9944.2	1800.8

10000	1763.1	10037.3	1767.4	10054.5	1775.6	10080.7	1772	10111.6	1776
10166.4	1776.8	10189.7	1771.8	10200	1776.7	10215.4	1777.9	10219.9	1781.2
10240.4	1782.1	10276.9	1781.9	10431.4	1781	10609.3	1780.9	10623.1	1781.2
10668.7	1781.9	10784.1	1781.9	10826.3	1778.4	10829.1	1777	10876.2	1778.5
10887.3	1776.3	10916.2	1780.8	10955.3	1780.5	10985.8	1781.2	11061.8	1782.2
11083.6	1783.3	11122.1	1783.4	11228.2	1780.9	11365.8	1782.2	11411.6	1785.1

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9714.1	.06	9944.2	.03	10000	.033	10054.5	.08	10166.4	.025
10200	.06	10784.1	.12	10985.8	.06				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9944.2	10240.4	620	610	600	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.797

INPUT

Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9831.6	1799.2	9955.5	1796.6	10000	1760.6	10008.1	1761.3	10040	1761.4
10049.5	1765.8	10077.1	1771	10089.7	1771.9	10106.9	1769.4	10120	1772.3
10134.3	1770.7	10150.2	1771.6	10158.3	1776.1	10265.3	1776.8	10353.5	1776.3
10414.7	1774.9	10418.5	1774.5	10519.8	1775.7	10525.8	1774.9	10530.2	1775.7
10579.3	1776.1	10594.3	1776.8	10634.1	1776.6	10778.4	1777.1	10916	1777.6
10988	1772.3	10992.9	1772.4	11016.9	1773.4	11050	1776.1	11106.7	1774.9
11127.1	1778	11190.5	1779.4	11313.3	1777.9	11320.1	1777.5	11330	1777.9
11394.9	1778.6	11441	1780.5	11568.4	1782.1	11689.7	1782.7	11743.2	1782
11748.1	1780.9	11755.1	1781.8	11912.3	1782.5	11939.7	1783.4	11962.9	1785.1
12023.8	1787.3	12158.9	1788.1	12317.1	1788.4	12428.1	1789.3	12563.6	1789.4

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9831.6	.06	9955.5	.033	10000	.04	10049.5	.05	10158.3	.07
10916	.12	11190.5	.06						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9955.5	10158.3	560	550	550	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.693

INPUT

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9727.8	1792.9	9838	1791.4	9961.1	1791.7	10000	1756.3	10016.1	1757.7
10060.1	1760.3	10074.5	1762.8	10088.7	1762.8	10105.9	1770.2	10195.8	1771.7
10223.1	1769.6	10231.3	1771	10351.8	1770.9	10459.2	1772.3	10517	1773.4
10596.6	1774.7	10612.8	1775.5	10635.8	1775.1	10744.8	1773.7	10765	1774.3
10887.2	1771.4	10897.1	1769.7	10935	1770.5	10957.3	1767.3	10966.7	1769.5
10990.2	1769.3	11023.8	1773.7	11078.2	1775.9	11145	1776	11215.7	1772.4
11221.9	1771.2	11230.9	1773	11311.4	1776.9	11389.9	1778.9	11441.9	1779.5
11548.6	1779.3	11557	1778.6	11565.4	1779.8	11724	1780.3	11801.6	1781.6
11816.4	1782.9	11887.1	1786.3	11914.2	1786.5	12019.1	1786.2	12101.4	1786.2

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9727.8	.06	9961.1	.02	10000	.04	10060.1	.12	10195.8	.08
10765	.12	11023.8	.06						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9961.1	10195.8	490	470	460	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.604

INPUT

Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9545.8	1787.5	9740.2	1786.6	9792.1	1757.7	9813.5	1757.8	9823.8	1759.2
9851.8	1759.9	9893.9	1757.7	9964.9	1754.3	10000	1754.2	10014.4	1765.2
10026	1764.5	10038.5	1764.4	10081.8	1765.9	10113.1	1766.4	10150.4	1762.9
10183	1767.6	10221.3	1769.5	10240.7	1769.9	10369.3	1768.9	10411.8	1768.9
10444.5	1769.6	10528.9	1769	10540.6	1768.8	10569.9	1768.8	10586	1768.7
10619.2	1768.7	10644.4	1769.2	10712.7	1767.5	10717.3	1766.5	10727.3	1767.4
10765	1767.5	10793.9	1763.8	10813.3	1766.5	10822.3	1764.3	10830.3	1764.7
10835.3	1765.6	10867.7	1766.9	10888.5	1770.7	11019.7	1771.5	11084.6	1773.3
11105.7	1774.5	11211.2	1776	11321.6	1776.1	11340.7	1775.8	11354.5	1776.5
11523.2	1778.6	11547.1	1780.2	11597.4	1781.7	11629	1783.4	11700.6	1783.8

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9545.8	.06	9740.2	.08	9792.1	.038	10014.4	.08	10221.3	.07
10765	.12	10888.5	.06						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9740.2	10014.4	510	550	700	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.502

INPUT

Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9619.3	1783.5	9757.7	1784.1	9853.5	1783.8	9947.5	1773.7	9983.2	1748.8
10000	1750.6	10019.2	1751	10025.5	1750.2	10058.7	1752.1	10086.3	1754.1
10126.6	1760.3	10150.4	1762.5	10240	1763	10265.8	1759.5	10275.2	1759.9
10280.7	1762	10302	1762	10312.7	1758.3	10330	1761.1	10350.4	1762.8
10409.1	1762	10426.1	1760.8	10448.8	1762.5	10476	1763	10489.2	1763
10574.3	1761.9	10576.9	1761.2	10589.5	1762.3	10656	1761.9	10665.7	1759.8
10675	1761.7	10723.2	1763	10740.2	1763.7	10779.4	1762.6	10830.4	1759.6
10837.3	1758.4	10852.6	1760.6	10887.2	1761	10918.1	1759.1	10935.3	1762.5
10969	1761.8	10979.4	1759.1	11005	1764.1	11054.2	1767.7	11108.1	1769.6
11175.4	1770.5	11287.4	1771.3	11384	1772	11390	1771.2	11393.7	1771.8
11435.4	1773	11549.3	1776.9	11568.3	1777.1				

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9619.3	.06	9853.5	.12	9983.2	.035	10019.2	.04	10126.6	.08
10240	.04	10350.4	.08	10830.4	.12	11005	.08		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9853.5	10150.4	430	450	510	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.417

INPUT

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9619	1780	9751	1779.8	9848.4	1765.1	9889	1755.1	9942.8	1756.8
9989.2	1753.6	10000	1746.8	10057.8	1750.1	10121.9	1748.6	10141.8	1745.1
10177.2	1744.8	10200.8	1759.4	10367.6	1759.2	10536.5	1758.1	10689.7	1757.1
10725.2	1755.3	10783.7	1754.4	10809	1753	10842	1754	10860.1	1750.8
10874.8	1753.7	10893.3	1752.5	10912.4	1755.1	10941.7	1755.1	10962.6	1753.4
11035.1	1751.9	11041	1748.5	11049.8	1748.6	11095.5	1762	11211	1762.9
11248.2	1762.2	11252.4	1761.7	11257.5	1762.2	11350	1762.4	11431.4	1762.6

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9619	.06	9751	.12	9889	.08	10000	.035	10200.8	.06
10842	.12	11095.5	.06						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9751	10200.8	250	270	290	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.366

INPUT

Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9658.5	1777.3	9702.7	1769.8	9737.6	1755.9	9748	1745.3	9771.9	1746.2
9859.2	1746.7	9920.5	1748.4	9933.9	1745.5	9976.9	1746.9	10000	1742.6
10025.5	1742.7	10036.9	1742.6	10086.6	1742.3	10102.2	1743.4	10110.1	1755.1
10177.6	1755.6	10242.7	1755.3	10258.1	1754.3	10286.6	1755.9	10345.9	1754.6
10457.4	1754.7	10521.7	1750.9	10555	1751.5	10569.5	1753.4	10608.2	1753.3
10654.5	1750.7	10780.6	1753.3	10821.9	1751.3	10925.4	1752.1	10952	1751.4
11021.9	1747.6	11027.9	1746	11040.4	1746.4	11076.4	1749.8	11112.3	1745.8
11140.4	1756.7	11165.3	1758.8	11295.8	1759.3	11409.8	1757.2	11478.6	1757.7
11504.7	1757.4	11517.4	1756.9	11525.6	1756.7	11533.4	1756.1	11540.1	1757.2
11546.5	1757.4	11558	1758	11569.9	1759.2	11580.8	1759.7	11593.2	1760.2
11603.1	1760.4	11615.9	1760.6	11629.6	1760.6	11646.1	1760.7	11666	1760.2

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9658.5	.12	9748	.06	9920.5	.035	10025.5	.06	10952	.12
11140.4	.06								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9658.5	10110.1	230	240	240	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.32

INPUT

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9673.4	1760.8	9694.4	1752.3	9759.1	1752.8	9907.5	1749.8	9917.9	1740.3
9932.7	1743	9962.1	1742.9	10000	1740.3	10054	1740.9	10072.3	1754.9
10176.6	1751.7	10227.7	1750.2	10257.5	1751.4	10307.3	1750.3	10323	1751.9
10364.6	1752.2	10475.2	1750.2	10498.6	1751.7	10570	1752.1	10644.3	1749.6
10676	1751.5	10699.4	1747.4	10734	1750.8	10765.5	1751.3	10844.8	1749.9
10900.2	1746.3	10926.1	1746.8	11000.3	1749.3	11051.9	1744.4	11077.2	1742.8
11089	1744.6	11116.7	1743.9	11124	1743	11147.9	1755.9	11273.1	1758.2

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9673.4	.06	9673.4	.12	9694.4	.08	9907.5	.025	9932.7	.04
10054	.025	10072.3	.08						

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

9907.5 10072.3	260	275	300	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.265

INPUT

Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9689.5	1759.4	9689.6	1759.4	9689.7	1759.4	9703.1	1759.3	9739.2	1749.5
9795.3	1751	9900	1750.2	9968.4	1747	9973.2	1735.7	10000	1736.3
10044	1740.8	10063.1	1741.2	10128.7	1741.4	10164.2	1749	10201.7	1749.5
10298.4	1750	10337	1750.7	10382.1	1750.2	10397	1747.8	10460.8	1746.6
10464.3	1746	10469.8	1746.6	10509.2	1747.5	10531.9	1748.9	10575.2	1749.3
10618.4	1747.7	10638.3	1746.4	10653.5	1746.3	10687.3	1746.2	10707.3	1747.1
10752.2	1746.8	10780.1	1743.1	10795.7	1743.7	10810.8	1746.2	10849.5	1746.6
10861.6	1747.9	10861.7	1747.8	10890.4	1748	10939.7	1744.6	10986.2	1745.4
11055.7	1746.1	11101.8	1739.9	11124	1739.5	11134.3	1738.8	11149.2	1739.7
11174.7	1751.6	11300.7	1753.3	11301.3	1754	11313	1754	11321.2	1754.4
11337	1754.8	11356.1	1755.2	11373.2	1755.4	11392.5	1755.4	11407	1755.4
11425.8	1754.8	11445	1754.6	11463.1	1754.4	11479.9	1754.3	11498	1754.1
11515.1	1753.7	11533.8	1753.3	11552.5	1753	11572.1	1752.5	11582.7	1752.3
11593.1	1751.9	11601	1751.5	11609	1751.2	11613.9	1750.8	11619.8	1750.1
11623.4	1749.8	11627.9	1750.3	11631	1750.2	11635.8	1749.9	11638.3	1749.7
11643	1750	11648.1	1750.4	11654.4	1750.9	11666.4	1751.1	11674.7	1751
11679.2	1750.5	11684.6	1751.2	11697.1	1751.1	11709.4	1751.1	11725.3	1751.2
11744.6	1751.2	11767.4	1751.4	11782.6	1751.7	11797.6	1751.8	11808.6	1752.1
11818.4	1752.6	11828.8	1752.8	11839.8	1753.4	11850.9	1753.5	11865.9	1753.6
11873.3	1753.8								

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9689.5	.08	9739.2	.025	9795.3	.08	9968.4	.025	10000	.03
10337	.06	11055.7	.08	11174.7	.06				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9900	10337	210	210	220	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.226

INPUT

Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9788.6	1765	9788.7	1765	9834.4	1744	9877.9	1744.5	9880.7	1743.9
9928.4	1743.7	9943.3	1735.6	9989.5	1735.3	10000	1737.7	10065	1739
10106.8	1739.8	10145.4	1737.7	10162.8	1736.4	10188.7	1737.7	10259.4	1736.6
10269.7	1735	10283.3	1735.6	10320.4	1735.6	10332.8	1734.8	10380	1749
10432.1	1748.3	10448.1	1746.1	10526.8	1744.5	10533.7	1743.4	10543	1744.5
10562.1	1745	10583.3	1747.2	10798.5	1745.3	10855.8	1739.5	10881.8	1742.4
10907.3	1742.4	10936.1	1744.1	10999.9	1741.8	11004.2	1740.7	11013.1	1741.2
11029.8	1736.7	11054.5	1737.8	11059.9	1739.5	11075.5	1739.2	11099.3	1750.7
11246.8	1750.6	11302.9	1751.7	11329.3	1752.3	11347.4	1752.7	11364.1	1752.8
11382	1753.3	11400.2	1753.4	11418.8	1753.4	11459.9	1752.5	11486.2	1752.5
11518.4	1752.1	11540.6	1752	11570.8	1751.4	11606.5	1750.8	11632.5	1750.2
11649.9	1749.5	11657	1749.5						

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9788.6	.035	9834.4	.06	9928.4	.035	9989.5	.025	10065	.035
10188.7	.06	10332.8	.035	10380	.06	10855.8	.08		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9928.4	10380	310	300	300	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.169

INPUT

Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9850.9	1753.5	9881.6	1734.4	9933.2	1736	10000	1735.9	10145.7	1732.1
10155.1	1733.2	10194.3	1732.9	10218	1738.9	10265.5	1732.7	10315.5	1733.2
10339.7	1733.9	10379.9	1743.4	10395	1745.5	10481.8	1741.7	10526.6	1741.6
10538.6	1743.1	10564.2	1744.8	10687.1	1744.7	10812.4	1741.1	10854.3	1739.1
10885.4	1740.2	10910.1	1734.5	10918.1	1734.7	10928.8	1738.5	10948.6	1736.7
10976.7	1737.7	11000.2	1746.9	11111.9	1747.6	11159	1747.5	11174.1	1747.5
11189.1	1748.3	11210.4	1748.5	11233.8	1748.9	11254.7	1749.4	11271.8	1749.5
11286.5	1749.5	11301.5	1749.5	11313.6	1749.5	11329.4	1749.6	11343.5	1749.9
11358.7	1749.9	11375.7	1749.9	11377.6	1750				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9850.9	.025	10000	.05	10265.5	.038	10395	.08	11000.2	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9850.9	10395	400	330	310	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.106

INPUT

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9730.7	1755.7	9730.8	1755.7	9788	1731.8	9802.8	1731.6	9808.5	1733.6
9830.2	1734.8	9869.5	1734.7	9905.8	1733.3	9916.8	1734.4	9979.5	1732.4
10000	1729.1	10019.5	1728.6	10026.5	1731	10051.7	1731.4	10066.4	1732.4
10109.9	1730.6	10125	1732.1	10150.1	1728.9	10179	1727.7	10190.7	1725.7
10205.6	1727.8	10215	1736.1	10259.5	1736.8	10275.3	1742.7	10408.1	1742
10443.8	1738.5	10468.6	1739	10494.5	1738.6	10550.7	1741.2	10653.9	1737.2
10686.8	1739.5	10728.3	1738.8	10755.3	1736.2	10761.5	1736.9	10798.5	1737.4
10818.3	1733	10877	1743.8	10979.2	1745.6	11067.4	1745.6		

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9730.7	.06	9730.7	.038	9788	.033	9905.8	.06	10150.1	.04
10215	.08								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9730.7	10275.3	540	520	500	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.008

INPUT

Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9657.3	1746.2	9677.5	1745.5	9702.2	1731.7	9760.8	1724.6	9803.4	1724
9811	1725.9	9819.2	1725.7	9836	1725.2	9853.3	1727.3	9898.1	1725.7
9902.7	1726.6	9935.3	1727.3	9947.4	1726.4	9981.1	1723	10000	1723.9
10013.3	1726	10033.6	1726.6	10072.1	1726.5	10089.8	1725.6	10119.1	1726
10144.7	1724.9	10154.3	1724.9	10164	1736.3	10243.9	1735.8	10256.8	1740.5
10272.1	1734.5	10293.2	1734	10322.9	1732.5	10346.2	1737.2	10441.5	1737
10548.5	1734.8	10662.5	1733.9	10671.2	1729.8	10675.8	1730.3	10683.5	1733.9
10724	1733.5	10735.7	1734.2	10771.9	1733.6	10788	1731.6	10811.4	1739.6
10846.8	1739.9	10904.7	1739.3	10914.8	1739.2	10929.1	1739.3	10955.9	1739.4
10979.8	1739.6	10995.7	1740	10999.2	1740				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9657.3	.038	9702.2	.08	9803.4	.06	9981.1	.03	10164	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9657.3	10164	400	400	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.921

INPUT

Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9712.1	1739.4	9736.8	1725	9744.2	1723.7	9748.4	1722.7	9752.1	1723.7
9756.8	1723.1	9763.8	1723.7	9773.2	1724.1	9781.7	1722.5	9790.1	1724.1
9796.4	1722.1	9799.8	1722.1	9810.1	1723.2	9832.8	1722	9847.2	1722.8
9861	1723.1	9872.7	1723.2	9882	1723.9	9891	1724	9908	1723.1
9925.5	1723.1	9932.5	1723.2	9939.1	1723.2	9946.3	1722.6	9952.7	1720.7
9972.1	1721.1	9982.2	1720.7	10000	1720.2	10007.5	1720.4	10017.5	1720.3
10027.8	1723.1	10037.7	1724.4	10048.1	1724.6	10059.7	1725	10069.6	1725.1
10075.5	1725.1	10107.4	1724.1	10114.7	1724.2	10119.4	1724.1	10132.6	1722.7
10149	1731.9	10156.7	1732	10165.7	1732.1	10186.9	1733.5	10193.6	1732.2
10199.8	1732.8	10208.7	1732.2	10215.1	1733.8	10222	1732	10237.1	1732
10253.6	1734.9	10263.2	1734.4	10274.5	1734.5	10285	1734.6	10311.8	1734.6
10321.7	1734.3	10327.2	1734.2	10337.2	1734.9	10345.3	1735.1	10356.7	1734.8
10366.2	1735.2	10374.4	1735.3	10393.4	1734.2	10401.6	1734.7	10409.7	1734.7
10443	1735.5	10480.4	1734.5	10545.4	1728.1	10554.4	1728.5	10577.8	1732
10592.1	1732.7	10599.1	1732.5	10618.4	1733.4	10629.9	1733.4	10657.4	1734.3
10682.2	1733.4	10696.2	1733.4	10717.8	1733.5	10729.5	1733.3	10764.1	1728.8
10771.1	1730.5	10781.6	1731.2	10797.6	1731.3	10812.9	1729.2	10819.3	1730.8
10828.1	1731.1	10839.5	1731.1	10863	1729.1	10868.7	1727.4	10888.3	1728.3
10899.2	1732.9	10906.9	1735.9						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9712.1	.05	9939.1	.06	10027.8	.08	10149	.085

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9712.1	10149	450	430	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.845

INPUT

Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9258.1	1746.7	9258.2	1746.7	9258.3	1746.7	9377.6	1743.3	9416.7	1739.9
9553.3	1732.7	9611.4	1733.1	9623.1	1724	9645	1724.1	9657.8	1731.1
9688.6	1721.2	9793.2	1721.3	9834.9	1718.9	9871	1718.8	9877.3	1717
9905.1	1718	10000	1717.4	10020.1	1728	10087.9	1727.3	10102	1729.9
10120.9	1729.5	10143.7	1719.2	10152.7	1719.6	10170.8	1722.8	10191.5	1722.4
10209.4	1730.2	10236.4	1730.2	10253.5	1724.1	10271.5	1725.3	10285	1725.2
10290.8	1727	10349.1	1728.1	10437.8	1729.1	10474.8	1729.4	10537.7	1728
10556.6	1725.9	10581.4	1729.4	10622.5	1729.9	10657.4	1728.1	10665.1	1729.2
10684.7	1728.9	10712	1728.5	10721.6	1731.6	10793.1	1731.1	10864.9	1731.3
10874.9	1730	10889.4	1731.1	10914.9	1729.9	10946.4	1729.9	10982.9	1728.4

11003.8	1726.7	11030.4	1726.3	11042.7	1727.3	11090.1	1729.3	11124.8	1728.9
11229.8	1726.3	11246.7	1721.4	11279.8	1733	11346.5	1734.5		

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9258.1	.06	9611.4	.035	9688.6	.06	9834.9	.025	10000	.035
10102	.03	10349.1	.08	11003.8	.12				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9657.8	10020.1	350	370	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.775

INPUT

Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9691.5	1732.6	9752.3	1727.3	9766.7	1727.3	9797.7	1724.6	9824.8	1720
9841.5	1720.4	9854.8	1723.1	9874.3	1723.4	9880.2	1724.8	9914	1726.6
9920	1717	9967	1716.8	9980.1	1713.4	9991.4	1713.9	10000	1712.7
10018.8	1712.9	10027	1716.1	10072.7	1717.7	10087.6	1716.1	10107.9	1717.2
10187.6	1714.6	10207.6	1725.4	10229	1730.6	10296.7	1731.4	10391.5	1729.1
10407.3	1729.7	10446.8	1727.5	10465.7	1717.5	10489.7	1717.5	10502	1722.6
10543.4	1723.3	10550.5	1722.5	10561.3	1723.7	10596.4	1724.6	10685	1724.8
10729.9	1724	10770.1	1726.3	10789.2	1722.2	10806.5	1728.2	10931.3	1726.1
11003.7	1725.8	11039.1	1727.4	11121.5	1727	11179.5	1726.2	11192	1726.9
11304.1	1727.1	11425.9	1725.7	11447.1	1720.8	11492.7	1720	11507.2	1721.3
11534.8	1720.9	11554.6	1719.4	11578.7	1718.4	11599.8	1730.8	11618	1732.2
11746.8	1732.6	11876.6	1731	11956.3	1730.9				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9691.5	.08	9841.5	.12	9914	.025	10072.7	.03	10187.6	.035
10229	.08								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9914	10229	390	420	470	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.695

INPUT

Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9233.9	1747.7	9392.6	1744.2	9499.9	1739	9605.7	1721.1	9619.2	1719.7
9652.3	1718.9	9666.7	1721.5	9689.6	1722.5	9733.8	1724.9	9772.8	1723.1
9783.7	1718.4	9822.6	1714.6	9866.1	1714.3	9881.3	1721.4	9912.9	1719.6
9931.4	1710.6	9974.8	1711.5	9982.8	1709.5	9991.4	1709.5	10000	1710.7
10023.3	1710.9	10033.2	1709.9	10046.3	1710	10055.4	1724.6	10082.8	1722.9
10116.6	1723.8	10149.3	1721.7	10182.1	1723.1	10223.1	1723.3	10235.3	1725.8
10275.1	1725.9	10289.1	1727.2	10341.2	1725.9	10352.8	1713.2	10371.7	1714.3
10406.1	1713.1	10419	1717.4	10441.8	1716.9	10474.4	1719.4	10484.8	1718.6
10506	1720.9	10545.1	1719.7	10566	1715	10586.2	1718.5	10603.7	1719.2
10615.9	1724.2	10698.1	1723.5	10732.5	1722.9	10749.3	1725.3	10813.3	1723.6
10860.6	1722.9	10877.5	1721.2	10908.7	1722	10940.1	1718.5	10966.1	1722.2
11033.4	1722.4	11077.9	1721.5	11139	1722.1	11170.1	1722.9	11220.8	1721
11247.1	1722.6	11358.9	1721.6	11436.8	1714.6	11489.8	1714.9	11511.4	1725.3
11534.6	1727.2	11627.4	1728.5	11760.9	1728	11869.6	1728.1		

Manning's n Values num= 12

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9233.9	.06	9499.9	.12	9605.7	.025	9666.7	.035	9783.7	.025
9866.1	.035	10000	.025	10046.3	.06	10352.8	.025	10419	.06
10566	.035	10615.9	.08						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9881.3	10055.4	370	380	430	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.623

INPUT

Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8797.7	1747.3	8942.5	1745.6	9084	1741.2	9162	1737	9251.8	1726.3
9269	1723.8	9380.9	1724.5	9388.4	1725.7	9472.1	1723.6	9489.8	1724.7
9525.3	1732.7	9556.3	1723.3	9580.6	1723.4	9591.3	1728.1	9605.4	1722.9
9626.5	1721.7	9663.1	1708.4	9698.7	1703.9	9708.7	1706	9722.9	1704.6
9776	1704.3	9810.3	1707.3	9851.6	1708.9	9912.1	1707.8	9958.1	1705.2
10000	1705.1	10015.2	1709.5	10044.4	1709.9	10056.2	1712.8	10071	1712
10078.2	1714.1	10115.5	1709.3	10128.4	1720.1	10159.4	1719.4	10232.9	1720.3
10262.6	1719.5	10281.2	1720.4	10327.7	1718.6	10358.4	1718.9	10384	1720.9
10424.9	1721.8	10463.5	1721.3	10548.7	1718.5	10606.9	1716.8	10625.6	1713.9
10657.9	1717.2	10687.4	1718.2	10716.9	1717.6	10730.7	1716.3	10753.2	1718.2
10785.1	1718.1	10842.2	1715	10859.2	1712.2	10865.9	1713.5	10902.1	1714.1
10924.6	1717.7	10946.4	1716.9	10974.2	1714.2	11001.4	1707.5	11033.6	1712.7
11056	1711.8	11075.4	1713.6	11113	1714.2	11139.9	1715.4	11168.8	1717.2
11183.7	1715.9	11237.2	1720	11271.7	1720.1	11291.4	1719.7	11345.9	1720.9
11383	1722.5								

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val

8797.7	.08	9269	.12	9626.5	.035	9663.1	.06	9776	.038
9958.1	.025	10015.2	.08						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9626.5	10128.4	500	500	530	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.529

INPUT

Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8861.4	1745.1	9021.3	1744.1	9184	1741.9	9245.9	1739.6	9347.6	1729.6
9351	1729.6	9430.7	1721.5	9469.9	1721.2	9562.4	1719	9613.1	1718.7
9635.4	1720	9700.7	1718.5	9731.2	1720	9764.3	1719.8	9799	1709.3
9827.8	1708.5	9847.3	1705.4	9878.2	1708.1	9891.7	1704.8	9905.4	1704.5
9916.7	1702.9	10000	1702.6	10004	1703.6	10054.1	1703.8	10089.2	1705.3
10126.1	1705.2	10149.1	1703.3	10169.7	1716	10177.6	1714	10237	1713.4
10373.5	1712.2	10384.6	1713.6	10397.1	1711.5	10453.4	1713.8	10485.2	1711.9
10511.4	1713.5	10550	1714.4	10598.1	1713.3	10665.4	1712.7	10683.3	1708.3
10713.3	1709.1	10718.4	1710.3	10750.8	1710.4	10766.7	1712.3	10807.9	1710.9
10824.3	1712.2	10897	1712.7	10966	1712.7	11000.4	1710.3	11013.6	1706.5
11047.9	1706	11071.9	1704.8	11102.6	1711.3	11143.7	1711.9	11188.3	1712.5
11201.5	1713.1	11315.3	1714.4	11321.1	1714.4				

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8861.4	.08	9469.9	.06	9764.3	.035	9891.7	.025	10149.1	.035
10237	.025	10511.4	.08						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9764.3	10169.7	530	520	520	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.43

INPUT

Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9348	1739.7	9515.1	1736.9	9637.3	1735.3	9644.4	1736.3	9659.2	1736.1
9749	1726.7	9794.4	1700	9802	1700.1	9805.4	1701.3	9837.5	1700.9
9885	1699.8	9896.4	1701.1	9988.3	1700.4	10000	1700	10044	1701
10069.8	1702.6	10080	1702.3	10154.1	1701.8	10207	1700.1	10219.1	1697.7
10240.1	1697.5	10258.3	1706.6	10276.8	1706.8	10284.7	1712.4	10297.2	1710.5
10353.7	1711.7	10461	1710.5	10564.4	1708.6	10590.9	1707.7	10604.2	1715.9
10621.8	1713.6	10644.9	1708.7	10681.2	1707.2	10703.5	1704	10710.7	1706.2
10734.7	1706.6	10748.8	1708	10805.8	1709.2	10836.3	1708.8	10914.2	1707.7
10982.6	1709.3	11021.1	1706	11039.4	1702.2	11048.6	1704.1	11072.2	1705
11081.8	1701.1	11097	1700.6	11102.7	1702.7	11124.2	1704.4	11138.7	1704.3
11184.5	1708.1	11249.2	1706.1	11270.8	1706.7	11296.5	1706.8	11352	1710.9
11426.3	1712.5	11525.2	1713.3	11593.9	1713.4				

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9348	.06	9749	.08	9794.4	.04	10240.1	.035	10284.7	.06
10461	.025	10590.9	.08						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9749	10284.7	490	495	520	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.335

INPUT

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9299.1	1735.5	9492.8	1734.7	9615.6	1730.1	9645.8	1700	9701.2	1697.4
9715.3	1696.7	9771.9	1696.7	9794.1	1698.6	9886.3	1698.8	9892.3	1697.1
9903.3	1697.2	9912.9	1698.7	9947.7	1697.4	9953.9	1696.6	10000	1695.6
10024.1	1698.8	10103.3	1699.7	10141.9	1698.6	10190.7	1698.9	10245.8	1696.9
10262.9	1706.3	10271.6	1704.2	10292.9	1703.9	10302.3	1702.5	10333.4	1705.6
10438.8	1705.8	10464.6	1702.6	10574.7	1702.8	10627.4	1701.1	10710.5	1704.5
10816.3	1703.5	10852.4	1702.4	10868.2	1700.5	10906.9	1699.9	10920.3	1701.6
10938.8	1699.2	10949.1	1699	10961.4	1704	11033.5	1705.3	11149	1706
11213.4	1705.5	11298.3	1704.2	11358.3	1702.4	11389.1	1702.6	11435	1699.2
11451.6	1700.2	11466.4	1705.5	11486.3	1707.8	11519.8	1709.4	11639.6	1708.4
11729.4	1708.3	11833	1708.5						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9299.1	.06	9615.6	.022	9701.2	.065	10333.4	.08	11451.6	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9615.6	10262.9	495	500	520	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.239

INPUT

Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

9507.6	1731.2	9661.5	1731	9796.8	1730.5	9889.9	1729.1	9910.5	1726.4
9936.8	1692.8	10000	1692.8	10010.6	1697.2	10026.3	1700	10111.9	1700.8
10121.4	1695.5	10144.7	1693.3	10181.6	1693.1	10202	1699.5	10258	1699.3
10279.3	1701.3	10346.3	1702	10433.6	1699.1	10516.4	1698.2	10534.9	1705.5
10555.1	1702.8	10562.5	1699.5	10589	1699.1	10622.8	1698.1	10627.5	1700
10668.5	1700.4	10720.3	1699.7	10737.6	1695.6	10755	1696.1	10763.3	1698.4
10790	1698.9	10798.9	1697.5	10818.1	1699.5	10838.9	1700	10861.7	1698.1
10872.1	1698.1	10895.3	1696.1	10906.7	1695	10935.5	1700.5	11008.5	1700.7
11038	1699.2	11055.1	1700.2	11090	1698.6	11112.3	1699.5	11136	1698.8
11148.5	1698.1	11155.2	1699.1	11208.1	1697.7	11221.8	1693.3	11232.9	1693.6
11238.1	1696.2	11252.7	1697.1	11271.8	1697.2	11287.9	1695.3	11314.1	1697.8
11334	1699	11449	1700	11535.4	1699.8	11560.8	1699	11615.5	1696.2
11644.3	1697.2	11751.2	1695.6	11769.2	1698.9	11836.2	1702.2	11918.3	1703.1
11961.1	1704.3								

Manning's n Values num= 13

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9507.6	.06	9889.9	.022	9936.8	.025	10010.6	.06	10111.9	.035
10202	.025	10516.4	.06	10562.5	.025	10622.8	.08	10935.5	.12
11334	.08	11535.4	.12	11769.2	.08				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9889.9	10111.9	570	420	340	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.137

INPUT

Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9614.3	1724.2	9786.6	1725.3	9963.1	1725.9	10000	1685.7	10024.6	1686.6
10054.7	1691	10079	1704.1	10106.9	1695.9	10139.1	1697.5	10162	1690.1
10197.5	1689.9	10231.1	1686.4	10296.6	1700.2	10317.4	1698.9	10327	1693.9
10361.8	1695	10379.3	1696.6	10460.7	1695.4	10518.2	1694.2	10560.3	1695.5
10586.9	1695.3	10609	1701	10631.9	1692.3	10643.6	1691.9	10660.5	1694.6
10744.8	1696.7	10795.2	1694.7	10833.6	1694.3	10841	1696.8	10853.8	1697.5
10889.5	1696.2	10938	1697.5	10987.1	1693.5	10998.8	1695.3	11030.5	1696
11053.5	1696.6	11069.7	1695.4	11082.1	1697.2	11148.8	1697.9	11214.6	1694.6
11262.3	1696.9	11297.9	1695.8	11316.3	1694.4	11330.9	1695.8	11342.3	1692.6
11357.5	1692.7	11363.6	1694.3	11379.7	1694.4	11399.4	1691.9	11418.1	1691.9
11427.6	1693.6	11451	1693.5	11474.1	1690.6	11490.6	1690.6	11497.1	1693.8
11536	1696.4	11621.4	1696.2	11662.1	1694.2	11733.6	1693.6	11770.6	1694.9
11787.8	1697.5	11923.7	1698.4	11940.2	1700.1	12055.1	1699.7	12167.8	1700.3
12215.7	1700.5	12465	1702						

Manning's n Values num= 11

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9614.3	.06	9963.1	.022	10000	.035	10054.7	.022	10106.9	.06
10162	.025	10231.1	.08	10317.4	.06	10631.9	.08	11262.3	.12
11536	.08								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9963.1	10079	500	495	475	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.044

INPUT

Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9691.8	1717.7	9743.5	1718.1	9889.6	1719.7	9910.8	1717.4	9944.8	1685
10000	1684.3	10017.5	1691.1	10045.7	1691.8	10058.4	1694.1	10076.8	1694.2
10109.8	1692.7	10134.3	1694.2	10240	1693.8	10270.3	1690.9	10332	1686
10342.7	1689.4	10372.6	1689	10378.5	1691.3	10407.2	1692.5	10424.3	1691.5
10465.5	1692.8	10541.6	1692.2	10574.8	1689.6	10591.8	1689.7	10609.2	1691.6
10748.9	1691.8	10824.9	1687.8	10849.3	1689.9	10865.8	1693.9	10957	1693.1
11034.8	1693.6	11097.4	1691.3	11180.3	1689.8	11196.2	1691	11249.8	1690.3
11264.5	1689	11279.7	1690.3	11302.9	1691.7	11374.7	1691	11451.8	1686.1
11458.4	1688.3	11486.8	1687.1	11496.6	1687	11507.2	1689.5	11521.6	1686.8
11543.6	1688.7	11555.5	1686.7	11562.9	1689.2	11592.4	1692.6	11660	1693.7
11700	1694	12000	1696	12220	1698				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9691.8	.06	9889.6	.022	9944.8	.025	10000	.03	10076.8	.022
10240	.12								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9889.6	10076.8	750	650	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.919

INPUT

Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9686.7	1694.2	9698.8	1683.7	9704.8	1683	9711.8	1683.8	9733.6	1686.6
9756	1684.6	9769.8	1686.9	9778.5	1687.7	9794.3	1688.7	9803.7	1688.9
9857.9	1690.3	9864.9	1690.2	9902.3	1686.4	9909.2	1686.3	9921.8	1684.4
9927.5	1685	9937.3	1685.1	9956.5	1680.8	9961.6	1680.4	9964.9	1680.5
9970.9	1679.7	9980.4	1678.9	9987.9	1678.5	10000	1678.4	10007.5	1678.4
10014.7	1678.8	10019.3	1679.3	10022.9	1681	10034	1687.1	10039.1	1689.8

10046.9	1689.1	10072.2	1688.2	10095.7	1687.8	10104.8	1688.3	10120.8	1688.2
10126.1	1687.8	10131.2	1686.7	10136.7	1685.3	10143.4	1685.4	10152.9	1686.6
10159.2	1687.7	10214	1687.6	10220.9	1687.4	10226.7	1687.3	10246.9	1681.8
10257	1683.1	10289.3	1680.5	10293.4	1680.4	10298.9	1682.5	10305.9	1685.8
10318.5	1686.7	10326.7	1686.5	10345.6	1686.8	10362	1688.3	10366.4	1687.7
10561	1687.1	10569.9	1687.4	10617	1685.6	10625.2	1685.5	10631.6	1685
10639.5	1683.6	10644.4	1683.3	10647.4	1683.3	10656.5	1685.7	10662.4	1685.9
10685.4	1684.8	10705.2	1686.2	10711.2	1685.9	10718.3	1687.1	10726.1	1686.2
10733.8	1686.2	10742.9	1684.4	10756.9	1687.4	10767.4	1688.1	10776.6	1688.7
10792.4	1687.8	10801.6	1688.2	10835	1688.9	10930.2	1689.9	10953.9	1689.9
11087.9	1687.2	11095.6	1687.5	11105.1	1687.9	11142.7	1688.5	11160	1688
11175.7	1687.8	11194.1	1686	11200.8	1684.2	11221.4	1685.3	11238.4	1684.5
11244.1	1685.3	11252.4	1684.4	11271.4	1685.4	11289.2	1683.3	11299	1683
11338.8	1689.7	11561	1692						

Manning's n Values num= 10

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9686.7	.08	9704.8	.065	9857.9	.045	10039.1	.12	10257	.035
10362	.08	10625.2	.035	10835	.08	11175.7	.025	11338.8	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9857.9	10039.1	450	400	310	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.843

INPUT

Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9623.8	1698.3	9627.6	1682.9	9644.8	1678.7	9666.2	1684.2	9716.1	1682.9
9774.4	1685.7	9791.2	1682.3	9802.1	1683.1	9806.8	1682.5	9818.7	1685.1
9830.2	1685.6	9842	1685.9	9854.3	1684.9	9861.5	1685.7	9870.4	1686
9882.4	1686.1	9891.5	1685.8	9923.5	1682.4	9979.1	1679.7	9989.1	1676.2
10000	1673.9	10010.1	1673.7	10018.4	1673.6	10028.2	1673.5	10032.2	1674.1
10041.9	1674.4	10077.6	1685.5	10141.7	1684.1	10160.1	1684.1	10187	1685.2
10189.9	1684	10200.1	1685.1	10219.1	1684.6	10237.3	1682.3	10245	1678.2
10248.3	1678.1	10253.2	1679	10262.6	1679.1	10274	1679.5	10284.3	1680
10301	1680.1	10338.8	1676.7	10356	1682.8	10367.7	1684.8	10374.5	1684.8
10398.1	1683.7	10470.6	1682.5	10493.1	1682.5	10499.9	1683.2	10519.8	1679.7
10522.9	1679.8	10526.1	1681.2	10534.2	1681.8	10546.5	1684.2	10583	1685.2
10591.3	1685.1	10612.5	1683.1	10618.1	1683	10622.1	1683.7	10626.2	1683
10631.9	1683.6	10653.9	1684.3	10661.2	1685.2	10669.7	1685.9	10677.2	1686.2
10698.5	1686.2	10909.7	1683.4	10912.8	1683.5	10918.3	1684.2	10924.9	1684.3
10945.7	1683.7	10965.7	1685	10979.2	1681.9	10989.6	1675.8	10995.3	1675.9
11000.8	1676.1	11008.1	1675.9	11011.8	1676.2	11026.3	1682.7	11033.3	1683.4
11109.4	1684.2	11157.4	1683.2	11171.8	1683.3	11186.2	1683.2	11199.4	1682.7
11211.5	1678.9	11219.1	1679.2	11227.6	1682.2	11233.3	1683.8	11240.7	1684.3
11278.4	1684.7	11290.6	1684.9	11332.1	1687.4	11365	1690.6	11384.4	1690.7
11416.2	1690.2	11456	1690.2						

Manning's n Values num= 10

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9623.8	.022	9644.8	.08	9989.1	.04	10077.6	.12	10237.3	.035
10356	.12	10470.6	.035	10546.5	.08	10965.7	.025	11026.3	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9882.4	10077.6	540	370	210	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.75

INPUT

Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9574.2	1686.2	9577.4	1684.2	9588.3	1677.3	9602.8	1677.2	9608.9	1678.2
9649.3	1678.4	9658.4	1679.6	9680.9	1677.4	9706	1680.3	9746.5	1680.1
9765.4	1680.2	9804.2	1679.6	9826	1678.1	9835.7	1679.7	9845.9	1679.6
9850.5	1678.4	9864.7	1680.3	9925.3	1682	9973.2	1675.5	9977.4	1671.6
10000	1672.1	10041	1673	10061.9	1681.9	10085.9	1682.4	10144	1680.2
10156	1677.4	10176.5	1674.9	10219.7	1674.5	10233.2	1678.7	10250.1	1680.6
10292.9	1681.5	10435.2	1684.2	10518.7	1684.7	10668.2	1682.8	10824.7	1679.8
10841.6	1675.2	10869.3	1675.3	10881.2	1678.7	10897.6	1678.8	10923.8	1679.6
10960	1680.5	11003.7	1679.4	11058.5	1678	11069.3	1681.2	11178.7	1682.8
11266.2	1686.9	11357.1	1687.5	11434	1688.7	11483	1688.6		

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9574.2	.08	9577.4	.025	9588.3	.12	9977.4	.04	10041	.12
10144	.035	10233.2	.025	10824.7	.12	11069.3	.08		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9925.3	10061.9	270	280	280	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.699

INPUT

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9578.3	1683.7	9602	1673.8	9630.7	1671.6	9651.5	1674.4	9710.2	1675
9731.2	1677.4	9798.1	1678.6	9886.9	1677.9	9909.8	1671.6	9979.8	1670
10000	1669.4	10005.6	1672.4	10026.9	1673.1	10033	1678.4	10222.9	1681.5

10350.6	1681.3	10532	1680.2	10714	1679.8	10743.5	1678.2	10763.6	1672.4
10772.3	1673.2	10787.2	1671.9	10800.7	1674.6	10826.9	1672.1	10839.4	1675.7
10866.7	1675.7	10880.3	1678.6	10970.2	1679.2	11082.9	1680.4	11129.5	1685.1

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9578.3	.08	9578.3	.022	9578.3	.025	9602	.12	9886.9	.025
10714	.12								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9886.9	10033	290	290	290	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.644

INPUT

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9535.3	1680	9554.9	1672.9	9604.7	1668.7	9620.5	1674.6	9668.3	1675.1
9694.7	1671.6	9704.8	1672.2	9731.3	1672.4	9744.1	1675.7	9767.4	1677.2
9804.1	1675.7	9908.8	1676.6	9926.6	1669.8	10000	1670.1	10013.5	1670.1
10030.5	1675.2	10061.5	1677.3	10119.8	1676.6	10141.2	1678.8	10246.3	1678.6
10388.7	1677.6	10485.4	1677.1	10586.1	1676.7	10633	1677.8	10683.4	1676.6
10719.7	1677.8	10756.9	1672.7	10774.8	1674.2	10825	1672	10861.2	1669.3
10895.7	1676.8	10968.6	1676.5	11020.2	1675.5	11094.3	1682.8	11189.1	1683.6

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9535.3	.03	9535.3	.025	9554.9	.08	9668.3	.025	9731.3	.08
9926.6	.038	10030.5	.025	10774.8	.12				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9908.8	10030.5	360	320	280	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.56

INPUT

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9635.1	1678	9637.3	1677	9661.5	1666.3	9670.6	1666.5	9683.4	1671.3
9704.7	1671.6	9762.5	1669.6	9805.6	1668.1	9833.8	1668.5	9855.4	1671.8
9974.4	1674.1	10000	1668.9	10089	1670.8	10107.7	1679.6	10121.5	1673.7
10276.2	1673.7	10346.8	1674.3	10453.1	1673.5	10517.8	1672.9	10547	1672.2
10606.7	1672.9	10625.6	1673.9	10732.4	1675.6	10818.6	1674.2	10839.4	1668.1
10849.9	1668.3	10867.2	1670.4	10895.8	1669.9	10935.7	1667.3	10962.4	1665.9
10972.5	1666.8	10985.9	1670	11000.5	1675.5	11066.1	1680.6	11091.7	1681.2

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9635.1	.025	9637.3	.08	9782.5	.035	9855.4	.12	10000	.038
10089	.025	10818.6	.08						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9974.4	10089	320	300	290	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.519

INPUT

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9567.7	1678	9579.3	1664.3	9600.7	1665.2	9618.8	1667.7	9646.6	1667.9
9663.3	1669.9	9770.3	1670.4	9836.4	1671.4	9882	1671.7	9898.3	1670.2
9915.1	1672.1	9946	1672.4	9970	1670	10000	1668.3	10058.9	1670.1
10101	1672.2	10120.2	1670.6	10135.8	1674.5	10154.1	1671.6	10186.1	1671.5
10394.1	1670.6	10492.4	1670.5	10616.3	1670.7	10795.5	1671.1	10831.1	1664
10872.3	1669.6	10940	1667.9	10957.3	1661.6	10970.3	1661.6	10993.4	1675.6
11086.4	1679.2								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9567.7	.025	9663.3	.12	9970	.038	10135.8	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9970	10058.9	450	310	290	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.458

INPUT

Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8918.1	1679.6	8934.3	1679.6	8958.3	1678.4	9003.5	1678.6	9093.4	1682.4
9170.5	1686.7	9320.7	1688.6	9328.9	1687.7	9383.5	1686.8	9392	1688
9398.5	1686.3	9487.5	1683.8	9528.9	1677.1	9600.5	1672.1	9616.3	1663.6
9654.9	1663.2	9660.4	1666	9722.2	1666.4	9749.5	1667.8	9760.6	1666.5
9780.5	1668.1	9825.6	1669.2	9883.2	1667.7	9898.3	1675.4	9916.8	1668.1
9934.3	1666.8	9942.1	1669.3	9952.8	1665.7	10000	1665.5	10008.7	1668.5
10018	1667.2	10067.1	1669.1	10140.9	1664.9	10166.8	1678.5	10180.9	1669.1
10190	1668	10265.3	1668	10286.4	1668	10351.4	1668	10480	1668

10558.9	1668.1	10573.8	1667.8	10583.4	1670.2	10601.9	1665.9	10794.7	1669.5
10819.1	1664.6	10867	1664.3	10899	1667.1	10913.4	1667.1	10937.8	1664.1
10966.1	1660.5	10989.1	1673.9	11145	1677.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8918.1	.025	9616.3	.035	9654.9	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9942.1	10008.7	390	360	380	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.388

INPUT

Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8689.2	1677.1	8788.6	1676.8	8853	1674.2	8887.4	1672.3	8896.2	1673.7
8971	1674.4	9076	1679.5	9115.7	1678.8	9235.4	1668.5	9296.8	1666
9300.1	1665.6	9305.1	1666.4	9327.8	1665.3	9341.3	1666.1	9409	1666.4
9467.9	1665.9	9527	1661.5	9546.6	1656.6	9588.2	1659.9	9606.3	1660.5
9625.3	1663.8	9644.5	1666	9663	1664.6	9674.7	1662.3	9687.9	1664.8
9704	1665.2	9725.8	1666.5	9741.8	1663.3	9750.6	1663.6	9766	1666.8
9777.3	1665.9	9782	1664.7	9798.3	1664.9	9857.4	1665.4	9872.6	1666.5
9918.6	1666.1	10000	1665	10025.6	1672.8	10037.1	1666.3	10057.4	1665.2
10100.7	1666.1	10236.5	1664.3	10260.5	1665.2	10295.4	1664.2	10306.6	1662.9
10361.6	1664.8	10366.9	1665.9	10377.3	1665.4	10490.2	1666.4	10516	1662.5
10564.3	1662.2	10578.8	1663.3	10602.9	1660.1	10629.9	1660.4	10644.1	1663.8
10675.8	1665.5	10759.6	1672.2	10876.7	1674.1	11006.3	1674.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8689.2	.08	9527	.035	9606.3	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9467.9	9606.3	350	360	370	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.326

INPUT

Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8246.1	1670.2	8255.2	1669.4	8266.5	1670.9	8297.1	1672.1	8343.8	1673.3
8389	1671.7	8424	1669.2	8430.5	1666.4	8440.6	1668.1	8479.9	1671.3
8493.1	1670.6	8517.2	1672.8	8600.7	1672.4	8654.5	1672.6	8744.2	1665.8
8749.6	1667	8781	1669.2	8824.1	1673.3	8852.3	1677.1	8876.6	1677.4
8973.8	1667.7	9070.8	1666.5	9175.1	1665.5	9242.1	1661.1	9271.8	1661.3
9288.1	1660.7	9294.1	1661.4	9335.1	1661.5	9365.7	1657.2	9380.4	1653.2
9390.5	1653	9416.8	1657.2	9450.5	1657	9462.4	1655.9	9472.3	1659
9497.8	1661.1	9532.7	1660.8	9542.3	1659.8	9560.1	1662.5	9577	1661.9
9592.2	1660.1	9612.1	1662.9	9695.9	1663.6	9710.1	1662	9720.7	1663.4
9758	1663.8	9788.6	1662.5	9855.4	1661.6	9861.2	1662.5	9900.1	1662.2
9912	1659.7	9952.9	1658.9	9968.6	1660.5	9988.9	1659.2	10000	1656.4
10023.8	1656.5	10032.1	1660.3	10083.3	1660.6	10090.9	1657.8	10107.5	1660.8
10151.4	1661	10178.5	1660.9	10187.9	1657.8	10204.3	1657.7	10221.8	1661.5
10242.5	1659	10267.3	1658.9	10281.7	1656.4	10296.8	1661.5	10348.3	1660.3
10399.4	1658.9	10407.9	1661.2	10513.8	1664.2	10530.4	1666.3	10607	1669

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8246.1	.08	8744.2	.06	8973.8	.08	9335.1	.035	9472.3	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9335.1	9497.8	490	510	480	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.233

INPUT

Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8536.3	1664.2	8595.2	1663.9	8692.2	1660.9	8798.9	1658.6	8854.9	1658.1
8987.4	1656.2	9021.1	1658.8	9057.1	1659.7	9131.9	1660.4	9192.7	1658.7
9228.6	1659.6	9274.5	1659.1	9289.5	1653	9290.8	1647.3	9296.1	1647.3
9301.1	1648.9	9327.4	1650.3	9341.1	1655.3	9383.8	1656	9408.4	1654.9
9418.4	1656.1	9471.9	1655.7	9484.7	1657.3	9548	1657	9559	1656
9570	1657.7	9608.2	1657.2	9622.6	1656.2	9634.3	1656.4	9647.4	1658.2
9707.8	1657.4	9728.7	1654.8	9738.7	1656.8	9748.3	1655.8	9769.4	1657.6
9778.2	1656.7	9784.7	1655.5	9803.8	1657.5	9881	1657.4	9898.6	1656
9908.4	1657.1	9924.8	1654.4	9935.3	1656.1	9956.8	1656.7	9994.4	1653.9
10000	1652	10034.7	1652	10047.9	1657.4	10061.7	1656.8	10070	1655.4
10089.5	1656.6	10118.4	1654	10139.2	1657	10155.7	1656.5	10163.6	1652.5
10169.9	1652.6	10179.7	1656.7	10221.7	1657.4	10235.2	1653.7	10247.3	1655.4
10283.7	1655.8	10303.2	1658.2	10429.1	1658.6	10448.8	1659.1	10459.3	1661.5
10475.2	1663.9								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8536.3	.08	9131.9	.025	9289.5	.035	9341.1	.12

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

9228.6	9383.8		390	280	180		.1	.3	

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.18

INPUT

Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8629.4	1665.8	8720.9	1657.3	8743.1	1659	8779.6	1660.4	8859.3	1660.4
8905.9	1660.5	8960.7	1656.3	8986.1	1658.4	9017	1658	9047.1	1652
9057.1	1652	9065.1	1653.4	9144.5	1654.4	9161.8	1652.9	9200.6	1652
9213.5	1654.5	9262.6	1654.1	9306.6	1651.1	9319.4	1647.8	9353.2	1647.7
9371.6	1653.4	9387	1653.8	9403.9	1652.6	9413.7	1655.1	9490.2	1656.2
9515.2	1654.9	9522	1653.5	9544.3	1655.5	9581.6	1655.7	9597	1654.1
9633.5	1655.9	9660.4	1654.6	9698.9	1655.1	9707.3	1651.5	9717.8	1651.7
9725.7	1654.4	9749.7	1653.5	9785.9	1653	9814.3	1652.1	9830.6	1655.3
9894.7	1655.4	9911.5	1654.3	9924.2	1656.2	9944.4	1656.1	9955.6	1654.3
9969.6	1654.3	9978.6	1656	9986.8	1654.8	10000	1650.4	10046.2	1650.8
10057.5	1653.4	10064.2	1652	10072.4	1649.6	10076.1	1649.9	10082	1653
10097.1	1651.1	10114	1654.4	10135.8	1654.6	10157.7	1658.1	10214.9	1658
10240.1	1656.9	10265	1658.1	10356.6	1657.3	10390.4	1656.5	10430.2	1657.3
10435.3	1654.4	10447.7	1656.1	10474.4	1658.4	10537.3	1661.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8629.4	.08	9306.6	.025	9387	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9213.5	9387	500	430	430	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.099

INPUT

Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8593.8	1658	8725	1653	8775	1655	8820	1652	8880	1655
8902.4	1656	8914	1654.8	8923.1	1648.2	8947.9	1647.6	8959	1649.3
8988	1650.6	8994.8	1650.4	9011.4	1649.1	9029	1651.2	9064.3	1650.7
9070.4	1650.9	9080.4	1649.8	9091.8	1651.2	9112.7	1651.5	9150.2	1650.7
9170.3	1652	9209.7	1649	9215.4	1649	9234.1	1651.3	9242.9	1651.4
9259.9	1652.4	9267.2	1651.3	9283.7	1652.5	9327.5	1652.5	9336.8	1652
9346	1652	9367.6	1646.9	9387.8	1646.2	9395.9	1646	9409.8	1646
9416	1649.2	9430.5	1650.8	9435.8	1650.5	9441.6	1651.3	9458.6	1652
9468.4	1652.1	9490.1	1652.6	9497.2	1652.7	9515.2	1651.6	9558.3	1650
9571.1	1648.1	9578.8	1648.2	9591.2	1650.6	9608	1652.3	9644.5	1650.8
9662.4	1653.1	9730.6	1652.5	9735.4	1652.4	9742.7	1650.6	9748.7	1650.3
9757.9	1650.4	9838.9	1653.2	9859.1	1652.7	9868.9	1652.5	9876.9	1651
9887.2	1651.7	9904.9	1651.7	9919.5	1651.4	9928.8	1651	9936.8	1652.1
9941.9	1651.3	9951.4	1648.4	9960.9	1648.9	9971.1	1649.3	9982.9	1649.4
9991.2	1649.1	10000	1648.2	10008	1648.6	10015.4	1648.9	10024.3	1651.3
10032	1653	10041.4	1653.5	10048.6	1653.9	10063.9	1654.4	10069.1	1654.4
10087.5	1654	10094.2	1653.5	10100.6	1650.9	10104	1651.2	10111.3	1652.8
10127.5	1652.6	10146.3	1654.1	10155.8	1654.2	10167	1654.9	10211.1	1655
10219.9	1654.9	10225.1	1652.7	10229.6	1654.4	10254.6	1655.4	10292.9	1653.4
10301.5	1654.8	10341.2	1659.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8593.8	.08	9346	.025	9430.5	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9346	9430.5	430	470	530	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.01

INPUT

Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8006.1	1672.1	8015.7	1672.2	8040.5	1671.9	8166.9	1655.7	8240.8	1652.6
8305.9	1651.5	8397.8	1653.4	8557.9	1653.2	8664	1650.2	8678.1	1645.5
8694.6	1645.1	8698.5	1643.6	8743.7	1642.1	8747.6	1643.4	8759	1644.1
8766.4	1645	8783.5	1645	8787	1643.6	8803.9	1644.6	8809.9	1642.4
8823.5	1646	8878.3	1643.6	8880.6	1641.3	8905.4	1641.6	8912	1643
8929.6	1640.2	9059.1	1641.7	9087.8	1641	9124.3	1641.2	9143.5	1642.7
9180.8	1642.5	9199	1641.4	9223.1	1648.7	9248.1	1647.3	9294.1	1646.9
9311.5	1647.8	9355.3	1646.9	9364.6	1644	9372.7	1644.4	9382.7	1646.5
9445.1	1647.4	9456	1646.4	9476.2	1648.3	9555.9	1649.3	9687.1	1650.4
9734.1	1647.5	9745.5	1649	9770.2	1648.8	9776.5	1647.4	9818.2	1646.5
9823.9	1644	9848.6	1645.2	9869	1648	9935.5	1646.9	9964.9	1647.5
9975	1644.5	10000	1643.9	10006.6	1642.5	10019.8	1642.7	10037.7	1652.2
10149.5	1654.3	10163.8	1656.8	10228.1	1656.7	10311.7	1657.7	10370	1659.2
10380.2	1658.7	10385.8	1659.7	10508.2	1660.3	10543.5	1660.4	10549.3	1660.4
10550	1660.4								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8006.1	.08	8929.6	.035	9199	.08	9975	.035	10019.8	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8823.5	9223.1	410	480	550	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.919

INPUT

Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7894.9	1663.3	7925.8	1664.7	8046.2	1652.8	8068.4	1649.7	8168.9	1646.8
8183.9	1646.9	8190.2	1646.3	8195.5	1647.1	8236.4	1647.5	8239.8	1646.7
8249.6	1648	8266.1	1649	8326.9	1648	8332.7	1647.5	8340.6	1648.4
8422.4	1648.4	8461.9	1649.3	8494.5	1650.4	8588.8	1646.5	8604	1635.3
8637.8	1634.9	8647.2	1637.6	8695.7	1638.6	8709.6	1643.6	8729.6	1643.3
8742.5	1640.4	8768.3	1642.7	8785.3	1639.8	8803.3	1640.5	8813.8	1639.4
8836.9	1639.8	8858.9	1642.9	9045.7	1643.3	9126.5	1643.4	9133.6	1641.2
9145.6	1642.4	9152.9	1640.2	9184.9	1640.4	9199.9	1643.3	9234.5	1643.5
9243.9	1644	9302.9	1644.2	9335.8	1643.1	9351.3	1641.3	9379.6	1644.1
9538.9	1644.6	9559.5	1643.5	9583.1	1641.9	9599.3	1641.4	9611.3	1643.2
9644.3	1643.1	9654.2	1644.5	9688.9	1643.9	9716.3	1642.7	9728.5	1643.9
9795.8	1644.7	9805.1	1644	9810.7	1644.6	9870.7	1644.6	9882.5	1643.8
9896.4	1643.7	9907.8	1644.2	9927.7	1644.5	9936.8	1642.2	9947.6	1644.7
9971.5	1639.5	10000	1639.5	10008.5	1651.2	10153.9	1653.6	10346.6	1654.4
10467.5	1654.4	10648	1653.6						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
7894.9	.12	8604	.035	8647.2	.12	9947.6	.035	10000	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8494.5	8709.6	460	390	350	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.845

INPUT

Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8242.8	1648.4	8353.1	1644.3	8493.6	1646.2	8550.7	1643.6	8556.4	1644.1
8674.4	1646.7	8678.9	1646.6	8683.6	1646.5	8697.6	1638.4	8702.9	1636
8707.3	1635.7	8721.1	1635.6	8734.5	1635.6	8746.1	1635.3	8773.9	1635.3
8785.7	1641.9	8792.8	1641.9	8812.9	1639.6	8826.7	1641.6	8835.8	1641.3
8848.6	1638.2	8853.7	1638.3	8873	1640.6	8878.1	1639.9	8893.9	1639.9
8900.7	1640.9	8905.3	1641.1	8914.9	1640.4	8921.4	1642.3	8944.5	1642.3
8954.8	1642.2	8961.3	1642.2	9007.5	1642.9	9020.6	1642.9	9040.8	1638.5
9043.4	1638.6	9048.6	1640.1	9054.5	1640.5	9066.8	1640.6	9075.4	1640
9103.1	1638.3	9129	1641.8	9151.1	1641.2	9183.1	1641.2	9191.6	1641.6
9212.4	1641.5	9226.5	1641.7	9245.9	1641.7	9249.8	1641.4	9259	1641.1
9272.1	1638.6	9276	1639.2	9279.6	1638.6	9288.1	1640.6	9296.3	1640.6
9345.5	1641.7	9351	1640.8	9363.2	1640.6	9388.9	1641.5	9406.6	1637.5
9448.5	1641.8	9463	1640.7	9484.4	1641.7	9507.2	1641.7	9526.6	1642.4
9556.3	1641.8	9568.9	1642.2	9574.1	1640.9	9581.5	1640.9	9601.5	1642.2
9623.5	1642.2	9630.9	1642.5	9642.5	1642.3	9660.3	1641.1	9667.2	1641.4
9689.7	1641.3	9710.8	1640	9727.5	1639.8	9730.6	1637.8	9738.1	1638.4
9749.6	1637.9	9763.8	1641.1	9781.1	1641.2	9789.3	1640.5	9806.5	1640.5
9812.9	1640.9	9819.2	1640.6	9825.4	1641.3	9840.6	1641.6	9860.8	1641.2
9961.4	1643.2	9967.8	1642.9	9988.1	1639.5	10000	1639.1	10028.1	1639.2
10038.9	1640.3	10067	1647.4						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8242.8	.12	8702.9	.035	8773.9	.12	9988.1	.035	10038.9	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8674.4	8785.7	560	490	490	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.752

INPUT

Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8620	1641.3	8690	1642.2	8727.7	1641	8789.8	1632.4	8835.7	1638.2
8868.3	1637.5	8884.2	1632.4	8895.7	1632.9	8921	1629.8	8925.4	1629.3
8941.5	1629.2	8957.9	1632.7	8967	1632.4	8997	1638.3	9047.9	1637.9
9064.6	1633.4	9070.6	1633.2	9093.7	1634.7	9099.4	1634.2	9110.6	1636.1
9205	1632.5	9223.2	1633.1	9233.2	1633.6	9246.8	1638.1	9253.7	1638.6
9282.6	1638.4	9358.8	1637.9	9374.5	1634.7	9385.2	1634.3	9393.9	1633.5
9402.7	1633.4	9420.2	1637.7	9431.3	1638.2	9450.7	1638.4	9459	1638.3
9464.9	1638.1	9480.8	1635.5	9486.7	1635.9	9493.4	1636.3	9503.5	1637.7
9518.2	1638.8	9531.6	1637.9	9543.1	1635.9	9561.3	1633.7	9566.7	1635.4
9572.4	1635.8	9577.3	1637.1	9582	1635.1	9589.5	1634.8	9594	1634.9
9600.3	1636.7	9625.9	1637.5	9646.3	1636.3	9667.4	1637.7	9686.1	1634.1
9690.2	1633.1	9707.1	1633.3	9738.1	1633.6	9747	1638.5	9764.4	1639.4
9774.5	1639.6	9783.1	1639.6	9797.1	1639.1	9807.5	1637.1	9813.6	1635.1
9913.6	1637.9	9930.4	1638.8	9944.8	1638.4	9953.9	1637.5	9962	1635.1
9981.5	1633.7	9990	1633.5	10000	1633.5	10010.2	1634.2	10019	1635.9
10029.9	1638.7	10039.1	1639.8	10045	1640	10062.5	1640.2	10071.4	1640.2
10090.9	1639.3	10098.7	1638.2	10103.6	1638.1	10118.2	1639.7	10127.7	1638
10134.5	1635.2	10148.5	1636.6	10163.8	1638	10170.2	1639.5	10176.7	1637.8
10181.1	1638.4	10192	1642.1						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val

8620	.12	8895.7	.035	9253.7	.12	9981.5	.035	10010.2	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8895.7	8997	850	560	430	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.646

INPUT

Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8630	1650	8730	1640	8810	1636	8850	1635	8870	1636
8880	1631	8900	1634.5	8960	1632	9160	1630	9330	1630
9430	1631	9535	1630	9580	1630.5	9620	1630	9630	1627
9690	1626	9700	1630	9745.6	1630.5	9767.3	1629.1	9787.4	1629.8
9795.5	1633.2	9808.6	1633.2	9817.1	1634.6	9845.8	1632.7	9859.1	1631.3
9876.2	1631.4	9889.7	1633.8	9930.1	1632.8	9942.8	1630.9	9953	1630.6
9963.4	1632.6	9976.6	1632.7	9984.9	1633.6	10000	1626.7	10034.8	1627.2
10043.8	1628.3	10084.6	1629.3	10091.3	1630.5	10119.4	1630.4	10137.9	1635.3
10154.9	1634	10224.7	1634.1	10243.2	1634.2	10252	1632.6	10265.6	1632.8
10271	1634.5	10357	1633.7	10370.5	1634.1	10377	1633	10380.9	1633.2
10385.2	1634.1	10413.3	1633.5	10425.9	1631.8	10453.6	1631.7	10467.1	1634
10488.2	1634.7	10534.6	1634.6	10557.6	1633.3	10569.7	1634.8	10583.3	1633.9
10602.2	1634.9	10665.2	1634.8	10680.4	1633.7	10734.7	1634.8	10747.5	1633.8
10757.4	1635.4	10836.8	1634.9	10845.5	1633.5	10852.8	1634.6	10871.6	1634.1
10888.5	1635.4	10916.3	1635.1	10970.3	1636.1	11010.9	1636.5	11059.9	1635.4
11070.1	1637.2	11088.3	1636.8	11097.1	1637.5	11184	1638.4	11283.7	1639.7
11325.2	1639.1	11417.9	1639.9	11433.7	1639.4	11442.7	1640.3	11528.4	1640.3
11562.3	1641.1	11685.7	1643.5	11770.6	1644.9	11850	1646.3		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
8630	.12	8870	.035	8900	.12	10000	.035	10119.4	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9580	9745.6	760	640	620	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.525

INPUT

Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8760	1640	8900	1630	8980	1626	9090	1624	9091	1623.9
9210	1622	9300	1624.8	9740	1626	9750	1628	9810	1629.5
9860.5	1629.3	9875.7	1625	9886.2	1622	9888.6	1624	9950.3	1624.6
10000	1623.9	10009	1626.1	10014.8	1627.9	10045.5	1626.5	10058.2	1628
10078.4	1627.7	10093.3	1629.5	10189.4	1629.5	10203.4	1628.4	10226.7	1627.4
10233.1	1628.2	10238.3	1627.9	10269.2	1626.1	10276	1627.7	10289.6	1627
10329.9	1624.2	10343.7	1626.2	10362.1	1626.2	10386.8	1626.5	10392.3	1625.2
10407.3	1626.7	10422.4	1626.3	10426.4	1625.6	10440.7	1626.6	10487.2	1626
10496.5	1624.3	10533.1	1624.6	10535.6	1623.8	10559.6	1623.6	10571	1626.2
10584.3	1626	10594.7	1625.1	10629.9	1625.6	10638.3	1626.5	10646.9	1625.8
10653	1626.8	10702.1	1626.7	10708.9	1626	10722.5	1627	10773	1626.5
10799.7	1624.6	10821.2	1630.2	10836.1	1629.3	10848.3	1628	10860.1	1629.5
10884.1	1630.1	10962.7	1630.2	10975.8	1629.1	10990.4	1629.9	11060.9	1630.8
11099.6	1629.3	11114.2	1629.7	11135.1	1629.2	11152.9	1630.5	11227.9	1631.1
11241.4	1629.2	11256.3	1629.7	11266.1	1629.6	11276.1	1632.2	11287.4	1632.1
11322.3	1631.2	11327.4	1631.8	11358.7	1631.3	11373.8	1630.2	11383.2	1631.2
11397.3	1632	11415.9	1633.5	11424.4	1632.9	11439.7	1633.4	11448.3	1634.4
11464	1636.7	11605.1	1638	11693.3	1639.6	11775.2	1640.1	11881.3	1641.1
11932.2	1641.8	12003.2	1640.7	12023.9	1641.1	12043.4	1640.1	12125.8	1639.6

Manning's n Values num= 1

Sta	n Val
8760	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9860.5	10009	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9	n10	n11	n12	n13
Reach-1	36400	.065	.065	.065										
Reach-1	36310	.065	.045	.065										
Reach-1	36230	.065	.06	.065										
Reach-1	36180	.065	.06	.065										
Reach-1	36060	.065	.035	.065										
Reach-1	35960	.065	.035	.065										
Reach-1	35870	.065	.045	.065										
Reach-1	35770	.065	.045	.065										
Reach-1	35690	.06	.045	.06										
Reach-1	35590	.06	.045	.06										
Reach-1	35.54	.065	.06	.065										
Reach-1	35.47	.065	.06	.065										
Reach-1	35.37	.065	.06	.065										
Reach-1	35.28	.065	.06	.065										

Reach-1	35.24	.065	.06	.065							
Reach-1	35.18	.065	.06	.065							
Reach-1	35.15	.065	.06	.065							
Reach-1	35.09	.065	.06	.065							
Reach-1	35.01	.065	.06	.065							
Reach-1	34.92	.065	.06	.065							
Reach-1	34.88	.065	.06	.065							
Reach-1	34.83	.065	.06	.065							
Reach-1	34.73	.065	.06	.065							
Reach-1	34.63	.075	.07	.06							
Reach-1	34.54	.075	.07	.06							
Reach-1	34.45	.075	.07	.06							
Reach-1	34.36	.065	.055	.075							
Reach-1	34.27	.065	.055	.075							
Reach-1	34.19	.065	.055	.075							
Reach-1	34.08	.07	.055	.07							
Reach-1	33.98	.07	.055	.07							
Reach-1	33.89	.07	.055	.07							
Reach-1	33.77	.07	.055	.07							
Reach-1	33.67	.07	.055	.07							
Reach-1	33.56	.07	.055	.07							
Reach-1	33.46	.07	.055	.07							
Reach-1	33.36	.07	.055	.07							
Reach-1	33.26	.07	.055	.07							
Reach-1	33.17	.07	.055	.07							
Reach-1	33.08	.07	.055	.07							
Reach-1	32.99	.07	.055	.07							
Reach-1	32.9	.07	.055	.07							
Reach-1	32.8	.07	.055	.07							
Reach-1	32.7	.07	.045	.07							
Reach-1	32.62	.07	.045	.07							
Reach-1	32.52	.07	.045	.07							
Reach-1	32.49	.07	.045	.07							
Reach-1	32.44	.07	.045	.07							
Reach-1	32.33	.07	.045	.07							
Reach-1	32.24	.07	.045	.07							
Reach-1	32.15	.07	.045	.07							
Reach-1	32.07	.07	.045	.07							
Reach-1	31.98	.07	.045	.07							
Reach-1	31.91	.07	.045	.07							
Reach-1	31.87	.055	.055	.05							
Reach-1	31.82	.055	.055	.05							
Reach-1	31.75	.055	.055	.05							
Reach-1	31.63	.055	.055	.05							
Reach-1	31.54	.055	.055	.05							
Reach-1	31.45	.055	.055	.05							
Reach-1	31.34	.055	.055	.05							
Reach-1	31.25	.055	.05	.055							
Reach-1	31.17	.055	.05	.055							
Reach-1	31.14	.055	.05	.055							
Reach-1	31.05	.055	.05	.055							
Reach-1	30.96	.055	.05	.055							
Reach-1	30.85	.055	.05	.055							
Reach-1	30.75	.055	.05	.055							
Reach-1	30.65	.055	.05	.055							
Reach-1	30.52	.055	.05	.055							
Reach-1	30.42	.055	.05	.055							
Reach-1	30.28	.055	.05	.055							
Reach-1	30.2	.055	.05	.055							
Reach-1	30.1	.055	.05	.055							
Reach-1	29.85	.06	.035	.06							
Reach-1	29.77	.06	.045	.035	.045	.06					
Reach-1	29.72	.06	.045	.035	.06						
Reach-1	29.715	Bridge									
Reach-1	29.71	.06	.045	.06							
Reach-1	29.663	.06	.035	.025	.03	.08	.06				
Reach-1	29.601	.06	.035	.025	.06	.03	.12	.06			
Reach-1	29.538	.06	.025	.08	.028	.065	.06				
Reach-1	29.493	.065	.08	.04	.06	.033	.06	.025	.08	.025	.08
Reach-1	29.387	.06	.04	.12	.05	.025	.05	.12	.06		
Reach-1	29.351	.06	.04	.12	.05	.045	.07	.12	.06		
Reach-1	29.258	.06	.12	.035	.08	.06					
Reach-1	29.13	.06	.06	.04	.045	.043	.06				
Reach-1	29.012	.06	.035	.025	.04	.045	.05	.06			
Reach-1	28.934	.06	.12	.04	.025	.08	.06				
Reach-1	28.847	.06	.12	.035	.12	.04	.06				
Reach-1	28.75	.06	.12	.033	.05	.06	.06				
Reach-1	28.657	.06	.08	.033	.12	.025	.12	.06	.08	.06	
Reach-1	28.555	.06	.035	.025	.08	.06	.08				
Reach-1	28.462	.06	.08	.025	.12	.08	.06				
Reach-1	28.39	.06	.12	.025	.12	.03	.12				
Reach-1	28.326	.06	.12	.025	.12	.06	.12	.08			
Reach-1	28.241	.06	.12	.025	.028	.08	.06	.12	.08		
Reach-1	28.157	.06	.12	.04	.035	.025	.035	.12	.06		
Reach-1	28.091	.06	.03	.04	.12	.08	.04	.06	.12	.06	
Reach-1	28.023	.03	.04	.12	.08	.04	.06	.12	.06		
Reach-1	27.913	.06	.03	.033	.08	.025	.06	.12	.06		
Reach-1	27.797	.06	.033	.04	.05	.07	.12	.06			
Reach-1	27.693	.06	.02	.04	.12	.08	.12	.06			
Reach-1	27.604	.06	.08	.038	.08	.07	.12	.06			
Reach-1	27.502	.06	.12	.035	.04	.08	.04	.08	.12	.08	
Reach-1	27.417	.06	.12	.08	.035	.06	.12	.06			
Reach-1	27.366	.12	.06	.035	.06	.12	.06				
Reach-1	27.32	.06	.12	.08	.025	.04	.025	.08			
Reach-1	27.265	.08	.025	.08	.025	.03	.06	.08	.06		

Reach-1	27.226	.035	.06	.035	.025	.035	.06	.035	.06	.08	
Reach-1	27.169	.025	.05	.038	.08	.06					
Reach-1	27.106	.06	.038	.033	.06	.04	.08				
Reach-1	27.008	.038	.08	.06	.03	.08					
Reach-1	26.921	.05	.06	.08	.085						
Reach-1	26.845	.06	.035	.06	.025	.035	.03	.08	.12		
Reach-1	26.775	.08	.12	.025	.03	.035	.08				
Reach-1	26.695	.06	.12	.025	.035	.025	.035	.025	.06	.025	.08
Reach-1	26.623	.08	.12	.035	.06	.038	.025	.08			
Reach-1	26.529	.08	.06	.035	.025	.035	.025	.08			
Reach-1	26.43	.06	.08	.04	.035	.06	.025	.08			
Reach-1	26.335	.06	.022	.065	.08	.06					
Reach-1	26.239	.06	.022	.025	.06	.035	.025	.06	.025	.08	12
Reach-1	26.137	.06	.022	.035	.022	.06	.025	.08	.06	.08	12
Reach-1	26.044	.06	.022	.025	.03	.022	.12				
Reach-1	25.919	.08	.065	.045	.12	.035	.08	.035	.08	.025	.08
Reach-1	25.843	.022	.08	.04	.12	.035	.12	.035	.08	.025	.08
Reach-1	25.75	.08	.025	.12	.04	.12	.035	.025	.12	.08	
Reach-1	25.699	.08	.022	.025	.12	.025	.12				
Reach-1	25.644	.03	.025	.08	.025	.08	.038	.025	.12		
Reach-1	25.58	.025	.08	.035	.12	.038	.025	.08			
Reach-1	25.519	.025	.12	.038	.08						
Reach-1	25.458	.025	.035	.08							
Reach-1	25.388	.08	.035	.12							
Reach-1	25.326	.08	.06	.08	.035	.12					
Reach-1	25.233	.08	.025	.035	.12						
Reach-1	25.18	.08	.025	.12							
Reach-1	25.099	.08	.025	.12							
Reach-1	25.01	.08	.035	.08	.035	.08					
Reach-1	24.919	.12	.035	.12	.035	.12					
Reach-1	24.845	.12	.035	.12	.035	.12					
Reach-1	24.752	.12	.035	.12	.035	.12					
Reach-1	24.646	.12	.035	.12	.035	.12					
Reach-1	24.525	.12									

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	36400	510	480	490
Reach-1	36310	350	420	430
Reach-1	36230	240	260	250
Reach-1	36180	580	630	630
Reach-1	36060	560	580	560
Reach-1	35960	450	460	450
Reach-1	35870	520	530	520
Reach-1	35770	450	450	450
Reach-1	35690	460	530	470
Reach-1	35590	430	460	440
Reach-1	35.54	400	388	400
Reach-1	35.47	500	540	500
Reach-1	35.37	485	485	480
Reach-1	35.28	180	181	180
Reach-1	35.24	310	311	330
Reach-1	35.18	190	189	190
Reach-1	35.15	280	281	260
Reach-1	35.09	470	467	470
Reach-1	35.01	480	481	480
Reach-1	34.92	200	207	200
Reach-1	34.88	250	262	270
Reach-1	34.83	510	509	510
Reach-1	34.73	520	510	480
Reach-1	34.63	480	483	480
Reach-1	34.54	520	494	480
Reach-1	34.45	440	461	460
Reach-1	34.36	490	484	460
Reach-1	34.27	410	415	430
Reach-1	34.19	570	572	570
Reach-1	34.08	540	544	540
Reach-1	33.98	490	494	430
Reach-1	33.89	620	606	580
Reach-1	33.77	530	552	550
Reach-1	33.67	600	585	580
Reach-1	33.56	520	510	510
Reach-1	33.46	500	503	500
Reach-1	33.36	550	550	550
Reach-1	33.26	480	481	500
Reach-1	33.17	490	475	475
Reach-1	33.08	480	472	450
Reach-1	32.99	400	460	480
Reach-1	32.9	580	523	520
Reach-1	32.8	540	539	540
Reach-1	32.7	450	435	430
Reach-1	32.62	500	516	550
Reach-1	32.52	190	187	170
Reach-1	32.49	250	247	220
Reach-1	32.44	580	576	570
Reach-1	32.33	470	471	480
Reach-1	32.24	460	470	470
Reach-1	32.15	440	415	420

Reach-1	32.07	535	496	495
Reach-1	31.98	400	380	380
Reach-1	31.91	240	208	210
Reach-1	31.87	220	243	260
Reach-1	31.82	360	361	370
Reach-1	31.75	680	647	650
Reach-1	31.63	450	453	430
Reach-1	31.54	475	484	475
Reach-1	31.45	590	592	620
Reach-1	31.34	450	474	450
Reach-1	31.25	400	432	400
Reach-1	31.17	130	162	130
Reach-1	31.14	500	467	350
Reach-1	31.05	470	494	460
Reach-1	30.96	550	541	570
Reach-1	30.85	525	569	570
Reach-1	30.75	475	486	450
Reach-1	30.65	700	696	650
Reach-1	30.52	600	560	500
Reach-1	30.42	500	713	650
Reach-1	30.28	550	421	430
Reach-1	30.2	535	537	545
Reach-1	30.1	1100	1304	1325
Reach-1	29.85	400	400	400
Reach-1	29.77	50	200	550
Reach-1	29.72	127	127	127
Reach-1	29.715	Bridge		
Reach-1	29.71	533	233	73
Reach-1	29.663	330	330	330
Reach-1	29.601	370	330	330
Reach-1	29.538	270	240	230
Reach-1	29.493	610	560	520
Reach-1	29.387	190	190	200
Reach-1	29.351	500	490	490
Reach-1	29.258	710	705	710
Reach-1	29.13	590	595	600
Reach-1	29.012	400	410	420
Reach-1	28.934	410	460	470
Reach-1	28.847	520	510	500
Reach-1	28.75	500	490	470
Reach-1	28.657	550	540	540
Reach-1	28.555	490	490	500
Reach-1	28.462	380	380	380
Reach-1	28.39	350	340	340
Reach-1	28.326	440	450	470
Reach-1	28.241	400	440	490
Reach-1	28.157	340	350	370
Reach-1	28.091	330	360	400
Reach-1	28.023	600	580	580
Reach-1	27.913	620	610	600
Reach-1	27.797	560	550	550
Reach-1	27.693	490	470	460
Reach-1	27.604	510	550	700
Reach-1	27.502	430	450	510
Reach-1	27.417	250	270	290
Reach-1	27.366	230	240	240
Reach-1	27.32	260	275	300
Reach-1	27.265	210	210	220
Reach-1	27.226	310	300	300
Reach-1	27.169	400	330	310
Reach-1	27.106	540	520	500
Reach-1	27.008	400	400	400
Reach-1	26.921	450	430	400
Reach-1	26.845	350	370	400
Reach-1	26.775	390	420	470
Reach-1	26.695	370	380	430
Reach-1	26.623	500	500	530
Reach-1	26.529	530	520	520
Reach-1	26.43	490	495	520
Reach-1	26.335	495	500	520
Reach-1	26.239	570	420	340
Reach-1	26.137	500	495	475
Reach-1	26.044	750	650	400
Reach-1	25.919	450	400	310
Reach-1	25.843	540	370	210
Reach-1	25.75	270	280	280
Reach-1	25.699	290	290	290
Reach-1	25.644	360	320	280
Reach-1	25.58	320	300	290
Reach-1	25.519	450	310	290
Reach-1	25.458	390	360	380
Reach-1	25.388	350	360	370
Reach-1	25.326	490	510	480
Reach-1	25.233	390	280	180
Reach-1	25.18	500	430	430
Reach-1	25.099	430	470	530
Reach-1	25.01	410	480	550
Reach-1	24.919	460	390	350
Reach-1	24.845	560	490	490
Reach-1	24.752	850	560	430
Reach-1	24.646	760	640	620
Reach-1	24.525	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	36400	.1	.3
Reach-1	36310	.1	.3
Reach-1	36230	.1	.3
Reach-1	36180	.1	.3
Reach-1	36060	.1	.3
Reach-1	35960	.1	.3
Reach-1	35870	.1	.3
Reach-1	35770	.1	.3
Reach-1	35690	.1	.3
Reach-1	35590	.1	.3
Reach-1	35.54	.1	.3
Reach-1	35.47	.1	.3
Reach-1	35.37	.1	.3
Reach-1	35.28	.1	.3
Reach-1	35.24	.1	.3
Reach-1	35.18	.1	.3
Reach-1	35.15	.1	.3
Reach-1	35.09	.1	.3
Reach-1	35.01	.1	.3
Reach-1	34.92	.1	.3
Reach-1	34.88	.1	.3
Reach-1	34.83	.1	.3
Reach-1	34.73	.1	.3
Reach-1	34.63	.1	.3
Reach-1	34.54	.1	.3
Reach-1	34.45	.1	.3
Reach-1	34.36	.1	.3
Reach-1	34.27	.3	.5
Reach-1	34.19	.1	.3
Reach-1	34.08	.1	.3
Reach-1	33.98	.1	.3
Reach-1	33.89	.1	.3
Reach-1	33.77	.1	.3
Reach-1	33.67	.1	.3
Reach-1	33.56	.1	.3
Reach-1	33.46	.1	.3
Reach-1	33.36	.1	.3
Reach-1	33.26	.1	.3
Reach-1	33.17	.1	.3
Reach-1	33.08	.1	.3
Reach-1	32.99	.1	.3
Reach-1	32.9	.1	.3
Reach-1	32.8	.1	.3
Reach-1	32.7	.1	.3
Reach-1	32.62	.1	.3
Reach-1	32.52	.1	.3
Reach-1	32.49	.1	.3
Reach-1	32.44	.1	.3
Reach-1	32.33	.1	.3
Reach-1	32.24	.1	.3
Reach-1	32.15	.1	.3
Reach-1	32.07	.1	.3
Reach-1	31.98	.1	.3
Reach-1	31.91	.1	.3
Reach-1	31.87	.1	.3
Reach-1	31.82	.1	.3
Reach-1	31.75	.1	.3
Reach-1	31.63	.1	.3
Reach-1	31.54	.1	.3
Reach-1	31.45	.1	.3
Reach-1	31.34	.1	.3
Reach-1	31.25	.1	.3
Reach-1	31.17	.1	.3
Reach-1	31.14	.1	.3
Reach-1	31.05	.1	.3
Reach-1	30.96	.1	.3
Reach-1	30.85	.1	.3
Reach-1	30.75	.1	.3
Reach-1	30.65	.1	.3
Reach-1	30.52	.1	.3
Reach-1	30.42	.1	.3
Reach-1	30.28	.1	.3
Reach-1	30.2	.1	.3
Reach-1	30.1	.1	.3
Reach-1	29.85	.1	.3
Reach-1	29.77	.3	.5
Reach-1	29.72	.1	.3
Reach-1	29.715	Bridge	
Reach-1	29.71	.1	.3
Reach-1	29.663	.1	.3
Reach-1	29.601	.1	.3
Reach-1	29.538	.1	.3
Reach-1	29.493	.1	.3
Reach-1	29.387	.1	.3
Reach-1	29.351	.1	.3
Reach-1	29.258	.1	.3
Reach-1	29.13	.1	.3
Reach-1	29.012	.1	.3

```
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN  1998            *
*            VERSION 4.1            *
*                                   *
*  RUN DATE   09OCT00  TIME  11:23:43  *
*                                   *
*************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS   *
*    HYDROLOGIC ENGINEERING CENTER  *
*          609 SECOND STREET        *
*       DAVIS, CALIFORNIA 95616     *
*           (916) 756-1104          *
*                                   *
*************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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1                                   HEC-1 INPUT                                          PAGE  1

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID     N. Peoria Area Drainage Master Plan                 File:FTV100-6.IH1
  2           ID        For Maricopa County FCD 99-45                 Original:05-04-00     MCG
  3           ID        By Stantec Consulting, Inc. P82000146          Revised:10-09-00     MMZ
  4           ID
  5           ID     The N. Peoria ADMP study limits consists of several small tributary
  6           ID     watersheds to the Agua Fria River.  This model is for the future
  7           ID     condition 100-year, 6-hour storm event.  A companion model is also created
  8           ID     for the future condition 100-year, 24-hour storm event.  Both models
  9           ID     100-year, 6- and 24-hour) should be referenced for the determination of
 10           ID     storm event produces the highest peak discharge.
 11           ID
 12           ID     Modeling of the watersheds is performed using the following:
 13           ID        100-year, 6-hour rainfall with FCDMC design rainfall distributions
 14           ID        Green & Ampt Loss Rate Method
 15           ID        NMIN = 2 minutes
 16           ID        Clark Unit Hydrograph
 17           ID        Modified Puls channel storage routing
 18           ID
 19           ID     Watershed delineation performed using USGS 7.5 Minute Series Quadrangles
              *
              *DIAGRAM
              *
 20           IT       2                    1000
 21           IO       3
 22           IN      15
              *
              *       Depth-area reduction factors taken from Table 2.2 of FCDMC Drainage
              *       Design Manual
              *       6-hr rainfall distributions per Table 2.4 and Figure 2.17 of the Manual
              *
 23           JD    3.35    0.01
 24           PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
 25           PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
 26           PC   0.962   0.972   0.983   0.991   1.000
 27           JD    3.33    0.50
 28           JD    3.28    2.80
 29           PC   0.000   0.009   0.016   0.025   0.034   0.042   0.051   0.059   0.067   0.076
 30           PC   0.087   0.100   0.120   0.163   0.252   0.451   0.694   0.837   0.900   0.938
 31           PC   0.950   0.963   0.975   0.988   1.000
 32           JD    3.09    16.0
 33           PC   0.000   0.015   0.020   0.030   0.048   0.063   0.076   0.090   0.105   0.119
 34           PC   0.135   0.152   0.175   0.222   0.304   0.472   0.670   0.796   0.868   0.912
 35           PC   0.946   0.960   0.973   0.987   1.000
 36           JD    2.71    90.0
 37           PC   0.000   0.021   0.035   0.051   0.071   0.087   0.105   0.125   0.143   0.160
 38           PC   0.179   0.201   0.232   0.281   0.364   0.500   0.658   0.773   0.841   0.888
 39           PC   0.927   0.945   0.964   0.982   1.000
              *
              *  ************************************************************************
              *                 Begin Major Basin 100 (Unnamed Wash 1)
              *  ************************************************************************
              *
1                                   HEC-1 INPUT                                          PAGE  2

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 25.644 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 25.58 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 25.519 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.458 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.388 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 25.326 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 25.233 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.18 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.099 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 25.01 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 24.919 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 24.845 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 24.752 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 24.646 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 24.525 Profile: PF#1
Warning:Divided flow computed for this cross-section.

Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 26.695 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 26.623 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 26.529 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 26.43 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 26.335 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 26.239 Profile: PF#1
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.
River: RIVER-1 Reach: Reach-1 RS: 26.137 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 26.044 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 25.919 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 25.843 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.75 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 25.699 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning:The conveyance ratio (upstream 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.
River: RIVER-1 Reach: Reach-1 RS: 27.604 Profile: PF#1
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.
River: RIVER-1 Reach: Reach-1 RS: 27.502 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 27.417 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 27.366 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 27.32 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 27.265 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 27.226 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 27.169 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 27.106 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 27.008 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 26.921 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 26.845 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 26.775 Profile: PF#1

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 28.934 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 28.847 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 28.75 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 28.657 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 28.555 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 28.462 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 28.39 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 28.326 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
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.
River: RIVER-1 Reach: Reach-1 RS: 28.241 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 28.157 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 28.091 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 28.023 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 27.913 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 27.797 Profile: PF#1
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.
River: RIVER-1 Reach: Reach-1 RS: 27.693 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 30.1 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.85 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 29.77 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 29.72 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.715 Profile: PF#1
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
River: RIVER-1 Reach: Reach-1 RS: 29.715 Profile: PF#1 Upstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.715 Profile: PF#1 Downstream
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.
River: RIVER-1 Reach: Reach-1 RS: 29.71 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 29.663 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 29.601 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 29.538 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 29.493 Profile: PF#1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
River: RIVER-1 Reach: Reach-1 RS: 29.387 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.351 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 29.258 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
River: RIVER-1 Reach: Reach-1 RS: 29.13 Profile: PF#1
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.
River: RIVER-1 Reach: Reach-1 RS: 29.012 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.91 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.87 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.82 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.75 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.63 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.54 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.45 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.34 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.25 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.17 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.14 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 31.05 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.96 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.85 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.75 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.65 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.52 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.42 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.28 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 30.2 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The

River: RIVER-1 Reach: Reach-1 RS: 33.77 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 33.67 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 33.56 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 33.46 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 33.36 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 33.26 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 33.17 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 33.08 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 32.99 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 32.9 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 32.8 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 32.7 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 32.62 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 32.52 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 32.49 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 32.44 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 32.33 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 32.24 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 32.15 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 32.07 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.98 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 35.28 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 35.24 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 35.18 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 35.15 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 35.09 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 35.01 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.92 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.88 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.83 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.73 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.63 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.54 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.45 Profile: PF#1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.36 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.27 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.19 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 34.08 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 33.98 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 33.89 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
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.

Reach-1	25.644	36800.00	1669.80	1678.48	1678.48	1679.90	0.010157	12.61	4350.63	1385.43	0.80
Reach-1	25.58	36800.00	1668.90	1676.34	1674.98	1677.03	0.005451	5.98	5558.30	1357.97	0.43
Reach-1	25.519	36800.00	1668.30	1674.72	1673.32	1675.38	0.005442	9.02	6580.10	1421.47	0.68
Reach-1	25.458	36800.00	1665.50	1673.22	1670.33	1673.57	0.004376	4.50	8078.51	1375.68	0.30
Reach-1	25.388	36800.00	1656.60	1669.29	1669.29	1671.18	0.009307	15.45	6675.86	1479.25	0.94
Reach-1	25.326	36800.00	1653.00	1665.26	1665.26	1667.42	0.009178	15.55	6100.43	1343.54	0.97
Reach-1	25.233	38200.00	1647.30	1661.83	1661.01	1662.76	0.006693	12.30	8381.61	1799.19	0.83
Reach-1	25.18	38200.00	1647.70	1659.89	1659.04	1661.23	0.004894	13.00	8123.18	1661.67	0.80
Reach-1	25.099	38200.00	1646.00	1656.69	1656.69	1658.82	0.005558	18.75	7923.62	1687.87	1.11
Reach-1	25.01	38200.00	1640.20	1650.85	1648.02	1651.44	0.003513	7.16	7208.82	1394.07	0.43
Reach-1	24.919	38200.00	1634.90	1648.67	1646.75	1649.27	0.005467	9.48	8811.73	1775.32	0.59
Reach-1	24.845	38200.00	1635.30	1645.98	1644.37	1646.59	0.011420	9.86	7533.91	1690.32	0.57
Reach-1	24.752	38200.00	1629.20	1639.84	1639.57	1641.44	0.009106	15.64	5281.91	1410.43	1.00
Reach-1	24.646	38200.00	1626.00	1636.38	1634.59	1636.68	0.006941	4.01	9127.71	2245.57	0.25
Reach-1	24.525	38200.00	1622.00	1633.13	1627.96	1633.23	0.003001	2.80	15473.40	2565.67	0.17

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : CC FDS

River: RIVER-1 Reach: Reach-1 RS: 36400 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 36310 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: RIVER-1 Reach: Reach-1 RS: 36230 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 36180 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 36060 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 35960 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: RIVER-1 Reach: Reach-1 RS: 35870 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 35770 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: RIVER-1 Reach: Reach-1 RS: 35690 Profile: PF#1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 35590 Profile: PF#1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: RIVER-1 Reach: Reach-1 RS: 35.54 Profile: PF#1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 35.47 Profile: PF#1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 35.37 Profile: PF#1
Warning:Divided flow computed for this cross-section.

Reach-1	33.67	24000.00	2035.70	2049.07	2049.07	2053.98	0.017081	19.08	1478.85	155.38	0.95
Reach-1	33.56	24400.00	2024.90	2042.14	2041.20	2045.23	0.009920	17.18	2080.75	243.85	0.75
Reach-1	33.46	24700.00	2024.10	2038.16	2036.88	2040.17	0.008617	13.68	2596.05	476.92	0.67
Reach-1	33.36	24700.00	2020.50	2034.69	2031.85	2036.27	0.006442	12.30	2753.60	294.02	0.59
Reach-1	33.26	30900.00	2017.70	2029.95	2027.63	2031.89	0.010216	13.99	2932.72	323.33	0.72
Reach-1	33.17	30900.00	2011.30	2025.04	2022.93	2027.10	0.009327	14.91	3001.13	391.32	0.71
Reach-1	33.08	30900.00	2011.90	2020.37	2018.91	2021.91	0.011931	12.07	3299.18	495.93	0.74
Reach-1	32.99	30900.00	2005.60	2016.16	2013.48	2017.29	0.007267	10.67	3864.08	488.70	0.60
Reach-1	32.9	30900.00	1995.30	2011.89	2010.17	2013.66	0.009219	13.73	3266.30	414.10	0.68
Reach-1	32.8	31200.00	1992.20	2007.87	2005.08	2009.45	0.006064	12.71	3639.20	461.39	0.58
Reach-1	32.7	31200.00	1986.50	2002.26	2002.26	2005.53	0.008130	18.14	2974.62	445.27	0.82
Reach-1	32.62	31200.00	1985.50	1997.81	1997.40	2000.24	0.008010	15.38	3311.72	546.35	0.79
Reach-1	32.52	31200.00	1982.10	1993.35	1993.35	1995.86	0.008938	15.14	3337.86	666.75	0.82
Reach-1	32.49	31300.00	1980.50	1991.43	1991.43	1994.02	0.011387	17.02	3188.03	590.63	0.92
Reach-1	32.44	31300.00	1977.50	1990.09	1988.83	1991.48	0.007007	14.84	4201.42	647.91	0.74
Reach-1	32.33	31300.00	1972.50	1985.74	1984.42	1987.69	0.005954	13.78	3635.96	531.06	0.68
Reach-1	32.24	31300.00	1968.40	1981.18	1981.18	1983.95	0.011113	18.26	3128.04	533.62	0.93
Reach-1	32.15	31300.00	1963.70	1978.24	1976.91	1979.55	0.005687	14.62	4575.33	753.65	0.68
Reach-1	32.07	31300.00	1959.80	1974.03	1973.68	1976.50	0.008514	17.27	3372.83	540.23	0.83
Reach-1	31.98	31300.00	1956.50	1969.73	1968.90	1972.06	0.008697	17.08	3244.99	460.86	0.83
Reach-1	31.91	31400.00	1953.30	1966.96	1965.66	1968.86	0.007103	15.60	3625.76	506.75	0.75
Reach-1	31.87	31400.00	1953.60	1965.43	1964.04	1967.07	0.008121	12.58	3220.40	506.29	0.65
Reach-1	31.82	31400.00	1952.70	1962.31	1962.24	1964.58	0.014049	13.99	2768.69	633.03	0.82
Reach-1	31.75	31400.00	1946.50	1958.16	1957.75	1959.83	0.011222	12.98	3221.80	816.99	0.73
Reach-1	31.63	31400.00	1940.50	1952.28	1951.24	1953.51	0.007521	11.79	3775.26	776.71	0.62
Reach-1	31.54	31400.00	1940.10	1948.39	1947.58	1949.74	0.009880	10.69	3451.99	863.07	0.67
Reach-1	31.45	31400.00	1933.30	1944.79	1943.44	1945.73	0.006421	9.34	4242.74	963.74	0.55
Reach-1	31.34	31400.00	1931.50	1939.91	1938.84	1941.10	0.009153	9.92	3685.06	773.87	0.64
Reach-1	31.25	31400.00	1925.90	1935.02	1934.61	1936.33	0.012118	11.52	3657.95	1037.65	0.79
Reach-1	31.17	31400.00	1921.70	1931.34	1930.28	1932.30	0.007101	10.78	4342.11	1010.13	0.64
Reach-1	31.14	31400.00	1917.80	1929.44	1929.44	1931.03	0.011035	14.94	3747.38	1040.17	0.81
Reach-1	31.05	31400.00	1917.10	1925.45	1924.58	1926.43	0.009142	11.17	4183.76	1023.26	0.70
Reach-1	30.96	31400.00	1912.30	1921.96	1920.56	1922.80	0.006239	10.13	4561.50	934.97	0.60
Reach-1	30.85	33800.00	1907.50	1917.31	1916.18	1918.72	0.008422	11.62	3765.52	797.86	0.69
Reach-1	30.75	33800.00	1902.40	1913.83	1911.73	1914.90	0.004851	10.10	4430.49	657.81	0.54
Reach-1	30.65	33800.00	1897.20	1909.80	1909.62	1911.73	0.009845	15.00	3518.48	787.59	0.78
Reach-1	30.52	33800.00	1893.50	1902.20	1902.14	1903.74	0.013572	14.21	3834.25	1102.21	0.87
Reach-1	30.42	33800.00	1887.80	1897.33	1895.80	1898.18	0.006113	9.42	4877.50	951.84	0.58
Reach-1	30.28	33800.00	1877.10	1891.62	1891.62	1893.67	0.008277	14.42	3803.73	874.05	0.72
Reach-1	30.2	33800.00	1875.20	1885.55	1885.55	1887.25	0.011244	13.03	3899.86	1089.05	0.79
Reach-1	30.1	33800.00	1867.40	1880.25	1878.65	1881.31	0.005581	11.42	4555.01	1076.36	0.59
Reach-1	29.85	33800.00	1857.70	1871.82	1871.82	1874.64	0.005333	17.25	3718.35	636.09	0.84
Reach-1	29.77	33800.00	1857.20	1868.36	1866.55	1871.00	0.005263	13.03	2593.53	779.09	0.74
Reach-1	29.72	33800.00	1855.00	1867.35	1865.20	1869.77	0.005977	12.50	2704.57	276.53	0.70
Reach-1	29.715	Bridge									
Reach-1	29.71	33800.00	1853.90	1865.50	1863.43	1867.74	0.007830	12.01	2815.30	310.85	0.70
Reach-1	29.663	33800.00	1850.90	1864.38	1861.60	1865.28	0.008629	7.95	4641.34	1540.66	0.54
Reach-1	29.601	33800.00	1849.90	1859.85	1859.32	1861.44	0.016920	10.17	3371.32	776.76	0.84
Reach-1	29.538	33800.00	1845.50	1855.00	1855.00	1857.03	0.009501	11.43	2956.58	736.33	1.01
Reach-1	29.493	33800.00	1843.40	1852.91	1851.58	1853.84	0.009704	7.80	4448.71	942.20	0.62
Reach-1	29.387	33800.00	1838.80	1849.61	1846.70	1850.25	0.002804	6.43	5268.82	848.97	0.45
Reach-1	29.351	33800.00	1835.90	1848.80	1844.95	1849.49	0.006619	6.68	5125.60	710.49	0.42
Reach-1	29.258	33800.00	1828.70	1842.59	1841.29	1845.71	0.007962	14.17	2393.62	293.20	0.81
Reach-1	29.13	33800.00	1821.00	1837.34	1836.92	1839.29	0.009371	11.73	3226.49	743.54	0.78
Reach-1	29.012	33800.00	1818.70	1832.98	1832.98	1835.24	0.004109	13.98	3643.29	899.06	0.73
Reach-1	28.934	33800.00	1815.50	1829.49	1828.78	1830.63	0.008393	9.03	3965.61	1040.30	0.51
Reach-1	28.847	33800.00	1811.90	1825.52	1825.21	1827.18	0.006262	12.08	3960.45	919.37	0.64
Reach-1	28.75	33800.00	1808.30	1822.93	1820.98	1823.84	0.006032	8.76	4883.62	865.47	0.46
Reach-1	28.657	33800.00	1800.50	1819.89	1816.90	1820.57	0.007408	6.90	5125.97	728.81	0.36
Reach-1	28.555	33800.00	1799.40	1814.13	1814.13	1816.42	0.007365	13.61	3616.94	838.82	0.71
Reach-1	28.462	33800.00	1794.80	1810.15	1809.18	1811.34	0.010176	10.50	4799.45	981.86	0.53
Reach-1	28.39	33800.00	1792.80	1807.21	1805.66	1808.00	0.006796	7.02	4763.25	920.05	0.38
Reach-1	28.326	33800.00	1791.30	1803.94	1803.13	1805.05	0.011605	9.97	4588.94	1083.57	0.60
Reach-1	28.241	33800.00	1789.90	1799.11	1799.11	1801.29	0.004451	12.96	4190.55	1108.64	0.86
Reach-1	28.157	33800.00	1782.60	1794.11	1794.11	1796.04	0.004862	14.51	4315.97	1161.42	0.89
Reach-1	28.091	33800.00	1780.80	1790.54	1790.04	1792.52	0.011047	13.13	3758.06	886.46	0.87
Reach-1	28.023	33800.00	1772.50	1787.35	1786.43	1789.21	0.007481	9.62	4096.12	1033.91	0.56
Reach-1	27.913	33800.00	1763.10	1783.54	1782.75	1784.70	0.007242	9.79	5199.44	1417.24	0.56
Reach-1	27.797	33800.00	1760.60	1779.37	1778.89	1780.88	0.005254	11.61	5464.78	1432.54	0.61
Reach-1	27.693	33800.00	1756.30	1775.19	1774.08	1776.25	0.018532	9.76	4690.11	1171.93	0.55
Reach-1	27.604	33800.00	1754.20	1768.46	1766.56	1770.58	0.005229	12.10	3539.55	629.49	0.65
Reach-1	27.502	33800.00	1748.80	1764.39	1764.39	1766.27	0.012338	12.74	4071.42	1048.12	0.71
Reach-1	27.417	33800.00	1744.80	1757.52	1757.52	1759.99	0.006824	13.60	3634.66	772.75	0.93
Reach-1	27.366	33800.00	1742.30	1755.30	1751.96	1755.90	0.003570	7.02	6506.46	1254.13	0.40
Reach-1	27.32	33800.00	1740.30	1752.37	1752.37	1754.67	0.005891	14.37	4456.86	1284.04	0.79
Reach-1	27.265	33800.00	1735.70	1749.27	1749.27	1750.66	0.008159	11.46	4306.12	1041.76	0.79
Reach-1	27.226	33800.00	1734.80	1743.36	1742.96	1745.49	0.011293	12.11	3139.20	665.92	0.87
Reach-1	27.169	33800.00	1732.10	1741.42	1739.82	1742.78	0.005206	9.59	3878.52	686.07	0.65
Reach-1	27.106	33800.00	1725.70	1738.74	1737.64	1740.37	0.011893	10.40	3465.59	702.67	0.73
Reach-1	27.008	33800.00	1723.00	1734.46	1731.55	1735.60	0.005920	8.61	4108.56	729.32	0.53
Reach-1	26.921	33800.00	1720.20	1731.13	1729.13	1732.66	0.009398	10.00	3578.78	609.48	0.63
Reach-1	26.845	36800.00	1717.00	1727.74	1726.42	1729.36	0.005965	10.71	3690.37	781.26	0.67
Reach-1	26.775	36800.00	1712.70	1723.98	1723.98	1727.14	0.005127	14.88	3270.73	651.54	0.94
Reach-1	26.695	36800.00	1709.50	1720.67	1720.67	1722.92	0.006557	13.68	3301.35	731.22	0.84
Reach-1	26.623	36800.00	1703.90	1716.40	1713.28	1717.36	0.004825	8.14	5107.32	842.83	0.49
Reach-1	26.529	36800.00	1702.60	1711.52	1711.52	1714.46	0.006076	14.21	3076.45	621.48	0.98
Reach-1	26.43	36800.00	1697.50	1707.80	1706.58	1709.36	0.006711	10.37	4056.48	828.77	0.71
Reach-1	26.335	36800.00	1695.60	1705.42	1702.99	1706.01	0.005588	6.70	6728.67	1543.91	0.44
Reach-1	26.239	36800.00	1692.80	1701.54	1700.74	1702.24	0.010748	8.86	5674.75	1802.54	0.75
Reach-1	26.137	36800.00	1685.70	1698.79	1697.66	1699.62	0.003849	12.52	7196.95	1869.58	0.73
Reach-1	26.044	36800.00	1684.30	1695.38	1695.38	1697.10	0.007342	15.97	7677.32	1972.56	1.09
Reach-1	25.919	36800.00	1678.40	1689.05	1689.05	1690.49	0.010585	11.28	3982.93	1419.30	0.80
Reach-1	25.843	36800.00	1673.50	1685.97	1685.25	1686.88	0.005565	9.38	5072.38	1620.29	0.64
Reach-1	25.75	36800.00	1671.60	1684.91	1682.59	1685.37	0.004170	4.78	7473.32	1647.49	0.27
Reach-1	25.699	36800.00	1669.40	1682.57	1682.57	1684.34	0.002291	13.68	6773.57	1523.43	0.73

Reach-1	28.934	.1	.3
Reach-1	28.847	.1	.3
Reach-1	28.75	.1	.3
Reach-1	28.657	.1	.3
Reach-1	28.555	.1	.3
Reach-1	28.462	.1	.3
Reach-1	28.39	.1	.3
Reach-1	28.326	.1	.3
Reach-1	28.241	.1	.3
Reach-1	28.157	.1	.3
Reach-1	28.091	.1	.3
Reach-1	28.023	.1	.3
Reach-1	27.913	.1	.3
Reach-1	27.797	.1	.3
Reach-1	27.693	.1	.3
Reach-1	27.604	.1	.3
Reach-1	27.502	.1	.3
Reach-1	27.417	.1	.3
Reach-1	27.366	.1	.3
Reach-1	27.32	.1	.3
Reach-1	27.265	.1	.3
Reach-1	27.226	.1	.3
Reach-1	27.169	.1	.3
Reach-1	27.106	.1	.3
Reach-1	27.008	.1	.3
Reach-1	26.921	.1	.3
Reach-1	26.845	.1	.3
Reach-1	26.775	.1	.3
Reach-1	26.695	.1	.3
Reach-1	26.623	.1	.3
Reach-1	26.529	.1	.3
Reach-1	26.43	.1	.3
Reach-1	26.335	.1	.3
Reach-1	26.239	.1	.3
Reach-1	26.137	.1	.3
Reach-1	26.044	.1	.3
Reach-1	25.919	.1	.3
Reach-1	25.843	.1	.3
Reach-1	25.75	.1	.3
Reach-1	25.699	.1	.3
Reach-1	25.644	.1	.3
Reach-1	25.58	.1	.3
Reach-1	25.519	.1	.3
Reach-1	25.458	.1	.3
Reach-1	25.388	.1	.3
Reach-1	25.326	.1	.3
Reach-1	25.233	.1	.3
Reach-1	25.18	.1	.3
Reach-1	25.099	.1	.3
Reach-1	25.01	.1	.3
Reach-1	24.919	.1	.3
Reach-1	24.845	.1	.3
Reach-1	24.752	.1	.3
Reach-1	24.646	.1	.3
Reach-1	24.525	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	36400	28271.00	2188.77	2202.22	2199.49	2204.09	0.009921	11.29	2685.98	320.81	0.60
Reach-1	36310	28319.00	2179.37	2194.37	2194.37	2198.63	0.011727	19.88	2021.04	232.06	0.95
Reach-1	36230	28319.00	2174.87	2188.17	2187.45	2190.74	0.015157	13.89	2360.74	327.16	0.78
Reach-1	36180	28319.00	2169.97	2183.52	2182.61	2186.60	0.016494	14.43	2075.53	250.27	0.81
Reach-1	36060	28319.00	2160.87	2177.72	2177.05	2180.14	0.003692	14.89	3476.13	549.89	0.70
Reach-1	35960	28319.00	2159.77	2174.52	2174.52	2177.64	0.004965	15.53	2823.92	492.47	0.79
Reach-1	35870	28319.00	2157.57	2168.93	2168.74	2171.41	0.009667	14.30	2733.73	561.65	0.82
Reach-1	35770	28319.00	2153.27	2163.33	2163.33	2165.85	0.011616	14.56	2705.32	544.56	0.89
Reach-1	35690	28338.00	2146.17	2158.69	2157.64	2160.53	0.006778	13.08	3103.56	547.73	0.70
Reach-1	35590	28338.00	2139.57	2154.66	2154.66	2156.94	0.007371	14.71	3137.78	658.71	0.74
Reach-1	35.54	23200.00	2138.10	2150.86	2150.35	2152.65	0.012076	14.43	2494.64	471.21	0.73
Reach-1	35.47	23200.00	2135.50	2146.32	2145.73	2147.84	0.011865	12.66	2713.47	540.92	0.70
Reach-1	35.37	23200.00	2126.20	2142.69	2140.17	2143.50	0.004004	8.80	3782.36	585.63	0.42
Reach-1	35.28	23200.00	2123.70	2138.50	2138.50	2140.62	0.009809	13.78	2505.73	751.02	0.66
Reach-1	35.24	23200.00	2123.40	2136.25	2136.25	2138.59	0.012284	13.89	2228.82	598.80	0.72
Reach-1	35.18	23200.00	2119.60	2131.50	2130.47	2132.93	0.009761	11.19	2775.23	539.46	0.63
Reach-1	35.15	23200.00	2117.30	2129.20	2128.70	2130.83	0.012517	12.54	2590.85	530.50	0.71
Reach-1	35.09	23200.00	2114.40	2126.43	2125.46	2127.76	0.009004	10.96	2942.42	643.13	0.61
Reach-1	35.01	23200.00	2109.90	2121.95	2121.03	2123.29	0.010117	11.13	2851.32	567.17	0.63
Reach-1	34.92	23400.00	2107.90	2117.50	2115.87	2118.66	0.008951	10.14	2889.99	475.08	0.60
Reach-1	34.88	23400.00	2102.80	2114.43	2113.82	2116.40	0.013396	13.77	2324.21	393.89	0.75
Reach-1	34.83	23400.00	2100.20	2112.36	2110.67	2113.45	0.007349	10.90	3101.39	492.25	0.56
Reach-1	34.73	23400.00	2095.30	2106.02	2105.76	2108.20	0.016036	14.26	2238.65	412.53	0.81
Reach-1	34.63	23400.00	2089.30	2100.27	2097.80	2101.28	0.009815	9.02	2949.32	420.09	0.53
Reach-1	34.54	23400.00	2084.10	2095.59	2093.55	2096.53	0.009871	9.32	3080.25	500.04	0.53
Reach-1	34.45	23400.00	2080.70	2089.66	2088.30	2090.89	0.013000	9.67	2814.27	535.27	0.60
Reach-1	34.36	23400.00	2069.70	2085.59	2083.80	2086.59	0.005795	10.84	3408.28	522.89	0.55
Reach-1	34.27	23400.00	2065.90	2080.07	2078.73	2082.41	0.015998	15.51	2012.89	262.86	0.85
Reach-1	34.19	23400.00	2056.50	2075.15	2074.13	2076.87	0.008706	14.69	2822.30	414.43	0.66
Reach-1	34.08	23400.00	2058.00	2068.96	2068.60	2071.00	0.012359	14.43	2481.92	477.81	0.78
Reach-1	33.98	23400.00	2050.90	2064.51	2062.35	2065.73	0.006173	10.90	3100.60	510.59	0.56
Reach-1	33.89	23400.00	2047.50	2060.34	2058.40	2062.25	0.008786	12.78	2348.84	281.46	0.67
Reach-1	33.77	24000.00	2039.30	2056.81	2051.41	2058.10	0.004302	10.91	2857.07	246.08	0.49

APPENDIX F.2

Cave Creek: Existing Conditions

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Upper Cave Creek and Apache Wash WMP
Project File : Cavecrk.prj
Run Date and Time: 12/29/99 3:07:14 PM

Project in English units

Project Description:
Upper Cave Creek and Apache Wash Watercourse Master Plan

For Cave Creek
above Cave Buttes Dam
by Stantec Consulting Inc. for the Flood Control
District of Maricopa County
FCD:

March 1999

PLAN DATA

Plan Title: Existing condition study reach
Plan File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.p02

Geometry Title: Revised Geometry
Geometry File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.g02

Flow Title : Existing condition study discharges
Flow File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.f02

Plan Summary Information:
Number of: Cross Sections = 89 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 1

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 at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Program Selects Appropriate method
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
31.91	10-year	1	9728.8410	052.71
31.87	10-year	1	9701.0310	053.91
31.82	10-year	1	9697.75	10037.6
31.75	10-year	1	9721.7710	070.68
31.63	10-year	1	9783.92	10440.3
31.54	10-year	1	9928.910	544.54
31.45	10-year	1	9881.84	10506.3
31.34	10-year	1	9949.910	498.12
31.25	10-year	1	9790.4710	387.38
31.17	10-year	1	9683.710	462.51
31.14	10-year	1	9815.0610	606.14
31.05	10-year	1	9934.210	807.35
30.96	10-year	1	9963.1510	706.14
30.85	10-year	1	9912.410	461.24
30.75	10-year	1	9610.7410	162.09
30.65	10-year	1	9587.9410	027.52
30.52	10-year	1	9600.2410	300.97
30.42	10-year	1	9630.3210	401.71

30.28	10-year	1	9454.46	10030.37
30.2	10-year	1	9405.25	10111.27
30.1	10-year	1	9312.74	10022.59
29.85	10-year	1	9448.5	10043.5
29.71	10-year	1	9733	10033
29.663	10-year	1	9650	10100
29.601	10-year	1	9500	10060
29.538	10-year	1	9300	10120
29.493	10-year	1	9300	10160
29.387	10-year	1	9570	10303
29.351	10-year	1	9695	10400
29.258	10-year	1	9794.05	10550
29.13	10-year	1	9971.96	10650
29.012	10-year	1	9940.76	10590
28.934	10-year	1	9857.38	10510
28.847	10-year	1	9911.57	10560
28.75	10-year	1	9899.35	10550
28.657	10-year	1	9948.21	10450
28.555	10-year	1	9944.6	10450
28.462	10-year	1	9892.28	10475
28.39	10-year	1	9879.53	10530
28.326	10-year	1	9836.34	10435
28.241	10-year	1	9663.83	10265
28.157	10-year	1	9623.6	10175
28.091	10-year	1	9666.86	10145
28.023	10-year	1	9772.23	10225
27.913	10-year	1	9970.17	10450
27.797	10-year	1	9976.19	10605
27.693	10-year	1	9980.25	10480
27.604	10-year	1	9772.54	10415
27.502	10-year	1	9960.71	10600
27.417	10-year	1	9878.99	10890
27.366	10-year	1	9738.63	11000
27.32	10-year	1	9694.13	11000
27.265	10-year	1	9959.8	11000
27.226	10-year	1	9929.17	10930
27.169	10-year	1	9869.83	10770
27.106	10-year	1	9771.98	10600
27.008	10-year	1	9696.87	10400
26.921	10-year	1	9726.09	10450
26.845	10-year	1	9618.23	10700
26.775	10-year	1	9800.99	10950
26.695	10-year	1	9810.17	10920
26.623	10-year	1	9641.05	10600
26.529	10-year	1	9791.21	10650
26.43	10-year	1	9781.12	10750
26.335	10-year	1	9641	10650
26.239	10-year	1	9931	11050
26.137	10-year	1	9988	11210
26.044	10-year	1	9934	11270
25.919	10-year	1	9693	11150
25.843	10-year	1	9627	11100
25.75	10-year	1	9578	10950
25.699	10-year	1	9583.8	10789.8
25.644	10-year	1	9540	10760
25.58	10-year	1	9639	10790
25.519	10-year	1	9571	10750
25.458	10-year	1	9581	10830
25.388	10-year	1	9330	10450
25.326	10-year	1	9180	10260
25.233	10-year	1	8750	10400

FLOW DATA

Flow Title: Existing condition study discharges
Flow File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.f02

Flow Data (cfs)

River	Reach	RS	100-year	10-year	2-year	100 year
RIVER-1	Reach-1	31.91	31400	7400	1700	31400
RIVER-1	Reach-1	30.85	33800	8100	2000	33800
RIVER-1	Reach-1	29.012	33800	7800	1800	33800
RIVER-1	Reach-1	26.845	36700	8600	1900	36700
RIVER-1	Reach-1	25.233	38100	8800	1900	38100

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	100-year		Normal S = .003

GEOMETRY DATA

Geometry Title: Revised Geometry
Geometry File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.g02

CROSS SECTION RIVER: RIVER-1

```
REACH: Reach-1            RS: 31.91

INPUT
Description: End of Reach    51
Start of Reach  52


Station Elevation Data     num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9636.6    1972  9656.6    1971  9686.4  1963.7  9704.8  1959.7  9716.5  1960.1
  9740.5  1960.3  9793.6  1959.1  9812.1  1957.7  9816.1    1956    9828    1956
  9842.6  1959.3  9856.4  1961.4  9879.9  1958.9  9894.2  1959.2  9914.2  1959.2
    9933  1959.7    9940    1959  9949.2    1956    9968  1954.5  9982.5    1954
   10000  1953.3 10025.9  1953.4 10025.9  1953.5 10050.7  1961.3 10078.7  1962.7
   10106  1963.8   10139  1964.8 10170.4    1966 10188.1  1967.8 10199.5  1968.7
 10207.3  1970.1 10222.6  1973.4

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9636.6     .06    9933    .044 10050.7     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9933 10050.7              240     208     210              .1       .3
Left Levee      Station=    9933      Elevation=  1959.7
Right Levee     Station= 10050.7      Elevation=  1961.3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.87

INPUT
Description: For this floodplain analysis, the existing berm for
                  the private pond is assumed to be in-place.   The
Station Elevation Data     num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9626.3  1971.3    9643  1969.2  9648.1  1966.3  9655.8  1961.2  9670.8  1960.6
  9690.2  1960.1  9693.1  1959.1  9818.6  1958.9  9829.2  1966.8    9837  1967.4
  9848.6  1966.2  9864.1  1957.6  9879.3  1955.4  9900.2  1955.5  9938.9  1953.7
  9982.7  1953.6   10000  1953.8 10007.4  1953.9 10017.7  1959.6 10059.8  1961.5
 10114.9  1962.7 10134.9  1963.6 10168.9  1965.1   10197  1966.1 10206.3  1967.7
 10227.4  1973.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9626.3     .07  9848.6    .044 10017.7     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9848.6 10017.7            220     243     260              .1       .3
Left Levee      Station=  9848.6      Elevation=  1966.2
Right Levee     Station= 10017.7      Elevation=  1959.6

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.82

INPUT

Station Elevation Data     num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9640.8  1968.8    9660 1959.59  9667.9  1955.8  9681.8  1954.9  9690.9  1956.6
  9720.3  1957.2  9781.8  1957.2    9801  1957.1  9810.2  1956.7  9828.3  1963.5
  9839.4  1963.3  9861.7  1953.4  9901.8  1953.4  9938.9  1953.2   10000  1952.7
 10017.6  1956.1   10035    1957 10046.1  1959.4 10068.7    1959 10077.7  1961.5
 10084.5  1960.7 10108.5  1961.3 10154.5  1961.4 10172.2  1961.1 10255.5  1961.9
 10327.1  1962.5 10369.1  1963.5 10384.7  1964.2   10402  1965.9 10410.2    1967

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9640.8     .07  9839.4    .044 10046.1     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9839.4 10046.1            360     361     370              .1       .3
Left Levee      Station=  9839.4      Elevation=  1963.3
Right Levee     Station= 10046.1      Elevation=  1959.4

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.75

INPUT
Description:
Station Elevation Data     num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9535  1968.8  9569.1    1958    9580  1956.1  9600.1  1955.6  9620.2  1955.1
  9640.7  1955.2    9671  1955.2  9699.4  1955.2  9797.4    1954  9807.2    1951
    9817  1951.4  9830.1  1947.9  9838.9  1947.8  9849.4  1947.7  9874.7  1951.2
  9893.5  1951.4    9936  1950.8  9965.9    1948  9988.6  1946.5  9994.7  1946.9
   10000  1947.2   10016  1951.4 10027.6    1953 10055.5  1953.5 10095.7    1954
 10148.4  1957.1 10176.9  1957.3 10201.8  1957.5 10202.3  1957.4 10265.2  1957.5
 10341.9  1957.8 10415.1  1958.4 10486.4  1959.7 10533.3  1960.5 10567.4  1961.2
 10582.5  1964.1

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9535     .07  9797.4    .044 10027.6     .07

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

```
        9797.4 10027.6                680     647     650              .1       .3
Left Levee      Station=  9797.4      Elevation=    1954
Right Levee     Station= 10027.6      Elevation=    1953

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.63

INPUT
Description:
Station Elevation Data     num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9746.7  1958.1  9772.3  1949.7  9798.9    1949  9843.2  1948.9  9868.4  1948.3
  9884.3  1947.5  9917.9  1947.6  9928.5  1946.4  9961.1  1947.3  9972.7  1942.5
  9988.2  1940.5   10000  1940.6 10001.6  1940.7 10023.2  1940.7   10037  1941.7
 10056.6  1944.7 10070.9  1945.2 10102.8  1945.1 10113.1  1944.7 10125.9  1946.9
 10153.9  1948.2 10190.6  1948.6 10229.8  1947.5 10260.8  1947.3 10312.4    1947
 10336.4  1946.3 10337.3  1947.6 10361.7  1950.5 10392.2  1949.2 10414.1  1948.8
 10424.8  1946.3 10444.7  1948.2 10460.1  1951.7 10492.2  1952.9 10511.8  1952.8
   10540  1952.1   10555  1952.4 10593.1  1952.2 10675.7  1952.4 10701.9  1956.7
 10708.4  1956.6

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9746.7     .07  9961.1    .044 10153.9     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9961.1 10153.9               450     453     430              .1       .3
Left Levee      Station=  9961.1      Elevation=  1947.3
Right Levee     Station= 10153.9      Elevation=  1948.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.54

INPUT
Description:
Station Elevation Data     num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9903.1  1953.1     9916 1946.65  9928.9  1940.2  9945.4  1940.1  9977.3  1940.2
   10000  1940.3 10041.5  1941.1 10050.6  1940.6 10073.6  1940.7   10094    1942
 10112.1  1941.9 10138.9  1942.1 10155.4  1942.2 10165.5  1944.3 10182.8  1946.3
 10201.5  1945.8 10229.8  1946.2 10266.6  1946.9 10296.7  1946.7 10320.8  1944.2
 10335.4    1945 10361.1  1944.8 10368.2  1943.4   10400  1941.6 10407.2  1940.6
 10429.9  1940.7   10439  1941.7 10456.4  1941.5   10470    1945 10481.4  1946.2
 10490.5    1946 10514.6  1943.2 10538.9  1941.4   10556    1948 10565.9  1948.9
 10611.6  1948.3   10647  1947.9 10681.6  1947.6 10740.1  1947.4 10783.6  1947.9
   10820  1948.4 10875.2  1948.4 10907.6  1951.6 10932.1    1952

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9903.1     .07    9916    .044 10182.8     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9916 10182.8               475     484     475              .1       .3
Left Levee      Station=    9916      Elevation= 1946.65
Right Levee     Station= 10165.5      Elevation=  1944.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.45

INPUT
Description:
Station Elevation Data     num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9794.4  1951.3  9827.8  1948.9  9836.9  1946.7    9850  1944.6  9861.9  1933.4
  9869.7  1933.1  9885.4  1933.7  9905.9  1937.6  9927.1  1938.3  9964.4  1936.2
  9983.8  1935.2  9993.3  1933.6   10000  1933.3 10008.5  1933.3 10009.4  1933.8
   10031  1941.1 10073.8    1941 10110.3    1941 10145.4  1940.3 10163.5  1939.8
 10168.6  1939.1 10186.5  1941.7 10204.8  1941.5 10230.5  1939.5 10250.8  1939.5
 10270.7  1938.2 10293.2  1937.5 10327.6  1938.3 10334.1  1938.7 10346.9  1942.7
 10385.9  1942.5 10399.4  1941.7   10439  1937.4 10462.8  1939.3 10480.5  1941.9
 10521.6  1941.8 10548.4    1942 10567.9    1942 10608.9  1942.1   10642  1942.4
 10694.7  1945.4 10736.6  1945.2 10772.4  1944.2 10798.3  1943.2 10813.1    1944
 10862.6  1944.1 10879.9  1944.8 10899.7  1949.7

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9794.4     .07    9850    .044   10031     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9850   10031               590     592     620              .1       .3
Left Levee      Station=    9850      Elevation=  1944.6
Right Levee     Station=   10031      Elevation=  1941.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.34

INPUT

Station Elevation Data     num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9664.3  1943.7  9718.8  1943.4    9793  1939.1  9862.7  1937.3  9930.2  1937.1
  9935.3  1935.5  9949.9  1933.3   10000  1931.5 10027.2  1933.2 10104.9  1934.1
 10113.8  1933.1 10116.6  1932.9 10126.5  1935.4 10137.5  1936.5 10146.5  1935.1
   10157  1934.7   10166  1932.9   10178  1932.1 10184.4  1932.9 10196.8  1936.1
 10210.6  1936.6 10248.8  1936.5 10254.7    1936 10322.1  1935.9 10332.9  1935.1
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 10365.4  1935.1 10379.2  1932.4 10394.9  1931.5 10412.7  1931.9   10417  1934.9
 10429.2  1935.8 10471.2  1935.2 10485.5  1935.9 10497.1  1935.8 10509.7  1934.5
 10532.2  1933.7 10540.5  1933.8 10545.2  1934.1   10555    1940

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9664.3     .07  9930.2    .044 10137.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9930.2 10137.5              450     474     450             .1       .3
Left Levee       Station=  9930.2      Elevation=  1937.1
Right Levee      Station= 10137.5      Elevation=  1936.5

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.25

INPUT
Station Elevation Data     num=       58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9373.1  1938.6  9395.2  1936.9  9406.7  1936.4  9423.4    1935    9428    1935
  9455.8  1933.5  9505.3  1931.6  9509.8  1932.3  9528.7  1932.8  9546.8  1932.9
    9565  1932.5  9570.8  1931.7  9591.6  1932.8  9610.1  1933.2  9655.8  1934.5
  9676.8  1934.5    9701  1934.9  9746.6  1934.9  9783.9  1934.1  9798.6    1926
    9809  1925.5  9818.8  1925.4  9828.6  1928.3  9837.7  1929.5  9857.7  1930.7
  9867.3    1931  9881.1  1931.1  9937.9  1928.7  9978.9  1927.2  9992.1    1926
  9998.1    1926   10000  1926.1 10008.2  1925.9 10019.5  1927.4 10031.4  1931.4
 10041.9  1932.1 10070.2    1932 10095.4  1931.1   10102    1931   10114  1930.7
 10132.1  1928.7 10149.7  1930.9 10161.2  1929.9 10181.8  1931.8 10190.3  1931.8
 10215.9  1932.1 10261.6  1932.1 10286.1  1931.9 10318.8  1931.3 10340.5  1932.6
 10366.6  1932.7 10388.8  1931.9 10413.5  1931.8 10430.7  1931.3 10443.2    1929
 10452.1  1928.6   10466  1929.3 10483.8    1940

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9373.1     .07  9783.9    .044 10041.9     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9783.9 10041.9              400     432     400             .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev
  9373.1    9750
Left Levee       Station=  9783.9      Elevation=  1934.1
Right Levee      Station=   10033      Elevation=  1930.5

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.17

INPUT
Station Elevation Data     num=       39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9491.6  1936.3    9506    1932  9521.4  1929.3  9545.1  1928.2  9562.9    1928
  9579.7  1928.1  9634.1  1929.3  9653.3  1929.5  9726.8  1928.9  9786.7    1929
  9825.3  1929.9  9852.5  1931.1  9871.9  1922.6  9888.2  1922.6  9897.9  1920.8
    9911  1921.3  9918.2  1924.7  9936.1  1924.7  9965.1  1923.2   10000  1921.7
 10001.5  1921.7 10054.8  1923.1 10062.1  1923.8 10080.5  1926.2 10099.2  1926.9
 10124.8  1927.8 10182.8  1928.2 10210.3  1930.9 10228.1  1928.3 10247.7  1926.1
 10279.7  1924.7 10302.1  1928.2 10328.3  1928.8 10367.3  1928.5 10402.1    1928
 10441.8  1926.3 10469.9  1924.6   10497  1925.2 10536.2  1935.7

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9491.6     .07  9852.5    .044 10210.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9852.5 10210.3              130     162     130             .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev
  9491.6  9653.3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.14

INPUT
Description:
Station Elevation Data     num=       51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9585.1  1936.6  9604.8  1932.6  9617.8  1929.8  9636.3    1928  9669.3  1927.7
  9692.5  1927.8    9713  1927.9  9756.8  1927.5  9801.2  1926.6    9847  1926.6
  9879.8  1927.5  9908.3  1928.2  9926.4  1928.7  9939.6  1922.6  9947.4  1921.1
  9965.8  1920.2  9973.5    1919   10000  1917.8 10010.3  1918.4 10026.5  1920.5
 10045.6  1924.5 10071.7  1925.6 10108.7  1926.9 10146.3  1928.3 10165.5  1928.3
 10175.7    1928 10200.1  1926.5 10211.8  1925.2 10216.9  1923.6 10228.2  1923.6
 10244.9  1922.4 10260.3  1927.1 10283.8    1928 10333.2  1927.9 10349.7  1926.4
   10374  1927.2 10391.8  1926.2 10409.7  1925.9 10420.3  1924.3   10437  1923.7
 10478.4  1926.1 10521.1  1925.7 10538.5  1925.7 10563.6    1926 10576.4  1926.4
 10583.9  1922.6 10604.4  1924.1 10631.6    1924 10648.6  1925.6 10664.9  1931.2
 10690.6  1939.2

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9585.1     .07  9926.4    .044 10146.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9926.4 10146.3              500     467     350             .1       .3
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CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 31.05

INPUT
Description:
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9874.9    1932    9886 1923.33  9891.8  1918.8  9913.5  1918.9  9925.9  1920.4
  9934.2  1918.3  9959.6  1917.1  9981.5  1917.8   10000  1917.8 10017.7  1918.1
 10031.9  1919.2 10043.6  1920.9 10072.9  1920.4 10087.3  1921.7 10103.6  1922.6
 10109.5    1923 10135.9  1922.9 10144.8  1921.9 10184.5  1922.2 10203.3  1921.3
   10234  1923.4 10256.6  1923.4   10289  1922.9 10317.1  1923.9 10318.2  1923.8
 10374.4  1923.3 10391.5  1922.2 10427.9  1921.5 10450.6  1921.6 10476.8  1924.3
 10506.7  1924.3 10573.2  1922.6   10624  1921.7   10643  1921.8 10662.9  1920.7
 10689.1  1920.8 10706.9  1920.3   10715  1917.2 10722.6  1916.9   10745  1921.9
 10764.6  1921.7 10790.9  1921.3 10806.3    1919 10836.8  1920.1 10849.3    1920
 10866.4    1918 10887.8  1917.4 10913.9  1928.6 10928.2  1930.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9874.9     .07    9886    .044 10109.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9886 10109.5              470     494     460              .1       .3
Right Levee     Station= 10087.3      Elevation=  1921.7

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 30.96

INPUT

Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9841.1    1926    9870  1918.3  9883.8  1918.3  9925.5  1918.1  9943.8  1914.4
  9973.8  1913.9  9986.9    1913   10000  1912.3 10026.1  1912.5   10032  1914.1
 10040.4  1913.5 10048.6  1913.3   10068  1917.1 10108.6  1917.3 10126.3  1918.4
 10145.6  1919.6 10178.2  1919.1   10215    1918 10251.6  1917.6 10288.4  1914.8
 10300.7  1916.8 10314.7  1917.5 10337.5  1917.7 10354.8  1915.9 10368.2  1913.7
   10381  1915.1 10420.6    1917 10463.2  1919.4 10491.4  1920.1 10517.7  1920.5
 10535.8  1920.3 10566.8  1919.1 10590.8  1919.3 10602.1  1917.5 10612.3  1916.8
 10626.6  1916.6 10646.3    1912 10653.8  1912.4 10665.1  1915.2 10676.9  1916.8
 10689.9  1917.3   10727  1916.6 10740.6  1916.5 10749.9  1914.6 10758.8  1914.1
 10771.1  1915.9 10798.3  1924.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9841.1     .07  9925.5    .044 10145.6     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9925.5 10145.6              550     541     570              .1       .3
Right Levee     Station= 10126.3      Elevation=  1918.4

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 30.85

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9554.5  1919.8  9596.5  1919.4  9645.1  1918.6  9696.1  1917.4  9729.2  1916.6
  9804.9    1916    9834  1915.8  9835.9  1915.8  9863.9  1915.6  9889.7    1915
  9901.4  1912.1  9912.4  1908.2  9928.9  1909.4  9950.5  1908.5  9972.9  1909.1
   10000  1907.5 10018.4  1907.9 10051.3  1914.3 10090.2  1914.5 10129.5  1915.2
 10148.9  1915.3 10185.9  1915.5 10222.7  1914.7 10246.4  1910.5 10276.3  1913.3
 10294.3  1913.9 10316.8  1914.1   10327  1911.5   10361  1910.9 10370.8  1909.4
 10385.6  1908.6 10407.2  1910.2 10436.5  1907.9 10442.7  1905.6 10474.8  1905.3
 10484.7  1907.4 10503.4  1921.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9554.5     .07  9889.7    .044 10051.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9889.7 10051.3              525     569     570              .1       .3
Left Levee      Station=  9889.7      Elevation=    1915
Right Levee     Station=   10044      Elevation=    1912

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 30.75

INPUT
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9299.3  1918.1  9316.1  1915.8  9339.6  1915.2  9376.8  1914.8  9417.3  1914.4
    9491  1914.4  9531.6  1913.7  9560.3  1909.8  9621.7  1909.6  9660.3  1908.9
  9712.4  1909.4  9755.1  1909.2  9793.8  1909.1  9820.7  1909.1  9857.1  1909.7
  9869.1  1909.4  9885.3  1906.2  9912.3  1907.2    9935  1906.7  9963.4  1904.1
  9982.7  1902.6  9993.3  1902.5   10000  1902.4 10050.3  1903.8 10096.8    1903
 10116.3    1901 10126.1  1903.4 10142.7  1903.2 10165.8  1902.8 10184.4  1915.5
 10241.8  1916.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9299.3     .07  9857.1    .044 10184.4     .07
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9857.1 10184.4              475     486     450             .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 30.65

INPUT

Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9206.9    1913  9224.3  1910.7  9241.6  1909.7  9297.7  1908.9  9329.1    1908
  9386.1  1907.1  9430.3  1907.9  9448.3  1908.6  9465.2  1908.9    9483  1908.4
    9506  1908.7  9526.3    1908  9563.6  1906.8  9601.3  1906.3  9627.1  1905.9
  9654.8  1905.5  9691.5  1905.5  9715.1  1905.8  9732.3  1906.1  9743.9  1906.2
  9771.6  1901.9  9791.3  1900.6  9799.1  1901.6    9813  1903.2  9833.8  1904.1
    9871    1903  9891.8  1904.2  9909.4  1904.4  9919.7  1902.4  9933.9  1901.8
  9943.8  1898.6  9971.6    1899  9988.4  1898.3  9995.5  1897.2   10000  1897.3
 10019.6  1898.2 10027.8  1910.2 10041.2  1911.2 10070.7  1911.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9206.9     .06  9909.4    .044 10027.8     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9909.4 10027.8              700     696     650             .1       .3
Left Levee      Station=  9909.4      Elevation=  1904.4
Right Levee     Station= 10027.8      Elevation=  1910.2

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 30.52

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9283.8  1904.7    9298  1900.8  9317.2  1900.7    9342  1900.5  9401.2  1900.8
  9431.3  1900.4    9463  1900.9  9498.9  1900.8  9566.3  1900.4  9630.3  1899.9
  9649.8    1900  9696.8  1900.1  9721.3  1899.9  9744.6  1899.1  9757.6  1899.3
    9771  1899.2  9785.1  1899.6  9811.3  1900.4  9826.1  1900.9  9851.7    1900
  9872.3  1898.1  9876.3  1894.7  9887.7  1894.9  9902.1    1895    9914  1897.4
  9933.1  1898.2    9965  1896.5  9983.4  1893.6   10000  1893.8 10049.4  1893.5
 10061.8    1894 10068.7  1894.9 10095.2  1898.8 10107.9  1898.9 10132.4  1898.9
 10161.8  1898.1 10213.6    1899 10221.1    1899 10242.8  1898.8 10260.3  1897.4
 10275.9  1896.9   10291  1893.8 10300.9  1894.4 10323.3  1900.1 10340.6  1899.8
 10361.4  1898.7 10366.8  1896.7 10383.8  1899.3 10401.4  1903.8 10420.5  1904.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9283.8     .06  9826.1    .044 10401.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9826.1 10401.4              600     560     500             .1       .3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 30.42

INPUT
Description:
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9501.6  1906.6    9533  1893.1  9568.7  1893.6  9613.1  1892.9  9631.9  1892.9
  9666.7  1892.9  9714.6  1894.3  9733.5  1894.8  9755.5  1894.8  9800.7  1894.6
  9854.8  1895.2    9868  1892.9  9893.2  1893.9  9900.4  1893.6  9907.3  1890.9
  9918.4  1890.6  9931.2  1895.4  9957.5  1895.6  9970.3  1890.3  9999.9  1887.8
   10000  1888.1 10037.1  1889.6 10052.9  1890.3 10080.7  1892.7 10102.6  1892.4
 10123.6  1891.7 10145.5  1891.1 10159.9  1885.8 10186.9    1889 10200.7  1889.8
 10211.4  1892.1 10239.2  1890.7 10258.2  1888.3 10277.2    1893 10320.1  1892.4
 10362.3  1889.9 10390.2  1889.7 10402.9  1891.4 10438.8  1890.9   10443  1890.9
 10455.4  1893.1 10487.8  1900.1 10552.6  1901.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9501.6     .06  9957.5    .044 10487.8     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9957.5 10487.8              500     713     650             .1       .3
Left Levee      Station=  9854.8      Elevation=  1895.2

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 30.28

INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9132.4  1901.6  9162.5  1889.1  9181.6  1889.5  9200.7  1888.4  9222.8  1889.3
  9264.4    1890  9316.4  1890.1  9351.6  1890.2  9388.9  1888.4  9396.9    1887
  9406.9  1886.6  9427.9    1888  9442.8  1888.6    9470  1887.8  9491.8  1889.3
  9550.4  1890.2  9595.4  1889.5  9616.6  1889.6  9631.3  1887.7    9649    1887
  9679.4  1889.5  9694.4  1888.6  9704.9  1886.6  9717.5  1889.5  9732.1  1890.4
  9751.7    1890  9775.3  1888.7    9814    1888  9833.6  1885.9  9881.7  1885.2
  9895.3  1884.3  9908.6  1881.8  9934.5  1880.9  9947.3  1879.7  9978.3  1878.3
  9989.9  1877.8   10000  1877.8 10008.3  1877.1 10014.5  1877.5 10033.5  1894.3

Manning's n Values        num=       3
```

Sta	n Val	Sta	n Val	Sta	n Val
9132.4	.06	9881.7	.044	10033.5	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9881.7	10033.5	550	421	430	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.2

INPUT

Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8955.2	1897.8	8990	1882.4	9026.6	1880.4	9055.2	1882	9073.3	1883.7
9087.5	1885	9107	1885.1	9146.3	1884.1	9170.8	1881.8	9184	1881.9
9204	1882.7	9235.3	1882	9246.9	1882.4	9262.4	1882.3	9272.2	1883.5
9292.3	1884.4	9312.7	1883.6	9337.9	1881.6	9347.9	1881.1	9366	1882.5
9381.9	1882.6	9390.1	1886.1	9418.6	1885.7	9457.3	1884.4	9490	1883
9504.1	1883.8	9564.4	1883.4	9590.9	1882	9616.7	1883.3	9641.3	1883.5
9663.9	1879.3	9669.6	1879.5	9684.6	1882.3	9695.5	1882.8	9707	1881.9
9714.1	1879.8	9731.2	1879.9	9741.7	1882.8	9753.1	1883	9796	1883.3
9822.3	1884.1	9859	1883.7	9900.1	1882.8	9927.7	1876.5	9939.7	1875.8
9976.9	1877	10000	1876.1	10000.6	1876.4	10021.2	1877.9	10045.5	1878.8
10069.8	1878.2	10086	1876	10093.2	1875.2	10132.3	1897.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8955.2	.06	9900.1	.044	10132.3	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9900.1	10132.3	535	537	545	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.1

INPUT
Description:
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8723.4	1891	8748.2	1877.9	8775.4	1875.5	8780	1876	8810.6	1878
8835.2	1880.5	8853	1878.9	8871.3	1879.6	8898.7	1878.8	8919.7	1879.2
8960.2	1880.2	9014.6	1879.7	9044.7	1878.9	9052.4	1879.9	9099.2	1880.3
9155.3	1880.3	9227.8	1880.9	9243.7	1876.8	9255.3	1876.3	9276.4	1874.4
9307.4	1874.2	9329.9	1872.2	9342	1872.1	9355.7	1873.5	9390	1876.3
9392.9	1873.5	9404	1871.8	9420.7	1873.1	9425.8	1874.2	9428.7	1876.8
9441.3	1878.7	9466.4	1877.6	9482.9	1877.8	9496.3	1880.2	9512.7	1881.2
9529.5	1880.1	9533.3	1878.9	9544.7	1877	9559.8	1877.4	9578.4	1878.1
9589.9	1879.3	9614.6	1877.1	9633.8	1874.7	9643.6	1871.3	9667.4	1872.3
9672.6	1871.1	9693.9	1870.2	9717.8	1870.5	9722.8	1872.1	9730.9	1873.4
9755.3	1874.4	9768.6	1874.7	9788.6	1880.6	9817.8	1881.3	9848.5	1880.6
9860.4	1879.2	9872.6	1875.7	9880.1	1875	9891.8	1874	9935.6	1873
9949.8	1868.2	10000	1867.4	10010.8	1869.6	10037.3	1895.1	10037.9	1895.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8723.4	.06	9817.8	.036	10037.9	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9817.8	10037.9	1100	1304	1325	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.85

INPUT

Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9386	1874.2	9406.8	1872	9413.5	1870	9438.9	1868	9504.5	1868
9609.1	1870	9646.3	1870.4	9735.6	1868	9757.6	1868	9924.1	1866
9938.5	1864	9945.1	1860	10015.9	1857.7	10029.3	1858	10043.7	1872
10081.4	1878	10127.5	1880						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9386	.07	9924.1	.036	10043.7	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9924.1	10043.7	400	400	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.77

INPUT

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9195	1874	9222	1872	9240	1866	9317.8	1865.3	9364.1	1864.3
9408	1863.8	9449	1863	9466.8	1862.2	9505.3	1863.7	9551.4	1863
9588.5	1862.1	9603.5	1862	9676.4	1861.8	9720	1863.6	9724.1	1864.1
9736.3	1867.1	9745.8	1870	9764.6	1870.5	9772.8	1866.9	9782.5	1861.7
9792.9	1857.2	9809.5	1858.2	9826.1	1859	9869.9	1859.7	10011.1	1857.3
10024.3	1858.4	10033.6	1864.1	10042.5	1869.2	10051.1	1872.7	10073.5	1873.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
    9195     .07  9764.6    .036 10051.1     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9764.6 10051.1                 50     200     550              .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9195    9754  1890.6 10051.1 10073.5  1872.7
Left Levee      Station=  9764.6      Elevation=  1870.5
Right Levee     Station= 10051.1      Elevation=  1872.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 29.72

INPUT

Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  8869.7    18819215.525  1872.29314.096  1872.2 9421.28  1873.79524.462  1874.5
9593.191    18769595.541  1875.49606.067  1871.4 9623.12  1864.29639.302  1856.1
9677.061  1858.49702.812  1858.69734.566  1857.59853.061    18559885.425  1862.8
9899.954  1870.39922.835  1875.29940.845  1875.99956.504  1876.110290.06  1870.7
10455.19  1869.910966.75  1873.411297.17    187411468.65    1875

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  8869.7     .079593.191    .0369956.504     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9593.1919956.504                127     127     127              .1       .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  8869.79593.191    18809956.50411468.65    1880
Left Levee      Station=9593.191      Elevation=    1876
Right Levee     Station=9956.504      Elevation=  1876.1

BRIDGE                  RIVER: RIVER-1
REACH: Reach-1             RS: 29.715

INPUT
Description: Bridge #1

Distance from Upstream XS =      10
Deck/Roadway Width        =     117
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
9542.061  1877.4    18729559.061 1880.24 1872.239646.561 1880.86 1872.85
9734.061  1881.1 1873.099821.561 1880.95 1872.949909.061 1880.42 1872.41
9926.061  1877.6    1872

Upstream Bridge Cross Section Data
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  8869.7    18819215.525  1872.29314.096  1872.2 9421.28  1873.79524.462  1874.5
9593.191    18769595.541  1875.49606.067  1871.4 9623.12  1864.29639.302  1856.1
9677.061  1858.49702.812  1858.69734.566  1857.59853.061    18559885.425  1862.8
9899.954  1870.39922.835  1875.29940.845  1875.99956.504  1876.110290.06  1870.7
10455.19  1869.910966.75  1873.411297.17    187411468.65    1875

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  8869.7     .079593.191    .0369956.504     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
      9593.1919956.504              .1       .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  8869.79593.191    18809956.50411468.65    1880
Left Levee      Station=9593.191      Elevation=    1876
Right Levee     Station=9956.504      Elevation=  1876.1

Downstream  Deck/Roadway Coordinates
    num=       9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9695 1876.13    1870  9702.5 1876.15    1870  9719.5 1878.87 1870.83
  9782.5 1879.06 1871.02    9870 1879.13 1871.09  9957.5 1879.02 1870.98
   10045 1878.71 1870.67   10069 1878.62 1870.56   10086 1875.88    1870

Downstream Bridge Cross Section Data
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9609    1872    9715  1871.2    9754    1862    9764    1860    9772    1858
    9788    1856    9801  1854.5    9835  1856.1    9891  1856.5    9910    1856
    9976    1854   10000  1853.9   10023    1855   10064 1870.95   10200    1872

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9609     .07    9715     .04   10064     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9715   10064              .1       .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
```

```
   9609    9715    1890   10064   10200    1890
Left Levee      Station=    9715      Elevation=  1871.2
Right Levee     Station=   10064      Elevation= 1870.95

Upstream Embankment side slope              =         horiz. to 1.0 vertical
Downstream Embankment side slope            =         horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =
Elevation at which weir flow begins         =  1879.8
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream=9646.561    Downstream=  9800.5
Upstream     num=        2
    Width   Elev    Width   Elev
        4   1854        4   1874
Downstream     num=        2
    Width   Elev    Width   Elev
        4   1853        4   1874

Pier Data
Pier Station     Upstream=9734.061    Downstream=    9888
Upstream     num=        2
    Width   Elev    Width   Elev
        4   1854        4   1874
Downstream     num=        2
    Width   Elev    Width   Elev
        4   1853        4   1874

Pier Data
Pier Station     Upstream=9821.561    Downstream=  9975.5
Upstream     num=        2
    Width   Elev    Width   Elev
        4   1854        4   1873
Downstream     num=        2
    Width   Elev    Width   Elev
        4   1853        4   1873

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =    1.33
       Yarnell                 KVal =    1.05
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

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

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 29.71

INPUT

Station Elevation Data     num=       15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9609    1872    9715  1871.2    9754    1862    9764    1860    9772    1858
    9788    1856    9801  1854.5    9835  1856.1    9891  1856.5    9910    1856
    9976    1854   10000  1853.9   10023    1855   10064 1870.95   10200    1872

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9609     .07    9715     .04   10064     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9715   10064              533     233      73             .1       .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9609    9715    1890   10064   10200    1890
Left Levee      Station=    9715      Elevation=  1871.2
Right Levee     Station=   10064      Elevation= 1870.95

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 29.663

INPUT

Station Elevation Data     num=       35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9166  1874.6  9201.1  1872.5  9233.9  1863.4  9249.5  1861.7  9285.2  1863.9
  9357.9  1862.6  9384.7  1861.5  9415.8  1859.9  9468.3    1862    9538  1860.7
  9615.1  1862.3  9670.5  1862.6  9803.9  1862.5  9827.7  1851.7  9840.5  1850.9
  9860.9  1850.9  9897.3    1856  9915.3  1855.5  9955.8    1854   10000  1853.7
 10025.2  1852.9 10051.5  1857.5   10159  1856.8 10194.6  1869.1 10357.1    1867
 10470.9  1866.3 10698.7  1864.6 10792.8  1863.6 10916.7  1862.8 11013.8  1862.3
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 11221.1  1860.8 11281.8  1861.8 11330.4  1866.3 11375.2  1870.2   11430  1875.3

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9166     .07  9803.9    .044 10194.6     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9803.9 10194.6              330     330     330              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9166  9615.1  1862.3 10201.4   11430  1889.3
Left Levee       Station=  9803.9      Elevation=  1862.5
Right Levee      Station= 10194.6      Elevation=  1869.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 29.601

INPUT

Station Elevation Data     num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9099.7  1872.9  9117.8  1868.4  9156.4  1856.1  9183.7    1859  9210.1    1860
  9257.3  1861.3  9286.8  1861.4  9337.3  1859.7  9385.8  1857.8  9431.3  1857.6
  9472.7  1856.4  9515.2  1856.9  9628.9  1858.9    9679  1859.4  9695.4  1858.5
  9710.3  1850.7  9734.3  1849.9  9784.6  1851.2  9797.7  1852.1  9832.4  1854.3
  9848.1  1854.8  9885.6  1853.5  9929.9  1851.5  9960.4  1851.1   10000    1851
   10019  1852.2 10035.2  1857.7 10046.6    1859 10060.2  1867.1 10084.7  1867.9
   10148  1868.6

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9099.7     .07    9679    .044 10060.2     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9679 10060.2              370     330     330              .1       .3
Left Levee       Station=    9679      Elevation=  1859.4
Right Levee      Station= 10060.2      Elevation=  1867.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 29.538

INPUT
Description: SECTION NO. BJ


Station Elevation Data     num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9071    1860  9096.6  1852.7  9109.2  1854.5  9115.6  1856.5  9129.7  1855.8
  9160.4    1855  9182.2  1856.2  9231.6  1856.6  9294.3  1856.8  9331.2  1855.1
  9372.5  1853.7  9376.2  1850.6  9382.6  1854.1  9400.2  1854.4  9419.1  1848.9
  9441.4  1850.1  9480.9  1851.4    9528  1851.9    9545  1851.1  9586.2  1849.7
  9625.5  1850.4    9667  1850.7  9703.9  1850.1  9733.9  1852.7  9774.5    1851
  9838.1  1851.2  9871.5  1850.5  9915.1  1850.9  9948.9  1848.7  9970.4  1848.7
  9990.7  1847.4   10000  1845.5 10016.1  1848.1 10034.4  1854.1 10071.6  1856.5
 10085.4  1857.7

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9071     .07  9400.2     .05 10034.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9400.2 10034.4              270     240     230              .1       .3
Left Levee       Station=  9400.2      Elevation=  1854.4
Right Levee      Station= 10034.4      Elevation=  1854.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 29.493

INPUT
Description: SECTION NO. BI


Station Elevation Data     num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9184.2  1855.3  9195.2  1850.5  9301.4  1850.5  9318.7  1850.3  9336.2  1850.7
  9357.2  1846.3  9369.9  1843.9    9386  1843.4  9410.6  1843.8  9421.7  1845.6
    9428  1845.7  9442.5    1848  9450.2  1848.1  9459.5  1847.9  9471.8  1847.4
  9486.4  1846.6  9503.9  1847.6  9515.6  1847.9  9534.1  1848.2  9543.7  1849.3
  9563.8  1849.5  9572.1  1850.7  9582.2  1850.8  9618.4  1850.6  9647.1  1847.2
  9657.9  1846.8  9679.3  1846.1  9696.8  1849.6  9711.8  1848.9    9717  1848.6
  9732.5  1849.3  9747.1  1848.9  9758.6  1846.3  9765.8  1845.5    9772  1845.4
    9786    1847  9807.2  1849.1  9819.2  1849.2  9831.7  1847.5  9838.8  1847.3
  9868.6  1845.8  9885.7  1844.4  9905.8  1847.2    9907  1847.6  9915.7  1847.9
  9951.2  1847.8  9989.8  1845.4   10000  1845.2   10018  1844.8 10024.4  1845.6
 10038.6  1850.7 10047.8  1850.8 10063.5  1850.3 10071.1  1850.7 10089.3  1850.9
 10099.8  1849.2 10106.4  1848.8 10109.9  1849.1 10142.8  1854.8 10156.3  1855.2

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9184.2     .07  9336.2     .05 10047.8     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9336.2 10047.8              610     560     520              .1       .3
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Left Levee      Station=  9336.2      Elevation=  1850.7
Right Levee     Station= 10047.8      Elevation=  1850.8

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.387

INPUT
Description: SECTION NO. BH


Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9481  1854.2  9493.6  1841.8  9511.4  1841.9  9527.3  1844.7  9552.5  1844.5
  9575.8  1839.3  9627.7  1839.1  9645.2  1840.2  9667.5  1844.3  9682.9    1845
  9722.4  1842.2    9732  1839.9  9749.9  1839.7  9757.7  1840.9  9778.9  1847.4
  9822.3  1847.6  9845.5  1843.7  9863.2    1845  9906.2  1844.6  9921.9  1842.7
  9960.2  1839.7  9986.9  1838.8   10000  1839.8   10037  1839.3 10066.4  1838.9
   10082  1843.9 10107.4  1845.2 10128.4  1844.2 10146.8    1845 10179.3  1843.4
 10240.2  1845.8 10277.7  1845.8 10302.4  1850.7 10351.2  1850.5 10398.2  1850.5
 10434.3  1850.2 10467.4  1848.9 10486.8  1849.5 10517.6  1857.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9481     .07    9481     .05 10107.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9481 10107.4              190     190     200             .1       .3
Right Levee     Station= 10302.4      Elevation=  1850.7

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.351

INPUT
Description: SECTION NO. BG


Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9651.1    1864  9668.9  1858.9  9684.3  1849.7  9698.1  1836.7  9722.5  1839.1
  9741.4  1838.9  9747.3  1836.7  9758.1  1836.8  9768.8  1838.3  9795.9  1841.6
  9818.1  1839.9    9839  1839.5  9861.3  1842.7  9879.5  1845.3    9898    1839
  9912.1    1841  9924.3  1841.4  9957.8  1842.3  9979.9  1838.9   10000  1835.9
 10027.2  1836.7   10064    1838 10092.9  1841.9 10150.2    1842 10186.7  1840.3
   10213  1842.3 10230.5  1840.9   10250  1841.3 10277.5  1845.9 10296.9  1847.8
   10317  1848.9 10342.3  1849.3 10371.3  1849.2 10418.4  1848.8 10471.2  1849.3
 10503.3  1848.5 10544.6  1847.1   10566  1847.7 10595.3  1854.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9651.1     .07  9684.3     .05 10150.2     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9684.3 10150.2            500     490     490             .1       .3
Right Levee     Station= 10342.3      Elevation=  1849.2

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.258

INPUT
Description: SECTION NO. BF


Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9781.3  1852.7  9805.1  1834.5  9824.7  1831.9  9842.8  1828.7  9857.3  1831.8
  9870.6  1832.7  9915.5  1834.1  9954.2  1833.1   10000  1831.2 10016.4  1832.3
 10026.1  1832.7 10051.4  1844.5 10107.4  1844.3 10169.9  1844.4 10230.7  1844.3
 10274.3  1843.9 10318.2  1844.5 10378.2  1843.7 10417.3  1843.3 10451.7  1842.7
 10494.3  1842.2 10508.4    1843 10543.7  1851.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9781.3     .07  9781.3    .044 10051.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9781.3 10051.4            710     705     710             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 10051.4 10543.7  1844.5
Right Levee     Station= 10051.4      Elevation=  1844.5

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.13

INPUT
Description: SECTION NO. BE


Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9960.7    1855  9979.7  1824.5  9987.1    1821   10000  1821.6 10015.3  1822.1
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 10027.6  1824.1 10046.3  1826.2 10055.7  1827.7 10091.4  1827.9 10098.6  1829.1
 10106.7  1831.5 10331.6  1834.5 10356.3  1834.2   10392  1834.1 10428.2    1834
 10440.7  1833.4 10483.6  1835.9 10502.3  1835.1 10508.1  1834.8 10530.9  1836.2
 10559.2  1838.1 10574.2  1838.9 10612.5  1839.3 10733.7  1838.3 10808.3  1836.4
 10832.6  1836.4 10902.5  1837.2 10928.5  1836.9 10946.7  1837.6 10954.1  1839.3
 10971.2  1842.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9960.7     .07  9960.7    .036 10106.7     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9960.7 10106.7              590     595     600              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 10612.5 10971.2  1839.3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.012

INPUT
Description: SECTION NO. BD


Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9889.9  1853.7  9922.8    1850  9955.5    1819  9982.8  1818.9   10000  1818.7
 10031.4  1820.6 10041.2  1822.8 10066.9  1822.6 10091.3  1827.5 10113.2  1828.5
 10186.8  1828.1 10220.1  1828.8 10250.7  1828.6 10267.4  1827.9 10303.6  1828.5
   10341  1829.6 10376.4  1830.3 10413.9  1830.2   10452    1831 10517.5  1832.7
 10558.9  1832.8 10660.3  1831.5 10714.5  1831.6 10788.3  1830.7   10835  1831.7
 10861.6  1838.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9889.9     .07  9922.8    .036 10091.3     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9922.8 10091.3              400     410     420              .1       .3
Left Levee      Station=  9922.8      Elevation=    1850
Right Levee     Station= 10091.3      Elevation=  1827.5

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 28.934

INPUT
Description: SECTION NO. BC


Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9795.5    1853  9824.7  1851.1  9864.6  1824.7  9894.9  1823.9  9914.2  1820.4
  9923.4  1819.2  9934.8  1819.1  9940.2  1816.6  9967.7  1815.9   10000  1815.5
 10007.5  1817.3 10022.2  1817.6 10035.2  1819.8 10054.9  1826.8 10096.7    1828
 10161.6    1827 10183.8  1825.9 10214.6  1826.4 10239.3  1825.4 10268.1  1824.2
 10298.7  1823.9 10324.5  1824.1   10353  1827.5 10391.2  1828.5 10425.6  1829.3
 10455.1    1829 10502.7  1827.8 10545.1  1827.4 10578.5  1827.6   10687  1826.1
 10744.9  1827.3 10818.8  1828.1 10868.7    1827   10873  1826.9 10900.6  1829.8
 11009.4  1831.1 11166.8  1831.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9795.5     .07  9824.7    .036 10054.9     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9824.7 10054.9              410     460     470              .1       .3
Left Levee      Station=  9824.7      Elevation=  1851.1
Right Levee     Station= 10054.9      Elevation=  1826.8

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 28.847

INPUT
Description: SECTION NO. BB


Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9867.2  1848.5  9881.1    1847  9927.3  1814.5  9952.1  1813.5  9978.2  1811.9
   10000    1812 10041.6  1812.5 10076.9  1821.4 10110.6  1821.2 10147.8  1820.5
 10162.1  1818.4 10179.8  1820.8 10200.5  1824.9 10242.3  1825.3 10284.1    1825
 10343.6  1824.4 10403.2  1824.5 10447.7  1823.5 10492.8  1822.7 10553.5  1821.8
 10574.2  1821.8 10617.2  1822.3 10650.1  1822.8 10692.5  1822.5 10726.3    1820
 10757.2  1821.3 10780.5  1821.3   10814  1822.3 10837.2  1826.7 10862.2  1828.2
 10897.8  1827.1 10969.2  1826.9   11071    1827 11206.2  1827.8 11575.5  1826.8
 11637.6  1827.3 11709.7  1828.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9867.2     .07  9881.1    .036 10076.9     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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        9881.1 10076.9              520     510     500              .1       .3
Left Levee      Station=  9881.1      Elevation=    1847
Right Levee     Station= 10076.9      Elevation=  1821.4

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.75

INPUT
Description: SECTION NO. BA


Station Elevation Data     num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9866.8  1844.3  9915.2  1812.6  9936.1  1812.5    9952  1809.4  9972.2  1808.3
   10000  1808.5 10033.3  1808.9 10041.9  1809.5 10053.6  1811.1 10066.5  1811.1
 10101.5    1814 10113.1    1816   10129  1819.7 10171.9  1821.3 10292.1  1820.2
 10343.7  1820.4 10481.8  1818.3 10539.4  1817.7 10623.4    1818 10650.9  1817.4
 10735.6    1818 10749.8  1818.7 10820.5  1825.1 10892.7    1824 10991.1  1824.3
 11079.1  1823.6 11186.1  1824.2 11305.7  1825.2 11432.7  1823.8   11468  1824.2
 11672.9  1825.2 11735.5  1825.5 11821.7  1830.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9866.8     .07  9866.8    .036   10129     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9866.8   10129              500     490     470              .1       .3
Left Levee      Station=  9866.8      Elevation=  1844.3
Right Levee     Station=   10129      Elevation=  1819.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.657

INPUT
Description: SECTION NO. AZ


Station Elevation Data     num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9910.1  1841.5  9933.6  1839.5  9961.9  1801.7  9986.1  1800.5   10000  1800.6
 10009.7  1802.1 10034.1    1805 10053.9  1806.9 10069.1  1808.6 10089.5  1813.2
   10113  1812.3 10124.3  1810.2   10130  1809.6 10142.8  1809.6   10162  1812.9
   10179  1814.9   10197  1816.7 10224.3  1816.8 10327.9  1815.5 10385.1    1814
 10514.2  1814.4 10614.1  1814.6 10650.2  1816.7 10678.3    1820 10877.4  1822.3
 11067.7  1821.4 11188.8  1821.7   11264  1823.3 11476.7  1821.4 11657.4  1822.5
   11753  1826.4

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9910.1     .07  9933.6    .036   10197     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9933.6   10197              550     540     540              .1       .3
Left Levee      Station=  9933.6      Elevation=  1839.5
Right Levee     Station=   10197      Elevation=  1816.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.555

INPUT
Description: SECTION NO. AY


Station Elevation Data     num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9869.9  1835.9  9919.4  1833.2  9940.2  1817.6  9961.8  1800.2  9983.5  1800.1
   10000  1799.4 10032.9  1799.4 10059.2    1801 10096.4  1809.1 10111.4    1810
 10139.6  1809.1 10223.1  1811.3   10283  1811.4 10355.8  1810.6 10399.9  1810.2
 10470.4  1811.2 10526.5    1812 10579.7  1813.1 10607.8    1813 10653.4  1813.2
 10691.4  1812.6 10780.8  1813.9 10824.9  1816.4   10871  1817.2 11005.7  1818.1

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9869.9     .07  9919.4    .036 10111.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9919.4 10111.4              490     490     500              .1       .3
Left Levee      Station=  9919.4      Elevation=  1833.2
Right Levee     Station= 10111.4      Elevation=    1810

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.462

INPUT
Description: SECTION NO. AX


Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9871.7  1827.9  9909.8  1794.9   10000  1794.8 10034.2  1803.6 10061.2  1805.6
   10078  1805.3 10175.8  1806.6   10284  1805.7 10463.4  1807.2 10524.9  1808.6
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 10599.5  1807.4 10682.2  1805.3 10732.4  1805.1 10776.4  1808.1 10847.3    1809
   10922  1812.2 11030.5  1812.7 11215.6  1812.5 11317.2  1812.6 11404.3  1814.1
 11476.1    1815 11558.8  1819.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9871.7     .07  9871.7    .036 10061.2     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9871.7 10061.2              380     380     380              .1       .3
Left Levee      Station=  9871.7      Elevation=  1827.9
Right Levee     Station= 10061.2      Elevation=  1805.6

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.39

INPUT
Description: SECTION NO. AW


Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9819.6  1821.5  9863.1  1815.7  9907.7  1793.2  9924.1  1793.4  9961.5  1793.9
   10000  1792.8 10013.4  1800.1 10063.6  1802.7 10104.8  1802.5 10139.1    1805
 10177.8    1804 10316.5    1803 10382.7  1802.6 10449.1    1803 10520.6  1803.8
   10603    1804 10705.5    1802 10716.7  1802.4 10767.7  1802.8 10800.6  1807.3
 10917.5  1809.4 11054.7  1809.5 11066.1  1809.2 11175.1  1809.6 11281.1  1810.8
 11284.7  1811.5 11364.3    1812   11470  1816.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9819.6     .07  9863.1    .036 10063.6     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9863.1 10063.6              350     340     340              .1       .3
Left Levee      Station=  9863.1      Elevation=  1815.7
Right Levee     Station= 10063.6      Elevation=  1802.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.326

INPUT
Description: SECTION NO. AV


Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9689.6  1822.4  9817.5  1809.8  9861.7  1794.9  9937.3  1792.4   10000  1791.3
 10050.1  1801.8 10195.5  1801.9 10252.1  1801.4 10306.4  1802.1 10388.6  1799.1
 10476.5  1799.1   10599  1800.3 10683.7  1799.1 10731.3  1800.9 10770.4  1800.8
 10806.2  1803.6 10872.4  1803.5 10955.7  1805.2 11057.2  1806.2 11208.6  1807.9
 11340.5  1810.2 11379.7  1812.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9689.6     .07  9817.5    .036 10050.1     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9817.5 10050.1              440     450     470              .1       .3
Left Levee      Station=  9817.5      Elevation=  1809.8
Right Levee     Station= 10050.1      Elevation=  1801.8

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.241

INPUT
Description: SECTION NO. AU


Station Elevation Data    num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9639.9  1808.3  9692.2  1795.4  9741.5  1795.8  9757.5    1795  9762.7  1794.5
  9785.6  1793.6  9819.4  1793.6  9830.9  1791.7    9858  1789.9  9876.8  1791.1
  9926.9  1790.7   10000    1790   10028  1795.7 10050.5  1796.6 10063.2  1795.7
   10223  1797.2 10301.6  1798.6 10415.7  1797.7 10531.3    1797   10566  1797.1
 10615.4  1794.2 10624.7  1791.9   10652  1794.1 10662.7  1793.8 10675.3  1792.1
 10702.3  1795.8 10754.1  1797.3 10794.7  1801.3 10837.5  1802.6 10880.1  1802.5
 10980.9  1801.9 11104.8  1803.2 11135.2  1803.7 11251.1    1805 11386.2  1804.9
 11429.3  1806.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9639.9     .07  9639.9    .044 10050.5     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9639.9 10050.5              400     440     490              .1       .3
Left Levee      Station=  9639.9      Elevation=  1808.3
Right Levee     Station= 10050.5      Elevation=  1796.6

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.157
```

INPUT
Description: SECTION NO. AT

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9591.2	1807	9646.4	1785	9667.1	1784.5	9689.6	1786.5	9722.3	1788.2
9789.6	1788.8	9804.4	1790.5	9831.6	1791	9866.2	1791.1	9893	1788.7
9942	1788.5	9970.6	1786.6	10000	1782.6	10043.2	1782.8	10055.2	1792
10073	1792.3	10110.2	1790.2	10121.6	1790.9	10139	1792.5	10222.1	1793.7
10322	1795.6	10374.2	1796.2	10485.5	1794	10581.9	1792.9	10712	1792
10720.5	1791.2	10824.2	1790.2	10837.6	1785.6	10842.6	1785.7	10865.9	1787.4
10897.9	1792.5	10939.7	1791.3	11027.4	1794.3	11060.5	1796	11145.9	1796.4
11285.8	1796.3	11405.2	1796.8	11552.6	1797.9	11574.2	1800		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9591.2	.07	9591.2	.044	10055.2	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9591.2 10055.2 340 350 370 .1 .3
Left Levee Station= 9591.2 Elevation= 1807
Right Levee Station= 10055.2 Elevation= 1792

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.091

INPUT
Description: SECTION NO. AS

Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9641.3	1811.7	9676.9	1782.1	9726.3	1781.9	9742.3	1786.5	9856.7	1786.6
9900.2	1786.5	9967.4	1785.1	9978.8	1782.5	10000	1780.8	10010.4	1780.9
10050.9	1782.1	10108.3	1781.7	10121.5	1789.6	10160.5	1792.1	10223.1	1792.6
10307.6	1792.9	10457.3	1791.1	10591.5	1789.3	10748.9	1787.6	10778.3	1786.6
10797.4	1782.5	10809.4	1782.9	10850.7	1786.5	10876.8	1789.6	11005.3	1792.7
11117.2	1793.1	11229.1	1792.3	11377.9	1792.6	11520.3	1792	11698.5	1792.3
11860.8	1795.2	11901.4	1796.4	12045.9	1798.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9641.3	.07	9641.3	.044	10160.5	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9641.3 10160.5 330 360 400 .1 .3
Left Levee Station= 9641.3 Elevation= 1811.7
Right Levee Station= 10121.5 Elevation= 1789.6

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.023

INPUT
Description: SECTION NO. AR

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9770	1792.675	9777.6	1775.2	9806.4	1775	9813	1774.3	9821.4	1775.2
9826.9	1776.6	9837.5	1779.2	9842.9	1780.7	9866.6	1781.5	9880.7	1782.4
9892.3	1782.9	9937.4	1782.1	9958.7	1781	9970.3	1773.7	9995.9	1773.1
10000	1772.5	10006.6	1773.7	10023.8	1775.1	10039.3	1777.1	10057	1778
10067	1778.8	10073.4	1784	10077.1	1785.2	10111.8	1785.2	10157.6	1786.6
10200.9	1787.2	10258.3	1789.7	10302.2	1789.6	10378.7	1787.7	10426.3	1787.3
10545.4	1785.5	10604.2	1784.3	10662.6	1783.1	10699	1781.9	10706.3	1781.8
10709.9	1780.7	10712.2	1780.7	10731.9	1783.4	10757.3	1782.8	10778.7	1783.1
10811.5	1785.4	10870.5	1786.8	10952	1786.6	11033.3	1787.5	11082.5	1787.8
11153	1788.5	11217.6	1789						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9770	.07	9770	.044	10077.1	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9770 10077.1 600 580 580 .1 .3
Left Levee Station= 9770 Elevation=1792.675
Right Levee Station= 10077.1 Elevation= 1785.2

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.913

INPUT
Description: SECTION NO. AQ

Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9944.2	1800.8	10000	1763.1	10037.3	1767.4	10080.7	1772	10111.6	1776
10166.4	1776.8	10200	1776.7	10215.4	1777.9	10219.9	1781.2	10240.4	1782.1
10276.9	1781.9	10431.4	1781	10609.3	1780.9	10668.7	1781.9	10784.1	1781.9

```
 10826.3  1778.4 10876.2  1777.5 10916.2  1780.8 10985.8  1781.2 11061.8  1782.2
 11083.6  1783.3 11122.1  1783.4 11228.2  1780.9 11365.8  1782.2 11411.6  1785.1

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9944.2     .07  9944.2    .036 10240.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9944.2 10240.4              620     610     600             .1        .3
Left Levee      Station=  9944.2      Elevation=  1800.8
Right Levee     Station= 10240.4      Elevation=  1782.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.797

INPUT
Description: SECTION NO. AP


Station Elevation Data     num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    99691785.679   10000  1760.6 10008.1  1761.3   10040  1761.4 10049.5  1765.8
 10077.1     1771 10089.7  1771.9   10120  1772.3 10150.2  1771.6 10158.3  1776.1
 10265.3  1776.8 10353.5  1776.3 10418.5  1774.5 10519.8  1775.7 10634.1  1776.6
 10778.4  1777.1   10916  1777.6   10988  1772.3 10992.9  1772.4 11016.9  1773.4
   11050  1776.1 11106.7  1774.9 11127.1     1778 11190.5  1779.4 11313.3  1777.9
 11394.9  1778.6   11441  1780.5 11568.4  1782.1 11689.7  1782.7 11743.2    1782
 11912.3  1782.5 11962.9  1785.1

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9969     .07    9969    .036 10158.3     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9969 10158.3              560     550     550             .1        .3
Left Levee      Station=     9969     Elevation=1785.679
Right Levee     Station= 10158.3      Elevation=  1776.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.693

INPUT
Description: SECTION NO. AO


Station Elevation Data     num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9961.1  1791.7   10000  1756.3 10016.1  1757.7 10060.1  1760.3 10074.5  1762.8
 10088.7  1762.8 10105.9  1770.2 10195.8  1771.7 10231.3    1771 10351.8  1770.9
 10459.2  1772.3 10596.6  1774.7 10635.8  1775.1 10744.8  1773.7 10897.1  1769.7
   10935  1770.5 10957.3  1767.3 10990.2  1769.3 11023.8  1773.7 11078.2  1775.9
   11145    1776 11215.7  1772.4 11230.9    1773 11311.4  1776.9 11389.9  1778.9
 11565.4  1779.8   11724  1780.3 11801.6  1781.6 11816.4  1782.9

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9961.1     .07  9961.1    .036 10195.8     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9961.1 10195.8              490     470     460             .1        .3
Left Levee      Station=  9961.1      Elevation=  1791.7
Right Levee     Station= 10195.8      Elevation=  1771.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.604

INPUT
Description: SECTION NO. AN


Station Elevation Data     num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9740.2  1786.6  9792.1  1757.7  9813.5  1757.8  9823.8  1759.2  9851.8  1759.9
  9893.9  1757.7  9964.9  1754.3   10000  1754.2 10014.4  1765.2 10038.5  1764.4
 10081.8  1765.9 10113.1  1766.4 10150.4  1762.9   10183  1767.6 10240.7  1769.9
 10369.3  1768.9 10444.5  1769.6 10528.9    1769 10644.4  1769.2 10727.3  1767.4
   10765  1767.5 10793.9  1763.8 10830.3  1764.7 10867.7  1766.9 10888.5  1770.7
 11019.7  1771.5 11105.7  1774.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9740.2     .07  9740.2    .036 10014.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9740.2 10014.4              510     550     700             .1        .3
Left Levee      Station=  9740.2      Elevation=  1786.6
Right Levee     Station= 10014.4      Elevation=  1765.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.502

INPUT
```

Description: SECTION NO. AM

Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9853.5	1783.8	9947.5	1773.7	9983.2	1748.8	10000	1750.6	10025.5	1750.2
10058.7	1752.1	10086.3	1754.1	10126.6	1760.3	10150.4	1762.5	10240	1763
10265.8	1759.5	10275.2	1759.9	10280.7	1762	10302	1762	10312.7	1758.3
10330	1761.1	10350.4	1762.8	10409.1	1762	10489.2	1763	10589.5	1762.3
10675	1761.7	10723.2	1763	10740.2	1763.7	10779.4	1762.6	10837.3	1758.4
10852.6	1760.6	10887.2	1761	10918.1	1759.1	10935.3	1762.5	10969	1761.8
10979.4	1759.1	11005	1764.1	11054.2	1767.7	11108.1	1769.6	11175.4	1770.5
11287.4	1771.3	11384	1772						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9853.5	.07	9947.5	.036	10150.4	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9947.5	10150.4	430	450	510	.1	.3

Left Levee Station= 9947.5 Elevation= 1773.7
Right Levee Station= 10150.4 Elevation= 1762.5

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.417

INPUT
Description: SECTION NO. AL

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9848.4	1765.1	9889	1755.1	9942.8	1756.8	9989.2	1753.6	10000	1746.8
10057.8	1750.1	10121.9	1748.6	10141.8	1745.1	10177.2	1744.8	10200.8	1759.4
10367.6	1759.2	10536.5	1758.1	10689.7	1757.1	10725.2	1755.3	10783.7	1754.4
10842	1754	10860.1	1750.8	10893.3	1752.5	10912.4	1755.1	10941.7	1755.1
10962.6	1753.4	11035.1	1751.9	11041	1748.5	11049.8	1748.6	11095.5	1762
11211	1762.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9848.4	.07	9942.8	.044	10200.8	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9942.8	10200.8	250	270	290	.1	.3

Left Levee Station= 9942.8 Elevation= 1756.8
Right Levee Station= 10200.8 Elevation= 1755

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.366

INPUT
Description: SECTION NO. AK

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9702.7	1769.8	9737.6	1755.9	9748	1745.3	9771.9	1746.2	9859.2	1746.7
9920.5	1748.4	9933.9	1745.5	9976.9	1746.9	10000	1742.6	10086.6	1742.3
10102.2	1743.4	10110.1	1755.1	10177.6	1755.6	10242.7	1755.3	10286.6	1755.9
10345.9	1754.6	10457.4	1754.7	10521.7	1750.9	10555	1751.5	10569.5	1753.4
10608.2	1753.3	10654.5	1750.7	10780.6	1753.3	10821.9	1751.3	10925.4	1752.1
10952	1751.4	11021.9	1747.6	11027.9	1746	11040.4	1746.4	11076.4	1749.8
11112.3	1745.8	11140.4	1756.7	11165.3	1758.8	11295.8	1759.3	11409.8	1757.2
11478.6	1757.7	11533.4	1756.1	11558	1758	11593.2	1760.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9702.7	.07	9737.6	.044	10110.1	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9737.6	10110.1	230	240	240	.1	.3

Left Levee Station= 9737.6 Elevation= 1755.9
Right Levee Station= 10110.1 Elevation= 1750

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.32

INPUT
Description: SECTION NO. AJ

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9673.4	1760.8	9694.4	1752.3	9759.1	1752.8	9907.5	1749.8	9932.7	1743
9962.1	1742.9	10000	1740.3	10054	1740.9	10072.3	1754.9	10176.6	1751.7
10227.7	1750.2	10307.3	1750.3	10323	1751.9	10364.6	1752.2	10475.2	1750.2
10498.6	1751.7	10570	1752.1	10644.3	1749.6	10676	1751.5	10734	1750.8
10765.5	1751.3	10844.8	1749.9	10900.2	1746.3	10926.1	1746.8	11000.3	1749.3
11051.9	1744.4	11077.2	1742.8	11116.7	1743.9	11147.9	1755.9	11273.1	1758.2

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9673.4     .07  9907.5    .044 10072.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9907.5 10072.3              260     275     300            .1        .3
Left Levee      Station=  9907.5      Elevation=  1749.8
Right Levee     Station= 10072.3      Elevation=    1750

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.265

INPUT
Description: SECTION NO. AI


Station Elevation Data     num=       46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9689.5  1759.4  9689.6  1759.4  9689.7  1759.4  9703.1  1759.3  9739.2  1749.5
  9795.3    1751    9900  1750.2  9968.4    1747  9973.2  1735.7   10000  1736.3
   10044  1740.8 10063.1  1741.2 10128.7  1741.4 10164.2    1749 10201.7  1749.5
 10298.4    1750   10337  1750.7 10382.1  1750.2   10397  1747.8 10460.8  1746.6
 10469.8  1746.6 10509.2  1747.5 10531.9  1748.9 10575.2  1749.3 10618.4  1747.7
 10638.3  1746.4 10687.3  1746.2 10707.3  1747.1 10752.2  1746.8 10780.1  1743.1
 10795.7  1743.7 10810.8  1746.2 10849.5  1746.6 10861.6  1747.9 10861.7  1747.8
 10890.4    1748 10939.7  1744.6 10986.2  1745.4 11055.7  1746.1 11101.8  1739.9
   11124  1739.5 11134.3  1738.8 11149.2  1739.7 11174.7  1751.6 11300.7  1753.3
 11373.2  1755.4

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9689.5     .07    9900    .044 10164.2     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9900 10164.2             210     210     220            .1        .3
Left Levee      Station=    9900      Elevation=  1750.2
Right Levee     Station= 10164.2      Elevation=    1749

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.226

INPUT
Description: SECTION NO. AH


Station Elevation Data     num=       35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9788.6    1765  9788.7    1765  9877.9  1744.5  9928.4  1743.7  9943.3  1735.6
  9989.5  1735.3   10000  1737.7   10065    1739 10106.8  1739.8 10145.4  1737.7
 10162.8  1736.4 10188.7  1737.7 10259.4  1736.6 10269.7    1735 10283.3  1735.6
 10320.4  1735.6 10332.8  1734.8   10380    1749 10432.1  1748.3 10448.1  1746.1
 10526.8  1744.5 10562.1    1745 10583.3  1747.2 10796.5  1745.3 10855.8  1739.5
 10881.8  1742.4 10936.1  1744.1 10999.9  1741.8 11013.1  1741.2 11029.8  1736.7
 11054.5  1737.8 11059.9  1739.5 11099.3  1750.7 11246.8  1750.6 11400.2  1753.4

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9788.6     .07  9928.4    .044   10380     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9928.4   10380              310     300     300            .1        .3
Left Levee      Station=  9928.4      Elevation=  1743.7
Right Levee     Station=   10380      Elevation=    1740

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.169

INPUT
Description: SECTION NO. AG


Station Elevation Data     num=       28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9850.9  1753.5  9881.6  1734.4  9933.2    1736   10000  1735.9 10145.7  1732.1
 10155.1  1733.2 10194.3  1732.9   10218  1738.9 10265.5  1732.7 10315.5  1733.2
 10339.7  1733.9 10379.9  1743.4   10395  1745.5 10481.8  1741.7 10526.6  1741.6
 10538.6  1743.1 10564.2  1744.8 10687.1  1744.7 10812.4  1741.1 10854.3  1739.1
 10885.4  1740.2 10910.1  1734.5 10918.1  1734.7 10928.8  1738.5 10948.6  1736.7
 10976.7  1737.7 11000.2  1746.9 11111.9  1747.6

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9850.9     .07  9850.9    .044   10395     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9850.9   10395              400     330     310            .1        .3
Left Levee      Station=  9850.9      Elevation=  1753.5
Right Levee     Station=   10395      Elevation=    1740

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.106
```

INPUT
Description: SECTION NO. AF

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9730.7	1755.7	9730.8	1755.7	9788	1731.8	9802.8	1731.6	9808.5	1733.6
9830.2	1734.8	9869.5	1734.7	9905.8	1733.3	9916.8	1734.4	9979.5	1732.4
10000	1729.1	10019.5	1728.6	10026.5	1731	10051.7	1731.4	10066.4	1732.4
10109.9	1730.6	10125	1732.1	10150.1	1728.9	10179	1727.7	10190.7	1725.7
10205.6	1727.8	10215	1736.1	10259.5	1736.8	10275.3	1742.7	10408.1	1742
10443.8	1738.5	10468.6	1739	10494.5	1738.6	10550.7	1741.2	10653.9	1737.2
10686.8	1739.5	10728.3	1738.8	10755.3	1736.2	10761.5	1736.9	10798.5	1737.4
10818.3	1733	10877	1743.8	10979.2	1745.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9730.7	.07	9730.7	.044	10275.3	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9730.7	10275.3	540	520	500	.1	.3

Left Levee Station= 9730.7 Elevation= 1755.7
Right Levee Station= 10259.5 Elevation= 1736.8

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.008

INPUT
Description: SECTION NO. AE

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9657.3	1746.2	9677.5	1745.5	9702.2	1731.7	9760.8	1724.6	9803.4	1724
9811	1725.9	9819.2	1725.7	9836	1725.2	9853.3	1727.3	9898.1	1725.7
9902.7	1726.6	9935.3	1727.3	9947.4	1726.4	9981.1	1723	10000	1723.9
10013.3	1726	10033.6	1726.6	10072.1	1726.5	10089.8	1725.6	10119.1	1726
10144.7	1724.9	10154.3	1724.9	10164	1736.3	10243.9	1735.8	10272.1	1734.5
10293.2	1734	10322.9	1732.5	10346.2	1737.2	10441.5	1737	10548.5	1734.8
10662.5	1733.9	10671.2	1729.8	10675.8	1730.3	10683.5	1733.9	10724	1733.5
10735.7	1734.2	10771.9	1733.6	10788	1731.6	10811.4	1739.6	10846.8	1739.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9657.3	.07	9677.5	.044	10164	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9677.5	10164	400	400	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.921

INPUT
Description: SECTION NO. AD

Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9712.1	1739.4	9736.8	1725	9744.2	1723.7	9756.8	1723.1	9796.4	1722.1
9799.8	1722.1	9810.1	1723.2	9832.8	1722	9872.7	1723.2	9882	1723.9
9891	1724	9908	1723.1	9939.1	1723.2	9946.3	1722.6	9952.7	1720.7
9972.1	1721.1	10000	1720.2	10017.5	1720.3	10027.8	1723.1	10048.1	1724.6
10059.7	1725	10075.5	1725.1	10107.4	1724.1	10132.6	1722.7	10149	1731.9
10156.7	1732	10165.7	1732.1	10186.9	1733.5	10193.6	1732.2	10237.1	1732
10263.2	1734.4	10321.7	1734.3	10345.3	1735.1	10409.7	1734.7	10443	1735.5
10480.4	1734.5	10545.4	1728.1	10554.4	1728.5	10577.8	1732	10599.1	1732.5
10618.4	1733.4	10657.4	1734.3	10682.2	1733.4	10717.8	1733.5	10729.5	1733.3
10764.1	1728.8	10771.1	1730.5	10781.6	1731.2	10797.6	1731.3	10812.9	1729.2
10828.1	1731.1	10839.5	1731.1	10863	1729.1	10868.7	1727.4	10888.3	1728.3
10899.2	1732.9	10906.9	1735.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9712.1	.07	9712.1	.044	10149	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9712.1	10149	450	430	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.845

INPUT
Description: SECTION NO. AC

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9611.4	1733.1	9657.8	1731.1	9688.6	1721.2	9793.2	1721.3	9834.9	1718.9
9871	1718.8	9877.3	1717	9905.1	1718	10000	1717.4	10020.1	1728
10087.9	1727.3	10102	1729.9	10120.9	1729.5	10143.7	1719.2	10152.7	1719.6
10191.5	1722.4	10209.4	1730.2	10236.4	1730.2	10253.5	1724.1	10271.5	1725.3

10290.8	1727	10349.1	1726.1	10437.8	1729.1	10474.8	1729.4	10537.7	1728
10556.6	1725.9	10581.4	1729.4	10622.5	1729.9	10684.7	1728.9	10712	1728.5
10721.6	1731.6	10793.1	1731.1	10864.9	1731.3	10914.9	1729.9	10946.4	1729.9
10982.9	1728.4	11003.8	1726.7	11030.4	1726.3	11042.7	1727.3	11090.1	1729.3
11124.8	1728.9	11229.8	1726.3	11246.7	1721.4	11279.8	1733	11346.5	1734.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9611.4	.07	9657.8	.044	10020.1	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9657.8	10020.1	350	370	400	.1	.3

Right Levee Station= 10011 Elevation= 1721.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.775

INPUT
Description: SECTION NO. AB

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9691.5	1732.6	9766.7	1727.3	9914	1726.6	9920	1717	9967	1716.8
9980.1	1713.4	10000	1712.7	10018.8	1712.9	10027	1716.1	10072.7	1717.7
10107.9	1717.2	10187.6	1714.6	10207.6	1725.4	10229	1730.6	10296.7	1731.4
10391.5	1729.1	10446.8	1727.5	10465.7	1717.5	10489.7	1717.5	10502	1722.6
10561.3	1723.7	10596.4	1724.6	10685	1724.8	10729.9	1724	10770.1	1726.3
10806.5	1728.2	10931.3	1726.1	11003.7	1725.8	11039.1	1727.4	11121.5	1727
11192	1726.9	11304.1	1727.1	11425.9	1725.7	11447.1	1720.8	11492.7	1720
11554.6	1719.4	11578.7	1718.4	11599.8	1730.8	11618	1732.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9691.5	.07	9914	.044	10229	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9914	10229	390	420	470	.1	.3

Right Levee Station= 10202 Elevation= 1718.7

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.695

INPUT
Description: SECTION NO. AA

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9733.8	1724.9	9772.8	1723.1	9783.7	1718.4	9822.6	1714.6	9866.1	1714.3
9881.3	1721.4	9912.9	1719.6	9931.4	1710.6	9982.8	1709.5	9991.4	1709.5
10033.2	1709.9	10046.3	1710	10055.4	1724.6	10116.6	1723.8	10149.3	1721.7
10223.1	1723.3	10280.1	1727.2	10341.2	1725.9	10352.8	1713.2	10406.1	1713.1
10441.8	1716.9	10484.8	1718.6	10506	1720.9	10545.1	1719.7	10566	1715
10603.7	1719.2	10615.9	1724.2	10732.5	1722.9	10813.3	1723.6	10860.6	1722.9
10877.5	1721.2	10908.7	1722	11033.4	1722.4	11077.9	1721.5	11170.1	1722.9
11247.1	1722.6	11358.9	1721.6	11436.8	1714.6	11489.8	1714.9	11511.4	1725.3
11534.6	1727.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9733.8	.07	9772.8	.044	10055.4	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9772.8	10055.4	370	380	430	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.623

INPUT
Description: SECTION NO. Z

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9626.5	1721.7	9663.1	1708.4	9698.7	1703.9	9722.9	1704.6	9776	1704.3
9810.3	1707.3	9851.6	1708.9	9912.1	1707.8	9958.1	1705.2	10000	1705.1
10015.2	1709.5	10044.4	1709.9	10071	1712	10078.2	1714.1	10128.4	1720.1
10159.4	1719.4	10281.2	1720.4	10327.7	1718.6	10358.4	1718.9	10384	1720.9
10424.9	1721.8	10463.5	1721.3	10548.7	1718.5	10606.9	1716.8	10625.6	1713.9
10657.9	1717.2	10687.4	1718.2	10785.1	1718.1	10842.2	1715	10865.9	1713.5
10902.1	1714.1	10924.6	1717.7	10974.2	1714.2	11001.4	1707.5	11033.6	1712.7
11113	1714.2	11183.7	1715.9	11271.7	1720.1				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9626.5	.07	9626.5	.044	10128.4	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9626.5	10128.4	500	500	530	.1	.3

Right Levee Station= 10015.2 Elevation= 1709.9

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.529

INPUT
Description: SECTION NO. Y

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9731.2	1720	9764.3	1719.8	9799	1709.3	9827.8	1708.5	9878.2	1708.1
9891.7	1704.8	9916.7	1702.9	10000	1702.6	10004	1703.6	10054.1	1703.8
10089.2	1705.3	10126.1	1705.2	10149.1	1703.3	10177.6	1714	10237	1713.4
10373.5	1712.2	10397.1	1711.5	10453.4	1713.8	10511.4	1713.5	10550	1714.4
10598.1	1713.3	10665.4	1712.7	10683.3	1708.3	10713.3	1709.1	10718.4	1710.3
10750.8	1710.4	10766.7	1712.3	10824.3	1712.2	10897	1712.7	10966	1712.7
11000.4	1710.3	11013.6	1706.5	11047.9	1706	11071.9	1704.8	11102.6	1711.3
11143.7	1711.9	11201.5	1713.1	11315.3	1714.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9731.2	.07	9764.3	.044	10177.6	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9764.3	10177.6	530	520	520	.1	.3

Right Levee Station= 10161 Elevation= 1706.7

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.43

INPUT
Description: SECTION NO. X

Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9770	1711.8	9794.4	1700	9837.5	1700.9	9885	1699.8	10000	1700
10044	1701	10080	1702.3	10154.1	1701.8	10207	1700.1	10219.1	1697.7
10240.1	1697.5	10258.3	1706.6	10297.2	1710.5	10353.7	1711.7	10461	1710.5
10590.9	1707.7	10644.9	1708.7	10710.7	1706.2	10734.7	1706.6	10748.8	1708
10805.8	1709.2	10914.2	1707.7	10982.6	1709.3	11021.1	1706	11039.4	1702.2
11097	1700.6	11102.7	1702.7	11124.2	1704.4	11138.7	1704.3	11249.2	1708.1
11352	1710.9	11426.3	1712.5	11525.2	1713.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9770	.07	9770	.044	10353.7	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9770	10353.7	490	495	520	.1	.3

Right Levee Station= 10252 Elevation= 1702.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.335

INPUT
Description: SECTION NO. W

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9635	1710.764	9645.8	1700	9646	1699.991	9701.2	1697.4	9715.3	1696.7
9771.9	1696.7	9794.1	1698.6	9886.3	1698.8	9953.9	1696.6	10000	1695.6
10024.1	1698.8	10103.3	1699.7	10141.9	1698.6	10190.7	1698.9	10245.8	1696.9
10271.6	1704.2	10333.4	1705.6	10438.8	1705.8	10464.6	1702.6	10574.7	1702.8
10627.4	1701.1	10710.5	1704.5	10816.3	1703.5	10852.4	1702.4	10868.2	1700.5
10906.9	1699.9	10938.8	1699.2	10949.1	1699	10961.4	1704	11033.5	1705.3
11149	1706	11213.4	1705.5	11298.3	1704.2	11389.1	1702.6	11435	1699.2
11451.6	1700.2	11466.4	1705.5	11486.3	1707.8	11519.8	1709.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9635	.07	9635	.044	10333.4	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9635	10333.4	495	500	520	.1	.3

Right Levee Station= 10263 Elevation= 1700.6

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.239

INPUT
Description: SECTION NO. V

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9925	1707.875	9936.8	1692.8	10000	1692.8	10010.6	1697.2	10026.3	1700
10111.9	1700.8	10121.4	1695.5	10144.7	1693.3	10181.6	1693.1	10202	1699.5
10279.3	1701.3	10346.3	1702	10433.6	1699.1	10516.4	1698.2	10562.5	1699.5
10627.5	1700	10668.5	1700.4	10720.3	1699.7	10737.6	1695.6	10755	1696.1
10763.3	1698.4	10838.9	1700	10861.7	1698.1	10872.1	1698.1	10895.3	1696.1

10906.7	1695	10935.5	1700.5	11008.5	1700.7	11038	1699.2	11090	1698.6
11112.3	1699.5	11155.2	1699.1	11208.1	1697.7	11221.8	1693.3	11232.9	1693.6
11238.1	1696.2	11271.8	1697.2	11314.1	1697.8	11334	1699	11449	1700
11535.4	1699.8	11560.8	1699	11615.5	1696.2	11751.2	1695.6	11769.2	1698.9
11836.2	1702.2	11961.1	1704.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9925	.07	9925	.044	10279.3	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9925	10279.3	570	420	340	.1	.3

Right Levee Station= 10194 Elevation= 1696.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.137

INPUT
Description: SECTION NO. U

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9975	1712.935	10000	1685.7	10024.6	1686.6	10054.7	1691	10106.9	1695.9
10139.1	1697.5	10162	1690.1	10231.1	1686.4	10296.6	1700.2	10317.4	1698.9
10379.3	1696.6	10460.7	1695.4	10518.2	1694.2	10560.3	1695.5	10586.9	1695.3
10631.9	1692.3	10643.6	1691.9	10660.5	1694.6	10744.8	1696.7	10795.2	1694.7
10833.6	1694.3	10841	1696.8	10938	1697.5	10998.8	1695.3	11030.5	1696
11148.8	1697.9	11214.6	1694.6	11262.3	1696.9	11297.9	1695.8	11316.3	1694.4
11363.6	1694.3	11379.7	1694.4	11399.4	1691.9	11418.1	1691.9	11474.1	1690.6
11490.6	1690.6	11497.1	1693.8	11536	1696.4	11621.4	1696.2	11662.1	1694.2
11733.6	1693.6	11770.6	1694.9	11787.8	1697.5	11923.7	1698.4	11940.2	1700.1
12055.1	1699.7	12465	1702						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9975	.07	9975	.044	10296.6	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975	10296.6	500	495	475	.1	.3

Right Levee Station= 10259 Elevation= 1692.5

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.044

INPUT
Description: SECTION NO. T

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9926	1702.915	9944.8	1685	10000	1684.3	10017.5	1691.1	10045.7	1691.8
10058.4	1694.1	10076.8	1694.2	10134.3	1694.2	10240	1693.8	10270.3	1690.9
10332	1686	10342.7	1689.4	10378.5	1691.3	10407.2	1692.5	10465.5	1692.8
10541.6	1692.2	10574.8	1689.6	10591.8	1689.7	10609.2	1691.6	10748.9	1691.8
10824.9	1687.8	10849.3	1689.9	10865.8	1693.9	10957	1693.1	11034.8	1693.6
11097.4	1691.3	11180.3	1689.8	11196.2	1691	11249.8	1690.3	11302.9	1691.7
11374.7	1691	11451.8	1686.1	11486.8	1687.1	11555.5	1686.7	11562.9	1689.2
11592.4	1692.6	11660	1693.7	12000	1696	12220	1698		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9926	.07	9926	.044	10076.8	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9926	10076.8	750	650	400	.1	.3

Right Levee Station= 10017.5 Elevation= 1691.1

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.919

INPUT
Description: SECTION NO. S

Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9686.7	1694.2	9857.9	1690.3	9864.9	1690.2	9902.3	1686.4	9921.8	1684.4
9956.5	1680.8	9980.4	1678.9	9987.9	1678.5	10000	1678.4	10007.5	1678.4
10014.7	1678.8	10019.3	1679.3	10022.9	1681	10034	1687.1	10046.9	1689.1
10072.2	1688.2	10120.8	1688.2	10136.7	1685.3	10143.4	1685.4	10152.9	1686.6
10159.2	1687.7	10226.7	1687.3	10246.9	1681.8	10289.3	1680.5	10293.4	1680.4
10298.9	1682.5	10305.9	1685.8	10345.6	1686.8	10366.4	1687.7	10561	1687.1
10617	1685.6	10625.2	1685.5	10639.5	1683.6	10644.4	1683.3	10647.4	1683.3
10656.5	1685.7	10705.2	1686.2	10756.9	1687.4	10767.4	1688.1	10776.6	1688.7
10930.2	1689.9	10953.9	1689.9	11087.9	1687.2	11105.1	1687.9	11142.7	1686.5
11175.7	1687.8	11194.1	1686	11221.4	1685.3	11238.4	1684.5	11289.2	1683.3
11299	1683	11338.8	1689.7	11561	1692				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9686.7	.07	9857.9	.044	10046.9	.06

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9857.9 10046.9              450     400     310            .1        .3
Right Levee     Station=   10032      Elevation=  1684.5

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.843

INPUT
Description: SECTION NO. R


Station Elevation Data     num=       56
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9623.8  1698.3  9666.2  1684.2  9716.1  1682.9  9774.4  1685.7    9842  1685.9
  9882.4  1686.1  9891.5  1685.8  9923.5  1682.4  9979.1  1679.7  9989.1  1676.2
   10000  1673.9 10028.2  1673.5 10041.9  1674.4 10077.6  1685.5 10141.7  1684.1
   10187  1685.2 10219.1  1684.6 10237.3  1682.3   10245  1678.2 10248.3  1678.1
   10274  1679.5   10301  1680.1 10338.8  1676.7   10356  1682.8 10367.7  1684.8
 10374.5  1684.8 10398.1  1683.7 10493.1  1682.5 10519.8  1679.7 10522.9  1679.8
 10526.1  1681.2 10546.5  1684.2   10583  1685.2 10591.3  1685.1 10612.5  1683.1
 10626.2     1683 10653.9  1684.3 10669.7  1685.9 10698.5  1686.2 10909.7  1683.4
 10924.9  1684.3 10965.7    1685 10979.2  1681.9 10989.6  1675.8 11011.8  1676.2
 11026.3  1682.7 11033.3  1683.4 11109.4  1684.2 11157.4  1683.2 11199.4  1682.7
 11211.5  1678.9 11219.1  1679.2 11227.6  1682.2 11233.3  1683.8 11290.6  1684.9
   11365  1690.6

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9623.8     .07  9891.5    .044 10077.6     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9891.5 10077.6              540     370     210            .1        .3
Left Levee      Station=  9891.5      Elevation=  1685.8
Right Levee     Station=   10061      Elevation=  1680.3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.75

INPUT
Description: SECTION NO. Q


Station Elevation Data     num=       40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9574.2  1686.2  9577.4  1684.2  9588.3  1677.3  9602.8  1677.2  9608.9  1678.2
  9649.3  1678.4    9706  1680.3  9746.5  1680.1  9804.2  1679.6  9864.7  1680.3
  9925.3    1682  9973.2  1675.5  9977.4  1671.6   10000  1672.1   10041    1673
 10061.9  1681.9 10085.9  1682.4   10144  1680.2   10156  1677.4 10176.5  1674.9
 10219.7  1674.5 10233.2  1678.7 10250.1  1680.6 10292.9  1681.5 10435.2  1684.2
 10518.7  1684.7 10668.2  1682.8 10824.7  1679.8 10841.6  1675.2 10869.3  1675.3
 10881.2  1678.7 10923.8  1679.6   10960  1680.5 11003.7  1679.4 11058.5    1678
 11069.3  1681.2 11178.7  1682.8 11266.2  1686.9 11357.1  1687.5   11434  1688.7

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9574.2     .07  9925.3    .044 10085.9     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9925.3 10085.9              270     280     280            .1        .3
Left Levee      Station=  9925.3      Elevation=    1682
Right Levee     Station=   10055      Elevation=  1677.9

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.699

INPUT
Description: SECTION NO. P


Station Elevation Data     num=       22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9578.3  1683.7  9798.1  1678.6  9886.9  1677.9  9909.8  1671.6  9979.8    1670
   10000  1669.4 10005.6  1672.4 10026.9  1673.1   10033  1678.4 10222.9  1681.5
 10350.6  1681.3   10532  1680.2   10714  1679.8 10743.5  1678.2 10763.6  1672.4
 10787.2  1671.9 10826.9  1672.1 10839.4  1675.7 10880.3  1678.6 10970.2  1679.2
 11082.9  1680.4 11129.5  1685.1

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9578.3     .07  9886.9    .044   10033     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9886.9   10033              290     290     290            .1        .3
Left Levee      Station=    9890      Elevation=  1676.7
Right Levee     Station=   10033      Elevation=  1676.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.644

INPUT
Description: SECTION NO. O
```

```
Station Elevation Data     num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9535.3    1680  9767.4  1677.2  9804.1  1675.7  9908.8  1676.6  9926.6  1669.8
   10000  1670.1 10013.5  1670.1 10030.5  1675.2 10061.5  1677.3 10119.8  1676.6
 10141.2  1678.8 10246.3  1678.6 10388.7  1677.6 10485.4  1677.1 10586.1  1676.7
   10633  1677.8 10683.4  1676.6 10719.7  1677.8 10774.8  1674.2   10825    1672
 10861.2  1669.3 10895.7  1676.8 10968.6  1676.5 11020.2  1675.5 11094.3  1682.8

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9535.3     .07  9908.8    .044 10061.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9908.8 10061.5              360     320     280              .1       .3
Left Levee      Station=  9908.8      Elevation=  1676.6
Right Levee     Station= 10030.5      Elevation=  1675.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.58

INPUT
Description: SECTION NO. N


Station Elevation Data     num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9635.1    1678  9637.3    1677  9704.7  1671.6  9855.4  1671.8  9974.4  1674.1
   10000  1668.9   10089  1670.8 10121.5  1673.7 10276.2  1673.7 10346.8  1674.3
 10453.1  1673.5 10517.8  1672.9   10547  1672.2 10606.7  1672.9 10625.8  1673.9
 10732.4  1675.8 10818.6  1674.2 10867.2  1670.4 10895.8  1669.9 10935.7  1667.3
 10962.4  1665.9 10972.5  1666.8 10985.9    1670 11000.5  1675.5 11066.1  1680.6

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9635.1     .07  9974.4    .044 10121.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9974.4 10121.5              320     300     290              .1       .3
Left Levee      Station=  9974.4      Elevation=  1674.1
Right Levee     Station= 10121.5      Elevation=  1673.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.519

INPUT
Description: SECTION NO. M


Station Elevation Data     num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9567.7    1678     9570    1672  9663.3  1669.9  9770.3  1670.4  9836.4  1671.4
  9915.1  1672.1     9946  1672.4    9970    1670   10000  1668.3 10058.9  1670.1
   10101  1672.2 10154.1  1671.6 10186.1  1671.5 10394.1  1670.6 10492.4  1670.5
 10616.3  1670.7 10795.5  1671.1 10831.1    1664 10872.3  1669.6   10940  1667.9
 10957.3  1661.6 10970.3  1661.6 10993.4  1675.6 11086.4  1679.2

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9567.7     .07    9946    .044   10101     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9946   10101              450     310     290              .1       .3
Left Levee      Station=    9946      Elevation=  1672.4
Right Levee     Station=   10101      Elevation=  1672.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.458

INPUT
Description: SECTION NO. L


Station Elevation Data     num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9528.9  1677.1  9600.5  1672.1  9605.5    1668  9749.5  1667.8  9780.5  1668.1
  9825.6  1669.2  9883.2  1667.7  9916.8  1668.1  9934.3  1666.8  9952.8  1665.7
   10000  1665.5   10018  1667.2 10067.1  1669.1 10140.9  1664.9   10190    1668
 10558.9  1668.1 10573.8  1667.8 10601.9  1665.9 10794.7  1669.5 10819.1  1664.6
   10867  1664.3   10899  1667.1 10913.4  1667.1 10937.8  1664.1 10966.1  1660.5
 10989.1  1673.9   11145  1677.6

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9528.9     .07  9916.8    .044 10067.1     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9916.8 10067.1              390     360     380              .1       .3
Right Levee     Station= 10067.1      Elevation=  1669.1
```

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.388

INPUT
Description: SECTION NO. K

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9115.7	1678.8	9235.4	1668.5	9296.8	1666	9300.1	1665.6	9409	1666.4
9467.9	1665.9	9527	1661.5	9546.6	1656.6	9606.3	1660.5	9625.3	1663.8
9644.5	1666	9663	1664.6	9704	1665.2	9725.8	1666.5	9766	1666.8
9777.3	1665.9	9782	1664.7	9857.4	1665.4	9872.6	1666.5	9918.6	1666.1
10000	1665	10037.1	1666.3	10100.7	1666.1	10236.5	1664.3	10260.5	1665.2
10295.4	1664.2	10306.6	1662.9	10361.6	1664.8	10366.9	1665.9	10490.2	1666.4
10516	1662.5	10564.3	1662.2	10602.9	1660.1	10629.9	1660.4	10644.1	1663.8
10675.8	1665.5	10759.6	1672.2	10876.7	1674.1				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9115.7	.07	9467.9	.044	9644.5	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9467.9	9644.5	350	360	370	.1	.3

Right Levee Station= 9625.3 Elevation= 1663.8

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.326

INPUT
Description: SECTION NO. J

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9070.8	1666.5	9175.1	1665.5	9242.1	1661.1	9294.1	1661.4	9335.1	1661.5
9365.7	1657.2	9380.4	1653.2	9390.5	1653	9416.8	1657.2	9450.5	1657
9472.3	1659	9497.8	1661.1	9532.7	1660.8	9592.2	1660.1	9612.1	1662.9
9698.9	1663.6	9758	1663.8	9788.6	1662.5	9855.4	1661.6	9861.2	1662.5
9900.1	1662.2	9912	1659.7	9952.9	1658.9	9988.9	1659.2	10000	1656.4
10023.8	1656.5	10032.1	1660.3	10151.4	1661	10178.5	1660.9	10187.9	1657.8
10204.3	1657.7	10221.8	1661.5	10242.5	1659	10267.3	1658.9	10281.7	1656.4
10296.8	1661.5	10348.3	1660.3	10399.4	1658.9	10407.9	1661.2	10513.8	1664.2
10530.4	1666.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9070.8	.07	9335.1	.044	9497.8	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9335.1	9497.8	490	510	480	.1	.3

Left Levee Station= 9335.1 Elevation= 1661.5
Right Levee Station= 9497.8 Elevation= 1661.1

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.233

INPUT
Description: SECTION NO. I

Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8536.3	1664.2	8595.2	1663.9	8692.2	1660.9	8798.9	1658.6	8854.9	1658.1
8987.4	1656.2	9021.1	1658.8	9057.1	1659.7	9131.9	1660.4	9192.7	1658.7
9228.6	1659.6	9274.5	1659.1	9289.5	1653	9290.8	1647.3	9296.1	1647.3
9301.1	1648.9	9327.4	1650.3	9341.1	1655.3	9383.8	1656	9418.4	1656.1
9471.9	1655.7	9484.7	1657.3	9548	1657	9570	1657.7	9608.2	1657.2
9622.6	1656.2	9634.3	1656.4	9647.4	1658.2	9707.8	1657.4	9728.7	1654.8
9748.3	1655.8	9778.2	1656.7	9803.8	1657.5	9881	1657.4	9908.4	1657.1
9924.8	1654.4	9935.3	1656.1	9956.8	1656.7	9994.4	1653.9	10000	1652
10034.7	1652	10047.9	1657.4	10061.7	1656.8	10070	1655.4	10089.5	1656.6
10118.4	1654	10139.2	1657	10155.7	1656.5	10163.6	1652.5	10169.9	1652.6
10179.7	1656.7	10221.7	1657.4	10235.2	1653.7	10247.3	1655.4	10283.7	1655.8
10303.2	1658.2	10429.1	1658.6	10448.8	1659.1	10459.3	1661.5	10475.2	1663.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8536.3	.07	9274.5	.044	9383.8	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9274.5	9383.8	390	280	180	.1	.3

Left Levee Station= 9274.5 Elevation= 1659.1
Right Levee Station= 9383.8 Elevation= 1656

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.18

INPUT
Description: SECTION NO. H

Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8859.3	1660.4	8905.9	1660.5	8986.1	1658.4	9017	1658	9047.1	1652
9057.1	1652	9065.1	1653.4	9144.5	1654.4	9161.8	1652.9	9200.6	1652
9213.5	1654.5	9262.6	1654.1	9306.6	1651.1	9319.4	1647.8	9353.2	1647.7
9371.6	1653.4	9387	1653.8	9413.7	1655.1	9490.2	1656.2	9515.2	1654.9
9544.3	1655.5	9581.6	1655.7	9597	1654.1	9633.5	1655.9	9660.4	1654.6
9698.9	1655.1	9707.3	1651.5	9717.8	1651.7	9725.7	1654.4	9749.7	1653.5
9785.9	1653	9814.3	1652.1	9830.6	1655.3	9894.7	1655.4	9911.5	1654.3
9924.2	1656.2	9944.4	1656.1	9955.6	1654.3	9969.6	1654.3	9978.6	1656
9986.8	1654.8	10000	1650.4	10046.2	1650.8	10072.4	1649.6	10076.1	1649.9
10097.1	1651.1	10114	1654.4	10135.8	1654.6	10157.7	1658.1	10214.9	1658
10240.1	1656.9	10265	1658.1	10356.6	1657.3	10390.4	1656.5	10430.2	1657.3
10537.3	1661.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8859.3	.07	9213.5	.044	9413.7	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9213.5	9413.7	500	430	430	.1	.3

Right Levee Station= 9413.7 Elevation= 1655.1

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.099

INPUT
Description: SECTION NO. G

Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8593.8	1658	8775	1655	8880	1655	8914	1654.8	8923.1	1648.2
8947.9	1647.6	8959	1649.3	8988	1650.6	9029	1651.2	9064.3	1650.7
9091.8	1651.2	9112.7	1651.5	9150.2	1650.7	9209.7	1649	9215.4	1649
9234.1	1651.3	9259.9	1652.4	9283.7	1652.5	9327.5	1652.5	9346	1652
9367.6	1646.9	9387.8	1646.2	9395.9	1646	9409.8	1646	9416	1649.2
9430.5	1650.8	9458.6	1652	9490.1	1652.6	9515.2	1651.6	9558.3	1650
9571.1	1648.1	9578.8	1648.2	9591.2	1650.6	9608	1652.3	9662.4	1653.1
9735.4	1652.4	9742.7	1650.6	9748.7	1650.3	9757.9	1650.4	9838.9	1653.2
9868.9	1652.5	9904.9	1651.7	9919.5	1651.4	9941.9	1651.3	9951.4	1648.4
9960.9	1648.9	9982.9	1649.4	10000	1648.2	10015.4	1648.9	10024.3	1651.3
10032	1653	10048.6	1653.9	10063.9	1654.4	10087.5	1654	10094.2	1653.5
10100.6	1650.9	10104	1651.2	10111.3	1652.8	10146.3	1654.1	10167	1654.9
10211.1	1655	10254.6	1655.4	10292.9	1653.4	10301.5	1654.8	10341.2	1659.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8593.8	.07	9327.5	.044	9490.1	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9327.5	9490.1	430	470	530	.1	.3

Right Levee Station= 9430.5 Elevation= 1650.8

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.01

INPUT
Description: SECTION NO. F

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8397.8	1653.4	8557.9	1653.2	8664	1650.2	8678.1	1645.5	8694.6	1645.1
8698.5	1643.6	8743.7	1642.1	8747.6	1643.4	8759	1644.1	8766.4	1645
8823.5	1646	8878.3	1643.6	8880.6	1641.3	8929.6	1640.2	9059.1	1641.7
9087.8	1641	9124.3	1641.2	9143.5	1642.7	9180.8	1642.5	9248.1	1647.3
9294.1	1646.9	9355.3	1646.9	9364.6	1644	9372.7	1644.4	9382.7	1646.5
9445.1	1647.4	9476.2	1648.3	9555.9	1649.3	9687.1	1650.4	9734.1	1647.5
9776.5	1647.4	9818.2	1646.5	9823.9	1644	9848.6	1645.2	9869	1648
9935.5	1646.9	9975	1644.5	10000	1643.9	10006.6	1642.5	10019.8	1642.7
10037.7	1652.2	10149.5	1654.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8397.8	.07	8823.5	.044	9248.1	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8823.5	9248.1	410	480	550	.1	.3

Right Levee Station= 9203 Elevation= 1643.91

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.919

INPUT
Description: SECTION NO. E

Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8046.2	1652.8	8068.4	1649.7	8168.9	1646.8	8195.5	1647.1	8249.6	1648

8266.1	1649	8326.9	1648	8422.4	1648.4	8461.9	1649.3	8494.5	1650.4
8588.8	1646.5	8604	1635.3	8637.8	1634.9	8647.2	1637.6	8695.7	1638.6
8709.6	1643.6	8729.6	1643.3	8768.3	1642.7	8785.3	1639.8	8813.8	1639.4
8836.9	1639.8	8858.9	1642.9	9045.7	1643.3	9126.5	1643.4	9133.6	1641.2
9152.9	1640.2	9184.9	1640.4	9199.9	1643.3	9243.9	1644	9302.9	1644.2
9335.8	1643.1	9351.3	1641.3	9379.6	1644.1	9538.9	1644.6	9559.5	1643.5
9583.1	1641.9	9599.3	1641.4	9611.3	1643.2	9654.2	1644.5	9688.9	1643.9
9795.8	1644.7	9882.5	1643.8	9927.7	1644.5	9936.8	1642.2	9971.5	1639.5
10000	1639.5	10008.5	1651.2	10153.9	1653.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8046.2	.07	8494.5	.044	8709.6	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8494.5	8709.6	460	390	350	.1	.3

Left Levee Station= 8494.5 Elevation= 1650.4
Right Levee Station= 8709.6 Elevation= 1643.6

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.845

INPUT
Description: SECTION NO. D

Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8242.8	1648.4	8353.1	1644.3	8493.6	1646.2	8556.4	1644.1	8674.4	1646.7
8697.6	1638.4	8702.9	1636	8721.1	1635.6	8773.9	1635.3	8792.8	1641.9
8826.7	1641.6	8873	1640.6	8878.1	1639.9	8893.9	1639.9	8914.9	1640.4
8921.4	1642.3	8981.3	1642.2	9007.5	1642.9	9040.8	1638.5	9043.4	1638.6
9066.8	1640.6	9103.1	1638.3	9129	1641.8	9191.6	1641.6	9245.9	1641.7
9249.8	1641.4	9272.1	1638.6	9279.6	1638.6	9296.3	1640.6	9345.5	1641.7
9388.9	1641.5	9406.6	1637.5	9448.5	1641.8	9507.2	1641.7	9526.6	1642.4
9556.3	1641.8	9630.9	1642.5	9667.2	1641.4	9689.7	1641.3	9710.8	1640
9730.6	1637.8	9749.6	1637.9	9781.1	1641.2	9840.6	1641.6	9961.4	1643.2
9967.8	1642.9	9988.1	1639.5	10038.9	1640.3	10067	1647.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8242.8	.07	8674.4	.044	8792.8	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8674.4	8792.8	560	490	490	.1	.3

Left Levee Station= 8674.4 Elevation= 1646.7
Right Levee Station= 8789 Elevation= 1640.1

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.752

INPUT
Description: SECTION NO. C

Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8690	1642.2	8727.7	1641	8789.8	1632.4	8835.7	1638.2	8868.3	1637.5
8884.2	1632.4	8921	1629.8	8925.4	1629.3	8941.5	1629.2	8967	1632.4
8997	1638.3	9047.9	1637.9	9064.6	1633.4	9070.6	1633.2	9099.4	1634.2
9110.6	1636.1	9205	1632.5	9223.2	1633.1	9233.2	1633.6	9246.8	1638.1
9253.7	1638.6	9282.6	1638.4	9358.8	1637.9	9374.5	1634.7	9385.2	1634.3
9393.9	1633.5	9402.7	1633.4	9420.2	1637.7	9431.3	1638.2	9450.7	1638.4
9459	1638.3	9464.9	1638.1	9480.8	1635.5	9493.4	1636.3	9503.5	1637.7
9518.2	1638.8	9531.6	1637.9	9543.1	1635.9	9566.7	1635.4	9589.5	1634.8
9594	1634.9	9600.3	1636.7	9625.9	1637.5	9646.3	1636.3	9667.4	1637.7
9686.1	1634.1	9690.2	1633.1	9707.1	1633.3	9738.1	1633.6	9747	1638.5
9764.4	1639.4	9774.5	1639.6	9783.1	1639.6	9797.1	1639.1	9807.5	1637.1
9813.6	1635.1	9913.6	1637.9	9930.4	1638.8	9944.8	1638.4	9953.9	1637.5
9962	1635.1	9981.5	1633.7	9990	1633.5	10000	1633.5	10010.2	1634.2
10019	1635.9	10029.9	1638.7	10039.1	1639.8	10045	1640	10062.5	1640.2
10071.4	1640.2	10090.9	1639.3	10098.7	1638.2	10103.6	1638.1	10127.7	1638
10134.5	1635.2	10148.5	1636.6	10163.8	1638	10181.1	1638.4	10192	1642.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8690	.07	8835.7	.044	8997	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8835.7	8997	850	560	430	.1	.3

Left Levee Station= 8876 Elevation= 1635.29
Right Levee Station= 8980 Elevation= 1635.21

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.646

INPUT
Description: SECTION NO. B

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

8810	1636	8850	1635	8900	1634.5	8960	1632	9160	1630
9330	1630	9430	1631	9535	1630	9580	1630.5	9620	1630
9630	1627	9690	1626	9700	1630	9745.6	1630.5	9767.3	1629.1
9787.4	1629.8	9795.5	1633.2	9817.1	1634.6	9845.8	1632.7	9859.1	1631.3
9876.2	1631.4	9889.7	1633.8	9930.1	1632.8	9963.4	1632.6	10000	1628.2
10034.8	1627.2	10043.8	1628.3	10084.6	1629.3	10091.3	1630.5	10154.9	1634
10243.2	1634.2	10271	1634.5	10357	1633.7	10370.5	1634.1	10385.2	1634.1
10413.3	1633.5	10425.9	1631.8	10453.6	1631.7	10467.1	1634	10488.2	1634.7
10534.6	1634.6	10602.2	1634.9	10665.2	1634.8	10680.4	1633.7	10734.7	1634.8
10757.4	1635.4	10836.8	1634.9	10852.8	1634.6	10871.6	1634.1	10916.3	1635.1
10970.3	1636.1	11010.9	1636.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8810	.07	9580	.044	9745.6	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9580	9745.6	760	640	620	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev
8810	9430	

Left Levee Station= 9580 Elevation= 1630.5
Right Levee Station= 9745.6 Elevation= 1630.5

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.525

INPUT
Description: SECTION NO. A

Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8760	1640	8900	1630	8980	1626	9090	1624	9091	1623.9
9300	1624.8	9740	1626	9750	1628	9810	1629.5	9860.5	1629.3
9875.7	1625	9888.6	1624	9950.3	1624.6	10000	1623.9	10009	1628.1
10093.3	1629.5	10189.4	1629.5	10203.4	1628.4	10276	1627.7	10289.6	1627
10343.7	1626.2	10386.8	1626.5	10487.2	1626	10496.5	1624.3	10571	1626.2
10584.3	1626	10629.9	1625.6	10638.3	1626.5	10653	1626.8	10702.1	1626.7
10722.5	1627	10773	1626.5	10821.2	1630.2	10962.7	1630.2	11060.9	1630.8
11152.9	1630.5	11227.9	1631.1	11276.1	1632.2	11287.4	1632.1	11327.4	1631.8
11358.7	1631.3	11397.3	1632	11424.4	1632.9	11439.7	1633.4	11448.3	1634.4
11484	1636.7	11605.1	1638	11693.3	1639.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8760	.07	9860.5	.044	10093.3	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9860.5	10093.3	0	0	0	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev
8760	9300	

Left Levee Station= 9865 Elevation= 1628.1
Right Levee Station= 10009 Elevation= 1628.1

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	31.91	.06	.044	.07
Reach-1	31.87	.07	.044	.07
Reach-1	31.82	.07	.044	.07
Reach-1	31.75	.07	.044	.07
Reach-1	31.63	.07	.044	.06
Reach-1	31.54	.07	.044	.06
Reach-1	31.45	.07	.044	.06
Reach-1	31.34	.07	.044	.06
Reach-1	31.25	.07	.044	.06
Reach-1	31.17	.07	.044	.06
Reach-1	31.14	.07	.044	.06
Reach-1	31.05	.07	.044	.06
Reach-1	30.96	.07	.044	.06
Reach-1	30.85	.07	.044	.06
Reach-1	30.75	.07	.044	.07
Reach-1	30.65	.06	.044	.07
Reach-1	30.52	.06	.044	.07
Reach-1	30.42	.06	.044	.07
Reach-1	30.28	.06	.044	.07
Reach-1	30.2	.06	.044	.07
Reach-1	30.1	.06	.036	.07
Reach-1	29.85	.07	.036	.07
Reach-1	29.77	.07	.036	.07
Reach-1	29.72	.07	.036	.07
Reach-1	29.715	Bridge		
Reach-1	29.71	.07	.04	.07
Reach-1	29.663	.07	.044	.07
Reach-1	29.601	.07	.044	.07
Reach-1	29.538	.07	.05	.07
Reach-1	29.493	.07	.05	.07

Reach-1	29.387	.07	.05	.07
Reach-1	29.351	.07	.05	.07
Reach-1	29.258	.07	.044	.07
Reach-1	29.13	.07	.036	.07
Reach-1	29.012	.07	.036	.07
Reach-1	28.934	.07	.036	.07
Reach-1	28.847	.07	.036	.07
Reach-1	28.75	.07	.036	.07
Reach-1	28.657	.07	.036	.07
Reach-1	28.555	.07	.036	.07
Reach-1	28.462	.07	.036	.07
Reach-1	28.39	.07	.036	.07
Reach-1	28.326	.07	.036	.07
Reach-1	28.241	.07	.044	.07
Reach-1	28.157	.07	.044	.07
Reach-1	28.091	.07	.044	.07
Reach-1	28.023	.07	.044	.07
Reach-1	27.913	.07	.036	.07
Reach-1	27.797	.07	.036	.07
Reach-1	27.693	.07	.036	.07
Reach-1	27.604	.07	.036	.07
Reach-1	27.502	.07	.036	.07
Reach-1	27.417	.07	.044	.06
Reach-1	27.366	.07	.044	.06
Reach-1	27.32	.07	.044	.06
Reach-1	27.265	.07	.044	.06
Reach-1	27.226	.07	.044	.06
Reach-1	27.169	.07	.044	.06
Reach-1	27.106	.07	.044	.06
Reach-1	27.008	.07	.044	.06
Reach-1	26.921	.07	.044	.06
Reach-1	26.845	.07	.044	.06
Reach-1	26.775	.07	.044	.06
Reach-1	26.695	.07	.044	.06
Reach-1	26.623	.07	.044	.06
Reach-1	26.529	.07	.044	.06
Reach-1	26.43	.07	.044	.06
Reach-1	26.335	.07	.044	.06
Reach-1	26.239	.07	.044	.06
Reach-1	26.137	.07	.044	.06
Reach-1	26.044	.07	.044	.06
Reach-1	25.919	.07	.044	.06
Reach-1	25.843	.07	.044	.06
Reach-1	25.75	.07	.044	.06
Reach-1	25.699	.07	.044	.06
Reach-1	25.644	.07	.044	.06
Reach-1	25.58	.07	.044	.06
Reach-1	25.519	.07	.044	.06
Reach-1	25.458	.07	.044	.06
Reach-1	25.388	.07	.044	.06
Reach-1	25.326	.07	.044	.06
Reach-1	25.233	.07	.044	.06
Reach-1	25.18	.07	.044	.06
Reach-1	25.099	.07	.044	.06
Reach-1	25.01	.07	.044	.06
Reach-1	24.919	.07	.044	.06
Reach-1	24.845	.07	.044	.06
Reach-1	24.752	.07	.044	.06
Reach-1	24.646	.07	.044	.06
Reach-1	24.525	.07	.044	.06

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	31.91	240	208	210
Reach-1	31.87	220	243	260
Reach-1	31.82	360	361	370
Reach-1	31.75	680	647	650
Reach-1	31.63	450	453	430
Reach-1	31.54	475	484	475
Reach-1	31.45	590	592	620
Reach-1	31.34	450	474	450
Reach-1	31.25	400	432	400
Reach-1	31.17	130	162	130
Reach-1	31.14	500	467	350
Reach-1	31.05	470	494	460
Reach-1	30.96	550	541	570
Reach-1	30.85	525	569	570
Reach-1	30.75	475	486	450
Reach-1	30.65	700	696	650
Reach-1	30.52	600	560	500
Reach-1	30.42	500	713	650
Reach-1	30.28	550	421	430
Reach-1	30.2	535	537	545
Reach-1	30.1	1100	1304	1325
Reach-1	29.85	400	400	400
Reach-1	29.77	50	200	550
Reach-1	29.72	127	127	127
Reach-1	29.715	Bridge		

Reach-1	29.71	533	233	73
Reach-1	29.663	330	330	330
Reach-1	29.601	370	330	330
Reach-1	29.538	270	240	230
Reach-1	29.493	610	560	520
Reach-1	29.387	190	190	200
Reach-1	29.351	500	490	490
Reach-1	29.258	710	705	710
Reach-1	29.13	590	595	600
Reach-1	29.012	400	410	420
Reach-1	28.934	410	460	470
Reach-1	28.847	520	510	500
Reach-1	28.75	500	490	470
Reach-1	28.657	550	540	540
Reach-1	28.555	490	490	500
Reach-1	28.462	380	380	380
Reach-1	28.39	350	340	340
Reach-1	28.326	440	450	470
Reach-1	28.241	400	440	490
Reach-1	28.157	340	350	370
Reach-1	28.091	330	360	400
Reach-1	28.023	600	580	580
Reach-1	27.913	620	610	600
Reach-1	27.797	560	550	550
Reach-1	27.693	490	470	460
Reach-1	27.604	510	550	700
Reach-1	27.502	430	450	510
Reach-1	27.417	250	270	290
Reach-1	27.366	230	240	240
Reach-1	27.32	260	275	300
Reach-1	27.265	210	210	220
Reach-1	27.226	310	300	300
Reach-1	27.169	400	330	310
Reach-1	27.106	540	520	500
Reach-1	27.008	400	400	400
Reach-1	26.921	450	430	400
Reach-1	26.845	350	370	400
Reach-1	26.775	390	420	470
Reach-1	26.695	370	380	430
Reach-1	26.623	500	500	530
Reach-1	26.529	530	520	520
Reach-1	26.43	490	495	520
Reach-1	26.335	495	500	520
Reach-1	26.239	570	420	340
Reach-1	26.137	500	495	475
Reach-1	26.044	750	650	400
Reach-1	25.919	450	400	310
Reach-1	25.843	540	370	210
Reach-1	25.75	270	280	280
Reach-1	25.699	290	290	290
Reach-1	25.644	360	320	280
Reach-1	25.58	320	300	290
Reach-1	25.519	450	310	290
Reach-1	25.458	390	360	380
Reach-1	25.386	350	360	370
Reach-1	25.326	490	510	480
Reach-1	25.233	390	280	180
Reach-1	25.18	500	430	430
Reach-1	25.099	430	470	530
Reach-1	25.01	410	480	550
Reach-1	24.919	460	390	350
Reach-1	24.845	560	490	490
Reach-1	24.752	850	560	430
Reach-1	24.646	760	640	620
Reach-1	24.525	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	31.91	.1	.3
Reach-1	31.87	.1	.3
Reach-1	31.82	.1	.3
Reach-1	31.75	.1	.3
Reach-1	31.63	.1	.3
Reach-1	31.54	.1	.3
Reach-1	31.45	.1	.3
Reach-1	31.34	.1	.3
Reach-1	31.25	.1	.3
Reach-1	31.17	.1	.3
Reach-1	31.14	.1	.3
Reach-1	31.05	.1	.3
Reach-1	30.96	.1	.3
Reach-1	30.85	.1	.3
Reach-1	30.75	.1	.3
Reach-1	30.65	.1	.3
Reach-1	30.52	.1	.3
Reach-1	30.42	.1	.3
Reach-1	30.28	.1	.3
Reach-1	30.2	.1	.3

Reach-1	30.1		.1	.3
Reach-1	29.85		.1	.3
Reach-1	29.77		.3	.5
Reach-1	29.72		.1	.3
Reach-1	29.715	Bridge		
Reach-1	29.71		.1	.3
Reach-1	29.663		.1	.3
Reach-1	29.601		.1	.3
Reach-1	29.538		.1	.3
Reach-1	29.493		.1	.3
Reach-1	29.387		.1	.3
Reach-1	29.351		.1	.3
Reach-1	29.258		.1	.3
Reach-1	29.13		.1	.3
Reach-1	29.012		.1	.3
Reach-1	28.934		.1	.3
Reach-1	28.847		.1	.3
Reach-1	28.75		.1	.3
Reach-1	28.657		.1	.3
Reach-1	28.555		.1	.3
Reach-1	28.462		.1	.3
Reach-1	28.39		.1	.3
Reach-1	28.326		.1	.3
Reach-1	28.241		.1	.3
Reach-1	28.157		.1	.3
Reach-1	28.091		.1	.3
Reach-1	28.023		.1	.3
Reach-1	27.913		.1	.3
Reach-1	27.797		.1	.3
Reach-1	27.693		.1	.3
Reach-1	27.604		.1	.3
Reach-1	27.502		.1	.3
Reach-1	27.417		.1	.3
Reach-1	27.366		.1	.3
Reach-1	27.32		.1	.3
Reach-1	27.265		.1	.3
Reach-1	27.226		.1	.3
Reach-1	27.169		.1	.3
Reach-1	27.106		.1	.3
Reach-1	27.008		.1	.3
Reach-1	26.921		.1	.3
Reach-1	26.845		.1	.3
Reach-1	26.775		.1	.3
Reach-1	26.695		.1	.3
Reach-1	26.623		.1	.3
Reach-1	26.529		.1	.3
Reach-1	26.43		.1	.3
Reach-1	26.335		.1	.3
Reach-1	26.239		.1	.3
Reach-1	26.137		.1	.3
Reach-1	26.044		.1	.3
Reach-1	25.919		.1	.3
Reach-1	25.843		.1	.3
Reach-1	25.75		.1	.3
Reach-1	25.699		.1	.3
Reach-1	25.644		.1	.3
Reach-1	25.58		.1	.3
Reach-1	25.519		.1	.3
Reach-1	25.458		.1	.3
Reach-1	25.388		.1	.3
Reach-1	25.326		.1	.3
Reach-1	25.233		.1	.3
Reach-1	25.18		.1	.3
Reach-1	25.099		.1	.3
Reach-1	25.01		.1	.3
Reach-1	24.919		.1	.3
Reach-1	24.845		.1	.3
Reach-1	24.752		.1	.3
Reach-1	24.646		.1	.3
Reach-1	24.525		.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	31.91	31400.00	1953.30	1969.87	1965.19	1970.69	0.002082	9.08	5157.54	544.79	0.42
Reach-1	31.87	31400.00	1953.60	1965.70	1965.70	1969.63	0.010764	16.50	2273.76	336.13	0.90
Reach-1	31.82	31400.00	1952.70	1963.31	1963.31	1965.33	0.007870	12.77	3441.25	697.58	0.75
Reach-1	31.75	31400.00	1946.50	1957.90	1957.41	1960.72	0.011277	14.43	3013.91	784.22	0.89
Reach-1	31.63	31400.00	1940.50	1952.28	1951.70	1954.03	0.008273	12.60	3687.76	775.83	0.77
Reach-1	31.54	31400.00	1940.10	1948.46	1946.73	1950.12	0.009167	11.79	3542.10	924.86	0.78
Reach-1	31.45	31400.00	1933.10	1944.73	1944.17	1946.12	0.007121	11.69	4175.52	958.30	0.70
Reach-1	31.34	31400.00	1931.50	1940.28	1939.19	1941.52	0.008016	10.88	3991.26	782.40	0.73
Reach-1	31.25	31400.00	1925.40	1935.16	1934.94	1937.02	0.011851	12.61	3299.31	1054.24	0.88
Reach-1	31.17	31400.00	1920.80	1931.25	1930.53	1932.61	0.008329	10.38	3857.48	1009.34	0.73
Reach-1	31.14	31400.00	1917.80	1929.59	1929.43	1931.13	0.011625	12.33	3908.02	1040.23	0.87
Reach-1	31.05	31400.00	1917.10	1925.55	1924.99	1926.69	0.009150	10.87	4300.96	1023.65	0.77
Reach-1	30.96	31400.00	1912.30	1922.24	1920.77	1923.07	0.005682	9.23	4874.47	936.93	0.62
Reach-1	30.85	33800.00	1907.50	1917.41	1915.44	1919.06	0.009378	12.87	3860.80	802.02	0.81
Reach-1	30.75	33800.00	1901.00	1913.94	1911.64	1915.14	0.003988	9.42	4491.45	664.67	0.54
Reach-1	30.65	33800.00	1897.20	1910.35	1910.35	1912.41	0.008800	14.68	3919.26	799.49	0.80
Reach-1	30.52	33800.00	1893.50	1902.10	1902.10	1903.75	0.012869	10.88	3696.65	1101.47	0.87
Reach-1	30.42	33800.00	1885.80	1897.21	1895.87	1898.17	0.005352	8.46	4752.43	950.99	0.59

Reach-1	30.28	33800.00	1877.10	1892.13	1892.13	1894.16	0.006592	13.53	4114.53	875.84	0.71
Reach-1	30.2	33800.00	1875.20	1885.81	1885.81	1887.57	0.009067	12.78	4250.74	1108.23	0.79
Reach-1	30.1	33800.00	1867.40	1880.92	1878.70	1882.10	0.005022	11.45	5302.46	1238.19	0.71
Reach-1	29.85	33800.00	1857.70	1872.88	1872.88	1875.71	0.005506	15.87	3852.67	650.78	0.79
Reach-1	29.77	33800.00	1857.20	1868.44	1867.01	1871.27	0.005706	13.51	2501.57	271.86	0.78
Reach-1	29.72	33800.00	1855.00	1867.64	1865.49	1870.03	0.004455	12.41	2722.83	279.83	0.70
Reach-1	29.715	Bridge									
Reach-1	29.71	33800.00	1853.90	1864.17	1863.53	1867.28	0.009310	14.15	2388.58	301.77	0.89
Reach-1	29.663	33800.00	1850.90	1863.01	1861.56	1864.93	0.007433	11.32	3445.68	875.04	0.72
Reach-1	29.601	33800.00	1849.90	1859.52	1859.52	1861.92	0.011349	12.79	3116.33	757.26	0.87
Reach-1	29.538	33800.00	1845.50	1855.29	1855.01	1857.15	0.017017	10.99	3172.54	766.44	0.88
Reach-1	29.493	33800.00	1843.40	1852.76	1851.64	1853.82	0.008655	8.42	4323.43	941.02	0.64
Reach-1	29.387	33800.00	1838.80	1849.08	1846.76	1849.89	0.005132	7.47	4888.57	808.03	0.51
Reach-1	29.351	33800.00	1835.90	1848.01	1845.11	1848.94	0.004665	8.07	4555.59	614.64	0.50
Reach-1	29.258	33800.00	1828.70	1843.05	1841.32	1845.88	0.007850	13.52	2500.74	254.36	0.76
Reach-1	29.13	33800.00	1821.00	1838.04	1838.04	1841.10	0.005651	15.79	3515.68	791.71	0.79
Reach-1	29.012	33800.00	1818.70	1833.74	1833.74	1836.19	0.004503	14.19	4306.96	902.71	0.72
Reach-1	28.934	33800.00	1815.50	1829.80	1829.80	1832.11	0.005099	13.56	4287.03	1043.82	0.75
Reach-1	28.847	33800.00	1811.90	1825.89	1825.89	1828.29	0.004508	13.91	4268.25	921.79	0.72
Reach-1	28.75	33800.00	1808.30	1820.98	1820.98	1823.84	0.005987	14.21	3344.46	828.96	0.81
Reach-1	28.657	33800.00	1800.50	1817.38	1817.30	1820.04	0.006112	13.70	3301.44	705.83	0.80
Reach-1	28.555	33800.00	1799.40	1814.52	1814.52	1817.14	0.004585	14.19	3933.47	847.68	0.73
Reach-1	28.462	33800.00	1794.80	1809.64	1809.64	1812.05	0.004521	13.85	4276.45	969.52	0.72
Reach-1	28.39	33800.00	1792.80	1806.71	1806.71	1808.96	0.005481	13.82	4292.20	915.37	0.77
Reach-1	28.326	33800.00	1791.30	1803.73	1803.73	1805.92	0.005450	13.31	4343.13	1048.40	0.77
Reach-1	28.241	33800.00	1789.90	1799.03	1799.03	1800.81	0.010727	11.77	4010.31	1094.18	0.83
Reach-1	28.157	33800.00	1782.60	1793.91	1793.37	1795.47	0.008996	10.76	4151.47	1130.88	0.76
Reach-1	28.091	33800.00	1780.80	1790.37	1789.69	1792.08	0.010241	11.02	3688.69	863.97	0.80
Reach-1	28.023	33800.00	1772.50	1787.86	1785.77	1789.25	0.004753	10.12	4738.65	1160.14	0.58
Reach-1	27.913	33800.00	1763.10	1781.86	1781.35	1785.50	0.008379	15.32	2206.56	262.65	0.93
Reach-1	27.797	33800.00	1760.60	1779.05	1779.05	1781.06	0.004591	13.08	4966.22	1384.44	0.71
Reach-1	27.693	33800.00	1756.30	1774.38	1774.38	1776.88	0.006585	14.05	3973.71	1030.34	0.83
Reach-1	27.604	33800.00	1754.20	1767.33	1766.66	1770.18	0.005632	13.86	2906.60	509.97	0.78
Reach-1	27.502	33800.00	1748.80	1764.82	1764.82	1767.00	0.004813	13.34	4479.66	1054.60	0.73
Reach-1	27.417	33800.00	1744.80	1757.03	1757.03	1759.35	0.011475	13.61	3276.57	703.21	0.88
Reach-1	27.366	33800.00	1742.30	1755.20	1751.63	1755.87	0.002360	7.30	6385.31	1204.03	0.41
Reach-1	27.32	33800.00	1740.30	1751.35	1751.17	1754.63	0.014625	16.95	3131.95	975.97	1.01
Reach-1	27.265	33800.00	1735.70	1749.01	1749.01	1750.61	0.010176	12.23	4039.74	979.37	0.81
Reach-1	27.226	33800.00	1734.80	1743.57	1742.98	1745.58	0.010880	11.75	3195.31	660.34	0.84
Reach-1	27.169	33800.00	1732.10	1741.62	1740.01	1742.86	0.005712	9.17	4017.94	703.98	0.62
Reach-1	27.106	33800.00	1725.70	1737.91	1737.70	1740.14	0.013092	12.09	2922.37	625.12	0.90
Reach-1	27.008	33800.00	1723.00	1733.39	1731.57	1734.92	0.006227	9.95	3446.02	522.87	0.65
Reach-1	26.921	33800.00	1720.20	1730.99	1729.02	1732.53	0.005752	10.04	3551.87	588.14	0.63
Reach-1	26.845	36700.00	1717.00	1727.81	1726.30	1729.71	0.007494	11.60	3662.87	765.34	0.72
Reach-1	26.775	36700.00	1712.70	1725.12	1723.74	1726.99	0.006969	11.83	3894.44	752.19	0.70
Reach-1	26.695	36700.00	1709.50	1720.43	1720.43	1722.92	0.013850	14.32	3266.04	624.58	0.95
Reach-1	26.623	36700.00	1703.90	1716.15	1713.04	1717.28	0.003859	8.78	4767.39	826.27	0.53
Reach-1	26.529	36700.00	1702.60	1711.90	1711.30	1714.24	0.011696	12.86	3282.12	665.69	0.88
Reach-1	26.43	36700.00	1697.50	1707.36	1706.11	1708.92	0.007857	10.43	3942.48	771.26	0.72
Reach-1	26.335	36700.00	1695.60	1704.80	1702.78	1705.62	0.004512	7.73	5813.00	1420.55	0.54
Reach-1	26.239	36700.00	1692.80	1701.66	1701.10	1702.41	0.010408	9.11	5899.61	1851.97	0.77
Reach-1	26.137	36700.00	1685.70	1698.11	1697.50	1699.08	0.007048	10.01	6128.50	1838.87	0.67
Reach-1	26.044	36700.00	1684.30	1695.08	1693.79	1695.64	0.006696	9.23	7050.54	1929.85	0.65
Reach-1	25.919	36700.00	1678.40	1689.94	1689.79	1691.39	0.012193	13.20	4975.57	1494.86	0.89
Reach-1	25.843	36700.00	1673.50	1686.58	1686.10	1687.68	0.008338	11.56	5762.57	1653.41	0.75
Reach-1	25.75	36700.00	1671.60	1685.01	1683.09	1685.59	0.004118	8.96	7557.14	1649.80	0.54
Reach-1	25.699	36700.00	1669.40	1682.52	1682.52	1684.09	0.006442	12.99	5584.98	1474.74	0.70
Reach-1	25.644	36700.00	1669.80	1679.96	1679.96	1681.41	0.009842	13.32	5300.13	1526.65	0.83
Reach-1	25.58	36700.00	1668.90	1677.00	1675.98	1677.79	0.008264	10.47	5889.25	1382.40	0.73
Reach-1	25.519	36700.00	1668.30	1674.46	1673.23	1675.14	0.009385	8.82	5853.23	1422.46	0.74
Reach-1	25.458	36700.00	1665.50	1672.08	1670.30	1672.63	0.006153	8.01	6545.03	1385.46	0.62
Reach-1	25.388	36700.00	1656.60	1668.25	1668.16	1669.58	0.011049	12.73	5113.92	1468.58	0.86
Reach-1	25.326	36700.00	1653.00	1664.68	1664.29	1665.85	0.009119	12.09	5306.93	1330.02	0.79
Reach-1	25.233	38100.00	1647.30	1660.75	1659.98	1661.58	0.007887	11.20	6437.79	1757.07	0.71
Reach-1	25.18	38100.00	1647.70	1659.39	1657.49	1660.02	0.005069	8.97	7080.17	1531.46	0.59
Reach-1	25.099	38100.00	1646.00	1655.04	1654.67	1656.41	0.018382	13.71	4847.45	1485.06	1.06
Reach-1	25.01	38100.00	1640.20	1649.79	1648.31	1650.75	0.004697	8.86	5890.02	1285.91	0.57
Reach-1	24.919	38100.00	1634.90	1647.73	1646.62	1648.31	0.004489	8.92	7176.53	1446.80	0.55
Reach-1	24.845	38100.00	1635.30	1644.61	1644.48	1645.90	0.011514	13.73	5210.79	1375.70	0.88
Reach-1	24.752	38100.00	1629.20	1640.73	1639.35	1641.43	0.005925	9.73	6633.88	1458.31	0.63
Reach-1	24.646	38100.00	1626.00	1636.06	1635.99	1637.44	0.010367	13.01	5401.29	2158.30	0.84
Reach-1	24.525	38100.00	1623.90	1632.39	1629.36	1632.68	0.003004	6.22	9720.43	2542.47	0.44

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Ex100-WMP

River: RIVER-1 Reach: Reach-1 RS: 31.91 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.87 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was

used.
River: RIVER-1 Reach: Reach-1 RS: 31.82 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 31.75 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.63 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 31.54 Profile: 100-year
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: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 31.45 Profile: 100-year
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: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 31.34 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.25 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.17 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.14 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.05 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.96 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.85 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 30.75 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.65 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 30.52 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 30.42 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.28 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: RIVER-1 Reach: Reach-1 RS: 30.2 Profile: 100-year

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

Warning:Divided flow computed for this cross-section.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: RIVER-1 Reach: Reach-1 RS: 30.1 Profile: 100-year

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

Warning:Divided flow computed for this cross-section.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

River: RIVER-1 Reach: Reach-1 RS: 29.85 Profile: 100-year

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

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

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

River: RIVER-1 Reach: Reach-1 RS: 29.77 Profile: 100-year

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

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 29.72 Profile: 100-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: RIVER-1 Reach: Reach-1 RS: 29.715 Profile: 100-year

Warning:The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should be run as a mixed flow problem.

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

River: RIVER-1 Reach: Reach-1 RS: 29.715 Profile: 100-year Upstream

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

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

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

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: RIVER-1 Reach: Reach-1 RS: 29.715 Profile: 100-year Downstream

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: RIVER-1 Reach: Reach-1 RS: 29.71 Profile: 100-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: RIVER-1 Reach: Reach-1 RS: 29.663 Profile: 100-year

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: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 29.601 Profile: 100-year

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

Warning:Divided flow computed for this cross-section.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 29.538 Profile: 100-year

Warning:Divided flow computed for this cross-section.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

River: RIVER-1 Reach: Reach-1 RS: 29.493 Profile: 100-year

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

River: RIVER-1 Reach: Reach-1 RS: 29.387 Profile: 100-year

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 29.351 Profile: 100-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 29.258 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 29.13 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 29.012 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.934 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.847 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.75 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.657 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.555 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.462 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.39 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.326 Profile: 100-year

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

River: RIVER-1 Reach: Reach-1 RS: 28.241 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 28.157 Profile: 100-year
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: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 28.091 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 28.023 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.913 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.797 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.693 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.604 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.502 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.417 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: RIVER-1 Reach: Reach-1 RS: 27.366 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.32 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.265 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.226 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.169 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.106 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 27.008 Profile: 100-year
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.

River: RIVER-1 Reach: Reach-1 RS: 26.921 Profile: 100-year
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.

River: RIVER-1 Reach: Reach-1 RS: 26.845 Profile: 100-year
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.

River: RIVER-1 Reach: Reach-1 RS: 26.775 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 26.695 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: RIVER-1 Reach: Reach-1 RS: 26.623 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

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    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 26.529     Profile: 100-year
    Warning:Divided flow computed for this cross-section.
    Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 26.43     Profile: 100-year
    Warning:Divided flow computed for this cross-section.
    Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 26.335     Profile: 100-year
    Warning:Divided flow computed for this cross-section.
    Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
            This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 26.239     Profile: 100-year
    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.
River: RIVER-1  Reach: Reach-1     RS: 26.137     Profile: 100-year
    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.
River: RIVER-1  Reach: Reach-1     RS: 26.044     Profile: 100-year
    Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.919     Profile: 100-year
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.843     Profile: 100-year
    Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.75     Profile: 100-year
    Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.699     Profile: 100-year
    Warning:The energy equation could not be balanced within the specified number of iterations.  The program used critical depth
            for the water surface and continued on with the calculations.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
    Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
            water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
            program defaulted to critical depth.
River: RIVER-1  Reach: Reach-1     RS: 25.644     Profile: 100-year
    Warning:The energy equation could not be balanced within the specified number of iterations.  The program used critical depth
            for the water surface and continued on with the calculations.
    Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.58     Profile: 100-year
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.519     Profile: 100-year
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.458     Profile: 100-year
    Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.388     Profile: 100-year
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.326     Profile: 100-year
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.233     Profile: 100-year
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.18     Profile: 100-year
    Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
    Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
            This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.099     Profile: 100-year
    Warning:Divided flow computed for this cross-section.
    Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
            This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
            the need for additional cross sections.
River: RIVER-1  Reach: Reach-1     RS: 25.01     Profile: 100-year
    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.
River: RIVER-1  Reach: Reach-1     RS: 24.919     Profile: 100-year
    Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
    Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
            This may indicate the need for additional cross sections.
    Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
```

the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 24.845 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 24.752 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 24.646 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

APPENDIX F.3

Cave Creek: Future Conditions

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Upper Cave Creek and Apache Wash WMP
Project File : Cavecrk.prj
Run Date and Time: 1/19/00 3:24:26 PM

Project in English units

Project Description:
Upper Cave Creek and Apache Wash Watercourse Master Plan

For Cave Creek
above Cave Buttes Dam
by Stantec Consulting Inc. for the Flood Control
District of Maricopa County
FCD:

March 1999

PLAN DATA

Plan Title: Future condition study reach
Plan File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.p03

Geometry Title: Revised Geometry
Geometry File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.g02

Flow Title : Future condition study discharges
Flow File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.f03

Plan Summary Information:
Number of: Cross Sections = 89 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 1

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 at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
31.91	100 yr encr	1	9728.84	10052.71
31.87	100 yr encr	1	9701.03	10053.91
31.82	100 yr encr	1	9697.75	10046.1
31.75	100 yr encr	1	9721.77	10070.68
31.63	100 yr encr	1	9783.92	10440.3
31.54	100 yr encr	1	9916	10544.54
31.45	100 yr encr	1	9850	10506.3
31.34	100 yr encr	1	9930.21	0498.12
31.25	100 yr encr	1	9783.91	0387.38
31.17	100 yr encr	1	9683.71	0462.51
31.14	100 yr encr	1	9815.06	10606.14
31.05	100 yr encr	1	9886	10807.35
30.96	100 yr encr	1	9925.51	0706.14
30.85	100 yr encr	1	9889.71	0461.24
30.75	100 yr encr	1	9610.74	10184.4
30.65	100 yr encr	1	9587.94	10027.8
30.52	100 yr encr	1	9600.24	10401.4
30.42	100 yr encr	1	9630.32	10487.8

30.28	100 yr encr	1	9454.46	10033.5
30.2	100 yr encr	1	9405.25	10132.3
30.1	100 yr encr	1	9312.74	10037.9
29.85	100 yr encr	1	9448.12	10043.7
29.71	100 yr encr	1	9733	10064
29.663	100 yr encr	1	9650	10194.6
29.601	100 yr encr	1	9500	10060.2
29.538	100 yr encr	1	9300	10120
29.493	100 yr encr	1	9300	10160
29.387	100 yr encr	1	9481	10303
29.351	100 yr encr	1	9684.3	10400
29.258	100 yr encr	1	9781.3	10550
29.13	100 yr encr	1	9960.7	10650
29.012	100 yr encr	1	9922.8	10590
28.934	100 yr encr	1	9824.7	10510
28.847	100 yr encr	1	9881.1	10560
28.75	100 yr encr	1	9866.8	10550
28.657	100 yr encr	1	9933.6	10450
28.555	100 yr encr	1	9919.4	10450
28.462	100 yr encr	1	9871.7	10475
28.39	100 yr encr	1	9863.1	10530
28.326	100 yr encr	1	9817.5	10435
28.241	100 yr encr	1	9639.9	10265
28.157	100 yr encr	1	9591.2	10175
28.091	100 yr encr	1	9641.3	10160.5
28.023	100 yr encr	1	9770	10225
27.913	100 yr encr	1	9944.2	10450
27.797	100 yr encr	1	9969	10605
27.693	100 yr encr	1	9961.1	10480
27.604	100 yr encr	1	9740.2	10415
27.502	100 yr encr	1	9947.5	10600
27.417	100 yr encr	1	9878.99	10890
27.366	100 yr encr	1	9737.6	11000
27.32	100 yr encr	1	9694.13	11000
27.265	100 yr encr	1	9900	11000
27.226	100 yr encr	1	9928.4	10930
27.169	100 yr encr	1	9850.9	10770
27.106	100 yr encr	1	9730.7	10600
27.008	100 yr encr	1	9677.5	10400
26.921	100 yr encr	1	9712.1	10450
26.845	100 yr encr	1	9618.23	10700
26.775	100 yr encr	1	9800.99	10950
26.695	100 yr encr	1	9772.8	10920
26.623	100 yr encr	1	9626.5	10600
26.529	100 yr encr	1	9764.3	10650
26.43	100 yr encr	1	9770	10750
26.335	100 yr encr	1	9635	10650
26.239	100 yr encr	1	9925	11050
26.137	100 yr encr	1	9975	11210
26.044	100 yr encr	1	9926	11270
25.919	100 yr encr	1	9693	11150
25.843	100 yr encr	1	9627	11100
25.75	100 yr encr	1	9578	10950
25.699	100 yr encr	1	9583.8	10789.8
25.644	100 yr encr	1	9540	10760
25.58	100 yr encr	1	9639	10790
25.519	100 yr encr	1	9571	10750
25.458	100 yr encr	1	9581	10830
25.388	100 yr encr	1	9330	10450
25.326	100 yr encr	1	9180	10260
25.233	100 yr encr	1	8750	10400

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
31.91	10-year	0	0	0
31.87	10-year	0	0	0
31.82	10-year	0	0	0
31.75	10-year	0	0	0
31.63	10-year	0	0	0
31.54	10-year	0	0	0
31.45	10-year	0	0	0
31.34	10-year	0	0	0
31.25	10-year	0	0	0
31.17	10-year	0	0	0
31.14	10-year	0	0	0
31.05	10-year	0	0	0
30.96	10-year	0	0	0
30.85	10-year	0	0	0
30.75	10-year	0	0	0
30.65	10-year	0	0	0
30.52	10-year	0	0	0
30.42	10-year	0	0	0
30.28	10-year	0	0	0
30.2	10-year	0	0	0
30.1	10-year	0	0	0
29.85	10-year	0	0	0
29.71	10-year	0	0	0
29.663	10-year	0	0	0
29.601	10-year	0	0	0
29.538	10-year	0	0	0
29.493	10-year	0	0	0
29.387	10-year	0	0	0
29.351	10-year	0	0	0
29.258	10-year	0	0	0
29.13	10-year	0	0	0

29.012	10-year	0	0	0
28.934	10-year	0	0	0
28.847	10-year	0	0	0
28.75	10-year	0	0	0
28.657	10-year	0	0	0
28.555	10-year	0	0	0
28.462	10-year	0	0	0
28.39	10-year	0	0	0
28.326	10-year	0	0	0
28.241	10-year	0	0	0
28.157	10-year	0	0	0
28.091	10-year	0	0	0
28.023	10-year	0	0	0
27.913	10-year	0	0	0
27.797	10-year	0	0	0
27.693	10-year	0	0	0
27.604	10-year	0	0	0
27.502	10-year	0	0	0
27.417	10-year	0	0	0
27.366	10-year	0	0	0
27.32	10-year	0	0	0
27.265	10-year	0	0	0
27.226	10-year	0	0	0
27.169	10-year	0	0	0
27.106	10-year	0	0	0
27.008	10-year	0	0	0
26.921	10-year	0	0	0
26.845	10-year	0	0	0
26.775	10-year	0	0	0
26.695	10-year	0	0	0
26.623	10-year	0	0	0
26.529	10-year	0	0	0
26.43	10-year	0	0	0
26.335	10-year	0	0	0
26.239	10-year	0	0	0
26.137	10-year	0	0	0
26.044	10-year	0	0	0
25.919	10-year	0	0	0
25.843	10-year	0	0	0
25.75	10-year	0	0	0
25.699	10-year	0	0	0
25.644	10-year	0	0	0
25.58	10-year	0	0	0
25.519	10-year	0	0	0
25.458	10-year	0	0	0
25.388	10-year	0	0	0
25.326	10-year	0	0	0
25.233	10-year	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
31.91	2-year	1	9728.8	10052.71
31.87	2-year	1	9701.03	10053.91
31.82	2-year	1	9697.75	10037.6
31.75	2-year	1	9721.77	10070.68
31.63	2-year	1	9783.92	10440.3
31.54	2-year	1	9928.91	10544.54
31.45	2-year	1	9881.84	10506.3
31.34	2-year	1	9949.91	10498.12
31.25	2-year	1	9790.47	10387.38
31.17	2-year	1	9683.71	10462.51
31.14	2-year	1	9815.06	10606.14
31.05	2-year	1	9934.21	10807.35
30.96	2-year	1	9963.15	10706.14
30.85	2-year	1	9912.41	10461.24
30.75	2-year	1	9610.74	10162.09
30.65	2-year	1	9587.94	10027.52
30.52	2-year	1	9600.24	10300.97
30.42	2-year	1	9630.32	10401.71
30.28	2-year	1	9454.46	10030.37
30.2	2-year	1	9405.25	10111.27
30.1	2-year	1	9312.74	10022.59
29.85	2-year	1	9448.5	10043.5
29.71	2-year	1	9733	10033
29.663	2-year	1	9650	10100
29.601	2-year	1	9500	10060
29.538	2-year	1	9300	10120
29.493	2-year	1	9300	10160
29.387	2-year	1	9570	10303
29.351	2-year	1	9695	10400
29.258	2-year	1	9794.05	10550
29.13	2-year	1	9971.96	10650
29.012	2-year	1	9940.76	10590
28.934	2-year	1	9857.38	10510
28.847	2-year	1	9911.57	10560
28.75	2-year	1	9899.35	10550
28.657	2-year	1	9948.21	10450
28.555	2-year	1	9944.6	10450
28.462	2-year	1	9892.28	10475
28.39	2-year	1	9879.53	10530
28.326	2-year	1	9836.34	10435
28.241	2-year	1	9663.83	10265
28.157	2-year	1	9623.6	10175
28.091	2-year	1	9666.86	10145
28.023	2-year	1	9772.23	10225

27.913	2-year	1	9970.17	10450
27.797	2-year	1	9976.19	10605
27.693	2-year	1	9980.25	10480
27.604	2-year	1	9772.54	10415
27.502	2-year	1	9960.71	10600
27.417	2-year	1	9878.99	10890
27.366	2-year	1	9738.63	11000
27.32	2-year	1	9694.13	11000
27.265	2-year	1	9959.8	11000
27.226	2-year	1	9929.17	10930
27.169	2-year	1	9869.83	10770
27.106	2-year	1	9771.98	10600
27.008	2-year	1	9696.87	10400
26.921	2-year	1	9726.09	10450
26.845	2-year	1	9618.23	10700
26.775	2-year	1	9800.99	10950
26.695	2-year	1	9810.17	10920
26.623	2-year	1	9641.05	10600
26.529	2-year	1	9791.21	10650
26.43	2-year	1	9781.12	10750
26.335	2-year	1	9641	10650
26.239	2-year	1	9931	11050
26.137	2-year	1	9988	11210
26.044	2-year	1	9934	11270
25.919	2-year	1	9693	11150
25.843	2-year	1	9627	11100
25.75	2-year	1	9578	10950
25.699	2-year	1	9583.8	10789.8
25.644	2-year	1	9540	10760
25.58	2-year	1	9639	10790
25.519	2-year	1	9571	10750
25.458	2-year	1	9581	10830
25.388	2-year	1	9330	10450
25.326	2-year	1	9180	10260
25.233	2-year	1	8750	10400

FLOW DATA

Flow Title: Future condition study discharges
Flow File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.f03

Flow Data (cfs)

River	Reach	RS	100-year	100 yr encr	10-year	2-year
RIVER-1	Reach-1	31.91	33500	33500	8300	2300
RIVER-1	Reach-1	30.85	36000	36000	9100	2500
RIVER-1	Reach-1	29.012	35800	35800	8800	2300
RIVER-1	Reach-1	26.845	39700	39700	9800	2600
RIVER-1	Reach-1	25.233	41400	41400	10100	2600

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	100-year		Normal S = .003

GEOMETRY DATA

Geometry Title: Revised Geometry
Geometry File : p:\28900077\design calculations\HecRas\Cave Creek\Cavecrk.g02

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 31.91

INPUT
Description: End of Reach 51
Start of Reach 52

Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9636.6	1972	9656.6	1971	9686.4	1963.7	9704.8	1959.7	9716.5	1960.1
9740.5	1960.3	9793.6	1959.1	9812.1	1957.7	9816.1	1956	9828	1956
9842.6	1959.3	9856.4	1961.4	9879.9	1958.9	9894.2	1959.2	9914.2	1959.2
9933	1959.7	9940	1959	9949.2	1956	9968	1954.5	9982.5	1954
10000	1953.3	10025.9	1953.4	10025.9	1953.5	10050.7	1961.3	10078.7	1962.7
10106	1963.6	10139	1964.8	10170.4	1966	10188.1	1967.8	10199.5	1968.7
10207.3	1970.1	10222.6	1973.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9636.6	.06	9933	.044	10050.7	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9933 10050.7 240 208 210 .1 .3
Left Levee Station= 9933 Elevation= 1959.7
Right Levee Station= 10050.7 Elevation= 1961.3

```
CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 31.87

INPUT
Description: For this floodplain analysis, the existing berm for
                 the private pond is assumed to be in-place.   The
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9626.3  1971.3    9643  1969.2  9648.1  1966.3  9655.8  1961.2  9670.8  1960.6
  9690.2  1960.1  9693.1  1959.1  9818.6  1958.9  9829.2  1966.8    9837  1967.4
  9848.6  1966.2  9864.1  1957.6  9879.3  1955.4  9900.2  1955.5  9938.9  1953.7
  9982.7  1953.6   10000  1953.8 10007.4  1953.9 10017.7  1959.6 10059.8  1961.5
 10114.9  1962.7 10134.9  1963.6 10168.9  1965.1   10197  1966.1 10206.3  1967.7
 10227.4  1973.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9626.3     .07  9848.6    .044 10017.7     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9848.6 10017.7              220     243     260              .1       .3
Left Levee      Station=  9848.6      Elevation=  1966.2
Right Levee     Station= 10017.7      Elevation=  1959.6

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 31.82

INPUT

Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9640.8  1968.8    9660 1959.59  9667.9  1955.8  9681.8  1954.9  9690.9  1956.6
  9720.3  1957.2  9781.8  1957.2    9801  1957.1  9810.2  1956.7  9828.3  1963.5
  9839.4  1963.3  9861.7  1953.4  9901.8  1953.4  9938.9  1953.2   10000  1952.7
 10017.6  1956.1   10035    1957 10046.1  1959.4 10068.7    1959 10077.7  1961.5
 10084.5  1960.7 10108.5  1961.3 10154.5  1961.4 10172.2  1961.1 10255.5  1961.9
 10327.1  1962.5 10369.1  1963.5 10384.7  1964.2   10402  1965.9 10410.2    1967

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9640.8     .07  9839.4    .044 10046.1     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9839.4 10046.1              360     361     370              .1       .3
Left Levee      Station=  9839.4      Elevation=  1963.3
Right Levee     Station= 10046.1      Elevation=  1959.4

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 31.75

INPUT
Description:
Station Elevation Data    num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9535  1968.8  9569.1    1958    9580  1956.1  9600.1  1955.6  9620.2  1955.1
  9640.7  1955.2    9671  1955.2  9699.4  1955.2  9797.4    1954  9807.2    1951
    9817  1951.4  9830.1  1947.9  9838.9  1947.8  9849.4  1947.7  9874.7  1951.2
  9893.5  1951.4    9936  1950.8  9965.9    1948  9988.6  1946.5  9994.7  1946.9
   10000  1947.2   10016  1951.4 10027.6    1953 10055.5  1953.5 10095.7    1954
 10148.4  1957.1 10176.9  1957.3 10201.8  1957.5 10202.3  1957.4 10265.2  1957.5
 10341.9  1957.8 10415.1  1958.4 10486.4  1959.7 10533.3  1960.5 10567.4  1961.2
 10582.5  1964.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9535     .07  9797.4    .044 10027.6     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9797.4 10027.6              680     647     650              .1       .3
Left Levee      Station=  9797.4      Elevation=    1954
Right Levee     Station= 10027.6      Elevation=    1953

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 31.63

INPUT
Description:
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9746.7  1958.1  9772.3  1949.7  9798.9    1949  9843.2  1948.9  9868.4  1948.3
  9884.3  1947.5  9917.9  1947.6  9928.5  1946.4  9961.1  1947.3  9972.7  1942.5
  9988.2  1940.5   10000  1940.6 10001.6  1940.7 10023.2  1940.7   10037  1941.7
 10056.6  1944.7 10070.9  1945.2 10102.8  1945.1 10113.1  1944.7 10125.9  1946.9
 10153.9  1948.2 10190.6  1948.6 10229.8  1947.5 10260.8  1947.3 10312.4    1947
 10336.4  1946.3 10337.3  1947.6 10361.7  1950.5 10392.2  1949.2 10414.1  1948.8
 10424.8  1946.3 10444.7  1948.2 10460.1  1951.7 10492.2  1952.9 10511.8  1952.8
   10540  1952.1   10555  1952.4 10593.1  1952.2 10675.7  1952.4 10701.9  1956.7
 10708.4  1956.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9746.7     .07  9961.1    .044 10153.9     .06

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

```
        9961.1 10153.9                450     453     430              .1        .3
Left Levee      Station=  9961.1      Elevation=  1947.3
Right Levee     Station= 10153.9      Elevation=  1948.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.54

INPUT
Description:
Station Elevation Data     num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9903.1  1953.1    9916 1946.65  9928.9  1940.2  9945.4  1940.1  9977.3  1940.2
   10000  1940.3 10041.5  1941.1 10050.6  1940.6 10073.6  1940.7   10094    1942
 10112.1  1941.9 10138.9  1942.1 10155.4  1942.2 10165.5  1944.3 10182.8  1946.3
 10201.5  1945.8 10229.8  1946.2 10266.6  1946.9 10296.7  1946.7 10320.8  1944.2
 10335.4    1945 10361.1  1944.8 10368.2  1943.4   10400  1941.6 10407.2  1940.6
 10429.9  1940.7   10439  1941.7 10456.4  1941.5   10470    1945 10481.4  1946.2
 10490.5    1946 10514.6  1943.2 10538.9  1941.4   10556    1948 10565.9  1948.9
 10611.6  1948.3   10647  1947.9 10681.6  1947.6 10740.1  1947.4 10783.6  1947.9
   10820  1948.4 10875.2  1948.4 10907.6  1951.6 10932.1    1952

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9903.1     .07    9916    .044 10182.8     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9916 10182.8               475     484     475              .1        .3
Left Levee      Station=    9916      Elevation= 1946.65
Right Levee     Station= 10165.5      Elevation=  1944.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.45

INPUT
Description:
Station Elevation Data     num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9794.4  1951.3  9827.8  1948.9  9836.9  1946.7    9850  1944.6  9861.9  1933.4
  9869.7  1933.1  9885.4  1933.7  9905.9  1937.6  9927.1  1938.3  9964.4  1936.2
  9983.8  1935.2  9993.3  1933.6   10000  1933.3 10008.5  1933.3 10009.4  1933.8
   10031  1941.1 10073.8    1941 10110.3    1941 10145.4  1940.3 10163.5  1939.8
 10168.6  1939.1 10186.5  1941.7 10204.8  1941.5 10230.5  1939.5 10250.8  1939.5
 10270.7  1938.2 10293.2  1937.5 10327.6  1938.3 10334.1  1938.7 10346.9  1942.7
 10385.9  1942.5 10399.4  1941.7   10439  1937.4 10462.8  1939.3 10480.5  1941.9
 10521.6  1941.8 10548.4    1942 10567.9    1942 10608.9  1942.1   10642  1942.4
 10694.7  1945.4 10736.6  1945.2 10772.4  1944.2 10798.3  1943.2 10813.1    1944
 10862.6  1944.1 10879.9  1944.8 10899.7  1949.7

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9794.4     .07    9850    .044   10031     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9850   10031               590     592     620              .1        .3
Left Levee      Station=    9850      Elevation=  1944.6
Right Levee     Station=   10031      Elevation=  1941.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.34

INPUT

Station Elevation Data     num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9664.3  1943.7  9718.8  1943.4    9793  1939.1  9862.7  1937.3  9930.2  1937.1
  9935.3  1935.5  9949.9  1933.3   10000  1931.5 10027.2  1933.2 10104.9  1934.1
 10113.8  1933.1 10116.6  1932.9 10126.5  1935.4 10137.5  1936.5 10146.5  1935.1
   10157  1934.7   10166  1932.9   10178  1932.1 10184.4  1932.9 10196.8  1936.1
 10210.6  1936.6 10248.8  1936.5 10254.7    1936 10322.1  1935.9 10332.9  1935.1
 10365.4  1935.1 10379.2  1932.4 10394.9  1931.5 10412.7  1931.9   10417  1934.9
 10429.2  1935.8 10471.2  1935.2 10485.5  1935.9 10497.1  1935.8 10509.7  1934.5
 10532.2  1933.7 10540.5  1933.8 10545.2  1934.1   10555    1940

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9664.3     .07  9930.2    .044 10137.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9930.2 10137.5               450     474     450              .1        .3
Left Levee      Station=  9930.2      Elevation=  1937.1
Right Levee     Station= 10137.5      Elevation=  1936.5

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.25

INPUT
Description: Cross Section    31.25   located just north of New River
             Rd.


Station Elevation Data     num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9373.1  1938.6  9395.2  1936.9  9406.7  1936.4  9423.4    1935    9428    1935
  9455.8  1933.5  9505.3  1931.6  9509.8  1932.3  9528.7  1932.8  9546.8  1932.9
    9565  1932.5  9570.8  1931.7  9591.6  1932.8  9610.1  1933.2  9655.8  1934.5
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  9676.8  1934.5    9701  1934.9  9746.6  1934.9  9783.9  1934.1  9798.6    1926
    9809  1925.5  9818.8  1925.4  9828.6  1928.3  9837.7  1929.5  9857.7  1930.7
  9867.3    1931  9881.1  1931.1  9937.9  1928.7  9978.9  1927.2  9992.1    1926
  9998.1    1926   10000  1926.1 10008.2  1925.9 10019.5  1927.4 10031.4  1931.4
 10041.9  1932.1 10070.2    1932 10095.4  1931.1   10102    1931   10114  1930.7
 10132.1  1928.7 10149.7  1930.9 10161.2  1929.9 10181.8  1931.8 10190.3  1931.8
 10215.9  1932.1 10261.6  1932.1 10286.1  1931.9 10318.8  1931.3 10340.5  1932.6
 10366.6  1932.7 10388.8  1931.9 10413.5  1931.8 10430.7  1931.3 10443.2    1929
 10452.1  1928.6   10466  1929.3 10483.8    1940

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9373.1     .07  9783.9    .044 10041.9     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9783.9 10041.9              400     432     400              .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev
  9373.1    9750
Left Levee       Station=  9783.9      Elevation=  1934.1
Right Levee      Station=   10033      Elevation=  1930.5

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.17

INPUT

Station Elevation Data     num=       39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9491.6  1936.3    9506    1932  9521.4  1929.3  9545.1  1928.2  9562.9    1928
  9579.7  1928.1  9634.1  1929.3  9653.3  1929.5  9726.8  1928.9  9786.7    1929
  9825.3  1929.9  9852.5  1931.1  9871.9  1922.6  9888.2  1922.6  9897.9  1920.8
    9911  1921.3  9918.2  1924.7  9936.1  1924.7  9965.1  1923.2   10000  1921.7
 10001.5  1921.7 10054.8  1923.1 10062.1  1923.8 10080.5  1926.2 10099.2  1926.9
 10124.8  1927.8 10182.8  1928.2 10210.3  1930.9 10228.1  1928.3 10247.7  1926.1
 10279.7  1924.7 10302.1  1928.2 10328.3  1928.8 10367.3  1928.5 10402.1    1928
 10441.8  1926.3 10469.9  1924.6   10497  1925.2 10536.2  1935.7

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9491.6     .07  9852.5    .044 10210.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9852.5 10210.3              130     162     130              .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev
  9491.6  9653.3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.14

INPUT
Description:
Station Elevation Data     num=       51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9585.1  1936.6  9604.8  1932.6  9617.8  1929.8  9636.3    1928  9669.3  1927.7
  9692.5  1927.8    9713  1927.9  9756.8  1927.5  9801.2  1926.6    9847  1926.6
  9879.8  1927.5  9908.3  1928.2  9926.4  1928.7  9939.6  1922.6  9947.4  1921.1
  9965.8  1920.2  9973.5    1919   10000  1917.8 10010.3  1918.4 10026.5  1920.5
 10045.6  1924.5 10071.7  1925.6 10108.7  1926.9 10146.3  1928.3 10165.5  1928.3
 10175.7    1928 10200.1  1926.5 10211.8  1925.2 10216.9  1923.6 10228.2  1923.6
 10244.9  1922.4 10260.3  1927.1 10283.8    1928 10333.2  1927.9 10349.7  1926.4
   10374  1927.2 10391.8  1926.2 10409.7  1925.9 10420.3  1924.3   10437  1923.7
 10478.4  1926.1 10521.1  1925.7 10538.5  1925.7 10563.6    1926 10576.4  1926.4
 10583.9  1922.6 10604.4  1924.1 10631.6    1924 10648.6  1925.6 10664.9  1931.2
 10690.6  1939.2

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9585.1     .07  9926.4    .044 10146.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9926.4 10146.3              500     467     350              .1       .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 31.05

INPUT
Description:
Station Elevation Data     num=       49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9874.9    1932    9886 1923.33  9891.8  1918.8  9913.5  1918.9  9925.9  1920.4
  9934.2  1918.3  9959.6  1917.1  9981.5  1917.8   10000  1917.8 10017.7  1918.1
 10031.9  1919.2 10043.6  1920.9 10072.9  1920.4 10087.3  1921.7 10103.6  1922.6
 10109.5    1923 10135.9  1922.9 10144.8  1921.9 10184.5  1922.2 10203.3  1921.3
   10234  1923.4 10256.6  1923.4   10289  1922.9 10317.1  1923.9 10318.2  1923.8
 10374.4  1923.3 10391.5  1922.2 10427.9  1921.5 10450.6  1921.6 10476.8  1924.3
 10506.7  1924.3 10573.2  1922.6   10624  1921.7   10643  1921.8 10662.9  1920.7
 10689.1  1920.8 10706.9  1920.3   10715  1917.2 10722.6  1916.9   10745  1921.9
 10764.6  1921.7 10790.9  1921.3 10806.3    1919 10836.8  1920.1 10849.3    1920
 10866.4    1918 10887.8  1917.4 10913.9  1928.6 10928.2  1930.4

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9874.9     .07    9886    .044 10109.5     .06
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```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9886 10109.5              470     494     460            .1        .3
Right Levee     Station= 10087.3      Elevation=  1921.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 30.96

INPUT
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9841.1    1926    9870  1918.3  9883.8  1918.3  9925.5  1918.1  9943.8  1914.4
  9973.8  1913.9  9986.9    1913   10000  1912.3 10026.1  1912.5   10032  1914.1
 10040.4  1913.5 10048.6  1913.3   10068  1917.1 10108.6  1917.3 10126.3  1918.4
 10145.6  1919.6 10178.2  1919.1   10215    1918 10251.6  1917.6 10288.4  1914.8
 10300.7  1916.8 10314.7  1917.5 10337.5  1917.7 10354.8  1915.9 10368.2  1913.7
   10381  1915.1 10420.6    1917 10463.2  1919.4 10491.4  1920.1 10517.7  1920.5
 10535.8  1920.3 10566.8  1919.1 10590.8  1919.3 10602.1  1917.5 10612.3  1916.8
 10626.6  1916.6 10646.3    1912 10653.8  1912.4 10665.1  1915.2 10676.9  1916.8
 10689.9  1917.3   10727  1916.6 10740.6  1916.5 10749.9  1914.6 10758.8  1914.1
 10771.1  1915.9 10798.3  1924.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9841.1     .07  9925.5    .044 10145.6     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9925.5 10145.6            550     541     570            .1        .3
Right Levee     Station= 10126.3      Elevation=  1918.4

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 30.85

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9554.5  1919.8  9596.5  1919.4  9645.1  1918.6  9696.1  1917.4  9729.2  1916.6
  9804.9    1916    9834  1915.8  9835.9  1915.8  9863.9  1915.6  9889.7    1915
  9901.4  1912.1  9912.4  1908.2  9928.9  1909.4  9950.5  1908.5  9972.9  1909.1
   10000  1907.5 10018.4  1907.9 10051.3  1914.3 10090.2  1914.5 10129.5  1915.2
 10146.9  1915.3 10185.9  1915.5 10222.7  1914.7 10246.4  1910.5 10276.3  1913.3
 10294.3  1913.9 10316.8  1914.1   10327  1911.5   10361  1910.9 10370.8  1909.4
 10385.6  1908.6 10407.2  1910.2 10436.5  1907.9 10442.7  1905.6 10474.8  1905.3
 10484.7  1907.4 10503.4  1921.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9554.5     .07  9889.7    .044 10051.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9889.7 10051.3            525     569     570            .1        .3
Left Levee      Station=  9889.7      Elevation=    1915
Right Levee     Station=   10044      Elevation=    1912

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 30.75

INPUT

Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9299.3  1918.1  9316.1  1915.8  9339.6  1915.2  9376.8  1914.8  9417.3  1914.4
    9491  1914.4  9531.6  1913.7  9560.3  1909.8  9621.7  1909.6  9660.3  1908.9
  9712.4  1909.4  9755.1  1909.2  9793.8  1909.1  9820.7  1909.1  9857.1  1909.7
  9869.1  1909.4  9885.3  1906.2  9912.3  1907.2    9935  1906.7  9963.4  1904.1
  9982.7  1902.6  9993.3  1902.5   10000  1902.4 10050.3  1903.8 10096.8    1903
 10116.3    1901 10126.1  1903.4 10142.7  1903.2 10165.8  1902.8 10184.4  1915.5
 10241.8  1916.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9299.3     .07  9857.1    .044 10184.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9857.1 10184.4            475     486     450            .1        .3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 30.65

INPUT

Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9206.9    1913  9224.3  1910.7  9241.6  1909.7  9297.7  1908.9  9329.1    1908
  9386.1  1907.1  9430.3  1907.9  9448.3  1908.6  9465.2  1908.9    9483  1908.4
    9506  1908.7  9526.3    1908  9563.6  1906.8  9601.3  1906.3  9627.1  1905.9
  9654.8  1905.5  9691.5  1905.5  9715.1  1905.8  9732.3  1906.1  9743.9  1906.2
  9771.6  1901.9  9791.3  1900.6  9799.1  1901.6    9813  1903.2  9833.8  1904.1
    9871    1903  9891.8  1904.2  9909.4  1904.4  9919.7  1902.4  9933.9  1901.8
  9943.8  1898.6  9971.6    1899  9988.4  1898.3  9995.5  1897.2   10000  1897.3
 10019.6  1898.2 10027.8  1910.2 10041.2  1911.2 10070.7  1911.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

9206.9 .06 9909.4 .044 10027.8 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9909.4 10027.8 700 696 650 .1 .3
Left Levee Station= 9909.4 Elevation= 1904.4
Right Levee Station= 10027.8 Elevation= 1910.2

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.52

INPUT
Description:
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9283.8	1904.7	9298	1900.8	9317.2	1900.7	9342	1900.5	9401.2	1900.8
9431.3	1900.4	9463	1900.9	9498.9	1900.8	9566.3	1900.4	9630.3	1899.9
9649.8	1900	9696.8	1900.1	9721.3	1899.9	9744.6	1899.1	9757.6	1899.3
9771	1899.2	9785.1	1899.6	9811.3	1900.4	9826.1	1900.9	9851.7	1900
9872.3	1898.1	9876.3	1894.7	9887.7	1894.9	9902.1	1895	9914	1897.4
9933.1	1898.2	9965	1896.5	9983.4	1893.6	10000	1893.8	10049.4	1893.5
10061.8	1894	10068.7	1894.9	10095.2	1898.8	10107.9	1898.9	10132.4	1898.9
10161.8	1898.1	10213.6	1899	10221.1	1899	10242.8	1898.8	10260.3	1897.4
10275.9	1896.9	10291	1893.8	10300.9	1894.4	10323.3	1900.1	10340.6	1899.8
10361.4	1898.7	10366.8	1896.7	10383.8	1899.3	10401.4	1903.8	10420.5	1904.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9283.8	.06	9826.1	.044	10401.4	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9826.1 10401.4 600 560 500 .1 .3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.42

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9501.6	1906.6	9533	1893.1	9568.7	1893.6	9613.1	1892.9	9631.9	1892.9
9666.7	1892.9	9714.6	1894.3	9733.5	1894.8	9755.5	1894.8	9800.7	1894.6
9854.8	1895.2	9868	1892.9	9893.2	1893.9	9900.4	1893.6	9907.3	1890.9
9918.4	1890.6	9931.2	1895.4	9957.5	1895.6	9970.3	1890.3	9999.9	1887.8
10000	1888.1	10037.1	1889.6	10052.9	1890.3	10080.7	1892.7	10102.6	1892.4
10123.6	1891.7	10145.5	1891.1	10159.9	1885.8	10186.9	1889	10200.7	1889.8
10211.4	1892.1	10239.2	1890.7	10258.2	1888.3	10277.2	1893	10320.1	1892.4
10362.3	1889.9	10390.2	1889.7	10402.9	1891.4	10438.8	1890.9	10443	1890.9
10455.4	1893.1	10487.8	1900.1	10552.6	1901.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9501.6	.06	9957.5	.044	10487.8	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9957.5 10487.8 500 713 650 .1 .3
Left Levee Station= 9854.8 Elevation= 1895.2

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.28

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9132.4	1901.6	9162.5	1889.1	9181.6	1889.5	9200.7	1888.4	9222.8	1889.3
9264.4	1890	9316.4	1890.1	9351.6	1890.2	9388.9	1888.4	9396.9	1887
9406.9	1886.6	9427.9	1888	9442.8	1888.6	9470	1887.8	9491.8	1889.3
9550.4	1890.2	9595.4	1889.5	9616.6	1889.6	9631.3	1887.7	9649	1887
9679.4	1889.5	9694.4	1888.6	9704.9	1886.6	9717.5	1889.5	9732.1	1890.4
9751.7	1890	9775.3	1888.7	9814	1888	9833.6	1885.9	9881.7	1885.2
9895.3	1884.3	9908.6	1881.8	9934.5	1880.9	9947.3	1879.7	9978.3	1878.3
9989.9	1877.8	10000	1877.8	10008.3	1877.1	10014.5	1877.5	10033.5	1894.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9132.4	.06	9881.7	.044	10033.5	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9881.7 10033.5 550 421 430 .1 .3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.2

INPUT
Description: Cross section river mile stationing based upon FEMA cross

section
DA being river mile 30.10. See FEMA FIS Maricopa

Coun
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8955.2	1897.8	8990	1882.4	9026.6	1880.4	9055.2	1882	9073.3	1883.7
9087.5	1885	9107	1885.1	9146.3	1884.1	9170.8	1881.8	9184	1881.9
9204	1882.7	9235.3	1882	9246.9	1882.4	9262.4	1882.3	9272.2	1883.5
9292.3	1884.4	9312.7	1883.6	9337.9	1881.6	9347.9	1881.1	9366	1882.5
9381.9	1882.6	9390.1	1886.1	9418.6	1885.7	9457.3	1884.4	9490	1883
9504.1	1883.8	9564.4	1883.4	9590.9	1882	9616.7	1883.3	9641.3	1883.5
9663.9	1879.3	9669.6	1879.5	9684.6	1882.3	9695.5	1882.8	9707	1881.9
9714.1	1879.8	9731.2	1879.9	9741.7	1882.8	9753.1	1883	9796	1883.3
9822.3	1884.1	9859	1883.7	9900.1	1882.8	9927.7	1876.5	9939.7	1875.8
9976.9	1877	10000	1876.1	10000.6	1876.4	10021.2	1877.9	10045.5	1878.8
10069.8	1878.2	10086	1876	10093.2	1875.2	10132.3	1897.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8955.2	.06	9900.1	.044	10132.3	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9900.1	10132.3	535	537	545	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30.1

INPUT
Description:
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8723.4	1891	8748.2	1877.9	8775.4	1875.5	8780	1876	8810.6	1878
8835.2	1880.5	8853	1878.9	8871.3	1879.6	8898.7	1878.8	8919.7	1879.2
8960.2	1880.2	9014.6	1879.7	9044.7	1878.9	9052.4	1879.9	9099.2	1880.3
9155.3	1880.3	9227.8	1880.9	9243.7	1876.8	9255.3	1876.3	9276.4	1874.4
9307.4	1874.2	9329.9	1872.2	9342	1872.1	9355.7	1873.5	9390	1876.3
9392.9	1873.5	9404	1871.8	9420.7	1873.1	9425.8	1874.2	9428.7	1876.8
9441.3	1878.7	9466.4	1877.8	9482.9	1877.8	9496.3	1880.2	9512.7	1881.2
9529.5	1880.1	9533.3	1878.9	9544.7	1877	9559.8	1877.4	9578.4	1878.1
9589.9	1879.3	9614.6	1877.1	9633.8	1874.7	9643.6	1871.3	9667.4	1872.3
9672.6	1871.1	9693.9	1870.2	9717.8	1870.5	9722.8	1872.1	9730.9	1873.4
9755.3	1874.4	9768.6	1874.7	9788.6	1880.6	9817.8	1881.3	9848.5	1880.6
9860.4	1879.2	9872.6	1875.7	9880.1	1875	9891.8	1874	9935.6	1873
9949.8	1868.2	10000	1867.4	10010.8	1869.6	10037.3	1895.1	10037.9	1895.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8723.4	.06	9817.8	.036	10037.9	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9817.8	10037.9	1100	1304	1325	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.85

INPUT
Description: SECTION NO. BP (NEW SECTION ADDED @ 400' UPSTREAM OF 68)

Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9386	1874.2	9406.8	1872	9413.5	1870	9438.9	1868	9504.5	1868
9609.1	1870	9646.3	1870.4	9735.6	1868	9757.6	1868	9924.1	1866
9938.5	1864	9945.1	1860	10015.9	1857.7	10029.3	1858	10043.7	1872
10081.4	1878	10127.5	1880						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9386	.07	9924.1	.036	10043.7	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9924.1	10043.7	400	400	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.77

INPUT

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9195	1874	9222	1872	9240	1866	9317.8	1865.3	9364.1	1864.3
9408	1863.8	9449	1863	9466.8	1862.2	9505.3	1863.7	9551.4	1863
9588.5	1862.1	9603.5	1862	9676.4	1861.8	9720	1863.6	9724.1	1864.1
9736.3	1867.1	9745.8	1870	9764.6	1870.5	9772.8	1866.9	9782.5	1861.7
9792.9	1857.2	9809.5	1858.2	9826.1	1859	9869.9	1859.7	10011.1	1857.3
10024.3	1858.4	10033.6	1864.1	10042.5	1869.2	10051.1	1872.7	10073.5	1873.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9195	.07	9764.6	.036	10051.1	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9764.6	10051.1	50	200	550	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
9195	9754	1890.6	10051.1	10073.5	1872.7

Left Levee Station= 9764.6 Elevation= 1870.5
Right Levee Station= 10051.1 Elevation= 1872.7

```
CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.72

INPUT

Station Elevation Data     num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  8869.7    18819215.525  1872.29314.096  1872.2 9421.28  1873.79524.462  1874.5
9593.191    18769595.541  1875.49606.067  1871.4 9623.12  1864.29639.302  1856.1
9677.061  1858.49702.812  1858.69734.566  1857.59853.061    18559885.425  1862.8
9899.954  1870.39922.835  1875.29940.845  1875.99956.504  1876.110290.06  1870.7
10455.19  1869.910966.75  1873.411297.17    187411468.65    1875

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  8869.7     .079593.191    .0369956.504     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9593.1919956.504              127     127     127              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  8869.79593.191    18809956.50411468.65    1880
Left Levee      Station=9593.191      Elevation=    1876
Right Levee     Station=9956.504      Elevation=  1876.1

BRIDGE                 RIVER: RIVER-1
REACH: Reach-1            RS: 29.715

INPUT
Description: Bridge #1

Distance from Upstream XS =      10
Deck/Roadway Width        =     117
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
9542.061  1877.4    18729559.061 1880.24 1872.239646.561 1880.86 1872.85
9734.061  1881.1 1873.099821.561 1880.95 1872.949909.061 1880.42 1872.41
9926.061  1877.6    1872

Upstream Bridge Cross Section Data
Station Elevation Data     num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  8869.7    18819215.525  1872.29314.096  1872.2 9421.28  1873.79524.462  1874.5
9593.191    18769595.541  1875.49606.067  1871.4 9623.12  1864.29639.302  1856.1
9677.061  1858.49702.812  1858.69734.566  1857.59853.061    18559885.425  1862.8
9899.954  1870.39922.835  1875.29940.845  1875.99956.504  1876.110290.06  1870.7
10455.19  1869.910966.75  1873.411297.17    187411468.65    1875

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  8869.7     .079593.191    .0369956.504     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
      9593.1919956.504              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  8869.79593.191    18809956.50411468.65    1880
Left Levee      Station=9593.191      Elevation=    1876
Right Levee     Station=9956.504      Elevation=  1876.1

Downstream  Deck/Roadway Coordinates
    num=       9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     9695 1876.13    1870  9702.5 1876.15    1870  9719.5 1878.87 1870.83
  9782.5 1879.06 1871.02    9870 1879.13 1871.09  9957.5 1879.02 1870.98
   10045 1878.71 1870.67   10069 1878.62 1870.56   10086 1875.88    1870

Downstream Bridge Cross Section Data
Station Elevation Data     num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9609    1872    9715  1871.2    9754    1862    9764    1860    9772    1858
    9788    1856    9801  1854.5    9835  1856.1    9891  1856.5    9910    1856
    9976    1854   10000  1853.9   10023    1855   10064 1870.95   10200    1872

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9609     .07    9715     .04   10064     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9715   10064              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9609    9715    1890   10064   10200    1890
Left Levee      Station=    9715      Elevation=  1871.2
Right Levee     Station=   10064      Elevation= 1870.95

Upstream Embankment side slope              =         horiz. to 1.0 vertical
Downstream Embankment side slope            =         horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =
Elevation at which weir flow begins         =  1879.8
Energy head used in spillway design         =
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Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream=9646.561    Downstream=  9800.5
Upstream     num=        2
    Width   Elev    Width   Elev
        4   1854        4   1874
Downstream     num=        2
    Width   Elev    Width   Elev
        4   1853        4   1874

Pier Data
Pier Station     Upstream=9734.061    Downstream=    9888
Upstream     num=        2
    Width   Elev    Width   Elev
        4   1854        4   1874
Downstream     num=        2
    Width   Elev    Width   Elev
        4   1853        4   1874

Pier Data
Pier Station     Upstream=9821.561    Downstream=  9975.5
Upstream     num=        2
    Width   Elev    Width   Elev
        4   1854        4   1873
Downstream     num=        2
    Width   Elev    Width   Elev
        4   1853        4   1873

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
      Momentum                Cd   =    1.33
      Yarnell                 KVal =    1.05
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
      Energy Only

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

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.71

INPUT

Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9609    1872    9715  1871.2    9754    1862    9764    1860    9772    1858
    9788    1856    9801  1854.5    9835  1856.1    9891  1856.5    9910    1856
    9976    1854   10000  1853.9   10023    1855   10064 1870.95   10200    1872

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9609     .07    9715     .04   10064     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9715   10064              533     233      73              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9609    9715    1890   10064   10200    1890
Left Levee      Station=    9715      Elevation=  1871.2
Right Levee     Station=   10064      Elevation= 1870.95

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.663

INPUT
Description: SECTION NO. BL


Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9166  1874.6  9201.1  1872.5  9233.9  1863.4  9249.5  1861.7  9285.2  1863.9
  9357.9  1862.6  9384.7  1861.5  9415.8  1859.9  9468.3    1862    9538  1860.7
  9615.1  1862.3  9670.5  1862.6  9803.9  1862.5  9827.7  1851.7  9840.5  1850.9
  9860.9  1850.9  9897.3    1856  9915.3  1855.5  9955.8    1854   10000  1853.7
 10025.2  1852.9 10051.5  1857.5   10159  1856.8 10194.6  1869.1 10357.1    1867
 10470.9  1866.3 10698.7  1864.6 10792.8  1863.6 10916.7  1862.8 11013.8  1862.3
 11221.1  1860.8 11281.8  1861.8 11330.4  1866.3 11375.2  1870.2   11430  1875.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9166     .07  9803.9    .044 10194.6     .07
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9803.9 10194.6              330     330     330            .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9166  9615.1  1862.3 10201.4   11430  1889.3
Left Levee      Station=  9803.9      Elevation=  1862.5
Right Levee     Station= 10194.6      Elevation=  1869.1

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.601

INPUT
Description: SECTION NO. BK


Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9099.7  1872.9  9117.8  1868.4  9156.4  1856.1  9183.7    1859  9210.1    1860
  9257.3  1861.3  9286.8  1861.4  9337.3  1859.7  9385.8  1857.8  9431.3  1857.6
  9472.7  1856.4  9515.2  1856.9  9628.9  1858.9    9679  1859.4  9695.4  1858.5
  9710.3  1850.7  9734.3  1849.9  9784.6  1851.2  9797.7  1852.1  9832.4  1854.3
  9848.1  1854.8  9885.6  1853.5  9929.9  1851.5  9960.4  1851.1   10000    1851
   10019  1852.2 10035.2  1857.7 10046.6    1859 10060.2  1867.1 10084.7  1867.9
   10148  1868.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9099.7     .07    9679    .044 10060.2     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9679 10060.2             370     330     330            .1        .3
Left Levee      Station=    9679      Elevation=  1859.4
Right Levee     Station= 10060.2      Elevation=  1867.1

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.538

INPUT
Description: SECTION NO. BJ


Station Elevation Data    num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9071    1860  9096.6  1852.7  9109.2  1854.5  9115.6  1856.5  9129.7  1855.8
  9160.4    1855  9182.2  1856.2  9231.6  1856.6  9294.3  1856.8  9331.2  1855.1
  9372.5  1853.7  9376.2  1850.6  9382.6  1854.1  9400.2  1854.4  9419.1  1848.9
  9441.4  1850.1  9480.9  1851.4    9528  1851.9    9545  1851.1  9586.2  1849.7
  9625.5  1850.4    9667  1850.7  9703.9  1850.1  9733.9  1852.7  9774.5    1851
  9838.1  1851.2  9871.5  1850.5  9915.1  1850.9  9948.9  1848.7  9970.4  1848.7
  9990.7  1847.4   10000  1845.5 10016.1  1848.1 10034.4  1854.1 10071.6  1856.5
 10085.4  1857.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9071     .07  9400.2     .05 10034.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9400.2 10034.4              270     240     230            .1        .3
Left Levee      Station=  9400.2      Elevation=  1854.4
Right Levee     Station= 10034.4      Elevation=  1854.1

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.493

INPUT
Description: SECTION NO. BI


Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9184.2  1855.3  9195.2  1850.5  9301.4  1850.5  9318.7  1850.3  9336.2  1850.7
  9357.2  1846.3  9369.9  1843.9    9386  1843.4  9410.6  1843.8  9421.7  1845.6
    9428  1845.7  9442.5    1848  9450.2  1848.1  9459.5  1847.9  9471.8  1847.4
  9486.4  1846.6  9503.9  1847.6  9515.6  1847.9  9534.1  1848.2  9543.7  1849.3
  9563.8  1849.5  9572.1  1850.7  9582.2  1850.8  9618.4  1850.6  9647.1  1847.2
  9657.9  1846.8  9679.3  1846.1  9696.8  1849.6  9711.8  1848.9    9717  1848.6
  9732.5  1849.3  9747.1  1848.9  9758.6  1846.3  9765.8  1845.5    9772  1845.4
    9786    1847  9807.2  1849.1  9819.2  1849.2  9831.7  1847.5  9838.8  1847.3
  9868.6  1845.8  9885.7  1844.4  9905.8  1847.2    9907  1847.6  9915.7  1847.9
  9951.2  1847.8  9989.8  1845.4   10000  1845.2   10018  1844.8 10024.4  1845.6
 10038.6  1850.7 10047.8  1850.8 10063.5  1850.3 10071.1  1850.7 10089.3  1850.9
 10099.8  1849.2 10106.4  1848.8 10109.9  1849.1 10142.8  1854.8 10156.3  1855.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9184.2     .07  9336.2     .05 10047.8     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9336.2 10047.8              610     560     520            .1        .3
Left Levee      Station=  9336.2      Elevation=  1850.7
Right Levee     Station= 10047.8      Elevation=  1850.8
```

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.387

INPUT
Description: SECTION NO. BH

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9481	1854.2	9493.6	1841.8	9511.4	1841.9	9527.3	1844.7	9552.5	1844.5
9575.8	1839.3	9627.7	1839.1	9645.2	1840.2	9667.5	1844.3	9682.9	1845
9722.4	1842.2	9732	1839.9	9749.9	1839.7	9757.7	1840.9	9778.9	1847.4
9822.3	1847.6	9845.5	1843.7	9863.2	1845	9906.2	1844.6	9921.9	1842.7
9960.2	1839.7	9986.9	1838.8	10000	1839.8	10037	1839.3	10066.4	1838.9
10082	1843.9	10107.4	1845.2	10128.4	1844.2	10146.8	1845	10179.3	1843.4
10240.2	1845.8	10277.7	1845.8	10302.4	1850.7	10351.2	1850.5	10398.2	1850.5
10434.3	1850.2	10467.4	1848.9	10486.8	1849.5	10517.6	1857.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9481	.07	9481	.05	10107.4	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9481	10107.4	190	190	200	.1	.3

Right Levee Station= 10302.4 Elevation= 1850.7

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.351

INPUT
Description: SECTION NO. BG

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9651.1	1864	9668.9	1858.9	9684.3	1849.7	9698.1	1836.7	9722.5	1839.1
9741.4	1838.9	9747.3	1836.7	9758.1	1836.8	9768.8	1838.3	9795.9	1841.6
9818.1	1839.9	9839	1839.5	9861.3	1842.7	9879.5	1845.3	9898	1839
9912.1	1841	9924.3	1841.4	9957.8	1842.3	9979.9	1838.9	10000	1835.9
10027.2	1836.7	10064	1838	10092.9	1841.9	10150.2	1842	10186.7	1840.3
10213	1842.3	10230.5	1840.9	10250	1841.3	10277.5	1845.9	10296.9	1847.8
10317	1848.9	10342.3	1849.3	10371.3	1849.2	10418.4	1848.8	10471.2	1849.3
10503.3	1848.5	10544.6	1847.1	10566	1847.7	10595.3	1854.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9651.1	.07	9684.3	.05	10150.2	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9684.3	10150.2	500	490	490	.1	.3

Right Levee Station= 10342.3 Elevation= 1849.2

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.258

INPUT
Description: SECTION NO. BF

Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9781.3	1852.7	9805.1	1834.5	9824.7	1831.9	9842.8	1828.7	9857.3	1831.8
9870.6	1832.7	9915.5	1834.1	9954.2	1833.1	10000	1831.2	10016.4	1832.3
10026.1	1832.7	10051.4	1844.5	10107.4	1844.3	10169.9	1844.4	10230.7	1844.3
10274.3	1843.9	10318.2	1844.5	10378.2	1843.7	10417.3	1843.3	10451.7	1842.7
10494.3	1842.2	10508.4	1843	10543.7	1851.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9781.3	.07	9781.3	.044	10051.4	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9781.3	10051.4	710	705	710	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev
10051.4	10543.7	1844.5

Right Levee Station= 10051.4 Elevation= 1844.5

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 29.13

INPUT
Description: SECTION NO. BE

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9960.7	1855	9979.7	1824.5	9987.1	1821	10000	1821.6	10015.3	1822.1
10027.6	1824.1	10046.3	1826.2	10055.7	1827.7	10091.4	1827.9	10098.6	1829.1
10106.7	1831.5	10331.6	1834.5	10356.3	1834.2	10392	1834.1	10428.2	1834
10440.7	1833.4	10483.6	1835.9	10502.3	1835.1	10508.1	1834.8	10530.9	1836.2

```
 10559.2  1838.1 10574.2  1838.9 10612.5  1839.3 10733.7  1838.3 10808.3  1836.4
 10832.6  1836.4 10902.5  1837.2 10928.5  1836.9 10946.7  1837.6 10954.1  1839.3
 10971.2  1842.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9960.7     .07  9960.7    .036 10106.7     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9960.7 10106.7              590     595     600             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 10612.5 10971.2  1839.3

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 29.012

INPUT
Description: SECTION NO. BD


Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9889.9  1853.7  9922.8    1850  9955.5    1819  9982.8  1818.9   10000  1818.7
 10031.4  1820.6 10041.2  1822.8 10066.9  1822.6 10091.3  1827.5 10113.2  1828.5
 10186.8  1828.1 10220.1  1828.8 10250.7  1828.6 10267.4  1827.9 10303.6  1828.5
   10341  1829.6 10376.4  1830.3 10413.9  1830.2   10452    1831 10517.5  1832.7
 10558.9  1832.8 10660.3  1831.5 10714.5  1831.6 10788.3  1830.7   10835  1831.7
 10861.6  1838.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9889.9     .07  9922.8    .036 10091.3     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9922.8 10091.3              400     410     420             .1       .3
Left Levee      Station=  9922.8      Elevation=    1850
Right Levee     Station= 10091.3      Elevation=  1827.5

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 28.934

INPUT
Description: SECTION NO. BC


Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9795.5    1853  9824.7  1851.1  9864.6  1824.7  9894.9  1823.9  9914.2  1820.4
  9923.4  1819.2  9934.8  1819.1  9940.2  1816.6  9967.7  1815.9   10000  1815.5
 10007.5  1817.3 10022.2  1817.6 10035.2  1819.8 10054.9  1826.8 10096.7    1828
 10161.6    1827 10183.8  1825.9 10214.6  1826.4 10239.3  1825.4 10268.1  1824.2
 10298.7  1823.9 10324.5  1824.1   10353  1827.5 10391.2  1828.5 10425.6  1829.3
 10455.1    1829 10502.7  1827.8 10545.1  1827.4 10578.5  1827.6   10687  1826.1
 10744.9  1827.3 10818.8  1828.1 10868.7    1827   10873  1826.9 10900.6  1829.8
 11009.4  1831.1 11166.8  1831.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9795.5     .07  9824.7    .036 10054.9     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9824.7 10054.9              410     460     470             .1       .3
Left Levee      Station=  9824.7      Elevation=  1851.1
Right Levee     Station= 10054.9      Elevation=  1826.8

CROSS SECTION          RIVER: RIVER-1
REACH: Reach-1            RS: 28.847

INPUT
Description: SECTION NO. BB


Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9867.2  1848.5  9881.1    1847  9927.3  1814.5  9952.1  1813.5  9978.2  1811.9
   10000    1812 10041.6  1812.5 10076.9  1821.4 10110.6  1821.2 10147.8  1820.5
 10162.1  1818.4 10179.8  1820.8 10200.5  1824.9 10242.3  1825.3 10284.1    1825
 10343.6  1824.4 10403.2  1824.5 10447.7  1823.5 10492.8  1822.7 10553.5  1821.8
 10574.2  1821.8 10617.2  1822.3 10650.1  1822.8 10692.5  1822.5 10726.3    1820
 10757.2  1821.3 10780.5  1821.3   10814  1822.3 10837.2  1826.7 10862.2  1828.2
 10897.8  1827.1 10969.2  1826.9   11071    1827 11206.2  1827.8 11575.5  1826.8
 11637.6  1827.3 11709.7  1828.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9867.2     .07  9881.1    .036 10076.9     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9881.1 10076.9              520     510     500             .1       .3
Left Levee      Station=  9881.1      Elevation=    1847
Right Levee     Station= 10076.9      Elevation=  1821.4
```

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.75

INPUT
Description: SECTION NO. BA

Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9866.8	1844.3	9915.2	1812.6	9936.1	1812.5	9952	1809.4	9972.2	1808.3
10000	1808.5	10033.3	1808.9	10041.9	1809.5	10053.6	1811.1	10066.5	1811.1
10101.5	1814	10113.1	1816	10129	1819.7	10171.9	1821.3	10292.1	1820.2
10343.7	1820.4	10481.8	1818.3	10539.4	1817.7	10623.4	1818	10650.9	1817.4
10735.6	1818	10749.8	1818.7	10820.5	1825.1	10892.7	1824	10991.1	1824.3
11079.1	1823.6	11186.1	1824.2	11305.7	1825.2	11432.7	1823.8	11468	1824.2
11672.9	1825.2	11735.5	1825.5	11821.7	1830.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9866.8	.07	9866.8	.036	10129	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9866.8	10129	500	490	470	.1	.3

Left Levee Station= 9866.8 Elevation= 1844.3
Right Levee Station= 10129 Elevation= 1819.7

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.657

INPUT
Description: SECTION NO. AZ

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9910.1	1841.5	9933.6	1839.5	9961.9	1801.7	9986.1	1800.5	10000	1800.6
10009.7	1802.1	10034.1	1805	10053.9	1806.9	10069.1	1808.6	10089.5	1813.2
10113	1812.3	10124.3	1810.2	10130	1809.6	10142.8	1809.6	10162	1812.9
10179	1814.9	10197	1816.7	10224.3	1816.8	10327.9	1815.5	10385.1	1814
10514.2	1814.4	10614.1	1814.6	10650.2	1816.7	10678.3	1820	10877.4	1822.3
11067.7	1821.4	11188.8	1821.7	11264	1823.3	11476.7	1821.4	11657.4	1822.5
11753	1826.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9910.1	.07	9933.6	.036	10197	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9933.6	10197	550	540	540	.1	.3

Left Levee Station= 9933.6 Elevation= 1839.5
Right Levee Station= 10197 Elevation= 1816.7

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.555

INPUT
Description: SECTION NO. AY

Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9869.9	1835.9	9919.4	1833.2	9940.2	1817.6	9961.8	1800.2	9983.5	1800.1
10000	1799.4	10032.9	1799.4	10059.2	1801	10096.4	1809.1	10111.4	1810
10139.6	1809.1	10223.1	1811.3	10283	1811.4	10355.8	1810.6	10399.9	1810.2
10470.4	1811.2	10526.5	1812	10579.7	1813.1	10607.8	1813	10653.4	1813.2
10691.4	1812.6	10780.8	1813.9	10824.9	1816.4	10871	1817.2	11005.7	1818.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9869.9	.07	9919.4	.036	10111.4	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9919.4	10111.4	490	490	500	.1	.3

Left Levee Station= 9919.4 Elevation= 1833.2
Right Levee Station= 10111.4 Elevation= 1810

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.462

INPUT
Description: SECTION NO. AX

Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9871.7	1827.9	9909.8	1794.9	10000	1794.8	10034.2	1803.6	10061.2	1805.6
10078	1805.3	10175.8	1806.6	10284	1805.7	10463.4	1807.2	10524.9	1808.6
10599.5	1807.4	10682.2	1805.3	10732.4	1805.1	10776.4	1808.1	10847.3	1809
10922	1812.2	11030.5	1812.7	11215.6	1812.5	11317.2	1812.6	11404.3	1814.1
11476.1	1815	11558.8	1819.3						

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9871.7     .07  9871.7    .036 10061.2     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9871.7 10061.2              380     380     380              .1       .3
Left Levee      Station=  9871.7      Elevation=  1827.9
Right Levee     Station= 10061.2      Elevation=  1805.6

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.39

INPUT
Description: SECTION NO. AW


Station Elevation Data     num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9819.6  1821.5  9863.1  1815.7  9907.7  1793.2  9924.1  1793.4  9961.5  1793.9
   10000  1792.8 10013.4  1800.1 10063.6  1802.7 10104.8  1802.5 10139.1    1805
 10177.8    1804 10316.5    1803 10382.7  1802.6 10449.1    1803 10520.6  1803.8
   10603    1804 10705.5    1802 10716.7  1802.4 10767.7  1802.8 10800.6  1807.3
 10917.5  1809.4 11054.7  1809.5 11066.1  1809.2 11175.1  1809.6 11281.1  1810.8
 11284.7  1811.5 11364.3    1812   11470  1816.4

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9819.6     .07  9863.1    .036 10063.6     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9863.1 10063.6              350     340     340              .1       .3
Left Levee      Station=  9863.1      Elevation=  1815.7
Right Levee     Station= 10063.6      Elevation=  1802.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.326

INPUT
Description: SECTION NO. AV


Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9689.6  1822.4  9817.5  1809.8  9861.7  1794.9  9937.3  1792.4   10000  1791.3
 10050.1  1801.8 10195.5  1801.9 10252.1  1801.4 10306.4  1802.1 10388.6  1799.1
 10476.5  1799.1   10599  1800.3 10683.7  1799.1 10731.3  1800.9 10770.4  1800.8
 10806.2  1803.6 10872.4  1803.5 10955.7  1805.2 11057.2  1806.2 11208.6  1807.9
 11340.5  1810.2 11379.7  1812.8

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9689.6     .07  9817.5    .036 10050.1     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9817.5 10050.1              440     450     470              .1       .3
Left Levee      Station=  9817.5      Elevation=  1809.8
Right Levee     Station= 10050.1      Elevation=  1801.8

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.241

INPUT
Description: SECTION NO. AU


Station Elevation Data     num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9639.9  1808.3  9692.2  1795.4  9741.5  1795.8  9757.5    1795  9762.7  1794.5
  9785.6  1793.6  9819.4  1793.6  9830.9  1791.7    9858  1789.9  9876.8  1791.1
  9926.9  1790.7   10000    1790   10028  1795.7 10050.5  1796.6 10063.2  1795.7
   10223  1797.2 10301.6  1798.6 10415.7  1797.7 10531.3    1797   10566  1797.1
 10615.4  1794.2 10624.7  1791.9   10652  1794.1 10662.7  1793.8 10675.3  1792.1
 10702.3  1795.8 10754.1  1797.3 10794.7  1801.3 10837.5  1802.6 10880.1  1802.5
 10980.9  1801.9 11104.8  1803.2 11135.2  1803.7 11251.1    1805 11386.2  1804.9
 11429.3  1806.9

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9639.9     .07  9639.9    .044 10050.5     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9639.9 10050.5              400     440     490              .1       .3
Left Levee      Station=  9639.9      Elevation=  1808.3
Right Levee     Station= 10050.5      Elevation=  1796.6

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.157

INPUT
Description: SECTION NO. AT
```

```
Station Elevation Data     num=       39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9591.2    1807  9646.4    1785  9667.1  1784.5  9689.6  1786.5  9722.3  1788.2
  9789.6  1788.8  9804.4  1790.5  9831.6    1791  9866.2  1791.1    9893  1788.7
    9942  1788.5  9970.6  1786.6   10000  1782.6 10043.2  1782.8 10055.2    1792
   10073  1792.3 10110.2  1790.2 10121.6  1790.9   10139  1792.5 10222.1  1793.7
   10322  1795.6 10374.2  1796.2 10485.5    1794 10581.9  1792.9   10712    1792
 10720.5  1791.2 10824.2  1790.2 10837.6  1785.6 10842.6  1785.7 10865.9  1787.4
 10897.9  1792.5 10939.7  1791.3 11027.4  1794.3 11060.5    1796 11145.9  1796.4
 11285.8  1796.3 11405.2  1796.8 11552.6  1797.9 11574.2    1800

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9591.2     .07  9591.2    .044 10055.2     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9591.2 10055.2                340     350     370              .1       .3
Left Levee      Station=  9591.2      Elevation=    1807
Right Levee     Station= 10055.2      Elevation=    1792

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.091

INPUT
Description: SECTION NO. AS


Station Elevation Data     num=       33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9641.3  1811.7  9676.9  1782.1  9726.3  1781.9  9742.3  1786.5  9856.7  1786.6
  9900.2  1786.5  9967.4  1785.1  9978.8  1782.5   10000  1780.8 10010.4  1780.9
 10050.9  1782.1 10108.3  1781.7 10121.5  1789.6 10160.5  1792.1 10223.1  1792.6
 10307.6  1792.9 10457.3  1791.1 10591.5  1789.3 10748.9  1787.6 10778.3  1786.6
 10797.4  1782.5 10809.4  1782.9 10850.7  1786.5 10876.8  1789.6 11005.3  1792.7
 11117.2  1793.1 11229.1  1792.3 11377.9  1792.6 11520.3    1792 11698.5  1792.3
 11860.8  1795.2 11901.4  1796.4 12045.9  1798.4

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9641.3     .07  9641.3    .044 10160.5     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9641.3 10160.5                330     360     400              .1       .3
Left Levee      Station=  9641.3      Elevation=  1811.7
Right Levee     Station= 10121.5      Elevation=  1789.6

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 28.023

INPUT
Description: SECTION NO. AR


Station Elevation Data     num=       47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    97701792.675  9777.6  1775.2  9806.4    1775     9813  1774.3  9821.4  1775.2
  9826.9  1776.6  9837.5  1779.2  9842.9  1780.7  9866.6  1781.5  9880.7  1782.4
  9892.3  1782.9  9937.4  1782.1  9958.7    1781  9970.3  1773.7  9995.9  1773.1
   10000  1772.5 10006.6  1773.7 10023.8  1775.1 10039.3  1777.1   10057    1778
   10067  1778.8 10073.4    1784 10077.1  1785.2 10111.8  1785.2 10157.6  1786.6
 10200.9  1787.2 10258.3  1789.7 10302.2  1789.6 10378.7  1787.7 10426.3  1787.3
 10545.4  1785.5 10604.2  1784.3 10662.6  1783.1   10699  1781.9 10706.3  1781.8
 10709.9  1780.7 10712.2  1780.7 10731.9  1783.4 10757.3  1782.8 10778.7  1783.1
 10811.5  1785.4 10870.5  1786.8   10952  1786.6 11033.3  1787.5 11082.5  1787.8
   11153  1788.5 11217.6    1789

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9770     .07    9770    .044 10077.1     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9770 10077.1                600     580     580              .1       .3
Left Levee      Station=    9770      Elevation=1792.675
Right Levee     Station= 10077.1      Elevation=  1785.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.913

INPUT
Description: SECTION NO. AQ


Station Elevation Data     num=       25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9944.2  1800.8   10000  1763.1 10037.3  1767.4 10080.7    1772 10111.6    1776
 10166.4  1776.8   10200  1776.7 10215.4  1777.9 10219.9  1781.2 10240.4  1782.1
 10276.9  1781.9 10431.4    1781 10609.3  1780.9 10668.7  1781.9 10784.1  1781.9
 10826.3  1778.4 10876.2  1777.5 10916.2  1780.8 10985.8  1781.2 11061.8  1782.2
 11083.6  1783.3 11122.1  1783.4 11228.2  1780.9 11365.8  1782.2 11411.6  1785.1
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9944.2     .07  9944.2    .036 10240.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9944.2 10240.4              620     610     600              .1       .3
Left Levee      Station=  9944.2      Elevation=  1800.8.
Right Levee     Station= 10240.4      Elevation=  1782.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.797

INPUT
Description: SECTION NO. AP


Station Elevation Data     num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    99691785.679   10000  1760.6 10008.1  1761.3   10040  1761.4 10049.5  1765.8
 10077.1    1771 10089.7  1771.9   10120  1772.3 10150.2  1771.6 10158.3  1776.1
 10265.3  1776.8 10353.5  1776.3 10418.5  1774.5 10519.8  1775.7 10634.1  1776.6
 10778.4  1777.1   10916  1777.6   10988  1772.3 10992.9  1772.4 11016.9  1773.4
   11050  1776.1 11106.7  1774.9 11127.1    1778 11190.5  1779.4 11313.3  1777.9
 11394.9  1778.6   11441  1780.5 11568.4  1782.1 11689.7  1782.7 11743.2    1782
 11912.3  1782.5 11962.9  1785.1

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9969     .07    9969    .036 10158.3     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9969 10158.3              560     550     550              .1       .3
Left Levee      Station=    9969      Elevation=1785.679
Right Levee     Station= 10158.3      Elevation=  1776.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.693

INPUT
Description: SECTION NO. AO


Station Elevation Data     num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9961.1  1791.7   10000  1756.3 10016.1  1757.7 10060.1  1760.3 10074.5  1762.8
 10088.7  1762.8 10105.9  1770.2 10195.8  1771.7 10231.3    1771 10351.8  1770.9
 10459.2  1772.3 10596.6  1774.7 10635.8  1775.1 10744.8  1773.7 10897.1  1769.7
   10935  1770.5 10957.3  1767.3 10990.2  1769.3 11023.8  1773.7 11078.2  1775.9
   11145    1776 11215.7  1772.4 11230.9    1773 11311.4  1776.9 11389.9  1778.9
 11565.4  1779.8   11724  1780.3 11801.6  1781.6 11816.4  1782.9

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9961.1     .07  9961.1    .036 10195.8     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9961.1 10195.8              490     470     460              .1       .3
Left Levee      Station=  9961.1      Elevation=  1791.7
Right Levee     Station= 10195.8      Elevation=  1771.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.604

INPUT
Description: SECTION NO. AN


Station Elevation Data     num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9740.2  1786.6  9792.1  1757.7  9813.5  1757.8  9823.8  1759.2  9851.8  1759.9
  9893.9  1757.7  9964.9  1754.3   10000  1754.2 10014.4  1765.2 10038.5  1764.4
 10081.8  1765.9 10113.1  1766.4 10150.4  1762.9   10183  1767.6 10240.7  1769.9
 10369.3  1768.9 10444.5  1769.6 10528.9    1769 10644.4  1769.2 10727.3  1767.4
   10765  1767.5 10793.9  1763.8 10830.3  1764.7 10867.7  1766.9 10888.5  1770.7
 11019.7  1771.5 11105.7  1774.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9740.2     .07  9740.2    .036 10014.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9740.2 10014.4              510     550     700              .1       .3
Left Levee      Station=  9740.2      Elevation=  1786.6
Right Levee     Station= 10014.4      Elevation=  1765.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.502

INPUT
Description: SECTION NO. AM
```

Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9853.5	1783.8	9947.5	1773.7	9983.2	1748.8	10000	1750.6	10025.5	1750.2
10058.7	1752.1	10086.3	1754.1	10126.6	1760.3	10150.4	1762.5	10240	1763
10265.8	1759.5	10275.2	1759.9	10280.7	1762	10302	1762	10312.7	1758.3
10330	1761.1	10350.4	1762.8	10409.1	1762	10489.2	1763	10589.5	1762.3
10675	1761.7	10723.2	1763	10740.2	1763.7	10779.4	1762.6	10837.3	1758.4
10852.6	1760.6	10887.2	1761	10918.1	1759.1	10935.3	1762.5	10969	1761.8
10979.4	1759.1	11005	1764.1	11054.2	1767.7	11108.1	1769.6	11175.4	1770.5
11287.4	1771.3	11384	1772						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9853.5	.07	9947.5	.036	10150.4	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9947.5	10150.4	430	450	510	.1	.3

Left Levee Station= 9947.5 Elevation= 1773.7
Right Levee Station= 10150.4 Elevation= 1762.5

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.417

INPUT
Description: SECTION NO. AL

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9848.4	1765.1	9889	1755.1	9942.8	1756.8	9989.2	1753.6	10000	1746.8
10057.8	1750.1	10121.9	1748.6	10141.8	1745.1	10177.2	1744.8	10200.8	1759.4
10367.6	1759.2	10536.5	1758.1	10689.7	1757.1	10725.2	1755.3	10783.7	1754.4
10842	1754	10860.1	1750.8	10893.3	1752.5	10912.4	1755.1	10941.7	1755.1
10962.6	1753.4	11035.1	1751.9	11041	1748.5	11049.8	1748.6	11095.5	1762
11211	1762.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9848.4	.07	9942.8	.044	10200.8	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9942.8	10200.8	250	270	290	.1	.3

Left Levee Station= 9942.8 Elevation= 1756.8
Right Levee Station= 10200.8 Elevation= 1755

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.366

INPUT
Description: SECTION NO. AK

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9702.7	1769.8	9737.6	1755.9	9748	1745.3	9771.9	1746.2	9859.2	1746.7
9920.5	1748.4	9933.9	1745.5	9976.9	1746.9	10000	1742.6	10086.6	1742.3
10102.2	1743.4	10110.1	1755.1	10177.6	1755.6	10242.7	1755.3	10286.6	1755.9
10345.9	1754.6	10457.4	1754.7	10521.7	1750.9	10555	1751.5	10569.5	1753.4
10608.2	1753.3	10654.5	1750.7	10780.6	1753.3	10821.9	1751.3	10925.4	1752.1
10952	1751.4	11021.9	1747.6	11027.9	1746	11040.4	1746.4	11076.4	1749.8
11112.3	1745.8	11140.4	1756.7	11165.3	1758.8	11295.8	1759.3	11409.8	1757.2
11478.6	1757.7	11533.4	1756.1	11558	1758	11593.2	1760.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9702.7	.07	9737.6	.044	10110.1	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9737.6	10110.1	230	240	240	.1	.3

Left Levee Station= 9737.6 Elevation= 1755.9
Right Levee Station= 10110.1 Elevation= 1750

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.32

INPUT
Description: SECTION NO. AJ

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9673.4	1760.8	9694.4	1752.3	9759.1	1752.8	9907.5	1749.8	9932.7	1743
9962.1	1742.9	10000	1740.3	10054	1740.9	10072.3	1754.9	10176.6	1751.7
10227.7	1750.2	10307.3	1750.3	10323	1751.9	10364.6	1752.2	10475.2	1750.2
10498.6	1751.7	10570	1752.1	10644.3	1749.6	10676	1751.5	10734	1750.8
10765.5	1751.3	10844.8	1749.9	10900.2	1746.3	10926.1	1746.8	11000.3	1749.3
11051.9	1744.4	11077.2	1742.8	11116.7	1743.9	11147.9	1755.9	11273.1	1758.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9673.4	.07	9907.5	.044	10072.3	.06

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9907.5 10072.3              260     275     300              .1       .3
Left Levee      Station=  9907.5      Elevation=  1749.8
Right Levee     Station= 10072.3      Elevation=    1750

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.265

INPUT
Description: SECTION NO. AI


Station Elevation Data     num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9689.5  1759.4  9689.6  1759.4  9689.7  1759.4  9703.1  1759.3  9739.2  1749.5
  9795.3    1751    9900  1750.2  9968.4    1747  9973.2  1735.7   10000  1736.3
   10044  1740.8 10063.1  1741.2 10128.7  1741.4 10164.2    1749 10201.7  1749.5
 10298.4    1750   10337  1750.7 10382.1  1750.2   10397  1747.8 10460.8  1746.6
 10469.8  1746.6 10509.2  1747.5 10531.9  1748.9 10575.2  1749.3 10618.4  1747.7
 10638.3  1746.4 10687.3  1746.2 10707.3  1747.1 10752.2  1746.8 10780.1  1743.1
 10795.7  1743.7 10810.8  1746.2 10849.5  1746.6 10861.6  1747.9 10861.7  1747.8
 10890.4    1748 10939.7  1744.6 10986.2  1745.4 11055.7  1746.1 11101.8  1739.9
   11124  1739.5 11134.3  1738.8 11149.2  1739.7 11174.7  1751.6 11300.7  1753.3
 11373.2  1755.4

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9689.5     .07    9900    .044 10164.2     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9900 10164.2              210     210     220              .1       .3
Left Levee      Station=    9900      Elevation=  1750.2
Right Levee     Station= 10164.2      Elevation=    1749

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.226

INPUT
Description: SECTION NO. AH


Station Elevation Data     num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9788.6    1765  9788.7    1765  9877.9  1744.5  9928.4  1743.7  9943.3  1735.6
  9989.5  1735.3   10000  1737.7   10065    1739 10106.8  1739.8 10145.4  1737.7
 10162.8  1736.4 10188.7  1737.7 10259.4  1736.6 10269.7    1735 10283.3  1735.6
 10320.4  1735.6 10332.8  1734.8   10380    1749 10432.1  1748.3 10448.1  1746.1
 10526.8  1744.5 10562.1    1745 10583.3  1747.2 10798.5  1745.3 10855.8  1739.5
 10881.8  1742.4 10936.1  1744.1 10999.9  1741.8 11013.1  1741.2 11029.8  1736.7
 11054.5  1737.8 11059.9  1739.5 11099.3  1750.7 11246.8  1750.6 11400.2  1753.4

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9788.6     .07  9928.4    .044   10380     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9928.4   10380              310     300     300              .1       .3
Left Levee      Station=  9928.4      Elevation=  1743.7
Right Levee     Station=   10380      Elevation=    1740

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.169

INPUT
Description: SECTION NO. AG


Station Elevation Data     num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9850.9  1753.5  9881.6  1734.4  9933.2    1736   10000  1735.9 10145.7  1732.1
 10155.1  1733.2 10194.3  1732.9   10218  1738.9 10265.5  1732.7 10315.5  1733.2
 10339.7  1733.9 10379.9  1743.4   10395  1745.5 10481.8  1741.7 10526.6  1741.6
 10538.6  1743.1 10564.2  1744.8 10687.1  1744.7 10812.4  1741.1 10854.3  1739.1
 10885.4  1740.2 10910.1  1734.5 10918.1  1734.7 10928.8  1738.5 10948.6  1736.7
 10976.7  1737.7 11000.2  1746.9 11111.9  1747.6

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9850.9     .07  9850.9    .044   10395     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9850.9   10395              400     330     310              .1       .3
Left Levee      Station=  9850.9      Elevation=  1753.5
Right Levee     Station=   10395      Elevation=    1740

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 27.106

INPUT
Description: SECTION NO. AF
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Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9730.7	1755.7	9730.8	1755.7	9788	1731.8	9802.8	1731.6	9808.5	1733.6
9830.2	1734.8	9869.5	1734.7	9905.8	1733.3	9916.8	1734.4	9979.5	1732.4
10000	1729.1	10019.5	1728.6	10026.5	1731	10051.7	1731.4	10066.4	1732.4
10109.9	1730.6	10125	1732.1	10150.1	1728.9	10179	1727.7	10190.7	1725.7
10205.6	1727.8	10215	1736.1	10259.5	1736.8	10275.3	1742.7	10408.1	1742
10443.8	1738.5	10468.6	1739	10494.5	1738.6	10550.7	1741.2	10653.9	1737.2
10686.8	1739.5	10728.3	1738.8	10755.3	1736.2	10761.5	1736.9	10798.5	1737.4
10818.3	1733	10877	1743.8	10979.2	1745.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9730.7	.07	9730.7	.044	10275.3	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9730.7	10275.3	540	520	500	.1	.3

Left Levee Station= 9730.7 Elevation= 1755.7
Right Levee Station= 10259.5 Elevation= 1736.8

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.008

INPUT
Description: SECTION NO. AE

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9657.3	1746.2	9677.5	1745.5	9702.2	1731.7	9760.8	1724.6	9803.4	1724
9811	1725.9	9819.2	1725.7	9836	1725.2	9853.3	1727.3	9898.1	1725.7
9902.7	1726.6	9935.3	1727.3	9947.4	1726.4	9981.1	1723	10000	1723.9
10013.3	1726	10033.6	1726.6	10072.1	1726.5	10089.8	1725.6	10119.1	1726
10144.7	1724.9	10154.3	1724.9	10164	1736.3	10243.9	1735.8	10272.1	1734.5
10293.2	1734	10322.9	1732.5	10346.2	1737.2	10441.5	1737	10548.5	1734.8
10662.5	1733.9	10671.2	1729.8	10675.8	1730.3	10683.5	1733.9	10724	1733.5
10735.7	1734.2	10771.9	1733.6	10788	1731.6	10811.4	1739.6	10846.8	1739.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9657.3	.07	9677.5	.044	10164	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9677.5	10164	400	400	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.921

INPUT
Description: SECTION NO. AD

Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9712.1	1739.4	9736.8	1725	9744.2	1723.7	9756.8	1723.1	9796.4	1722.1
9799.8	1722.1	9810.1	1723.2	9832.8	1722	9872.7	1723.2	9882	1723.9
9891	1724	9908	1723.1	9939.1	1723.2	9946.3	1722.6	9952.7	1720.7
9972.1	1721.1	10000	1720.2	10017.5	1720.3	10027.8	1723.1	10048.1	1724.6
10059.7	1725	10075.5	1725.1	10107.4	1724.1	10132.6	1722.7	10149	1731.9
10156.7	1732	10165.7	1732.1	10186.9	1733.5	10193.6	1732.2	10237.1	1732
10263.2	1734.4	10321.7	1734.3	10345.3	1735.1	10409.7	1734.7	10443	1735.5
10480.4	1734.5	10545.4	1728.1	10554.4	1728.5	10577.8	1732	10599.1	1732.5
10618.4	1733.4	10657.4	1734.3	10682.2	1733.4	10717.8	1733.5	10729.5	1733.3
10764.1	1728.8	10771.1	1730.5	10781.6	1731.2	10797.6	1731.3	10812.9	1729.2
10828.1	1731.1	10839.5	1731.1	10863	1729.1	10868.7	1727.4	10888.3	1728.3
10899.2	1732.9	10906.9	1735.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9712.1	.07	9712.1	.044	10149	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9712.1	10149	450	430	400	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.845

INPUT
Description: SECTION NO. AC

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9611.4	1733.1	9657.8	1731.1	9688.6	1721.2	9793.2	1721.3	9834.9	1718.9
9871	1718.8	9877.3	1717	9905.1	1718	10000	1717.4	10020.1	1728
10087.9	1727.3	10102	1729.9	10120.9	1729.5	10143.7	1719.2	10152.7	1719.6
10191.5	1722.4	10209.4	1730.2	10236.4	1730.2	10253.5	1724.1	10271.5	1725.3
10290.8	1727	10349.1	1728.1	10437.8	1729.1	10474.8	1729.4	10537.7	1728
10556.6	1725.9	10581.4	1729.4	10622.5	1729.9	10684.7	1728.9	10712	1728.5
10721.6	1731.6	10793.1	1731.1	10864.9	1731.3	10914.9	1729.9	10946.4	1729.9

10982.9	1728.4	11003.8	1726.7	11030.4	1726.3	11042.7	1727.3	11090.1	1729.3
11124.8	1728.9	11229.8	1726.3	11246.7	1721.4	11279.8	1733	11346.5	1734.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9611.4	.07	9657.8	.044	10020.1	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9657.8	10020.1	350	370	400	.1	.3

Right Levee Station= 10011 Elevation= 1721.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.775

INPUT
Description: SECTION NO. AB

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9691.5	1732.6	9766.7	1727.3	9914	1726.6	9920	1717	9967	1716.8
9980.1	1713.4	10000	1712.7	10018.8	1712.9	10027	1716.1	10072.7	1717.7
10107.9	1717.2	10187.6	1714.6	10207.6	1725.4	10229	1730.6	10296.7	1731.4
10391.5	1729.1	10446.8	1727.5	10465.7	1717.5	10489.7	1717.5	10502	1722.6
10561.3	1723.7	10596.4	1724.6	10685	1724.8	10729.9	1724	10770.1	1726.3
10806.5	1728.2	10931.3	1726.1	11003.7	1725.8	11039.1	1727.4	11121.5	1727
11192	1726.9	11304.1	1727.1	11425.9	1725.7	11447.1	1720.8	11492.7	1720
11554.6	1719.4	11578.7	1718.4	11599.8	1730.8	11618	1732.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9691.5	.07	9914	.044	10229	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9914	10229	390	420	470	.1	.3

Right Levee Station= 10202 Elevation= 1718.7

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.695

INPUT
Description: SECTION NO. AA

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9733.8	1724.9	9772.8	1723.1	9783.7	1718.4	9822.6	1714.6	9866.1	1714.3
9881.3	1721.4	9912.9	1719.6	9931.4	1710.6	9982.8	1709.5	9991.4	1709.5
10033.2	1709.9	10046.3	1710	10055.4	1724.6	10116.6	1723.8	10149.3	1721.7
10223.1	1723.3	10280.1	1727.2	10341.2	1725.9	10352.8	1713.2	10406.1	1713.1
10441.8	1716.9	10484.8	1718.6	10506	1720.9	10545.1	1719.7	10566	1715
10603.7	1719.2	10615.9	1724.2	10732.5	1722.9	10813.3	1723.6	10860.6	1722.9
10877.5	1721.2	10908.7	1722	11033.4	1722.4	11077.9	1721.5	11170.1	1722.9
11247.1	1722.6	11358.9	1721.6	11436.8	1714.6	11489.8	1714.9	11511.4	1725.3
11534.6	1727.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9733.8	.07	9772.8	.044	10055.4	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9772.8	10055.4	370	380	430	.1	.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.623

INPUT
Description: SECTION NO. Z

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9626.5	1721.7	9663.1	1708.4	9698.7	1703.9	9722.9	1704.6	9776	1704.3
9810.3	1707.3	9851.6	1708.9	9912.1	1707.8	9958.1	1705.2	10000	1705.1
10015.2	1709.5	10044.4	1709.9	10071	1712	10078.2	1714.1	10128.4	1720.1
10159.4	1719.4	10281.2	1720.4	10327.7	1718.6	10358.4	1718.9	10384	1720.9
10424.9	1721.8	10463.5	1721.3	10548.7	1718.5	10606.9	1716.8	10625.6	1713.9
10657.9	1717.2	10687.4	1718.2	10785.1	1718.1	10842.2	1715	10865.9	1713.5
10902.1	1714.1	10924.6	1717.7	10974.2	1714.2	11001.4	1707.5	11033.6	1712.7
11113	1714.2	11183.7	1715.9	11271.7	1720.1				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9626.5	.07	9626.5	.044	10128.4	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9626.5	10128.4	500	500	530	.1	.3

Right Levee Station= 10015.2 Elevation= 1709.9

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.529

INPUT
Description: SECTION NO. Y

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9731.2	1720	9764.3	1719.8	9799	1709.3	9827.8	1708.5	9878.2	1708.1
9891.7	1704.8	9916.7	1702.9	10000	1702.6	10004	1703.6	10054.1	1703.8
10089.2	1705.3	10126.1	1705.2	10149.1	1703.3	10177.6	1714	10237	1713.4
10373.5	1712.2	10397.1	1711.5	10453.4	1713.8	10511.4	1713.5	10550	1714.4
10598.1	1713.3	10665.4	1712.7	10683.3	1708.3	10713.3	1709.1	10718.4	1710.3
10750.8	1710.4	10766.7	1712.3	10824.3	1712.2	10897	1712.7	10966	1712.7
11000.4	1710.3	11013.6	1706.5	11047.9	1706	11071.9	1704.8	11102.6	1711.3
11143.7	1711.9	11201.5	1713.1	11315.3	1714.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9731.2	.07	9764.3	.044	10177.6	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9764.3	10177.6	530	520	520	.1	.3

Right Levee Station= 10161 Elevation= 1706.7

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.43

INPUT
Description: SECTION NO. X

Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9770	1711.8	9794.4	1700	9837.5	1700.9	9885	1699.8	10000	1700
10044	1701	10080	1702.3	10154.1	1701.8	10207	1700.1	10219.1	1697.7
10240.1	1697.5	10258.3	1706.6	10297.2	1710.5	10353.7	1711.7	10461	1710.5
10590.9	1707.7	10644.9	1708.7	10710.7	1706.2	10734.7	1706.6	10748.8	1708
10805.8	1709.2	10914.2	1707.7	10982.6	1709.3	11021.1	1706	11039.4	1702.2
11097	1700.6	11102.7	1702.7	11124.2	1704.4	11138.7	1704.3	11249.2	1708.1
11352	1710.9	11426.3	1712.5	11525.2	1713.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9770	.07	9770	.044	10353.7	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9770	10353.7	490	495	520	.1	.3

Right Levee Station= 10252 Elevation= 1702.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.335

INPUT
Description: SECTION NO. W

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9635	1710.764	9645.8	1700	9646	1699.991	9701.2	1697.4	9715.3	1696.7
9771.9	1696.7	9794.1	1698.6	9886.3	1698.8	9953.9	1696.6	10000	1695.6
10024.1	1698.8	10103.3	1699.7	10141.9	1698.6	10190.7	1698.9	10245.8	1696.9
10271.6	1704.2	10333.4	1705.6	10438.8	1705.8	10464.6	1702.6	10574.7	1702.8
10627.4	1701.1	10710.5	1704.5	10816.3	1703.5	10852.4	1702.4	10868.2	1700.5
10906.9	1699.9	10938.8	1699.2	10949.1	1699	10961.4	1704	11033.5	1705.3
11149	1706	11213.4	1705.5	11298.3	1704.2	11389.1	1702.6	11435	1699.2
11451.6	1700.2	11466.4	1705.5	11486.3	1707.8	11519.8	1709.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9635	.07	9635	.044	10333.4	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9635	10333.4	495	500	520	.1	.3

Right Levee Station= 10263 Elevation= 1700.6

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.239

INPUT
Description: SECTION NO. V

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9925	1707.875	9936.8	1692.8	10000	1692.8	10010.6	1697.2	10026.3	1700
10111.9	1700.8	10121.4	1695.5	10144.7	1693.3	10181.6	1693.1	10202	1699.5
10279.3	1701.3	10346.3	1702	10433.6	1699.1	10516.4	1698.2	10562.5	1699.5
10627.5	1700	10668.5	1700.4	10720.3	1699.7	10737.6	1695.6	10755	1696.1
10763.3	1698.4	10838.9	1700	10861.7	1698.1	10872.1	1698.1	10895.3	1696.1
10906.7	1695	10935.5	1700.5	11008.5	1700.7	11038	1699.2	11090	1698.6
11112.3	1699.5	11155.2	1699.1	11208.1	1697.7	11221.8	1693.3	11232.9	1693.6
11238.1	1696.2	11271.8	1697.2	11314.1	1697.8	11334	1699	11449	1700

```
 11535.4  1699.8 11560.8    1699 11615.5  1696.2 11751.2  1695.6 11769.2  1698.9
 11836.2  1702.2 11961.1  1704.3

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9925     .07    9925    .044 10279.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9925 10279.3              570     420     340              .1       .3
Right Levee     Station=   10194      Elevation=  1696.3

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 26.137

INPUT
Description: SECTION NO. U


Station Elevation Data     num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    99751712.935   10000  1685.7 10024.6  1686.6 10054.7    1691 10106.9  1695.9
 10139.1  1697.5   10162  1690.1 10231.1  1686.4 10296.6  1700.2 10317.4  1698.9
 10379.3  1696.6 10460.7  1695.4 10518.2  1694.2 10560.3  1695.5 10586.9  1695.3
 10631.9  1692.3 10643.6  1691.9 10660.5  1694.6 10744.8  1696.7 10795.2  1694.7
 10833.6  1694.3   10841  1696.8   10938  1697.5 10998.8  1695.3 11030.5    1696
 11148.8  1697.9 11214.6  1694.6 11262.3  1696.9 11297.9  1695.8 11316.3  1694.4
 11363.6  1694.3 11379.7  1694.4 11399.4  1691.9 11418.1  1691.9 11474.1  1690.6
 11490.6  1690.6 11497.1  1693.8   11536  1696.4 11621.4  1696.2 11662.1  1694.2
 11733.6  1693.6 11770.6  1694.9 11787.8  1697.5 11923.7  1698.4 11940.2  1700.1
 12055.1  1699.7   12465    1702

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9975     .07    9975    .044 10296.6     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975 10296.6              500     495     475              .1       .3
Right Levee     Station=   10259      Elevation=  1692.5

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 26.044

INPUT
Description: SECTION NO. T


Station Elevation Data     num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    99261702.915  9944.8    1685   10000  1684.3 10017.5  1691.1 10045.7  1691.8
 10058.4  1694.1 10076.8  1694.2 10134.3  1694.2   10240  1693.8 10270.3  1690.9
   10332     1686 10342.7  1689.4 10378.5  1691.3 10407.2  1692.5 10465.5  1692.8
 10541.6  1692.2 10574.8  1689.6 10591.8  1689.7 10609.2  1691.6 10748.9  1691.8
 10824.9  1687.8 10849.3  1689.9 10865.8  1693.9   10957  1693.1 11034.8  1693.6
 11097.4  1691.3 11180.3  1689.8 11196.2    1691 11249.8  1690.3 11302.9  1691.7
 11374.7    1691 11451.8  1686.1 11486.8  1687.1 11555.5  1686.7 11562.9  1689.2
 11592.4  1692.6   11660  1693.7   12000    1696   12220    1698

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9926     .07    9926    .044 10076.8     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9926 10076.8              750     650     400              .1       .3
Right Levee     Station= 10017.5      Elevation=  1691.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.919

INPUT
Description: SECTION NO. S


Station Elevation Data     num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9686.7  1694.2  9857.9  1690.3  9864.9  1690.2  9902.3  1686.4  9921.8  1684.4
  9956.5  1680.8  9980.4  1678.9  9987.9  1678.5   10000  1678.4 10007.5  1678.4
 10014.7  1678.8 10019.3  1679.3 10022.9    1681   10034  1687.1 10046.9  1689.1
 10072.2  1688.2 10120.8  1688.2 10136.7  1685.3 10143.4  1685.4 10152.9  1686.6
 10159.2  1687.7 10226.7  1687.3 10246.9  1681.8 10289.3  1680.5 10293.4  1680.4
 10298.9  1682.5 10305.9  1685.8 10345.6  1686.8 10366.4  1687.7   10561  1687.1
   10617  1685.6 10625.2  1685.5 10639.5  1683.6 10644.4  1683.3 10647.4  1683.3
 10656.5  1685.7 10705.2  1686.2 10756.9  1687.4 10767.4  1688.1 10776.6  1688.7
 10930.2  1689.9 10953.9  1689.9 11087.9  1687.2 11105.1  1687.9 11142.7  1688.5
 11175.7  1687.8 11194.1    1686 11221.4  1685.3 11238.4  1684.5 11289.2  1683.3
   11299     1683 11338.8  1689.7   11561    1692

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9686.7     .07  9857.9    .044 10046.9     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9857.9 10046.9              450     400     310              .1       .3
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Right Levee Station= 10032 Elevation= 1684.5

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.843

INPUT
Description: SECTION NO. R

Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9623.8	1698.3	9666.2	1684.2	9716.1	1682.9	9774.4	1685.7	9842	1685.9
9882.4	1686.1	9891.5	1685.8	9923.5	1682.4	9979.1	1679.7	9989.1	1676.2
10000	1673.9	10028.2	1673.5	10041.9	1674.4	10077.6	1685.5	10141.7	1684.1
10187	1685.2	10219.1	1684.6	10237.3	1682.3	10245	1678.2	10248.3	1678.1
10274	1679.5	10301	1680.1	10338.8	1676.7	10356	1682.8	10367.7	1684.8
10374.5	1684.8	10398.1	1683.7	10493.1	1682.5	10519.8	1679.7	10522.9	1679.8
10526.1	1681.2	10546.5	1684.2	10583	1685.2	10591.3	1685.1	10612.5	1683.1
10626.2	1683	10653.9	1684.3	10669.7	1685.9	10698.5	1686.2	10909.7	1683.4
10924.9	1684.3	10965.7	1685	10979.2	1681.9	10989.6	1675.8	11011.8	1676.2
11026.3	1682.7	11033.3	1683.4	11109.4	1684.2	11157.4	1683.2	11199.4	1682.7
11211.5	1678.9	11219.1	1679.2	11227.6	1682.2	11233.3	1683.8	11290.6	1684.9
11365	1690.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9623.8	.07	9891.5	.044	10077.6	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9891.5 10077.6 540 370 210 .1 .3
Left Levee Station= 9891.5 Elevation= 1685.8
Right Levee Station= 10061 Elevation= 1680.3

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.75

INPUT
Description: SECTION NO. Q

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9574.2	1686.2	9577.4	1684.2	9588.3	1677.3	9602.8	1677.2	9608.9	1678.2
9649.3	1678.4	9706	1680.3	9746.5	1680.1	9804.2	1679.6	9864.7	1680.3
9925.3	1682	9973.2	1675.5	9977.4	1671.6	10000	1672.1	10041	1673
10061.9	1681.9	10085.9	1682.4	10144	1680.2	10156	1677.4	10176.5	1674.9
10219.7	1674.5	10233.2	1676.7	10250.1	1680.6	10292.9	1681.5	10435.2	1684.2
10518.7	1684.7	10668.2	1682.8	10824.7	1679.8	10841.6	1675.2	10869.3	1675.3
10881.2	1678.7	10923.8	1679.6	10960	1680.5	11003.7	1679.4	11058.5	1678
11069.3	1681.2	11178.7	1682.8	11266.2	1686.9	11357.1	1687.5	11434	1688.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9574.2	.07	9925.3	.044	10085.9	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9925.3 10085.9 270 280 280 .1 .3
Left Levee Station= 9925.3 Elevation= 1682
Right Levee Station= 10055 Elevation= 1677.9

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.699

INPUT
Description: SECTION NO. P

Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9578.3	1683.7	9798.1	1678.6	9886.9	1677.9	9909.8	1671.6	9979.8	1670
10000	1669.4	10005.6	1672.4	10026.9	1673.1	10033	1678.4	10222.9	1681.5
10350.6	1681.3	10532	1680.2	10714	1679.8	10743.5	1678.2	10763.6	1672.4
10787.2	1671.9	10826.9	1672.1	10839.4	1675.7	10880.3	1678.6	10970.2	1679.2
11082.9	1680.4	11129.5	1685.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9578.3	.07	9886.9	.044	10033	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9886.9 10033 290 290 290 .1 .3
Left Levee Station= 9890 Elevation= 1676.7
Right Levee Station= 10033 Elevation= 1676.7

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.644

INPUT
Description: SECTION NO. O

```
Station Elevation Data     num=       25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9535.3    1680  9767.4  1677.2  9804.1  1675.7  9908.8  1676.6  9926.6  1669.8
   10000  1670.1 10013.5  1670.1 10030.5  1675.2 10061.5  1677.3 10119.8  1676.6
 10141.2  1678.8 10246.3  1678.6 10388.7  1677.6 10485.4  1677.1 10586.1  1676.7
   10633  1677.8 10683.4  1676.6 10719.7  1677.8 10774.8  1674.2   10825    1672
 10861.2  1669.3 10895.7  1676.8 10968.6  1676.5 11020.2  1675.5 11094.3  1682.8

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9535.3     .07  9908.8    .044 10061.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9908.8 10061.5              360     320     280             .1        .3
Left Levee      Station=  9908.8      Elevation=  1676.6
Right Levee     Station= 10030.5      Elevation=  1675.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.58

INPUT
Description: SECTION NO. N


Station Elevation Data     num=       25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9635.1    1678  9637.3    1677  9704.7  1671.6  9855.4  1671.8  9974.4  1674.1
   10000  1668.9   10089  1670.8 10121.5  1673.7 10276.2  1673.7 10346.8  1674.3
 10453.1  1673.5 10517.8  1672.9   10547  1672.2 10606.7  1672.9 10625.8  1673.9
 10732.4  1675.8 10818.6  1674.2 10867.2  1670.4 10895.8  1669.9 10935.7  1667.3
 10962.4  1665.9 10972.5  1666.8 10985.9    1670 11000.5  1675.5 11066.1  1680.6

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9635.1     .07  9974.4    .044 10121.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9974.4 10121.5              320     300     290             .1        .3
Left Levee      Station=  9974.4      Elevation=  1674.1
Right Levee     Station= 10121.5      Elevation=  1673.7

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.519

INPUT
Description: SECTION NO. M


Station Elevation Data     num=       24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9567.7    1678     9570    1672  9663.3  1669.9  9770.3  1670.4  9836.4  1671.4
  9915.1  1672.1     9946  1672.4    9970    1670   10000  1668.3 10058.9  1670.1
   10101  1672.2 10154.1  1671.6 10186.1  1671.5 10394.1  1670.6 10492.4  1670.5
 10616.3  1670.7 10795.5  1671.1 10831.1    1664 10872.3  1669.6   10940  1667.9
 10957.3  1661.6 10970.3  1661.6 10993.4  1675.6 11086.4  1679.2

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9567.7     .07    9946    .044   10101     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9946   10101              450     310     290             .1        .3
Left Levee      Station=    9946      Elevation=  1672.4
Right Levee     Station=   10101      Elevation=  1672.2

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.458

INPUT
Description: SECTION NO. L


Station Elevation Data     num=       27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9528.9  1677.1  9600.5  1672.1  9605.5    1668  9749.5  1667.8  9780.5  1668.1
  9825.6  1669.2  9883.2  1667.7  9916.8  1668.1  9934.3  1666.8  9952.8  1665.7
   10000  1665.5   10018  1667.2 10067.1  1669.1 10140.9  1664.9   10190    1668
 10558.9  1668.1 10573.8  1667.8 10601.9  1665.9 10794.7  1669.5 10819.1  1664.6
   10867  1664.3   10899  1667.1 10913.4  1667.1 10937.8  1664.1 10966.1  1660.5
 10989.1  1673.9   11145  1677.6

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9528.9     .07  9916.8    .044 10067.1     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9916.8 10067.1              390     360     380             .1        .3
Right Levee     Station= 10067.1      Elevation=  1669.1

CROSS SECTION           RIVER: RIVER-1
REACH: Reach-1             RS: 25.388
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INPUT
Description: SECTION NO. K

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9115.7	1678.8	9235.4	1668.5	9296.8	1666	9300.1	1665.6	9409	1666.4
9467.9	1665.9	9527	1661.5	9546.6	1656.6	9606.3	1660.5	9625.3	1663.8
9644.5	1666	9663	1664.6	9704	1665.2	9725.8	1666.5	9766	1666.8
9777.3	1665.9	9782	1664.7	9857.4	1665.4	9872.6	1666.5	9918.6	1666.1
10000	1665	10037.1	1666.3	10100.7	1666.1	10236.5	1664.3	10260.5	1665.2
10295.4	1664.2	10306.6	1662.9	10361.6	1664.8	10366.9	1665.9	10490.2	1666.4
10516	1662.5	10564.3	1662.2	10602.9	1660.1	10629.9	1660.4	10644.1	1663.8
10675.8	1665.5	10759.6	1672.2	10876.7	1674.1				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9115.7	.07	9467.9	.044	9644.5	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9467.9	9644.5	350	360	370	.1	.3

Right Levee Station= 9625.3 Elevation= 1663.8

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.326

INPUT
Description: SECTION NO. J

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9070.8	1666.5	9175.1	1665.5	9242.1	1661.1	9294.1	1661.4	9335.1	1661.5
9365.7	1657.2	9380.4	1653.2	9390.5	1653	9416.8	1657.2	9450.5	1657
9472.3	1659	9497.8	1661.1	9532.7	1660.8	9592.2	1660.1	9612.1	1662.9
9698.9	1663.6	9758	1663.8	9788.6	1662.5	9855.4	1661.6	9861.2	1662.5
9900.1	1662.2	9912	1659.7	9952.9	1658.9	9988.9	1659.2	10000	1656.4
10023.8	1656.5	10032.1	1660.3	10151.4	1661	10178.5	1660.9	10187.9	1657.8
10204.3	1657.7	10221.8	1661.5	10242.5	1659	10267.3	1658.9	10281.7	1656.4
10296.8	1661.5	10348.3	1660.3	10399.4	1658.9	10407.9	1661.2	10513.8	1664.2
10530.4	1666.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9070.8	.07	9335.1	.044	9497.8	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9335.1	9497.8	490	510	480	.1	.3

Left Levee Station= 9335.1 Elevation= 1661.5
Right Levee Station= 9497.8 Elevation= 1661.1

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.233

INPUT
Description: SECTION NO. I

Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8536.3	1664.2	8595.2	1663.9	8692.2	1660.9	8798.9	1658.6	8854.9	1658.1
8987.4	1656.2	9021.1	1658.8	9057.1	1659.7	9131.9	1660.4	9192.7	1658.7
9228.6	1659.6	9274.5	1659.1	9289.5	1653	9290.8	1647.3	9296.1	1647.3
9301.1	1648.9	9327.4	1650.3	9341.1	1655.3	9383.8	1656	9418.4	1656.1
9471.9	1655.7	9484.7	1657.3	9548	1657	9570	1657.7	9608.2	1657.2
9622.6	1656.2	9634.3	1656.4	9647.4	1658.2	9707.8	1657.4	9728.7	1654.8
9748.3	1655.8	9778.2	1656.7	9803.8	1657.5	9881	1657.4	9908.4	1657.1
9924.8	1654.4	9935.3	1656.1	9956.8	1656.7	9994.4	1653.9	10000	1652
10034.7	1652	10047.9	1657.4	10061.7	1656.8	10070	1655.4	10089.5	1656.6
10118.4	1654	10139.2	1657	10155.7	1656.5	10163.6	1652.5	10169.9	1652.6
10179.7	1656.7	10221.7	1657.4	10235.2	1653.7	10247.3	1655.4	10283.7	1655.8
10303.2	1658.2	10429.1	1658.6	10448.8	1659.1	10459.3	1661.5	10475.2	1663.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8536.3	.07	9274.5	.044	9383.8	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9274.5	9383.8	390	280	180	.1	.3

Left Levee Station= 9274.5 Elevation= 1659.1
Right Levee Station= 9383.8 Elevation= 1656

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.18

INPUT
Description: SECTION NO. H

Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

8859.3	1660.4	8905.9	1660.5	8986.1	1658.4	9017	1658	9047.1	1652
9057.1	1652	9065.1	1653.4	9144.5	1654.4	9161.8	1652.9	9200.6	1652
9213.5	1654.5	9262.6	1654.1	9306.6	1651.1	9319.4	1647.8	9353.2	1647.7
9371.6	1653.4	9387	1653.8	9413.7	1655.1	9490.2	1656.2	9515.2	1654.9
9544.3	1655.5	9581.6	1655.7	9597	1654.1	9633.5	1655.9	9660.4	1654.6
9698.9	1655.1	9707.3	1651.5	9717.8	1651.7	9725.7	1654.4	9749.7	1653.5
9785.9	1653	9814.3	1652.1	9830.6	1655.3	9894.7	1655.4	9911.5	1654.3
9924.2	1656.2	9944.4	1656.1	9955.6	1654.3	9969.6	1654.3	9978.6	1656
9986.8	1654.8	10000	1650.4	10046.2	1650.8	10072.4	1649.6	10076.1	1649.9
10097.1	1651.1	10114	1654.4	10135.8	1654.6	10157.7	1658.1	10214.9	1658
10240.1	1656.9	10265	1658.1	10356.6	1657.3	10390.4	1656.5	10430.2	1657.3
10537.3	1661.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8859.3	.07	9213.5	.044	9413.7	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9213.5	9413.7	500	430	430	.1	.3

Right Levee Station= 9413.7 Elevation= 1655.1

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.099

INPUT
Description: SECTION NO. G

Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8593.8	1658	8775	1655	8880	1655	8914	1654.8	8923.1	1648.2
8947.9	1647.6	8959	1649.3	8988	1650.6	9029	1651.2	9064.3	1650.7
9091.8	1651.2	9112.7	1651.5	9150.2	1650.7	9209.7	1649	9215.4	1649
9234.1	1651.3	9259.9	1652.4	9283.7	1652.5	9327.5	1652.5	9346	1652
9367.6	1646.9	9387.6	1646.2	9395.9	1646	9409.8	1646	9416	1649.2
9430.5	1650.8	9458.6	1652	9490.1	1652.6	9515.2	1651.6	9558.3	1650
9571.1	1648.1	9578.8	1648.2	9591.2	1650.6	9608	1652.3	9662.4	1653.1
9735.4	1652.4	9742.7	1650.6	9748.7	1650.3	9757.9	1650.4	9838.9	1653.2
9868.9	1652.5	9904.9	1651.7	9919.5	1651.4	9941.9	1651.3	9951.4	1648.4
9960.9	1648.9	9982.9	1649.4	10000	1648.2	10015.4	1648.9	10024.3	1651.3
10032	1653	10048.6	1653.9	10063.9	1654.4	10087.5	1654	10094.2	1653.5
10100.6	1650.9	10104	1651.2	10111.3	1652.8	10146.3	1654.1	10167	1654.9
10211.1	1655	10254.6	1655.4	10292.9	1653.4	10301.5	1654.8	10341.2	1659.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8593.8	.07	9327.5	.044	9490.1	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9327.5	9490.1	430	470	530	.1	.3

Right Levee Station= 9430.5 Elevation= 1650.8

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.01

INPUT
Description: SECTION NO. F

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8397.8	1653.4	8557.9	1653.2	8664	1650.2	8678.1	1645.5	8694.6	1645.1
8698.5	1643.6	8743.7	1642.1	8747.6	1643.4	8759	1644.1	8766.4	1645
8823.5	1646	8878.3	1643.6	8880.6	1641.3	8929.6	1640.2	9059.1	1641.7
9087.8	1641	9124.3	1641.2	9143.5	1642.7	9180.8	1642.5	9248.1	1647.3
9294.1	1646.9	9355.3	1646.9	9364.6	1644	9372.7	1644.4	9382.7	1646.5
9445.1	1647.4	9476.2	1648.3	9555.9	1649.3	9687.1	1650.4	9734.1	1647.5
9776.5	1647.4	9818.2	1646.5	9823.9	1644	9848.6	1645.2	9869	1648
9935.5	1646.9	9975	1644.5	10000	1643.9	10006.6	1642.5	10019.8	1642.7
10037.7	1652.2	10149.5	1654.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8397.8	.07	8823.5	.044	9248.1	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8823.5	9248.1	410	480	550	.1	.3

Right Levee Station= 9203 Elevation= 1643.91

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.919

INPUT
Description: SECTION NO. E

Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8046.2	1652.8	8068.4	1649.7	8168.9	1646.8	8195.5	1647.1	8249.6	1648
8266.1	1649	8326.9	1648	8422.4	1648.4	8461.9	1649.3	8494.5	1650.4
8588.8	1646.5	8604	1635.3	8637.8	1634.9	8647.2	1637.6	8695.7	1638.6
8709.6	1643.6	8729.6	1643.3	8768.3	1642.7	8785.3	1639.8	8813.8	1639.4

8836.9	1639.8	8858.9	1642.9	9045.7	1643.3	9126.5	1643.4	9133.6	1641.2
9152.9	1640.2	9184.9	1640.4	9199.9	1643.3	9243.9	1644	9302.9	1644.2
9335.8	1643.1	9351.3	1641.3	9379.6	1644.1	9538.9	1644.6	9559.5	1643.5
9583.1	1641.9	9599.3	1641.4	9611.3	1643.2	9654.2	1644.5	9688.9	1643.9
9795.8	1644.7	9882.5	1643.8	9927.7	1644.5	9936.8	1642.2	9971.5	1639.5
10000	1639.5	10008.5	1651.2	10153.9	1653.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8046.2	.07	8494.5	.044	8709.6	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8494.5	8709.6	460	390	350	.1	.3

Left Levee Station= 8494.5 Elevation= 1650.4
Right Levee Station= 8709.6 Elevation= 1643.6

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.845

INPUT
Description: SECTION NO. D

Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8242.8	1648.4	8353.1	1644.3	8493.6	1646.2	8556.4	1644.1	8674.4	1646.7
8697.6	1638.4	8702.9	1636	8721.1	1635.6	8773.9	1635.3	8792.8	1641.9
8826.7	1641.6	8873	1640.6	8878.1	1639.9	8893.9	1639.9	8914.9	1640.4
8921.4	1642.3	8981.3	1642.2	9007.5	1642.9	9040.8	1638.5	9043.4	1638.6
9066.8	1640.6	9103.1	1638.3	9129	1641.8	9191.6	1641.6	9245.9	1641.7
9249.8	1641.4	9272.1	1638.6	9279.6	1638.6	9296.3	1640.6	9345.5	1641.7
9388.9	1641.5	9406.6	1637.5	9448.5	1641.8	9507.2	1641.7	9526.6	1642.4
9556.3	1641.8	9630.9	1642.5	9667.2	1641.4	9689.7	1641.3	9710.8	1640
9730.6	1637.8	9749.6	1637.9	9781.1	1641.2	9840.6	1641.6	9961.4	1643.2
9967.8	1642.9	9988.1	1639.5	10038.9	1640.3	10067	1647.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8242.8	.07	8674.4	.044	8792.8	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8674.4	8792.8	560	490	490	.1	.3

Left Levee Station= 8674.4 Elevation= 1646.7
Right Levee Station= 8789 Elevation= 1640.1

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.752

INPUT
Description: SECTION NO. C

Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8690	1642.2	8727.7	1641	8789.8	1632.4	8835.7	1638.2	8868.3	1637.5
8884.2	1632.4	8921	1629.8	8925.4	1629.3	8941.5	1629.2	8967	1632.4
8997	1638.3	9047.9	1637.9	9064.6	1633.4	9070.6	1633.2	9099.4	1634.2
9110.6	1636.1	9205	1632.5	9223.2	1633.1	9233.2	1633.6	9246.8	1638.1
9253.7	1638.6	9282.6	1638.4	9358.8	1637.9	9374.5	1634.7	9385.2	1634.3
9393.9	1633.5	9402.7	1633.4	9420.2	1637.7	9431.3	1638.2	9450.7	1638.4
9459	1638.3	9464.9	1638.1	9480.8	1635.5	9493.4	1636.3	9503.5	1637.7
9518.2	1638.8	9531.6	1637.9	9543.1	1635.9	9566.7	1635.4	9589.5	1634.8
9594	1634.9	9600.3	1636.7	9625.9	1637.5	9646.3	1636.3	9667.4	1637.7
9686.1	1634.1	9690.2	1633.1	9707.1	1633.3	9738.1	1633.6	9747	1638.5
9764.4	1639.4	9774.5	1639.6	9783.1	1639.6	9797.1	1639.1	9807.5	1637.1
9813.6	1635.1	9913.6	1637.9	9930.4	1638.8	9944.8	1638.4	9953.9	1637.5
9962	1635.1	9981.5	1633.7	9990	1633.5	10000	1633.5	10010.2	1634.2
10019	1635.9	10029.9	1638.7	10039.1	1639.8	10045	1640	10062.5	1640.2
10071.4	1640.2	10090.9	1639.3	10098.7	1638.2	10103.6	1638.1	10127.7	1638
10134.5	1635.2	10148.5	1636.6	10163.8	1638	10181.1	1638.4	10192	1642.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8690	.07	8835.7	.044	8997	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8835.7	8997	850	560	430	.1	.3

Left Levee Station= 8876 Elevation= 1635.29
Right Levee Station= 8980 Elevation= 1635.21

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.646

INPUT
Description: SECTION NO. B

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8810	1636	8850	1635	8900	1634.5	8960	1632	9160	1630
9330	1630	9430	1631	9535	1630	9580	1630.5	9620	1630
9630	1627	9690	1626	9700	1630	9745.6	1630.5	9767.3	1629.1

9787.4	1629.8	9795.5	1633.2	9817.1	1634.6	9845.8	1632.7	9859.1	1631.3
9876.2	1631.4	9889.7	1633.8	9930.1	1632.8	9963.4	1632.6	10000	1628.2
10034.8	1627.2	10043.8	1628.3	10084.6	1629.3	10091.3	1630.5	10154.9	1634
10243.2	1634.2	10271	1634.5	10357	1633.7	10370.5	1634.1	10385.2	1634.1
10413.3	1633.5	10425.9	1631.8	10453.6	1631.7	10467.1	1634	10488.2	1634.7
10534.6	1634.6	10602.2	1634.9	10665.2	1634.8	10680.4	1633.7	10734.7	1634.8
10757.4	1635.4	10836.8	1634.9	10852.8	1634.6	10871.6	1634.1	10916.3	1635.1
10970.3	1636.1	11010.9	1636.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8810	.07	9580	.044	9745.6	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9580	9745.6	760	640	620	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev
8810	9430	

Left Levee Station= 9580 Elevation= 1630.5
Right Levee Station= 9745.6 Elevation= 1630.5

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.525

INPUT
Description: SECTION NO. A

Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8760	1640	8900	1630	8980	1626	9090	1624	9091	1623.9
9300	1624.8	9740	1626	9750	1628	9810	1629.5	9860.5	1629.3
9875.7	1625	9888.6	1624	9950.3	1624.6	10000	1623.9	10009	1628.1
10093.3	1629.5	10189.4	1629.5	10203.4	1628.4	10276	1627.7	10289.6	1627
10343.7	1626.2	10386.8	1626.5	10487.2	1626	10496.5	1624.3	10571	1626.2
10584.3	1626	10629.9	1625.6	10638.3	1626.5	10653	1626.8	10702.1	1626.7
10722.5	1627	10773	1626.5	10821.2	1630.2	10962.7	1630.2	11060.9	1630.8
11152.9	1630.5	11227.9	1631.1	11276.1	1632.2	11287.4	1632.1	11327.4	1631.8
11358.7	1631.3	11397.3	1632	11424.4	1632.9	11439.7	1633.4	11448.3	1634.4
11484	1636.7	11605.1	1638	11693.3	1639.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8760	.07	9860.5	.044	10093.3	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9860.5	10093.3	0	0	0	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev
8760	9300	

Left Levee Station= 9865 Elevation= 1628.1
Right Levee Station= 10009 Elevation= 1628.1

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	31.91	.06	.044	.07
Reach-1	31.87	.07	.044	.07
Reach-1	31.82	.07	.044	.07
Reach-1	31.75	.07	.044	.07
Reach-1	31.63	.07	.044	.06
Reach-1	31.54	.07	.044	.06
Reach-1	31.45	.07	.044	.06
Reach-1	31.34	.07	.044	.06
Reach-1	31.25	.07	.044	.06
Reach-1	31.17	.07	.044	.06
Reach-1	31.14	.07	.044	.06
Reach-1	31.05	.07	.044	.06
Reach-1	30.96	.07	.044	.06
Reach-1	30.85	.07	.044	.06
Reach-1	30.75	.07	.044	.07
Reach-1	30.65	.06	.044	.07
Reach-1	30.52	.06	.044	.07
Reach-1	30.42	.06	.044	.07
Reach-1	30.28	.06	.044	.07
Reach-1	30.2	.06	.044	.07
Reach-1	30.1	.06	.036	.07
Reach-1	29.85	.07	.036	.07
Reach-1	29.77	.07	.036	.07
Reach-1	29.72	.07	.036	.07
Reach-1	29.715	Bridge		
Reach-1	29.71	.07	.04	.07
Reach-1	29.663	.07	.044	.07
Reach-1	29.601	.07	.044	.07
Reach-1	29.538	.07	.05	.07
Reach-1	29.493	.07	.05	.07
Reach-1	29.387	.07	.05	.07
Reach-1	29.351	.07	.05	.07
Reach-1	29.258	.07	.044	.07

Reach-1	29.13	.07	.036	.07
Reach-1	29.012	.07	.036	.07
Reach-1	28.934	.07	.036	.07
Reach-1	28.847	.07	.036	.07
Reach-1	28.75	.07	.036	.07
Reach-1	28.657	.07	.036	.07
Reach-1	28.555	.07	.036	.07
Reach-1	28.462	.07	.036	.07
Reach-1	28.39	.07	.036	.07
Reach-1	28.326	.07	.036	.07
Reach-1	28.241	.07	.044	.07
Reach-1	28.157	.07	.044	.07
Reach-1	28.091	.07	.044	.07
Reach-1	28.023	.07	.044	.07
Reach-1	27.913	.07	.036	.07
Reach-1	27.797	.07	.036	.07
Reach-1	27.693	.07	.036	.07
Reach-1	27.604	.07	.036	.07
Reach-1	27.502	.07	.036	.07
Reach-1	27.417	.07	.044	.06
Reach-1	27.366	.07	.044	.06
Reach-1	27.32	.07	.044	.06
Reach-1	27.265	.07	.044	.06
Reach-1	27.226	.07	.044	.06
Reach-1	27.169	.07	.044	.06
Reach-1	27.106	.07	.044	.06
Reach-1	27.008	.07	.044	.06
Reach-1	26.921	.07	.044	.06
Reach-1	26.845	.07	.044	.06
Reach-1	26.775	.07	.044	.06
Reach-1	26.695	.07	.044	.06
Reach-1	26.623	.07	.044	.06
Reach-1	26.529	.07	.044	.06
Reach-1	26.43	.07	.044	.06
Reach-1	26.335	.07	.044	.06
Reach-1	26.239	.07	.044	.06
Reach-1	26.137	.07	.044	.06
Reach-1	26.044	.07	.044	.06
Reach-1	25.919	.07	.044	.06
Reach-1	25.843	.07	.044	.06
Reach-1	25.75	.07	.044	.06
Reach-1	25.699	.07	.044	.06
Reach-1	25.644	.07	.044	.06
Reach-1	25.58	.07	.044	.06
Reach-1	25.519	.07	.044	.06
Reach-1	25.458	.07	.044	.06
Reach-1	25.388	.07	.044	.06
Reach-1	25.326	.07	.044	.06
Reach-1	25.233	.07	.044	.06
Reach-1	25.18	.07	.044	.06
Reach-1	25.099	.07	.044	.06
Reach-1	25.01	.07	.044	.06
Reach-1	24.919	.07	.044	.06
Reach-1	24.845	.07	.044	.06
Reach-1	24.752	.07	.044	.06
Reach-1	24.646	.07	.044	.06
Reach-1	24.525	.07	.044	.06

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	31.91	240	208	210
Reach-1	31.87	220	243	260
Reach-1	31.82	360	361	370
Reach-1	31.75	680	647	650
Reach-1	31.63	450	453	430
Reach-1	31.54	475	484	475
Reach-1	31.45	590	592	620
Reach-1	31.34	450	474	450
Reach-1	31.25	400	432	400
Reach-1	31.17	130	162	130
Reach-1	31.14	500	467	350
Reach-1	31.05	470	494	460
Reach-1	30.96	550	541	570
Reach-1	30.85	525	569	570
Reach-1	30.75	475	486	450
Reach-1	30.65	700	696	650
Reach-1	30.52	600	560	500
Reach-1	30.42	500	713	650
Reach-1	30.28	550	421	430
Reach-1	30.2	535	537	545
Reach-1	30.1	1100	1304	1325
Reach-1	29.85	400	400	400
Reach-1	29.77	50	200	550
Reach-1	29.72	127	127	127
Reach-1	29.715	Bridge		
Reach-1	29.71	533	233	73
Reach-1	29.663	330	330	330
Reach-1	29.601	370	330	330

Reach-1	29.538	270	240	230
Reach-1	29.493	610	560	520
Reach-1	29.387	190	190	200
Reach-1	29.351	500	490	490
Reach-1	29.258	710	705	710
Reach-1	29.13	590	595	600
Reach-1	29.012	400	410	420
Reach-1	28.934	410	460	470
Reach-1	28.847	520	510	500
Reach-1	28.75	500	490	470
Reach-1	28.657	550	540	540
Reach-1	28.555	490	490	500
Reach-1	28.462	380	380	380
Reach-1	28.39	350	340	340
Reach-1	28.326	440	450	470
Reach-1	28.241	400	440	490
Reach-1	28.157	340	350	370
Reach-1	28.091	330	360	400
Reach-1	28.023	600	580	580
Reach-1	27.913	620	610	600
Reach-1	27.797	560	550	550
Reach-1	27.693	490	470	460
Reach-1	27.604	510	550	700
Reach-1	27.502	430	450	510
Reach-1	27.417	250	270	290
Reach-1	27.366	230	240	240
Reach-1	27.32	260	275	300
Reach-1	27.265	210	210	220
Reach-1	27.226	310	300	300
Reach-1	27.169	400	330	310
Reach-1	27.106	540	520	500
Reach-1	27.008	400	400	400
Reach-1	26.921	450	430	400
Reach-1	26.845	350	370	400
Reach-1	26.775	390	420	470
Reach-1	26.695	370	380	430
Reach-1	26.623	500	500	530
Reach-1	26.529	530	520	520
Reach-1	26.43	490	495	520
Reach-1	26.335	495	500	520
Reach-1	26.239	570	420	340
Reach-1	26.137	500	495	475
Reach-1	26.044	750	650	400
Reach-1	25.919	450	400	310
Reach-1	25.843	540	370	210
Reach-1	25.75	270	280	280
Reach-1	25.699	290	290	290
Reach-1	25.644	360	320	280
Reach-1	25.58	320	300	290
Reach-1	25.519	450	310	290
Reach-1	25.458	390	360	380
Reach-1	25.388	350	360	370
Reach-1	25.326	490	510	480
Reach-1	25.233	390	280	180
Reach-1	25.18	500	430	430
Reach-1	25.099	430	470	530
Reach-1	25.01	410	480	550
Reach-1	24.919	460	390	350
Reach-1	24.845	560	490	490
Reach-1	24.752	850	560	430
Reach-1	24.646	760	640	620
Reach-1	24.525	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	31.91	.1	.3
Reach-1	31.87	.1	.3
Reach-1	31.82	.1	.3
Reach-1	31.75	.1	.3
Reach-1	31.63	.1	.3
Reach-1	31.54	.1	.3
Reach-1	31.45	.1	.3
Reach-1	31.34	.1	.3
Reach-1	31.25	.1	.3
Reach-1	31.17	.1	.3
Reach-1	31.14	.1	.3
Reach-1	31.05	.1	.3
Reach-1	30.96	.1	.3
Reach-1	30.85	.1	.3
Reach-1	30.75	.1	.3
Reach-1	30.65	.1	.3
Reach-1	30.52	.1	.3
Reach-1	30.42	.1	.3
Reach-1	30.28	.1	.3
Reach-1	30.2	.1	.3
Reach-1	30.1	.1	.3
Reach-1	29.85	.1	.3
Reach-1	29.77	.3	.5

Reach-1	29.72		.1	.3
Reach-1	29.715	Bridge		
Reach-1	29.71		.1	.3
Reach-1	29.663		.1	.3
Reach-1	29.601		.1	.3
Reach-1	29.538		.1	.3
Reach-1	29.493		.1	.3
Reach-1	29.387		.1	.3
Reach-1	29.351		.1	.3
Reach-1	29.258		.1	.3
Reach-1	29.13		.1	.3
Reach-1	29.012		.1	.3
Reach-1	28.934		.1	.3
Reach-1	28.847		.1	.3
Reach-1	28.75		.1	.3
Reach-1	28.657		.1	.3
Reach-1	28.555		.1	.3
Reach-1	28.462		.1	.3
Reach-1	28.39		.1	.3
Reach-1	28.326		.1	.3
Reach-1	28.241		.1	.3
Reach-1	28.157		.1	.3
Reach-1	28.091		.1	.3
Reach-1	28.023		.1	.3
Reach-1	27.913		.1	.3
Reach-1	27.797		.1	.3
Reach-1	27.693		.1	.3
Reach-1	27.604		.1	.3
Reach-1	27.502		.1	.3
Reach-1	27.417		.1	.3
Reach-1	27.366		.1	.3
Reach-1	27.32		.1	.3
Reach-1	27.265		.1	.3
Reach-1	27.226		.1	.3
Reach-1	27.169		.1	.3
Reach-1	27.106		.1	.3
Reach-1	27.008		.1	.3
Reach-1	26.921		.1	.3
Reach-1	26.845		.1	.3
Reach-1	26.775		.1	.3
Reach-1	26.695		.1	.3
Reach-1	26.623		.1	.3
Reach-1	26.529		.1	.3
Reach-1	26.43		.1	.3
Reach-1	26.335		.1	.3
Reach-1	26.239		.1	.3
Reach-1	26.137		.1	.3
Reach-1	26.044		.1	.3
Reach-1	25.919		.1	.3
Reach-1	25.843		.1	.3
Reach-1	25.75		.1	.3
Reach-1	25.699		.1	.3
Reach-1	25.644		.1	.3
Reach-1	25.58		.1	.3
Reach-1	25.519		.1	.3
Reach-1	25.458		.1	.3
Reach-1	25.388		.1	.3
Reach-1	25.326		.1	.3
Reach-1	25.233		.1	.3
Reach-1	25.18		.1	.3
Reach-1	25.099		.1	.3
Reach-1	25.01		.1	.3
Reach-1	24.919		.1	.3
Reach-1	24.845		.1	.3
Reach-1	24.752		.1	.3
Reach-1	24.646		.1	.3
Reach-1	24.525		.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	31.91	33500.00	1953.30	1968.05	1965.47	1969.48	0.004228	11.83	4184.37	522.63	0.58
Reach-1	31.87	33500.00	1953.60	1966.21	1966.21	1968.29	0.006493	13.18	3621.26	529.26	0.70
Reach-1	31.82	33500.00	1952.70	1963.31	1963.31	1965.61	0.008958	13.63	3441.25	697.58	0.80
Reach-1	31.75	33500.00	1946.50	1958.64	1958.64	1960.97	0.008695	13.42	3625.50	861.01	0.79
Reach-1	31.63	33500.00	1940.50	1952.52	1951.92	1954.33	0.008293	12.86	3892.88	871.93	0.77
Reach-1	31.54	33500.00	1940.10	1948.64	1948.20	1950.38	0.009351	12.11	3712.76	943.01	0.80
Reach-1	31.45	33500.00	1933.10	1944.95	1944.61	1946.38	0.007130	11.90	4390.04	973.92	0.71
Reach-1	31.34	33500.00	1931.50	1940.55	1939.36	1941.82	0.007819	11.02	4203.35	787.06	0.73
Reach-1	31.25	33500.00	1925.40	1935.33	1935.13	1937.29	0.012122	12.97	3421.06	1056.52	0.89
Reach-1	31.17	33500.00	1920.80	1931.40	1930.67	1932.84	0.008639	10.73	3984.84	1010.73	0.75
Reach-1	31.14	33500.00	1917.80	1929.80	1929.59	1931.35	0.011311	12.44	4131.18	1043.04	0.86
Reach-1	31.05	33500.00	1917.10	1925.63	1925.12	1926.87	0.009897	11.39	4373.07	1023.91	0.80
Reach-1	30.96	33500.00	1912.30	1922.66	1920.90	1923.45	0.005085	9.08	5264.06	939.87	0.59
Reach-1	30.85	36000.00	1907.50	1917.33	1916.94	1919.26	0.011118	13.92	3798.08	798.67	0.88
Reach-1	30.75	36000.00	1901.00	1914.29	1911.90	1915.54	0.003973	9.62	4725.78	685.32	0.54
Reach-1	30.65	36000.00	1897.20	1910.53	1910.53	1912.67	0.009046	15.06	4066.76	805.13	0.81
Reach-1	30.52	36000.00	1893.50	1902.20	1902.20	1903.97	0.013469	11.28	3806.27	1102.22	0.90
Reach-1	30.42	36000.00	1885.80	1897.48	1895.99	1898.46	0.005195	8.56	5008.65	952.86	0.58
Reach-1	30.28	36000.00	1877.10	1892.29	1892.29	1894.43	0.006887	13.94	4257.63	876.42	0.72
Reach-1	30.2	36000.00	1875.20	1885.99	1885.99	1887.80	0.009208	13.05	4446.74	1121.86	0.80
Reach-1	30.1	36000.00	1867.40	1881.46	1879.28	1882.48	0.004574	10.80	5989.39	1281.66	0.68

Reach-1	29.85	36000.00	1857.70	1873.11	1873.11	1876.08	0.005698	16.35	4003.32	654.41	0.81
Reach-1	29.77	36000.00	1857.20	1868.84	1867.31	1871.79	0.005657	13.78	2611.67	273.49	0.79
Reach-1	29.72	36000.00	1855.00	1868.08	1865.80	1870.56	0.004404	12.65	2845.84	281.72	0.70
Reach-1	29.715	Bridge									
Reach-1	29.71	36000.00	1853.90	1864.33	1863.85	1867.72	0.009938	14.78	2436.11	302.84	0.92
Reach-1	29.663	36000.00	1850.90	1863.25	1862.31	1865.25	0.007493	11.58	3657.78	895.21	0.72
Reach-1	29.601	36000.00	1849.90	1859.80	1859.76	1862.23	0.011024	12.94	3329.31	773.46	0.86
Reach-1	29.538	36000.00	1845.50	1855.30	1855.15	1857.40	0.019220	11.69	3177.22	767.06	0.94
Reach-1	29.493	36000.00	1843.40	1852.84	1851.75	1854.00	0.009320	8.83	4397.67	941.66	0.67
Reach-1	29.387	36000.00	1838.80	1849.51	1846.90	1850.31	0.004690	7.44	5233.95	810.61	0.49
Reach-1	29.351	36000.00	1835.90	1848.50	1845.29	1849.43	0.004351	8.09	4856.18	624.02	0.49
Reach-1	29.258	36000.00	1828.70	1843.27	1841.69	1846.34	0.008309	14.08	2556.71	255.12	0.78
Reach-1	29.13	36000.00	1821.00	1838.33	1838.33	1841.49	0.005764	16.17	3685.68	811.89	0.81
Reach-1	29.012	35800.00	1818.70	1834.00	1834.00	1836.47	0.004521	14.40	4540.51	903.96	0.72
Reach-1	28.934	35800.00	1815.50	1830.00	1830.00	1832.39	0.005202	13.86	4499.65	1061.04	0.76
Reach-1	28.847	35800.00	1811.90	1826.12	1826.12	1828.57	0.004572	14.17	4481.77	923.34	0.73
Reach-1	28.75	35800.00	1808.30	1821.30	1821.30	1824.17	0.005859	14.34	3614.83	876.10	0.81
Reach-1	28.657	35800.00	1800.50	1817.60	1817.54	1820.36	0.006220	14.03	3453.90	707.83	0.81
Reach-1	28.555	35800.00	1799.40	1814.77	1814.77	1817.45	0.004643	14.46	4146.29	852.41	0.73
Reach-1	28.462	35800.00	1794.80	1809.87	1809.87	1812.33	0.004582	14.11	4501.73	975.20	0.72
Reach-1	28.39	35800.00	1792.80	1806.89	1806.89	1809.22	0.005634	14.17	4457.28	917.04	0.79
Reach-1	28.326	35800.00	1791.30	1803.93	1803.93	1806.17	0.005533	13.58	4552.50	1058.73	0.78
Reach-1	28.241	35800.00	1789.90	1799.19	1799.19	1801.01	0.010793	11.99	4184.53	1096.44	0.84
Reach-1	28.157	35800.00	1782.60	1794.02	1793.51	1795.68	0.009394	11.12	4281.37	1149.76	0.78
Reach-1	28.091	35800.00	1780.80	1790.77	1789.92	1792.40	0.009189	10.80	4043.81	916.94	0.77
Reach-1	28.023	35800.00	1772.50	1786.66	1786.09	1788.99	0.009110	12.84	3522.85	814.25	0.79
Reach-1	27.913	35800.00	1763.10	1783.00	1783.00	1785.16	0.004900	12.54	4441.08	1346.26	0.72
Reach-1	27.797	35800.00	1760.60	1779.27	1779.27	1781.30	0.004597	13.26	5275.84	1418.17	0.71
Reach-1	27.693	35800.00	1756.30	1774.68	1774.68	1777.17	0.006403	14.15	4288.87	1090.15	0.82
Reach-1	27.604	35800.00	1754.20	1767.51	1766.98	1770.58	0.005926	14.38	3004.91	556.89	0.81
Reach-1	27.502	35800.00	1748.80	1765.01	1765.01	1767.26	0.004926	13.65	4678.95	1057.45	0.74
Reach-1	27.417	35800.00	1744.80	1757.10	1757.10	1759.63	0.012360	14.21	3328.58	705.57	0.91
Reach-1	27.366	35800.00	1742.30	1754.93	1752.38	1755.76	0.003014	8.09	6059.03	1176.36	0.47
Reach-1	27.32	35800.00	1740.30	1752.95	1752.95	1754.62	0.006945	12.95	5066.35	1381.39	0.72
Reach-1	27.265	35800.00	1735.70	1749.01	1749.01	1750.81	0.011416	12.95	4039.74	979.37	0.86
Reach-1	27.226	35800.00	1734.80	1743.60	1743.22	1745.83	0.011989	12.37	3216.55	662.85	0.88
Reach-1	27.169	35800.00	1732.10	1742.04	1740.04	1743.25	0.005238	9.10	4330.07	768.74	0.60
Reach-1	27.106	35800.00	1725.70	1737.90	1737.90	1740.41	0.014755	12.82	2917.64	624.66	0.95
Reach-1	27.008	35800.00	1723.00	1733.67	1731.76	1735.26	0.006156	10.14	3598.07	559.40	0.65
Reach-1	26.921	35800.00	1720.20	1731.38	1729.22	1732.93	0.005468	10.09	3794.21	635.22	0.62
Reach-1	26.845	39700.00	1717.00	1728.16	1726.79	1730.14	0.007518	11.92	3943.39	848.70	0.73
Reach-1	26.775	39700.00	1712.70	1725.78	1724.13	1727.53	0.006144	11.57	4395.07	778.11	0.66
Reach-1	26.695	39700.00	1709.50	1720.44	1720.44	1723.35	0.016132	15.46	3272.53	625.43	1.02
Reach-1	26.623	39700.00	1703.90	1716.70	1713.44	1717.82	0.003624	8.79	5238.69	874.57	0.51
Reach-1	26.529	39700.00	1702.60	1712.20	1711.30	1714.67	0.011787	13.25	3486.83	707.19	0.89
Reach-1	26.43	39700.00	1697.50	1707.48	1706.44	1709.23	0.008664	11.06	4033.19	781.67	0.76
Reach-1	26.335	39700.00	1695.60	1705.12	1703.13	1705.95	0.004431	7.80	6284.85	1478.10	0.54
Reach-1	26.239	39700.00	1692.80	1701.77	1701.23	1702.59	0.010940	9.50	6111.71	1868.72	0.79
Reach-1	26.137	39700.00	1685.70	1698.34	1697.63	1699.32	0.006975	10.15	6554.42	1880.91	0.67
Reach-1	26.044	39700.00	1684.30	1695.21	1694.19	1695.82	0.007065	9.61	7311.26	1949.86	0.67
Reach-1	25.919	39700.00	1678.40	1690.30	1690.30	1691.58	0.011051	12.57	5518.09	1539.04	0.85
Reach-1	25.843	39700.00	1673.50	1686.65	1686.43	1687.88	0.009227	12.24	5879.07	1654.54	0.79
Reach-1	25.75	39700.00	1671.60	1685.28	1683.28	1685.87	0.004061	9.09	8004.06	1656.01	0.54
Reach-1	25.699	39700.00	1669.40	1682.72	1682.72	1684.35	0.006634	13.35	5884.18	1485.45	0.71
Reach-1	25.644	39700.00	1669.80	1680.16	1680.16	1681.64	0.009843	13.55	5613.32	1532.23	0.83
Reach-1	25.58	39700.00	1668.90	1677.21	1676.13	1678.04	0.008293	10.72	6183.56	1385.64	0.74
Reach-1	25.519	39700.00	1668.30	1674.63	1673.37	1675.36	0.009628	9.16	6093.05	1422.81	0.75
Reach-1	25.458	39700.00	1665.50	1672.32	1670.46	1672.90	0.006131	8.24	6878.45	1389.10	0.62
Reach-1	25.388	39700.00	1656.60	1668.47	1668.32	1669.82	0.010880	12.90	5433.54	1476.63	0.86
Reach-1	25.326	39700.00	1653.00	1664.85	1664.46	1666.09	0.009414	12.48	5537.50	1334.03	0.80
Reach-1	25.233	41400.00	1647.30	1661.03	1660.08	1661.85	0.007578	11.24	6918.73	1769.13	0.70
Reach-1	25.18	41400.00	1647.70	1659.85	1657.59	1660.45	0.004509	8.81	7794.57	1560.11	0.56
Reach-1	25.099	41400.00	1646.00	1654.80	1654.80	1656.49	0.023052	14.87	4520.29	1285.75	1.17
Reach-1	25.01	41400.00	1640.20	1650.09	1648.56	1651.09	0.004725	9.11	6274.56	1327.21	0.57
Reach-1	24.919	41400.00	1634.90	1648.14	1646.75	1648.70	0.004189	8.55	7785.38	1457.25	0.53
Reach-1	24.845	41400.00	1635.30	1644.66	1644.66	1646.13	0.013083	14.69	5277.80	1376.03	0.94
Reach-1	24.752	41400.00	1629.20	1641.09	1639.49	1641.79	0.005513	9.70	7164.79	1464.26	0.61
Reach-1	24.646	41400.00	1626.00	1636.13	1636.13	1637.68	0.011638	13.86	5503.20	2163.25	0.89
Reach-1	24.525	41400.00	1623.90	1632.64	1629.36	1632.95	0.003004	6.39	10251.72	2553.56	0.44

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Future

River: RIVER-1 Reach: Reach-1 RS: 31.91 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.87 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: RIVER-1 Reach: Reach-1 RS: 31.82 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: RIVER-1 Reach: Reach-1 RS: 31.75 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.63 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 31.54 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 31.45 Profile: 100-year
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.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: RIVER-1 Reach: Reach-1 RS: 31.34 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.25 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.17 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.14 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 31.05 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.96 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.85 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.75 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.65 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: RIVER-1 Reach: Reach-1 RS: 30.52 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 30.42 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 30.28 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 30.2 Profile: 100-year

Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 30.1 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.85 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 29.77 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.72 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.715 Profile: 100-year
Warning:The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should be run as a mixed flow problem.
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
River: RIVER-1 Reach: Reach-1 RS: 29.715 Profile: 100-year Upstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: RIVER-1 Reach: Reach-1 RS: 29.715 Profile: 100-year Downstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: RIVER-1 Reach: Reach-1 RS: 29.71 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.663 Profile: 100-year
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.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 29.601 Profile: 100-year
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.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 29.538 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.493 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.351 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.258 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 29.13 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 29.012 Profile: 100-year
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.934 Profile: 100-year
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.847 Profile: 100-year
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.75 Profile: 100-year
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.657 Profile: 100-year
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 28.555 Profile: 100-year
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.462 Profile: 100-year
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.39 Profile: 100-year
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.326 Profile: 100-year
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.241 Profile: 100-year
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The

program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.157 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 28.091 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 28.023 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 27.913 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 27.797 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 27.693 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 27.604 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 27.502 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 27.417 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: RIVER-1 Reach: Reach-1 RS: 27.366 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 27.32 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 27.265 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 27.226 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 27.169 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 27.106 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 27.008 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 26.921 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 26.845 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 26.775 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 26.695 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 26.623 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 26.529 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 26.43 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 26.335 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 26.239 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 26.137 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 26.044 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.919 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 25.843 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.75 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.699 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 25.644 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 25.58 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.519 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.458 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.388 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.326 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.233 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.18 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 25.099 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The

program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 25.01 Profile: 100-year
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.
River: RIVER-1 Reach: Reach-1 RS: 24.919 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 24.845 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: RIVER-1 Reach: Reach-1 RS: 24.752 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 24.646 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

APPENDIX F.4

Apache Wash: FDS Model

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Apache Wash WMP
Project File : Apache1.prj
Run Date and Time: 1/20/00 8:53:40 AM

Project in English units

Project Description:
Upper Cave Creek and Apache Wash Watercourse Master Plan

For Apache Wash
above Cave Buttes Dam
by Stantec Consulting Inc. for the Flood Control
District of Maricopa County
FCD:

March 1999

PLAN DATA

Plan Title: Apache Wash FDS
Plan File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.p17

Geometry Title: Base Geometry (imported from FDS models)
Geometry File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.g17

Flow Title : FDS Discharges
Flow File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.f01

Plan Summary Information:
Number of: Cross Sections = 148 Mulitple Openings = 0
Culverts = 1 Inline Weirs = 0
Bridges = 0

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

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = Apache Wash Reach = Reach 1

RS	Profile	Method	Value1	Value2
8.5	100yr encr	1	9952	10075
8.4	100yr encr	1	9916	10039
8.31	100yr encr	1	9978	10065
8.21	100yr encr	1	9944	10040
8.12	100yr encr	1	9950	10120
8.02	100yr encr	1	9825	10110
7.98	100yr encr	1	9700	10075
7.89	100yr encr	1	9875	10155
7.84	100yr encr	1	9885	10110
7.74	100yr encr	1	9850	10131
7.65	100yr encr	1	9800	10050
7.55	100yr encr	1	9911	10150
7.46	100yr encr	1	9923	10110
7.36	100yr encr	1	9825	10040.3
7.28	100yr encr	1	9755	10042.8
7.17	100yr encr	1	9951	10097
7.08	100yr encr	1	9926	10066
6.98	100yr encr	1	9900	10075

6.9	100yr encr	1	9822	10024
6.8	100yr encr	1	9800	10037
6.71	100yr encr	1	9965	10150
6.63	100yr encr	1	9982	10140
6.58	100yr encr	1	9926	10100
6.5	100yr encr	1	9850	10072
6.43	100yr encr	1	9800	10040
6.32	100yr encr	1	9957	10240
6.25	100yr encr	1	9940	10240
6.16	100yr encr	1	9974	10319
6.09	100yr encr	1	9920	10230
6.01	100yr encr	1	9920	10250
5.92	100yr encr	1	9940	10250
5.83	100yr encr	1	9820	10120
5.76	100yr encr	1	9705	10100
5.66	100yr encr	1	9800	10120
5.64	100yr encr	1	9870	10180
5.57	100yr encr	1	9812	10050
5.48	100yr encr	1	9860	10120
5.38	100yr encr	1	9860	10100
5.31	100yr encr	1	9808	10100
5.21	100yr encr	1	9850	10175
5.15	100yr encr	1	9962	10330
5.09	100yr encr	1	9890	10320
5.03	100yr encr	1	9900	10350
4.96	100yr encr	1	9900	10350
4.9	100yr encr	1	9825	10340
4.82	100yr encr	1	9832	10456
4.78	100yr encr	1	9971	10640
4.74	100yr encr	1	9822	10700
4.65	100yr encr	1	9820	10360
4.6	100yr encr	1	9890	10500
4.58	100yr encr	1	9900	10500
4.57	100yr encr	1	9910	10500
4.56	100yr encr	1	9944	10216
4.49	100yr encr	1	9910	10183
4.4	100yr encr	1	9938	10249
4.31	100yr encr	1	9920	10114
4.23	100yr encr	1	9830	10097
4.22	100yr encr	1	9780	10082
4.11	100yr encr	1	9975	10293
4.05	100yr encr	1	9968	10270
3.96	100yr encr	1	9877	10433
3.86	100yr encr	1	9950	10330
3.78	100yr encr	1	9950	10226
3.75	100yr encr	1	9960	10220
3.65	100yr encr	1	9900	10190
3.6	100yr encr	1	9891	10160
3.52	100yr encr	1	9900	10141
3.48	100yr encr	1	9900	10170
3.4	100yr encr	1	9800	10140
3.32	100yr encr	1	9800	10175
3.21	100yr encr	1	9780	10170
3.13	100yr encr	1	9600	10068
3.07	100yr encr	1	9740	10150
2.97	100yr encr	1	8995.5	9365
2.92	100yr encr	1	9350	10190

River = Apache Wash Reach = Reach 2

RS	Profile	Method	Value1	Value2
2.90	100yr encr	1	9530	10300
2.87	100yr encr	1	9400	10040
2.82	100yr encr	1	9530	10050
2.73	100yr encr	1	9787	10080

River = Apache Wash Reach = Reach 1a

RS	Profile	Method	Value1	Value2
8.02	100yr encr	1	9825	10110
7.98	100yr encr	1	9700	10075
7.89	100yr encr	1	9875	10155
7.84	100yr encr	1	9885	10110
7.74	100yr encr	1	9850	10131
7.65	100yr encr	1	9800	10050
7.55	100yr encr	1	9911	10150
7.46	100yr encr	1	9923	10110
7.36	100yr encr	1	9825	10040.3
7.28	100yr encr	1	9755	10042.8
7.17	100yr encr	1	9951	10097
7.08	100yr encr	1	9926	10066
6.98	100yr encr	1	9900	10075
6.9	100yr encr	1	9822	10024
6.8	100yr encr	1	9800	10037
6.71	100yr encr	1	9965	10150
6.63	100yr encr	1	9982	10140
6.58	100yr encr	1	9926	10100
6.5	100yr encr	1	9850	10072
6.43	100yr encr	1	9800	10040
6.32	100yr encr	1	9957	10240
6.25	100yr encr	1	9940	10240
6.16	100yr encr	1	9974	10319
6.09	100yr encr	1	9920	10230
6.01	100yr encr	1	9920	10250
5.92	100yr encr	1	9940	10250
5.83	100yr encr	1	9820	10120
5.76	100yr encr	1	9705	10100

5.66	100yr encr	1	9800	10120
5.64	100yr encr	1	9870	10180
.57	100yr encr	1	9812	10050
.48	100yr encr	1	9860	10120
5.38	100yr encr	1	9860	10100
5.31	100yr encr	1	9808	10100
5.21	100yr encr	1	9850	10175
5.15	100yr encr	1	9962	10330
5.09	100yr encr	1	9890	10320
5.03	100yr encr	1	9900	10350
4.96	100yr encr	1	9900	10350
4.9	100yr encr	1	9825	10340
4.82	100yr encr	1	9832	10456
4.78	100yr encr	1	9964.87	10640

River = Apache Wash Reach = Reach 1b

RS	Profile	Method	Value1	Value2
4.74	100yr encr	1	9822	10700
4.65	100yr encr	1	9820	10360
4.6	100yr encr	1	9890	10500
4.58	100yr encr	1	9900	10500
4.575	100yr encr	1	9910	10500
4.56	100yr encr	1	9944	10216
4.49	100yr encr	1	9910	10183
4.4	100yr encr	1	9938	10249
4.31	100yr encr	1	9920	10114
4.23	100yr encr	1	9830	10097
4.22	100yr encr	1	9780	10082
4.11	100yr encr	1	9975	10293
4.05	100yr encr	1	9968	10270

River = Apache Wash Reach = Reach 1c

RS	Profile	Method	Value1	Value2
3.96	100yr encr	1	9877	10433
3.86	100yr encr	1	9950	10330
3.78	100yr encr	1	9950	10226
3.75	100yr encr	1	9960	10220
3.65	100yr encr	1	9900	10190
3.6	100yr encr	1	9891	10160
3.52	100yr encr	1	9900	10141
3.48	100yr encr	1	9900	10170
3.4	100yr encr	1	9800	10140
3.32	100yr encr	1	9800	10175
3.21	100yr encr	1	9780	10170
3.13	100yr encr	1	9600	10068
3.07	100yr encr	1	9740	10150
2.97	100yr encr	1	8995.5	11098
.92	100yr encr	1	9350	10755

River = Apache Wash Reach = Reach 3

RS	Profile	Method	Value1	Value2
2.60	100yr encr	1	9800	10450
2.52	100yr encr	1	9850	10385
2.47	100yr encr	1	9940	10310
2.40	100yr encr	1	9800	10047
2.33	100yr encr	1	9830	10042
2.24	100yr encr	1	9850	10155
2.17	100yr encr	1	9834	10285
2.08	100yr encr	1	9970	10620
2.00	100yr encr	1	9969	10760
1.88	100yr encr	1	9771	10410
1.85	100yr encr	1	9819	10400
1.81	100yr encr	1	9947	10410
1.75	100yr encr	1	9953	10321
1.66	100yr encr	1	9860	10250
1.60	100yr encr	1	9610	10049
1.56	100yr encr	1	9610	10057
1.47	100yr encr	1	9570	10060
1.37	100yr encr	1	9560	10052
1.27	100yr encr	1	9880	10290
1.18	100yr encr	1	9885	10375
1.09	100yr encr	1	9923	10430
0.99	100yr encr	1	9931	10550
0.84	100yr encr	1	9885	10280
0.75	100yr encr	1	9750	10214
0.71	100yr encr	1	9730	10150
0.63	100yr encr	1	9662	10180
0.54	100yr encr	1	9840	10340
0.43	100yr encr	1	9900	10368
0.33	100yr encr	1	9900	10300
0.20	100yr encr	1	9600	10190

River = Desert Hills Was Reach = Reach 3

RS	Profile	Method	Value1	Value2
2.60	100yr encr	1	9800	10450
2.52	100yr encr	1	9850	10385
2.47	100yr encr	1	9940	10310
2.40	100yr encr	1	9800	10047
2.33	100yr encr	1	9830	10042
2.24	100yr encr	1	9850	10155
2.17	100yr encr	1	9834	10285
2.08	100yr encr	1	9970	10620
.00	100yr encr	1	9969	10760
.88	100yr encr	1	9771	10410
1.85	100yr encr	1	9819	10400

1.81	100yr encr	1	9947	10410
1.75	100yr encr	1	9953	10321
.66	100yr encr	1	9860	10250
.60	100yr encr	1	9610	10049
1.56	100yr encr	1	9610	10057
1.47	100yr encr	1	9570	10060
1.37	100yr encr	1	9560	10052
1.27	100yr encr	1	9880	10290
1.18	100yr encr	1	9885	10375
1.09	100yr encr	1	9923	10430
0.99	100yr encr	1	9931	10550
0.84	100yr encr	1	9885	10280
0.75	100yr encr	1	9750	10214
0.71	100yr encr	1	9730	10150
0.63	100yr encr	1	9662	10180
0.54	100yr encr	1	9840	10340
0.43	100yr encr	1	9900	10368
0.33	100yr encr	1	9900	10300
0.20	100yr encr	1	9600	10190

River = Desert Hills Was Reach = Reach 1

RS	Profile	Method	Value1	Value2
0.99	100yr encr	1	9750	10175
0.90	100yr encr	1	9750	10200
0.81	100yr encr	1	9750	10350
0.72	100yr encr	1	9950	10335
0.64	100yr encr	1	9750	10230
0.56	100yr encr	1	9513	10084
0.48	100yr encr	1	9758	10314
0.40	100yr encr	1	9580	10120

River = Paradise Wash Reach = Reach 1

RS	Profile	Method	Value1	Value2
4.51	100yr encr	1	9986	10027.3
4.41	100yr encr	1	9971	10050
4.32	100yr encr	1	9971	10024.8
4.2	100yr encr	1	9966.3	10041
4.1	100yr encr	1	9989.7	10056.3
4.03	100yr encr	1	9971.4	10048.6
3.93	100yr encr	1	9977	10035
3.84	100yr encr	1	9971	10020.3
3.75	100yr encr	1	9957.5	10014.5
3.67	100yr encr	1	9977	10035
3.58	100yr encr	1	9957	10023
3.49	100yr encr	1	9984	10037
3.4	100yr encr	1	9977	10039
3.3	100yr encr	1	9962	10037
3.263	100yr encr	1	9979	10036
.244	100yr encr	1	9981	10070
3.224	100yr encr	1	9965	10034
3.206	100yr encr	1	9965	10035
3.177	100yr encr	1	9988	10013
3.149	100yr encr	1	9988	10012
3.14	100yr encr	1	9966	10034
3.13	100yr encr	1	9965	10035
3.12	100yr encr	1	9964	10036
3.111	100yr encr	1	9966	10033
3.08	100yr encr	1	9977.9	10062
2.97	100yr encr	1	9927	10022
2.88	100yr encr	1	9977.2	10038
2.79	100yr encr	1	9958.44	10042.24
2.71	100yr encr	1	9950.9	10035
2.62	100yr encr	1	9950	10048
2.53	100yr encr	1	9940	10041
2.45	100yr encr	1	9968	10070
2.37	100yr encr	1	9962	10082
2.23	100yr encr	1	9937	10150
2.14	100yr encr	1	9965.2	10219
2.07	100yr encr	1	9956.8	10270
2.00	100yr encr	1	9965.67	10180
1.92	100yr encr	1	9928	10100
1.83	100yr encr	1	9968	10190
1.75	100yr encr	1	9940	10306
1.65	100yr encr	1	9915	10418
1.54	100yr encr	1	9972	10228
1.46	100yr encr	1	9885	10179
1.37	100yr encr	1	9866	10069
1.27	100yr encr	1	9960	10150
1.21	100yr encr	1	9750	10131
1.12	100yr encr	1	9640	10031
1.04	100yr encr	1	9750	10058
0.95	100yr encr	1	9870	10120
0.89	100yr encr	1	9930	10100
0.80	100yr encr	1	9870	10150
0.72	100yr encr	1	9800	10062
0.62	100yr encr	1	9900	10170
0.53	100yr encr	1	9880	10108
0.44	100yr encr	1	9900	10166
0.34	100yr encr	1	9905	10327
0.28	100yr encr	1	9814	10085
0.17	100yr encr	1	9963.2	10150
0.13	100yr encr	1	9960.5	10220
0.04	100yr encr	1	9705	10250

FLOW DATA

Flow Title: FDS Discharges
Flow File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.f01

Flow Data (cfs)

River	Reach	RS	100-year	100yr encr
Desert Hills Was	Reach 1	0.99	10259	10259
Apache Wash	Reach 1a	8.02	7187	7187
Apache Wash	Reach 1a	6.01	7213	7213
Apache Wash	West Channel	4.744	285	285
Apache Wash	West Channel	4.722	723	723
Apache Wash	West Channel	4.655	1250	1250
Apache Wash	West Channel	4.499	1866	1866
Apache Wash	Reach 1b	4.74	6928	6928
Apache Wash	Reach 1b	4.65	6053	6053
Apache Wash	Reach 1b	4.6	5873	5873
Apache Wash	Reach 1b	4.58	5739	5739
Apache Wash	Reach 1b	4.56	5347	5347
Apache Wash	Reach 1c	3.96	7213	7213
Apache Wash	Reach 1c	3.78	7534	7534
Apache Wash	Reach 2	2.90	13541	13541
Apache Wash	Reach 3	2.60	17136	17136
Paradise Wash	Reach 1	2.23	4179	4179
Paradise Wash	Reach 1	1.54	5763	5763

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Apache Wash	Reach 3	100-year		Normal S = .005

GEOMETRY DATA

Geometry Title: Base Geometry (imported from FDS models)
Geometry File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.g17

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Desert Hills Was	Reach 1		DH & A Wash
Apache Wash	Reach 1a		Apache Split
Apache Wash	West Channel	Apache Split	Combine
Apache Wash	Reach 1b	Apache Split	Combine
Apache Wash	Reach 1c	Combine	DH & A Wash
Apache Wash	Reach 2	DH & A Wash	P & A Wash
Apache Wash	Reach 3	P & A Wash	
Paradise Wash	Reach 1		P & A Wash

JUNCTION INFORMATION

Name: P & A Wash
Description: Junction at section 2.6
Energy computation Method

Length across Junction		Tributary			
River	Reach	River	Reach	Length	Angle
Apache Wash	Reach 2	to Apache Wash	Reach 3	750	
Paradise Wash	Reach 1	to Apache Wash	Reach 3	205	

Name: Apache Split
Description:
Energy computation Method

Length across Junction		Tributary			
River	Reach	River	Reach	Length	Angle
Apache Wash	Reach 1a	to Apache Wash	Reach 1b	200	
Apache Wash	Reach 1a	to Apache Wash	West Channel	900	

Name: Combine
Description:
Energy computation Method

Length across Junction		Tributary			
River	Reach	River	Reach	Length	Angle
Apache Wash	Reach 1b	to Apache Wash	Reach 1c	500	
Apache Wash	West Channel	to Apache Wash	Reach 1c	500	

Name: DH & A Wash
Description:
Energy computation Method

Length across Junction		Tributary			
River	Reach	River	Reach	Length	Angle
Apache Wash	Reach 1c	to Apache Wash	Reach 2	140	
Desert Hills Was	Reach 1	to Apache Wash	Reach 2	140	

```
CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.99

INPUT
Description: 0.99
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9333.68    1762 9403.72    1760 9486.25    1758 9487.32    1758 9640.92    1756
  9732.38    1754 9737.95    1754 9814.01    1754 9988.19    1752 9989.38    1750
  9990.31    1750 9991.34    1752 9992.23    1752 9994.34    1750 9996.33    1748
 10004.96    174810008.87    175010012.73    175210163.12    175410423.96    1756
 10451.19    175610470.06    175610553.26    175810641.18    1760

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9333.68    .065 9988.19     .0510012.73    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.1910012.73              490     470     440            .6        .9

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.90

INPUT
Description: 0.9
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9300    1760 9357.07    1760 9449.84    1760 9643.57    1760  9698.3    1758
  9729.54   1756 9766.39    1754 9766.58    1754 9831.51    1752 9950.49    1751
  9996.49   175010000.96    174810013.62    174810013.64    174810017.63    1750
 10021.66   175210021.74    175210038.07    175210038.12    175210235.65    1752
 10411.03   175410599.65    1756   10800    1758

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9300    .065 9996.49     .0510017.63    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9996.4910017.63              500     491     480            .6        .9

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.81

INPUT
Description: 0.81
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9680  1755.3     9730    1754 9779.07    1752 9805.44    1752 9883.96    1750
  9884.14   1750 9983.58    1750 9983.71    1750 9988.29    1750  9989.3    1748
  9990.31   1746 9990.32    1746 10011.7    174610014.89    174810014.94    1748
  10017.9   175010018.03    175010035.47    175010035.57    1750   10105  1748.5
    10270   1750   10535    1752   10680    1754   10740    1756

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9680    .065 9983.58     .0510018.03    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.5810018.03              550     492     400            .6        .9

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.72

INPUT
Description: 0.72
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9365    1756     9470    1754     9625    1752     9800    1750 9986.71    1748
  9986.75   1748 9991.03    1746 9991.08    1746 9995.08    1744 9995.12    1744
 10010.29   174410013.39    1746 10016.5    174810081.37    1748   10315  1746.2
    10380   1748   10510    1750   10610    1750   10740    1752   10800    1754
    10835   1756

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9365    .065 9986.71     .05 10016.5    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.71 10016.5              340     373     325            .6        .9

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.64

INPUT
Description: 0.64
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9235    1752     9420    1750     9590    1748     9825    1746     9920    1746
  9977.76   1746 9985.32    1744 9985.39    1744  9985.4    1744 9993.02    1742
  9993.84   1742  9996.5    1742 9999.03    174210000.86    174210006.33    1742
  10006.4   174210009.48    174410011.89    174410012.11    174410018.06    1746
    10130   1746   10220    1746   10280    1746   10290  1745.8   10305    1746
    10415   1748   10517    1750   10585    1752
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9235    .065 9977.76     .0510018.06    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.7610018.06              270     450     450            .6        .9

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.56

INPUT
Description: 0.56
Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8615  1752.3    8680    1752    8850    1750    8940    1750    9000    1749
    9200    1748    9475    1746    9600    1744    9615    1744    9730    1745
 9986.89    1744 9991.42    1742 9998.14    174010012.68    174010012.77    1740
10016.12    174210019.47    174410081.48    174410085.66    1744   10180    1746
10292.39    1748   10350    1750   10465    1752

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8615    .065 9986.89     .0510019.47    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.8910019.47              320     436     450            .6        .9

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.48

INPUT
Description: 0.48

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8900  1750.2    9100    1750    9415    1748    9560    1746    9775    1744
 9979.98    1742 9985.45    174010006.35    174010013.02    1742   10335    1744
   10440    1746   10475    1748   10500    1750

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8900    .065 9979.98     .0510013.02    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.9810013.02              400     382     300            .6        .9

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.40

INPUT
Description: 0.4
Station Elevation Data     num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9000    1748    9100    1748 9402.16    1746 9610.77    1744 9720.22    1742
 9949.58    1742 9966.56    1742 9976.95    1740 9988.11    1738 9999.42    1738
10008.13    174010016.94    174210021.82    174210103.85    174210240.84    1744
10290.98    174610292.67    174610324.41    174810327.05    174810352.56    1750

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9000    .065 9966.56     .0510021.82    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.5610021.82              380     478     570            .6        .9

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.31

INPUT
Description: 0.31

Station Elevation Data     num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8920    1752    8990    1746    9000    1744    9020    1738    9045    1738
    9055    1740    9065    1742    9170    1742    9365    1744    9375    1744
    9750    1742    9800  1741.5    9910  1741.3    9984    1740 9986.95    1738
 9989.63    1736 9995.85    173610007.33    1738 10018.7    174010238.69    1740
10248.88    174010511.29    174210690.41    1744   10750    1746

Manning's n Values          num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    8920      20    9375    .065    9984     .05 10018.7    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9984 10018.7              450     425     400            .6        .9

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.22

INPUT
Description: 0.22
Station Elevation Data     num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9230    1750    9310    1744    9350    1742    9410    1740    9430    1736
    9440    1735    9450    1736    9465    1740    9600    1741    9880    1740
```

9975	1738	9990	1736	10000	1734	10025	1736	10035	1738
10100	1740	10130	1742	10160	1742	10170	1738	10200	1738
10435	1740	10625	1742	10790	1742	10925	1746	11135	1750

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9230	.065	9410	.05	9465	.065	9880	.05	10100	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9410	9465	0	0	0	.6	.9

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1a RS: 8.02

INPUT
Description: 8.02
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9610	1996	9700	1992	9765	1991.9	9862	1990	9894	1988
9897	1988	9951	1989.2	9977	1988	9989	1986	10000	1985.1
10020	1986	10037	1988	10077	1990	10109	1992	10116	1994
10125	1996	10132	1998	10141	2000				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9610	.1	9977	.055	10037	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9977	10037	215	235	245	.3	.5

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1a RS: 7.98

INPUT
Description: 7.98
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9500	1992	9570	1990	9630	1988	9740	1986	9757	1985
9773	1986	9859	1986	9898	1986.4	9927	1986	9950	1986
9975	1986	9982	1984	9991	1982	10000	1981.8	10005	1982
10017	1984	10039	1986	10075	1988	10097	1988.2	10116	1990
10127	1992	10136	1994						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9500	.1	9982	.055	10017	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9982	10017	280	465	520	.3	.5

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1a RS: 7.89

INPUT
Description: 7.89
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9715	1988	9756	1986	9764	1984	9791	1982.5	9845	1984
9878	1984	9978	1982	9983	1982	9987	1980	9992	1978
10000	1977	10020	1978	10054	1980	10082	1980	10149	1981.8
10170	1982	10189	1982	10219	1982	10224	1984	10256	1985.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9715	.1	9978	.055	10020	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9978	10020	300	300	220	.3	.5

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1a RS: 7.84

INPUT
Description: 7.84
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9793	1984	9828	1982	9841	1980	9908	1978	9916	1976
9918	1976	9941	1976	9975	1976	9984	1976	10000	1974.4
10025	1976	10036	1978	10073	1978	10206	1980	10222	1982
10267	1983								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9793	.1	9984	.055	10025	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9984	10025	575	500	425	.3	.5

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1a RS: 7.74

INPUT
Description: 7.74
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
    9733    1978    9744    1976    9754    1974    9765    1972    9800    1972
    9836  1972.3    9888    1972    9915    1972    9968  1972.4    9981    1972
    9987    1970   10000  1969.1   10010    1970   10062    1972   10086  1972.3
   10097    1972   10110    1970   10118    1970   10123    1972   10127    1974
   10133    1976   10138    1978   10170    1980   10247  1980.4

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9733      .1    9981    .055   10010      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9981   10010               425     500     475              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 7.65

INPUT
Description: 7.65
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9787    1970    9805    1966    9827    1964    9882  1965.5    9917    1964
 9977.37    1964 9986.15    1962   10000  1961.810010.39   196210016.47    1964
10022.56   196610109.69   196810128.52    1970   10165    1971

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9787      .1 9977.37   .05510022.56      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.3710022.56               520     500     470              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 7.55

INPUT
Description: 7.55
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9800    1972 9802.58    1972 9850.37    1970 9877.72    1968 9895.81    1966
 9913.89    1964 9929.39    1962 9970.07    1960 9981.49    1958   10000  1956.7
10024.51   195810145.16   196010158.57   196210173.58    1964 10182.6    1966
10293.44    1968

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9800      .1 9970.07   .05510024.51      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.0710024.51               510     500     480              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 7.46

INPUT
Description: 7.46

Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9800    1960 9830.45    1960 9861.07    1958 9923.22    1956 9969.47    1954
 9976.86    1952    9990  1951.5 10000.7   195210032.17   195210051.31    1953
10081.59    1954 10119.3   195610130.99    1958 10142.8   196010154.64    1962
10190.46    1964

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9800      .1 9969.47   .05510051.31      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.4710051.31               490     500     510              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 7.36

INPUT
Description: 7.36

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9680    1960    9740    1952    9800    1950 9835.52    1950 9949.32    1948
 9977.98    1946    9998  1944.510011.65   194610023.48   194810033.89    1950
10040.39   195210046.86   195410053.34   195610087.91    1958

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9680      .1 9949.32   .05510053.34      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.3210053.34               420     446     470              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 7.28

NPUT
escription: 7.28
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Station Elevation Data     num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9710    1950    9760    1944    9800    1942 9836.63    1942 9849.74  1941.8
 9874.17  1941.8 9924.41    1942 9962.25    1944 9972.18    1944 9988.71    1942
    9998  1940.810010.16    194210021.65    194410030.54    1946 10038.9    1948
 10047.2    195010071.47    1952

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9710      .1 9972.18    .055 10047.2      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9972.18 10047.2               475     554     410             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 7.17

INPUT
Description: 7.17

Station Elevation Data     num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9800    1970 9822.45    1970 9843.47    1968  9868.2    1966 9879.21    1964
 9899.02    1962  9911.7    1960 9916.85    1958    9922    1956 9926.87    1954
 9931.61    1952 9936.36    1950  9941.1    1948 9945.85    1946 9950.59    1944
 9955.33    1942 9960.08    1940 9967.15    1938 9978.76    1936  9991.7    1934
   10000  1934.310014.37    193410024.18    1936   10034    193810043.85    1940
10082.22    194210098.58    194410112.55    194610123.98    194810128.56    1948
10135.98    194810203.76    1950

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9800     .09 9960.08    .05510043.85     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9960.0810043.85               500     500     520             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 7.08

INPUT
Description: 7.08

Station Elevation Data     num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9800    1948 9860.62    1948  9886.7    1946  9902.9    1944 9911.05    1942
 9917.61    1940 9925.72    1938 9934.65    1936 9943.58    1934 9953.07    1932
 9965.94    1930    9967    192910007.17    193010021.87    193210036.31    1934
 10051.7    1936 10067.1    1938 10082.5    194010198.22    1942

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9800     .09 9953.07    .05510021.87     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9953.0710021.87               485     500     500             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 6.98

INPUT
Description: 6.98

Station Elevation Data     num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9675    1940    9740    1932    9780    1930    9795  1929.5    9810    1930
    9900    1932    9935    1932 9944.17    1930 9975.97    1928  9985.4    1926
 9994.24    192410004.06    192410020.09    192610031.62    192810071.11    1930
10085.11    193210100.97    193410133.62    193610247.69    1938

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9675     .08 9975.97    .05510031.62     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.9710031.62               400     437     470             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 6.9

INPUT
Description: 6.9

Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9525    1940    9625    1926    9640    1924    9705    1926    9770    1928
    9800    1928 9822.48    1928 9857.37    1926 9954.17    1924 9987.42    1922
10000.76    192010011.02    192010014.22    192210017.39    192410020.56    1926
10023.72    192810026.89    193010289.88    1932

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9525     .08 9987.42    .05510026.89     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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      9987.4210026.89                490     529     560              .3       .5

 ROSS SECTION          RIVER: Apache Wash
 EACH: Reach 1a           RS: 6.8

 INPUT
 Description: 6.8

 Station Elevation Data    num=      24
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     9620    1930    9660    1924    9705    1920    9725    1919    9755    1920
     9800    1920 9880.75    1920 9901.03    1920 9976.63    1918 9976.81    1918
  9982.58    1916 9982.91    1916  9988.6    1914 9988.73    191410004.27    1914
 10004.41    191410010.43    191610010.46    1916 10016.4    191810016.52    1918
 10022.44    192010022.57    192010028.44    1922   10040  1923.7

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     9620     .07 9976.63    .05510028.44     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9976.6310028.44               500     495     400              .3       .5

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1a           RS: 6.71

 INPUT
 Description: 6.71

 Station Elevation Data    num=      12
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     9780    1926    9930    1922    9960    1920    9970    1918    9990    1908
    10000  1907.5   10010    1908   10025    1912   10045    1914   10090    1916
    10225    1918   10290    1920

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     9780     .07    9960    .055   10025     .07

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9960   10025               425     390     350              .3       .5

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1a           RS: 6.63

 INPUT
 Description: 6.63
 tation Elevation Data    num=      19
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9899.64    1920 9949.36    1918 9976.91    1916 9982.13    1914 9983.41    1912
  9984.66    1910 9985.91    1908 9987.08    1906    9995    1905   10005    1905
 10015.13    190610021.82    190810050.15    191010131.79    191210273.67    1914
 10318.49    191610398.87    191610411.76    1916   10525    1918

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
  9899.64    .065 9976.91    .0610021.82    .065

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9976.9110021.82               300     290     290              .1       .3

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1a           RS: 6.58

 INPUT
 Description: 6.58
 Station Elevation Data    num=      22
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9707.43    1920 9758.33    1918 9792.06    1916 9808.53    1916 9858.47    1916
  9877.36    1914 9897.27    1912 9926.14    1910 9950.13    1908  9965.1    1906
  9980.22    1904 9998.11    190210006.79    190210014.85    190410022.84    1906
 10088.23    190810249.56    191010282.55    191210348.27    191210386.32    1912
 10434.86    1914   10475    1916

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
  9707.43    .065 9950.13    .0510022.84    .065

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9950.1310022.84               430     430     430              .1       .3

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1a           RS: 6.5

 INPUT
 Description: 6.5
 Station Elevation Data    num=      20
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9610.75    1914 9623.59    1912 9636.39    1910 9702.53    1908 9718.78    1906
  9747.02    1904  9794.4    1904 9947.45    1904 9967.32    1902 9987.47    1900
     9995    1899   10010    189910019.82    190010042.69    190210071.54    1904
 10099.13    1906 10152.4    1908   10187    191010245.02    1912   10400    1914

 ıanning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
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 9610.75    .065 9987.47     .0510019.82    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.4710019.82              310     345     355             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 6.43

INPUT
Description: 6.43

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9630    1908    9655    1906    9665    1904    9680    1902    9690    1900
    9925    1900    9970    1898    9990  1896.5   10010  1896.5   10020    1898
   10030    1900   10040    1902   10120    1904   10285    1906   10340    1906
   10410    1908

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9630    .065    9970     .05   10020    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10020              475     450     360             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 6.32

INPUT
Description: 6.32
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9821.18    1904 9906.54    1902 9951.16    1900  9957.9    1898 9964.52    1896
 9970.99    1894 9977.55    1892 9984.06    189010006.52    189010013.72    1892
10020.18    189410100.18    189610266.52    189810293.42    189810347.28    1898
10412.02    190010596.97    1902

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9821.18    .065 9951.16     .0610020.18    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.1610020.18              410     390     350             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 6.25

INPUT
Description: 6.25
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9911.34    1898 9931.58    1896 9947.24    1894 9961.84    1892 9976.08    1890
    9990    1888   10015    1888 10030.1    189010045.42    189210069.44    1892
10268.14    189210454.21    189410476.27    189610569.33    1898 10677.6    1900

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9911.34    .065 9961.84     .0510045.42    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9961.8410045.42              490     460     430             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 6.16

INPUT
Description: 6.16
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9875  1892.5 9961.21    1892  9972.1    1890 9977.65    1888  9983.3    1886
 9989.16    1884 9996.77    1883 9997.18    188310022.78    188410039.58    1886
10050.58    188810110.58    188810208.91    188610225.08    188610318.94    1888
10345.72    1890 10414.9    189210424.02    189210428.81    189210502.35    1894
10541.21    1896

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9875    .065 9961.21     .0610039.58    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9961.2110039.58              270     360     450             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 6.09

INPUT
Description: 6.09

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9815    1886    9890    1884    9935    1882    9970    1880   10010  1879.5
   10050    1880   10070    1882   10345    1884   10380    1886   10520    1888

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
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    9815    .065    9935     .05   10070    .065

 ank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9935   10070              470     445     435            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 6.01

INPUT
Description: 6.01

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9750    1883    9870    1882    9920    1880    9955    1878    9980    1876
   10000  1875.5   10010    1876   10020    1878   10035    1880   10075    1880
   10160    1878   10175    1877   10190    1878   10260    1880   10280    1882
   10400    1884   10580    1886

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9750    .065    9955     .05   10020    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9955   10020              485     490     510            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 5.92

INPUT
Description: 5.92
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9720    1877 9854.04    1876 9948.34    1874 9975.43    1872   10000  1870.2
10006.77    187210015.55    187410024.34    187610034.96    187610094.25    1874
10130.93    1872 10149.3    187010150.59    187010177.58    187210238.14    1874
10251.91    187410318.15    187410335.66    187610350.37    1878

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9720    .065 9948.34     .0510024.34    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.3410024.34              375     400     375            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 5.83

INPUT
Description: 5.83

Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9500    1874    9550    1872    9575    1870    9615    1870    9650    1872
    9710    1872    9735    1870    9890    1870    9960    1868    9990    1866
   10000  1865.5   10005    1866   10030    1868   10105    1866   10120    1870
   10140    1872   10155    1874   10250    1875

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9500    .065    9960     .05   10030    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9960   10030              375     380     380            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 5.76

INPUT
Description: 5.76
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9640    1870 9674.85    1868 9704.99    1866 9711.21    1864 9712.43    1864
 9741.92    1866    9835    1866    9865    1866 9968.58    1864 9985.72    1862
10014.25    186210043.06    186410096.64    1866 10124.8    186810142.86    1870
10144.93    1870

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9640    .065 9968.58     .0510043.06    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.5810043.06              470     540     570            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 5.66

INPUT
Description: 5.66
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9480.86    1866 9504.86    1864 9505.03    1864  9622.9    1862 9622.94    1862
 9802.24    1862 9802.28    1862 9805.57    1862 9805.58    1862 9814.49    1860
 9838.73    1858 9838.74    1858 9839.05    1858 9857.77    1860 9911.58    1860
 9911.59    1860 9980.02    1860 9989.02    1858  9993.4    1856 9998.49    1854
10000.64    185410007.51    185610014.57    1858   10030    1859 10136.3    1860
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10136.31    186010169.16    1862   10210  1862.5   10615    1863

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9480.86    .065 9980.02     .05   10030    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.02   10030               460     440     320             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 5.64

INPUT
Description: 5.64

Station Elevation Data     num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9650    1862    9775    1860    9870    1858    9955    1856   10038    1855
   10170    1856   10275    1858   10365    1860   10575  1862.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9650    .065    9955    .045   10170    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9955   10170               370     345     320             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 5.57

INPUT
Description: 5.57

Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400    1859    9520    1858    9700    1856    9731    1858    9800    1858
    9812    1856    9824    1854    9977    1854    9985    1852    9993    1850
   10005    1850   10014    1852   10024    1854   10035    1856   10170    1858
   10299    1860   10556    1860   10739    1862

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .065    9977     .05   10035    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9977   10035               400     450     450             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 5.48

INPUT
Description: 5.48
Station Elevation Data     num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9300    1855    9440    1854    9750    1854    9790    1852    9895    1852
 9929.89    1850 9954.41    1850 9954.47    1850 9978.41    1850 9989.41    1848
10000.42    1846 10004.4    184610025.59    184810044.06    185010141.09    1852
10147.22    185210201.27    185210201.36    185210214.48    185210214.49    1852
10259.46    1852 10259.5    185210418.73    185210547.75    185410626.53    1856
10717.29    1858

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9300    .065 9978.41     .0510044.06    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110044.06               530     500     500             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 5.38

INPUT
Description: 5.38

Station Elevation Data     num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9250    1850    9440    1848    9500    1846    9510    1846    9635    1848
    9700    1850    9815    1850    9880    1848    9900    1846    9910    1844
    9985    1844    9995    1842   10000    1841   10005    1842   10015    1844
   10030    1846   10110    1846   10255    1848   10460    1850   10570    1852

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9250    .065    9985     .05   10015    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9985   10015               350     375     425             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1a           RS: 5.31

INPUT
Description: 5.31
Station Elevation Data     num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
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    9325    1847 9444.34    1846 9557.15    1844 9574.11    1844 9596.05    1844
 9692.33    1844 9887.76    1844 9899.69    1842 9911.33    1840 9919.33    1840
 9919.34    1840 9933.33    1842 9933.43    1842 9988.23    1842 9988.24    1842
 9992.97    1840 9997.67    183810005.97    1838 10015.5    1840 10024.7    1842
10044.49    1844 10044.5    184410061.08    184410218.05    1844   10565    1846

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9325    .065 9887.76     .0610061.08    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9887.7610061.08               500     500     480             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 5.21

INPUT
Description: 5.21

Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1842    9780    1840    9860    1838    9885    1836    9890    1836
    9915    1838    9970    1838    9985    1836   10000    1834   10015    1836
   10030    1838   10085    1838   10110    1837   10120    1838   10135    1840
   10150    1840   10245    1838   10310    1838   10355    1840   10400    1840
   10525    1842

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .065    9970     .05   10030    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10030               330     310     300             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 5.15

INPUT
Description: 5.15

Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9870    1839    9945    1838    9978    1836    9988    1834    9995    1832
   10000    1830   10010    1830   10015    1832   10025    1834   10130    1834
   10170    1836   10200    1836   10320    1835   10495    1836   10522    1838
   10780    1840

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9870     .06    9978     .05   10025    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10025               350     352     355             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 5.09

INPUT
Description: 5.09

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9480    1835    9515    1834    9550    1832    9970    1832    9985    1830
   10000    1831   10025    1832   10075    1834   10120    1830   10145    1832
   10255    1832   10320    1834   10435    1834   10780    1836

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9480     .06    9970     .05   10025    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10025               300     300     310             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 5.03

INPUT
Description: 5.03
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9515    1833 9590.59    1832 9640.88    1830 9975.12    1830 9983.12    1828
 9992.06    182610001.75    1826   10007    182810012.26    183010053.03    1830
 10053.1    183010133.33    183010140.53    183010188.37    182810281.59    1828
   10440    1830   10620    1832   10750  1832.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9515    .065 9975.12     .0610012.26    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.1210012.26               345     365     340             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 4.96
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INPUT
Description: 4.96
Station Elevation Data     num=      24
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9716.18     1828 9717.02     1828 9800.79     1826 9840.35     1826 9843.77     1826
 9974.19     1826  9988.4     1824 9995.82     182210000.05     1822 10005.5     1824
10005.51     182410011.03     182610011.04     182610058.68     182610136.37     1826
10156.72     182610156.73     1826   10310     182410344.97     182410425.12     1826
10592.76     182710594.98     1827   10670     1828   10790     1830

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9716.18    .065 9974.19     .0610011.03    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9974.1910011.03               400     320     200              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 4.9

INPUT
Description: 4.9

Station Elevation Data     num=      21
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9730     1826     9825     1824     9870     1822     9885     1820     9905     1822
    9940     1824     9955     1822     9965     1822     9985     1822    10000     1822
   10005     1822    10010     1822    10018     1824    10030     1824    10155     1822
   10290     1822    10310     1820    10330     1822    10405     1824    10560     1826
   10750     1828

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9730     .05     9940     .05    10018     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940   10018               220     200     160              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 4.82

INPUT
Description: 4.82
Station Elevation Data     num=      28
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9480     1826 9740.85     1824 9830.85     1822 9875.16     1820 9888.17     1818
 9903.71     1818 9930.33     1820 9930.34     1820 9974.99     1820     9975     1820
 9990.22     181810005.12     181810009.43     1820 10013.6     182210024.29     1822
10070.59     1820   10100     181810126.15     182010181.41     182010189.94     1818
   10200  1817.110207.92     181810217.21     182010264.85     1820   10280     1818
   10315     1820   10435     1822   10565     1824

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9480    .065     9975     .0510009.43    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          997510009.43               480     480     480              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1a            RS: 4.78

INPUT
Description: 4.78
Station Elevation Data     num=      23
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9743.69     1820 9905.26     1818 9905.48     1818 9931.86     1818 9931.87     1818
 9964.87     1818 9964.88     1818 9983.35     1816 9995.72     181310010.03     1813
10010.04     181410021.41     181610106.14     181610182.26     181410190.46     1814
10211.72     181610230.89     181610317.17     181410376.07     1813 10488.8     1814
 10508.5     1814   10540     1816   10640     1818

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9743.69    .065 9964.87     .0510021.41    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.8710021.41                 0       0       0              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: West Channel        RS: 4.744

INPUT
Description:
Station Elevation Data     num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9600   1815.4     9810     1814     9900     1812     9970     1810    10000     1809
   10040     1810    10145     1812

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9600    .065     9970     .055    10040    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10040               190     170     170              .1       .3
```

```
CROSS SECTION          RIVER: Apache Wash
REACH: West Channel       RS: 4.722

INPUT
Description:
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9600    1812    9785    1812    9880    1810    9965    1808   10000    1807
   10035    1808   10265    1810   10400    1812

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9600    .065    9965    .055   10035    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9965   10035              550     475     430            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: West Channel       RS: 4.655

INPUT
Description:
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9530    1806    9650    1804    9900    1804    9980    1802   10020    1802
   10150    1804   10210    1806   10285    1808

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9530    .065    9980    .055   10020    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   10020              560     540     500            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: West Channel       RS: 4.499

INPUT
Description:
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9300    1802    9465    1800    9600    1800    9985    1798   10000  1797.5
   10010    1798   10155    1800   10335    1802   10450    1802

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9300    .065    9985    .055   10010    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9985   10010              450     550     575            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: West Channel       RS: 4.311

INPUT
Description:
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400    1796    9890    1794    9945    1794    9995    1792   10005    1792
   10010    1794   10150    1794   10230    1796   10430    1798

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .065    9995    .055   10005    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9995   10005              370     370     340            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: West Channel       RS: 4.233

INPUT
Description:
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9425    1794    9550    1792    9840    1790    9990    1790   10000    1789
   10010    1790   10040    1790   10145    1792   10355    1794

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9425    .065    9990    .055   10010    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9990   10010              420     430     410            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: West Channel       RS: 4.111

INPUT
Description:
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9560    1790    9775    1788    9905    1786    9995    1786   10000  1784.2
   10005    1786   10090    1786   10270    1788   10430    1790   10570    1792
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9560    .065    9995    .055   10005    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9995   10005              320     250     200            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: West Channel       RS: 4.055

INPUT
Description:
Station Elevation Data     num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9850    1786    9925    1784    9965    1782    9983    1783    9995    1782
   10005    1782   10115    1784   10250    1786   10500    1787

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9850    .065    9965    .055   10005    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9965   10005              300     290     285            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1b           RS: 4.74

INPUT
Description: 4.74
Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9500.14    1818 9960.29    1816 9979.29    1814 9986.69    1812    9994    1810
 9994.01    1810 9999.53    1810 9999.55    181010010.02    181210029.03    1814
10029.36    181410136.55    1814   10140    1813   10160    1814   10380    1814
   10400    1811   10425    1814   10440    1814   10485    1813   10530    1814
   10590    1815   10700    1815

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9500.14    .065 9960.29    .0510029.03    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9960.2910029.03              400     500     500            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1b           RS: 4.65

 NPUT
Description: 4.65

Station Elevation Data     num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400  1815.5    9600    1814    9724    1812    9725    1812 9830.73    1810
 9982.47    1808 9997.03    180610002.86    180610014.29    180810049.57    1808
10059.42    180610060.51    180610093.98    180810225.15    180810250.89    1808
   10270    1810   10360    1810

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400     .08 9982.47    .07510093.98     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.4710093.98              260     280     260            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1b           RS: 4.6

INPUT
Description: 4.6

Station Elevation Data     num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9675    1812 9807.06    1810 9812.65    1810 9836.34    1810 9875.78    1808
 9883.17    1808 9966.89    1806  9971.4    1806 9976.73    1804 9979.77    1804
 9986.27    1802  9987.4    1802 9998.69    1802 9998.98    180210008.42    1804
10010.82    180410015.98    180610022.46    180610112.04    1806   10123    1806
10129.02    180410130.11    180410134.03    180410156.04    180410274.93    1804
10281.42    180410322.77    180610440.24    180610500.19    1808

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9675    .065  9971.4    .0510015.98    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9971.410015.98              83      83      83            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1b           RS: 4.58

INPUT
Description: Geometry data points 6 and 7 are adjusted to account for the 3
             barrel 10' x 5' cbc.  The stationing for both points is increased
             by 5'.  The right bank and ineffective flow areas are adjusted
             accordingly.  The elevations of points 5 and 6 are changed from
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            1802 to 1801.3 to match the surveyed invert of the box culvert
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1810    9790    1808    9945    1806    9983    1804    9984  1801.3
   10015  1801.3   10016    1804   10250    1804   10320    1806   10500    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .065    9983     .05   10016    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9983   10016               180     180     170              .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9685    9983  1808.9   10016   10500  1808.8

CULVERT                 RIVER: Apache Wash
REACH: Reach 1b            RS: 4.575

INPUT
Description: Culvert #1 (3 10' x 5' Boxes)

Distance from Upstream XS =        5
Deck/Roadway Width        =   118.44
Weir Coefficient          =      3.1
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=        4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9422.54  1810.7         9750.64 1809.46        10406.84 1807.87
11391.14 1804.92

Upstream Bridge Cross Section Data
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1810    9790    1808    9945    1806    9983    1804    9984  1801.3
   10015  1801.3   10016    1804   10250    1804   10320    1806   10500    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .065    9983     .05   10016    .065

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9983   10016              .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9685    9983  1808.9   10016   10500  1808.8

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9750.64 1809.46        10406.84 1807.87

Downstream Bridge Cross Section Data
Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9550    1812    9730    1810    9915    1808    9945    1806    9960    1804
    9975    1802    9985    1800   10000    1799   10035    1800   10115    1802
   10150    1804   10215    1806   10240    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9550    .065    9960     .05   10150    .065

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9960   10150              .1       .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9550    9950    1809   10050   10240  1808.7

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =    1807
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Box1                Box         5      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  5   114.1       .015                   .4                1
Number of Barrels =  3
Upstream   Elevation =  1801.3
Centerline Stations
    Sta.    Sta.    Sta.
    9989  9999.5   10010
Downstream Elevation =  1800.67
Centerline Stations
    Sta.    Sta.    Sta.
```

9989.5 10000 10010.5

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1b RS: 4.56

INPUT
Description: Geometry data point 8 is adjusted to account for the 3 barrel 10' x 5' cbc. The culvert was extended and cross section 4.57 of the FIS was eliminated. This cross section is the first downstream cross section of the culvert. The elevation of data point 8 is adjusted from 1799 to 1800. The right bank station is moved from station 10035 to 10150.

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9550	1812	9730	1810	9915	1808	9945	1806	9960	1804
9975	1802	9985	1800	10000	1799	10035	1800	10115	1802
10150	1804	10215	1806	10240	1808				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9550	.065	9960	.05	10150	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9960	10150	365	365	350	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
9550	9950	1809	10050	10240	1808.7

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1b RS: 4.49

INPUT
Description: 4.49

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9550.57	1810	9727.02	1808	9821.99	1806	9901.91	1804	9916.74	1802
9954.9	1800	9973.89	1798	9983.53	1796	10011.1	1796	10018.97	1798
10053.62	1800	10105.02	1802	10240.68	1804	10340	1804.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9550.57	.065	9954.9	.05	10053.62	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9954.9	10053.62	490	450	450	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1b RS: 4.4

INPUT
Description: 4.4

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9610	1805.5	9840	1804	9925	1802	9940	1800	9970	1798
9990	1796	9995	1794	10005	1792.3	10020	1794	10030	1796
10080	1796	10090	1794.3	10110	1796	10175	1798	10210	1800
10270	1801								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9610	.065	9990	.05	10030	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9990	10030	475	510	490	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1b RS: 4.31

INPUT
Description: 4.31

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9330.41	1802	9596.56	1800	9706.51	1798	9770.7	1796	9896.31	1794
9980.54	1792	9986.9	1790	10005.88	1788	10009.89	1788	10014.81	1790
10019.75	1792	10055.21	1794	10110.95	1796	10150.57	1796.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9330.41	.065	9980.54	.05	10019.75	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9980.54	10019.75	410	420	410	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1b RS: 4.23

INPUT
Description: 4.23

Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9343	1798	9343.6	1798	9520.61	1796	9614.39	1794	9686.85	1792

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 9762.38    1790 9929.17    1788 9933.91    1788 9961.17    1790 9980.16    1790
 9985.61    1788 9991.04    178610007.85    178610015.65    178810030.19    1790
 0081.29    179210132.36    1794

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9343    .065 9980.16     .0510030.19    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.1610030.19               140     150     150              .6       .9

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1b           RS: 4.22

INPUT
Description: 4.22

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9435    1796    9530    1794    9595    1792    9650    1790    9780    1788
    9885    1788    9975    1790    9990    1786   10000  1785.5   10010    1786
   10020    1788   10030    1790   10085    1792   10135  1792.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9435    .065    9975     .05   10030    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10030               280     280     260              .6       .9

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1b           RS: 4.11

INPUT
Description: 4.11

Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9581.8    1796 9581.86    1796 9856.27    1794 9954.62    1792 9972.66    1790
 9975.22    1788 9978.48    1786 9982.42    1784 9988.23    178210014.08    1782
 10019.7    1784 10107.8    1786 10273.4    178810355.58    179010489.42    1790

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9581.8    .065 9978.48     .05 10019.7    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.48 10019.7               240     250     300              .6       .9

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1b           RS: 4.05

INPUT
Description: 4.05
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9645    1794    9870    1792    9940    1790    9960    1788    9990    1780
   10000    1779   10015    1780   10025    1782   10200    1782   10270    1786
   10320  1786.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9645    .065    9960     .05   10025    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9960   10025                 0       0       0              .6       .9

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1c           RS: 3.96

INPUT
Description: 3.96

Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9412    1790 9412.72    1790 9643.42    1788 9807.32    1786 9852.78    1784
 9882.85    1782 9912.96    1780 9952.91    1778 9978.94    1776 9989.34    1774
10006.21    177410013.45    177610020.91    177810028.53    178010057.49    1782
10179.95    178210409.79    178010418.05    1778 10422.6    177810433.36    1780
10548.23    178210801.62    178410916.09    1786

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9412    .065 9882.85     .0510057.49    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9882.8510057.49               490     520     460              .6       .9

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1c           RS: 3.86

INPUT
Description: 3.86

Station Elevation Data    num=      25
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     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9243    1786  9243.8    1786 9498.14    1784 9623.72    1782 9728.15    1780
 9811.03    1778 9980.73    1776 9988.57    1774 9988.42    1772 9992.41    1770
 0006.32    177010015.17    1772 10048.5    177410083.77    1774 10108.2    1774
10125.25    1776 10163.1    177810205.78    177810245.62    177610274.92    1774
10300.77    177410341.24    177610373.74    1778 10496.8    178010680.54  1780.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9243    .065 9980.73     .05 10048.5    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.73 10048.5              360     400     490              .6       .9

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1c            RS: 3.78

INPUT
Description: 3.78

Station Elevation Data     num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9135    1784 9135.46    1784 9354.53    1782  9529.4    1780 9609.76    1778
 9660.11    1776    9740  1774.1  9978.4    1774 9983.58    1770 9988.22    1768
 9992.92    1766 9993.96    176610017.34    176810036.94    177010060.68    1772
10120.11    177210142.25    177010151.27    176810155.15    176810163.26    1770
10225.58    177210348.04    177410455.07    177410545.54    177410650.82    1775

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9135    .065  9978.4     .0510060.68    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9978.410060.68              170     170     170              .6       .9

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1c            RS: 3.75

INPUT
Description: 3.75

Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400    1780    9515    1778    9590    1776    9655    1774    9710    1772
    9725    1772    9780    1774    9945    1774    9975    1772    9985    1770
    9999    1764   10010    1764   10015    1766   10020    1768   10150    1770
   10310    1772   10800    1772   10805    1770   10815    1770   10840    1772
   10885    1776

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .065    9975     .05   10020    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9975   10020              500     500     500              .6       .9

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1c            RS: 3.65

INPUT
Description: 3.65

Station Elevation Data     num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9100    1780    9470    1768    9580    1770    9830    1770    9970    1764
    9990    1762   10010    1762   10015    1764   10370    1770

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9100    .065    9970     .05   10015    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9970   10015              250     280     260              .6       .9

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1c            RS: 3.6

INPUT
Description: 3.6

Station Elevation Data     num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9057    1778 9057.08    1778 9182.31    1776 9255.08    1774  9318.5    1772
 9378.25    1770 9475.66    1768 9891.47    1766 9979.85    1764 9985.11    1762
 9990.28    176010010.06    176010013.99    176210085.33    176410161.24    1766
10247.91    176810365.75    1770

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9057    .065 9979.85     .0510013.99    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.8510013.99              400     420     450              .6       .9

CROSS SECTION           RIVER: Apache Wash
```

REACH: Reach 1c RS: 3.52

'NPUT
escription: 3.52

Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9078	1774	9078.29	1774	9196	1772	9265.69	1770	9406.56	1768
9445.44	1768	9517.35	1770	9599.57	1770	9628.79	1768	9669.22	1766
9704.26	1764	9851.82	1764	9883.69	1764	9945.91	1762	9949.59	1762
9950.69	1762	9977.47	1762	9977.93	1762	9981.96	1760	9986.06	1758
10002.04	1756	10006.86	1756	10011.86	1758	10017.06	1760	10100.32	1762
10273.56	1764	10646.59	1766						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9078	.065	9981.96	.05	10017.06	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9981.96	10017.06	200	200	200	.6	.9

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1c RS: 3.48

INPUT
Description: 3.48

Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9086	1772	9086.01	1772	9203.74	1770	9274.51	1768	9344.72	1766
9447.35	1764	9468.21	1764	9537.17	1766	9593.47	1766	9620.29	1764
9671.6	1762	9835.81	1762	9884.13	1762	9911.39	1762	9965.97	1762
9985.39	1760	9988.6	1758	9991.9	1756	10009.76	1756	10018.81	1758
10110.6	1760	10298.95	1762	10615	1764				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9086	.065	9985.39	.05	10018.81	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9985.39	10018.81	360	450	435	.6	.9

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1c RS: 3.4

INPUT
Description: 3.4

tation Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9215	1768	9310	1766	9415	1764	9460	1762	9500	1760
9725	1758	9865	1758	9920	1756	9985	1756	10000	1752
10020	1754	10030	1756	10060	1758	10215	1758	10465	1760
10700	1760.2	10850	1761						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9215	.065	9985	.05	10030	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9985	10030	490	470	430	.6	.9

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1c RS: 3.32

INPUT
Description: 3.32

Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9223	1768	9223.2	1768	9223.26	1768	9330.1	1766	9330.58	1766
9432.55	1764	9432.56	1764	9497.22	1762	9497.51	1762	9543.64	1760
9544.84	1760	9599.26	1758	9599.45	1758	9630.94	1756	9632.14	1756
9725.16	1754	9801.22	1754	9955.22	1754	9974.26	1752	9981.64	1750
10008.82	1750	10020.21	1754	10242.15	1754	10416.5	1756	10490	1756.7
10560	1756.2	10725	1756.2	10790	1756.5	10929.84	1758		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9223	.065	9955.22	.05	10020.21	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9955.22	10020.21	510	560	560	.6	.9

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1c RS: 3.21

INPUT
Description: 3.21

Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9355	1762	9450	1760	9505	1758	9560	1756	9595	1754
9630	1752	9660	1750	9680	1749	9710	1750	9900	1751
9965	1750	9990	1746	10010	1746	10070	1748	10130	1750

```
   10315    1752   10390  1752.1

 'anning's n Values          num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
     9355    .065     9965     .05    10130    .065

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9965   10130              250     310     350              .6       .9

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1c           RS: 3.13

 INPUT
 Description: 3.13

 Station Elevation Data     num=       22
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     9160    1762 9160.32    1762    9275    1760    9340    1758 9387.31    1756
  9419.28    1754 9442.64    1752 9467.83    1750 9512.79    1748 9587.44    1748
   9655.1    1748  9675.3    1748 9870.47    1748 9978.41    1746 9984.92    1744
  9996.99    174210009.71    174210016.22    174410022.13    174610027.88    1748
 10067.68    1750   10100  1750.2

 Manning's n Values          num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
     9160    .065 9978.41     .0510027.88    .065

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9978.4110027.88              200     280     300              .6       .9

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1c           RS: 3.07

 INPUT
 Description: 3.07

 Station Elevation Data     num=       13
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     9360    1760    9505    1756    9575    1754    9610    1752    9640    1748
     9665    1746 9912.66    1746 9979.95    1744 9988.79    174210019.37    1742
 10028.11    174410080.68    174610180.41    1748

 Manning's n Values          num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
     9360    .065 9979.95     .0510028.11    .065

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9979.9510028.11              540     520     420              .6       .9

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1c           RS: 2.97

 INPUT
 Description: 2.97

 Station Elevation Data     num=       24
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     8920    1752    8990    1746    9000    1744    9020    1738    9045    1738
     9055    1740    9065    1742    9170    1742    9365    1744    9375    1744
     9750    1742    9800  1741.5    9910  1741.3    9984    1740 9986.95    1738
  9989.63    1736 9995.85    173610007.33    1738 10018.7    174010238.69    1740
 10248.88    174010511.29    174210690.41    1744   10750    1746

 Manning's n Values          num=        5
      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val
     8920    .065     9000     .05     9065    .065     9365      20     9375      20

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9000    9065              270     270     270              .6       .9

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1c           RS: 2.92

 INPUT
 Description: 2.92
 Station Elevation Data     num=       25
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     9230    1750    9310    1744    9350    1742    9410    1740    9430    1736
     9440    1735    9450    1736    9465    1740    9600    1741    9880    1740
     9975    1738    9990    1736   10000    1734   10025    1736   10035    1738
    10100    1740   10130    1742   10160    1742   10170    1738   10200    1738
    10435    1740   10625    1742   10790    1742   10925    1746   11135    1750

 Manning's n Values          num=        5
      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val
     9230    .065     9410     .05     9465    .065     9880     .05    10100    .065

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9410    9465                0       0       0              .6       .9

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 2            RS: 2.90

 .NPUT
 Description: 2.9
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Station Elevation Data     num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9320    1750    9390    1746    9425    1744    9500    1740    9645    1738
    9655    1734    9665  1733.5    9675    1734    9685    1738    9765    1740
    9850    1740    9965    1738    9980    1734   10000    1733   10005    1734
   10020    1736   10140    1738   10190    1740   10275    1744   10410    1738
   10440    1740   10610    1740   10675    1742   10745    1744   11000    1748

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    9320    .065    9645     .05    9685    .065    9965     .05   10140    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9645    9685              175     190     150              .6       .9

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 2             RS: 2.87

INPUT
Description: 2.87

Station Elevation Data     num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9232    1748 9232.79    1748 9262.53    1746  9290.5    1744    9320    1742
 9320.56    1742 9357.22    1740 9522.91    1738    9568    1736 9575.76    1734
    9591    1734    9620    1738 9700.62    1738 9774.16    1738 9800.39    1736
    9820    1736 9921.67    1736 9984.19    1734  9991.2    173210016.07    1732
 10028.2    173410040.34    1736 10188.5    173810250.69    174210350.34    1740
   10725    1748

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    9232    .065 9522.91     .05    9620    .065    9820    .0510040.34    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9522.91    9620              240     275     500              .6       .9

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 2             RS: 2.82

INPUT
Description: 2.82

Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9250    1750    9355    1746    9455    1738    9550    1736    9710    1736
    9735    1732    9740    1731    9745    1732    9765    1736    9950    1736
    9980    1734    9990    1730   10000    1729   10010    1730   10025    1734
   10055    1736   10085    1740   10165    1750

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    9250    .065    9710     .05    9765    .065    9950     .05   10055    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9710    9765              200     480     500              .6       .9

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 2             RS: 2.73

INPUT
Description: 2.73
Station Elevation Data     num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9594.08    1750  9634.4    1748 9671.35    1746 9703.58    1744 9729.78    1742
 9756.45    1740 9787.82    1738 9811.88    1736 9885.68    1734 9971.87    1732
 9979.06    1730 9986.23    172810019.94    172810029.07    173010036.42    1732
10071.17    173410086.17    173610101.17    1738   10235    1748

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9594.08    .065 9971.87    .0510036.42    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.8710036.42               0       0       0              .6       .9

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 2.60

INPUT
Description: 2.6

Station Elevation Data     num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9420    1750    9540    1742    9610    1740    9680    1738    9750    1736
    9780    1734    9820    1732    9935    1732    9945    1730    9960    1724
    9965    1724   10020    1726   10030    1728   10140    1730   10265    1732
   10335    1732   10370    1730   10390    1730   10440    1734   10625    1750

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9420     .07    9945    .055   10030     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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          9945   10030                390     430     450              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.52

INPUT
Description: 2.52

Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9565    1748 9565.18    1748 9622.44    1746 9653.84    1744 9708.63    1742
 9739.13    1740 9769.43    1738 9805.03    1736 9840.17    1734 9866.23    1732
 9876.33    1730 9886.43    1728 9957.59    1726 9963.27    1724 9970.23    1722
10021.41    172210025.07    172410028.76    172610120.86    172810211.79    1728
10215.37    172810279.41    172810316.87    172810363.84    173010395.26    1732
10419.34    173410459.58    173610490.34    1738

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9565     .07 9957.59    .05510028.76     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.5910028.76               270     260     250              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.47

INPUT
Description: 2.47

Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9708    1746    9709    1746 9709.82    1746 9786.76    1744 9841.66    1742
 9866.87    1740  9887.6    1738 9904.28    1736 9920.54    1734 9942.57    1732
 9947.49    1730 9952.41    1728 9957.33    1726 9962.26    1724 9967.18    1722
  9972.1    1720 9990.76    172010013.06    172210027.81    1724 10090.1    1726
10100.63    172610110.13    172410200.41    172610300.68    1728   10340    1730
   10360    1734   10400    1740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9708     .07 9962.26    .05510027.81     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9962.2610027.81               340     400     450              .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.40

INPUT
Description: 2.4

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9705    1740    9780    1734    9795    1732    9800    1730    9840    1724
    9890    1722    9940    1720    9980    1718   10020    1718   10065    1740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9705     .07    9980    .055   10020     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   10020               300     360     370              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.33

INPUT
Description: 2.33

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9720    1732    9778    1730    9800    1728    9840    1724    9870    1722
    9890    1720    9945    1720    9960    1718   10000    1717   10028    1718
   10030    1720   10045    1730   10055    1740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9720     .07    9945    .055   10030     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9945   10030               450     450     450              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.24

INPUT
Description: 2.24

Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9530    1742 9530.38    1742 9598.29    1740 9650.09    1738 9688.65    1736
 9709.55    1734 9728.83    1732 9751.11    1730 9767.21    1728 9781.96    1726
 9796.25    1724  9825.6    1722 9855.35    1720 9939.57    1718 9956.56    1716
 9973.56    171410001.06    171410029.46    171610055.42    171810148.55    1720
```

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10166.48    172210188.25    172410215.72    172610237.62    172810263.41    1730
10296.98    173210331.79    173410370.07    173610406.21    173810456.13    1740

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9530     .07 9939.57    .05510055.42     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.5710055.42               380     380     390             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 2.17

INPUT
Description: 2.17

Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9675.45    1738    9692    1736 9708.55    1734  9724.8    1732 9741.11    1730
 9757.42    1728 9773.73    1726 9790.06    1724 9809.96    1722 9833.72    1720
 9861.48    1718 9889.63    1716 9892.16    1716 9948.16    1716 9962.44    1714
10027.88    171410055.88    171610136.87    1716 10199.6    171610234.24    1718
10416.55    172010468.74    1722   10735    1730

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9675.45     .07 9948.16    .05510055.88     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.1610055.88               500     520     350             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 2.08

INPUT
Description: 2.08

Station Elevation Data     num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9610    1750 9610.35    1750  9714.7    1748 9778.99    1746  9816.5    1744
 9837.83    1742 9858.64    1740 9877.26    1738 9893.19    1736 9909.01    1734
 9925.37    1732 9931.07    1730 9939.15    1728 9947.24    1726    9955    1724
 9959.01    1722 9963.02    1720 9967.02    1718 9971.03    1716 9975.04    1714
 9979.05    1712  9983.3    171010015.86    171010024.93    1712 10034.4    1714
10080.47    171610200.63    1717   10300    1716   10360    1714   10450    1712
   10490    1710   10510    1710   10545    1712   10580    1714   10700    1716
   10745    1718   10790    1720   10970    1730

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9610     .07 9971.03    .05510080.47     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.0310080.47               440     440     270             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 2.00

INPUT
Description: 2

Station Elevation Data     num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9840    1740    9905    1738    9980    1710    9985  1708.5   10020  1708.5
   10050    1709   10090  1708.5   10115    1710   10150    1712   10360  1713.8
   10535    1712   10590    1710   10610  1708.5   10675  1708.5   10700    1710
   10755    1712   10805    1714   10830    1716   10930    1724

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9840     .07    9980    .055   10050     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   10050               550     490     230             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.88

INPUT
Description: 1.88

Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9700    1730    9790    1708    9890    1708    9950    1706    9975    1704
    9990  1702.1   10010  1702.1   10025    1704   10040    1706   10060    1708
   10085    1710   10210    1710   10300    1708   10340    1706   10370    1706
   10390    1708   10455    1710   10545    1720

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9700     .07    9975    .055   10025     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10025               190     200     230             .1       .3
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CROSS SECTION RIVER: Apache Wash
REACH: Reach 3 RS: 1.85

NPUT
Description: 1.85
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9617	1734	9617.78	1734	9718.01	1734	9749.45	1732	9758.46	1730
9765.23	1728	9771.66	1726	9778.24	1724	9784.96	1722	9791.47	1720
9798.05	1718	9804.78	1716	9811.47	1714	9819.07	1712	9828.06	1710
9836.36	1708	9915.83	1706	9954.99	1704	9975.55	170210002.05		1700
10011.48	170010026.03		170210041.54		170410064.87		170610129.94		1708
10187.04	170810294.81		170610368.04		170610414.01		170810424.61		1710
10432.86	171010451.94		1712 10481.6		171410483.31		171410525.65		1716
10530.36	171610599.55		171810599.74		171810653.56		172010655.77		1720

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9617	.07	9915.83	.05	10064.87	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9915.8	10064.87	210	190	150	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 3 RS: 1.81

INPUT
Description: 1.81

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9525	1732	9525.97	1732	9808.07	1732	9857.81	1730	9887.91	1728
9906.35	1726	9911.82	1724	9917.19	1722	9922.73	1720	9928.27	1718
9933.8	1716	9939.22	1714	9944.51	1712	9949.8	1710	9955.09	1708
9960.39	1706	9965.71	1704	9971.05	1702	9975.68	170010013.24		1700
10031	170210060.69		170410188.05		170610206.68		170610298.14		1704
10327.71	170410350.59		170610431.76		170810457.85		171010486.49		1712
10535.63	171410555.63		171410590.13		171610590.33		1716 10637.2		1718
10637.39	171810678.15		172010683.54		1720				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9525	.07	9965.71	.05	10060.69	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9965.7	10060.69	300	300	240	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 3 RS: 1.75

INPUT
Description: 1.75

Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9627	1728	9628.93	1728	9726.87	1726	9774.56	1724	9826.98	1722
9867.7	1720	9898.97	1718	9915.66	1716	9930.46	1714	9944.78	1712
9951.17	1710	9956.46	1708	9961.13	1706	9965.64	1704	9970.05	1702
9974.47	1700	9978.76	169810016.76		169810034.19		170010072.31		1702
10151.35	170410320.71		170610429.93		170810503.73		171010539.07		1712
10573.7	171410610.99		171610636.96		171810663.36		172010663.46		1720
10691.17	172210691.38		172210720.35		172410720.52		172410752.55		1726
10752.96	172610784.42		1728						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9627	.07	9970.05	.05	10072.31	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9970.0	10072.31	480	500	520	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 3 RS: 1.66

INPUT
Description: 1.66

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9490	1720	9522.7	1718	9556.29	1716	9593.85	1714	9648.34	1712
9708.49	1710	9744.33	1708	9785.11	1706	9829.76	1704	9931.63	1702
9952.11	1700	9967.65	1698	9993.88	169610014.03		169610029.43		1698
10034	170010102.15		170010112.65		1698 10118.5		169810189.52		1698
10197.65	169810205.31		170010212.95		170210237.12		170410277.66		1706
10306.08	1708 10329.5		171010356.19		171210386.31		171410422.81		1716

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9490	.07	9952.11	.055	10034	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9952.11	10034	300	250	240	.3	.5

CROSS SECTION RIVER: Apache Wash
REACH: Reach 3 RS: 1.60

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INPUT
Description: 1.6

Station Elevation Data     num=      34
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9170     1722 9172.78     1722 9221.64     1720 9251.21     1718 9274.81     1716
 9313.58     1714 9342.85     1712 9365.07     1710 9388.01     1708 9416.18     1706
 9448.11     1704 9518.79     1702 9799.12     1700 9907.12     1698 9959.73     1696
 9980.66     1694  9995.9     1692 10008.9     169210012.95     169410016.94     1696
10020.86     169810024.53     170010027.88     170210031.18     170410062.39     1706
10086.53     1708 10106.2     171010125.71     171210149.92     171410182.13     1716
10243.56     171810316.07     172010399.82     172210450.64     1724

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9170     .07 9959.73    .05510016.94     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.7310016.94               190     180     180              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.56

INPUT
Description: 1.56

Station Elevation Data     num=      35
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9195     1722  9200.6     1722 9240.99     1720 9274.78     1718  9306.6     1716
 9337.19     1714  9363.9     1712 9384.66     1710  9404.5     1708 9426.84     1706
 9453.43     1704 9496.71     1702 9564.46     1700 9664.24     1700 9690.11     1700
 9951.37     1698 9973.37     1696 9978.24     1694 9983.09     169210014.85     1692
10019.26     169410023.72     169610028.61     169810033.88     170010039.18     1702
10058.37     170410091.18     170610120.61     170810147.29     171010178.32     1712
10210.86     171410248.86     171610309.79     171810367.94     1720   10445     1722

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9195     .07 9951.37    .05510028.61     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.3710028.61               400     500     540              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.47

INPUT
Description: 1.47
Station Elevation Data     num=      30
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9277.32     1714 9301.68     1712  9320.6     1710 9339.84     1708 9361.64     1706
 9397.25     1704 9462.33     1702 9530.85     1700 9560.22     1698 9579.82     1696
 9593.84     1694  9595.9     1694 9800.63     1698 9911.62     1696 9964.37     1694
 9971.85     1692 9980.99     169010017.81     169010025.12     169210032.41     1694
10042.54     169610056.56     169810067.04     170010103.76     1702 10130.3     1704
10164.24     170610204.16     170810282.99     171010346.85     1712   10480     1716

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9277.32     .07 9964.37    .05510032.41     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.3710032.41               490     500     520              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.37

INPUT
Description: 1.37

Station Elevation Data     num=      23
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9284.44     1710 9305.13     1708 9325.72     1706 9350.78     1704 9383.08     1702
 9429.28     1700 9493.05     1698 9549.07     1696 9580.08     1694 9932.08     1692
 9963.31     1690  9977.4     168810014.54     168810022.33     1690 10030.2     1692
 10037.9     169410045.77     169610053.61     1698 10073.7     170010163.35     1702
10234.68     1704 10286.7     1706   10540     1710

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9284.44     .07 9932.08    .055 10030.2     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9932.08 10030.2               400     500     440              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.27

INPUT
Description: 1.27

Station Elevation Data     num=      23
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9530     1710 9550.32     1708 9575.57     1706 9590.36     1704  9615.9     1702
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  9622.2    1700 9681.06    1698 9761.67    1696 9801.63    1694 9834.16    1692
 9884.96    1690 9937.31    1688 9956.16    1686 9975.71    1684 9991.73    1684
10031.28    168610120.68    168810200.23    1690   10280    1692   10410    1694
   10520    1696   10820    1698   10900    1700

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9530     .07 9937.31     .0610031.28     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.3110031.28               450     460     500             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.18

INPUT
Description: 1.18

Station Elevation Data     num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9420    1712    9421    1712    9500    1710 9629.93    1708 9660.57    1706
 9689.28    1704 9717.55    1702 9746.16    1700 9771.65    1698 9802.81    1696
 9835.83    1694  9879.8    1692 9898.73    1690 9912.85    1688 9927.29    1686
 9937.42    1684 9947.19    168210003.85    168010019.17    168010024.04    1682
10028.94    168410063.29    168610104.15    168810198.56    1690   10670    1690
   10870    1692   11415    1692   11570    1700

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9420     .07 9937.42     .0610028.94     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.4210028.94               500     500     350             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.09

INPUT
Description: 1.09

Station Elevation Data     num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9882.18    1702 9887.93    1700 9893.49    1698 9899.07    1696 9904.63    1694
 9910.19    1692  9915.8    1690 9921.37    1688 9926.88    1686 9934.74    1684
 9960.45    1682 9968.65    168010020.29    1680 10028.7    1682 10039.1    1682
10089.72    1682   10150    1686 10190.2    168610355.69    168410580.15    1686
10925.55    168610929.48    1686   11500    1687   11610    1688   11820    1700

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9882.18     .07 9960.45    .045 10039.1     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9960.45 10039.1               500     500     440             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 0.99

INPUT
Description: 0.99

Station Elevation Data     num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9881.43    1698 9890.45    1696 9898.75    1694 9906.88    1692 9914.24    1690
 9920.09    1688 9925.53    1686 9931.39    1684 9950.02    1682 9969.66    1680
 9976.28    167810018.49    167810026.04    168010147.08    1682 10189.7    1682
10277.01    168010326.93    1678 10368.2    167810378.07    167810418.53    1678
10542.32    168010746.79    168210764.47    168210897.04    168210898.28    1682
10913.43    168210917.62    1682   11420    1684   11490    1684   11740    1682
   11790    1684   11900    1690

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9881.43     .07 9969.66    .05510026.04     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.6610026.04               890     900     550             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 0.84

INPUT
Description: 0.84

Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9780    1686    9910    1676    9975    1672    9980    1670   10020    1670
   10030    1672   10080   1673.8   10110    1672   10125    1670   10150    1674
   10230    1674   10290    1678   10320    1678   10380    1676   10400    1676
   10460    1678   10590    1680   10890    1680   10950    1678   11015    1678
   11070    1680   11295    1690

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9780     .07    9975     .07   10030     .07
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10030              420     440     430            .3        .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.75

INPUT
Description: 0.75
Station Elevation Data    num=      54
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9238.04    1686 9283.63    1684 9320.34    1682 9357.26    1680 9398.37    1678
 9509.61    1676 9623.97    1674 9819.83    1674 9823.85    1674 9849.05    1674
 9850.71    1674 9883.74    1672 9884.15    1672 9943.61    1670 9943.82    1670
 9967.12    1668 9967.18    1668 9978.01    1666 9978.08    166610016.12    1666
10016.17    166610021.87    166810021.92    166810027.72    167010059.95    1670
10060.05    167010080.45    167010080.56    167010093.84    1672   10094    1672
10119.59    167210119.71    167210128.45    1670 10128.5    1670 10145.7    1670
10145.78    1670 10173.1    167210173.36    167210214.32    1674 10214.6    1674
10324.36    167410324.59    167410391.18    167410391.21    167410479.43    1676
10479.48    167610551.03    167810551.49    167810563.65    167810630.55    1680
10673.09    168210746.72    168410847.23    168610966.86    1688

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9238.04     .07 9943.82    .05510027.72     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.8210027.72              180     200     210            .3        .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.71

INPUT
Description: 0.71
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9258.9    1680 9328.02    1678 9410.74    1676 9517.84    1674 9806.35    1672
 9806.66    1672 9929.72    1670 9930.71    1670 9973.93    1668 9973.94    1668
 9979.82    1666  9979.9    1666 9985.76    1664  9985.8    166410015.71    1664
 10015.9    166410024.34    166610024.46    166610029.59    166810030.23    1668
10045.83    166810045.97    166810052.42    166610052.62    166610063.21    1666
 10063.3    166610070.56    166810070.63    166810089.81    1670 10092.7    1670
10125.78    167210126.63    167210161.49    167410162.73    167410201.55    1676
10201.61    167610269.53    167810438.22    168010523.85    1682

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9258.9     .07 9973.94    .05510070.56     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.9410070.56              370     400     440            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.63

INPUT
Description: 0.63
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9000    1678 9021.62    1678  9023.6    1678 9089.33    1676 9089.53    1676
 9196.04    1674    9300    1672 9418.17    1672 9467.58    1672 9467.59    1672
 9524.47    1670 9524.59    1670 9629.26    1670 9630.41    1670 9661.89    1670
 9662.28    1670 9798.92    1668 9852.54    1668 9856.43    1668 9967.22    1668
 9967.27    1668 9971.89    1666 9971.91    1666 9976.44    1664 9976.56    1664
10025.48    166410033.05    166610033.09    166610044.06    166810044.68    1668
10128.35    166810128.42    166810151.63    1668   10172    1670   10188    1672
10267.84    167410318.63    167610393.26    1678

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9000     .07 9967.27    .05510044.06     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.2710044.06              300     500     600            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.54

INPUT
Description: 0.54
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9200    1684    9290    1676    9340    1674    9450    1672    9600    1670
    9840    1668    9875    1664    9965    1664 9974.34    1660 9974.39    1660
10019.28    166010019.49    166010023.02    166210023.25    166210027.02    1664
10027.05    166410027.06    166410068.43    166610068.89    166610198.37    1666
10198.64    166610255.88    166610256.31    1666 10278.1    166610360.71    1666
10418.56    166410470.56    166410510.35    166610530.78    166810614.05    1670
10680.93    1674

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9200     .07    9965    .05510027.02     .07
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          996510027.02              800     640     400              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.43

INPUT
Description: 0.43

Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9580    1676    9730    1666    9900    1664    9940    1662    9950    1660
    9980    1656    9985    1655   10015    1655   10020    1656   10035    1660
   10050  1661.8   10120  1661.8   10190    1660   10240    1658   10270    1660
   10290    1662   10350    1662   10405    1660   10430    1660   10500    1662
   10535    1664   10620    1666   10715    1670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9580     .07    9950    .055   10035     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9950   10035              505     500     440              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.33

INPUT
Description: 0.33

Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9558    1670    9645    1662    9722    1660    9820    1660    9900    1662
    9920    1660    9970    1654    9980  1652.2   10020  1652.2   10040    1654
   10090    1658   10135    1658   10150  1652.6   10170    1656   10220    1658
   10250    1660   10305    1662   10375    1664   10515    1664   10570    1666
   10720    1668   10775    1670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9558     .07    9920    .055   10090     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9920   10090              350     650     700              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.20

INPUT
Description: 0.2

Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9106  1672.1  9106.59    1672  9164.69    1670  9201.55    1668  9225.67    1666
  9249.76    1664  9269.28    1662  9288.16    1660  9525.13    1658  9560.23    1658
  9606.89    1658  9642.09    1656   9673.5    1656  9827.21    1656  9904.07    1654
   9939.9    1652  9967.74    1650  9974.66    1648   9981.5    1646 10015.7    1646
 10020.38    1648    10025  165010029.82  165210034.56    1654 10039.4    1656
 10066.58  165610160.82  165610176.86  165810191.81  166010208.08    1662
 10226.71  166410245.46  166610319.02  166810495.71    1670   10500    1670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9106     .07  9967.74    .055  10039.4     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.74 10039.4               0       0       0              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.23

INPUT
Description: 2.23

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9000    1844  9114.42    1844  9451.06    1842  9689.56    1840  9803.45    1838
  9879.99    1836  9916.62    1834  9941.49    1832  9962.82    1830  9979.43    1828
  9994.11  182610007.33  182610023.07  182810034.76    1830   10373    1832
   10480    1832   10620    1834

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9000    .065  9979.43     .0510023.07    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.4310023.07              435     440     445              .6       .9

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.14

INPUT
Description: 2.14

Station Elevation Data    num=      25
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9000	1842	9068.32	1842	9096.42	1842	9106.78	1842	9107.17	1842
9124.18	1842	9126.13	1842	9368.44	1840	9666.77	1838	9789.99	1836
9840.56	1834	9888.3	1832	9926.13	1830	9961.98	1828	9969.94	1826
9979.01	182410025.81		182410218.97		182610361.55		182610637.58		1826
10689.74	182810753.61		183010858.53		1830	10980	1828	11000	1828

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9000	.065	9979.01	.05	10025.81	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9979.01	10025.81	385	380	380	.6	.9

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 2.07

INPUT
Description: 2.07

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9000	1838	9166.19	1838	9444.11	1836	9490.91	1836	9730.61	1834
9739.5	1834	9793.58	1832	9833.52	1832	9863.76	1832	9869.43	1832
9901.41	1830	9906.46	1830	9925.02	1828	9942.07	1826	9955.42	1824
9969.04	1822	9980	1821	10020	1821	10060	182210120.08		1822
10146.9	182210667.15		182210737.75		182410792.24		1826	10992.5	1826
11000	1826								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9000	.065	9969.04	.05	10060	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9969.04	10060	415	390	260	.6	.9

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 2.00

INPUT
Description: 2

Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9000	1830	9230.32	1830	9734.67	1830	9834.67	1828	9905.71	1826
9944.86	1824	9956.92	1822	9965.44	1820	9965.99	1820	9973.16	1818
9974.89	1818	9981.08	1816	9983.46	1816	9989.77	1814	9993.01	1814
10005.51	181410007.19		181410022.29		181610025.64		181610088.76		1818
10094.45	181810488.79		182010556.69		1820	10588.7	182010637.44		1822
10701.32	1824	10748.5	182610809.26		182810897.14		1828		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9000	.065	9983.46	.05	10022.29	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.46	10022.29	390	400	390	.6	.9

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 1.92

INPUT
Description: 1.92

Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9735	1826	9820	1824	9860	1822	9890	1820	9910	1818
9925	1816	9935	1814	9945	1812	9965	1810	10010	1810
10015	1812	10025	1814	10050	1812	10100	1814	10230	1814
10265	1814	10300	1814	10340	1814	10380	1816	10420	1818

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9735	.065	9945	.05	10015	.065

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945	10015	460	455	450	.6	.9

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 1.83

INPUT
Description: 1.83

Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9000	1822	9066.97	1822	9131.65	1824	9307.78	1826	9460.19	1826
9648.7	1824	9760.26	1822	9822.31	1820	9866.75	1818	9901.85	1816
9931.27	1814	9956.91	1812	9974.62	1810	9983.67	1808	9990.95	1806
10005.18	180610038.99		180810189.64		181010254.89		181010353.21		1808
10359.32	1808	10390.3	181010422.67		181210446.72		181410487.35		1816
10546.73	181810679.16		181810683.47		1818	10721.9	181610731.34		1816
10789.14	181410800.27		181410855.83		181210858.97		1812	10936.2	1812
11000	1812								

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9000    .065 9983.67     .0510038.99    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.6710038.99              440     445     450             .6       .9

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.75

INPUT
Description: 1.75

Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9300    1822 9473.63    1822 9572.49    1820 9686.97    1818    9755    1816
 9800.07    1814 9838.97    1812 9872.92    1810 9898.13    1808 9923.03    1806
 9964.44    1804 9975.68    1802  9998.4    180010003.69    180010013.01    1802
10022.87    180410187.38    180410279.87    180210305.65    180210330.32    1804
10358.49    180610403.64    1808

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9300    .065 9964.44     .0510022.87    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.4410022.87              485     490     500             .6       .9

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.65

INPUT
Description: 1.65

Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9300    1816 9612.12    1816 9696.55    1814 9805.58    1812 9874.13    1810
 9884.19    1808 9892.47    1806 9899.94    1804 9907.78    1802  9915.7    1800
 9924.08    1798 9986.26    179610010.85    179610019.63    179810250.25    1800
10303.79    180010316.07    1798   10328    179610363.97    1796 10417.6    1798
   10600    1800   10825    1800   10895    1804

Manning's n Values          num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    9300     .08 9924.08     .0510010.85    .06510316.07     .05 10417.6    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.2610010.85              600     600     575             .6       .9

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.54

INPUT
Description: 1.54

Station Elevation Data     num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9300    1806 9510.22    1806 9563.88    1804 9604.68    1802  9637.2    1800
 9669.92    1798 9735.34    1796 9972.06    1794 9986.03    1792 9993.93    1790
 10012.3    179010020.15    179210029.59    179210124.43    179010160.57    1790
10181.54    179210288.06    179410480.53    179410495.09    179410533.67    1796
10587.48    179810620.69    180010644.29    180210666.21    179810669.69    1800
10675.27    180410675.88    180210685.29    1804   10700    1804

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9300     .07 9986.03     .0510181.54    .065

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.0310020.15              400     400     400             .6       .9

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.46

INPUT
Description: 1.46
Station Elevation Data     num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9000    1796 9015.96    1796 9043.99    1798 9075.34    1800    9345    1800
    9375    1798    9395    1796    9420    1794    9455    1792    9645    1790
    9685    1790 9843.42    1792 9885.29    1792 9920.09    1790 9973.03    1788
 9983.48    178610027.78    178610028.33    178610038.59    1788 10039.2    1788
10179.12    179010179.17    179010295.57    179210295.61    179210332.13    1794
10332.89    179410363.15    179610363.28    179610393.04    179810393.05    1798
10425.74    180010426.07    180010466.42    180210466.47    180210507.58    1804
10507.82    180410631.97    1806 10632.3    1806 10913.9    180810929.65    1808
   11000    1808

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9000     .07 9973.03     .05510038.59    .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.0310038.59              260     500     670             .6       .9
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CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 1.37

INPUT
Description: 1.37
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9300	1796	9316	1794	9345	1792	9385	1790	9440	1788
9490	1788	9627.73	1790	9705.39	1790	9806.04	1788	9806.97	1788
9865.72	1786	9866.07	1786	9886.2	1784	9886.27	1784	9899.07	1784
9899.61	1784	9957.84	1784	9958.87	1784	9968.7	1782	9968.84	1782
9972.6	1782	9973.25	1782	9983.87	1784	9984.59	178410010.64		1784
10011.18	178410045.64		178410046.01		178410055.46		178610057.12		1786
10069.22	178810069.72		178810154.04		178810154.06		178810164.16		1788
10181.45	178810258.34		179010303.11		179210374.22		179410438.87		1796
10528.04	1798	10700	1798						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9300	.07	9958.87	.055	9983.87	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9958.87	9983.87	570	500	430	.6	.9

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 1.27

INPUT
Description: 1.27

Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9300	1790	9323.63	1790	9347.73	1788	9366.76	1786	9787.72	1784
9788.51	1784	9835.06	1784	9835.11	1784	9960.27	1784	9960.65	1784
9969.04	1782	9969.12	1782	9978.7	1780	9979.03	1780	9988.65	1778
9989.09	177810011.61		177810012.22		177810031.48		1780	10031.9	1780
10057.73	178210058.84		178210169.81		178410171.13		178410189.36		1786
10189.68	178610205.64		178810206.31		178810265.97		179010417.27		1792
10521.52	179410622.71		1796	10700	1796				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9300	.07	9969.12	.05	10057.73	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9969.12	10057.73	390	350	320	.6	.9

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 1.21

INPUT
Description: 1.21

Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9300	1800	9303.71	1800	9333.03	1798	9354.86	1796	9371.76	1794
9384.23	1792	9393.21	1790	9402.24	1788	9411.46	1786	9421	1784
9430.6	1782	9440.23	1780	9469.65	1780	9507.88	1780	9538.2	1780
9595.38	1782	9602.57	1782	9614.68	1782	9618.31	1782	9801.74	1780
9802.59	1780	9835.89	1780	9836.44	1780	9877.07	1782	9886.63	1782
9973.74	1780	9977.68	1780	9982.64	1778	9983.14	1778	9988.05	1776
9988.44	177610013.91		1776	10014.5	177610020.25		1778	10020.6	1778
10035.39	1780	10042.7	178010073.76		177810073.98		177810096.24		1778
10106.85	178010131.31		178210206.15		178410275.22		178610351.64		1788
10518.81	179010587.96		179210658.56		1794	10700	1794		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9300	.07	9973.74	.05	10035.39	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9973.74	10035.39	400	440	450	.6	.9

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 1.12

INPUT
Description: 1.12

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9300	1786	9301.69	1786	9301.78	1786	9312.43	1784	9312.61	1784
9323.43	1782	9323.49	1782	9334.19	1780	9334.29	1780	9344.65	1778
9345.18	1778	9460	1778	9546.2	1776	9547.35	1776	9567.17	1776
9568.03	1776	9626.95	1776	9627.24	1776	9660.25	1776	9661.37	1776
9701.23	1778	9701.63	1778	9764.83	1780	9764.91	1780	9845.43	1780
9895.68	1778	9943.46	1776	9981.99	177410002.99		177210010.59		1772
10016.88	177410023.31		177610029.68		177810036.17		178010084.32		1782
10199.4	178410402.86		178610463.11		178810534.47		1790	10700	1790

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9300	.07	9943.46	.05	10023.31	.07

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

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        9943.4610023.31                320      420      470              .6        .9

 CROSS SECTION           RIVER: Paradise Wash
 REACH: Reach 1             RS: 1.04

 INPUT
 Description: 1.04

 Station Elevation Data     num=       42
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     9300     1788 9308.87     1788 9309.07     1788 9317.99     1786  9318.4     1786
  9327.16     1784 9327.57     1784 9337.16     1782 9337.49     1782 9348.55     1780
  9348.99     1780 9371.44     1778 9371.87     1778 9451.43     1776 9452.44     1776
  9547.56     1774 9547.64     1774 9594.03     1774 9594.17     1774 9676.69     1774
  9678.18     1774 9732.85     1772 9740.57     1772 9783.28     1772 9803.92     1772
  9831.47     1772 9839.62     1772 9911.54     1772 9930.86     1772  9985.5     1772
   9989.4     177010015.91     177010029.11     177210041.77     177410053.67     1776
 10108.42     177810239.41     178010312.96     178210376.01     178410462.35     1786
 10616.63     1788   10700     1788

 Manning's n Values         num=        3
      Sta    n Val      Sta    n Val      Sta    n Val
     9300      .07  9985.5     .05510029.11      .07

 Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
         9985.510029.11                500      400      300              .6        .9

 CROSS SECTION           RIVER: Paradise Wash
 REACH: Reach 1             RS: 0.95

 INPUT
 Description: 0.95

 Station Elevation Data     num=       39
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     9300     1790 9306.75     1790 9307.31     1790  9372.8     1788 9372.97     1788
  9415.98     1786 9416.22     1786 9443.26     1784 9443.84     1784 9462.12     1782
  9462.99     1782 9507.21     1780 9507.56     1780 9526.62     1778 9527.22     1778
  9551.75     1776 9552.05     1776  9590.3     1774  9590.4     1774 9688.06     1772
  9688.13     1772 9765.23     1772 9809.24     1772 9851.63     1772 9982.32     1772
  9984.49     1770 9986.77     176810001.77     176610019.78     176610036.54     1768
 10070.19     177010159.61     177210232.27     177410301.62     177610431.37     1778
 10537.83     178010604.33     178210676.56     1784   10700     1784

 Manning's n Values         num=        3
      Sta    n Val      Sta    n Val      Sta    n Val
     9300      .07 9984.49     .05510070.19      .07

 Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
         9984.4910070.19                250      275      310              .6        .9

 CROSS SECTION           RIVER: Paradise Wash
 REACH: Reach 1             RS: 0.89

 INPUT
 Description: 0.89

 Station Elevation Data     num=       36
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     9300     1788 9424.76     1788 9426.01     1788 9450.57     1786 9451.16     1786
  9470.61     1784 9470.93     1784 9487.63     1782 9487.96     1782 9502.14     1780
   9502.4     1780 9516.61     1778 9517.07     1778 9532.07     1776 9532.28     1776
  9556.12     1774 9556.82     1774 9582.26     1772 9582.35     1772 9640.11     1770
  9792.59     1770 9921.21     1770 9981.01     1768 9983.09     1766 9985.21     1764
 10009.58     176410018.11     176610077.25     176810163.03     177010270.58     1772
 10351.92     177410413.54     177610455.94     177810517.17     178010654.68     1782
    10700     1782

 Manning's n Values         num=        3
      Sta    n Val      Sta    n Val      Sta    n Val
     9300      .07 9981.01     .05510077.25      .07

 Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
         9981.0110077.25                520      500      480              .6        .9

 CROSS SECTION           RIVER: Paradise Wash
 REACH: Reach 1             RS: 0.80

 INPUT
 Description: 0.8

 Station Elevation Data     num=       29
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     9300     1784 9372.44     1784  9372.5     1784 9426.73     1782 9460.69     1780
  9484.42     1778 9507.24     1776 9523.83     1774 9540.67     1772 9561.19     1770
  9593.82     1768 9646.26     1766 9687.09     1766 9785.49     1766 9982.14     1764
  9986.25     176210011.66     176210020.71     176410067.65     1764 10104.6     1764
 10291.13     1766 10321.7     176810349.52     177010380.68     177210425.05     1774
 10495.76     177610593.27     177810681.17     1780   10700     1780

 Manning's n Values         num=        3
      Sta    n Val      Sta    n Val      Sta    n Val
     9300      .07 9982.14     .05510020.71      .07

 Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
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      9982.1410020.71                420      350      330                .6        .9

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.72

INPUT
Description: 0.72

Station Elevation Data     num=       35
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9300     1774 9315.54     1774 9315.86     1774 9338.31     1772 9338.55     1772
 9356.22     1770 9356.61     1770 9374.98     1768 9375.04     1768 9397.09     1766
 9397.14     1766  9427.1     1764 9427.53     1764 9471.02     1762 9471.12     1762
 9623.53     1760 9679.14     1760  9760.9     1760  9886.4     1760 9971.86     1760
 9983.28     1760 9988.72     175810013.01     175810020.83     176010062.88     1762
10105.65     176410142.86     176610183.89     1768 10228.2     177010263.64     1772
 10307.7     177410365.66     177610446.05     177810559.24     1780   10700     1780

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9300     .07 9983.28    .05510020.83     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9983.2810020.83                400      420      425                .6        .9

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.62

INPUT
Description: 0.62

Station Elevation Data     num=       50
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9300     1772 9347.29     1772  9380.6     1770 9409.38     1768 9425.95     1766
 9441.84     1764 9466.41     1764 9511.97     1764 9550.51     1762 9585.83     1760
 9654.35     1758 9750.86     1758 9751.04     1758 9934.36     1758 9934.97     1758
 9965.48     1756 9965.56     1756 9980.22     1754 9980.28     175410016.08     1754
10016.37     175410027.28     175610027.34     175610030.43     175610030.53     1756
10044.97     1754 10046.8     175410055.43     1754 10055.5     175410068.18     1756
10068.87     175610082.06     175810082.35     175810099.76     175810099.84     1758
10217.75     175810217.85     175810240.82     176010244.69     176210246.45     1760
10250.34     176210262.67     176210276.76     176410296.62     1766 10325.2     1768
10348.29     177010378.74     177210422.99     177410523.11     1776   10700     1776

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9300     .07 9965.56    .05510027.28     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9965.5610027.28                420      450      460                .6        .9

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.53

INPUT
Description: 0.53

Station Elevation Data     num=       25
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9300     1772 9322.94     1772 9359.88     1770 9385.05     1768 9409.96     1766
  9429.6     1764  9449.9     1762 9471.98     1760 9508.37     1758 9573.14     1756
 9723.72     1754 9970.83     1752 9979.76     175010013.73     175010023.23     1752
10094.47     175410111.56     175610125.77     1758 10139.5     176010161.89     1762
10183.51     176410210.29     176610249.05     176810267.35     176010268.95     1762

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9300     .07 9970.83    .05510023.23     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9970.8310023.23                475      495      500                .6        .9

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.44

INPUT
Description: 0.44

Station Elevation Data     num=       32
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9300     1770 9313.37     1770 9421.15     1768 9456.38     1766 9485.14     1764
 9505.58     1762 9521.65     1760 9537.46     1758  9554.4     1756 9578.18     1754
 9603.04     1752 9682.28     1750 9992.46     174810001.98     1746   10007     1746
10019.54     174810032.09     175010044.36     175010105.67     1748 10138.9     1746
10140.02     174610149.52     174810159.12     1750 10170.1     175210203.73     1754
10257.48     175610284.67     175810316.04     176010347.87     176210382.54     1764
10443.39     1766   10700     1766

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9300     .07 9992.46    .05510032.09     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9992.4610032.09                480      490      500                .6        .9
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```
CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.34

INPUT
Description: 0.34

Station Elevation Data     num=      27
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9300     1764 9551.93     1764 9605.84     1762 9645.17     1760 9668.98     1758
 9690.83     1756 9710.38     1754 9730.12     1752 9749.69     1750 9772.57     1748
 9799.65     1746 9969.75     174410014.83     174410073.32     174610188.93     1746
10285.92     174410293.88     174410308.23     174610324.22     1748 10351.7     1750
10393.89     175210441.94     175410484.28     175610521.08     175810575.15     1760
10669.79     1762   10700     1762

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9300     .07 9969.75    .05510073.32     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.7510073.32              560     480     370              .6       .9

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.28

INPUT
Description: 0.28

Station Elevation Data     num=      30
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9300     1764 9382.72     1764 9564.77     1762 9638.93     1760 9664.88     1758
 9680.83     1756 9696.79     1754 9712.74     1752 9728.65     1750 9747.16     1748
 9766.04     1746 9784.93     1744 9813.61     1742 9985.49     1740 9996.96     1738
10011.78     173810021.63     174010035.07     174210234.78     1742 10240.9     1742
10260.26     174410319.83     174610367.43     174810409.59     175010442.71     1752
10470.09     175410502.72     175610552.61     175810654.01     1760   10700     1760

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9300     .07 9985.49    .05510035.07     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.4910035.07              550     470     380              .6       .9

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.17

INPUT
Description: 0.17

Station Elevation Data     num=      34
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9300     1758 9750.52     1758  9818.2     1756 9853.66     1754 9880.69     1752
 9903.35     1750 9924.21     1748 9943.94     1746  9948.6     1744 9953.26     1742
 9957.91     1740 9962.57     1738 9967.23     1736 9974.51     1734 9982.28     1732
 9983.75     173210022.71     173410084.24     173610128.49     173810173.84     1738
10260.45     173810423.55     173610511.08     173610520.92     173610528.63     1738
10535.63     174010543.28     174210551.22     174410559.17     174610567.11     1746
10595.03     175010642.37     175210673.82     1754   10700     1754

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9300     .07 9967.23    .05510084.24     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.2310084.24              275     225     200              .6       .9

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.13

INPUT
Description: 0.13

Station Elevation Data     num=      25
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9300     1754 9351.49     1754 9354.61     1754 9370.05     1754 9721.98     1754
  9784.3     1752 9822.24     1750 9852.88     1748 9886.08     1746  9917.6     1744
 9939.97     1742 9949.72     1740 9959.46     1738 9969.21     1736 9978.41     1734
 9986.34     173210019.39     173210047.54     1734 10172.1     173610224.65     1736
10263.75     173610407.51     1736 10543.1     173610551.08     173810559.07     1740

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9300     .07 9978.41    .05510047.54     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110047.54              425     390     465              .6       .9

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.04

INPUT
Description: 0.04
Station Elevation Data     num=      31
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
```

9440	1750	9470	1748	9500	1746	9530	1744	9555	1742
9670	1740	9680	1738	9725	1736	9765	1734	9850	1732
9915	1732	9922.46	1734	9946.82	1732	9970.15	1730	9983.45	1728
9998.41	172610018.18		172610025.76		172810032.22		173010090.04		1732
10169.15	173410255.73		173610279.91		173810301.52		174010321.92		1742
10343.48	174410365.07		174610404.44		174810456.52		1750	10552.6	1752
10700	1752								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9440	.07	9922.46	.05	10032.22	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9922.46	10032.22	0	0	0	.6	.9

SUMMARY OF MANNING'S N VALUES

River:Desert Hills Was

Reach	River Sta.	n1	n2	n3	n4	n5
Reach 1	0.99	.065	.05	.065		
Reach 1	0.90	.065	.05	.065		
Reach 1	0.81	.065	.05	.065		
Reach 1	0.72	.065	.05	.065		
Reach 1	0.64	.065	.05	.065		
Reach 1	0.56	.065	.05	.065		
Reach 1	0.48	.065	.05	.065		
Reach 1	0.40	.065	.05	.065		
Reach 1	0.31	20	.065	.05	.065	
Reach 1	0.22	.065	.05	.065	.05	.065

River:Apache Wash

Reach	River Sta.	n1	n2	n3	n4	n5
Reach 1a	8.02	.1	.055	.1		
Reach 1a	7.98	.1	.055	.1		
Reach 1a	7.89	.1	.055	.1		
Reach 1a	7.84	.1	.055	.1		
Reach 1a	7.74	.1	.055	.1		
Reach 1a	7.65	.1	.055	.1		
Reach 1a	7.55	.1	.055	.1		
Reach 1a	7.46	.1	.055	.1		
Reach 1a	7.36	.1	.055	.1		
Reach 1a	7.26	.1	.055	.1		
Reach 1a	7.17	.09	.055	.09		
Reach 1a	7.08	.09	.055	.09		
Reach 1a	6.98	.08	.055	.08		
Reach 1a	6.9	.08	.055	.08		
Reach 1a	6.8	.07	.055	.07		
Reach 1a	6.71	.07	.055	.07		
Reach 1a	6.63	.065	.06	.065		
Reach 1a	6.58	.065	.05	.065		
Reach 1a	6.5	.065	.05	.065		
Reach 1a	6.43	.065	.05	.065		
Reach 1a	6.32	.065	.06	.065		
Reach 1a	6.25	.065	.05	.065		
Reach 1a	6.16	.065	.06	.065		
Reach 1a	6.09	.065	.05	.065		
Reach 1a	6.01	.065	.05	.065		
Reach 1a	5.92	.065	.05	.065		
Reach 1a	5.83	.065	.05	.065		
Reach 1a	5.76	.065	.05	.065		
Reach 1a	5.66	.065	.05	.065		
Reach 1a	5.64	.065	.045	.065		
Reach 1a	5.57	.065	.05	.065		
Reach 1a	5.48	.065	.05	.065		
Reach 1a	5.38	.065	.05	.065		
Reach 1a	5.31	.065	.06	.065		
Reach 1a	5.21	.065	.05	.065		
Reach 1a	5.15	.06	.05	.065		
Reach 1a	5.09	.06	.05	.065		
Reach 1a	5.03	.065	.06	.065		
Reach 1a	4.96	.065	.06	.065		
Reach 1a	4.9	.05	.05	.05		
Reach 1a	4.82	.065	.05	.065		
Reach 1a	4.78	.065	.05	.065		
West Channel	4.744	.065	.055	.065		
West Channel	4.722	.065	.055	.065		
West Channel	4.655	.065	.055	.065		
West Channel	4.499	.065	.055	.065		
West Channel	4.311	.065	.055	.065		
West Channel	4.233	.065	.055	.065		
West Channel	4.111	.065	.055	.065		
West Channel	4.055	.065	.055	.065		
Reach 1b	4.74	.065	.05	.065		
Reach 1b	4.65	.08	.075	.08		
Reach 1b	4.6	.065	.05	.065		
Reach 1b	4.58	.065	.05	.065		
Reach 1b	4.575	Culvert				
Reach 1b	4.56	.065	.05	.065		

Reach 1b	4.49	.065	.05	.065		
Reach 1b	4.4	.065	.05	.065		
Reach 1b	4.31	.065	.05	.065		
Reach 1b	4.23	.065	.05	.065		
Reach 1b	4.22	.065	.05	.065		
Reach 1b	4.11	.065	.05	.065		
Reach 1b	4.05	.065	.05	.065		
Reach 1c	3.96	.065	.05	.065		
Reach 1c	3.86	.065	.05	.065		
Reach 1c	3.78	.065	.05	.065		
Reach 1c	3.75	.065	.05	.065		
Reach 1c	3.65	.065	.05	.065		
Reach 1c	3.6	.065	.05	.065		
Reach 1c	3.52	.065	.05	.065		
Reach 1c	3.48	.065	.05	.065		
Reach 1c	3.4	.065	.05	.065		
Reach 1c	3.32	.065	.05	.065		
Reach 1c	3.21	.065	.05	.065		
Reach 1c	3.13	.065	.05	.065		
Reach 1c	3.07	.065	.05	.065		
Reach 1c	2.97	.065	.05	.065	20	20
Reach 1c	2.92	.065	.05	.065	.05	.065
Reach 2	2.90	.065	.05	.065	.05	.065
Reach 2	2.87	.065	.05	.065	.05	.065
Reach 2	2.82	.065	.05	.065	.05	.065
Reach 2	2.73	.065	.05	.065		
Reach 3	2.60	.07	.055	.07		
Reach 3	2.52	.07	.055	.07		
Reach 3	2.47	.07	.055	.07		
Reach 3	2.40	.07	.055	.07		
Reach 3	2.33	.07	.055	.07		
Reach 3	2.24	.07	.055	.07		
Reach 3	2.17	.07	.055	.07		
Reach 3	2.08	.07	.055	.07		
Reach 3	2.00	.07	.055	.07		
Reach 3	1.88	.07	.055	.07		
Reach 3	1.85	.07	.055	.07		
Reach 3	1.81	.07	.055	.07		
Reach 3	1.75	.07	.055	.07		
Reach 3	1.66	.07	.055	.07		
Reach 3	1.60	.07	.055	.07		
Reach 3	1.56	.07	.055	.07		
Reach 3	1.47	.07	.055	.07		
Reach 3	1.37	.07	.055	.07		
Reach 3	1.27	.07	.06	.07		
Reach 3	1.18	.07	.06	.07		
Reach 3	1.09	.07	.045	.07		
Reach 3	0.99	.07	.055	.07		
Reach 3	0.84	.07	.07	.07		
Reach 3	0.75	.07	.055	.07		
Reach 3	0.71	.07	.055	.07		
Reach 3	0.63	.07	.055	.07		
Reach 3	0.54	.07	.055	.07		
Reach 3	0.43	.07	.055	.07		
Reach 3	0.33	.07	.055	.07		
Reach 3	0.20	.07	.055	.07		

River:Paradise Wash

Reach	River Sta.	n1	n2	n3	n4	n5
Reach 1	2.23	.065	.05	.065		
Reach 1	2.14	.065	.05	.065		
Reach 1	2.07	.065	.05	.065		
Reach 1	2.00	.065	.05	.065		
Reach 1	1.92	.065	.05	.065		
Reach 1	1.83	.065	.05	.065		
Reach 1	1.75	.065	.05	.065		
Reach 1	1.65	.08	.05	.065	.05	.065
Reach 1	1.54	.07	.05	.065		
Reach 1	1.46	.07	.055	.07		
Reach 1	1.37	.07	.055	.07		
Reach 1	1.27	.07	.055	.07		
Reach 1	1.21	.07	.055	.07		
Reach 1	1.12	.07	.055	.07		
Reach 1	1.04	.07	.055	.07		
Reach 1	0.95	.07	.055	.07		
Reach 1	0.89	.07	.055	.07		
Reach 1	0.80	.07	.055	.07		
Reach 1	0.72	.07	.055	.07		
Reach 1	0.62	.07	.055	.07		
Reach 1	0.53	.07	.055	.07		
Reach 1	0.44	.07	.055	.07		
Reach 1	0.34	.07	.055	.07		
Reach 1	0.28	.07	.055	.07		
Reach 1	0.17	.07	.055	.07		
Reach 1	0.13	.07	.055	.07		
Reach 1	0.04	.07	.055	.07		

UMMARY OF REACH LENGTHS

River: Desert Hills Was

Reach	River Sta.	Left	Channel	Right
Reach 1	0.99	490	470	440
Reach 1	0.90	500	491	480
Reach 1	0.81	550	492	400
Reach 1	0.72	340	373	325
Reach 1	0.64	270	450	450
Reach 1	0.56	320	436	450
Reach 1	0.48	400	382	300
Reach 1	0.40	380	478	570
Reach 1	0.31	450	425	400
Reach 1	0.22	0	0	0

River: Apache Wash

Reach	River Sta.	Left	Channel	Right
Reach 1a	8.02	215	235	245
Reach 1a	7.98	280	465	520
Reach 1a	7.89	300	300	220
Reach 1a	7.84	575	500	425
Reach 1a	7.74	425	500	475
Reach 1a	7.65	520	500	470
Reach 1a	7.55	510	500	480
Reach 1a	7.46	490	500	510
Reach 1a	7.36	420	446	470
Reach 1a	7.28	475	554	410
Reach 1a	7.17	500	500	520
Reach 1a	7.08	485	500	500
Reach 1a	6.98	400	437	470
Reach 1a	6.9	490	529	560
Reach 1a	6.8	500	495	400
Reach 1a	6.71	425	390	350
Reach 1a	6.63	300	290	290
Reach 1a	6.58	430	430	430
Reach 1a	6.5	310	345	355
Reach 1a	6.43	475	450	360
Reach 1a	6.32	410	390	350
Reach 1a	6.25	490	460	430
Reach 1a	6.16	270	360	450
Reach 1a	6.09	470	445	435
Reach 1a	6.01	485	490	510
Reach 1a	5.92	375	400	375
Reach 1a	5.83	375	380	380
Reach 1a	5.76	470	540	570
Reach 1a	5.66	460	440	320
Reach 1a	5.64	370	345	320
Reach 1a	5.57	400	450	450
Reach 1a	5.48	530	500	500
Reach 1a	5.38	350	375	425
Reach 1a	5.31	500	500	480
Reach 1a	5.21	330	310	300
Reach 1a	5.15	350	352	355
Reach 1a	5.09	300	300	310
Reach 1a	5.03	345	365	340
Reach 1a	4.96	400	320	200
Reach 1a	4.9	220	200	160
Reach 1a	4.82	480	480	480
Reach 1a	4.78	0	0	0
West Channel	4.744	190	170	170
West Channel	4.722	550	475	430
West Channel	4.655	560	540	500
West Channel	4.499	450	550	575
West Channel	4.311	370	370	340
West Channel	4.233	420	430	410
West Channel	4.111	320	250	200
West Channel	4.055	300	290	285
Reach 1b	4.74	400	500	500
Reach 1b	4.65	260	280	260
Reach 1b	4.6	83	83	83
Reach 1b	4.58	180	180	170
Reach 1b	4.575	Culvert		
Reach 1b	4.56	365	365	350
Reach 1b	4.49	490	450	450
Reach 1b	4.4	475	510	490
Reach 1b	4.31	410	420	410
Reach 1b	4.23	140	150	150
Reach 1b	4.22	280	280	260
Reach 1b	4.11	240	250	300
Reach 1b	4.05	0	0	0
Reach 1c	3.96	490	520	460
Reach 1c	3.86	360	400	490
Reach 1c	3.78	170	170	170
Reach 1c	3.75	500	500	500
Reach 1c	3.65	250	280	260
Reach 1c	3.6	400	420	450
Reach 1c	3.52	200	200	200
Reach 1c	3.48	360	450	435
Reach 1c	3.4	490	470	430
Reach 1c	3.32	510	560	560
Reach 1c	3.21	250	310	350
Reach 1c	3.13	200	280	300

Reach 1c	3.07	540	520	420
Reach 1c	2.97	270	270	270
Reach 1c	2.92	0	0	0
Reach 2	2.90	175	190	150
Reach 2	2.87	240	275	500
Reach 2	2.82	200	480	500
Reach 2	2.73	0	0	0
Reach 3	2.60	390	430	450
Reach 3	2.52	270	260	250
Reach 3	2.47	340	400	450
Reach 3	2.40	300	360	370
Reach 3	2.33	450	450	450
Reach 3	2.24	380	380	390
Reach 3	2.17	500	520	350
Reach 3	2.08	440	440	270
Reach 3	2.00	550	490	230
Reach 3	1.88	190	200	230
Reach 3	1.85	210	190	150
Reach 3	1.81	300	300	240
Reach 3	1.75	480	500	520
Reach 3	1.66	300	250	240
Reach 3	1.60	190	180	180
Reach 3	1.56	400	500	540
Reach 3	1.47	490	500	520
Reach 3	1.37	400	500	440
Reach 3	1.27	450	460	500
Reach 3	1.18	500	500	350
Reach 3	1.09	500	500	440
Reach 3	0.99	890	900	550
Reach 3	0.84	420	440	430
Reach 3	0.75	180	200	210
Reach 3	0.71	370	400	440
Reach 3	0.63	300	500	600
Reach 3	0.54	800	640	400
Reach 3	0.43	505	500	440
Reach 3	0.33	350	650	700
Reach 3	0.20	0	0	0

River: Paradise Wash

Reach	River Sta.	Left	Channel	Right
Reach 1	2.23	435	440	445
Reach 1	2.14	385	380	380
Reach 1	2.07	415	390	260
Reach 1	2.00	390	400	390
Reach 1	1.92	460	455	450
Reach 1	1.83	440	445	450
Reach 1	1.75	485	490	500
Reach 1	1.65	600	600	575
Reach 1	1.54	400	400	400
Reach 1	1.46	260	500	670
Reach 1	1.37	570	500	430
Reach 1	1.27	390	350	320
Reach 1	1.21	400	440	450
Reach 1	1.12	320	420	470
Reach 1	1.04	500	400	300
Reach 1	0.95	250	275	310
Reach 1	0.89	520	500	480
Reach 1	0.80	420	350	330
Reach 1	0.72	400	420	425
Reach 1	0.62	420	450	460
Reach 1	0.53	475	495	500
Reach 1	0.44	480	490	500
Reach 1	0.34	560	480	370
Reach 1	0.28	550	470	380
Reach 1	0.17	275	225	200
Reach 1	0.13	425	390	465
Reach 1	0.04	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Desert Hills Was

Reach	River Sta.	Contr.	Expan.
Reach 1	0.99	.6	.9
Reach 1	0.90	.6	.9
Reach 1	0.81	.6	.9
Reach 1	0.72	.6	.9
Reach 1	0.64	.6	.9
Reach 1	0.56	.6	.9
Reach 1	0.48	.6	.9
Reach 1	0.40	.6	.9
Reach 1	0.31	.6	.9
Reach 1	0.22	.6	.9

River: Apache Wash

Reach	River Sta.	Contr.	Expan.

Reach 1a	8.02		.3	.5
Reach 1a	7.98		.3	.5
Reach 1a	7.89		.3	.5
Reach 1a	7.84		.3	.5
Reach 1a	7.74		.3	.5
Reach 1a	7.65		.3	.5
Reach 1a	7.55		.3	.5
Reach 1a	7.46		.3	.5
Reach 1a	7.36		.3	.5
Reach 1a	7.28		.3	.5
Reach 1a	7.17		.3	.5
Reach 1a	7.08		.3	.5
Reach 1a	6.98		.3	.5
Reach 1a	6.9		.3	.5
Reach 1a	6.8		.3	.5
Reach 1a	6.71		.3	.5
Reach 1a	6.63		.1	.3
Reach 1a	6.58		.1	.3
Reach 1a	6.5		.1	.3
Reach 1a	6.43		.1	.3
Reach 1a	6.32		.1	.3
Reach 1a	6.25		.1	.3
Reach 1a	6.16		.1	.3
Reach 1a	6.09		.1	.3
Reach 1a	6.01		.1	.3
Reach 1a	5.92		.1	.3
Reach 1a	5.83		.1	.3
Reach 1a	5.76		.1	.3
Reach 1a	5.66		.1	.3
Reach 1a	5.64		.1	.3
Reach 1a	5.57		.1	.3
Reach 1a	5.48		.1	.3
Reach 1a	5.38		.1	.3
Reach 1a	5.31		.1	.3
Reach 1a	5.21		.1	.3
Reach 1a	5.15		.1	.3
Reach 1a	5.09		.1	.3
Reach 1a	5.03		.1	.3
Reach 1a	4.96		.1	.3
Reach 1a	4.9		.3	.5
Reach 1a	4.82		.1	.3
Reach 1a	4.78		.1	.3
West Channel	4.744		.1	.3
West Channel	4.722		.1	.3
West Channel	4.655		.1	.3
West Channel	4.499		.1	.3
West Channel	4.311		.1	.3
West Channel	4.233		.1	.3
West Channel	4.111		.1	.3
West Channel	4.055		.1	.3
Reach 1b	4.74		.1	.3
Reach 1b	4.65		.1	.3
Reach 1b	4.6		.1	.3
Reach 1b	4.58		.3	.5
Reach 1b	4.575	Culvert		
Reach 1b	4.56		.1	.3
Reach 1b	4.49		.1	.3
Reach 1b	4.4		.1	.3
Reach 1b	4.31		.1	.3
Reach 1b	4.23		.6	.9
Reach 1b	4.22		.6	.9
Reach 1b	4.11		.6	.9
Reach 1b	4.05		.6	.9
Reach 1c	3.96		.6	.9
Reach 1c	3.86		.6	.9
Reach 1c	3.78		.6	.9
Reach 1c	3.75		.6	.9
Reach 1c	3.65		.6	.9
Reach 1c	3.6		.6	.9
Reach 1c	3.52		.6	.9
Reach 1c	3.48		.6	.9
Reach 1c	3.4		.6	.9
Reach 1c	3.32		.6	.9
Reach 1c	3.21		.6	.9
Reach 1c	3.13		.6	.9
Reach 1c	3.07		.6	.9
Reach 1c	2.97		.6	.9
Reach 1c	2.92		.6	.9
Reach 2	2.90		.6	.9
Reach 2	2.87		.6	.9
Reach 2	2.82		.6	.9
Reach 2	2.73		.6	.9
Reach 3	2.60		.1	.3
Reach 3	2.52		.1	.3
Reach 3	2.47		.3	.5
Reach 3	2.40		.1	.3
Reach 3	2.33		.1	.3
Reach 3	2.24		.1	.3
Reach 3	2.17		.1	.3
Reach 3	2.08		.1	.3
Reach 3	2.00		.1	.3
Reach 3	1.88		.1	.3
Reach 3	1.85		.1	.3
Reach 3	1.81		.1	.3

Reach 3	1.75	.1	.3
Reach 3	1.66	.3	.5
Reach 3	1.60	.1	.3
Reach 3	1.56	.1	.3
Reach 3	1.47	.1	.3
Reach 3	1.37	.3	.5
Reach 3	1.27	.1	.3
Reach 3	1.18	.1	.3
Reach 3	1.09	.1	.3
Reach 3	0.99	.1	.3
Reach 3	0.84	.3	.5
Reach 3	0.75	.3	.5
Reach 3	0.71	.1	.3
Reach 3	0.63	.1	.3
Reach 3	0.54	.1	.3
Reach 3	0.43	.1	.3
Reach 3	0.33	.1	.3
Reach 3	0.20	.1	.3

River: Paradise Wash

Reach	River Sta.	Contr.	Expan.
Reach 1	2.23	.6	.9
Reach 1	2.14	.6	.9
Reach 1	2.07	.6	.9
Reach 1	2.00	.6	.9
Reach 1	1.92	.6	.9
Reach 1	1.83	.6	.9
Reach 1	1.75	.6	.9
Reach 1	1.65	.6	.9
Reach 1	1.54	.6	.9
Reach 1	1.46	.6	.9
Reach 1	1.37	.6	.9
Reach 1	1.27	.6	.9
Reach 1	1.21	.6	.9
Reach 1	1.12	.6	.9
Reach 1	1.04	.6	.9
Reach 1	0.95	.6	.9
Reach 1	0.89	.6	.9
Reach 1	0.80	.6	.9
Reach 1	0.72	.6	.9
Reach 1	0.62	.6	.9
Reach 1	0.53	.6	.9
Reach 1	0.44	.6	.9
Reach 1	0.34	.6	.9
Reach 1	0.28	.6	.9
Reach 1	0.17	.6	.9
Reach 1	0.12	.6	.9
Reach 1	0.04	.6	.9

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	
Paradise Wash	Reach 1	2.23		4179.00	1826.00	1832.54	1832.54	1833.27	0.008683	8.95	977.73	582.89	0.65
Paradise Wash	Reach 1	2.23		4179.00	1826.00	1832.52	1832.33	1833.61	0.011211	10.15	639.58	213.00	0.74
Paradise Wash	Reach 1	2.14		4179.00	1824.00	1827.09	1826.90	1827.46	0.014846	7.68	1038.82	700.29	0.77
Paradise Wash	Reach 1	2.14		4179.00	1824.00	1827.99	1827.07	1828.49	0.009658	7.35	798.31	253.80	0.65
Paradise Wash	Reach 1	2.07		4179.00	1821.00	1823.94	1823.06	1824.08	0.005391	4.19	1500.72	779.89	0.45
Paradise Wash	Reach 1	2.07		4179.00	1821.00	1824.74	1823.74	1825.12	0.007660	5.95	913.79	313.20	0.56
Paradise Wash	Reach 1	2.00		4179.00	1814.00	1819.88	1819.88	1820.94	0.014473	10.83	798.70	499.20	0.83
Paradise Wash	Reach 1	2.00		4179.00	1814.00	1819.90	1819.90	1821.14	0.015313	11.17	596.43	213.67	0.85
Paradise Wash	Reach 1	1.92		4179.00	1810.00	1815.30	1815.06	1815.94	0.008161	7.76	898.34	437.54	0.61
Paradise Wash	Reach 1	1.92		4179.00	1810.00	1815.99	1814.92	1816.74	0.006915	7.79	687.29	172.00	0.58
Paradise Wash	Reach 1	1.83		4179.00	1806.00	1810.91	1810.72	1811.52	0.011858	8.35	871.77	438.56	0.72
Paradise Wash	Reach 1	1.83		4179.00	1806.00	1811.32	1811.12	1812.30	0.013838	9.60	631.20	222.00	0.79
Paradise Wash	Reach 1	1.75		4179.00	1800.00	1805.38	1805.08	1805.94	0.012942	8.09	843.12	413.72	0.74
Paradise Wash	Reach 1	1.75		4179.00	1800.00	1805.50	1803.83	1806.09	0.012454	8.11	817.34	366.00	0.73
Paradise Wash	Reach 1	1.65		4179.00	1796.00	1799.63	1799.15	1800.04	0.010570	7.22	868.42	551.11	0.67
Paradise Wash	Reach 1	1.65		4179.00	1796.00	1799.69	1799.17	1800.19	0.011025	7.46	772.68	410.39	0.68
Paradise Wash	Reach 1	1.54		5763.00	1790.00	1794.79	1793.74	1795.19	0.007067	6.57	1206.95	631.49	0.56
Paradise Wash	Reach 1	1.54		5763.00	1790.00	1795.10	1793.69	1795.63	0.006258	6.47	998.79	256.00	0.53
Paradise Wash	Reach 1	1.46		5763.00	1786.00	1792.20	1791.40	1792.58	0.005926	6.76	1705.81	847.91	0.49
Paradise Wash	Reach 1	1.46		5763.00	1786.00	1792.61	1791.26	1793.13	0.006171	7.21	1168.00	294.00	0.51
Paradise Wash	Reach 1	1.37		5763.00	1782.00	1789.61	1787.39	1789.87	0.005275	6.97	1759.89	724.15	0.47
Paradise Wash	Reach 1	1.37		5763.00	1782.00	1789.82	1787.29	1790.25	0.005304	7.13	1141.72	203.00	0.47
Paradise Wash	Reach 1	1.27		5763.00	1778.00	1785.20	1785.01	1786.02	0.009612	8.37	1132.28	646.00	0.62
Paradise Wash	Reach 1	1.27		5763.00	1778.00	1785.74	1784.65	1786.67	0.008542	8.39	844.48	190.00	0.59
Paradise Wash	Reach 1	1.21		5763.00	1776.00	1782.97	1781.78	1783.21	0.004559	5.65	1883.10	741.87	0.42

Paradise Wash	Reach 1	1.21	5763.00	1776.00	1783.99	1782.19	1784.26	0.003496	5.53	1579.54	381.00	0.38
Paradise Wash	Reach 1	1.12	5763.00	1772.00	1778.58	1778.58	1779.49	0.016485	9.46	1022.86	528.72	0.78
Paradise Wash	Reach 1	1.12	5763.00	1772.00	1779.24	1779.14	1780.68	0.017716	10.73	740.03	267.03	0.83
Paradise Wash	Reach 1	1.04	5763.00	1770.00	1776.36	1774.52	1776.52	0.003117	4.91	2043.58	626.10	0.35
Paradise Wash	Reach 1	1.04	5763.00	1770.00	1776.92	1774.40	1777.18	0.003334	5.40	1519.70	308.00	0.37
Paradise Wash	Reach 1	0.95	5763.00	1766.00	1773.48	1773.10	1774.14	0.007916	7.74	1259.22	597.84	0.56
Paradise Wash	Reach 1	0.95	5763.00	1766.00	1774.33	1773.02	1775.01	0.006089	7.43	1030.88	250.00	0.51
Paradise Wash	Reach 1	0.89	5763.00	1764.00	1771.70	1770.95	1772.11	0.005618	6.36	1536.76	663.39	0.47
Paradise Wash	Reach 1	0.89	5763.00	1764.00	1772.21	1770.70	1773.05	0.007658	7.87	857.46	170.00	0.56
Paradise Wash	Reach 1	0.80	5763.00	1762.00	1766.76	1766.67	1767.37	0.018180	9.69	1192.28	676.30	0.81
Paradise Wash	Reach 1	0.80	5763.00	1762.00	1767.65	1766.77	1768.27	0.011212	8.61	1011.36	280.00	0.66
Paradise Wash	Reach 1	0.72	5763.00	1758.00	1763.04	1761.91	1763.26	0.006141	5.87	1691.18	636.81	0.48
Paradise Wash	Reach 1	0.72	5763.00	1758.00	1764.06	1762.71	1764.58	0.008249	7.75	1085.62	262.00	0.57
Paradise Wash	Reach 1	0.62	5763.00	1754.00	1759.67	1757.81	1760.14	0.008734	7.61	1403.66	640.06	0.58
Paradise Wash	Reach 1	0.62	5763.00	1754.00	1760.33	1757.81	1761.00	0.008612	8.17	1026.11	270.00	0.59
Paradise Wash	Reach 1	0.53	5763.00	1750.00	1755.85	1755.11	1756.32	0.008565	7.75	1341.17	526.21	0.58
Paradise Wash	Reach 1	0.53	5763.00	1750.00	1756.63	1755.32	1757.29	0.008026	8.19	998.61	228.00	0.58
Paradise Wash	Reach 1	0.44	5763.00	1746.00	1751.58	1750.56	1751.88	0.009106	6.52	1420.92	548.00	0.57
Paradise Wash	Reach 1	0.44	5763.00	1746.00	1752.16	1750.86	1752.69	0.010473	7.64	1029.61	266.00	0.62
Paradise Wash	Reach 1	0.34	5763.00	1744.00	1748.34	1746.84	1748.54	0.005034	4.64	1693.19	560.12	0.42
Paradise Wash	Reach 1	0.34	5763.00	1744.00	1748.70	1747.04	1748.96	0.005099	4.97	1498.88	422.00	0.43
Paradise Wash	Reach 1	0.28	5763.00	1738.00	1743.72	1743.42	1744.37	0.015523	9.08	1080.73	468.69	0.76
Paradise Wash	Reach 1	0.28	5763.00	1738.00	1744.41	1743.64	1745.11	0.011870	8.74	961.84	271.00	0.68
Paradise Wash	Reach 1	0.17	5763.00	1732.00	1739.33	1738.71	1739.80	0.006454	6.47	1373.40	573.97	0.50
Paradise Wash	Reach 1	0.17	5763.00	1732.00	1740.18	1738.55	1740.92	0.006576	7.23	905.73	186.80	0.52
Paradise Wash	Reach 1	0.13	5763.00	1732.00	1737.98	1737.29	1738.35	0.006248	6.60	1529.02	591.46	0.50
Paradise Wash	Reach 1	0.13	5763.00	1732.00	1738.06	1737.50	1738.95	0.011551	9.06	901.42	259.50	0.68
Paradise Wash	Reach 1	0.04	5763.00	1726.00	1737.06	1733.57	1737.18	0.001131	3.52	2502.42	567.48	0.22
Paradise Wash	Reach 1	0.04	5763.00	1726.00	1737.05	1733.57	1737.17	0.001121	3.50	2481.41	545.00	0.22
Apache Wash	Reach 1a	8.02	7187.00	1985.10	1992.58	1992.58	1993.93	0.015872	11.61	1224.92	424.16	0.81
Apache Wash	Reach 1a	8.02	7187.00	1985.10	1992.35	1992.23	1993.84	0.018035	12.06	1035.86	285.00	0.86
Apache Wash	Reach 1a	7.98	7187.00	1981.80	1989.82	1988.98	1990.42	0.009277	9.69	1809.06	538.81	0.63
Apache Wash	Reach 1a	7.98	7187.00	1981.80	1990.11	1988.97	1990.71	0.008307	9.41	1643.87	375.00	0.60
Apache Wash	Reach 1a	7.89	7187.00	1977.00	1984.96	1984.37	1985.78	0.013095	10.52	1482.11	484.44	0.73
Apache Wash	Reach 1a	7.89	7187.00	1977.00	1985.42	1984.47	1986.38	0.012404	10.72	1230.26	280.00	0.72
Apache Wash	Reach 1a	7.84	7187.00	1974.40	1982.05	1980.95	1982.70	0.009538	9.50	1580.34	397.40	0.64
Apache Wash	Reach 1a	7.84	7187.00	1974.40	1982.60	1980.84	1983.39	0.009251	9.84	1285.51	225.00	0.64
Apache Wash	Reach 1a	7.74	7187.00	1969.10	1975.29	1974.64	1976.04	0.018940	11.40	1336.33	383.34	0.86
Apache Wash	Reach 1a	7.74	7187.00	1969.10	1975.69	1975.02	1976.69	0.020335	12.39	1149.04	281.00	0.90
Apache Wash	Reach 1a	7.65	7187.00	1961.80	1969.73	1968.21	1970.37	0.008539	9.06	1498.81	337.71	0.60
Apache Wash	Reach 1a	7.65	7187.00	1961.80	1969.77	1968.13	1970.50	0.009172	9.42	1335.22	250.00	0.62
Apache Wash	Reach 1a	7.55	7187.00	1956.70	1964.12	1962.98	1965.13	0.012661	10.47	1169.39	261.26	0.73
Apache Wash	Reach 1a	7.55	7187.00	1956.70	1964.20	1962.95	1965.20	0.012053	10.30	1149.07	237.92	0.71
Apache Wash	Reach 1a	7.46	7187.00	1951.50	1959.07	1957.70	1960.02	0.008499	9.03	1242.43	292.58	0.60
Apache Wash	Reach 1a	7.46	7187.00	1951.50	1959.29	1957.59	1960.30	0.008271	9.10	1088.90	187.00	0.60
Apache Wash	Reach 1a	7.36	7187.00	1944.50	1952.08	1952.08	1953.63	0.019881	11.36	963.25	301.22	0.88
Apache Wash	Reach 1a	7.36	7187.00	1944.50	1952.04	1951.96	1953.78	0.021584	11.80	838.06	215.30	0.91
Apache Wash	Reach 1a	7.28	7187.00	1940.80	1949.00	1945.50	1949.27	0.004697	5.67	1887.81	324.69	0.43
Apache Wash	Reach 1a	7.28	7187.00	1940.80	1949.06	1945.48	1949.34	0.004546	5.63	1824.98	287.80	0.42
Apache Wash	Reach 1a	7.17	7187.00	1934.00	1943.95	1942.42	1945.51	0.009455	10.29	805.98	147.48	0.65
Apache Wash	Reach 1a	7.17	7187.00	1934.00	1943.58	1942.42	1945.34	0.011305	10.89	751.78	143.55	0.70
Apache Wash	Reach 1a	7.08	7187.00	1929.00	1937.86	1936.96	1939.87	0.012889	11.99	741.22	139.72	0.76
Apache Wash	Reach 1a	7.08	7187.00	1929.00	1938.56	1936.96	1940.15	0.009222	10.74	838.93	140.00	0.65
Apache Wash	Reach 1a	6.98	7187.00	1924.00	1933.57	1932.82	1934.44	0.007678	9.38	1354.21	370.34	0.58
Apache Wash	Reach 1a	6.98	7187.00	1924.00	1934.08	1933.03	1935.43	0.009228	10.72	951.65	175.00	0.65
Apache Wash	Reach 1a	6.9	7187.00	1920.00	1928.27	1927.80	1929.45	0.019435	12.46	1148.79	415.36	0.87
Apache Wash	Reach 1a	6.9	7187.00	1920.00	1929.16	1928.60	1930.42	0.015195	11.84	951.80	202.00	0.77
Apache Wash	Reach 1a	6.8	7187.00	1914.00	1923.45	1922.12	1923.96	0.006264	7.72	1481.32	372.12	0.51
Apache Wash	Reach 1a	6.8	7187.00	1914.00	1923.71	1922.51	1924.56	0.008497	9.22	1123.65	237.00	0.60
Apache Wash	Reach 1a	6.71	7187.00	1907.50	1919.13	1918.44	1920.23	0.008863	9.92	1105.75	297.21	0.61
Apache Wash	Reach 1a	6.71	7187.00	1907.50	1919.23	1918.19	1920.37	0.008540	9.86	978.22	185.00	0.60
Apache Wash	Reach 1a	6.63	7187.00	1905.00	1914.42	1914.42	1915.76	0.016335	11.74	961.63	301.95	0.73
Apache Wash	Reach 1a	6.63	7187.00	1905.00	1914.59	1914.01	1916.07	0.015306	11.60	805.93	158.00	0.71

Apache Wash	Reach 1a	6.58	7187.00	1902.00	1911.03	1910.58	1912.07	0.008613	9.71	1141.19	355.16	0.66
Apache Wash	Reach 1a	6.58	7187.00	1902.00	1911.29	1910.39	1912.62	0.009301	10.35	878.22	174.00	0.69
Apache Wash	Reach 1a	6.5	7187.00	1899.00	1906.16	1906.16	1907.39	0.014029	12.72	1097.98	386.00	0.85
Apache Wash	Reach 1a	6.5	7187.00	1899.00	1906.77	1906.42	1908.10	0.011971	12.43	945.68	222.00	0.80
Apache Wash	Reach 1a	6.43	7187.00	1896.50	1903.47	1902.31	1904.00	0.006065	8.06	1490.11	430.06	0.56
Apache Wash	Reach 1a	6.43	7187.00	1896.50	1903.66	1902.77	1904.59	0.008840	9.91	1075.15	240.00	0.67
Apache Wash	Reach 1a	6.32	7187.00	1890.00	1898.73	1898.73	1899.88	0.015831	10.52	1066.12	415.40	0.73
Apache Wash	Reach 1a	6.32	7187.00	1890.00	1898.87	1898.50	1899.92	0.013258	9.86	1016.36	283.00	0.67
Apache Wash	Reach 1a	6.25	7187.00	1888.00	1895.04	1894.29	1895.55	0.006351	7.46	1567.36	526.58	0.55
Apache Wash	Reach 1a	6.25	7187.00	1888.00	1895.30	1894.40	1896.09	0.007866	8.56	1174.24	300.00	0.62
Apache Wash	Reach 1a	6.16	7187.00	1883.00	1889.40	1889.40	1890.55	0.024203	10.81	954.67	363.94	0.87
Apache Wash	Reach 1a	6.16	7187.00	1883.00	1889.48	1889.40	1890.56	0.022010	10.43	969.40	345.00	0.83
Apache Wash	Reach 1a	6.09	7187.00	1879.50	1885.56	1884.53	1886.04	0.005231	6.53	1603.34	540.96	0.50
Apache Wash	Reach 1a	6.09	7187.00	1879.50	1885.63	1884.41	1886.27	0.006155	7.15	1263.68	310.00	0.54
Apache Wash	Reach 1a	6.01	7213.00	1875.50	1881.80	1881.40	1882.68	0.011588	9.79	1182.01	403.07	0.74
Apache Wash	Reach 1a	6.01	7213.00	1875.50	1881.97	1881.38	1882.80	0.010221	9.39	1161.61	330.00	0.70
Apache Wash	Reach 1a	5.92	7213.00	1870.20	1876.52	1875.63	1877.05	0.010542	7.72	1395.90	554.89	0.67
Apache Wash	Reach 1a	5.92	7213.00	1870.20	1876.86	1875.70	1877.54	0.010650	8.19	1161.70	310.00	0.69
Apache Wash	Reach 1a	5.83	7213.00	1865.50	1871.62	1871.44	1872.49	0.013137	9.79	1221.57	510.10	0.78
Apache Wash	Reach 1a	5.83	7213.00	1865.50	1871.84	1871.49	1872.90	0.013380	10.18	1016.62	300.00	0.79
Apache Wash	Reach 1a	5.76	7213.00	1862.00	1868.46	1867.57	1869.00	0.006502	7.76	1498.24	462.10	0.57
Apache Wash	Reach 1a	5.76	7213.00	1862.00	1868.21	1867.54	1868.88	0.008182	8.45	1319.28	395.00	0.63
Apache Wash	Reach 1a	5.66	7213.00	1854.00	1862.45	1862.45	1863.60	0.018611	11.97	1183.20	609.96	0.92
Apache Wash	Reach 1a	5.66	7213.00	1854.00	1862.77	1862.31	1863.67	0.012520	10.20	1099.67	320.00	0.76
Apache Wash	Reach 1a	5.64	7213.00	1855.00	1860.22	1858.56	1860.57	0.003311	5.34	1854.46	621.90	0.43
Apache Wash	Reach 1a	5.64	7213.00	1855.00	1860.55	1858.62	1861.00	0.003413	5.68	1432.29	310.00	0.45
Apache Wash	Reach 1a	5.57	7213.00	1850.00	1857.85	1857.38	1858.64	0.010303	9.48	1257.43	553.69	0.70
Apache Wash	Reach 1a	5.57	7213.00	1850.00	1858.25	1857.16	1859.12	0.008974	9.26	1074.68	238.00	0.66
Apache Wash	Reach 1a	5.48	7213.00	1846.00	1853.46	1853.40	1854.22	0.010148	9.42	1513.54	752.48	0.70
Apache Wash	Reach 1a	5.48	7213.00	1846.00	1854.19	1853.51	1855.18	0.009264	9.75	1066.89	260.00	0.68
Apache Wash	Reach 1a	5.38	7213.00	1841.00	1848.97	1848.22	1849.45	0.008341	9.30	1747.38	824.94	0.64
Apache Wash	Reach 1a	5.38	7213.00	1841.00	1849.81	1848.50	1850.63	0.008395	10.12	1128.64	240.00	0.66
Apache Wash	Reach 1a	5.31	7213.00	1838.00	1845.62	1845.20	1846.02	0.009830	6.15	1788.79	1034.03	0.54
Apache Wash	Reach 1a	5.31	7213.00	1838.00	1846.56	1845.39	1847.23	0.009538	6.97	1161.28	292.00	0.55
Apache Wash	Reach 1a	5.21	7213.00	1834.00	1840.84	1840.26	1841.31	0.009294	8.15	1639.39	711.98	0.65
Apache Wash	Reach 1a	5.21	7213.00	1834.00	1841.13	1840.55	1841.96	0.011762	9.52	1123.49	325.00	0.74
Apache Wash	Reach 1a	5.15	7213.00	1830.00	1837.57	1837.19	1838.18	0.011178	9.25	1415.62	564.02	0.71
Apache Wash	Reach 1a	5.15	7213.00	1830.00	1838.35	1837.45	1838.94	0.007895	8.53	1346.94	368.00	0.61
Apache Wash	Reach 1a	5.09	7213.00	1830.00	1834.45	1833.49	1834.71	0.008235	6.04	1969.84	1013.34	0.58
Apache Wash	Reach 1a	5.09	7213.00	1830.00	1835.22	1834.37	1835.73	0.010402	7.78	1343.07	430.00	0.67
Apache Wash	Reach 1a	5.03	7213.00	1826.00	1831.56	1830.93	1831.83	0.010923	6.50	1872.16	978.53	0.57
Apache Wash	Reach 1a	5.03	7213.00	1826.00	1832.26	1831.19	1832.67	0.009423	6.71	1454.85	450.00	0.54
Apache Wash	Reach 1a	4.96	7213.00	1822.00	1827.85	1827.12	1828.11	0.010805	6.24	1858.66	935.20	0.56
Apache Wash	Reach 1a	4.96	7213.00	1822.00	1828.16	1827.44	1828.69	0.014557	7.63	1280.41	450.00	0.66
Apache Wash	Reach 1a	4.9	7213.00	1822.00	1824.72	1824.13	1825.16	0.012331	5.94	1360.68	670.50	0.67
Apache Wash	Reach 1a	4.9	7213.00	1822.00	1824.70	1824.17	1825.25	0.012865	6.04	1214.22	515.00	0.69
Apache Wash	Reach 1a	4.82	7213.00	1818.00	1822.28	1821.60	1822.75	0.014866	8.60	1435.73	635.38	0.79
Apache Wash	Reach 1a	4.82	7213.00	1818.00	1822.27	1821.59	1822.73	0.014854	8.57	1422.20	620.27	0.79
Apache Wash	Reach 1a	4.78	7213.00	1813.00	1817.81	1816.40	1818.04	0.006777	4.84	1874.85	663.63	0.50
Apache Wash	Reach 1a	4.78	7213.00	1813.00	1817.80	1816.40	1818.04	0.006791	4.84	1873.55	663.51	0.50
Apache Wash	West Channel	4.744	285.00	1809.00	1810.96	1810.32	1811.04	0.004782	2.40	142.63	154.06	0.35
Apache Wash	West Channel	4.744	285.00	1809.00	1810.96	1810.32	1811.04	0.004765	2.40	142.83	154.18	0.35
Apache Wash	West Channel	4.722	723.00	1807.00	1809.18	1808.91	1809.41	0.013284	4.40	227.89	256.24	0.60
Apache Wash	West Channel	4.722	723.00	1807.00	1809.18	1808.91	1809.41	0.013349	4.41	227.42	255.95	0.60
Apache Wash	West Channel	4.655	1250.00	1802.00	1804.40	1804.15	1804.57	0.008814	4.55	499.37	536.36	0.52
Apache Wash	West Channel	4.655	1250.00	1802.00	1804.41	1804.15	1804.57	0.008787	4.55	499.96	536.46	0.52
Apache Wash	West Channel	4.499	1866.00	1797.50	1800.37	1799.66	1800.47	0.006957	4.28	854.09	753.99	0.47
Apache Wash	West Channel	4.499	1866.00	1797.50	1800.37	1799.66	1800.47	0.006968	4.28	853.63	753.89	0.47
Apache Wash	West Channel	4.311	1866.00	1792.00	1795.23	1795.02	1795.45	0.015586	7.38	613.36	611.94	0.72
Apache Wash	West Channel	4.311	1866.00	1792.00	1795.24	1795.02	1795.45	0.015566	7.37	613.66	612.08	0.72
Apache Wash	West Channel	4.233	1866.00	1789.00	1792.04	1791.17	1792.13	0.005989	3.88	827.56	601.32	0.43
Apache Wash	West Channel	4.233	1866.00	1789.00	1792.04	1791.17	1792.13	0.005995	3.88	827.27	601.24	0.43
Apache Wash	West Channel	4.111	1866.00	1784.20	1787.58	1787.27	1787.83	0.021490	6.96	493.70	429.51	0.78
Apache Wash	West Channel	4.111	1866.00	1784.20	1787.58	1787.27	1787.83	0.021390	6.95	494.54	429.82	0.78

Apache Wash	West Channel	4.055	1866.00	1782.00	1786.44	1784.45	1786.52	0.002196	3.22	1006.73	510.75	0.28
Apache Wash	West Channel	4.055	1866.00	1782.00	1786.42	1784.45	1786.49	0.002257	3.25	993.96	504.46	0.29
Apache Wash	Reach 1b	4.74	6928.00	1810.00	1816.59	1815.55	1816.80	0.005602	5.36	2020.26	874.72	0.49
Apache Wash	Reach 1b	4.74	6928.00	1810.00	1816.55	1815.55	1816.77	0.005898	5.46	1984.58	865.28	0.50
Apache Wash	Reach 1b	4.65	6053.00	1806.00	1810.32	1809.98	1811.10	0.043636	8.70	962.48	546.14	0.88
Apache Wash	Reach 1b	4.65	6053.00	1806.00	1810.41	1809.98	1811.10	0.037373	8.21	1010.44	540.00	0.81
Apache Wash	Reach 1b	4.6	5873.00	1802.00	1809.94	1807.00	1810.02	0.001054	3.34	2812.78	662.72	0.23
Apache Wash	Reach 1b	4.6	5873.00	1802.00	1810.03	1805.92	1810.11	0.001001	3.29	2800.26	610.00	0.22
Apache Wash	Reach 1b	4.58	5739.00	1801.30	1809.88	1808.81	1809.94	0.000791	3.24	3240.09	808.64	0.20
Apache Wash	Reach 1b	4.58	5739.00	1801.30	1809.96	1808.81	1810.03	0.000833	3.34	2910.58	600.00	0.20
Apache Wash	Reach 1b	4.575	Culvert									
Apache Wash	Reach 1b	4.56	5347.00	1799.00	1806.26	1805.17	1807.80	0.010632	9.98	546.85	277.24	0.72
Apache Wash	Reach 1b	4.56	5347.00	1799.00	1806.29	1805.17	1807.81	0.010455	9.92	549.76	272.00	0.72
Apache Wash	Reach 1b	4.49	5347.00	1796.00	1803.44	1802.45	1804.34	0.007623	8.18	853.29	296.81	0.61
Apache Wash	Reach 1b	4.49	5347.00	1796.00	1803.34	1802.45	1804.28	0.008151	8.36	821.10	273.00	0.63
Apache Wash	Reach 1b	4.4	5347.00	1792.30	1800.82	1799.17	1801.34	0.005445	7.90	1155.51	325.28	0.53
Apache Wash	Reach 1b	4.4	5347.00	1792.30	1801.06	1799.17	1801.49	0.004376	7.24	1227.69	311.00	0.48
Apache Wash	Reach 1b	4.31	5347.00	1788.00	1796.26	1796.26	1797.46	0.011612	11.25	889.39	369.46	0.76
Apache Wash	Reach 1b	4.31	5347.00	1788.00	1796.31	1796.31	1797.86	0.013269	12.09	676.79	194.00	0.81
Apache Wash	Reach 1b	4.23	5347.00	1786.00	1792.77	1791.42	1793.13	0.005619	6.68	1315.49	442.11	0.51
Apache Wash	Reach 1b	4.23	5347.00	1786.00	1793.09	1791.59	1793.60	0.006204	7.30	1040.83	267.00	0.54
Apache Wash	Reach 1b	4.22	5347.00	1785.50	1792.06	1790.56	1792.32	0.004538	5.69	1484.41	499.36	0.45
Apache Wash	Reach 1b	4.22	5347.00	1785.50	1792.13	1790.88	1792.63	0.007152	7.22	1049.98	302.00	0.57
Apache Wash	Reach 1b	4.11	5347.00	1782.00	1788.56	1788.56	1789.74	0.013834	11.32	829.66	321.75	0.81
Apache Wash	Reach 1b	4.11	5347.00	1782.00	1788.65	1788.65	1789.73	0.012460	10.86	859.52	318.00	0.78
Apache Wash	Reach 1b	4.05	5347.00	1779.00	1786.52	1784.55	1786.84	0.004579	5.98	1286.72	337.04	0.46
Apache Wash	Reach 1b	4.05	5347.00	1779.00	1786.44	1784.55	1786.77	0.004407	5.92	1252.94	302.00	0.45
Apache Wash	Reach 1c	3.96	7213.00	1774.00	1782.52	1782.23	1783.20	0.009821	7.52	1411.28	738.79	0.65
Apache Wash	Reach 1c	3.96	7213.00	1774.00	1782.75	1782.31	1783.42	0.008616	7.31	1347.90	556.00	0.62
Apache Wash	Reach 1c	3.86	7213.00	1770.00	1778.48	1777.52	1779.10	0.006876	8.32	1563.53	612.21	0.58
Apache Wash	Reach 1c	3.86	7213.00	1770.00	1778.46	1777.44	1779.23	0.007928	8.92	1285.30	380.00	0.62
Apache Wash	Reach 1c	3.78	7534.00	1766.00	1774.67	1773.76	1775.46	0.009726	9.09	1571.56	900.38	0.68
Apache Wash	Reach 1c	3.78	7534.00	1766.00	1775.22	1773.83	1775.95	0.006965	8.18	1225.40	276.00	0.58
Apache Wash	Reach 1c	3.75	7534.00	1764.00	1773.10	1772.94	1773.65	0.009021	9.20	1848.68	969.67	0.65
Apache Wash	Reach 1c	3.75	7534.00	1764.00	1773.40	1772.58	1774.37	0.010603	10.29	1084.42	260.00	0.71
Apache Wash	Reach 1c	3.65	7534.00	1762.00	1769.94	1768.54	1770.35	0.004733	7.70	1949.06	701.52	0.50
Apache Wash	Reach 1c	3.65	7534.00	1762.00	1770.55	1768.33	1770.98	0.003670	7.14	1599.44	290.00	0.45
Apache Wash	Reach 1c	3.6	7534.00	1760.00	1768.70	1767.76	1769.08	0.004692	7.94	2168.74	847.78	0.50
Apache Wash	Reach 1c	3.6	7534.00	1760.00	1769.21	1767.47	1769.78	0.004864	8.42	1422.49	269.00	0.51
Apache Wash	Reach 1c	3.52	7534.00	1756.00	1765.29	1765.25	1766.12	0.008974	10.89	1696.57	832.29	0.68
Apache Wash	Reach 1c	3.52	7534.00	1756.00	1765.84	1765.03	1766.86	0.008116	10.83	1131.66	241.00	0.66
Apache Wash	Reach 1c	3.48	7534.00	1756.00	1763.56	1763.28	1764.12	0.008554	9.71	1868.37	914.80	0.65
Apache Wash	Reach 1c	3.48	7534.00	1756.00	1764.14	1763.32	1765.06	0.008970	10.49	1152.42	270.00	0.68
Apache Wash	Reach 1c	3.4	7534.00	1752.00	1760.15	1757.86	1760.67	0.007874	8.96	2023.69	1150.01	0.63
Apache Wash	Reach 1c	3.4	7534.00	1752.00	1760.80	1759.91	1761.49	0.007210	9.14	1356.06	340.00	0.61
Apache Wash	Reach 1c	3.32	7534.00	1750.00	1756.47	1755.93	1756.90	0.007994	7.82	1913.03	1103.14	0.61
Apache Wash	Reach 1c	3.32	7534.00	1750.00	1757.07	1756.36	1757.77	0.008759	8.81	1325.15	375.00	0.65
Apache Wash	Reach 1c	3.21	7534.00	1746.00	1752.36	1751.73	1752.87	0.006679	6.71	1692.82	766.29	0.55
Apache Wash	Reach 1c	3.21	7534.00	1746.00	1752.70	1751.88	1753.40	0.007232	7.33	1301.30	390.00	0.58
Apache Wash	Reach 1c	3.13	7534.00	1742.00	1750.54	1749.83	1751.03	0.006111	8.20	1772.46	638.92	0.55
Apache Wash	Reach 1c	3.13	7534.00	1742.00	1750.83	1750.04	1751.38	0.005970	8.34	1602.38	468.00	0.55
Apache Wash	Reach 1c	3.07	7534.00	1742.00	1749.46	1748.07	1749.76	0.003621	6.56	2047.78	551.36	0.43
Apache Wash	Reach 1c	3.07	7534.00	1742.00	1749.64	1748.20	1750.05	0.004224	7.21	1739.64	410.00	0.47
Apache Wash	Reach 1c	2.97	7534.00	1738.00	1744.93	1744.93	1746.01	0.016094	11.44	5408.22	1722.71	0.87
Apache Wash	Reach 1c	2.97	7534.00	1738.00	1744.93	1744.93	1746.01	0.016085	11.44	5409.06	1722.58	0.87
Apache Wash	Reach 1c	2.92	7534.00	1735.00	1743.23	1740.42	1743.27	0.000770	2.73	4673.08	1505.89	0.19
Apache Wash	Reach 1c	2.92	7534.00	1735.00	1743.60	1740.42	1743.64	0.000548	2.40	5119.07	1405.00	0.17
Apache Wash	Reach 2	2.90	13541.00	1733.50	1742.82	1740.63	1743.00	0.002147	5.35	4345.80	1205.20	0.33
Apache Wash	Reach 2	2.90	13541.00	1733.50	1743.03	1740.63	1743.31	0.002646	6.04	3343.18	727.52	0.37
Apache Wash	Reach 2	2.87	13541.00	1734.00	1742.60	1738.73	1742.71	0.001041	3.34	5272.99	1160.98	0.23
Apache Wash	Reach 2	2.87	13541.00	1734.00	1742.74	1738.99	1742.94	0.001418	3.95	3864.40	640.00	0.27
Apache Wash	Reach 2	2.82	13541.00	1731.00	1741.98	1738.18	1742.17	0.001390	4.54	4152.50	695.60	0.28
Apache Wash	Reach 2	2.82	13541.00	1731.00	1742.03	1738.15	1742.27	0.001688	5.02	3553.03	520.00	0.30

Apache Wash	Reach 2	2.73	13541.00	1728.00	1739.36	1737.83	1740.54	0.006129	10.99	1947.14	352.75	0.60
Apache Wash	Reach 2	2.73	13541.00	1728.00	1739.33	1737.78	1740.53	0.006055	10.91	1856.31	293.00	0.60
Apache Wash	Reach 3	2.60	17136.00	1724.00	1735.86	1733.89	1736.39	0.003967	7.98	3641.89	709.34	0.44
Apache Wash	Reach 3	2.60	17136.00	1724.00	1735.82	1733.92	1736.37	0.004020	8.02	3540.39	650.00	0.44
Apache Wash	Reach 3	2.52	17136.00	1722.00	1734.50	1731.23	1734.93	0.002768	7.32	3887.44	597.95	0.37
Apache Wash	Reach 3	2.52	17136.00	1722.00	1734.51	1731.24	1734.93	0.002642	7.15	3812.83	535.00	0.36
Apache Wash	Reach 3	2.47	17136.00	1720.00	1733.60	1730.09	1734.16	0.003164	8.01	3279.10	433.08	0.40
Apache Wash	Reach 3	2.47	17136.00	1720.00	1733.55	1729.95	1734.16	0.003308	8.17	3087.28	370.00	0.41
Apache Wash	Reach 3	2.40	17136.00	1718.00	1731.42	1727.50	1732.45	0.005056	10.85	2339.27	251.00	0.52
Apache Wash	Reach 3	2.40	17136.00	1718.00	1731.38	1727.50	1732.42	0.005082	10.86	2326.69	247.00	0.52
Apache Wash	Reach 3	2.33	17136.00	1717.00	1728.12	1726.49	1730.05	0.010206	12.84	1755.05	243.55	0.70
Apache Wash	Reach 3	2.33	17136.00	1717.00	1728.17	1726.45	1730.05	0.009761	12.59	1715.38	212.00	0.69
Apache Wash	Reach 3	2.24	17136.00	1714.00	1724.49	1722.97	1725.74	0.008201	10.55	2260.14	402.25	0.62
Apache Wash	Reach 3	2.24	17136.00	1714.00	1724.60	1722.91	1725.90	0.008054	10.54	2096.98	305.00	0.62
Apache Wash	Reach 3	2.17	17136.00	1714.00	1721.87	1720.42	1722.58	0.007476	8.92	2969.20	653.93	0.57
Apache Wash	Reach 3	2.17	17136.00	1714.00	1722.02	1720.21	1722.81	0.007284	8.93	2628.63	451.00	0.57
Apache Wash	Reach 3	2.08	17136.00	1710.00	1718.26	1716.78	1718.86	0.010301	8.43	3001.72	784.32	0.63
Apache Wash	Reach 3	2.08	17136.00	1710.00	1718.30	1716.74	1719.00	0.011083	8.79	2735.18	650.00	0.66
Apache Wash	Reach 3	2.00	17136.00	1708.50	1715.20	1714.19	1715.77	0.009210	9.05	3215.74	853.90	0.62
Apache Wash	Reach 3	2.00	17136.00	1708.50	1715.30	1714.20	1715.86	0.008665	8.86	3190.53	791.00	0.61
Apache Wash	Reach 3	1.88	17136.00	1702.10	1712.91	1711.35	1713.45	0.005088	9.06	3508.23	711.26	0.50
Apache Wash	Reach 3	1.88	17136.00	1702.10	1712.97	1711.37	1713.55	0.005258	9.24	3344.07	639.00	0.51
Apache Wash	Reach 3	1.85	17136.00	1700.00	1712.10	1709.57	1712.57	0.003373	6.77	3651.75	634.77	0.40
Apache Wash	Reach 3	1.85	17136.00	1700.00	1712.17	1709.57	1712.65	0.003335	6.77	3561.09	581.00	0.40
Apache Wash	Reach 3	1.81	17136.00	1700.00	1711.37	1708.72	1711.93	0.003927	7.82	3312.75	531.31	0.44
Apache Wash	Reach 3	1.81	17136.00	1700.00	1711.46	1708.67	1712.03	0.003800	7.74	3198.06	463.00	0.43
Apache Wash	Reach 3	1.75	17136.00	1698.00	1709.53	1708.03	1710.55	0.006309	9.94	2696.46	533.96	0.55
Apache Wash	Reach 3	1.75	17136.00	1698.00	1709.54	1707.82	1710.65	0.006455	10.06	2383.14	368.00	0.56
Apache Wash	Reach 3	1.66	17136.00	1696.00	1706.68	1704.09	1707.43	0.005709	9.06	2878.82	516.01	0.52
Apache Wash	Reach 3	1.66	17136.00	1696.00	1706.97	1704.02	1707.68	0.004929	8.59	2780.32	390.00	0.49
Apache Wash	Reach 3	1.60	17136.00	1692.00	1705.27	1703.66	1705.99	0.005017	9.69	3240.26	623.30	0.50
Apache Wash	Reach 3	1.60	17136.00	1692.00	1705.51	1703.49	1706.33	0.005081	9.89	2841.92	439.00	0.51
Apache Wash	Reach 3	1.56	17136.00	1692.00	1704.03	1702.82	1704.90	0.006786	10.02	2892.89	605.96	0.56
Apache Wash	Reach 3	1.56	17136.00	1692.00	1704.06	1702.86	1705.15	0.007813	10.77	2470.43	447.00	0.60
Apache Wash	Reach 3	1.47	17136.00	1690.00	1701.26	1699.69	1702.04	0.005973	9.83	3024.34	602.30	0.54
Apache Wash	Reach 3	1.47	17136.00	1690.00	1701.16	1699.67	1701.99	0.006116	9.88	2820.71	490.00	0.54
Apache Wash	Reach 3	1.37	17136.00	1688.00	1697.80	1696.39	1698.69	0.007727	9.76	2712.01	554.32	0.59
Apache Wash	Reach 3	1.37	17136.00	1688.00	1697.91	1696.40	1698.74	0.007045	9.39	2692.95	492.00	0.57
Apache Wash	Reach 3	1.27	17136.00	1684.00	1695.28	1692.48	1695.82	0.004707	7.90	3500.83	704.04	0.44
Apache Wash	Reach 3	1.27	17136.00	1684.00	1695.65	1692.56	1696.22	0.004081	7.53	3063.36	410.00	0.41
Apache Wash	Reach 3	1.18	17136.00	1680.00	1694.36	1689.75	1694.56	0.001468	5.26	6810.81	1630.95	0.26
Apache Wash	Reach 3	1.18	17136.00	1680.00	1692.55	1689.75	1693.69	0.006883	10.33	2544.14	490.00	0.54
Apache Wash	Reach 3	1.09	17136.00	1680.00	1686.40	1685.97	1692.16	0.048177	23.64	1682.41	1233.32	1.71
Apache Wash	Reach 3	1.09	17136.00	1680.00	1688.18	1688.03	1689.81	0.011259	13.62	2235.76	507.00	0.86
Apache Wash	Reach 3	0.99	17136.00	1678.00	1684.48	1682.97	1684.70	0.005595	6.80	5183.01	1868.83	0.48
Apache Wash	Reach 3	0.99	17136.00	1678.00	1684.95	1682.94	1685.45	0.006918	7.93	3145.73	619.00	0.54
Apache Wash	Reach 3	0.84	17136.00	1670.00	1679.61	1677.63	1680.18	0.008887	8.81	3181.30	859.10	0.51
Apache Wash	Reach 3	0.84	17136.00	1670.00	1680.11	1677.56	1680.80	0.007224	8.22	2642.53	395.00	0.46
Apache Wash	Reach 3	0.75	17136.00	1666.00	1677.21	1675.69	1677.66	0.003968	7.82	4278.55	1080.37	0.44
Apache Wash	Reach 3	0.75	17136.00	1666.00	1677.30	1675.41	1678.09	0.005400	9.18	2834.94	464.00	0.51
Apache Wash	Reach 3	0.71	17136.00	1664.00	1675.58	1674.66	1676.52	0.006689	9.96	3023.71	760.32	0.56
Apache Wash	Reach 3	0.71	17136.00	1664.00	1675.81	1674.32	1676.84	0.006576	10.03	2510.74	420.00	0.56
Apache Wash	Reach 3	0.63	17136.00	1664.00	1673.21	1671.79	1673.79	0.006687	9.06	3616.48	998.85	0.55
Apache Wash	Reach 3	0.63	17136.00	1664.00	1673.63	1671.76	1674.28	0.005863	8.76	2985.80	518.00	0.52
Apache Wash	Reach 3	0.54	17136.00	1660.00	1669.23	1668.17	1670.06	0.009401	10.85	3097.20	890.12	0.65
Apache Wash	Reach 3	0.54	17136.00	1660.00	1670.06	1669.02	1671.04	0.008429	10.92	2587.42	500.00	0.62
Apache Wash	Reach 3	0.43	17136.00	1655.00	1665.71	1663.96	1666.31	0.005467	8.62	3472.54	852.69	0.50
Apache Wash	Reach 3	0.43	17136.00	1655.00	1666.10	1664.50	1666.95	0.006366	9.57	2718.83	468.00	0.55
Apache Wash	Reach 3	0.33	17136.00	1652.20	1663.09	1660.88	1663.78	0.005154	7.86	3156.22	709.88	0.48
Apache Wash	Reach 3	0.33	17136.00	1652.20	1663.11	1660.63	1664.00	0.006023	8.52	2503.02	400.00	0.52
Apache Wash	Reach 3	0.20	17136.00	1646.00	1660.00	1658.75	1660.80	0.005006	9.76	3534.49	903.27	0.50
Apache Wash	Reach 3	0.20	17136.00	1646.00	1659.88	1658.55	1660.71	0.005002	9.69	3081.97	590.00	0.50
Desert Hills Was	Reach 1	0.99	10259.00	1748.00	1757.96	1755.99	1758.13	0.003053	6.05	3503.62	1061.36	0.37

Desert Hills Was	Reach 1	0.99	10259.00	1748.00	1758.62	1756.05	1758.93	0.003360	6.67	2397.89	425.00	0.39
Desert Hills Was	Reach 1	0.90	10259.00	1748.00	1756.07	1754.53	1756.34	0.004671	7.68	2829.25	877.70	0.49
Desert Hills Was	Reach 1	0.90	10259.00	1748.00	1756.47	1754.75	1756.90	0.005354	8.51	2113.24	450.00	0.53
Desert Hills Was	Reach 1	0.81	10259.00	1746.00	1753.78	1752.35	1754.04	0.004722	6.82	2896.47	929.02	0.46
Desert Hills Was	Reach 1	0.81	10259.00	1746.00	1754.46	1752.31	1754.71	0.003305	6.08	2721.72	600.00	0.39
Desert Hills Was	Reach 1	0.72	10259.00	1744.00	1751.47	1749.79	1751.75	0.005668	7.43	2821.68	1034.84	0.51
Desert Hills Was	Reach 1	0.72	10259.00	1744.00	1752.20	1750.29	1752.69	0.005812	8.08	1941.73	385.00	0.53
Desert Hills Was	Reach 1	0.64	10259.00	1742.00	1749.92	1748.40	1750.13	0.003906	6.33	3242.93	1085.64	0.44
Desert Hills Was	Reach 1	0.64	10259.00	1742.00	1750.38	1748.67	1750.79	0.005102	7.57	2181.14	480.00	0.51
Desert Hills Was	Reach 1	0.56	10259.00	1740.00	1748.68	1746.87	1748.86	0.003047	6.14	3700.30	1249.05	0.39
Desert Hills Was	Reach 1	0.56	10259.00	1740.00	1749.00	1746.93	1749.27	0.003194	6.46	2706.30	571.00	0.40
Desert Hills Was	Reach 1	0.48	10259.00	1740.00	1747.63	1745.50	1747.79	0.002500	5.50	3645.71	1027.12	0.36
Desert Hills Was	Reach 1	0.48	10259.00	1740.00	1747.88	1745.43	1748.12	0.002783	5.94	2802.98	556.00	0.38
Desert Hills Was	Reach 1	0.40	10259.00	1738.00	1746.27	1744.70	1746.55	0.004390	6.80	2899.53	934.94	0.47
Desert Hills Was	Reach 1	0.40	10259.00	1738.00	1746.30	1744.81	1746.70	0.004986	7.27	2271.15	540.00	0.50
Desert Hills Was	Reach 1	0.31	10259.00	1736.00	1744.16	1742.90	1744.36	0.004375	6.65	4097.61	1696.03	0.46
Desert Hills Was	Reach 1	0.31	10259.00	1736.00	1744.31	1742.90	1744.48	0.003681	6.19	4353.69	1701.28	0.42
Desert Hills Was	Reach 1	0.22	10259.00	1735.00	1743.22	1740.85	1743.30	0.001440	3.73	4658.93	1505.38	0.27
Desert Hills Was	Reach 1	0.22	10259.00	1735.00	1743.61	1740.85	1743.67	0.001018	3.27	5248.46	1526.29	0.23

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : AW FDS

River: Desert Hills Was Reach: Reach 1 RS: 0.99 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.99 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Desert Hills Was Reach: Reach 1 RS: 0.90 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.90 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.81 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.81 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.72 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.72 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.64 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.64 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.56 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.56 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Desert Hills Was Reach: Reach 1 RS: 0.48 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.48 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.40 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.40 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Desert Hills Was Reach: Reach 1 RS: 0.31 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.31 Profile: 100yr encr

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 8.02 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1a RS: 8.02 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.98 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.98 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 7.89 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.89 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 7.84 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.84 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 7.74 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.74 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.65 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.65 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 7.55 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.55 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.46 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.46 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 7.36 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1a RS: 7.36 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 7.28 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.28 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.17 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.17 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.08 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 7.08 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 6.98 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 6.98 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 6.9 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 6.9 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 6.8 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 6.8 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 6.71 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 6.71 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 6.63 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1a RS: 6.63 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 6.58 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 6.58 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 6.5 Profile: 100-year

Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Apache Wash Reach: Reach 1a RS: 6.5 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1a RS: 6.43 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Apache Wash Reach: Reach 1a RS: 6.43 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1a RS: 6.32 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Apache Wash Reach: Reach 1a RS: 6.32 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1a RS: 6.25 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Apache Wash Reach: Reach 1a RS: 6.25 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Apache Wash Reach: Reach 1a RS: 6.16 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Apache Wash Reach: Reach 1a RS: 6.16 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1a RS: 6.09 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Apache Wash Reach: Reach 1a RS: 6.09 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1a RS: 6.01 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Apache Wash Reach: Reach 1a RS: 6.01 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1a RS: 5.92 Profile: 100-year
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.
iver: Apache Wash Reach: Reach 1a RS: 5.92 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 5.83 Profile: 100-year
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.
River: Apache Wash Reach: Reach 1a RS: 5.83 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.76 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 5.76 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.66 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.66 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
iver: Apache Wash Reach: Reach 1a RS: 5.64 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 5.64 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.57 Profile: 100-year
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.
River: Apache Wash Reach: Reach 1a RS: 5.57 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.48 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 5.48 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.38 Profile: 100-year
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.
River: Apache Wash Reach: Reach 1a RS: 5.38 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.31 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 5.31 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.21 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 5.21 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.15 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 5.15 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.09 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 5.09 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 5.03 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 5.03 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 4.96 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 4.96 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 4.9 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 4.9 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1a RS: 4.82 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 4.82 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 4.78 Profile: 100-year
Warning:A flow split was encountered. The program first calculated the momentum of both channels below the junction. An energy balance was performed across the junction from the stream with the highest momentum downstream to the section upstream.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1a RS: 4.78 Profile: 100yr encr
Warning:A flow split was encountered. The program first calculated the momentum of both channels below the junction. An energy balance was performed across the junction from the stream with the highest momentum downstream to the section upstream.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.744 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.744 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.722 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.722 Profile: 100yr encr
Warning:The conveyance ratio (upstream 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.
.iver: Apache Wash Reach: West Channel RS: 4.655 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.655 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.499 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.499 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.311 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.311 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.233 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.233 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.111 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.111 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.055 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: West Channel RS: 4.055 Profile: 100yr encr
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.74 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.74 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.65 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.65 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.6 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Apache Wash Reach: Reach 1b RS: 4.58 Profile: 100-year
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section

slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Apache Wash Reach: Reach 1b RS: 4.58 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Apache Wash Reach: Reach 1b RS: 4.575 Profile: 100-year Culv: Box1
Note: During the supercritical calculations a hydraulic jump occurred inside of the culvert.
Note: The culvert inlet is submerged and the culvert flows full over part or all of its length. Therefore, the culvert inlet equations are not valid and the supercritical result has been discarded. The outlet answer will be used.
River: Apache Wash Reach: Reach 1b RS: 4.575 Profile: 100yr encr Culv: Box1
Note: During the supercritical calculations a hydraulic jump occurred inside of the culvert.
Note: The culvert inlet is submerged and the culvert flows full over part or all of its length. Therefore, the culvert inlet equations are not valid and the supercritical result has been discarded. The outlet answer will be used.
River: Apache Wash Reach: Reach 1b RS: 4.56 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.56 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.49 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.49 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.4 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.4 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.31 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1b RS: 4.31 Profile: 100yr encr
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1b RS: 4.22 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.22 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.11 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1b RS: 4.11 Profile: 100yr encr
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1b RS: 4.05 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1b RS: 4.05 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.96 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.96 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.86 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.86 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.78 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.78 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.75 Profile: 100-year
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.
River: Apache Wash Reach: Reach 1c RS: 3.75 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.65 Profile: 100-year
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.
River: Apache Wash Reach: Reach 1c RS: 3.65 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1c RS: 3.6 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.6 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1c RS: 3.52 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.52 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1c RS: 3.48 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.48 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1c RS: 3.4 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.4 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1c RS: 3.32 Profile: 100-year
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.
River: Apache Wash Reach: Reach 1c RS: 3.32 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1c RS: 3.21 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.21 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1c RS: 3.13 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.13 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1c RS: 3.07 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1c RS: 3.07 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1c RS: 2.97 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1c RS: 2.97 Profile: 100yr encr
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 2 RS: 2.90 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.90 Profile: 100yr encr
Warning:Divided flow computed for this cross-section.
River: Apache Wash Reach: Reach 2 RS: 2.82 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.82 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 2 RS: 2.73 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.73 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.60 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.60 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.47 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.47 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.40 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.40 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.33 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.33 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.24 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.24 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.17 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.17 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.08 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.08 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.00 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.00 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.81 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.81 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.75 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.75 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.66 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.66 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.60 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.60 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.56 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.56 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.47 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Apache Wash Reach: Reach 3 RS: 1.47 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.37 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.37 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.27 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.27 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.18 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.18 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.09 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.09 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.99 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.99 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.84 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.84 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.75 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.75 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.71 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.71 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.63 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.63 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.54 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.54 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 3 RS: 0.43 Profile: 100-year
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.
iver: Apache Wash Reach: Reach 3 RS: 0.43 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.33 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.33 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 2.23 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 2.23 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 2.14 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 2.14 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 2.07 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 2.07 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
iver: Paradise Wash Reach: Reach 1 RS: 2.00 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 2.00 Profile: 100yr encr
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.92 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.92 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.83 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.83 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.75 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.75 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.65 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.65 Profile: 100yr encr

Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.54 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.54 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.46 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.46 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.37 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.37 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.27 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.27 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.21 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.21 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.12 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.12 Profile: 100yr encr
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.04 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.04 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.95 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.95 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.89 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.89 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.80 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.80 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.72 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.72 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.62 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.62 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.53 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.53 Profile: 100yr encr
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.44 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.44 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.34 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.34 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.28 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.28 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.17 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.17 Profile: 100yr encr
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.13 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.13 Profile: 100yr encr
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.04 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.04 Profile: 100yr encr
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

APPENDIX F.5

Apache Wash: 100-year
Existing Conditions

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Apache Wash WMP
Project File : Apache1.prj
Run Date and Time: 12/29/99 3:03:22 PM

Project in English units

Project Description:
Upper Cave Creek and Apache Wash Watercourse Master Plan

For Apache Wash
above Cave Buttes Dam
by Stantec Consulting Inc. for the Flood Control
District of Maricopa County
FCD:

March 1999

PLAN DATA

Plan Title: Existing Condition 100-year
Plan File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.p06

Geometry Title: Revised Geometry 100-year
Geometry File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.g04

Flow Title : Existing Condition 100-year
Flow File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.f17

Plan Summary Information:
Number of: Cross Sections = 139 Mulitple Openings = 0
Culverts = 1 Inline Weirs = 0
Bridges = 0

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

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Existing Condition 100-year
Flow File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.f17

Flow Data (cfs)

River	Reach	RS	100-year
Desert Hills Was	Reach 1	0.99	10259
Apache Wash	Reach 1	8.02	7187
Apache Wash	Reach 1	6.01	7213
Apache Wash	Reach 1	3.78	7534
Apache Wash	Reach 2	2.97	13541
Apache Wash	Reach 3	2.60	17136
Paradise Wash	Reach 1	2.23	4179
Paradise Wash	Reach 1	1.54	5763

Boundary Conditions

River	Reach	Profile	Upstream	Downstream

Apache Wash Reach 3 100-year Normal S = .005

GEOMETRY DATA

Geometry Title: Revised Geometry 100-year
Geometry File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.g04

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Desert Hills Was	Reach 1		DH & A Wash
Apache Wash	Reach 1		DH & A Wash
Apache Wash	Reach 2	DH & A Wash	P & A Wash
Apache Wash	Reach 3	P & A Wash	
Paradise Wash	Reach 1		P & A Wash

JUNCTION INFORMATION

Name: DH & A Wash
Description: Confluence of Desert Hills Wash with Apache Wash
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Apache Wash	Reach 1	to Apache Wash	Reach 2	520	
Desert Hills Was	Reach 1	to Apache Wash	Reach 2	400	

Name: P & A Wash
Description: Confluence of Paradise Wash with Apache Wash
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Apache Wash	Reach 2	to Apache Wash	Reach 3	700	
Paradise Wash	Reach 1	to Apache Wash	Reach 3	205	

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.99

INPUT
Description: 0.99
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9333.68	1762	9403.72	1760	9486.25	1758	9487.32	1758	9640.92	1756
9732.38	1754	9737.95	1754	9814.01	1754	9988.19	1752	9989.38	1750
9990.31	1750	9991.34	1752	9992.23	1752	9994.34	1750	9996.33	1748
10004.96	174810008.87		175010012.73		175210163.12		175410423.96		1756
10451.19	175610470.06		175610553.26		175810641.18		1760		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9333.68	.055	9988.19	.0310012.73		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.19	10012.73	490	470	440	.1	.3

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.90

INPUT
Description: 0.9
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9643.57	1760	9698.3	1758	9729.54	1756	9766.39	1754	9766.58	1754
9831.51	1752	9950.49	1751	9996.49	175010000.96		174810013.62		1748
10013.64	174810017.63		175010021.66		175210021.74		175210038.07		1752
10038.12	175210235.65		175210411.03		175410599.65		1756	10800	1758

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9643.57	.055	9996.49	.0310017.63		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9996.49	10017.63	500	491	480	.1	.3

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.81

INPUT
Description: 0.81
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9680	1755.3	9730	1754	9779.07	1752	9805.44	1752	9883.96	1750
9884.14	1750	9983.58	1750	9983.71	1750	9988.29	1750	9989.3	1748
9990.31	1746	9990.32	1746	10011.7	174610014.89		174810014.94		1748
10017.9	175010018.03		175010035.47		175010035.57		1750	10105	1748.5
10270	1750	10535	1752	10680	1754	10740	1756		

ianning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
    9680    .055 9983.58     .0310018.03    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.5810018.03              550     492     400            .1        .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.72

INPUT
Description: 0.72
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9365    1756    9470    1754    9625    1752    9800    1750 9986.71    1748
 9986.75    1748 9991.03    1746 9991.08    1746 9995.08    1744 9995.12    1744
10010.29    174410013.39    1746 10016.5    174810081.37    1748   10315  1746.2
   10380    1748   10510    1750   10610    1750   10740    1752   10800    1754
   10835    1756

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9365    .055 9986.71     .03 10016.5    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.71 10016.5              340     373     325            .1        .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.64

INPUT
Description: 0.64
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9420    1750    9590    1748    9825    1746 9977.76    1746 9993.02    1742
10006.33    1742 10006.4    174210018.06    1746   10305    1746   10517    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9420    .055 9977.76     .0310018.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.7610018.06              270     450     450            .1        .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.56

INPUT
Description: 0.56  -- First XS within WMP Study Limit
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8940    1750    9000    1749    9200    1748    9475    1746    9600    1744
    9615    1744    9730    1745 9986.89    1744 9998.14    174010012.68    1740
10012.77    174010019.47    174410081.48    174410085.66    174410292.39    1748
   10350    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8940    .055 9986.89     .0310019.47    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.8910019.47              320     436     450            .1        .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.48

INPUT
Description: 0.48
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8900  1750.2    9100    1750    9415    1748    9560    1746 9979.98    1742
 9985.27    174010007.03    174010013.02    1742   10335    1744   10440    1746
   10475    1748   10500    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8900    .055 9979.98     .0310013.02    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.9810013.02              410     380     340            .1        .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.40

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9000    1748    9100    1748 9402.16    1746 9610.77    1744 9720.22    1742
 9949.58    1742 9966.56    1742 9976.95    1740 9988.11    1738 9999.42    1738
10008.13    174010016.94    174210021.82    174210103.85    174210240.84    1744
10290.98    174610292.67    174610324.41    174810327.05    174810352.56    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9000    .055 9966.56     .0310021.82    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.5610021.82              180     260     320             .1       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.386

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9162    1748    9382    1746    9604    1744    9712    1742    9982    1740
    9988    1738   10012    1738   10014    1740   10212    1742   10235    1744
   10242    1744   10262    1742   10330    1744   10509    1746

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9162    .055    9982     .03   10014    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9982   10014                  0       0       0             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 8.02

INPUT
Description: 8.02

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9610    1996    9700    1992    9765  1991.9    9862    1990    9894    1988
    9897    1988    9951  1989.2    9977    1988    9989    1986   10000  1985.1
   10020    1986   10037    1988   10077    1990   10109    1992   10116    1994
   10125    1996

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9610    .055    9977     .03   10037    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9977   10037                215     235     245             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.98

INPUT
Description: 7.98

Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9500    1992    9570    1990    9630    1988    9740    1986    9773    1986
    9859    1986    9898  1986.4    9927    1986    9950    1986    9975    1986
    9982    1984    9991    1982   10000  1981.8   10005    1982   10017    1984
   10039    1986   10075    1988   10097  1988.2   10116    1990   10127    1992

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9500    .055    9975     .03   10039    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10039                280     465     520             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.89

INPUT
Description: 7.89

Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9756    1986    9764    1984    9845    1984    9878    1984    9978    1982
    9983    1982    9987    1980    9992    1978   10000    1977   10020    1978
   10054    1980   10082    1980   10149  1981.8   10170    1982   10189    1982
   10219    1982   10224    1984   10256  1985.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9756    .055    9983     .03   10054    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9983   10054                300     300     220             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.84

INPUT
Description: 7.84

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9793    1984    9828    1982    9841    1980    9908    1978    9916    1976
    9918    1976    9941    1976    9975    1976    9984    1976   10000  1974.4
   10025    1976   10036    1978   10073    1978   10206    1980   10222    1982
   10267    1983

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
    9793    .055    9984     .03   10025    .055

 ank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9984   10025              575     500     425             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.74

INPUT
Description: 7.74

Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9733    1978    9744    1976    9754    1974    9765    1972    9800    1972
    9836  1972.3    9888    1972    9915    1972    9968  1972.4    9981    1972
 9983.74 1970.96    9987    1970   10000  1969.1   10010    197010035.24    1971
   10062    1972   10086  1972.3   10097    1972   10123    1972   10127    1974
   10133    1976   10138    1978

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9733    .055 9983.74     .0310035.24    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.7410035.24              425     500     475             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.65

INPUT
Description: 7.65 -- Approximate Study Limit
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9787    1970    9805    1966    9882  1965.5    9917    1964 9977.37    1964
 9986.15    1962   10000  1961.810010.39    196210016.47    196410022.56    1966
10109.69    196810128.52    1970   10165    1971

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9787    .055 9977.37     .0310022.56    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.3710022.56              520     500     470             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.55

 NPUT
Description: 7.55

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9877.72    1968 9895.81    1966 9913.89    1964 9929.39    1962 9970.07    1960
 9981.49    1958   10000  1956.710024.51    195810028.16    196010145.16    1960
10158.57    196210173.58    1964 10182.6    196610293.44    1968

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9877.72    .055 9970.07     .0310028.16    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.0710028.16              510     500     480             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.46

INPUT
Description: 7.46

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9830.45    1960 9861.07    1958 9923.22    1956 9969.47    1954 9976.86    1952
    9990  1951.5 10000.7    195210032.17    195210051.31    195310081.59    1954
 10119.3    195610130.99    1958 10142.8    1960

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9830.45    .055 9969.47     .0310051.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.4710051.31              490     500     510             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.36

INPUT
Description: 7.36

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9725    1954    9740    1952    9800    1950 9835.52    1950 9949.32    1948
 9977.98    1946    9998  1944.510011.65    194610023.48    194810033.89    1950
10040.39    195210046.86    1954
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9725    .055 9949.32     .0310023.48    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.3210023.48               420     446     470             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 7.28

INPUT
Description: 7.28

Station Elevation Data     num=       14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9710    1950    9760    1944    9800    1942 9836.63    1942 9849.74  1941.8
 9874.17  1941.8 9924.41    1942 9988.71    1942    9998 1940.810010.16    1942
10021.65   194410030.54    1946 10038.9    1948 10047.2    1950

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9710    .055 9988.71     .0310010.16    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.7110010.16               475     554     410             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 7.17

INPUT
Description: 7.17

Station Elevation Data     num=       13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9950.59    1944 9955.33    1942 9960.08    1940 9967.15    1938 9978.76    1936
  9991.7    1934   10000 1934.310014.37    193410024.18    1936   10034    1938
10043.85   194010082.22    194210098.58    1944

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9950.59    .055 9978.76     .0310024.18    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.7610024.18               500     500     520             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 7.08

INPUT
Description: 7.08

Station Elevation Data     num=       13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9917.61    1940 9925.72    1938 9934.65    1936 9943.58    1934 9953.07    1932
 9965.94    1930    9987    192910007.17    193010021.87    193210036.31    1934
 10051.7    1936 10067.1    1938 10082.5    1940

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9917.61    .055 9953.07     .0310021.87    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9953.0710021.87               485     500     500             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.98

INPUT
Description: 6.98
Station Elevation Data     num=       16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9723.34    1934    9740    1932    9772    1930    9797    1930    9900    1932
    9935    1932 9944.17    1930 9975.97    1928  9985.4    1926 9994.24    1924
10004.06   192410020.09    192610031.62    192810071.11    193010085.11    1932
10100.97    1934

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9723.34    .055 9975.97     .0310031.62    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.9710031.62               400     437     470             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.9

INPUT
Description: 6.9

Station Elevation Data     num=       16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9598.79    1930    9625    1926    9705    1926    9770    1928    9800    1928
 9822.48    1928 9857.37    1926 9954.17    1924 9987.42    192210000.76    1920
10011.02   192010014.22    192210017.39    192410020.56    192610023.72    1928
10026.89    1930
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9598.79    .055 9954.17     .0310017.39    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.1710017.39               490     529     560              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.8

INPUT
Description: 6.8

Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9660    1924    9705    1920    9725    1919    9755    1920    9800    1920
 9880.75    1920 9901.03    1920 9976.63    1918 9976.81    1918 9982.58    1916
 9982.91    1916  9988.6    1914 9988.73    191410004.27    191410004.41    1914
10010.43    1916 10010.46    1916 10016.4    191810016.52    191810022.44    1920
10022.57    192010028.44    1922   10040  1923.7

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9660    .055 9976.63     .0310016.52    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.6310016.52               500     495     400              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.71

INPUT
Description: 6.71 -- Approximate Joy Ranch Road Alignment
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9970    1918 9977.71 1914.04 9981.63 1912.03    9990    1908   10000  1907.5
   10010    1908   10025    1912   10045    1914   10090    1916   10225    1918

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9970    .055 9981.63     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.63   10025               425     390     350              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.63

INPUT
Description: 6.63
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9976.91    1916 9982.13    1914 9983.41    1912 9984.66    1910 9985.91    1908
 9987.08    1906    9995    1905   10005    190510015.13    190610021.82    1908
10050.15    191010131.79    191210273.67    191410318.49    1916

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9976.91    .055 9985.91     .0310021.82    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.9110021.82               300     290     290              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.58

INPUT
Description: 6.58
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9897.27    1912 9926.14    1910 9950.13    1908  9965.1    1906 9980.22    1904
 9998.11    190210006.79    190210014.85    190410022.84    190610088.23    1908
10249.56    191010282.55    1912

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9897.27    .055  9965.1     .0310022.84    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9965.110022.84               430     430     430              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.5

INPUT
Description: 6.5
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9636.39    1910 9702.53    1908 9718.78    1906 9747.02    1904  9794.4    1904
 9947.45    1904 9967.32    1902 9987.47    1900    9995    1899   10010    1899
10019.82    190010042.69    190210071.54    190410099.13    1906 10152.4    1908
   10187    1910

Manning's n Values          num=       3
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```
     Sta    n Val      Sta    n Val      Sta    n Val
 9636.39     .055 9947.45      .0310071.54     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9947.4510071.54                310     345     355              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.43

INPUT
Description: 6.43

Station Elevation Data     num=       13
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9655     1906     9665     1904     9680     1902     9690     1900     9925     1900
    9970     1898     9990   1896.5    10010   1896.5    10020     1898    10030     1900
   10040     1902    10120     1904    10285     1906

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9655     .055     9925      .03    10030     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
           9925   10030                475     450     360              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.32

INPUT
Description: 6.32
Station Elevation Data     num=       14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9951.16     1900   9957.9     1898  9964.52     1896  9970.99     1894  9977.55     1892
 9984.06   189010006.52    189010013.72    189210020.18    189410100.18     1896
10266.52   189810293.42    189810347.28    189810412.02     1900

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9951.16     .055  9970.99      .0310020.18     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9970.9910020.18                410     390     350              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.25

INPUT
Description: 6.25
Station Elevation Data     num=       14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9911.34     1898  9931.58     1896  9947.24     1894  9961.84     1892  9976.08     1890
    9990     1888    10015     1888 10030.1    189010045.42    189210069.44     1892
10266.14   189210454.21    189410476.27    189610569.33     1898

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9911.34     .055  9961.84      .0310045.42     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9961.8410045.42                490     460     430              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.16

INPUT
Description: 6.16
Station Elevation Data     num=       20
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9875   1892.5  9961.21     1892   9972.1     1890  9977.65     1888   9983.3     1886
 9989.16     1884  9996.77     1883  9997.18   188310022.78   188410039.58     1886
10050.58   188810110.58    188810208.91    188610225.08    188610318.94     1888
10345.72     1890 10414.9   189210424.02    189210428.81    189210468.67  1893.08

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9875     .055  9977.65      .0310050.58     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9977.6510050.58                270     360     450              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.09

INPUT
Description: 6.09 -- Old New River Road
Station Elevation Data     num=       10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9815     1886     9890     1884     9935     1882     9970     1880    10010   1879.5
   10050     1880    10070     1882    10345     1884    10380     1886    10520     1888

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9815     .055     9935      .03    10070     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
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          9935   10070                470     445     435              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.01

INPUT
Description: 6.01

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9750    1883    9870    1882    9920    1880    9955    1878    9980    1876
   10000  1875.5   10010    1876   10020    1878   10035    1880   10075    1880
   10160    1878   10175    1877   10190    1878   10260    1880   10280    1882
   10400    1884   10580    1886

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9750    .055    9920     .03   10035    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9920   10035               485     490     510              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.92

INPUT
Description: 5.92
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9720    1877 9854.04    1876 9948.34    1874 9975.43    1872   10000  1870.2
10006.77    187210015.55    187410024.34    187610034.96    187610094.25    1874
10130.93    1872 10149.3    187010150.59    187010177.58    187210238.14    1874
10251.91    187410318.15    187410335.66    187610350.37    1878

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9720    .055 9948.34     .0310024.34    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.3410024.34               375     400     375              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.83

INPUT
Description: 5.83

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9500    1874    9550    1872    9650    1872    9710    1872    9735    1870
    9890    1870    9960    1868    9990    1866   10000  1865.5   10005    1866
   10030    1868   10105    1868   10120    1870   10140    1872   10155    1874
   10250    1875

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9500    .055    9960     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9960   10030               375     380     380              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.76

INPUT
Description: 5.76
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9640    1870 9674.85    1868 9704.99    1866 9712.43    1864 9741.92    1866
    9835    1866    9865    1866 9968.58    1864 9985.72    186210014.25    1862
10043.06    186410096.64    1866 10124.8    186810142.86    187010144.93    1870

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9640    .055 9968.58     .0310043.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.5810043.06               470     540     570              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.66

INPUT
Description: 5.66
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9504.86    1864 9505.03    1864  9622.9    1862 9622.94    1862 9802.24    1862
 9802.28    1862 9805.57    1862 9805.58    1862 9814.49    1860 9838.73    1858
 9838.74    1858 9839.05    1858 9857.77    1860 9980.02    1860 9995.33    1854
 10003.7    185410014.57    1858   10030    1859 10136.3    186010136.31    1860
10169.16    1862   10210  1862.5   10615    1863

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9504.86    .055 9980.02     .03   10030    .055
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.02   10030               460     440     320             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.64

INPUT
Description: 5.64 -- Cloud Road
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9650    1862    9775    1860    9870    1858    9955    185610037.94    1855
   10170    1856   10275    1858   10365    1860   10575  1862.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9650    .055    9955     .03   10170    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9955   10170               370     345     320             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.57

INPUT
Description: 5.57

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400    1859    9520    1858    9700    1856    9731    1858    9800    1858
    9812    1856    9824    1854    9977    1854    9985    1852    9993    1850
   10005    1850   10014    1852   10024    1854   10035    1856   10170    1858
   10299    1860

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .055    9977     .03   10035    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9977   10035               400     450     450             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.48

INPUT
Description: 5.48
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9300    1855    9440    1854    9750    1854    9790    1852    9895    1852
 9929.89    1850 9978.41    185010000.42    1846 10004.4    184610044.06    1850
10141.09    185210147.22    185210418.73    185210547.75    185410626.53    1856

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9300    .055 9978.41     .0310044.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110044.06               530     500     500             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.38

INPUT
Description: 5.38

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9815    1850    9880    1848    9900    1846    9910    1844    9985    1844
   10000    1841   10015    1844   10030    1846   10110    1846   10255    1848
   10460    1850

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9815    .055    9985     .03   10015    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9985   10015               350     375     425             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.31

INPUT
Description: 5.31
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9325    1847 9444.34    1846 9557.15    1844 9887.76    1844 9911.33    1840
 9919.33    1840 9919.34    1840 9933.33    1842 9933.43    1842 9988.23    1842
 9988.24    1842 9997.67    183810005.97    1838 10024.7    184210044.49    1844
 10044.5    184410061.08    184410218.05    1844   10565    1846

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9325    .055 9988.23     .0310044.49    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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      9988.2310044.49              500     500     480             .3       .5

CROSS SECTION          RIVER: Apache Wash
 EACH: Reach 1            RS: 5.21

INPUT
Description: 5.21

Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1842    9780    1840    9860    1838    9885    1836    9890    1836
    9915    1838    9970    1838    9985    1836   10000    1834   10015    1836
   10030    1838   10085    1838   10110    1837   10120    1838   10135    1840
   10150    1840   10245    1838   10310    1838   10355    1840   10400    1840
   10525    1842

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9970     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10030             330     310     300            .1       .3
Right Levee     Station=   10135      Elevation=    1840

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1           RS: 5.15

INPUT
Description: 5.15

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9870    1839    9945    1838    9978    1836    9988    1834   10000    1830
   10010    1830   10025    1834   10130    1834   10170    1836   10200    1836
   10320    1835   10495    1836   10522    1838   10780    1840

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9870    .055    9978     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10025             350     352     355            .1       .3
Right Levee     Station=   10170      Elevation=    1836

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1           RS: 5.09

INPUT
Description: 5.09

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9480    1835    9515    1834    9550    1832    9970    1832    9985    1830
   10000    1831   10025    1832   10075    1834   10120    1830   10145    1832
   10255    1832   10320    1834   10435    1834   10780    1836

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9480    .055    9970     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10025             300     300     310            .1       .3
Right Levee     Station=   10075      Elevation=    1834

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1           RS: 5.03

INPUT
Description: 5.03
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9515    1833 9590.59    1832 9640.88    1830 9975.12    1830 9992.06    1826
10001.75    182610012.26    1830 10053.1    183010133.33    183010186.37    1828
10281.59    1828   10620    1832   10750  1832.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9515    .055 9975.12     .0310012.26    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.1210012.26             345     365     340            .1       .3
Right Levee     Station=10133.33      Elevation=    1830

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1           RS: 4.96

INPUT
Description: 4.96
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9716.18    1828 9717.02    1828 9800.79    1826 9974.19    1826 9995.82    1822
10000.05    182210011.03    182610011.04    182610156.72    182610156.73    1826
   10310    182410344.97    182410425.12    182610592.76    182710594.98    1827
   10670    1828   10790    1830
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Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9716.18    .055 9974.19     .0310011.03    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9974.1910011.03              400      320     200            .1        .3
Right Levee     Station=10156.63      Elevation=    1826

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.9

INPUT
Description: 4.9
Station Elevation Data     num=       25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9757    1826    9850    1824    9881    1822    9910    1820    9912    1820
    9922    1822    9936    1824    9966    1824    9978    1822    9986    1820
   10014    1820   10023    1822   10032    1824   10049    1824   10175    1822
   10199    1822   10235  1823.2   10274    1822   10294    1822   10305    1820
   10320    1820   10334    1822   10374    1822   10386    1824   10805    1826

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9757    .055    9966     .03   10032    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        9966   10032              220      200     160            .1        .3
Left Levee      Station=    9966      Elevation=    1824
Right Levee     Station=   10032      Elevation=    1824

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.82

INPUT
Description: 4.82
Station Elevation Data     num=       28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9480    1826 9740.85    1824 9830.85    1822 9875.16    1820 9888.17    1818
 9903.71    1818 9930.33    1820 9930.34    1820 9974.99    1820    9975    1820
 9990.22    181810005.12    181810009.43    1820 10013.6    182210024.29    1822
10070.59    1820   10100    181810126.15    182010181.41    182010189.94    1818
   10200  1817.110207.92    181810217.21    182010264.85    1820   10280    1818
   10315    1820   10435    1822   10565    1824

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9480    .055 9875.16     .0310009.43    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9875.1610009.43              480      480     480            .1        .3
Left Levee      Station=    9975      Elevation=    1820
Right Levee     Station= 10013.6      Elevation=    1822

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.78

INPUT
Description: 4.78
Station Elevation Data     num=       17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9743.69    1820 9905.26    1818 9905.48    1818 9964.87    1818 9964.88    1818
 9983.35    1816 9995.72    181310010.03    181310021.41    181610211.72    1816
10230.89    181610317.17    181410376.07    1813 10488.8    1814 10508.5    1814
   10540    1816   10640    1818

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9743.69    .055 9964.87     .0310021.41    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9964.8710021.41              300      200     100            .1        .3
Right Levee     Station=10211.72      Elevation=    1816

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.74

INPUT
Description: 4.74
Station Elevation Data     num=       22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9500.14    1818 9960.29    1816 9979.29    1814 9986.69    1812    9994    1810
 9994.01    1810 9999.53    1810 9999.55    181010010.02    181210029.03    1814
10029.36    181410136.55    1814   10140    1813   10160    1814   10380    1814
   10400    1811   10425    1814   10440    1814   10485    1813   10530    1814
   10590    1815   10700    1815

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9500.14    .055 9960.29     .0310029.03    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9960.2910029.03              400      500     500            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.65
```

```
INPUT
Description: 4.65

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400  1815.5    9600    1814 9830.73    1810 9982.47    1808 9997.03    1806
10002.86    180610014.29    180810049.57    180810059.42    180610060.51    1806
10093.98    180810250.89    1808   10270    1810   10360    1810

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .055 9982.47     .0310093.98    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.4710093.98              260     280     260              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.6

INPUT
Description: 4.6

Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9675    1812 9812.65    1810 9836.34    1810 9875.78    1808 9883.17    1808
 9966.89    1806  9971.4    1806  9987.4    1802 9998.69    1802 9998.98    1802
10015.98    180610022.46    1806   10123    180610130.11    180410281.42    1804
10322.77    180610440.24    180610500.19    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9675    .055  9971.4     .0310015.98    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9971.410015.98               83      83      83              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.58

INPUT
Description: Geometry data points 6 and 7 are adjusted to account for the 3
             barrel 10' x 5' cbc.  The stationing for both points is increased
             by 5'.  The right bank and ineffective flow areas are adjusted
             accordingly.  The elevations of points 5 and 6 are changed from
             1802 to 1801.3 to match the surveyed invert of the box culvert
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1810    9790    1808    9945    1806    9983    1804    9984  1801.3
   10015  1801.3   10016    1804   10250    1804   10320    1806   10500    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9983     .03   10016    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9983   10016              180     180     170              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9685    9983    1808   10016   10500    1808

CULVERT                 RIVER: Apache Wash
REACH: Reach 1             RS: 4.575

INPUT
Description: Culvert #1 (3 10' x 5' Boxes)

Distance from Upstream XS =       5
Deck/Roadway Width        =   114.1
Weir Coefficient          =     3.1
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9685    1810    1800    9790    1808    1800    9945    1808    1800
    9983    1808    1800    9983    1808    1800    9984    1808    1800
   10010    1808    1800   10011    1808    1800   10011    1808    1800
   10250    1807    1800   10320    1807    1800   10500    1808    1800

Upstream Bridge Cross Section Data
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1810    9790    1808    9945    1806    9983    1804    9984  1801.3
   10015  1801.3   10016    1804   10250    1804   10320    1806   10500    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9983     .03   10015    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
           9983   10016              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9685    9983    1808   10016   10500    1808
```

```
Downstream  Deck/Roadway Coordinates
    num=      13
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9685    1808    1798    9790    1808    1798    9945    1808    1798
    9980    1808    1798    9980    1808    1798    9983    1808    1798
    9984    1808    1798   10010    1808    1798   10011    1808    1798
   10011    1808    1798   10250    1807    1798   10320    1807    1798
   10500    1808    1798

Downstream Bridge Cross Section Data
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9550    1812    9730    1810    9915    1808    9945    1806    9960    1804
    9975    1802    9985    1800   10000    1799   10035    1800   10115    1802
   10150    1804   10215    1806   10240    1808

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9550    .055    9975     .03   10115    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9975   10115          .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9550    9950    1808   10050   10240    1808

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =    1807
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Box1               Box         5      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  0   114.1       .015                   .5                1
Number of Barrels =  3
Upstream   Elevation =  1801.3
Centerline Stations
    Sta.    Sta.    Sta.
    9989  9999.5   10010
Downstream Elevation =  1800.67
Centerline Stations
    Sta.    Sta.    Sta.
  9989.5   10000 10010.5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.56

INPUT
Description: Geometry data point 8 is adjusted to account for the 3 barrel 10'
             x 5' cbc.  The culvert was extended and cross section 4.57 of the
             FIS was eliminated.  This cross section is the first downstream
             cross section of the culvert.  The elevation of data point 8 is
             adjusted from 1799 to 1800.  The right bank station is moved from
             station 10035 to 10150.
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9550    1812    9730    1810    9915    1808    9945    1806    9960    1804
    9975    1802    9985    1800   10000    1799   10035    1800   10115    1802
   10150    1804   10215    1806   10240    1808

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9550    .055    9975     .03   10115    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10115              365     365     350              .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9550    9950    1808   10050   10240    1808

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.49

INPUT
Description: 4.49

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9821.99    1806 9901.91    1804 9916.74    1802  9954.9    1800 9973.89    1798
 9983.53    1796 10011.1    179610018.97    179810053.62    180010105.02    1802
10240.68    1804   10340  1804.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9821.99    .055  9954.9    .0310053.62    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9954.910053.62              490     450     450             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.4

INPUT
Description: 4.4

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9925    1802    9940    1800    9970    1798    9990    1796    9995    1794
   10005  1792.3   10020    1794   10030    1796   10080    1796   10090  1794.3
   10110    1796   10175    1798   10210    1800   10270    1801

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9925    .055    9990     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9990   10030              475     510     490             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.31

INPUT
Description: 4.31

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9706.51    1798  9770.7    1796 9896.31    1794 9980.54    1792  9986.9    1790
10005.88    178810009.89    178810014.81    179010019.75    179210055.21    1794
10110.95    179610150.57  1796.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9706.51    .055 9980.54     .0310019.75    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.5410019.75              410     420     410             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.23

INPUT
Description: 4.23

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9520.61    1796 9614.39    1794 9762.38    1790 9933.91    1788 9961.17    1790
 9980.16    1790 9985.61    1788 9991.04    178610007.85    178610015.65    1788
10030.19    179010081.29    179210132.36    1794

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9520.61    .055 9980.16     .0310030.19    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.1610030.19              140     150     150             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.22

INPUT
Description: 4.22
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9435    1796    9530    1794    9595    1792    9650    1790    9780    1788
    9885    1788    9975    1790    9990    1786 9999.81  1785.5   10010    1786
   10030    1790   10085    1792   10135  1792.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9435    .055    9975     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10030              280     280     260             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.11

INPUT
Description: 4.11

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9954.62    1792 9972.66    1790 9978.48    1786 9982.42    1784 9988.23    1782
10014.08    1782 10019.7    1784 10107.8    1786 10273.4    178810355.58    1790
10489.42    1790

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9954.62    .055 9978.48     .03 10107.8    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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      9978.48 10107.8                240     250     300              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.05

INPUT
Description: 4.05

Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9960    1788 9981.93    1782    9990    1780   10000    1779   10015    1780
   10025    1782   10200    1782   10270    1786   10320  1786.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9960    .055 9981.93     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.93   10025               400     500     285              .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.96

INPUT
Description: 3.96

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9852.78    1784 9882.85    1782 9912.96    1780 9952.91    1778 9978.94    1776
 9989.34    177410006.21    177410028.53    178010057.49    178210179.95    1782
10409.79    178010418.05    1778 10422.6    177810433.36    178010548.23    1782
10801.62    1784

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9852.78    .055 9882.85     .0310057.49    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9882.8510057.49               490     520     460              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.86

INPUT
Description: 3.86

Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9728.15    1780 9811.03    1778 9980.73    1776 9992.41    177010006.32    1770
10015.17    1772 10048.5    1774 10108.2    177410125.25    1776 10163.1    1778
10205.78    177810274.92    177410300.77    177410373.74    1778 10496.8    1780

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9728.15    .055 9980.73     .03 10048.5    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.73 10048.5               360     400     490              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.78

INPUT
Description: 3.78

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9660.11    1776    9740  1774.1   9978.4    1774 9983.58    1770 9992.92    1766
 9993.96    176610036.94    177010060.68    177210120.11    177210142.25    1770
10151.27    176810155.15    176810163.26    177010225.58    177210348.04    1774
10545.54    177410650.82    1775

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9660.11    .055  9978.4     .0310060.68    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.410060.68               170     170     170              .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.75

INPUT
Description: 3.75

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9590    1776    9655    1774    9710    1772    9725    1772    9780    1774
    9945    1774    9975    1772 9982.65    1768 9991.06    1764   10010    1764
   10020    1768   10310    1772   10840    1772   10885    1776

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9590    .055 9982.65     .03   10020    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.65   10020              500     500     500             .1       .3

 ROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.65

INPUT
Description: 3.65
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9358.43 1771.68    9470    1768    9580    1770    9830    1770    9970    1764
 9990.15    176210009.75    1762   10015    1764   10370    1770

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9358.43    .055    9970     .03   10015    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9970   10015              250     280     260             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.6

INPUT
Description: 3.6
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9378.25    1770 9475.66    1768 9891.47    1766 9979.85    1764 9990.66    1760
10010.55    176010013.99    176210247.91    176810365.75    1770

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9378.25    .055 9979.85     .0310013.99    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.8510013.99              400     420     450             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.52

INPUT
Description: 3.52

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9669.22    1766 9704.26    1764 9883.69    1764 9945.91    1762 9977.47    1762
 9977.93    1762 9981.96    1760 9986.06    175810002.04    175610006.86    1756
 0017.06    176010100.32    176210273.56    176410646.59    1766

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9669.22    .055 9981.96     .0310017.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.9610017.06              200     200     200             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.48

INPUT
Description: 3.48
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9620.29    1764  9671.6    1762 9965.97    1762 9985.39    1760  9988.6    1758
 9993.36    175610009.59    175510018.81    1758 10110.6    176010298.95    1762
   10615    1764

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9620.29    .055 9985.39     .0310018.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.3910018.81              400     400     400             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.4

INPUT
Description: 3.4
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9462    1762    9493    1760    9714    1758    9869    1758    9914    1756
    9979    1756    9984    1754   10000    1752   10016    1754   10031    1756
   10057    1758   10212    1758   10464    1760   10809    1761

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9462    .055    9984     .03   10031    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9984   10031              480     470     440             .1       .3

'ROSS SECTION           RIVER: Apache Wash
EACH: Reach 1              RS: 3.32
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```
INPUT
Description: 3.32
Station Elevation Data     num=      16
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9599.26     1758 9599.45     1758 9630.94     1756 9632.14     1756 9725.16     1754
 9955.22     1754 9974.26     1752 9981.64     175010008.82     175010020.21     1754
10242.15     1754    10490  1756.7    10560  1756.2    10725  1756.2    10790  1756.5
10929.84     1758

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9599.26    .055 9955.22     .0310020.21    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9955.2210020.21               520     520     520              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.21

INPUT
Description: 3.21
Station Elevation Data     num=      14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9595     1754     9630     1752     9660     1750     9680     1749     9710     1750
    9900     1751     9965     1750 9990.25     174610009.88     174610029.09 1749.98
   10130     1750    10315     1752    10390  1752.1 10390.1     1754

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9595    .055     9965     .0310029.09    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          996510029.09               250     310     350              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.13

INPUT
Description: 3.13
Station Elevation Data     num=      10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9442.64     1752 9512.79     1748 9870.47     1748 9978.41     1746 9996.99     1742
10009.71     174210027.88     174810067.68     1750    10100  1750.2 10100.1     1752

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9442.64    .055 9978.41     .0310027.88    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110027.88               200     280     300              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.07

INPUT
Description: 3.07
Station Elevation Data     num=      11
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9625     1750     9640     1748     9665     1746 9912.66     1746 9979.95     1744
 9989.15     174210019.02     174110028.11     174410080.68     174610180.41     1748
10180.42     1750

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9625    .055 9979.95     .0310028.11    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.9510028.11                 0       0       0              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 2             RS: 2.97

INPUT
Description:
Station Elevation Data     num=      27
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9934     1748     9959     1746     9974     1744     9980     1742     9984     1740
    9988     1738    10012     1738    10020     1740    10052     1742    10134     1742
   10314   1743.5    10552     1742    10718     1740    10764   1738.5    10822     1740
   10826     1738    10830     1736    10860     1736    10864     1738    10870     1740
   10927     1740    10974     1739    11044     1740    11098     1740    11354     1742
   11484     1744    11602     1746

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9934    .055     9980     .049    11098    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   11098               270     270     280              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 2             RS: 2.92

INPUT
Description:
```

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9820	1748	9845	1746	9870	1744	9910	1742	9970	1740
9980	1738	9990	1735	10010	1735	10014	1738	10022	1740
10157	1741.5	10412	1740	10537	1738	10543	1736	10549	1734
10565	1734	10585	1736	10596	1738	10660	1738	10671	1740
10686	1742	10707	1742	10713	1740	10717	1738	10751	1738
11007	1740	11187	1742	11377	1742	11482	1744	11602	1746

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9820	.055	9970	.048	10660	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9970	10660	155	155	145	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 2 RS: 2.90

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9726	1746	9756	1744	9794	1742	9826	1740	9978	1738
9984	1736	9990	1734	10010	1734	10016	1736	10022	1738
10100	1740	10141	1740.5	10186	1740	10301	1738	10307	1736
10313	1734	10341	1734	10351	1736	10469	1738	10481	1740
10494	1742	10502	1744	10513	1746	10530	1746	10536	1744
10544	1742	10558	1740	10571	1738	10871	1738	10961	1740
11016	1742	11076	1744						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9726	.055	9978	.037	10469	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9978	10469	140	200	300	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 2 RS: 2.87

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9679	1746	9706	1744	9737	1742	9771	1740	9979	1738
9983	1736	9987	1734	10013	1734	10019	1736	10031	1738
10099	1738.5	10191	1738	10259	1736	10269	1734	10277	1732
10314	1732	10320	1734	10327	1736	10387	1736	10417	1734
10427	1732	10439	1732	10452	1734	10485	1736	10560	1738
10627	1740	10666	1742	10698	1744				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9679	.055	9979	.036	10485	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9979	10485	240	260	250	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 2 RS: 2.82

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9654	1744	9680	1742	9705	1740	9724	1738	9764	1736
9884	1735.5	9934	1736	9978	1736	9982	1734	9994	1731
10006	1731	10024	1734	10034	1736	10140	1736	10210	1736
10248	1734	10254	1732	10260	1730	10282	1730	10288	1732
10294	1734	10324	1736	10340	1738	10355	1740	10370	1742
10387	1744								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9654	.055	9978	.043	10294	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9978	10294	250	430	470	.3	.5

CROSS SECTION RIVER: Apache Wash
REACH: Reach 2 RS: 2.73

INPUT
Description: 2.73
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9756.45	1740	9787.82	1738	9811.88	1736	9971.87	1732	9986.23	1728
10019.94	172810036.42		173210071.17		173410101.17		173810127.41		1740.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9756.45	.055	9971.87	.0310036.42		.055

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

```
      9971.8710036.42                 0       0       0              .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.60

INPUT
Description: 2.6

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9750    1736    9820    1732    9935    1732    9945    1730    9960    1724
    9965    1724   10020    172610028.92  1729.5   10265    173210415.66    1732
10462.65 1736.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9750    .055    9945     .0310028.92    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          994510028.92              390     430     450              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.52

INPUT
Description: 2.52
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9805.03    1736 9840.17    1734 9866.23    1732 9886.43    1728 9957.59    1726
 9970.16    172210021.48    172110028.76    172610120.86    172810316.87    1728
10363.84    173010395.26    173210419.34    173410459.58    1736

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9805.03    .055 9957.59     .0310028.76    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.5910028.76              270     260     250              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.47

INPUT
Description: 2.47

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9920.54    1734 9942.57    1732 9962.26    1724  9972.1    1720 9990.76    1720
10013.06    172210027.81    1724 10090.1    172610200.41    172610300.68    1728
   10340    1730   10360    1734

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9920.54    .055 9962.26     .0310027.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9962.2610027.81              340     400     450              .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.40

INPUT
Description: 2.4

Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9795    1732    9800    1730    9840    1724    9940    1720    9980    1718
   10020    1718 10024.1 1719.9710048.34 1732.03

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9795    .055    9940     .03 10024.1    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940 10024.1              300     360     370              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.33

INPUT
Description: 2.33

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9778    1730    9840    1724    9870    1722    9890    1720    9945    1720
    9960    1718   10000    1717   10028    1718   10030    1720   10045    1730

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9778    .055    9945     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9945   10030              450     450     450              .1       .3

CROSS SECTION          RIVER: Apache Wash
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REACH: Reach 3            RS: 2.24

INPUT
Description: 2.24

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9781.96    1726 9796.25    1724 9855.35    1720 9939.57    1718 9973.56    1714
10001.06    171410055.42    171810148.55    172010188.25    172410215.72    1726

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9781.96    .055 9939.57     .0310055.42    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.5710055.42              380     380     390              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.17

INPUT
Description: 2.17

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9809.96    1722 9833.72    1720 9889.63    1716 9892.16    1716 9948.16    1716
 9962.44    171410027.88    171410055.88    1716 10199.6    171610234.24    1718
10416.55    172010468.74    1722

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9809.96    .055 9948.16     .0310055.88    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.1610055.88              500     520     350              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.08

INPUT
Description: 2.08
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9967.02    1718 9971.03    1716 9983.46    171010015.75    1710 10034.4    1714
10080.47    171610200.63    1717   10300    1716   10360    1714   10450    1712
   10490    1710   10510    1710   10545    1712   10580    1714   10700    1716
   10745    1718

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9967.02    .055 9971.03     .0310080.47    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.0310080.47              440     440     270              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.00

INPUT
Description: 2

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9964.46 1715.98     9980    1710     9985  1708.5   10020  1708.5   10115    1710
   10150    1712   10360  1713.8   10535    1712   10590    1710   10610  1708.5
   10675  1708.5   10700    1710   10805    1714   10830    1716

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9964.46    .055     9980     .03   10115    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   10115              550     490     230              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.88

INPUT
Description: 1.88

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9767.17 1713.01     9790    1708     9890    1708     9950    1706     9975    1704
    9990  1702.1    10010  1702.1   10040    1706   10085    1710   10210    1710
   10300    1708   10340    1706   10370    1706   10390    1708   10455    1710
10479.52 1713.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9767.17    .055     9950     .03   10040    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9950   10040              190     200     230              .1       .3

CROSS SECTION          RIVER: Apache Wash
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REACH: Reach 3            RS: 1.85

INPUT
Description: 1.85
Station Elevation Data     num=      16
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9819.07     1712 9828.06     1710 9836.36     1708 9915.83     1706 9954.99     1704
10002.05     170010011.48     170010041.54     170410064.87     170610129.94     1708
10187.04     170810294.81     170610368.04     170610414.01     170810424.61     1710
10451.94     1712

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9819.07    .055 9954.99     .0310041.54    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.9910041.54              210     190     150            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.81

INPUT
Description: 1.81
Station Elevation Data     num=      14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9944.51     1712 9965.71     1704 9971.05     1702 9975.82     170010012.24     1700
   10031     170210060.69     170410188.05     170610206.68     170610298.14     1704
10327.71     170410350.59     170610431.76     170810486.49     1712

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9944.51    .055 9971.05     .03   10031    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.05   10031              300     300     240            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.75

INPUT
Description: 1.75

Station Elevation Data     num=      12
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9951.17     1710 9965.64     1704 9970.05     1702 9974.47     1700 9978.76     1698
10016.76     169810034.19     170010072.31     170210151.35     170410320.71     1706
10429.93     170610503.73     1710

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9951.17    .055 9970.05     .0310072.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.0510072.31              480     500     520            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.66

INPUT
Description: 1.66

Station Elevation Data     num=      14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9744.33     1708 9829.76     1704 9931.63     1702 9952.11     1700 9967.65     1698
 9993.88     169610014.03     169610029.43     1698   10034     170010204.97 1700.01
10212.95     170210237.12     170410277.66     170610306.08     1708

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9744.33    .055 9952.11     .03   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9952.11   10034              300     250     240            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.60

INPUT
Description: 1.6

Station Elevation Data     num=      13
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9416.18     1706 9448.11     1704 9518.79     1702 9799.12     1700 9907.12     1698
 9959.73     1696 9980.66     1694  9995.9     1692 10008.9     169210012.95     1694
10016.94     169610031.18     170410062.39     1706

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9416.18    .055 9959.73     .0310016.94    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.7310016.94              190     180     180            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.56
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INPUT
Description: 1.56

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9426.84    1706 9453.43    1704 9496.71    1702 9564.46    1700 9690.11    1700
 9951.37    1698 9973.37    1696 9983.09    169210014.85    169210028.61    1698
10039.18    170210058.37    170410091.18    1706

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9426.84    .055 9951.37     .0310028.61    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.3710028.61               400     500     540             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.47

INPUT
Description: 1.47
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9462.33    1702 9530.85    1700 9560.22    1698 9800.63    1698 9911.62    1696
 9964.37    1694 9980.91    169010017.61    169010032.41    169410056.56    1698
10067.04    170010103.76    1702

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9462.33    .055 9964.37     .0310032.41    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.3710032.41               490     500     520             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.37

INPUT
Description: 1.37
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9493.05    1698 9549.07    1696 9580.08    1694 9932.08    1692 9963.31    1690
 9978.48    1688 10013.4    168810022.33    1690 10030.2    169210053.61    1698

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9493.05    .055 9932.08     .03 10030.2    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9932.08 10030.2               400     500     440             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.27

INPUT
Description: 1.27
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9673    1698    9745    1696    9795    1694    9817    1692    9842    1690
    9917    1688    9925    1686    9950    1684    9975    1684   10020    1686
   10077    1688   10163    1690   10260    1692   10395    1694   10505    1696
   10800    1698

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9673    .055    9917     .03   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9917   10020               450     460     500             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.18

INPUT
Description: 1.18
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9840    1694    9875    1692    9902    1690    9920    1688    9936    1686
    9947    1684    9957    1682   10015    1680   10020    1680   10025    1682
   10030    1684   10061    1686   10102    1688   10180    1690   10270    1690
   10390    1689   10460  1689.9   10600  1688.2   10670    1690   10863    1692
   10903  1693.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9840    .055    9947     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9947   10030               500     500     350             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.09

INPUT
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Description: 1.09
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9920    1690    9926    1688    9932    1686    9938    1684    9968    1682
    9974    1680   10026    1680   10034    1682   10098    1682   10120    1684
   10185    1686   10335    1684   10362    1684   10582    1686   10770    1685
   10920    1686   11621    1688   11652    1690

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9920    .055    9968     .03   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9968   10034              500     500     460            .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 0.99

INPUT
Description: 0.99
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9925.53    1686 9950.02    1682 9969.66    1680 9977.26    167810017.26    1678
10026.04    168010147.08    1682 10189.7    168210277.01    168010326.93    1678
10418.53    167810542.32    168010764.47    168210913.43    168210917.62    1682
   11420    1684   11790    168411823.04 1685.99

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9925.53    .055 9969.66     .0310026.04    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.6610026.04              890     900     550            .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 0.84

INPUT
Description: 0.84
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9854.82 1679.99    9910    1676    9975    1672 9980.41    167010019.82    1670
   10030    1672   10080  1673.8   10110    1672   10125    1670   10150    1674
   10230    1674   10290    1678   10320    1678   10380    1676   10400    1676
   10460    1678   10590    1680   10840    1680   10945    1678   11010    1678
   11067    1680

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9854.82    .055    9975     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10030              420     440     430            .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 0.75

INPUT
Description: 0.75
Station Elevation Data     num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9452.11 1676.99 9623.97    1674 9849.05    1674 9850.71    1674 9883.74    1672
 9884.15    1672 9943.61    1670 9943.82    1670 9967.12    1668 9967.18    1668
 9978.88    166610014.77    166610027.72    167010080.45    167010080.56    1670
10093.84    1672   10094    167210119.59    167210119.71    167210128.45    1670
 10128.5    1670 10145.7    167010145.78    1670 10173.1    167210173.36    1672
10214.32    1674 10214.6    167410391.18    167410391.21    167410479.43    1676
10479.48    167610512.05 1676.99

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9452.11    .055 9943.82     .0310027.72    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.8210027.72              180     200     210            .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 0.71

INPUT
Description: 0.71
Station Elevation Data     num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9410.74    1676 9517.84    1674 9806.35    1672 9806.66    1672 9929.72    1670
 9930.71    1670 9973.93    1668 9973.94    1668 9979.82    1666  9979.9    1666
 9985.76    1664  9985.8    166410015.71    1664 10015.9    166410024.34    1666
10024.46    166610029.59    166810030.23    166810045.83    166810045.97    1668
10052.42    166610052.62    166610063.21    1666 10063.3    166610070.56    1668
10070.63    1668 10092.7    167010201.55    167610201.61    1676

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9410.74    .055 9973.94     .0310029.59    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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      9973.9410029.59                370     400     440              .1       .3

 ROSS SECTION          RIVER: Apache Wash
 EACH: Reach 3            RS: 0.63

INPUT
Description: 0.63
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9246.69    1673    9300    1672 9467.58    1672 9467.59    1672 9524.47    1670
 9524.59    1670 9661.89    1670 9662.28    1670 9798.92    1668 9967.22    1668
 9967.27    1668 9971.89    1666 9971.91    1666 9976.44    1664 9976.56    1664
10025.48    166410033.05    166610033.09    166610044.06    166810044.68    1668
10151.63    1668   10188    167210227.11 1673.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9246.69    .055 9967.27     .0310044.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.2710044.06               300     500     600              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.54

INPUT
Description: 0.54
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9600    1670    9840    1668    9875    1664    9965    1664 9975.73    1660
10018.71    166010027.02    166410027.05    166410027.06    166410068.43    1666
10068.89    166610360.71    166610418.56    166410470.56    166410510.35    1666
10530.78    166810614.05    1670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9600    .055    9965     .0310027.02    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          996510027.02               800     640     400              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.43

INPUT
Description: 0.43

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9730    1666    9900    1664    9940    1662    9985    1655   10015    1655
   10050  1661.8   10120  1661.8   10190    1660   10240    1658   10270    1660
   10290    1662   10350    1662   10405    1660   10430    1660   10500    1662
   10535    1664   10620    1666

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9730    .055    9940     .03   10050    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940   10050               505     500     440              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.33

INPUT
Description: 0.33

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9631.93 1663.06    9645    1662    9722    1660    9820    1660    9900    1661
 9945.78 1658.03    9980  1652.2   10020  1652.2   10090    1658   10135    1658
   10150  1652.6   10170    1656   10220    1658   10250    1660   10305    1662
   10375    1664

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9631.93    .055 9945.78     .03   10090    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9945.78   10090               350     650     700              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.20

INPUT
Description: 0.2

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9288.16    1660 9525.13    1658 9606.89    1658 9642.09    1656 9827.21    1656
 9904.07    1654 9967.74    1650  9981.5    1646 10015.7    1646 10039.4    1656
10160.82    165610191.81    1660

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
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 9288.16    .055 9967.74     .03 10039.4    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.74 10039.4                 0       0       0             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.23

INPUT
Description: 2.23

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9916.62    1834 9941.49    1832 9962.82    1830 9979.43    1828 9994.11    1826
10007.33    182610023.07    182810034.76    1830   10373    1832   10480    1832
   10620    1834

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9916.62    .055 9979.43     .0310023.07    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.4310023.07               435     440     445             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.14

INPUT
Description: 2.14
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9961.98    1828 9969.94    1826 9979.01    1824 9981.08    182410020.87    1824
10025.81    182410218.97    182610361.55    182610637.58    182610689.74    1828

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9961.98    .055 9979.01     .0310025.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.0110025.81               385     380     380             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.07

INPUT
Description: 2.07

Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9955.42    1824 9969.04    1822    9980    1821   10020    1821   10060    1822
10667.15    182210737.75    1824

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9955.42    .055 9969.04     .03   10060    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.04   10060               415     390     260             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.00

INPUT
Description: 2.00 -- Approximate Alignment of Carefree Hwy
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9956.92    1822 9973.16    1818 9974.89    1818 9981.08    1816 9983.46    1816
 9989.77    1814 9993.01    181410005.51    181410007.19    181410022.29    1816
10025.64    181610088.76    181810488.79    1820 10588.7    182010637.44    1822

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9956.92    .055 9983.46     .0310022.29    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.4610022.29               390     400     390             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.92

INPUT
Description: 1.92

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9925    1816    9935    1814    9945    1812    9965    1810   10010    1810
   10015    1812   10025    1814   10050    1812   10100    1814   10340    1814
   10380    1816

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9925    .055    9935     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9935   10025               460     455     450             .1       .3
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CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.83

INPUT
Description: 1.83

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9956.91    1812 9974.62    1810 9983.67    1808 9990.95    180610005.18    1806
10038.99    180810189.64    181010254.89    181010359.32    180810422.67    1812

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9956.91    .055 9983.67     .0310038.99    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.6710038.99              440     445     450              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.75

INPUT
Description: 1.75

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9923.03    1806 9964.44    1804 9975.68    1802  9998.4    180010003.69    1800
10022.87    180410187.38    180410279.87    180210305.65    180210358.49    1806

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9923.03    .055 9964.44     .0310022.87    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.4410022.87              485     490     500              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.65

INPUT
Description: 1.65
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9893    1806     9901    1804    9909    1802    9915    1800    9923    1798
    9971  1797.8     9988    1796   10012    1796   10020    1798   10273    1800
 10273.1    1802

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9893    .055     9971     .03   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9971   10020              600     600     575              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.54

INPUT
Description: 1.54
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9735.34    1796 9972.06    1794 9986.03    1792 9993.93    1790 10012.3    1790
10020.15    179210029.59    179210124.43    179010160.57    179010181.54    1792
10288.06    179410495.09    179410533.67    1796

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9735.34    .055 9986.03     .0310020.15    .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.0310020.15              400     400     400              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.46

INPUT
Description: 1.46
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9420    1794     9455    1792    9645    1790    9685    1790 9843.42    1792
 9885.29    1792 9920.09    1790 9973.03    1788 9983.48    178610027.78    1786
10028.33    178610038.59    1788 10039.2    178810295.57    179210295.61    1792
10328.92 1793.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9420    .055 9973.03     .0310038.59    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.0310038.59              260     500     670              .1       .3
Left Levee      Station= 9885.29      Elevation=    1792

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.37
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INPUT
Description: 1.37
Station Elevation Data     num=      24
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9345     1792     9385     1790     9440     1788     9490     1788   9650.6 1789.51
 9806.04     1788  9806.97     1788  9865.72     1786  9866.07     1786   9886.2     1784
 9886.27     1784  9957.84     1784  9958.87     1784   9968.7     1782  9968.84     1782
 9990.03     178210020.46     178610055.46     178610057.12     178610069.22     1788
10069.72     178810181.45     178810258.34     179010303.11     1792

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9345    .055  9958.87     .0310020.46    .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9958.8710020.46               570      500      430              .1       .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.27

INPUT
Description: 1.27

Station Elevation Data     num=      18
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9347.73     1788  9366.76     1786  9787.72     1784  9788.51     1784  9960.27     1784
 9960.65     1784  9969.04     1782  9969.12     1782  9988.65     1778  9989.09     1778
10011.61     177810012.22     177810057.73     178210058.84     178210169.81     1784
10171.13     178410205.64     178810206.31     1788

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9347.73    .055  9969.12     .0310057.73    .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9969.1210057.73               390      350      320              .1       .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.21

INPUT
Description: 1.21
Station Elevation Data     num=      22
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9421     1784  9440.23     1780   9538.2     1780  9595.38     1782  9618.31     1782
 9801.74     1780  9802.59     1780  9835.89     1780  9836.44     1780  9877.07     1782
 9886.63     1782  9977.68     1780  9982.64     1778  9983.14     1778  9988.45     1776
10013.85     177610020.25     1778 10020.6     177810096.24     177810106.85     1780
10131.31     178210206.15     1784

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    9421    .055  9983.14     .03 10020.6    .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9983.14 10020.6               400      440      450              .1       .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.12

INPUT
Description: 1.12

Station Elevation Data     num=      23
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9323.43     1782  9323.49     1782  9334.19     1780  9334.29     1780  9344.65     1778
 9345.18     1778     9460     1778   9546.2     1776  9547.35     1776  9660.25     1776
 9661.37     1776  9701.23     1778  9701.63     1778  9764.83     1780  9764.91     1780
 9845.43     1780  9943.46     1776  9981.99     177410002.99     177210010.59     1772
10023.31     177610036.17     178010084.32     1782

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9323.43    .055  9943.46     .0310023.31    .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9943.4610023.31               320      420      470              .1       .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.04

INPUT
Description: 1.04
Station Elevation Data     num=      13
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9371.44     1778  9371.87     1778  9547.56     1774  9547.64     1774  9676.69     1774
 9678.18     1774  9732.85     1772   9985.5     1772  9991.67     177010013.58     1770
10029.11     177210053.67     177610108.42     1778

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9371.44    .055   9985.5     .0310029.11    .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
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        9985.510029.11              500     400     300             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.95

INPUT
Description: 0.95

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9590.3    1774  9590.4    1774 9688.06    1772 9688.13    1772 9982.32    1772
 9984.49    1770 9986.77    176810001.77    176610019.78    176610036.54    1768
10070.19    177010159.61    177210232.27    1774

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9590.3    .055 9984.49     .0310070.19    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9984.4910070.19              250     275     310             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.89

INPUT
Description: 0.89

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9582.26    1772 9582.35    1772 9640.11    1770 9921.21    1770 9981.01    1768
 9985.21    176410009.58    176410018.11    176610021.69    176810163.03    1770
10270.58    1772

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9582.26    .055 9981.01     .0310021.69    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.0110021.69              520     500     480             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.80

INPUT
Description: 0.8
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9593.82    1768 9646.26    1766 9785.49    1766 9982.14    1764 9989.01    1762
10010.62    176210020.71    1764 10104.6    176410291.13    1766 10321.7    1768

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9593.82    .055 9982.14     .0310020.71    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.1410020.71              420     350     330             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.72

INPUT
Description: 0.72
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9396    1766    9427    1764    9473    1762    9526    1761    9616    1762
    9682    1760    9721  1758.5    9758    1760    9796  1760.5    9886    1760
    9978    1760    9988    1758   10012    1758   10018    1760   10066    1762
   10106    1764   10141    1766

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9396    .055    9978     .03   10018    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10018              400     420     425             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.62

INPUT
Description: 0.62
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9548    1762    9586    1760    9657    1758    9688  1757.5    9750    1758
    9798  1758.5    9938    1758    9967    1756    9983    1754   10018    1754
   10031    1756   10085    1758   10218    1758   10245    1760   10263    1762

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9548    .055    9967     .03   10031    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9967   10031              420     450     460             .1       .3

CROSS SECTION          RIVER: Paradise Wash
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REACH: Reach 1            RS: 0.53

INPUT
Description: 0.53
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9511    1758    9574    1756    9729    1754    9976    1752    9983    1750
   10018    1750   10028    1752   10099    1754   10115    1756   10131    1758

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9511    .055    9976     .03   10028    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9976   10028               475     495     500              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.44

INPUT
Description: 0.44
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9603.04    1752 9682.28    1750 9992.46    174810001.98    1746   10007    1746
10019.54    174810028.31    174910052.71    174910105.67    1748 10138.9    1746
10140.02    174610149.52    174810159.12    1750 10170.1    1752

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9603.04    .055 9992.46     .0310028.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9992.4610028.31               500     450     380              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.34

INPUT
Description: 0.34
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9749.69    1750 9772.57    1748 9799.65    1746 9969.75    1744 9988.37    1744
10012.01    174410014.83    174410073.32    174610188.93    174610285.92    1744
10293.88    174410324.22    1748 10351.7    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9749.69    .055 9969.75     .0310014.83    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.7510014.83               290     300     340              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.28

INPUT
Description: 0.28
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9761    1746    9780    1744    9817    1742    9891    1740    9974    1742
    9982    1740    9991    1738   10008    1738   10017    1740   10038    1742
   10151    1744   10229    1743   10243    1744   10289    1746

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9761    .055    9974     .03   10038    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9974   10038               550     550     550              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.17

INPUT
Description: 0.17
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9957.91    1740 9974.51    1734  9980.5    173210003.82    173210022.71    1734
10084.24    173610128.49    173810423.55    173810511.08    173610520.92    1736
10528.63    173810535.83    1740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9957.91    .055 9974.51     .0310022.71    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9974.5110022.71               225     225     200              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.13

INPUT
Description: 0.13
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
 9952.71 1738.99 9978.41    1734 9988.85    173210019.25    173210047.54    1734
 10172.1    1736 10543.1    173610553.61 1738.99

 Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9952.71    .055 9978.41     .0310047.54    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110047.54              425     390     465             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.04

INPUT
Description: 0.04
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9680    1738    9765    1734    9850    1732 9946.82    1732 9970.15    1730
 9998.41    172610018.18    172610032.22    173010090.04    173210255.73    1736
10279.91    1738

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9680    .055 9970.15     .0310032.22    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.1510032.22                0       0       0             .1       .3
```

SUMMARY OF MANNING'S N VALUES

River:Desert Hills Was

Reach	River Sta.	n1	n2	n3
Reach 1	0.99	.055	.03	.055
Reach 1	0.90	.055	.03	.055
Reach 1	0.81	.055	.03	.055
Reach 1	0.72	.055	.03	.055
Reach 1	0.64	.055	.03	.055
Reach 1	0.56	.055	.03	.055
Reach 1	0.48	.055	.03	.055
Reach 1	0.40	.055	.03	.055
Reach 1	0.386	.055	.03	.055

River:Apache Wash

Reach	River Sta.	n1	n2	n3
Reach 1	8.02	.055	.03	.055
Reach 1	7.98	.055	.03	.055
Reach 1	7.89	.055	.03	.055
Reach 1	7.84	.055	.03	.055
Reach 1	7.74	.055	.03	.055
Reach 1	7.65	.055	.03	.055
Reach 1	7.55	.055	.03	.055
Reach 1	7.46	.055	.03	.055
Reach 1	7.36	.055	.03	.055
Reach 1	7.28	.055	.03	.055
Reach 1	7.17	.055	.03	.055
Reach 1	7.08	.055	.03	.055
Reach 1	6.98	.055	.03	.055
Reach 1	6.9	.055	.03	.055
Reach 1	6.8	.055	.03	.055
Reach 1	6.71	.055	.03	.055
Reach 1	6.63	.055	.03	.055
Reach 1	6.58	.055	.03	.055
Reach 1	6.5	.055	.03	.055
Reach 1	6.43	.055	.03	.055
Reach 1	6.32	.055	.03	.055
Reach 1	6.25	.055	.03	.055
Reach 1	6.16	.055	.03	.055
Reach 1	6.09	.055	.03	.055
Reach 1	6.01	.055	.03	.055
Reach 1	5.92	.055	.03	.055
Reach 1	5.83	.055	.03	.055
Reach 1	5.76	.055	.03	.055
Reach 1	5.66	.055	.03	.055
Reach 1	5.64	.055	.03	.055
Reach 1	5.57	.055	.03	.055
Reach 1	5.48	.055	.03	.055
Reach 1	5.38	.055	.03	.055
Reach 1	5.31	.055	.03	.055
Reach 1	5.21	.055	.03	.055
Reach 1	5.15	.055	.03	.055
Reach 1	5.09	.055	.03	.055
Reach 1	5.03	.055	.03	.055
Reach 1	4.96	.055	.03	.055
Reach 1	4.9	.055	.03	.055
Reach 1	4.82	.055	.03	.055
Reach 1	4.78	.055	.03	.055
Reach 1	4.74	.055	.03	.055
Reach 1	4.65	.055	.03	.055

Reach 1	4.6	.055	.03	.055
Reach 1	4.58	.055	.03	.055
Reach 1	4.575	Culvert		
Reach 1	4.56	.055	.03	.055
Reach 1	4.49	.055	.03	.055
Reach 1	4.4	.055	.03	.055
Reach 1	4.31	.055	.03	.055
Reach 1	4.23	.055	.03	.055
Reach 1	4.22	.055	.03	.055
Reach 1	4.11	.055	.03	.055
Reach 1	4.05	.055	.03	.055
Reach 1	3.96	.055	.03	.055
Reach 1	3.86	.055	.03	.055
Reach 1	3.78	.055	.03	.055
Reach 1	3.75	.055	.03	.055
Reach 1	3.65	.055	.03	.055
Reach 1	3.6	.055	.03	.055
Reach 1	3.52	.055	.03	.055
Reach 1	3.48	.055	.03	.055
Reach 1	3.4	.055	.03	.055
Reach 1	3.32	.055	.03	.055
Reach 1	3.21	.055	.03	.055
Reach 1	3.13	.055	.03	.055
Reach 1	3.07	.055	.03	.055
Reach 2	2.97	.055	.049	.055
Reach 2	2.92	.055	.048	.055
Reach 2	2.90	.055	.037	.055
Reach 2	2.87	.055	.036	.055
Reach 2	2.82	.055	.043	.055
Reach 2	2.73	.055	.03	.055
Reach 3	2.60	.055	.03	.055
Reach 3	2.52	.055	.03	.055
Reach 3	2.47	.055	.03	.055
Reach 3	2.40	.055	.03	.055
Reach 3	2.33	.055	.03	.055
Reach 3	2.24	.055	.03	.055
Reach 3	2.17	.055	.03	.055
Reach 3	2.08	.055	.03	.055
Reach 3	2.00	.055	.03	.055
Reach 3	1.88	.055	.03	.055
Reach 3	1.85	.055	.03	.055
Reach 3	1.81	.055	.03	.055
Reach 3	1.75	.055	.03	.055
Reach 3	1.66	.055	.03	.055
Reach 3	1.60	.055	.03	.055
Reach 3	1.56	.055	.03	.055
Reach 3	1.47	.055	.03	.055
Reach 3	1.37	.055	.03	.055
Reach 3	1.27	.055	.03	.055
Reach 3	1.18	.055	.03	.055
Reach 3	1.09	.055	.03	.055
Reach 3	0.99	.055	.03	.055
Reach 3	0.84	.055	.03	.055
Reach 3	0.75	.055	.03	.055
Reach 3	0.71	.055	.03	.055
Reach 3	0.63	.055	.03	.055
Reach 3	0.54	.055	.03	.055
Reach 3	0.43	.055	.03	.055
Reach 3	0.33	.055	.03	.055
Reach 3	0.20	.055	.03	.055

River:Paradise Wash

Reach	River Sta.	n1	n2	n3
Reach 1	2.23	.055	.03	.055
Reach 1	2.14	.055	.03	.055
Reach 1	2.07	.055	.03	.055
Reach 1	2.00	.055	.03	.055
Reach 1	1.92	.055	.03	.055
Reach 1	1.83	.055	.03	.055
Reach 1	1.75	.055	.03	.055
Reach 1	1.65	.055	.03	.055
Reach 1	1.54	.055	.03	.03
Reach 1	1.46	.055	.03	.055
Reach 1	1.37	.055	.03	.055
Reach 1	1.27	.055	.03	.055
Reach 1	1.21	.055	.03	.055
Reach 1	1.12	.055	.03	.055
Reach 1	1.04	.055	.03	.055
Reach 1	0.95	.055	.03	.055
Reach 1	0.89	.055	.03	.055
Reach 1	0.80	.055	.03	.055
Reach 1	0.72	.055	.03	.055
Reach 1	0.62	.055	.03	.055
Reach 1	0.53	.055	.03	.055
Reach 1	0.44	.055	.03	.055
Reach 1	0.34	.055	.03	.055
Reach 1	0.28	.055	.03	.055
Reach 1	0.17	.055	.03	.055
Reach 1	0.13	.055	.03	.055
Reach 1	0.04	.055	.03	.055

UMMARY OF REACH LENGTHS

River: Desert Hills Was

Reach	River Sta.	Left	Channel	Right
Reach 1	0.99	490	470	440
Reach 1	0.90	500	491	480
Reach 1	0.81	550	492	400
Reach 1	0.72	340	373	325
Reach 1	0.64	270	450	450
Reach 1	0.56	320	436	450
Reach 1	0.48	410	380	340
Reach 1	0.40	180	260	320
Reach 1	0.386	0	0	0

River: Apache Wash

Reach	River Sta.	Left	Channel	Right
Reach 1	8.02	215	235	245
Reach 1	7.98	280	465	520
Reach 1	7.89	300	300	220
Reach 1	7.84	575	500	425
Reach 1	7.74	425	500	475
Reach 1	7.65	520	500	470
Reach 1	7.55	510	500	480
Reach 1	7.46	490	500	510
Reach 1	7.36	420	446	470
Reach 1	7.28	475	554	410
Reach 1	7.17	500	500	520
Reach 1	7.08	485	500	500
Reach 1	6.98	400	437	470
Reach 1	6.9	490	529	560
Reach 1	6.8	500	495	400
Reach 1	6.71	425	390	350
Reach 1	6.63	300	290	290
Reach 1	6.58	430	430	430
Reach 1	6.5	310	345	355
Reach 1	6.43	475	450	360
Reach 1	6.32	410	390	350
Reach 1	6.25	490	460	430
Reach 1	6.16	270	360	450
Reach 1	6.09	470	445	435
Reach 1	6.01	485	490	510
Reach 1	5.92	375	400	375
Reach 1	5.83	375	380	380
Reach 1	5.76	470	540	570
Reach 1	5.66	460	440	320
Reach 1	5.64	370	345	320
Reach 1	5.57	400	450	450
Reach 1	5.48	530	500	500
Reach 1	5.38	350	375	425
Reach 1	5.31	500	500	480
Reach 1	5.21	330	310	300
Reach 1	5.15	350	352	355
Reach 1	5.09	300	300	310
Reach 1	5.03	345	365	340
Reach 1	4.96	400	320	200
Reach 1	4.9	220	200	160
Reach 1	4.82	480	480	480
Reach 1	4.78	300	200	100
Reach 1	4.74	400	500	500
Reach 1	4.65	260	280	260
Reach 1	4.6	83	83	83
Reach 1	4.58	180	180	170
Reach 1	4.575	Culvert		
Reach 1	4.56	365	365	350
Reach 1	4.49	490	450	450
Reach 1	4.4	475	510	490
Reach 1	4.31	410	420	410
Reach 1	4.23	140	150	150
Reach 1	4.22	280	280	260
Reach 1	4.11	240	250	300
Reach 1	4.05	400	500	285
Reach 1	3.96	490	520	460
Reach 1	3.86	360	400	490
Reach 1	3.78	170	170	170
Reach 1	3.75	500	500	500
Reach 1	3.65	250	280	260
Reach 1	3.6	400	420	450
Reach 1	3.52	200	200	200
Reach 1	3.48	400	400	400
Reach 1	3.4	480	470	440
Reach 1	3.32	520	520	520
Reach 1	3.21	250	310	350
Reach 1	3.13	200	280	300
Reach 1	3.07	0	0	0
Reach 2	2.97	270	270	280
Reach 2	2.92	155	155	145
Reach 2	2.90	140	200	300
Reach 2	2.87	240	260	250

Reach 2	2.82	250	430	470
Reach 2	2.73	0	0	0
Reach 3	2.60	390	430	450
Reach 3	2.52	270	260	250
Reach 3	2.47	340	400	450
Reach 3	2.40	300	360	370
Reach 3	2.33	450	450	450
Reach 3	2.24	380	380	390
Reach 3	2.17	500	520	350
Reach 3	2.08	440	440	270
Reach 3	2.00	550	490	230
Reach 3	1.88	190	200	230
Reach 3	1.85	210	190	150
Reach 3	1.81	300	300	240
Reach 3	1.75	480	500	520
Reach 3	1.66	300	250	240
Reach 3	1.60	190	180	180
Reach 3	1.56	400	500	540
Reach 3	1.47	490	500	520
Reach 3	1.37	400	500	440
Reach 3	1.27	450	460	500
Reach 3	1.18	500	500	350
Reach 3	1.09	500	500	460
Reach 3	0.99	890	900	550
Reach 3	0.84	420	440	430
Reach 3	0.75	180	200	210
Reach 3	0.71	370	400	440
Reach 3	0.63	300	500	600
Reach 3	0.54	800	640	400
Reach 3	0.43	505	500	440
Reach 3	0.33	350	650	700
Reach 3	0.20	0	0	0

River: Paradise Wash

Reach	River Sta.	Left	Channel	Right
Reach 1	2.23	435	440	445
Reach 1	2.14	385	380	380
Reach 1	2.07	415	390	260
Reach 1	2.00	390	400	390
Reach 1	1.92	460	455	450
Reach 1	1.83	440	445	450
Reach 1	1.75	485	490	500
Reach 1	1.65	600	600	575
Reach 1	1.54	400	400	400
Reach 1	1.46	260	500	670
Reach 1	1.37	570	500	430
Reach 1	1.27	390	350	320
Reach 1	1.21	400	440	450
Reach 1	1.12	320	420	470
Reach 1	1.04	500	400	300
Reach 1	0.95	250	275	310
Reach 1	0.89	520	500	480
Reach 1	0.80	420	350	330
Reach 1	0.72	400	420	425
Reach 1	0.62	420	450	460
Reach 1	0.53	475	495	500
Reach 1	0.44	500	450	380
Reach 1	0.34	290	300	340
Reach 1	0.28	550	550	550
Reach 1	0.17	225	225	200
Reach 1	0.13	425	390	465
Reach 1	0.04	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Desert Hills Was

Reach	River Sta.	Contr.	Expan.
Reach 1	0.99	.1	.3
Reach 1	0.90	.1	.3
Reach 1	0.81	.1	.3
Reach 1	0.72	.1	.3
Reach 1	0.64	.1	.3
Reach 1	0.56	.1	.3
Reach 1	0.48	.1	.3
Reach 1	0.40	.1	.3
Reach 1	0.386	.3	.5

River: Apache Wash

Reach	River Sta.	Contr.	Expan.
Reach 1	8.02	.1	.3
Reach 1	7.98	.1	.3
Reach 1	7.89	.1	.3
Reach 1	7.84	.1	.3
Reach 1	7.74	.1	.3

Reach 1	7.65		.1	.3
Reach 1	7.55		.1	.3
Reach 1	7.46		.1	.3
Reach 1	7.36		.1	.3
Reach 1	7.28		.3	.5
Reach 1	7.17		.1	.3
Reach 1	7.08		.1	.3
Reach 1	6.98		.3	.5
Reach 1	6.9		.1	.3
Reach 1	6.8		.1	.3
Reach 1	6.71		.1	.3
Reach 1	6.63		.1	.3
Reach 1	6.58		.1	.3
Reach 1	6.5		.1	.3
Reach 1	6.43		.1	.3
Reach 1	6.32		.1	.3
Reach 1	6.25		.1	.3
Reach 1	6.16		.1	.3
Reach 1	6.09		.1	.3
Reach 1	6.01		.1	.3
Reach 1	5.92		.1	.3
Reach 1	5.83		.1	.3
Reach 1	5.76		.1	.3
Reach 1	5.66		.1	.3
Reach 1	5.64		.1	.3
Reach 1	5.57		.1	.3
Reach 1	5.48		.1	.3
Reach 1	5.38		.3	.5
Reach 1	5.31		.3	.5
Reach 1	5.21		.1	.3
Reach 1	5.15		.1	.3
Reach 1	5.09		.1	.3
Reach 1	5.03		.1	.3
Reach 1	4.96		.1	.3
Reach 1	4.9		.1	.3
Reach 1	4.82		.1	.3
Reach 1	4.78		.1	.3
Reach 1	4.74		.1	.3
Reach 1	4.65		.1	.3
Reach 1	4.6		.1	.3
Reach 1	4.58		.3	.5
Reach 1	4.575	Culvert		
Reach 1	4.56		.1	.3
Reach 1	4.49		.1	.3
Reach 1	4.4		.1	.3
Reach 1	4.31		.1	.3
Reach 1	4.23		.1	.3
Reach 1	4.22		.1	.3
Reach 1	4.11		.1	.3
Reach 1	4.05		.3	.5
Reach 1	3.96		.1	.3
Reach 1	3.86		.1	.3
Reach 1	3.78		.3	.5
Reach 1	3.75		.1	.3
Reach 1	3.65		.1	.3
Reach 1	3.6		.1	.3
Reach 1	3.52		.1	.3
Reach 1	3.48		.1	.3
Reach 1	3.4		.1	.3
Reach 1	3.32		.1	.3
Reach 1	3.21		.1	.3
Reach 1	3.13		.1	.3
Reach 1	3.07		.3	.5
Reach 2	2.97		.1	.3
Reach 2	2.92		.1	.3
Reach 2	2.90		.1	.3
Reach 2	2.87		.1	.3
Reach 2	2.82		.3	.5
Reach 2	2.73		.3	.5
Reach 3	2.60		.1	.3
Reach 3	2.52		.1	.3
Reach 3	2.47		.3	.5
Reach 3	2.40		.1	.3
Reach 3	2.33		.1	.3
Reach 3	2.24		.1	.3
Reach 3	2.17		.1	.3
Reach 3	2.08		.1	.3
Reach 3	2.00		.1	.3
Reach 3	1.88		.1	.3
Reach 3	1.85		.1	.3
Reach 3	1.81		.1	.3
Reach 3	1.75		.1	.3
Reach 3	1.66		.1	.3
Reach 3	1.60		.1	.3
Reach 3	1.56		.1	.3
Reach 3	1.47		.1	.3
Reach 3	1.37		.1	.3
Reach 3	1.27		.3	.5
Reach 3	1.18		.3	.5
Reach 3	1.09		.1	.3
Reach 3	0.99		.3	.5
Reach 3	0.84		.3	.5
Reach 3	0.75		.1	.3
Reach 3	0.71		.1	.3
Reach 3	0.63		.1	.3

Reach 3	0.54	.1	.3
Reach 3	0.43	.1	.3
Reach 3	0.33	.1	.3
Reach 3	0.20	.1	.3

River: Paradise Wash

Reach	River Sta.	Contr.	Expan.
Reach 1	2.23	.1	.3
Reach 1	2.14	.1	.3
Reach 1	2.07	.1	.3
Reach 1	2.00	.1	.3
Reach 1	1.92	.1	.3
Reach 1	1.83	.1	.3
Reach 1	1.75	.1	.3
Reach 1	1.65	.1	.3
Reach 1	1.54	.1	.3
Reach 1	1.46	.1	.3
Reach 1	1.37	.1	.3
Reach 1	1.27	.1	.3
Reach 1	1.21	.1	.3
Reach 1	1.12	.1	.3
Reach 1	1.04	.1	.3
Reach 1	0.95	.1	.3
Reach 1	0.89	.1	.3
Reach 1	0.80	.1	.3
Reach 1	0.72	.1	.3
Reach 1	0.62	.1	.3
Reach 1	0.53	.1	.3
Reach 1	0.44	.1	.3
Reach 1	0.34	.1	.3
Reach 1	0.28	.1	.3
Reach 1	0.17	.1	.3
Reach 1	0.13	.1	.3
Reach 1	0.04	.1	.3

Profile Output Table - Standard Table 1

River	Reach	River Sta (cfs)	Q Total (ft)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft/ft)	E.G. Slope (ft/s)	Vel Chnl (sq ft)	Flow Area (ft)	Top Width	Froude # Chl	
Paradise Wash	Reach 1	2.23		4179.00	1826.00	1832.70	1832.70	1833.58	0.003457	9.58	1070.10	595.81	0.69
Paradise Wash	Reach 1	2.14		4179.00	1824.00	1827.10	1827.10	1827.66	0.008392	9.65	1049.60	700.76	0.97
Paradise Wash	Reach 1	2.07		4179.00	1821.00	1823.23	1823.23	1823.77	0.012455	8.64	959.20	750.08	1.09
Paradise Wash	Reach 1	2.00		4179.00	1814.00	1820.50	1820.50	1821.25	0.003394	9.41	1171.05	637.95	0.68
Paradise Wash	Reach 1	1.92		4179.00	1810.00	1815.05	1815.05	1816.01	0.004922	8.85	787.89	431.18	0.77
Paradise Wash	Reach 1	1.83		4179.00	1806.00	1810.95	1810.95	1811.82	0.005790	9.79	883.21	439.86	0.84
Paradise Wash	Reach 1	1.75		4179.00	1800.00	1805.30	1805.30	1806.19	0.007367	10.05	815.33	411.67	0.92
Paradise Wash	Reach 1	1.65		4179.00	1796.00	1800.73	1800.73	1801.71	0.006568	10.49	795.98	360.22	0.90
Paradise Wash	Reach 1	1.54		5763.00	1790.00	1794.03	1793.82	1795.19	0.012242	12.67	767.86	527.16	1.18
Paradise Wash	Reach 1	1.46		5763.00	1786.00	1792.01	1792.01	1792.78	0.003313	9.05	1516.23	840.87	0.67
Paradise Wash	Reach 1	1.37		5763.00	1782.00	1787.89	1787.89	1789.55	0.008112	12.53	765.69	258.29	1.01
Paradise Wash	Reach 1	1.27		5763.00	1778.00	1785.04	1785.04	1786.21	0.003816	9.57	1037.82	610.30	0.71
Paradise Wash	Reach 1	1.21		5763.00	1776.00	1781.98	1781.98	1783.07	0.005953	11.97	1219.56	663.39	0.89
Paradise Wash	Reach 1	1.12		5763.00	1772.00	1778.76	1778.76	1779.81	0.005196	9.99	1120.22	541.12	0.81
Paradise Wash	Reach 1	1.04		5763.00	1770.00	1775.53	1773.88	1775.99	0.003500	8.54	1537.15	570.25	0.67
Paradise Wash	Reach 1	0.95		5763.00	1766.00	1773.18	1773.18	1774.32	0.003871	9.58	1081.43	571.96	0.72
Paradise Wash	Reach 1	0.89		5763.00	1764.00	1771.67	1771.67	1772.63	0.003698	10.61	1407.33	661.11	0.71
Paradise Wash	Reach 1	0.80		5763.00	1762.00	1766.94	1766.94	1767.71	0.006970	11.17	1310.67	683.76	0.93
Paradise Wash	Reach 1	0.72		5763.00	1758.00	1762.44	1762.44	1763.24	0.008416	11.42	1210.13	611.82	1.00
Paradise Wash	Reach 1	0.62		5763.00	1754.00	1759.71	1759.71	1760.60	0.004298	9.79	1316.70	644.75	0.75
Paradise Wash	Reach 1	0.53		5763.00	1750.00	1755.41	1755.41	1756.51	0.006030	11.30	1114.33	490.32	0.88
Paradise Wash	Reach 1	0.44		5763.00	1746.00	1751.24	1750.78	1751.80	0.006334	9.88	1283.61	532.94	0.87
Paradise Wash	Reach 1	0.34		5763.00	1744.00	1747.17	1747.17	1748.00	0.011978	11.69	1054.70	534.01	1.16
Paradise Wash	Reach 1	0.28		5763.00	1738.00	1744.11	1744.11	1745.23	0.006701	10.91	996.61	466.54	0.91
Paradise Wash	Reach 1	0.17		5763.00	1732.00	1739.23	1739.23	1740.20	0.003410	10.23	1330.48	573.02	0.70
Paradise Wash	Reach 1	0.13		5763.00	1732.00	1737.50	1737.50	1738.41	0.004669	9.79	1246.10	588.01	0.78
Paradise Wash	Reach 1	0.04		5763.00	1726.00	1736.91	1733.86	1737.13	0.000525	5.06	2454.73	563.43	0.29
Apache Wash	Reach 1	8.02		7187.00	1985.10	1992.58	1992.58	1993.94	0.004759	11.65	1224.25	424.12	0.82
Apache Wash	Reach 1	7.98		7187.00	1981.80	1988.81	1988.81	1990.00	0.006207	11.53	1266.49	497.64	0.90
Apache Wash	Reach 1	7.89		7187.00	1977.00	1984.38	1984.38	1985.77	0.005064	11.35	1142.60	469.64	0.83
Apache Wash	Reach 1	7.84		7187.00	1974.40	1980.96	1980.96	1982.29	0.006817	13.11	1155.71	378.88	0.96
Apache Wash	Reach 1	7.74		7187.00	1969.10	1974.80	1974.80	1976.07	0.008298	12.67	1114.34	379.40	1.03
Apache Wash	Reach 1	7.65		7187.00	1961.80	1968.56	1968.56	1970.07	0.006869	13.20	1042.01	321.44	0.96
Apache Wash	Reach 1	7.55		7187.00	1956.70	1963.62	1963.62	1965.41	0.006795	13.12	923.70	253.84	0.96
Apache Wash	Reach 1	7.46		7187.00	1951.50	1957.71	1957.71	1959.59	0.006236	12.27	865.19	259.20	0.92
Apache Wash	Reach 1	7.36		7187.00	1944.50	1952.18	1952.18	1953.82	0.005299	11.83	993.78	302.31	0.85
Apache Wash	Reach 1	7.28		7187.00	1940.80	1948.12	1945.35	1948.50	0.002238	8.31	1681.48	313.72	0.56
Apache Wash	Reach 1	7.17		7187.00	1934.00	1943.23	1943.23	1946.09	0.005156	14.91	701.67	139.82	0.89
Apache Wash	Reach 1	7.08		7187.00	1929.00	1936.97	1936.97	1939.79	0.006160	14.00	621.13	128.84	0.94
Apache Wash	Reach 1	6.98		7187.00	1924.00	1933.01	1933.01	1934.59	0.004089	11.96	1136.35	361.53	0.77
Apache Wash	Reach 1	6.9		7187.00	1920.00	1928.65	1928.65	1930.00	0.004263	11.28	1223.91	417.08	0.77
Apache Wash	Reach 1	6.8		7187.00	1914.00	1922.66	1922.66	1924.13	0.004868	12.88	1191.52	357.79	0.83
Apache Wash	Reach 1	6.71		7187.00	1907.50	1918.79	1918.79	1920.77	0.003342	12.84	997.43	255.00	0.72
Apache Wash	Reach 1	6.63		7187.00	1905.00	1915.03	1915.03	1916.77	0.003817	13.20	1152.13	317.34	0.76
Apache Wash	Reach 1	6.58		7187.00	1902.00	1910.91	1910.91	1912.56	0.004315	12.10	1100.04	351.56	0.79
Apache Wash	Reach 1	6.5		7187.00	1899.00	1905.89	1905.89	1907.31	0.005923	10.45	993.65	377.25	0.86
Apache Wash	Reach 1	6.43		7187.00	1896.50	1902.34	1902.34	1903.70	0.006965	10.93	1033.51	376.26	0.93
Apache Wash	Reach 1	6.32		7187.00	1890.00	1899.21	1899.21	1900.70	0.003623	11.87	1269.46	432.54	0.73
Apache Wash	Reach 1	6.25		7187.00	1888.00	1894.51	1894.51	1895.65	0.005219	10.56	1290.90	516.59	0.82
Apache Wash	Reach 1	6.16		7187.00	1883.00	1889.76	1889.76	1891.14	0.006691	11.74	1088.13	369.82	0.92
Apache Wash	Reach 1	6.09		7187.00	1879.50	1884.61	1884.61	1885.85	0.005593	9.87	1113.13	488.59	0.83

Apache Wash	Reach 1	6.01	7213.00	1875.50	1881.41	1881.41	1882.71	0.007922	10.83	1026.33	389.32	0.97
Apache Wash	Reach 1	5.92	7213.00	1870.20	1875.78	1875.78	1877.11	0.012815	12.54	1027.85	451.60	1.20
Apache Wash	Reach 1	5.83	7213.00	1865.50	1871.75	1871.75	1873.01	0.006324	11.52	1170.40	424.29	0.91
Apache Wash	Reach 1	5.76	7213.00	1862.00	1867.81	1867.81	1869.09	0.005800	11.29	1203.10	444.44	0.87
Apache Wash	Reach 1	5.66	7213.00	1854.00	1861.85	1861.85	1864.30	0.012633	16.11	890.09	360.42	1.26
Apache Wash	Reach 1	5.64	7213.00	1855.00	1859.83	1858.61	1860.34	0.002265	6.26	1624.14	574.37	0.53
Apache Wash	Reach 1	5.57	7213.00	1850.00	1857.62	1857.62	1858.99	0.006513	12.22	1136.64	513.15	0.92
Apache Wash	Reach 1	5.48	7213.00	1846.00	1853.61	1853.61	1854.58	0.004352	10.41	1623.91	765.08	0.77
Apache Wash	Reach 1	5.38	7213.00	1841.00	1848.96	1848.96	1850.30	0.006856	14.05	1289.16	505.12	0.97
Apache Wash	Reach 1	5.31	7213.00	1838.00	1845.64	1845.64	1846.41	0.005634	10.53	1804.33	1037.49	0.84
Apache Wash	Reach 1	5.21	7213.00	1834.00	1840.59	1840.59	1841.54	0.006859	11.26	1464.41	684.41	0.93
Apache Wash	Reach 1	5.15	7213.00	1830.00	1837.53	1837.53	1838.53	0.006278	11.73	1403.70	563.01	0.90
Apache Wash	Reach 1	5.09	7213.00	1830.00	1834.23	1834.01	1834.69	0.007875	9.39	1747.82	966.81	0.93
Apache Wash	Reach 1	5.03	7213.00	1826.00	1831.22	1831.22	1831.92	0.010520	11.99	1575.12	943.92	1.09
Apache Wash	Reach 1	4.96	7213.00	1822.00	1828.04	1827.48	1828.40	0.004859	8.92	2051.33	956.47	0.76
Apache Wash	Reach 1	4.9	7213.00	1820.00	1824.15	1824.15	1825.86	0.022388	15.08	985.33	575.31	1.55
Apache Wash	Reach 1	4.82	7213.00	1818.00	1822.01	1822.01	1822.87	0.009197	9.62	1264.34	604.98	1.00
Apache Wash	Reach 1	4.78	7213.00	1813.00	1817.35	1816.86	1817.84	0.009123	9.16	1471.03	636.69	0.98
Apache Wash	Reach 1	4.74	7213.00	1810.00	1815.81	1815.81	1816.57	0.010914	10.90	1403.11	737.87	1.09
Apache Wash	Reach 1	4.65	7213.00	1806.00	1810.84	1810.84	1811.86	0.007896	10.27	1253.78	577.52	0.96
Apache Wash	Reach 1	4.6	7213.00	1802.00	1809.44	1805.99	1809.66	0.001479	6.18	2475.64	652.88	0.45
Apache Wash	Reach 1	4.58	7213.00	1801.30	1809.34	1808.01	1809.54	0.001173	6.30	2814.38	780.51	0.39
Apache Wash	Reach 1	4.575	Culvert									
Apache Wash	Reach 1	4.56	7213.00	1799.00	1808.00	1808.00	1808.48	0.000975	5.94	1600.04	325.01	0.38
Apache Wash	Reach 1	4.49	7213.00	1796.00	1803.43	1803.43	1805.29	0.005491	11.56	850.61	296.13	0.86
Apache Wash	Reach 1	4.4	7213.00	1792.30	1800.01	1800.01	1802.08	0.008573	15.21	913.89	270.54	1.08
Apache Wash	Reach 1	4.31	7213.00	1788.00	1797.30	1797.30	1798.69	0.004286	12.53	1308.96	421.72	0.79
Apache Wash	Reach 1	4.23	7213.00	1786.00	1792.54	1792.34	1793.68	0.007053	12.11	1207.21	426.60	0.95
Apache Wash	Reach 1	4.22	7213.00	1785.50	1791.36	1791.33	1792.51	0.009442	12.35	1154.16	454.98	1.06
Apache Wash	Reach 1	4.11	7213.00	1782.00	1788.79	1788.79	1790.36	0.006210	10.68	906.26	331.55	0.88
Apache Wash	Reach 1	4.05	7213.00	1779.00	1785.60	1785.60	1787.16	0.008205	13.81	1001.44	294.14	1.04
Apache Wash	Reach 1	3.96	7213.00	1774.00	1782.26	1782.26	1783.33	0.005502	9.00	1227.31	702.46	0.81
Apache Wash	Reach 1	3.86	7213.00	1770.00	1777.78	1777.78	1779.20	0.005794	11.77	1173.15	489.61	0.87
Apache Wash	Reach 1	3.78	7534.00	1766.00	1773.96	1773.96	1775.79	0.008485	12.85	991.31	366.90	1.03
Apache Wash	Reach 1	3.75	7534.00	1764.00	1773.35	1773.35	1774.21	0.002959	10.78	2120.50	989.79	0.66
Apache Wash	Reach 1	3.65	7534.00	1762.00	1769.27	1768.98	1770.34	0.004420	11.63	1517.92	588.62	0.79
Apache Wash	Reach 1	3.6	7534.00	1760.00	1768.14	1768.14	1769.16	0.004327	12.09	1742.45	787.66	0.78
Apache Wash	Reach 1	3.52	7534.00	1756.00	1765.61	1765.61	1766.59	0.003450	11.56	1978.77	898.76	0.71
Apache Wash	Reach 1	3.48	7534.00	1755.00	1763.64	1763.64	1764.54	0.004235	11.80	1949.45	928.74	0.77
Apache Wash	Reach 1	3.4	7534.00	1752.00	1760.02	1760.02	1760.95	0.004340	11.17	1913.45	979.67	0.78
Apache Wash	Reach 1	3.32	7534.00	1750.00	1756.31	1756.31	1757.12	0.005291	10.37	1751.69	1030.83	0.82
Apache Wash	Reach 1	3.21	7534.00	1746.00	1752.58	1752.58	1753.49	0.005199	10.64	1663.93	770.24	0.82
Apache Wash	Reach 1	3.13	7534.00	1742.00	1750.22	1750.22	1751.27	0.004685	11.43	1549.62	626.07	0.80
Apache Wash	Reach 1	3.07	7534.00	1741.00	1748.39	1748.39	1749.51	0.004820	11.75	1479.00	543.31	0.82
Apache Wash	Reach 2	2.97	13541.00	1736.00	1743.70	1742.21	1743.91	0.004214	3.78	3768.44	1489.94	0.41
Apache Wash	Reach 2	2.92	13541.00	1734.00	1742.67	1740.98	1742.87	0.003462	3.99	3988.92	1515.35	0.39
Apache Wash	Reach 2	2.90	13541.00	1734.00	1742.39	1740.15	1742.56	0.001252	3.83	4568.56	1194.36	0.32
Apache Wash	Reach 2	2.87	13541.00	1732.00	1742.18	1738.76	1742.36	0.000696	3.66	4483.61	934.73	0.26
Apache Wash	Reach 2	2.82	13541.00	1730.00	1741.99	1737.85	1742.17	0.000851	3.81	4291.33	689.76	0.25
Apache Wash	Reach 2	2.73	13541.00	1728.00	1738.21	1738.21	1740.79	0.005042	15.34	1547.54	319.29	0.89
Apache Wash	Reach 3	2.60	17136.00	1724.00	1734.78	1734.78	1736.58	0.003969	13.49	2609.93	675.77	0.78
Apache Wash	Reach 3	2.52	17136.00	1721.00	1733.06	1731.64	1734.17	0.002237	11.29	3088.17	555.56	0.60
Apache Wash	Reach 3	2.47	17136.00	1720.00	1731.17	1730.94	1733.29	0.004401	14.95	2169.77	401.22	0.84
Apache Wash	Reach 3	2.40	17136.00	1718.00	1729.86	1727.81	1731.85	0.002714	12.97	1952.50	243.06	0.68
Apache Wash	Reach 3	2.33	17136.00	1717.00	1726.91	1726.91	1730.35	0.006109	16.76	1469.92	230.46	0.98
Apache Wash	Reach 3	2.24	17136.00	1714.00	1723.28	1723.28	1725.84	0.005602	14.49	1789.96	374.19	0.92
Apache Wash	Reach 3	2.17	17136.00	1714.00	1720.86	1720.83	1722.62	0.006335	13.66	2323.50	615.31	0.95
Apache Wash	Reach 3	2.08	17136.00	1710.00	1717.34	1716.75	1718.92	0.011162	14.22	2291.01	761.81	1.17
Apache Wash	Reach 3	2.00	17136.00	1708.50	1714.59	1714.59	1715.98	0.006312	12.30	2659.44	844.32	0.92
Apache Wash	Reach 3	1.88	17136.00	1702.10	1711.60	1711.60	1713.29	0.004759	13.49	2593.66	694.09	0.85
Apache Wash	Reach 3	1.85	17136.00	1700.00	1711.04	1710.19	1712.23	0.002778	11.47	2975.43	615.46	0.66
Apache Wash	Reach 3	1.81	17136.00	1700.00	1710.49	1709.43	1711.73	0.002974	12.55	2850.71	517.29	0.70
Apache Wash	Reach 3	1.75	17136.00	1698.00	1708.35	1708.35	1710.64	0.004354	13.93	2096.15	487.76	0.82
Apache Wash	Reach 3	1.66	17136.00	1696.00	1705.38	1705.38	1707.67	0.005821	15.19	2048.51	464.73	0.94
Apache Wash	Reach 3	1.60	17136.00	1692.00	1704.16	1704.16	1706.14	0.004094	15.01	2565.81	588.27	0.82
Apache Wash	Reach 3	1.56	17136.00	1692.00	1703.30	1703.26	1705.19	0.004418	14.08	2455.72	582.99	0.82
Apache Wash	Reach 3	1.47	17136.00	1690.00	1701.18	1701.18	1703.24	0.003962	14.58	2503.78	598.52	0.80
Apache Wash	Reach 3	1.37	17136.00	1688.00	1696.83	1696.83	1698.85	0.005782	14.22	2183.45	523.13	0.92
Apache Wash	Reach 3	1.27	17136.00	1684.00	1693.34	1693.02	1695.33	0.004339	13.47	2281.87	547.87	0.82
Apache Wash	Reach 3	1.18	17136.00	1680.00	1691.90	1691.90	1693.52	0.002816	12.58	3148.65	976.71	0.68
Apache Wash	Reach 3	1.09	17136.00	1680.00	1688.01	1688.01	1688.97	0.004048	12.32	4155.90	1695.16	0.78
Apache Wash	Reach 3	0.99	17136.00	1678.00	1684.60	1683.35	1684.98	0.003175	9.47	5107.46	1865.80	0.66
Apache Wash	Reach 3	0.84	17136.00	1670.00	1677.86	1677.86	1680.71	0.009829	18.82	1900.30	535.40	1.20
Apache Wash	Reach 3	0.75	17136.00	1666.00	1676.85	1676.09	1677.76	0.002253	10.52	3892.72	1047.20	0.60
Apache Wash	Reach 3	0.71	17136.00	1664.00	1675.26	1675.26	1677.08	0.004051	14.80	2795.36	737.59	0.81
Apache Wash	Reach 3	0.63	17136.00	1664.00	1672.59	1672.59	1674.03	0.004837	13.42	3013.08	941.56	0.85
Apache Wash	Reach 3	0.54	17136.00	1660.00	1668.91	1668.91	1670.56	0.005470	14.76	2816.89	838.47	0.90
Apache Wash	Reach 3	0.43	17136.00	1655.00	1664.33	1664.19	1666.00	0.005559	13.18	2427.73	676.46	0.89
Apache Wash	Reach 3	0.33	17136.00	1652.20	1661.48	1661.41	1663.48	0.004817	12.75	2111.28	625.54	0.84
Apache Wash	Reach 3	0.20	17136.00	1646.00	1659.14	1659.14	1661.07	0.003266	13.76	2816.80	795.43	0.73
Desert Hills Was	Reach 1	0.99	10259.00	1748.00	1757.52	1756.55	1757.88	0.002887	9.46	3043.34	1008.71	0.59
Desert Hills Was	Reach 1	0.90	10259.00	1748.00	1755.53	1754.92	1756.15	0.004802	12.37	2376.58	817.28	0.82
Desert Hills Was	Reach 1	0.81	10259.00	1746.00	1753.38	1752.69	1753.90	0.004312	10.43	2531.74	890.11	0.73
Desert Hills Was	Reach 1	0.72	10259.00	1744.00	1750.96	1750.64	1751.63	0.006148	12.21	2308.48	956.23	0.88
Desert Hills Was	Reach 1	0.64	10259.00	1742.00	1749.36	1748.77	1749.89	0.004144	10.36	2655.61	1009.10	0.74
Desert Hills Was	Reach 1	0.56	10259.00	1740.00	1748.16	1747.24	1748.57	0.003019	9.66	3087.64	1128.06	0.64
Desert Hills Was	Reach 1	0.48	10259.00	1740.00	1747.25	1745.89	1747.54	0.002195	8.30	3265.26	992.24	0.56
Desert Hills Was	Reach 1	0.40	10259.00	1738.00	1745.91	1745.08	1746.49	0.003466	9.70	2581.16	877.76	0.69
Desert Hills Was	Reach 1	0.386	10259.00	1738.00	1745.12	1743.82	1745.62	0.003538	10.40	2746.80	950.75	0.70

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Ex100-WMP

River: Desert Hills Was Reach: Reach 1 RS: 0.99 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.90 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.81 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.72 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.64 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.56 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.48 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.386 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 8.02 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.98 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.89 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.84 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.74 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.65 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.55 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.46 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.36 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.28 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 7.17 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.08 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.98 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.9 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.8 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.71 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.63 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.58 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.5 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.43 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Apache Wash Reach: Reach 1 RS: 6.32 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 6.25 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 6.16 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 6.09 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 6.01 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 5.92 Profile: 100-year

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

Warning:Divided flow computed for this cross-section.

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

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

River: Apache Wash Reach: Reach 1 RS: 5.83 Profile: 100-year

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

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

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

Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1 RS: 5.76 Profile: 100-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

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

River: Apache Wash Reach: Reach 1 RS: 5.66 Profile: 100-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

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

River: Apache Wash Reach: Reach 1 RS: 5.64 Profile: 100-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 1 RS: 5.57 Profile: 100-year

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

Warning:Divided flow computed for this cross-section.

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

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

iver: Apache Wash Reach: Reach 1 RS: 5.48 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 5.38 Profile: 100-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 1 RS: 5.31 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 5.21 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 5.15 Profile: 100-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 1 RS: 5.09 Profile: 100-year

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

Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1 RS: 5.03 Profile: 100-year

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

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

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

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

River: Apache Wash Reach: Reach 1 RS: 4.96 Profile: 100-year

Warning:The cross-section end points had to be extended vertically for the computed water surface.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 1 RS: 4.9 Profile: 100-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

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

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: Apache Wash Reach: Reach 1 RS: 4.82 Profile: 100-year

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

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

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

Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1 RS: 4.78 Profile: 100-year

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

River: Apache Wash Reach: Reach 1 RS: 4.74 Profile: 100-year

Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water

surface that had the least amount of error between computed and assumed values.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.65 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.6 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Apache Wash Reach: Reach 1 RS: 4.58 Profile: 100-year
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.56 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Apache Wash Reach: Reach 1 RS: 4.49 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.4 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.31 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.23 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 4.22 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 4.11 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.05 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.96 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.86 Profile: 100-year

Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.78 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.75 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.65 Profile: 100-year
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.
River: Apache Wash Reach: Reach 1 RS: 3.6 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.52 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.48 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.4 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.32 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.21 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.13 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.07 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 2 RS: 2.97 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.92 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.90 Profile: 100-year
Warning:Divided flow computed for this cross-section.
River: Apache Wash Reach: Reach 2 RS: 2.82 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.73 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.60 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.52 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.47 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.40 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.33 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.24 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.17 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.08 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.00 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.88 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.81 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.75 Profile: 100-year

Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.66 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.60 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.56 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.47 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.37 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.27 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.18 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.09 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.99 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.84 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.75 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.71 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.63 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Apache Wash Reach: Reach 3 RS: 0.54 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 3 RS: 0.43 Profile: 100-year

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

River: Apache Wash Reach: Reach 3 RS: 0.33 Profile: 100-year

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

River: Apache Wash Reach: Reach 3 RS: 0.20 Profile: 100-year

Warning:Slope too steep for slope area to converge during supercritical flow calculations (normal depth is below critical depth). Water surface set to critical depth.

River: Paradise Wash Reach: Reach 1 RS: 2.23 Profile: 100-year

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

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 2.14 Profile: 100-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 2.07 Profile: 100-year

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

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 2.00 Profile: 100-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 1.92 Profile: 100-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 1.83 Profile: 100-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 1.75 Profile: 100-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 1.65 Profile: 100-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 1.54 Profile: 100-year

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

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

River: Paradise Wash Reach: Reach 1 RS: 1.46 Profile: 100-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.37 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.27 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.21 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.12 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.04 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.95 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.89 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.80 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.72 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.62 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.53 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.44 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.34 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.28 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.17 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.13 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.04 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

APPENDIX F.6

Apache Wash: 10-year
Existing Conditions

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Apache Wash WMP
Project File : Apache1.prj
Run Date and Time: 8/23/99 1:17:34 PM

Project in English units

Project Description:
Upper Cave Creek and Apache Wash Watercourse Master Plan

For Apache Wash
above Cave Buttes Dam
by Stantec Consulting Inc. for the Flood Control
District of Maricopa County
FCD:

March 1999

PLAN DATA

Plan Title: Existing Condition 10-year
Plan File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.p07

Geometry Title: Revised Geometry 10-year
Geometry File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.g01

Flow Title : Existing Condition 10-year
Flow File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.f03

Plan Summary Information:
Number of: Cross Sections = 146 Mulitple Openings = 0
Culverts = 1 Inline Weirs = 0
Bridges = 0

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

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Existing Condition 10-year
Flow File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.f03

Flow Data (cfs)

River	Reach	RS	10-year
Desert Hills Was	Reach 1	0.99	1990
Apache Wash	Reach 1	8.02	1130
Apache Wash	Reach 1	6.01	1210
Apache Wash	Reach 1	3.78	1370
Apache Wash	Reach 2	2.73	2710
Apache Wash	Reach 3	2.60	3280
Paradise Wash	Reach 1	2.23	1010
Paradise Wash	Reach 1	1.54	1150

Boundary Conditions

River	Reach	Profile	Upstream	Downstream

GEOMETRY DATA

Geometry Title: Revised Geometry 10-year
Geometry File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Desert Hills Was	Reach 1		DH & A Wash
Apache Wash	Reach 1		DH & A Wash
Apache Wash	Reach 2	DH & A Wash	P & A Wash
Apache Wash	Reach 3	P & A Wash	
Paradise Wash	Reach 1		P & A Wash

JUNCTION INFORMATION

Name: DH & A Wash
Description: Confluence of Desert Hills Wash with Apache Wash
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Apache Wash	Reach 1	to Apache Wash	Reach 2	430	
Desert Hills Was	Reach 1	to Apache Wash	Reach 2	470	

Name: P & A Wash
Description: Confluence of Paradise Wash with Apache Wash
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Apache Wash	Reach 2	to Apache Wash	Reach 3	360	
Paradise Wash	Reach 1	to Apache Wash	Reach 3	205	

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.99

INPUT
Description: 0.99
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9333.68	1762	9403.72	1760	9486.25	1758	9487.32	1758	9640.92	1756
9732.38	1754	9737.95	1754	9814.01	1754	9988.19	1752	9989.38	1750
9990.31	1750	9991.34	1752	9992.23	1752	9994.34	1750	9996.33	1748
10004.96	174810008.87		175010012.73		175210163.12		175410423.96		1756
10451.19	175610470.06		175610553.26		175810641.18		1760		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9333.68	.055	9988.19	.03	10012.73	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.19	10012.73	490	470	440	.1	.3

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.90

INPUT
Description: 0.9
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9300	1760	9357.07	1760	9449.84	1760	9643.57	1760	9698.3	1758
9729.54	1756	9766.39	1754	9766.58	1754	9831.51	1752	9950.49	1751
9996.49	175010000.96		174810013.62		174810013.64		174810017.63		1750
10021.66	175210021.74		175210038.07		175210038.12		175210235.65		1752
10411.03	175410599.65		1756	10800	1758				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9300	.055	9996.49	.03	10017.63	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9996.49	10017.63	500	491	480	.1	.3

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.81

INPUT
Description: 0.81
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9680	1755.3	9730	1754	9779.07	1752	9805.44	1752	9883.96	1750
9884.14	1750	9983.58	1750	9983.71	1750	9988.29	1750	9989.3	1748
9990.31	1746	9990.32	1746	10011.7	174610014.89		174810014.94		1748
10017.9	175010018.03		175010035.47		175010035.57		1750	10105	1748.5
10270	1750	10535	1752	10680	1754	10740	1756		

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
    9680    .055 9983.58     .0310018.03    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.5810018.03               550     492     400            .1       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.72

INPUT
Description: 0.72
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9365    1756    9470    1754    9625    1752    9800    1750 9986.71    1748
 9986.75    1748 9991.03    1746 9991.08    1746 9995.08    1744 9995.12    1744
10010.29    174410013.39    1746 10016.5    174810081.37    1748   10315  1746.2
   10380    1748   10510    1750   10610    1750   10740    1752   10800    1754
   10835    1756

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9365    .055 9986.71     .03 10016.5    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.71 10016.5               340     373     325             .3       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.64

INPUT
Description: 0.64
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9420    1750    9590    1748    9825    1746 9977.76    1746 9993.02    1742
10006.33    1742 10006.4    174210018.06    1746   10305    1746   10517    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9420    .055 9977.76     .0310018.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.7610018.06               270     450     450             .3       .5

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.56

INPUT
Description: 0.56  -- First XS within WMP Study Limit
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8940    1750    9000    1749    9200    1748    9475    1746    9600    1744
    9615    1744    9730    1745 9986.89    1744 9998.14    174010012.68    1740
10012.77    174010019.47    174410081.48    174410085.66    174410292.39    1748
   10350    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8940    .055 9986.89     .0310019.47    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.8910019.47               320     436     450             .3       .5

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.48

INPUT
Description: 0.48
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8900  1750.2    9100    1750    9415    1748    9560    1746 9979.98    1742
 9985.27    174010007.03    174010013.02    1742   10335    1744   10440    1746
   10475    1748   10500    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8900    .055 9979.98     .0310013.02    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.9810013.02               410     380     340             .3       .5

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.40

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9000    1748    9100    1748 9402.16    1746 9610.77    1744 9720.22    1742
 9949.58    1742 9966.56    1742 9976.95    1740 9988.11    1738 9999.42    1738
10008.13    174010016.94    174210021.82    174210103.85    174210240.84    1744
10290.98    174610292.67    174610324.41    174810327.05    174810352.56    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9000    .055 9966.56     .0310021.82    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.5610021.82              180     260     320            .3       .5

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.386

INPUT
Description:
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9162    1748    9382    1746    9604    1744    9712    1742    9982    1740
    9988    1738   10012    1738   10014    1740   10212    1742   10235    1744
   10262    1742   10330    1744   10509    1746

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9162    .055    9982     .03   10014    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9982   10014             405     400     380            .3       .5

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.31

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9469  1743.5    9707    1742    9873    1740    9919  1738.5    9977    1740
    9981    1738    9985    1736   10015    1736   10019    1738   10025    1740
   10082    1740   10129    1739   10199    1740   10253    1740   10509    1742
   10639    1744   10757    1746

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9469    .055    9977     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9977   10025             280     280     280            .1       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.22

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9600  1741.5    9855    1740    9980    1738    9986    1736    9992    1734
   10008    1734   10028    1736   10039    1738   10103    1738   10114    1740
   10129    1742   10150    1742   10156    1740   10160    1738   10194    1738
   10450    1740   10630    1742   10820    1742   10925    1744   11045    1746

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9600    .055    9980     .03   10039    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   10039             130     145     180            .1       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.19

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9818  1740.5    9863    1740    9978    1738    9984    1736    9990    1734
   10018    1734   10028    1736   10146    1738   10158    1740   10171    1742
   10179    1744   10190    1746   10207    1746   10213    1744   10221    1742
   10235    1740   10248    1738   10548    1738   10638    1740   10693    1742
   10753    1744

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9818    .055    9978     .03   10028    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10028             240     300     380            .1       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.09

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9803  1738.5    9895    1738    9963    1736    9973    1734    9981    1732
   10018    1732   10024    1734   10031    1736   10091    1736   10121    1734
   10131    1732   10143    1732   10156    1734   10189    1736   10264    1738
   10331    1740   10370    1742   10402    1744

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9803    .055    9963     .03   10031    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9963   10031              250     250     280              .1       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.04

INPUT
Description:
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9869    1736    9939    1736    9977    1734    9983    1732    9989    1730
   10011    1730   10017    1732   10023    1734   10053    1736   10069    1738
   10084    1740   10099    1742   10116    1744

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9869    .055    9977     .03   10023    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9977   10023                0       0       0              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 8.02

INPUT
Description: 8.02

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9610    1996    9700    1992    9765  1991.9    9862    1990    9894    1988
    9897    1988    9951  1989.2    9977    1988    9989    1986   10000  1985.1
   10020    1986   10037    1988   10077    1990   10109    1992   10116    1994
   10125    1996

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9610    .055    9977     .03   10037    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9977   10037              215     235     245              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.98

INPUT
Description: 7.98

Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9500    1992    9570    1990    9630    1988    9740    1986    9773    1986
    9859    1986    9898  1986.4    9927    1986    9950    1986    9975    1986
    9982    1984    9991    1982   10000  1981.8   10005    1982   10017    1984
   10039    1986   10075    1988   10097  1988.2   10116    1990   10127    1992

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9500    .055    9975     .03   10039    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10039              280     465     520              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.89

INPUT
Description: 7.89

Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9756    1986    9764    1984    9845    1984    9878    1984    9978    1982
    9983    1982    9987    1980    9992    1978   10000    1977   10020    1978
   10054    1980   10082    1980   10149  1981.8   10170    1982   10189    1982
   10219    1982   10224    1984   10256  1985.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9756    .055    9983     .03   10054    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9983   10054              300     300     220              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.84

INPUT
Description: 7.84

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9793    1984    9828    1982    9841    1980    9908    1978    9916    1976
    9918    1976    9941    1976    9975    1976    9984    1976   10000  1974.4
   10025    1976   10036    1978   10073    1978   10206    1980   10222    1982
   10267    1983
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9793    .055    9984     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9984   10025               575     500     425             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.74

INPUT
Description: 7.74

Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9733    1978    9744    1976    9754    1974    9765    1972    9800    1972
    9836  1972.3    9888    1972    9915    1972    9968  1972.4    9981    1972
 9983.74 1970.96    9987    1970   10000  1969.1   10010   197010035.24    1971
   10062    1972   10086  1972.3   10097    1972   10123    1972   10127    1974
   10133    1976   10138    1978

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9733    .055 9983.74    .0310035.24    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.7410035.24              425     500     475             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.65

INPUT
Description: 7.65 -- Approximate Study Limit
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9787    1970    9805    1966    9882  1965.5    9917    1964 9977.37    1964
 9986.15    1962   10000  1961.810010.39   196210016.47   196410022.56    1966
10109.69   196810128.52    1970   10165    1971

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9787    .055 9977.37    .0310022.56    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.3710022.56              520     500     470             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.55

INPUT
Description: 7.55

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9877.72    1966 9895.81    1966 9913.89    1964 9929.39    1962 9970.07    1960
 9981.49    1958   10000  1956.710024.51   195810028.16   196010145.16    1960
10158.57   196210173.56    1964 10182.6   196610293.44    1968

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9877.72    .055 9970.07    .0310028.16    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.0710028.16              510     500     480             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.46

INPUT
Description: 7.46

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9830.45    1960 9861.07    1958 9923.22    1956 9969.47    1954 9976.86    1952
    9990  1951.5 10000.7   195210032.17   195210051.31   195310081.59    1954
 10119.3   195610130.99    1958 10142.8    1960

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9830.45    .055 9969.47    .0310051.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.4710051.31              490     500     510             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.36

INPUT
Description: 7.36

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9725    1954    9740    1952    9800    1950 9835.52    1950 9949.32    1948
 9977.98    1946    9998  1944.510011.65   194610023.48   194810033.89    1950
10040.39   195210046.86    1954
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Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9725    .055 9949.32     .0310023.48    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.3210023.48               420     446     470              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 7.28

INPUT
Description: 7.28

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9710    1950    9760    1944    9800    1942 9836.63    1942 9849.74  1941.8
 9874.17  1941.8 9924.41    1942 9988.71    1942    9998  1940.810010.16    1942
10021.65    194410030.54    1946 10038.9    1948 10047.2    1950

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9710    .055 9988.71     .0310010.16    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.7110010.16               475     554     410              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 7.17

INPUT
Description: 7.17

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9950.59    1944 9955.33    1942 9960.08    1940 9967.15    1938 9978.76    1936
  9991.7    1934   10000  1934.310014.37    193410024.18    1936   10034    1938
10043.85    194010082.22    194210098.58    1944

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9950.59    .055 9978.76     .0310024.18    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.7610024.18               500     500     520              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 7.08

INPUT
Description: 7.08

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9917.61    1940 9925.72    1938 9934.65    1936 9943.58    1934 9953.07    1932
 9965.94    1930    9987    192910007.17    193010021.87    193210036.31    1934
 10051.7    1936 10067.1    1938 10082.5    1940

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9917.61    .055 9953.07     .0310021.87    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9953.0710021.87               485     500     500              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.98

INPUT
Description: 6.98

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9723.34    1934    9740    1932    9900    1932    9935    1932 9944.17    1930
 9975.97    1928  9985.4    1926 9994.24    192410004.06    192410020.09    1926
10031.62    192810071.11    193010085.11    193210100.97    1934

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9723.34    .055 9975.97     .0310031.62    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.9710031.62               400     437     470              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.9

INPUT
Description: 6.9

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9598.79    1930    9625    1926    9705    1926    9770    1928    9800    1928
 9822.48    1928 9857.37    1926 9954.17    1924 9987.42    192210000.76    1920
10011.02    192010014.22    192210017.39    192410020.56    192610023.72    1928
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10026.89    1930

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9598.79    .055 9954.17     .0310017.39    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.1710017.39              490     529     560            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.8

INPUT
Description: 6.8

Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9660    1924    9705    1920    9725    1919    9755    1920    9800    1920
 9880.75    1920 9901.03    1920 9976.63    1918 9976.81    1918 9982.58    1916
 9982.91    1916  9988.6    1914 9988.73    191410004.27    191410004.41    1914
10010.43    191610010.46    1916 10016.4    191810016.52    191810022.44    1920
10022.57    192010028.44    1922   10040  1923.7

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9660    .055 9976.63     .0310016.52    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.6310016.52              500     495     400            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.71

INPUT
Description: 6.71 -- Approximate Joy Ranch Road Alignment
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9970    1918 9977.71 1914.04 9981.63 1912.03    9990    1908   10000  1907.5
   10010    1908   10025    1912   10045    1914   10090    1916   10225    1918

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9970    .055 9981.63     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.63   10025              425     390     350            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.63

INPUT
Description: 6.63
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9976.91    1916 9982.13    1914 9983.41    1912 9984.66    1910 9985.91    1908
 9987.08    1906    9995    1905   10005    190510015.13    190610021.82    1908
10050.15    191010131.79    191210273.67    191410318.49    1916

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9976.91    .055 9985.91     .0310021.82    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.9110021.82              300     290     290            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.58

INPUT
Description: 6.58
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9897.27    1912 9926.14    1910 9950.13    1908  9965.1    1906 9980.22    1904
 9998.11    190210006.79    190210014.85    190410022.84    190610088.23    1908
10249.56    191010282.55    1912

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9897.27    .055  9965.1     .0310022.84    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9965.110022.84              430     430     430            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.5

INPUT
Description: 6.5
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9636.39    1910 9702.53    1908 9718.78    1906 9747.02    1904  9794.4    1904
 9947.45    1904 9967.32    1902 9987.47    1900    9995    1899   10010    1899
10019.82    190010042.69    190210071.54    190410099.13    1906 10152.4    1908
   10187    1910
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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9636.39    .055 9947.45     .0310071.54    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9947.4510071.54               310     345     355             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.43

INPUT
Description: 6.43

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9655    1906    9665    1904    9680    1902    9690    1900    9925    1900
    9970    1898    9990  1896.5   10010  1896.5   10020    1898   10030    1900
   10040    1902   10120    1904   10285    1906

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9655    .055    9925     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9925   10030               475     450     360             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.32

INPUT
Description: 6.32
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9951.16    1900  9957.9    1898 9964.52    1896 9970.99    1894 9977.55    1892
 9984.06    189010006.52    189010013.72    189210020.18    189410100.18    1896
10266.52    189810293.42    189810347.28    189810412.02    1900

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9951.16    .055 9970.99     .0310020.18    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.9910020.18               410     390     350             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.25

INPUT
Description: 6.25
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9911.34    1898 9931.58    1896 9947.24    1894 9961.84    1892 9976.08    1890
    9990    1888   10015    1888 10030.1    189010045.42    189210069.44    1892
10268.14    189210454.21    189410476.27    189610569.33    1898

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9911.34    .055 9961.84     .0310045.42    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9961.8410045.42               490     460     430             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.16

INPUT
Description: 6.16
Station Elevation Data     num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9875  1892.5 9961.21    1892  9972.1    1890 9977.65    1888  9983.3    1886
 9989.16    1884 9996.77    1883 9997.18    188310022.78    188410039.58    1886
10050.58    188810110.58    188810208.91    188610225.08    188610318.94    1888
10345.72    1890 10414.9    189210424.02    189210428.81    189210468.67 1893.08

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9875    .055 9977.65     .0310050.58    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.6510050.58               270     360     450             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.09

INPUT
Description: 6.09 -- Old New River Road
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9815    1886    9890    1884    9935    1882    9970    1880   10010  1879.5
   10050    1880   10070    1882   10345    1884   10380    1886   10520    1888

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9815    .055    9935     .03   10070    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9935   10070              470     445     435             .1       .3

 ROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.01

INPUT
Description: 6.01

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9750    1883    9870    1882    9920    1880    9955    1878    9980    1876
   10000  1875.5   10010    1876   10020    1878   10035    1880   10075    1880
   10160    1878   10175    1877   10190    1878   10260    1880   10280    1882
   10400    1884   10580    1886

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9750    .055    9920     .03   10035    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9920   10035              485     490     510             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 5.92

INPUT
Description: 5.92
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9720    1877 9854.04    1876 9948.34    1874 9975.43    1872   10000  1870.2
10006.77    187210015.55    187410024.34    187610034.96    187610094.25    1874
10130.93    1872 10149.3    187010150.59    187010177.58    187210238.14    1874
10251.91    187410318.15    187410335.66    187610350.37    1878

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9720    .055 9948.34     .0310024.34    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.3410024.34              375     400     375             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 5.83

INPUT
Description: 5.83

 tation Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9500    1874    9550    1872    9650    1872    9710    1872    9735    1870
    9890    1870    9960    1868    9990    1866   10000  1865.5   10005    1866
   10030    1868   10105    1868   10120    1870   10140    1872   10155    1874
   10250    1875

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9500    .055    9960     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9960   10030              375     380     380             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 5.76

INPUT
Description: 5.76
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9640    1870 9674.85    1868 9704.99    1866 9712.43    1864 9741.92    1866
    9835    1866    9865    1866 9968.58    1864 9985.72    186210014.25    1862
10043.06    186410096.64    1866 10124.8    186810142.86    187010144.93    1870

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9640    .055 9968.58     .0310043.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.5810043.06              470     540     570             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 5.66

INPUT
Description: 5.66
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9504.86    1864 9505.03    1864  9622.9    1862 9622.94    1862 9802.24    1862
 9802.28    1862 9805.57    1862 9805.58    1862 9814.49    1860 9838.73    1858
 9838.74    1858 9839.05    1858 9857.77    1860 9980.02    1860 9995.33    1854
 10003.7    185410014.57    1858   10030    1859 10136.3    186010136.31    1860
10169.16    1862   10210  1862.5   10615    1863

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
 9504.86    .055 9980.02     .03   10030    .055

 ank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.02   10030              460     440     320             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.64

INPUT
Description: 5.64 -- Cloud Road
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9650    1862    9775    1860    9870    1858    9955    185610037.94    1855
   10170    1856   10275    1858   10365    1860   10575  1862.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9650    .055    9955     .03   10170    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9955   10170              370     345     320             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.57

INPUT
Description: 5.57

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400    1859    9520    1858    9700    1856    9731    1858    9800    1858
    9812    1856    9824    1854    9977    1854    9985    1852    9993    1850
   10005    1850   10014    1852   10024    1854   10035    1856   10170    1858
   10299    1860

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .055    9977     .03   10035    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9977   10035              400     450     450             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.48

INPUT
Description: 5.48
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9300    1855    9440    1854    9750    1854    9790    1852    9895    1852
 9929.89    1850 9978.41    185010000.42    1846 10004.4    184610044.06    1850
10141.09    185210147.22    185210418.73    185210547.75    185410626.53    1856

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9300    .055 9978.41     .0310044.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110044.06              530     500     500             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.38

INPUT
Description: 5.38

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9815    1850    9880    1848    9900    1846    9910    1844    9985    1844
   10000    1841   10015    1844   10030    1846   10110    1846   10255    1848
   10460    1850

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9815    .055    9985     .03   10015    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9985   10015              350     375     425             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.31

INPUT
Description: 5.31
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9325    1847 9444.34    1846 9557.15    1844 9887.76    1844 9911.33    1840
 9919.33    1840 9919.34    1840 9933.33    1842 9933.43    1842 9988.23    1842
 9988.24    1842 9997.67    183810005.97    1838 10024.7    184210044.49    1844
 10044.5    184410061.08    184410218.05    1844   10565    1846

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9325    .055 9988.23     .0310044.49    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.2310044.49              500     500     480            .1        .3

 ROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.21

INPUT
Description: 5.21

Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1842    9780    1840    9860    1838    9885    1836    9890    1836
    9915    1838    9970    1838    9985    1836   10000    1834   10015    1836
   10030    1838   10085    1838   10110    1837   10120    1838   10135    1840
   10150    1840   10245    1838   10310    1838   10355    1840   10400    1840
   10525    1842

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9970     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10030              330     310     300            .1        .3
Right Levee     Station=   10135      Elevation=    1840

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.15

INPUT
Description: 5.15

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9870    1839    9945    1838    9978    1836    9988    1834   10000    1830
   10010    1830   10025    1834   10130    1834   10170    1836   10200    1836
   10320    1835   10495    1836   10522    1838   10780    1840

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9870    .055    9978     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10025              350     352     355            .3        .5
Right Levee     Station=   10170      Elevation=    1836

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.09

 NPUT
Description: 5.09

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9480    1835    9515    1834    9550    1832    9970    1832    9985    1830
   10000    1831   10025    1832   10075    1834   10120    1830   10145    1832
   10255    1832   10320    1834   10435    1834   10780    1836

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9480    .055    9970     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10025              300     300     310            .3        .5
Right Levee     Station=   10075      Elevation=    1834

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.03

INPUT
Description: 5.03
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9515    1833 9590.59    1832 9640.88    1830 9975.12    1830 9992.06    1826
10001.75    182610012.26    1830 10053.1    183010133.33    183010188.37    1828
10281.59    1828   10620    1832   10750  1832.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9515    .055 9975.12     .0310012.26    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.1210012.26              345     365     340            .1        .3
Right Levee     Station=10133.33      Elevation=    1830

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.96

INPUT
Description: 4.96
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9716.18    1828 9717.02    1828 9800.79    1826 9974.19    1826 9995.82    1822
 10000.05   182210011.03   182610011.04   182610156.72   182610156.73    1826
   10310    182410344.97   182410425.12   182610592.76   182710594.98    1827
   10670    1828   10790    1830
```

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9716.18    .055 9974.19     .0310011.03    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9974.1910011.03              400     320     200            .1        .3
Right Levee     Station=10156.63      Elevation=    1826

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.9

INPUT
Description: 4.9
Station Elevation Data     num=       14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9730    1826    9825    1824    9940    1824  9961.4  182210007.63    1822
   10018    1824   10030    1824   10155    1822   10290    1822   10310    1822
   10330    1822   10405    1824   10560    1826   10750    1828

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9730    .055    9940     .03   10018    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9940   10018              220     200     160            .1        .3
Left Levee      Station=    9940      Elevation=    1824
Right Levee     Station=   10018      Elevation=    1824

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.82

INPUT
Description: 4.82
Station Elevation Data     num=       28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9480    1826 9740.85    1824 9830.85    1822 9875.16    1820 9888.17    1818
 9903.71    1818 9930.33    1820 9930.34    1820 9974.99    1820    9975    1820
 9990.22    181810005.12    181810009.43    1820 10013.6    182210024.29    1822
10070.59    1820   10100    181810126.15    182010181.41    182010189.94    1818
   10200  1817.110207.92    181810217.21    182010264.85    1820   10280    1818
   10315    1820   10435    1822   10565    1824

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9480    .055    9975     .0310009.43    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           997510009.43              480     480     480            .3        .5
Left Levee      Station=    9975      Elevation=    1820
Right Levee     Station= 10013.6      Elevation=    1822

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.78

INPUT
Description: 4.78
Station Elevation Data     num=       17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9743.69    1820 9905.26    1818 9905.48    1818 9964.87    1818 9964.88    1818
 9983.35    1816 9995.72    181310010.03    181310021.41    181610211.72    1816
10230.89    181610317.17    181410376.07    1813 10488.8    1814 10508.5    1814
   10540    1816   10640    1818

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9743.69    .055 9964.87     .0310021.41    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.8710021.41              300     200     100            .1        .3
Right Levee     Station=10211.72      Elevation=    1816

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.74

INPUT
Description: 4.74
Station Elevation Data     num=       22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9500.14    1818 9960.29    1816 9979.29    1814 9986.69    1812    9994    1810
 9994.01    1810 9999.53    1810 9999.55    181010010.02    181210029.03    1814
10029.36    181410136.55    1814   10140    1813   10160    1814   10380    1814
   10400    1811   10425    1814   10440    1814   10485    1813   10530    1814
   10590    1815   10700    1815

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9500.14    .055 9960.29     .0310029.03    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9960.2910029.03              400     500     500            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.65
```

```
INPUT
Description: 4.65

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400  1815.5    9600    1814 9830.73    1810 9982.47    1808 9997.03    1806
10002.86    180610014.29    180810049.57    180810059.42    180610060.51    1806
10093.98    180810250.89    1808   10270    1810   10360    1810

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .055 9982.47     .0310093.98    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.4710093.98               260     280     260             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.6

INPUT
Description: 4.6

Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9675    1812 9812.65    1810 9836.34    1810 9875.78    1808 9883.17    1808
 9966.89    1806  9971.4    1806  9987.4    1802 9998.69    1802 9998.98    1802
10015.98    180610022.46    1806   10123    180610130.11    180410281.42    1804
10322.77    180610440.24    180610500.19    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9675    .055  9971.4     .0310015.98    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.410015.98                83      83      83             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.58

INPUT
Description: Geometry data points 6 and 7 are adjusted to account for the 3
             barrel 10' x 5' cbc.  The stationing for both points is increased
             by 5'.  The right bank and ineffective flow areas are adjusted
             accordingly.  The elevations of points 5 and 6 are changed from
             1802 to 1801.3 to match the surveyed invert of the box culvert
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1810    9790    1808    9945    1806    9983    1804    9984  1801.3
   10015  1801.3   10016    1804   10250    1804   10320    1806   10500    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9983     .03   10016    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9983   10016               180     180     170             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9685    9983    1808   10016   10500    1808

CULVERT                 RIVER: Apache Wash
REACH: Reach 1             RS: 4.575

INPUT
Description: Culvert #1 (3 10' x 5' Boxes)

Distance from Upstream XS =       5
Deck/Roadway Width        =   114.1
Weir Coefficient          =     3.1
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9685    1810    1800    9790    1808    1800    9945    1808    1800
    9983    1808    1800    9983    1808    1800    9984    1808    1800
   10010    1808    1800   10011    1808    1800   10011    1808    1800
   10250    1807    1800   10320    1807    1800   10500    1808    1800

Upstream Bridge Cross Section Data
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1810    9790    1808    9945    1806    9983    1804    9984  1801.3
   10015  1801.3   10016    1804   10250    1804   10320    1806   10500    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9983     .03   10015    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
           9983   10016             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9685    9983    1808   10016   10500    1808

Downstream  Deck/Roadway Coordinates
```

```
     num=       13
      Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     9685    1808    1798    9790    1808    1798    9945    1808    1798
     9980    1808    1798    9980    1808    1798    9983    1808    1798
     9984    1808    1798   10010    1808    1798   10011    1808    1798
    10011    1808    1798   10250    1807    1798   10320    1807    1798
    10500    1808    1798

 Downstream Bridge Cross Section Data
 Station Elevation Data     num=       13
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     9550    1812    9730    1810    9915    1808    9945    1806    9960    1804
     9975    1802    9985    1800   10000    1799   10035    1800   10115    1802
    10150    1804   10215    1806   10240    1808

 Manning's n Values         num=        3
      Sta   n Val     Sta   n Val     Sta   n Val
     9550    .055    9975     .03   10115    .055

 Bank Sta: Left   Right    Coeff Contr.   Expan.
           9975   10115          .1        .3
 Ineffective Flow     num=        2
    Sta L   Sta R    Elev   Sta L   Sta R    Elev
     9550    9950    1808   10050   10240    1808

 Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
 Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow =     .95
 Elevation at which weir flow begins           =    1807
 Energy head used in spillway design           =
 Spillway height used in design                =
 Weir crest shape                              = Broad Crested

 Number of Culverts =  1

 Culvert Name      Shape      Rise    Span
 Box1                Box        5      10
 FHWA Chart # 8 - flared wingwalls
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                   0   114.1       .015                   .5                1
 Number of Barrels =  3
 Upstream   Elevation =  1801.3
 Centerline Stations
     Sta.    Sta.    Sta.
     9989  9999.5   10010
 Downstream Elevation =  1800.67
 Centerline Stations
     Sta.    Sta.    Sta.
   9989.5   10000 10010.5

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1            RS: 4.56

 INPUT
 Description: Geometry data point 8 is adjusted to account for the 3 barrel 10'
              x 5' cbc.  The culvert was extended and cross section 4.57 of the
              FIS was eliminated.  This cross section is the first downstream
              cross section of the culvert.  The elevation of data point 8 is
              adjusted from 1799 to 1800.  The right bank station is moved from
              station 10035 to 10150.
 Station Elevation Data     num=       13
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     9550    1812    9730    1810    9915    1808    9945    1806    9960    1804
     9975    1802    9985    1800   10000    1799   10035    1800   10115    1802
    10150    1804   10215    1806   10240    1808

 Manning's n Values         num=        3
      Sta   n Val     Sta   n Val     Sta   n Val
     9550    .055    9975     .03   10115    .055

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9975   10115             365     365     350              .1        .3
 Ineffective Flow     num=        2
    Sta L   Sta R    Elev   Sta L   Sta R    Elev
     9550    9950    1808   10050   10240    1808

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1            RS: 4.49

 INPUT
 Description: 4.49

 Station Elevation Data     num=       12
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9821.99    1806 9901.91    1804 9916.74    1802  9954.9    1800 9973.89    1798
  9983.53    1796 10011.1    179610018.97    179810053.62    180010105.02    1802
 10240.68    1804   10340  1804.5

 Manning's n Values         num=        3
      Sta   n Val     Sta   n Val     Sta   n Val
  9821.99    .055  9954.9     .0310053.62    .055

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

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        9954.910053.62                490     450     450              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.4

INPUT
Description: 4.4

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9925    1802    9940    1800    9970    1798    9990    1796    9995    1794
   10005  1792.3   10020    1794   10030    1796   10080    1796   10090  1794.3
   10110    1796   10175    1798   10210    1800   10270    1801

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9925    .055    9990     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9990   10030               475     510     490              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.31

INPUT
Description: 4.31

Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9706.51    1798  9770.7    1796 9896.31    1794 9980.54    1792  9986.9    1790
10005.88    178810009.89    178810014.81    179010019.75    179210055.21    1794
10110.95    179610150.57  1796.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9706.51    .055 9980.54     .0310019.75    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.5410019.75               410     420     410              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.23

INPUT
Description: 4.23

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9520.61    1796 9614.39    1794 9762.38    1790 9933.91    1788 9961.17    1790
 9980.16    1790 9985.61    1788 9991.04    178610007.85    178610015.65    1788
10030.19    179010081.29    179210132.36    1794

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9520.61    .055 9980.16     .0310030.19    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.1610030.19               140     150     150              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.22

INPUT
Description: 4.22
Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9435    1796    9530    1794    9595    1792    9650    1790    9780    1788
    9885    1788    9975    1790    9990    1786 9999.81  1785.5   10010    1786
   10030    1790   10085    1792   10135  1792.4

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9435    .055    9975     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10030               280     280     260              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.11

INPUT
Description: 4.11

Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9954.62    1792 9972.66    1790 9978.48    1786 9982.42    1784 9988.23    1782
10014.08    1782 10019.7    1784 10107.8    1786 10273.4    178810355.58    1790
10489.42    1790

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9954.62    .055 9978.48     .03 10107.8    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.48 10107.8               240     250     300              .1       .3
```

```
CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.05

INPUT
Description: 4.05

Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9960    1788 9981.93    1782    9990    1780   10000    1779   10015    1780
   10025    1782   10200    1782   10270    1786   10320  1786.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9960    .055 9981.93     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.93   10025               400     500     285             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.96

INPUT
Description: 3.96

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9852.78    1784 9882.85    1782 9912.96    1780 9952.91    1778 9978.94    1776
 9989.34    177410006.21    177410028.53    178010057.49    178210179.95    1782
10409.79    178010418.05    1778 10422.6    177810433.36    178010548.23    1782
10801.62    1784

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9852.78    .055 9882.85     .0310057.49    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9882.8510057.49               490     520     460             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.86

INPUT
Description: 3.86

Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9728.15    1780 9811.03    1778 9980.73    1776 9992.41    177010006.32    1770
10015.17    1772 10048.5    1774 10108.2    177410125.25    1776 10163.1    1778
10205.78    177810274.92    177410300.77    177410373.74    1778 10496.8    1780

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9728.15    .055 9980.73     .03 10048.5    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.73 10048.5               360     400     490             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.78

INPUT
Description: 3.78

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9660.11    1776     9740  1774.1  9978.4    1774 9983.58    1770 9992.92    1766
 9993.96    176610036.94    177010060.68    177210120.11    177210142.25    1770
10151.27    176810155.15    176810163.26    177010225.58    177210348.04    1774
10545.54    177410650.82    1775

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9660.11    .055  9978.4     .0310060.68    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.410060.68               170     170     170             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.75

INPUT
Description: 3.75

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9590    1776    9655    1774    9710    1772    9725    1772    9780    1774
    9945    1774    9975    1772 9982.65    1768 9991.06    1764   10010    1764
   10020    1768   10310    1772   10840    1772   10885    1776

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9590    .055 9982.65     .03   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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      9982.65   10020                500      500      500              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.65

INPUT
Description: 3.65
Station Elevation Data     num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9358.43 1771.68    9470    1768    9580    1770    9830    1770    9970    1764
 9990.15    176210009.75    1762   10015    1764   10370    1770

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9358.43    .055    9970     .03   10015    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9970   10015               250      280      260              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.6

INPUT
Description: 3.6
Station Elevation Data     num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9378.25    1770 9475.66    1768 9891.47    1766 9979.85    1764 9990.66    1760
10010.55    176010013.99    176210247.91    176810365.75    1770

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9378.25    .055 9979.85     .0310013.99    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.8510013.99               400      420      450              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.52

INPUT
Description: 3.52

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9669.22    1766 9704.26    1764 9883.69    1764 9945.91    1762 9977.47    1762
 9977.93    1762 9981.96    1760 9986.06    175810002.04    175610006.86    1756
10017.06    176010100.32    176210273.56    176410646.59    1766

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9669.22    .055 9981.96     .0310017.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.9610017.06               200      200      200              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.48

INPUT
Description: 3.48
Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9620.29    1764  9671.6    1762 9965.97    1762 9985.39    1760  9988.6    1758
 9993.36    175610009.59    175510018.81    1758 10110.6    176010298.95    1762
   10615    1764

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9620.29    .055 9985.39     .0310018.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.3910018.81               360      450      435              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.4

INPUT
Description: 3.4

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9460    1762    9500    1760    9725    1758    9865    1758    9920    1756
    9985    1756   10000    1752   10030    1756   10060    1758   10215    1758
   10465    1760   10700  1760.2   10850    1761

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9460    .055    9985     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9985   10030               490      470      430              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.32
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```
INPUT
Description: 3.32
Station Elevation Data     num=      16
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9599.26     1758 9599.45     1758 9630.94     1756 9632.14     1756 9725.16     1754
 9955.22     1754 9974.26     1752 9981.64     175010008.82     175010020.21     1754
10242.15     1754    10490  1756.7    10560  1756.2    10725  1756.2    10790  1756.5
10929.84     1758

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9599.26     .055 9955.22      .0310020.21     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9955.2210020.21                520     520     520              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.21

INPUT
Description: 3.21
Station Elevation Data     num=      13
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9595     1754     9630     1752     9660     1750     9680     1749     9710     1750
    9900     1751     9965     1750 9990.25     174610009.88     174610029.09 1749.98
   10130     1750    10315     1752    10390  1752.1

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
    9595     .055     9965      .0310029.09     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
          996510029.09                250     310     350              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.13

INPUT
Description: 3.13

Station Elevation Data     num=       9
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9442.64     1752 9512.79     1748 9870.47     1748 9978.41     1746 9996.99     1742
10009.71     174210027.88     174810067.68     1750    10100  1750.2

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9442.64     .055 9978.41      .0310027.88     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9978.4110027.88                200     280     300              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.07

INPUT
Description: 3.07
Station Elevation Data     num=       9
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9640     1748     9665     1746 9912.66     1746 9979.95     1744 9989.15     1742
10019.02     174110028.11     174410080.68     174610180.41     1748

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
    9640     .055 9979.95      .0310028.11     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9979.9510028.11                560     520     480              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 2.97

INPUT
Description:
Station Elevation Data     num=      11
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9934     1748     9959     1746     9974     1744     9980     1742     9984     1740
    9988     1738    10012     1738    10020     1740    10052     1742    10134     1742
   10314   1743.5

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
    9934     .055     9980      .03    10052     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
           9980   10052                270     270     270              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 2.92

INPUT
Description:
Station Elevation Data     num=      11
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9820     1748     9845     1746     9870     1744     9910     1742     9970     1740
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    9980    1738    9990    1735   10010    1735   10014    1738   10022    1740
   10157  1741.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9820    .055    9970     .03   10022    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10022              155     155     155             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 2.90

INPUT
Description:
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9726    1746    9756    1744    9794    1742    9826    1740    9978    1738
    9984    1736    9990    1734   10010    1734   10016    1736   10022    1738
   10100    1740   10141  1740.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9726    .055    9978     .03   10022    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10022              140     200     250             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 2.87

INPUT
Description:
Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9679    1746    9706    1744    9737    1742    9771    1740    9979    1738
    9983    1736    9987    1734   10013    1734   10019    1736   10031    1738
   10099  1738.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9679    .055    9979     .03   10031    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9979   10031              240     260     270             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 2.82

INPUT
Description:
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9654    1744    9680    1742    9705    1740    9724    1738    9764    1736
    9884  1735.5    9934    1736    9978    1736    9982    1734    9994    1731
   10006    1731   10024    1734   10034    1736   10140    1736

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9654    .055    9978     .03   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10034                0       0       0             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 2            RS: 2.73

INPUT
Description: 2.73
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9756.45    1740 9787.82    1738 9811.88    1736 9971.87    1732 9986.23    1728
10019.94    172810036.42    173210071.17    173410101.17    173810127.41 1740.05

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9756.45    .055 9971.87     .0310036.42    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.8710036.42              190     190     190             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 2            RS: 2.70

INPUT
Description:
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9700    1746    9740    1744    9780    1742    9820    1740    9850    1738
    9875    1736    9905    1734    9960    1732    9970    1730    9980    1728
   10020    1728   10025    1730   10115    1732   10165    1734   10185    1736
   10215    1738   10235    1740   10260    1742

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
    9700    .055    9960     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9960   10025              160     160      90            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 2            RS: 2.67

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9784.5    1746  9809.5    1744  9834.5    1742  9854.5    1740  9879.5    1738
  9904.5    1736  9924.5    1734  9969.5    1732  9979.5    1730  9980.5    1728
 10019.5    1728 10024.5    1730 10069.5    1732 10279.5    1732 10294.5    1734
 10314.5    1736 10334.5    1738 10354.5    1740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9784.5    .055  9969.5     .03 10069.5    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9969.5 10069.5                 0       0       0            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.60

INPUT
Description: 2.6

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9750    1736    9820    1732    9935    1732    9945    1730    9960    1724
    9965    1724   10020    172610028.92  1729.5   10265    173210415.66    1732
10462.65 1736.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9750    .055    9945     .0310028.92    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          994510028.92              390     430     450            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.52

INPUT
Description: 2.52
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9805.03    1736 9840.17    1734 9866.23    1732 9886.43    1728 9957.59    1726
 9970.16    172210021.48    172110028.76    172610120.86    172810316.87    1728
10363.84    173010395.26    173210419.34    173410459.58    1736

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9805.03    .055 9957.59     .0310028.76    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.5910028.76              270     260     250            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.47

INPUT
Description: 2.47

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9920.54    1734 9942.57    1732 9962.26    1724  9972.1    1720 9990.76    1720
10013.06    172210027.81    1724 10090.1    172610200.41    172610300.68    1728
   10340    1730   10360    1734

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9920.54    .055 9962.26     .0310027.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9962.2610027.81              340     400     450            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.40

INPUT
Description: 2.4

Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9795    1732    9800    1730    9840    1724    9940    1720    9980    1718
   10020    1718 10024.1 1719.9710048.34 1732.03

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9795    .055    9940     .03 10024.1    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940 10024.1              300     360     370             .1       .3

 ROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.33

INPUT
Description: 2.33

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9778    1730    9840    1724    9870    1722    9890    1720    9945    1720
    9960    1718   10000    1717   10028    1718   10030    1720   10045    1730

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9778    .055    9945     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9945   10030              450     450     450             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.24

INPUT
Description: 2.24

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9781.96    1726 9796.25    1724 9855.35    1720 9939.57    1718 9973.56    1714
10001.06    171410055.42    171810148.55    172010188.25    172410215.72    1726

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9781.96    .055 9939.57     .0310055.42    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.5710055.42              380     380     390             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.17

INPUT
Description: 2.17

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9809.96    1722 9833.72    1720 9889.63    1716 9892.16    1716 9948.16    1716
 9962.44    171410027.88    171410055.88    1716 10199.6    171610234.24    1718
10416.55    172010468.74    1722

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9809.96    .055 9948.16     .0310055.88    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.1610055.88              500     520     350             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.08

INPUT
Description: 2.08
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9967.02    1718 9971.03    1716 9983.46    171010015.75    1710 10034.4    1714
10080.47    171610200.63    1717   10300    1716   10360    1714   10450    1712
   10490    1710   10510    1710   10545    1712   10580    1714   10700    1716
   10745    1718

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9967.02    .055 9971.03     .0310080.47    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.0310080.47              440     440     270             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.00

INPUT
Description: 2

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9964.46 1715.98    9980    1710    9985  1708.5   10020  1708.5   10115    1710
   10150    1712   10360  1713.8   10535    1712   10590    1710   10610  1708.5
   10675  1708.5   10700    1710   10805    1714   10830    1716

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9964.46    .055    9980     .03   10115    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   10115              550     490     230             .3       .5
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CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.88

INPUT
Description: 1.88

Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9767.17 1713.01    9790    1708    9890    1708    9950    1706    9975    1704
    9990  1702.1   10010  1702.1   10040    1706   10085    1710   10210    1710
   10300    1708   10340    1706   10370    1706   10390    1708   10455    1710
10479.52 1713.09

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9767.17    .055    9950     .03   10040    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9950   10040              190     200     230            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.85

INPUT
Description: 1.85
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9819.07    1712 9828.06    1710 9836.36    1708 9915.83    1706 9954.99    1704
10002.05    170010011.48    170010041.54    170410064.87    170610129.94    1708
10187.04    170810294.81    170610368.04    170610414.01    170810424.61    1710
10451.94    1712

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9819.07    .055 9954.99     .0310041.54    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.9910041.54              210     190     150            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.81

INPUT
Description: 1.81
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9944.51    1712 9965.71    1704 9971.05    1702 9975.82    170010012.24    1700
   10031    170210060.69    170410188.05    170610206.68    170610298.14    1704
10327.71    170410350.59    170610431.76    170810486.49    1712

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9944.51    .055 9971.05     .03   10031    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.05   10031              300     300     240            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.75

INPUT
Description: 1.75

Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9951.17    1710 9965.64    1704 9970.05    1702 9974.47    1700 9978.76    1698
10016.76    169810034.19    170010072.31    170210151.35    170410320.71    1706
10429.93    170810503.73    1710

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9951.17    .055 9970.05     .0310072.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.0510072.31              480     500     520            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.66

INPUT
Description: 1.66

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9744.33    1708 9829.76    1704 9931.63    1702 9952.11    1700 9967.65    1698
 9993.88    169610014.03    169610029.43    1698   10034    170010204.97 1700.01
10212.95    170210237.12    170410277.66    170610306.08    1708

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9744.33    .055 9952.11     .03   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9952.11   10034              300     250     240            .1       .3
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CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.60

INPUT
Description: 1.6

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9416.18    1706 9448.11    1704 9518.79    1702 9799.12    1700 9907.12    1698
 9959.73    1696 9980.66    1694  9995.9    1692 10008.9    169210012.95    1694
10016.94    169610031.18    170410062.39    1706

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9416.18    .055 9959.73     .0310016.94    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.7310016.94               190     180     180             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.56

INPUT
Description: 1.56

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9426.84    1706 9453.43    1704 9496.71    1702 9564.46    1700 9690.11    1700
 9951.37    1698 9973.37    1696 9983.09    169210014.85    169210028.61    1698
10039.18    170210058.37    170410091.18    1706

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9426.84    .055 9951.37     .0310028.61    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.3710028.61               400     500     540             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.47

INPUT
Description: 1.47
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9462.33    1702 9530.85    1700 9560.22    1698 9800.63    1698 9911.62    1696
 9964.37    1694 9980.91    169010017.61    169010032.41    169410056.56    1698
.0067.04    170010103.76    1702

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9462.33    .055 9964.37     .0310032.41    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.3710032.41               490     500     520             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.37

INPUT
Description: 1.37
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9493.05    1698 9549.07    1696 9580.08    1694 9932.08    1692 9963.31    1690
 9978.48    1688 10013.4    168810022.33    1690 10030.2    169210053.61    1698

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9493.05    .055 9932.08     .03 10030.2    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9932.08 10030.2               400     500     440             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.27

INPUT
Description: 1.27
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9673    1698    9745    1696    9795    1694    9817    1692    9842    1690
    9917    1688    9925    1686    9950    1684    9975    1684   10020    1686
   10077    1688   10163    1690   10260    1692   10395    1694   10505    1696
   10800    1698

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9673    .055    9917     .03   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9917   10020               450     460     500             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.18
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INPUT
Description: 1.18
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9840    1694    9875    1692    9902    1690    9920    1688    9936    1686
    9947    1684    9957    1682   10015    1680   10020    1680   10025    1682
   10030    1684   10061    1686   10102    1688   10180    1690   10270    1690
   10390    1689   10460  1689.9   10600  1688.2   10670    1690   10863    1692
   10903  1693.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9840    .055    9947     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9947   10030              500     500     350            .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.09

INPUT
Description: 1.09
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9920    1690    9926    1688    9932    1686    9938    1684    9968    1682
    9974    1680   10026    1680   10034    1682   10098    1682   10120    1684
   10185    1686   10335    1684   10362    1684   10582    1686   10770    1685
   10920    1686   11621    1688   11652    1690

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9920    .055    9968     .03   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9968   10034              500     500     460            .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.99

INPUT
Description: 0.99
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9925.53    1686 9950.02    1682 9969.66    1680 9977.26   167810017.26    1678
10026.04   168010147.08    1682 10189.7   168210277.01   168010326.93    1678
10418.53   167810542.32   168010764.47   168210913.43   168210917.62    1682
   11420    1684   11790   168411823.04 1685.99

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9925.53    .055 9969.66     .0310026.04    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.6610026.04              890     900     550            .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.84

INPUT
Description: 0.84
Station Elevation Data     num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9854.82 1679.99    9910    1676    9975    1672 9980.41   167010019.82    1670
   10030    1672   10080  1673.8   10110    1672   10125    1670   10150    1674
   10230    1674   10290    1678   10320    1678   10380    1676   10400    1676
   10460    1678   10590    1680

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9854.82    .055    9975     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10030              420     440     430            .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.75

INPUT
Description: 0.75
Station Elevation Data     num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9452.11 1676.99 9623.97    1674 9849.05    1674 9850.71    1674 9883.74    1672
 9884.15    1672 9943.61    1670 9943.82    1670 9967.12    1668 9967.18    1668
 9978.88   166610014.77   166610027.72   167010080.45   167010080.56    1670
10093.84    1672   10094   167210119.59   167210119.71   167210128.45    1670
 10128.5    1670 10145.7   167010145.78    1670 10173.1   167210173.36    1672
10214.32    1674 10214.6   167410391.18   167410391.21   167410479.43    1676
10479.48   167610512.05 1676.99

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9452.11    .055 9943.82     .0310027.72    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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      9943.8210027.72                180     200     210              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.71

INPUT
Description: 0.71
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9410.74    1676 9517.84    1674 9806.35    1672 9806.66    1672 9929.72    1670
 9930.71    1670 9973.93    1668 9973.94    1668 9979.82    1666  9979.9    1666
 9985.76    1664  9985.8    166410015.71    1664 10015.9    166410024.34    1666
10024.46    166610029.59    166810030.23    166810045.83    166810045.97    1668
10052.42    166610052.62    166610063.21    1666 10063.3    166610070.56    1668
10070.63    1668 10092.7    167010201.55    167610201.61    1676

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9410.74    .055 9973.94     .0310029.59    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.9410029.59               370     400     440              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.63

INPUT
Description: 0.63
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9246.69    1673    9300    1672 9467.58    1672 9467.59    1672 9524.47    1670
 9524.59    1670 9661.89    1670 9662.28    1670 9798.92    1668 9967.22    1668
 9967.27    1668 9971.89    1666 9971.91    1666 9976.44    1664 9976.56    1664
10025.48    166410033.05    166610033.09    166610044.06    166810044.68    1668
10151.63    1668   10188    167210227.11 1673.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9246.69    .055 9967.27     .0310044.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.2710044.06               300     500     600              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.54

INPUT
Description: 0.54
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9600    1670    9840    1668    9875    1664    9965    1664 9975.73    1660
10018.71    166010027.02    166410027.05    166410027.06    166410068.43    1666
10068.89    166610360.71    166610418.56    166410470.56    166410510.35    1666
10530.78    166810614.05    1670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9600    .055    9965     .0310027.02    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          996510027.02               800     640     400              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.43

INPUT
Description: 0.43

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9730    1666    9900    1664    9940    1662    9985    1655   10015    1655
   10050  1661.8   10120  1661.8   10190    1660   10240    1658   10270    1660
   10290    1662   10350    1662   10405    1660   10430    1660   10500    1662
   10535    1664   10620    1666

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9730    .055    9940     .03   10050    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940   10050               505     500     440              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.33

INPUT
Description: 0.33

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9631.93 1663.06    9645    1662    9722    1660    9820    1660    9900    1661
 9945.78 1658.03    9980  1652.2   10020  1652.2   10090    1658   10135    1658
   10150  1652.6   10170    1656   10220    1658   10250    1660   10305    1662
   10375    1664
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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9631.93    .055 9945.78     .03   10090    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9945.78   10090              350     650     700            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.20

INPUT
Description: 0.2

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9288.16    1660 9525.13    1658 9606.89    1658 9642.09    1656 9827.21    1656
 9904.07    1654 9967.74    1650  9981.5    1646 10015.7    1646 10039.4    1656
10160.82    165610191.81    1660

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9288.16    .055 9967.74     .03 10039.4    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.74 10039.4                0       0       0            .1        .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.23

INPUT
Description: 2.23

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9916.62    1834 9941.49    1832 9962.82    1830 9979.43    1828 9994.11    1826
10007.33    182610023.07    182810034.76    1830   10373    1832   10480    1832
   10620    1834

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9916.62    .055 9979.43    .0310023.07    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.4310023.07              435     440     445            .1        .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.14

INPUT
Description: 2.14
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9961.98    1828 9969.94    1826 9979.01    1824 9981.08    182410020.87    1824
10025.81    182410218.97    182610361.55    182610637.58    182610689.74    1828

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9961.98    .055 9979.01    .0310025.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.0110025.81              385     380     380            .1        .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.07

INPUT
Description: 2.07

Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9955.42    1824 9969.04    1822    9980    1821   10020    1821   10060    1822
10667.15    182210737.75    1824

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9955.42    .055 9969.04     .03   10060    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.04   10060              415     390     260            .1        .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.00

INPUT
Description: 2.00 -- Approximate Alignment of Carefree Hwy
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9956.92    1822 9973.16    1818 9974.89    1818 9981.08    1816 9983.46    1816
 9989.77    1814 9993.01    181410005.51    181410007.19    181410022.29    1816
10025.64    181610088.76    181810488.79    1820 10588.7    182010637.44    1822

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9956.92    .055 9983.46    .0310022.29    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.4610022.29              390     400     390             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.92

INPUT
Description: 1.92

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9925    1816    9935    1814    9945    1812    9965    1810   10010    1810
   10015    1812   10025    1814   10050    1812   10100    1814   10340    1814
   10380    1816

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9925    .055    9935     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9935   10025              460     455     450             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.83

INPUT
Description: 1.83

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9956.91    1812 9974.62    1810 9983.67    1808 9990.95    180610005.18    1806
10038.99    180810189.64    181010254.89    181010359.32    180810422.67    1812

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9956.91    .055 9983.67     .0310038.99    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.6710038.99              440     445     450             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.75

INPUT
Description: 1.75

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9923.03    1806 9964.44    1804 9975.68    1802  9998.4    180010003.69    1800
10022.87    180410187.38    180410279.87    180210305.65    180210358.49    1806

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9923.03    .055 9964.44     .0310022.87    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.4410022.87              485     490     500             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.65

INPUT
Description: 1.65
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9893    1806    9901    1804    9909    1802    9915    1800    9923    1798
    9971  1797.8    9988    1796   10012    1796   10020    1798   10273    1800
 10273.1    1802

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9893    .055    9971     .03   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9971   10020              600     600     575             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.54

INPUT
Description: 1.54
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9735.34    1796 9972.06    1794 9986.03    1792 9993.93    1790 10012.3    1790
10020.15    179210029.59    179210124.43    179010160.57    179010181.54    1792
10288.06    179410495.09    179410533.67    1796

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9735.34    .055 9986.03     .0310020.15    .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.0310020.15              400     400     400             .1       .3

CROSS SECTION          RIVER: Paradise Wash
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```
REACH: Reach 1            RS: 1.46

INPUT
Description: 1.46
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9420    1794    9455    1792    9645    1790    9685    1790 9843.42    1792
 9885.29    1792 9920.09    1790 9973.03    1788 9983.48    178610027.78    1786
10028.33    178610038.59    1788 10039.2    178810295.57    179210295.61    1792
10328.92 1793.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9420    .055 9973.03     .0310038.59    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.0310038.59               260     500     670              .1       .3
Left Levee      Station= 9885.29      Elevation=    1792

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1            RS: 1.37

INPUT
Description: 1.37
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9345    1792    9385    1790    9440    1788    9490    1788  9650.6 1789.51
 9806.04    1788 9806.97    1788 9865.72    1786 9866.07    1786  9886.2    1784
 9886.27    1784 9957.84    1784 9958.87    1784  9968.7    1782 9968.84    1782
 9990.03    178210020.46    178610055.46    178610057.12    178610069.22    1788
10069.72    178810181.45    178810258.34    179010303.11    1792

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9345    .055 9958.87     .0310020.46    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9958.8710020.46               570     500     430              .1       .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1            RS: 1.27

INPUT
Description: 1.27

Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9347.73    1788 9366.76    1786 9787.72    1784 9788.51    1784 9960.27    1784
 9960.65    1784 9969.04    1782 9969.12    1782 9988.65    1778 9989.09    1778
10011.61    177810012.22    177810057.73    178210058.84    178210169.81    1784
10171.13    178410205.64    178810206.31    1788

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9347.73    .055 9969.12     .0310057.73    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.1210057.73               390     350     320              .1       .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1            RS: 1.21

INPUT
Description: 1.21
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9421    1784 9440.23    1780  9538.2    1780 9595.38    1782 9618.31    1782
 9801.74    1780 9802.59    1780 9835.89    1780 9836.44    1780 9877.07    1782
 9886.63    1782 9977.68    1780 9982.64    1778 9983.14    1778 9988.45    1776
10013.85    177610020.25    1778 10020.6    177810096.24    177810106.85    1780
10131.31    178210206.15    1784

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9421    .055 9983.14      .03 10020.6    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.14 10020.6               400     440     450              .1       .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1            RS: 1.12

INPUT
Description: 1.12

Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9323.43    1782 9323.49    1782 9334.19    1780 9334.29    1780 9344.65    1778
 9345.18    1778    9460    1778  9546.2    1776 9547.35    1776 9660.25    1776
 9661.37    1776 9701.23    1778 9701.63    1778 9764.83    1780 9764.91    1780
 9845.43    1780 9943.46    1776 9981.99    177410002.99    177210010.59    1772
10023.31    177610036.17    178010084.32    1782

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
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 9323.43    .055 9943.46     .0310023.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.4610023.31               320     420     470             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.04

INPUT
Description: 1.04
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9371.44    1778 9371.87    1778 9547.56    1774 9547.64    1774 9676.69    1774
 9678.18    1774 9732.85    1772  9985.5    1772 9991.67    177010013.58    1770
10029.11    177210053.67    177610108.42    1778

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9371.44    .055  9985.5     .0310029.11    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.510029.11               500     400     300             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.95

INPUT
Description: 0.95

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9590.3    1774  9590.4    1774 9688.06    1772 9688.13    1772 9982.32    1772
 9984.49    1770 9986.77    176810001.77    176610019.78    176610036.54    1768
10070.19    177010159.61    177210232.27    1774

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9590.3    .055 9984.49     .0310070.19    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9984.4910070.19               250     275     310             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.89

INPUT
Description: 0.89

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9582.26    1772 9582.35    1772 9640.11    1770 9921.21    1770 9981.01    1768
 9985.21    176410009.58    176410018.11    176610021.69    176810163.03    1770
10270.58    1772

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9582.26    .055 9981.01     .0310021.69    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.0110021.69               520     500     480             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.80

INPUT
Description: 0.8
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9593.82    1768 9646.26    1766 9785.49    1766 9982.14    1764 9989.01    1762
10010.62    176210020.71    1764 10104.6    176410291.13    1766 10321.7    1768

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9593.82    .055 9982.14     .0310020.71    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.1410020.71               420     350     330             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.72

INPUT
Description: 0.72
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9396    1766    9427    1764    9473    1762    9526    1761    9616    1762
    9682    1760    9721  1758.5    9758    1760    9796  1760.5    9886    1760
    9978    1760    9988    1758   10012    1758   10018    1760   10066    1762
   10106    1764   10141    1766

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9396    .055    9978     .03   10018    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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          9978   10018              400     420     425             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.62

INPUT
Description: 0.62
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9548    1762    9586    1760    9657    1758    9688  1757.5    9750    1758
    9798  1758.5    9938    1758    9967    1756    9983    1754   10018    1754
   10031    1756   10047    1754   10056    1754   10069    1756   10085    1758
   10218    1758   10245    1760   10263    1762

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9548    .055    9967     .03   10031    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9967   10031              420     450     460             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.53

INPUT
Description: 0.53
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9511    1758    9574    1756    9729    1754    9976    1752    9983    1750
   10018    1750   10028    1752   10099    1754   10115    1756   10131    1758

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9511    .055    9976     .03   10028    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9976   10028              475     495     500             .3       .5

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.44

INPUT
Description: 0.44
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9603.04    1752 9682.28    1750 9992.46    174810001.98    1746   10007    1746
10019.54    174810028.31    174910052.71    174910105.67    1748 10138.9    1746
10140.02    174610149.52    174810159.12    1750 10170.1    1752

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9603.04    .055 9992.46     .0310028.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9992.4610028.31              500     450     380             .3       .5

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.34

INPUT
Description: 0.34
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9749.69    1750 9772.57    1748 9799.65    1746 9969.75    1744 9988.37    1744
10012.01    174410014.83    174410073.32    174610188.93    174610285.92    1744
10293.88    174410324.22    1748 10351.7    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9749.69    .055 9969.75     .0310014.83    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.7510014.83              290     300     340             .3       .5

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.28

INPUT
Description: 0.28
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9761    1746    9780    1744    9817    1742    9891    1740    9974    1742
    9982    1740    9991    1738   10008    1738   10017    1740   10038    1742
   10151    1744   10229    1743   10243    1744   10289    1746

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9761    .055    9974     .03   10038    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9974   10038              550     550     550             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.17
```

INPUT
Description: 0.17
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9957.91	1740	9974.51	1734	9980.5	173210003.82		173210022.71		1734
10084.24	173610128.49		173810423.55		173810511.08		173610520.92		1736
10528.63	173810535.83		1740						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9957.91	.055	9974.51	.0310022.71		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9974.5	110022.71	225	225	200	.1	.3

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 0.13

INPUT
Description: 0.13
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9952.71	1738.99	9978.41	1734	9988.85	173210019.25		173210047.54		1734
10172.1	1736	10543.1	173610553.61	1738.99					

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9952.71	.055	9978.41	.0310047.54		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9978.4	110047.54	425	390	465	.1	.3

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 0.04

INPUT
Description: 0.04
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9680	1738	9765	1734	9850	1732	9946.82	1732	9970.15	1730
9998.41	172610018.18		172610032.22		173010090.04		173210255.73		1736
10279.91	1738								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9680	.055	9970.15	.0310032.22		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9970.1	510032.22	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Desert Hills Was

Reach	River Sta.	n1	n2	n3
Reach 1	0.99	.055	.03	.055
Reach 1	0.90	.055	.03	.055
Reach 1	0.81	.055	.03	.055
Reach 1	0.72	.055	.03	.055
Reach 1	0.64	.055	.03	.055
Reach 1	0.56	.055	.03	.055
Reach 1	0.48	.055	.03	.055
Reach 1	0.40	.055	.03	.055
Reach 1	0.386	.055	.03	.055
Reach I	0.3I	.055	.03	.055
Reach 1	0.22	.055	.03	.055
Reach 1	0.19	.055	.03	.055
Reach 1	0.09	.055	.03	.055
Reach 1	0.04	.055	.03	.055

River:Apache Wash

Reach	River Sta.	n1	n2	n3
Reach 1	8.02	.055	.03	.055
Reach 1	7.98	.055	.03	.055
Reach 1	7.89	.055	.03	.055
Reach 1	7.84	.055	.03	.055
Reach 1	7.74	.055	.03	.055
Reach 1	7.65	.055	.03	.055
Reach 1	7.55	.055	.03	.055
Reach 1	7.46	.055	.03	.055
Reach 1	7.36	.055	.03	.055
Reach 1	7.28	.055	.03	.055
Reach 1	7.17	.055	.03	.055
Reach 1	7.08	.055	.03	.055
Reach 1	6.98	.055	.03	.055
Reach 1	6.9	.055	.03	.055
Reach 1	6.8	.055	.03	.055
Reach 1	6.71	.055	.03	.055
Reach 1	6.63	.055	.03	.055

Reach 1	6.58	.055	.03	.055
Reach 1	6.5	.055	.03	.055
Reach 1	6.43	.055	.03	.055
Reach 1	6.32	.055	.03	.055
Reach 1	6.25	.055	.03	.055
Reach 1	6.16	.055	.03	.055
Reach 1	6.09	.055	.03	.055
Reach 1	6.01	.055	.03	.055
Reach 1	5.92	.055	.03	.055
Reach 1	5.83	.055	.03	.055
Reach 1	5.76	.055	.03	.055
Reach 1	5.66	.055	.03	.055
Reach 1	5.64	.055	.03	.055
Reach 1	5.57	.055	.03	.055
Reach 1	5.48	.055	.03	.055
Reach 1	5.38	.055	.03	.055
Reach 1	5.31	.055	.03	.055
Reach 1	5.21	.055	.03	.055
Reach 1	5.15	.055	.03	.055
Reach 1	5.09	.055	.03	.055
Reach 1	5.03	.055	.03	.055
Reach 1	4.96	.055	.03	.055
Reach 1	4.9	.055	.03	.055
Reach 1	4.82	.055	.03	.055
Reach 1	4.78	.055	.03	.055
Reach 1	4.74	.055	.03	.055
Reach 1	4.65	.055	.03	.055
Reach 1	4.6	.055	.03	.055
Reach 1	4.58	.055	.03	.055
Reach 1	4.575	Culvert		
Reach 1	4.56	.055	.03	.055
Reach 1	4.49	.055	.03	.055
Reach 1	4.4	.055	.03	.055
Reach 1	4.31	.055	.03	.055
Reach 1	4.23	.055	.03	.055
Reach 1	4.22	.055	.03	.055
Reach 1	4.11	.055	.03	.055
Reach 1	4.05	.055	.03	.055
Reach 1	3.96	.055	.03	.055
Reach 1	3.86	.055	.03	.055
Reach 1	3.78	.055	.03	.055
Reach 1	3.75	.055	.03	.055
Reach 1	3.65	.055	.03	.055
Reach 1	3.6	.055	.03	.055
Reach 1	3.52	.055	.03	.055
Reach 1	3.48	.055	.03	.055
Reach 1	3.4	.055	.03	.055
Reach 1	3.32	.055	.03	.055
Reach 1	3.21	.055	.03	.055
Reach 1	3.13	.055	.03	.055
Reach 1	3.07	.055	.03	.055
Reach 1	2.97	.055	.03	.055
Reach 1	2.92	.055	.03	.055
Reach 1	2.90	.055	.03	.055
Reach 1	2.87	.055	.03	.055
Reach 1	2.82	.055	.03	.055
Reach 2	2.73	.055	.03	.055
Reach 2	2.70	.055	.03	.055
Reach 2	2.67	.055	.03	.055
Reach 3	2.60	.055	.03	.055
Reach 3	2.52	.055	.03	.055
Reach 3	2.47	.055	.03	.055
Reach 3	2.40	.055	.03	.055
Reach 3	2.33	.055	.03	.055
Reach 3	2.24	.055	.03	.055
Reach 3	2.17	.055	.03	.055
Reach 3	2.08	.055	.03	.055
Reach 3	2.00	.055	.03	.055
Reach 3	1.88	.055	.03	.055
Reach 3	1.85	.055	.03	.055
Reach 3	1.81	.055	.03	.055
Reach 3	1.75	.055	.03	.055
Reach 3	1.66	.055	.03	.055
Reach 3	1.60	.055	.03	.055
Reach 3	1.56	.055	.03	.055
Reach 3	1.47	.055	.03	.055
Reach 3	1.37	.055	.03	.055
Reach 3	1.27	.055	.03	.055
Reach 3	1.18	.055	.03	.055
Reach 3	1.09	.055	.03	.055
Reach 3	0.99	.055	.03	.055
Reach 3	0.84	.055	.03	.055
Reach 3	0.75	.055	.03	.055
Reach 3	0.71	.055	.03	.055
Reach 3	0.63	.055	.03	.055
Reach 3	0.54	.055	.03	.055
Reach 3	0.43	.055	.03	.055
Reach 3	0.33	.055	.03	.055
Reach 3	0.20	.055	.03	.055

River:Paradise Wash

Reach	River Sta.	n1	n2	n3

Reach 1	2.23	.055	.03	.055
Reach 1	2.14	.055	.03	.055
Reach 1	2.07	.055	.03	.055
Reach 1	2.00	.055	.03	.055
Reach 1	1.92	.055	.03	.055
Reach 1	1.83	.055	.03	.055
Reach 1	1.75	.055	.03	.055
Reach 1	1.65	.055	.03	.055
Reach 1	1.54	.055	.03	.03
Reach 1	1.46	.055	.03	.055
Reach 1	1.37	.055	.03	.055
Reach 1	1.27	.055	.03	.055
Reach 1	1.21	.055	.03	.055
Reach 1	1.12	.055	.03	.055
Reach 1	1.04	.055	.03	.055
Reach 1	0.95	.055	.03	.055
Reach 1	0.89	.055	.03	.055
Reach 1	0.80	.055	.03	.055
Reach 1	0.72	.055	.03	.055
Reach 1	0.62	.055	.03	.055
Reach 1	0.53	.055	.03	.055
Reach 1	0.44	.055	.03	.055
Reach 1	0.34	.055	.03	.055
Reach 1	0.28	.055	.03	.055
Reach 1	0.17	.055	.03	.055
Reach 1	0.13	.055	.03	.055
Reach 1	0.04	.055	.03	.055

SUMMARY OF REACH LENGTHS

River: Desert Hills Was

Reach	River Sta.	Left	Channel	Right
Reach 1	0.99	490	470	440
Reach 1	0.90	500	491	480
Reach 1	0.81	550	492	400
Reach 1	0.72	340	373	325
Reach 1	0.64	270	450	450
Reach 1	0.56	320	436	450
Reach 1	0.48	410	380	340
Reach 1	0.40	180	260	320
Reach 1	0.386	405	400	380
Reach 1	0.31	280	280	280
Reach 1	0.22	130	145	180
Reach 1	0.19	240	300	380
Reach 1	0.09	250	250	280
Reach 1	0.04	0	0	0

River: Apache Wash

Reach	River Sta.	Left	Channel	Right
Reach 1	8.02	215	235	245
Reach 1	7.98	280	465	520
Reach 1	7.89	300	300	220
Reach 1	7.84	575	500	425
Reach 1	7.74	425	500	475
Reach 1	7.65	520	500	470
Reach 1	7.55	510	500	480
Reach 1	7.46	490	500	510
Reach 1	7.36	420	446	470
Reach 1	7.28	475	554	410
Reach 1	7.17	500	500	520
Reach 1	7.08	485	500	500
Reach 1	6.98	400	437	470
Reach 1	6.9	490	529	560
Reach 1	6.8	500	495	400
Reach 1	6.71	425	390	350
Reach 1	6.63	300	290	290
Reach 1	6.58	430	430	430
Reach 1	6.5	310	345	355
Reach 1	6.43	475	450	360
Reach 1	6.32	410	390	350
Reach 1	6.25	490	460	430
Reach 1	6.16	270	360	450
Reach 1	6.09	470	445	435
Reach 1	6.01	485	490	510
Reach 1	5.92	375	400	375
Reach 1	5.83	375	380	380
Reach 1	5.76	470	540	570
Reach 1	5.66	460	440	320
Reach 1	5.64	370	345	320
Reach 1	5.57	400	450	450
Reach 1	5.48	530	500	500
Reach 1	5.38	350	375	425
Reach 1	5.31	500	500	480
Reach 1	5.21	330	310	300
Reach 1	5.15	350	352	355
Reach 1	5.09	300	300	310
Reach 1	5.03	345	365	340

Reach 1	4.96	400	320	200
Reach 1	4.9	220	200	160
Reach 1	4.82	480	480	480
Reach 1	4.78	300	200	100
Reach 1	4.74	400	500	500
Reach 1	4.65	260	280	260
Reach 1	4.6	83	83	83
Reach 1	4.58	180	180	170
Reach 1	4.575	Culvert		
Reach 1	4.56	365	365	350
Reach 1	4.49	490	450	450
Reach 1	4.4	475	510	490
Reach 1	4.31	410	420	410
Reach 1	4.23	140	150	150
Reach 1	4.22	280	280	260
Reach 1	4.11	240	250	300
Reach 1	4.05	400	500	285
Reach 1	3.96	490	520	460
Reach 1	3.86	360	400	490
Reach 1	3.78	170	170	170
Reach 1	3.75	500	500	500
Reach 1	3.65	250	280	260
Reach 1	3.6	400	420	450
Reach 1	3.52	200	200	200
Reach 1	3.48	360	450	435
Reach 1	3.4	490	470	430
Reach 1	3.32	520	520	520
Reach 1	3.21	250	310	350
Reach 1	3.13	200	280	300
Reach 1	3.07	560	520	480
Reach 1	2.97	270	270	270
Reach 1	2.92	155	155	155
Reach 1	2.90	140	200	250
Reach 1	2.87	240	260	270
Reach 1	2.82	0	0	0
Reach 2	2.73	190	190	190
Reach 2	2.70	160	160	90
Reach 2	2.67	0	0	0
Reach 3	2.60	390	430	450
Reach 3	2.52	270	260	250
Reach 3	2.47	340	400	450
Reach 3	2.40	300	360	370
Reach 3	2.33	450	450	450
Reach 3	2.24	380	380	390
Reach 3	2.17	500	520	350
Reach 3	2.08	440	440	270
Reach 3	2.00	550	490	230
Reach 3	1.88	190	200	230
Reach 3	1.85	210	190	150
Reach 3	1.81	300	300	240
Reach 3	1.75	480	500	520
Reach 3	1.66	300	250	240
Reach 3	1.60	190	180	180
Reach 3	1.56	400	500	540
Reach 3	1.47	490	500	520
Reach 3	1.37	400	500	440
Reach 3	1.27	450	460	500
Reach 3	1.18	500	500	350
Reach 3	1.09	500	500	460
Reach 3	0.99	890	900	550
Reach 3	0.84	420	440	430
Reach 3	0.75	180	200	210
Reach 3	0.71	370	400	440
Reach 3	0.63	300	500	600
Reach 3	0.54	800	640	400
Reach 3	0.43	505	500	440
Reach 3	0.33	350	650	700
Reach 3	0.20	0	0	0

River: Paradise Wash

Reach	River Sta.	Left	Channel	Right
Reach 1	2.23	435	440	445
Reach 1	2.14	385	380	380
Reach 1	2.07	415	390	260
Reach 1	2.00	390	400	390
Reach 1	1.92	460	455	450
Reach 1	1.83	440	445	450
Reach 1	1.75	485	490	500
Reach 1	1.65	600	600	575
Reach 1	1.54	400	400	400
Reach 1	1.46	260	500	670
Reach 1	1.37	570	500	430
Reach 1	1.27	390	350	320
Reach 1	1.21	400	440	450
Reach 1	1.12	320	420	470
Reach 1	1.04	500	400	300
Reach 1	0.95	250	275	310
Reach 1	0.89	520	500	480
Reach 1	0.80	420	350	330
Reach 1	0.72	400	420	425
Reach 1	0.62	420	450	460
Reach 1	0.53	475	495	500

Reach 1	0.44	500	450	380
Reach 1	0.34	290	300	340
Reach 1	0.28	550	550	550
Reach 1	0.17	225	225	200
Reach 1	0.13	425	390	465
Reach 1	0.04	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Desert Hills Was

Reach	River Sta.	Contr.	Expan.
Reach 1	0.99	.1	.3
Reach 1	0.90	.1	.3
Reach 1	0.81	.1	.3
Reach 1	0.72	.3	.3
Reach 1	0.64	.3	.5
Reach 1	0.56	.3	.5
Reach 1	0.48	.3	.5
Reach 1	0.40	.3	.5
Reach 1	0.386	.3	.5
Reach 1	0.31	.1	.3
Reach 1	0.22	.1	.3
Reach 1	0.19	.1	.3
Reach 1	0.09	.1	.3
Reach 1	0.04	.1	.3

River: Apache Wash

Reach	River Sta.	Contr.	Expan.
Reach 1	8.02	.1	.3
Reach 1	7.98	.1	.3
Reach 1	7.89	.1	.3
Reach 1	7.84	.1	.3
Reach 1	7.74	.1	.3
Reach 1	7.65	.1	.3
Reach 1	7.55	.1	.3
Reach 1	7.46	.1	.3
Reach 1	7.36	.3	.5
Reach 1	7.28	.3	.5
Reach 1	7.17	.1	.3
Reach 1	7.08	.1	.3
Reach 1	6.98	.1	.3
Reach 1	6.9	.1	.3
Reach 1	6.8	.1	.3
Reach 1	6.71	.1	.3
Reach 1	6.63	.1	.3
Reach 1	6.58	.1	.3
Reach 1	6.5	.1	.3
Reach 1	6.43	.1	.3
Reach 1	6.32	.1	.3
Reach 1	6.25	.1	.3
Reach 1	6.16	.1	.3
Reach 1	6.09	.1	.3
Reach 1	6.01	.1	.3
Reach 1	5.92	.1	.3
Reach 1	5.83	.1	.3
Reach 1	5.76	.1	.3
Reach 1	5.66	.3	.5
Reach 1	5.64	.3	.5
Reach 1	5.57	.1	.3
Reach 1	5.48	.1	.3
Reach 1	5.38	.1	.3
Reach 1	5.31	.1	.3
Reach 1	5.21	.1	.3
Reach 1	5.15	.3	.5
Reach 1	5.09	.3	.5
Reach 1	5.03	.1	.3
Reach 1	4.96	.1	.3
Reach 1	4.9	.1	.3
Reach 1	4.82	.3	.5
Reach 1	4.78	.1	.3
Reach 1	4.74	.1	.3
Reach 1	4.65	.3	.5
Reach 1	4.6	.3	.5
Reach 1	4.58	.3	.5
Reach 1	4.575 Culvert		
Reach 1	4.56	.1	.3
Reach 1	4.49	.1	.3
Reach 1	4.4	.1	.3
Reach 1	4.31	.3	.5
Reach 1	4.23	.3	.5
Reach 1	4.22	.1	.3
Reach 1	4.11	.1	.3
Reach 1	4.05	.1	.3
Reach 1	3.96	.1	.3
Reach 1	3.86	.1	.3
Reach 1	3.78	.1	.3
Reach 1	3.75	.1	.3

Reach 1	3.65	.1	.3
Reach 1	3.6	.1	.3
Reach 1	3.52	.1	.3
Reach 1	3.48	.1	.3
Reach 1	3.4	.1	.3
Reach 1	3.32	.1	.3
Reach 1	3.21	.1	.3
Reach 1	3.13	.1	.3
Reach 1	3.07	.1	.3
Reach 1	2.97	.1	.3
Reach 1	2.92	.1	.3
Reach 1	2.90	.1	.3
Reach 1	2.87	.1	.3
Reach 1	2.82	.1	.3
Reach 2	2.73	.1	.3
Reach 2	2.70	.1	.3
Reach 2	2.67	.1	.3
Reach 3	2.60	.1	.3
Reach 3	2.52	.1	.3
Reach 3	2.47	.1	.3
Reach 3	2.40	.1	.3
Reach 3	2.33	.1	.3
Reach 3	2.24	.1	.3
Reach 3	2.17	.1	.3
Reach 3	2.08	.1	.3
Reach 3	2.00	.3	.5
Reach 3	1.88	.1	.3
Reach 3	1.85	.1	.3
Reach 3	1.81	.1	.3
Reach 3	1.75	.1	.3
Reach 3	1.66	.1	.3
Reach 3	1.60	.1	.3
Reach 3	1.56	.1	.3
Reach 3	1.47	.1	.3
Reach 3	1.37	.1	.3
Reach 3	1.27	.3	.5
Reach 3	1.18	.3	.5
Reach 3	1.09	.3	.5
Reach 3	0.99	.3	.5
Reach 3	0.84	.3	.5
Reach 3	0.75	.1	.3
Reach 3	0.71	.1	.3
Reach 3	0.63	.1	.3
Reach 3	0.54	.1	.3
Reach 3	0.43	.1	.3
Reach 3	0.33	.1	.3
Reach 3	0.20	.1	.3

iver: Paradise Wash

Reach	River Sta.	Contr.	Expan.
Reach 1	2.23	.1	.3
Reach 1	2.14	.1	.3
Reach 1	2.07	.1	.3
Reach 1	2.00	.1	.3
Reach 1	1.92	.1	.3
Reach 1	1.83	.1	.3
Reach 1	1.75	.1	.3
Reach 1	1.65	.1	.3
Reach 1	1.54	.1	.3
Reach 1	1.46	.1	.3
Reach 1	1.37	.1	.3
Reach 1	1.27	.1	.3
Reach 1	1.21	.1	.3
Reach 1	1.12	.1	.3
Reach 1	1.04	.1	.3
Reach 1	0.95	.1	.3
Reach 1	0.89	.1	.3
Reach 1	0.80	.1	.3
Reach 1	0.72	.1	.3
Reach 1	0.62	.1	.3
Reach 1	0.53	.3	.5
Reach 1	0.44	.3	.5
Reach 1	0.34	.3	.5
Reach 1	0.28	.1	.3
Reach 1	0.17	.1	.3
Reach 1	0.13	.1	.3
Reach 1	0.04	.1	.3

Profile Output Table - Standard Table 1

River	Reach	River Sta (cfs)	Q Total (ft)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft/ft)	E.G. Slope (ft/s)	Vel Chnl (sq ft)	Flow Area (ft)	Top Width	Froude # Chl	
Paradise Wash	Reach 1	2.23		1010.00	1826.00	1829.37	1829.28	1830.45	0.007874	8.44	130.11	63.07	0.91
Paradise Wash	Reach 1	2.14		1010.00	1824.00	1825.76	1825.75	1826.32	0.010444	7.39	240.02	225.23	0.98
Paradise Wash	Reach 1	2.07		1010.00	1821.00	1822.49	1822.49	1822.73	0.008230	5.09	410.32	718.61	0.82
Paradise Wash	Reach 1	2.00		1010.00	1814.00	1817.37	1817.37	1818.41	0.007536	8.51	149.72	92.00	0.89
Paradise Wash	Reach 1	1.92		1010.00	1810.00	1812.39	1812.24	1813.16	0.008426	7.03	146.18	88.67	0.89
Paradise Wash	Reach 1	1.83		1010.00	1806.00	1809.04	1809.04	1809.73	0.006721	7.04	207.20	209.24	0.82
Paradise Wash	Reach 1	1.75		1010.00	1800.00	1803.43	1803.43	1804.10	0.008522	7.31	205.25	163.42	0.90
Paradise Wash	Reach 1	1.65		1010.00	1796.00	1798.89	1798.89	1799.56	0.006407	7.11	218.40	213.69	0.81

Paradise Wash	Reach 1	1.54	1150.00	1790.00	1791.96	1791.71	1792.34	0.007109	5.46	233.97	183.72	0.78
Paradise Wash	Reach 1	1.46	1150.00	1786.00	1788.67	1788.52	1789.48	0.006986	7.30	175.22	126.95	0.84
Paradise Wash	Reach 1	1.37	1150.00	1782.00	1785.09	1785.09	1785.85	0.008208	7.66	207.79	138.29	0.90
Paradise Wash	Reach 1	1.27	1150.00	1778.00	1781.41	1780.99	1782.08	0.006173	6.58	174.77	78.99	0.78
Paradise Wash	Reach 1	1.21	1150.00	1776.00	1779.43	1779.22	1780.12	0.005210	7.51	233.05	124.74	0.75
Paradise Wash	Reach 1	1.12	1150.00	1772.00	1775.82	1775.82	1776.82	0.011379	8.03	143.27	75.78	1.03
Paradise Wash	Reach 1	1.04	1150.00	1770.00	1772.87	1772.87	1773.35	0.006236	6.91	335.38	325.33	0.79
Paradise Wash	Reach 1	0.95	1150.00	1766.00	1770.09	1769.23	1770.55	0.003704	5.45	211.16	89.83	0.61
Paradise Wash	Reach 1	0.89	1150.00	1764.00	1767.87	1767.55	1769.09	0.007244	8.86	129.77	40.31	0.87
Paradise Wash	Reach 1	0.80	1150.00	1762.00	1765.17	1765.17	1765.72	0.005616	7.20	336.26	347.54	0.77
Paradise Wash	Reach 1	0.72	1150.00	1758.00	1760.79	1760.79	1761.21	0.005971	6.78	370.85	380.82	0.77
Paradise Wash	Reach 1	0.62	1150.00	1754.00	1756.40	1756.27	1757.14	0.009441	7.48	188.51	110.98	0.94
Paradise Wash	Reach 1	0.53	1150.00	1750.00	1753.02	1753.02	1753.79	0.006022	7.40	223.62	214.82	0.79
Paradise Wash	Reach 1	0.44	1150.00	1746.00	1749.40	1749.21	1749.70	0.005748	6.26	399.46	381.36	0.75
Paradise Wash	Reach 1	0.34	1150.00	1744.00	1745.59	1745.59	1746.07	0.012662	7.59	299.57	323.87	1.06
Paradise Wash	Reach 1	0.28	1150.00	1738.00	1741.61	1741.61	1742.31	0.007950	7.37	229.24	184.91	0.88
Paradise Wash	Reach 1	0.17	1150.00	1732.00	1736.13	1735.20	1736.63	0.002647	5.96	251.76	134.48	0.55
Paradise Wash	Reach 1	0.13	1150.00	1732.00	1734.67	1734.67	1735.59	0.009111	7.76	160.96	114.29	0.94
Paradise Wash	Reach 1	0.04	1150.00	1726.00	1731.70	1729.46	1731.95	0.000989	4.11	327.82	131.04	0.35
Apache Wash	Reach 1	8.02	1130.00	1985.10	1988.59	1988.59	1989.54	0.008231	7.89	160.11	123.67	0.91
Apache Wash	Reach 1	7.98	1130.00	1981.80	1985.74	1985.74	1986.86	0.010270	8.46	133.54	60.30	1.00
Apache Wash	Reach 1	7.89	1130.00	1977.00	1980.51	1980.51	1981.41	0.008962	7.67	163.07	115.18	0.93
Apache Wash	Reach 1	7.84	1130.00	1974.40	1977.45	1977.45	1978.26	0.009748	8.39	201.24	122.81	0.98
Apache Wash	Reach 1	7.74	1130.00	1969.10	1972.69	1972.69	1973.18	0.004605	6.37	332.74	363.21	0.69
Apache Wash	Reach 1	7.65	1130.00	1961.80	1965.22	1965.22	1966.04	0.007029	7.96	206.53	131.61	0.85
Apache Wash	Reach 1	7.55	1130.00	1956.70	1960.34	1960.34	1961.14	0.006320	7.31	190.14	184.28	0.80
Apache Wash	Reach 1	7.46	1130.00	1951.50	1953.96	1953.96	1954.80	0.010008	7.40	163.63	110.84	0.96
Apache Wash	Reach 1	7.36	1130.00	1944.50	1948.13	1948.13	1949.10	0.010810	7.93	142.95	82.01	1.01
Apache Wash	Reach 1	7.28	1130.00	1940.80	1943.29	1943.06	1943.61	0.009220	7.25	317.43	243.46	0.93
Apache Wash	Reach 1	7.17	1130.00	1934.00	1937.28	1937.28	1938.54	0.009038	9.08	131.34	59.09	0.97
Apache Wash	Reach 1	7.08	1130.00	1929.00	1932.24	1932.12	1933.16	0.008764	7.67	147.56	71.68	0.92
Apache Wash	Reach 1	6.98	1130.00	1924.00	1928.13	1927.89	1929.11	0.007502	7.95	142.47	60.34	0.88
Apache Wash	Reach 1	6.9	1130.00	1920.00	1924.12	1924.12	1925.21	0.010727	8.38	135.20	69.35	1.01
Apache Wash	Reach 1	6.8	1130.00	1914.00	1918.14	1918.14	1919.60	0.009659	9.72	116.65	45.47	1.00
Apache Wash	Reach 1	6.71	1130.00	1907.50	1912.18	1911.68	1913.20	0.005916	8.11	139.48	45.43	0.80
Apache Wash	Reach 1	6.63	1130.00	1905.00	1908.87	1908.87	1910.36	0.008869	9.81	119.95	48.81	0.97
Apache Wash	Reach 1	6.58	1130.00	1902.00	1905.92	1905.92	1907.07	0.010114	8.62	131.03	56.80	1.00
Apache Wash	Reach 1	6.5	1130.00	1899.00	1902.58	1902.19	1903.20	0.006454	6.30	179.23	89.50	0.79
Apache Wash	Reach 1	6.43	1130.00	1896.50	1899.42	1899.42	1900.29	0.011285	7.47	151.25	89.06	1.01
Apache Wash	Reach 1	6.32	1130.00	1890.00	1894.07	1893.53	1894.98	0.005687	7.65	147.79	52.42	0.78
Apache Wash	Reach 1	6.25	1130.00	1888.00	1890.98	1890.98	1892.01	0.010624	8.15	138.73	68.43	1.01
Apache Wash	Reach 1	6.16	1130.00	1883.00	1886.60	1886.60	1887.50	0.007981	7.70	169.56	135.39	0.89
Apache Wash	Reach 1	6.09	1130.00	1879.50	1881.92	1881.48	1882.31	0.005175	5.05	223.94	132.73	0.68
Apache Wash	Reach 1	6.01	1210.00	1875.50	1878.78	1878.70	1879.43	0.008025	6.80	222.96	175.05	0.87
Apache Wash	Reach 1	5.92	1210.00	1870.20	1873.17	1873.17	1873.86	0.016875	8.29	213.03	155.89	1.20
Apache Wash	Reach 1	5.83	1210.00	1865.50	1868.84	1868.84	1869.55	0.007730	7.15	226.16	180.84	0.87
Apache Wash	Reach 1	5.76	1210.00	1862.00	1864.71	1864.71	1865.58	0.008663	7.54	181.06	143.86	0.92
Apache Wash	Reach 1	5.66	1210.00	1854.00	1859.54	1859.54	1860.53	0.007047	8.19	181.10	139.21	0.85
Apache Wash	Reach 1	5.64	1210.00	1855.00	1856.88	1856.50	1857.11	0.004169	3.96	332.87	298.40	0.59
Apache Wash	Reach 1	5.57	1210.00	1850.00	1854.64	1854.64	1855.36	0.005203	7.22	246.50	207.31	0.74
Apache Wash	Reach 1	5.48	1210.00	1846.00	1850.18	1850.18	1851.16	0.008546	7.94	161.36	126.30	0.92
Apache Wash	Reach 1	5.38	1210.00	1841.00	1845.58	1845.58	1846.44	0.007313	8.84	225.92	124.69	0.89
Apache Wash	Reach 1	5.31	1210.00	1838.00	1842.71	1842.71	1843.51	0.007190	8.01	224.17	136.37	0.86
Apache Wash	Reach 1	5.21	1210.00	1834.00	1838.34	1838.34	1838.92	0.006228	6.84	288.00	276.04	0.79
Apache Wash	Reach 1	5.15	1210.00	1830.00	1834.93	1834.93	1835.73	0.005604	7.78	236.68	165.22	0.77
Apache Wash	Reach 1	5.09	1210.00	1830.00	1832.74	1832.74	1833.06	0.008469	6.34	410.66	506.24	0.87
Apache Wash	Reach 1	5.03	1210.00	1826.00	1830.01	1830.01	1830.25	0.003967	5.67	510.48	810.75	0.63
Apache Wash	Reach 1	4.96	1210.00	1822.00	1826.10	1826.10	1826.45	0.006179	6.70	446.05	644.33	0.77
Apache Wash	Reach 1	4.9	1210.00	1822.00	1824.00	1824.00	1824.07	0.001985	3.00	674.30	580.02	0.42
Apache Wash	Reach 1	4.82	1210.00	1818.00	1820.09	1820.09	1822.50	0.052900	14.94	132.82	136.56	2.13
Apache Wash	Reach 1	4.78	1210.00	1813.00	1816.01	1816.01	1816.10	0.002623	4.06	669.03	557.10	0.50
Apache Wash	Reach 1	4.74	1210.00	1810.00	1813.91	1813.91	1814.84	0.013056	8.92	208.95	196.12	1.11
Apache Wash	Reach 1	4.65	1210.00	1806.00	1808.69	1808.69	1809.15	0.009189	6.03	289.16	327.48	0.89
Apache Wash	Reach 1	4.6	1210.00	1802.00	1807.97	1805.23	1807.99	0.000172	1.74	1533.92	614.71	0.15
Apache Wash	Reach 1	4.58	1210.00	1801.30	1807.14	1804.84	1807.77	0.001850	6.37	189.99	565.83	0.47
Apache Wash	Reach 1	4.575	Culvert									
Apache Wash	Reach 1	4.56	1210.00	1799.00	1802.02	1801.82	1802.87	0.007888	7.39	163.78	140.53	0.88
Apache Wash	Reach 1	4.49	1210.00	1796.00	1799.83	1799.30	1800.40	0.005505	6.05	200.07	94.17	0.73
Apache Wash	Reach 1	4.4	1210.00	1792.30	1796.85	1796.85	1797.70	0.006402	8.15	229.54	156.24	0.83
Apache Wash	Reach 1	4.31	1210.00	1788.00	1792.74	1792.74	1794.06	0.007554	9.29	144.53	83.56	0.91
Apache Wash	Reach 1	4.23	1210.00	1786.00	1790.15	1789.79	1790.53	0.004017	5.98	366.36	277.14	0.64
Apache Wash	Reach 1	4.22	1210.00	1785.50	1789.18	1789.18	1789.73	0.006762	7.15	314.10	282.95	0.82
Apache Wash	Reach 1	4.11	1210.00	1782.00	1785.46	1785.46	1786.28	0.011644	7.25	166.90	104.60	1.01
Apache Wash	Reach 1	4.05	1210.00	1779.00	1782.94	1782.94	1783.56	0.005550	7.29	295.47	238.01	0.77
Apache Wash	Reach 1	3.96	1210.00	1774.00	1778.15	1777.82	1778.98	0.007352	7.34	165.52	77.61	0.85
Apache Wash	Reach 1	3.86	1210.00	1770.00	1774.40	1774.40	1775.23	0.007116	7.44	194.44	167.80	0.84
Apache Wash	Reach 1	3.78	1370.00	1766.00	1770.68	1770.68	1771.69	0.009306	8.40	197.17	112.09	0.96
Apache Wash	Reach 1	3.75	1370.00	1764.00	1768.69	1768.69	1770.15	0.007173	9.76	156.15	88.76	0.89
Apache Wash	Reach 1	3.65	1370.00	1762.00	1766.12	1765.68	1766.67	0.003405	6.68	344.48	219.56	0.62
Apache Wash	Reach 1	3.6	1370.00	1760.00	1764.37	1764.32	1765.39	0.006089	8.93	237.02	143.10	0.82
Apache Wash	Reach 1	3.52	1370.00	1756.00	1761.25	1761.25	1762.65	0.006665	9.71	169.52	89.57	0.87
Apache Wash	Reach 1	3.48	1370.00	1755.00	1759.99	1759.99	1761.20	0.006931	9.52	213.32	124.73	0.88
Apache Wash	Reach 1	3.4	1370.00	1752.00	1757.15	1757.14	1758.05	0.006073	8.20	245.07	159.00	0.81
Apache Wash	Reach 1	3.32	1370.00	1750.00	1754.01	1753.67	1754.98	0.006984	7.89	180.27	519.02	0.85
Apache Wash	Reach 1	3.21	1370.00	1746.00	1749.86	1749.86	1750.95	0.008531	8.45	177.70	105.89	0.93
Apache Wash	Reach 1	3.13	1370.00	1742.00	1746.83	1746.73	1748.07	0.007134	9.02	167.74	90.60	0.88
Apache Wash	Reach 1	3.07	1370.00	1741.00	1745.31	1745.07	1746.26	0.005420	8.06	211.80	126.56	0.78
Apache Wash	Reach 1	2.97	1370.00	1738.00	1742.17	1741.87	1743.05	0.007013	7.55	195.47	174.57	0.84
Apache Wash	Reach 1	2.92	1370.00	1735.00	1739.63	1739.45	1740.95	0.008241	9.23	148.45	48.68	0.93
Apache Wash	Reach 1	2.90	1370.00	1734.00	1739.65	1738.30	1740.14	0.002021	6.00	356.58	233.47	0.50
Apache Wash	Reach 1	2.87	1370.00	1734.00	1737.86	1737.86	1739.29	0.009782	9.58	143.02	50.92	1.01
Apache Wash	Reach 1	2.82	1370.00	1731.00	1735.51	1735.31	1736.77	0.008175	8.98	152.57	56.91	0.93
Apache Wash	Reach 2	2.73	2710.00	1728.00	1733.82	1732.91	1734.81	0.003390	8.19	408.60	168.82	0.65
Apache Wash	Reach 2	2.70	2710.00	1728.00	1733.61	1732.44	1734.16	0.002183	6.64	623.50	239.72	0.53
Apache Wash	Reach 2	2.67	2710.00	1728.00	1732.81	1732.76	1733.64	0.005570	7.76	489.23	334.24	0.78

Apache Wash	Reach 3	2.60	3280.00	1724.00	1729.15	1729.15	1731.01	0.008718	10.93	300.02	80.92	1.00
Apache Wash	Reach 3	2.52	3280.00	1721.00	1727.77	1726.21	1728.67	0.002572	7.79	528.55	215.82	0.58
Apache Wash	Reach 3	2.47	3280.00	1720.00	1725.73	1725.73	1727.55	0.006902	10.97	340.20	123.84	0.92
Apache Wash	Reach 3	2.40	3280.00	1718.00	1723.56	1722.17	1724.25	0.002313	6.97	595.18	180.35	0.55
Apache Wash	Reach 3	2.33	3280.00	1717.00	1721.42	1721.42	1722.83	0.007258	9.87	397.53	156.34	0.91
Apache Wash	Reach 3	2.24	3280.00	1714.00	1719.21	1718.50	1720.06	0.004027	7.49	492.68	223.50	0.69
Apache Wash	Reach 3	2.17	3280.00	1714.00	1717.31	1717.27	1718.14	0.006511	8.15	606.14	350.98	0.84
Apache Wash	Reach 3	2.08	3280.00	1710.00	1713.97	1713.68	1714.76	0.008103	9.28	604.11	277.00	0.93
Apache Wash	Reach 3	2.00	3280.00	1708.50	1711.30	1710.86	1711.89	0.007149	7.18	640.71	341.23	0.84
Apache Wash	Reach 3	1.88	3280.00	1702.10	1707.33	1707.33	1708.64	0.006638	9.47	427.60	214.51	0.88
Apache Wash	Reach 3	1.85	3280.00	1700.00	1706.51	1705.42	1707.34	0.002946	7.54	559.40	297.88	0.61
Apache Wash	Reach 3	1.81	3280.00	1700.00	1705.27	1705.27	1706.59	0.004835	9.84	507.74	280.81	0.79
Apache Wash	Reach 3	1.75	3280.00	1698.00	1703.58	1702.68	1704.46	0.003631	7.62	473.14	168.13	0.66
Apache Wash	Reach 3	1.66	3280.00	1696.00	1701.13	1701.13	1702.23	0.005471	8.99	518.22	268.85	0.80
Apache Wash	Reach 3	1.60	3280.00	1692.00	1699.85	1698.47	1700.70	0.002327	7.96	610.40	216.52	0.56
Apache Wash	Reach 3	1.56	3280.00	1692.00	1698.47	1698.00	1700.00	0.006050	9.94	343.45	139.60	0.85
Apache Wash	Reach 3	1.47	3280.00	1690.00	1695.60	1695.20	1697.14	0.005398	10.08	359.83	119.90	0.82
Apache Wash	Reach 3	1.37	3280.00	1688.00	1693.05	1692.97	1694.23	0.005845	8.87	454.27	287.64	0.82
Apache Wash	Reach 3	1.27	3280.00	1684.00	1690.33	1690.33	1691.59	0.004956	10.57	577.22	320.62	0.80
Apache Wash	Reach 3	1.18	3280.00	1680.00	1686.60	1684.60	1687.21	0.001750	6.37	579.25	154.77	0.48
Apache Wash	Reach 3	1.09	3280.00	1680.00	1684.15	1684.15	1685.49	0.006903	10.20	463.78	242.03	0.91
Apache Wash	Reach 3	0.99	3280.00	1678.00	1681.10	1680.29	1681.45	0.005355	7.17	941.57	568.58	0.75
Apache Wash	Reach 3	0.84	3280.00	1670.00	1674.22	1673.86	1675.90	0.009100	11.71	484.73	294.46	1.04
Apache Wash	Reach 3	0.75	3280.00	1666.00	1671.10	1671.10	1672.43	0.006308	9.55	431.27	214.29	0.86
Apache Wash	Reach 3	0.71	3280.00	1664.00	1670.46	1669.55	1671.45	0.003189	8.69	553.15	199.92	0.65
Apache Wash	Reach 3	0.63	3280.00	1664.00	1669.00	1669.00	1669.95	0.004366	8.47	641.16	430.41	0.73
Apache Wash	Reach 3	0.54	3280.00	1660.00	1665.38	1665.38	1666.52	0.004561	9.31	565.74	311.96	0.75
Apache Wash	Reach 3	0.43	3280.00	1655.00	1660.27	1660.27	1661.56	0.006948	9.47	432.28	226.64	0.89
Apache Wash	Reach 3	0.33	3280.00	1652.20	1656.61	1656.32	1657.71	0.007378	8.71	423.54	165.36	0.89
Apache Wash	Reach 3	0.20	3280.00	1646.00	1652.22	1651.63	1653.77	0.005004	10.11	355.52	97.98	0.79
Desert Hills Was	Reach 1	0.99	1990.00	1748.00	1754.74	1754.42	1755.09	0.002707	6.91	800.22	560.25	0.53
Desert Hills Was	Reach 1	0.90	1990.00	1748.00	1753.01	1752.97	1753.52	0.004099	8.54	678.60	525.62	0.70
Desert Hills Was	Reach 1	0.81	1990.00	1746.00	1750.74	1750.70	1751.28	0.005175	7.98	611.31	513.33	0.73
Desert Hills Was	Reach 1	0.72	1990.00	1744.00	1748.67	1748.50	1749.09	0.004521	7.59	658.45	499.70	0.70
Desert Hills Was	Reach 1	0.64	1990.00	1742.00	1747.03	1747.03	1747.54	0.004190	7.51	690.06	655.06	0.69
Desert Hills Was	Reach 1	0.56	1990.00	1740.00	1745.45	1745.45	1745.94	0.003488	7.52	735.47	651.71	0.64
Desert Hills Was	Reach 1	0.48	1990.00	1740.00	1744.49	1744.00	1744.71	0.002052	5.71	949.55	642.41	0.49
Desert Hills Was	Reach 1	0.40	1990.00	1738.00	1743.11	1743.00	1743.59	0.003902	6.86	625.21	520.27	0.66
Desert Hills Was	Reach 1	0.386	1990.00	1738.00	1742.37	1742.10	1742.69	0.002853	6.64	779.54	541.56	0.58
Desert Hills Was	Reach 1	0.31	1990.00	1736.00	1740.63	1740.63	1741.26	0.004066	7.56	570.90	512.57	0.68
Desert Hills Was	Reach 1	0.22	1990.00	1734.00	1739.01	1738.98	1739.82	0.004445	7.82	417.00	356.11	0.72
Desert Hills Was	Reach 1	0.19	1990.00	1734.00	1738.52	1738.52	1739.14	0.003814	7.42	542.27	527.66	0.67
Desert Hills Was	Reach 1	0.09	1990.00	1732.00	1737.28	1735.34	1737.51	0.001239	4.58	734.98	317.55	0.39
Desert Hills Was	Reach 1	0.04	1990.00	1730.00	1735.45	1735.07	1736.82	0.005308	9.53	238.83	95.44	0.80

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Ex-10

River: Desert Hills Was Reach: Reach 1 RS: 0.99 Profile: 10-year

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

River: Desert Hills Was Reach: Reach 1 RS: 0.90 Profile: 10-year

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

River: Desert Hills Was Reach: Reach 1 RS: 0.81 Profile: 10-year

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

River: Desert Hills Was Reach: Reach 1 RS: 0.72 Profile: 10-year

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

River: Desert Hills Was Reach: Reach 1 RS: 0.64 Profile: 10-year

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

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

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

River: Desert Hills Was Reach: Reach 1 RS: 0.56 Profile: 10-year

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

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

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

River: Desert Hills Was Reach: Reach 1 RS: 0.48 Profile: 10-year

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

River: Desert Hills Was Reach: Reach 1 RS: 0.386 Profile: 10-year

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.

River: Desert Hills Was Reach: Reach 1 RS: 0.31 Profile: 10-year

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

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

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

River: Desert Hills Was Reach: Reach 1 RS: 0.22 Profile: 10-year

Warning:Divided flow computed for this cross-section.
River: Desert Hills Was Reach: Reach 1 RS: 0.19 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Desert Hills Was Reach: Reach 1 RS: 0.09 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.04 Profile: 10-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 8.02 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.98 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.89 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.84 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.74 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.65 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.55 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.46 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.36 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Apache Wash Reach: Reach 1 RS: 7.28 Profile: 10-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

River: Apache Wash Reach: Reach 1 RS: 7.17 Profile: 10-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 7.08 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 6.98 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 6.9 Profile: 10-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 6.8 Profile: 10-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 6.71 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 6.63 Profile: 10-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 6.58 Profile: 10-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 1 RS: 6.5 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 6.43 Profile: 10-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 6.32 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 6.25 Profile: 10-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 6.16 Profile: 10-year

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

Warning:Divided flow computed for this cross-section.

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

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

River: Apache Wash Reach: Reach 1 RS: 6.09 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 6.01 Profile: 10-year

Warning:Divided flow computed for this cross-section.

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

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

the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 5.92 Profile: 10-year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 5.83 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.76 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.66 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.64 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 5.57 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.48 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.38 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.31 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.21 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 5.15 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Apache Wash Reach: Reach 1 RS: 5.09 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was

used.
River: Apache Wash Reach: Reach 1 RS: 5.03 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.96 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.9 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.82 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Apache Wash Reach: Reach 1 RS: 4.78 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.74 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: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.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.65 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.6 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 4.575 Profile: 10-year Culv: Box1
Note: The flow in the culvert is entirely supercritical.
River: Apache Wash Reach: Reach 1 RS: 4.56 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 4.49 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 4.4 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water

surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.31 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.22 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.11 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.05 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.96 Profile: 10-year
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.
River: Apache Wash Reach: Reach 1 RS: 3.86 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: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.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.78 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: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.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.75 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.65 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 3.6 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 3.52 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.48 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Apache Wash Reach: Reach 1 RS: 3.4 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 3.32 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 3.21 Profile: 10-year

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

Warning:Divided flow computed for this cross-section.

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

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

River: Apache Wash Reach: Reach 1 RS: 3.13 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 3.07 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 2.97 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 2.92 Profile: 10-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

River: Apache Wash Reach: Reach 1 RS: 2.90 Profile: 10-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

River: Apache Wash Reach: Reach 1 RS: 2.87 Profile: 10-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 2.82 Profile: 10-year

Warning:Divided flow computed for this cross-section.

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

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

River: Apache Wash Reach: Reach 2 RS: 2.70 Profile: 10-year

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

River: Apache Wash Reach: Reach 2 RS: 2.67 Profile: 10-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

River: Apache Wash Reach: Reach 3 RS: 2.60 Profile: 10-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

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

River: Apache Wash Reach: Reach 3 RS: 2.52 Profile: 10-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 3 RS: 2.47 Profile: 10-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

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

River: Apache Wash Reach: Reach 3 RS: 2.40 Profile: 10-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 3 RS: 2.33 Profile: 10-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
iver: Apache Wash Reach: Reach 3 RS: 2.24 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.17 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.08 Profile: 10-year
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.
River: Apache Wash Reach: Reach 3 RS: 2.00 Profile: 10-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.88 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.85 Profile: 10-year
Warning:Divided flow computed for this cross-section.
River: Apache Wash Reach: Reach 3 RS: 1.81 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.75 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.66 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.60 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.56 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.47 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.37 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.27 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.18 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.09 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.99 Profile: 10-year
Warning:Divided flow computed for this cross-section.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The 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.
iver: Apache Wash Reach: Reach 3 RS: 0.84 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.75 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
River: Apache Wash Reach: Reach 3 RS: 0.71 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.63 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.54 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.43 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: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.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.33 Profile: 10-year
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.
River: Paradise Wash Reach: Reach 1 RS: 2.23 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
`iver: Paradise Wash Reach: Reach 1 RS: 2.14 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 2.07 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 2.00 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.92 Profile: 10-year
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.
River: Paradise Wash Reach: Reach 1 RS: 1.83 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.75 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.65 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Paradise Wash Reach: Reach 1 RS: 1.54 Profile: 10-year

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.

River: Paradise Wash Reach: Reach 1 RS: 1.46 Profile: 10-year

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

River: Paradise Wash Reach: Reach 1 RS: 1.37 Profile: 10-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 1.27 Profile: 10-year

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

River: Paradise Wash Reach: Reach 1 RS: 1.21 Profile: 10-year

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

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

River: Paradise Wash Reach: Reach 1 RS: 1.12 Profile: 10-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

River: Paradise Wash Reach: Reach 1 RS: 1.04 Profile: 10-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 0.95 Profile: 10-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

River: Paradise Wash Reach: Reach 1 RS: 0.89 Profile: 10-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

River: Paradise Wash Reach: Reach 1 RS: 0.80 Profile: 10-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 0.72 Profile: 10-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 0.62 Profile: 10-year

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

River: Paradise Wash Reach: Reach 1 RS: 0.53 Profile: 10-year

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

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

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

River: Paradise Wash Reach: Reach 1 RS: 0.44 Profile: 10-year

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

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

River: Paradise Wash Reach: Reach 1 RS: 0.34 Profile: 10-year

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

Warning:Divided flow computed for this cross-section.

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

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

River: Paradise Wash Reach: Reach 1 RS: 0.28 Profile: 10-year

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

Warning:Divided flow computed for this cross-section.

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

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

the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.17 Profile: 10-year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.13 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.04 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

APPENDIX F.7

Apache Wash: 100-year Future Conditions

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Apache Wash WMP
Project File : Apache1.prj
Run Date and Time: 1/20/00 8:28:08 AM

Project in English units

Project Description:
Upper Cave Creek and Apache Wash Watercourse Master Plan

For Apache Wash
above Cave Buttes Dam
by Stantec Consulting Inc. for the Flood Control
District of Maricopa County
FCD:

March 1999

PLAN DATA

Plan Title: Future Condition 100-year
Plan File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.p01

Geometry Title: Revised Geometry 100-year
Geometry File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.g04

Flow Title : Future Condition 100-year
Flow File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.f05

Plan Summary Information:
Number of: Cross Sections = 139 Mulitple Openings = 0
Culverts = 1 Inline Weirs = 0
Bridges = 0

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

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = Apache Wash Reach = Reach 3

RS	Profile	Method	Value1	Value2
2.60	100yr encr	1	9800	10450
2.52	100yr encr	1	9850	10385
2.47	100yr encr	1	9940	10310
2.40	100yr encr	1	9800	10047
2.33	100yr encr	1	9830	10042
2.24	100yr encr	1	9850	10155
2.17	100yr encr	1	9834	10285
2.08	100yr encr	1	9970	10620
2.00	100yr encr	1	9969	10760
1.88	100yr encr	1	9771	10410
1.85	100yr encr	1	9819	10400
1.81	100yr encr	1	9947	10410
1.75	100yr encr	1	9953	10321
1.66	100yr encr	1	9860	10250
1.60	100yr encr	1	9610	10049
1.56	100yr encr	1	9610	10057
1.47	100yr encr	1	9570	10060
1.37	100yr encr	1	9560	10052

1.27	100yr encr	1	9880	10290
1.18	100yr encr	1	9885	10375
1.09	100yr encr	1	9923	10430
0.99	100yr encr	1	9931	10550
0.84	100yr encr	1	9885	10280
0.75	100yr encr	1	9750	10214
0.71	100yr encr	1	9730	10150
0.63	100yr encr	1	9662	10180
0.54	100yr encr	1	9840	10340
0.43	100yr encr	1	9900	10368
0.33	100yr encr	1	9900	10300
0.20	100yr encr	1	9600	10190

River = Apache Wash Reach = Reach 2

RS	Profile	Method	Value1	Value2
2.97	100yr encr	1	8995.5	11098
2.92	100yr encr	1	9350	10755
2.90	100yr encr	1	9530	10469
2.87	100yr encr	1	9400	10485
2.82	100yr encr	1	9530	10294
2.73	100yr encr	1	9787	10080

River = Apache Wash Reach = Reach 1

RS	Profile	Method	Value1	Value2
8.02	100yr encr	1	9825	10110
7.98	100yr encr	1	9700	10075
7.89	100yr encr	1	9875	10155
7.84	100yr encr	1	9885	10110
7.74	100yr encr	1	9850	10131
7.65	100yr encr	1	9800	10050
7.55	100yr encr	1	9911	10150
7.46	100yr encr	1	9923	10110
7.36	100yr encr	1	9825	10040.3
7.28	100yr encr	1	9755	10042.8
7.17	100yr encr	1	9951	10097
7.08	100yr encr	1	9926	10066
6.98	100yr encr	1	9900	10075
6.9	100yr encr	1	9822	10024
6.8	100yr encr	1	9800	10037
6.71	100yr encr	1	9965	10150
6.63	100yr encr	1	9982	10140
6.58	100yr encr	1	9926	10100
6.5	100yr encr	1	9850	10072
6.43	100yr encr	1	9800	10040
6.32	100yr encr	1	9957	10240
6.25	100yr encr	1	9940	10240
6.16	100yr encr	1	9974	10319
6.09	100yr encr	1	9920	10230
6.01	100yr encr	1	9920	10250
5.92	100yr encr	1	9940	10250
5.83	100yr encr	1	9820	10120
5.76	100yr encr	1	9705	10100
5.66	100yr encr	1	9800	10120
5.64	100yr encr	1	9870	10180
5.57	100yr encr	1	9812	10050
5.48	100yr encr	1	9860	10120
5.38	100yr encr	1	9860	10100
5.31	100yr encr	1	9808	10100
5.21	100yr encr	1	9850	10175
5.15	100yr encr	1	9962	10330
5.09	100yr encr	1	9890	10320
5.03	100yr encr	1	9900	10350
4.96	100yr encr	1	9900	10350
4.9	100yr encr	1	9825	10340
4.82	100yr encr	1	9832	10456
4.78	100yr encr	1	9964.87	10640
4.74	100yr encr	1	9822	10700
4.65	100yr encr	1	9820	10360
4.6	100yr encr	1	9890	10500
4.58	100yr encr	1	9900	10500
4.575	100yr encr	1	9910	10500
4.56	100yr encr	1	9944	10216
4.49	100yr encr	1	9910	10183
4.4	100yr encr	1	9938	10249
4.31	100yr encr	1	9920	10114
4.23	100yr encr	1	9830	10097
4.22	100yr encr	1	9780	10082
4.11	100yr encr	1	9975	10293
4.05	100yr encr	1	9968	10270
3.96	100yr encr	1	9877	10433
3.86	100yr encr	1	9950	10330
3.78	100yr encr	1	9950	10226
3.75	100yr encr	1	9960	10220
3.65	100yr encr	1	9900	10190
3.6	100yr encr	1	9891	10160
3.52	100yr encr	1	9900	10141
3.48	100yr encr	1	9900	10170
3.4	100yr encr	1	9800	10140
3.32	100yr encr	1	9800	10175
3.21	100yr encr	1	9780	10170
3.13	100yr encr	1	9600	10068
3.07	100yr encr	1	9740	10150

River = Paradise Wash Reach = Reach 1

RS	Profile	Method	Value1	Value2

2.23	100yr encr	1	9937	10150
2.14	100yr encr	1	9965.2	10219
2.07	100yr encr	1	9956.8	10270
2.00	100yr encr	1	9965.67	10180
1.92	100yr encr	1	9928	10100
1.83	100yr encr	1	9968	10190
1.75	100yr encr	1	9940	10306
1.65	100yr encr	1	9915	10417
1.54	100yr encr	1	9972	10228
1.46	100yr encr	1	9885	10179
1.37	100yr encr	1	9866	10069
1.27	100yr encr	1	9960	10150
1.21	100yr encr	1	9750	10131
1.12	100yr encr	1	9640	10031
1.04	100yr encr	1	9750	10058
0.95	100yr encr	1	9870	10120
0.89	100yr encr	1	9930	10100
0.80	100yr encr	1	9870	10150
0.72	100yr encr	1	9800	10062
0.62	100yr encr	1	9900	10170
0.53	100yr encr	1	9880	10108
0.44	100yr encr	1	9900	10166
0.34	100yr encr	1	9905	10327
0.28	100yr encr	1	9814	10085
0.17	100yr encr	1	9963.2	10150
0.13	100yr encr	1	9960.5	10220
0.04	100yr encr	1	9705	10250

River = Desert Hills Was Reach = Reach 1

RS	Profile	Method	Value1	Value2
0.99	100yr encr	1	9750	10175
0.90	100yr encr	1	9750	10200
0.81	100yr encr	1	9750	10350
0.72	100yr encr	1	9950	10335
0.64	100yr encr	1	9750	10230
0.56	100yr encr	1	9513	10084
0.48	100yr encr	1	9758	10314
0.40	100yr encr	1	9580	10120

FLOW DATA

Flow Title: Future Condition 100-year
Flow File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.f05

Flow Data (cfs)

River	Reach	RS	100-year	100yr encr
Desert Hills Was	Reach 1	0.99	10761	10761
Apache Wash	Reach 1	8.02	7408	7408
Apache Wash	Reach 1	6.01	7403	7403
Apache Wash	Reach 1	3.76	7727	7727
Apache Wash	Reach 2	2.97	13890	13890
Apache Wash	Reach 3	2.60	17944	17944
Paradise Wash	Reach 1	2.23	5401	5401
Paradise Wash	Reach 1	1.54	5992	5992

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Apache Wash	Reach 3	100-year		Normal S = .005

GEOMETRY DATA

Geometry Title: Revised Geometry 100-year
Geometry File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.g04

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Desert Hills Was	Reach 1		DH & A Wash
Apache Wash	Reach 1		DH & A Wash
Apache Wash	Reach 2	DH & A Wash	P & A Wash
Apache Wash	Reach 3	P & A Wash	
Paradise Wash	Reach 1		P & A Wash

JUNCTION INFORMATION

Name: DH & A Wash
Description: Confluence of Desert Hills Wash with Apache Wash
Energy computation Method

Length across Junction		Tributary			
River	Reach	River	Reach	Length	Angle
Apache Wash	Reach 1	to Apache Wash	Reach 2	520	
Desert Hills Was	Reach 1	to Apache Wash	Reach 2	400	

Name: P & A Wash
Description: Confluence of Paradise Wash with Apache Wash
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Apache Wash	Reach 2	to Apache Wash	Reach 3	700	
Paradise Wash	Reach 1	to Apache Wash	Reach 3	205	

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.99

INPUT
Description: 0.99
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9333.68	1762	9403.72	1760	9486.25	1758	9487.32	1758	9640.92	1756
9732.38	1754	9737.95	1754	9814.01	1754	9988.19	1752	9989.38	1750
9990.31	1750	9991.34	1752	9992.23	1752	9994.34	1750	9996.33	1748
10004.96	174810008.87		175010012.73		175210163.12		175410423.96		1756
10451.19	175610470.06		175610553.26		175810641.18		1760		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9333.68	.055	9988.19	.03	10012.73	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.19	10012.73	490	470	440	.1	.3

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.90

INPUT
Description: 0.9
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9643.57	1760	9696.3	1758	9729.54	1756	9766.39	1754	9766.58	1754
9831.51	1752	9950.49	1751	9996.49	175010000.96		174810013.62		1748
10013.64	174810017.63		175010021.66		175210021.74		175210038.07		1752
10038.12	175210235.65		175210411.03		175410599.65		1756	10800	1758

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9643.57	.055	9996.49	.03	10017.63	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9996.49	10017.63	500	491	480	.1	.3

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.81

INPUT
Description: 0.81
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9680	1755.3	9730	1754	9779.07	1752	9805.44	1752	9883.96	1750
9884.14	1750	9983.58	1750	9983.71	1750	9988.29	1750	9989.3	1748
9990.31	1746	9990.32	1746	10011.7	174610014.89		174810014.94		1748
10017.9	175010018.03		175010035.47		175010035.57		1750	10105	1748.5
10270	1750	10535	1752	10680	1754	10740	1756		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9680	.055	9983.58	.03	10018.03	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.58	10018.03	550	492	400	.1	.3

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.72

INPUT
Description: 0.72
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9365	1756	9470	1754	9625	1752	9800	1750	9986.71	1748
9986.75	1748	9991.03	1746	9991.08	1746	9995.08	1744	9995.12	1744
10010.29	174410013.39		1746	10016.5	174810081.37		1748	10315	1746.2
10380	1748	10510	1750	10610	1750	10740	1752	10800	1754
10835	1756								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9365	.055	9986.71	.03	10016.5	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.71	10016.5	340	373	325	.1	.3

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.64

INPUT
Description: 0.64
Station Elevation Data num= 10

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9420    1750    9590    1748    9825    1746 9977.76    1746 9993.02    1742
10006.33    1742 10006.4    174210018.06    1746   10305    1746   10517    1750

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9420    .055 9977.76     .0310018.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.7610018.06               270     450     450             .1       .3

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.56

INPUT
Description: 0.56  -- First XS within WMP Study Limit
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8940    1750    9000    1749    9200    1748    9475    1746    9600    1744
    9615    1744    9730    1745 9986.89    1744 9998.14    174010012.68    1740
10012.77    174010019.47    174410081.48    174410085.66    174410292.39    1748
   10350    1750

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8940    .055 9986.89     .0310019.47    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.8910019.47               320     436     450             .1       .3

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.48

INPUT
Description: 0.48
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8900  1750.2    9100    1750    9415    1748    9560    1746 9979.98    1742
 9985.27    174010007.03    174010013.02    1742   10335    1744   10440    1746
   10475    1748   10500    1750

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8900    .055 9979.98     .0310013.02    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.9810013.02               410     380     340             .1       .3

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.40

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9000    1748    9100    1748 9402.16    1746 9610.77    1744 9720.22    1742
 9949.58    1742 9966.56    1742 9976.95    1740 9988.11    1738 9999.42    1738
10008.13    174010016.94    174210021.82    174210103.85    174210240.84    1744
10290.98    174610292.67    174610324.41    174810327.05    174810352.56    1750

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9000    .055 9966.56     .0310021.82    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.5610021.82               180     260     320             .1       .3

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.386

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9162    1748    9382    1746    9604    1744    9712    1742    9982    1740
    9988    1738   10012    1738   10014    1740   10212    1742   10235    1744
   10242    1744   10262    1742   10330    1744   10509    1746

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9162    .055    9982     .03   10014    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9982   10014                 0       0       0             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 8.02

INPUT
Description: 8.02

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9610    1996    9700    1992    9765  1991.9    9862    1990    9894    1988
    9897    1988    9951  1989.2    9977    1988    9989    1986   10000  1985.1
```

10020	1986	10037	1988	10077	1990	10109	1992	10116	1994
10125	1996								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9610	.055	9977	.03	10037	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9977	10037	215	235	245	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1 RS: 7.98

INPUT
Description: 7.98

Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9500	1992	9570	1990	9630	1988	9740	1986	9773	1986
9859	1986	9898	1986.4	9927	1986	9950	1986	9975	1986
9982	1984	9991	1982	10000	1981.8	10005	1982	10017	1984
10039	1986	10075	1988	10097	1988.2	10116	1990	10127	1992

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9500	.055	9975	.03	10039	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975	10039	280	465	520	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1 RS: 7.89

INPUT
Description: 7.89

Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9756	1986	9764	1984	9845	1984	9878	1984	9978	1982
9983	1982	9987	1980	9992	1978	10000	1977	10020	1978
10054	1980	10082	1980	10149	1981.8	10170	1982	10189	1982
10219	1982	10224	1984	10256	1985.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9756	.055	9983	.03	10054	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983	10054	300	300	220	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1 RS: 7.84

INPUT
Description: 7.84

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9793	1984	9828	1982	9841	1980	9908	1978	9916	1976
9918	1976	9941	1976	9975	1976	9984	1976	10000	1974.4
10025	1976	10036	1978	10073	1978	10206	1980	10222	1982
10267	1983								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9793	.055	9984	.03	10025	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9984	10025	575	500	425	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1 RS: 7.74

INPUT
Description: 7.74

Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9733	1978	9744	1976	9754	1974	9765	1972	9800	1972
9836	1972.3	9888	1972	9915	1972	9968	1972.4	9981	1972
9983.74	1970.96	9987	1970	10000	1969.1	10010	1970	10035.24	1971
10062	1972	10086	1972.3	10097	1972	10123	1972	10127	1974
10133	1976	10138	1978						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9733	.055	9983.74	.03	10035.24	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.74	10035.24	425	500	475	.1	.3

CROSS SECTION RIVER: Apache Wash
REACH: Reach 1 RS: 7.65

INPUT

```
Description: 7.65 -- Approximate Study Limit
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9787    1970    9805    1966    9882  1965.5    9917    1964 9977.37    1964
 9986.15    1962   10000  1961.810010.39   196210016.47   196410022.56    1966
10109.69   196810128.52    1970   10165    1971

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9787    .055 9977.37    .0310022.56    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.3710022.56              520     500     470             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.55

INPUT
Description: 7.55

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9877.72    1968 9895.81    1966 9913.89    1964 9929.39    1962 9970.07    1960
 9981.49    1958   10000  1956.710024.51   195810028.16   196010145.16    1960
10158.57   196210173.58    1964 10182.6   196610293.44    1968

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9877.72    .055 9970.07    .0310028.16    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.0710028.16              510     500     480             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.46

INPUT
Description: 7.46

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9830.45    1960 9861.07    1958 9923.22    1956 9969.47    1954 9976.86    1952
    9990  1951.5 10000.7   195210032.17   195210051.31   195310081.59    1954
 10119.3   195610130.99    1958 10142.8    1960

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9830.45    .055 9969.47    .0310051.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.4710051.31              490     500     510             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.36

INPUT
Description: 7.36

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9725    1954    9740    1952    9800    1950 9835.52    1950 9949.32    1948
 9977.98    1946    9998  1944.510011.65   194610023.48   194810033.89    1950
10040.39   195210046.86    1954

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9725    .055 9949.32    .0310023.48    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.3210023.48              420     446     470             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.28

INPUT
Description: 7.28

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9710    1950    9760    1944    9800    1942 9836.63    1942 9849.74  1941.8
 9874.17  1941.8 9924.41    1942 9988.71    1942    9998  1940.810010.16    1942
10021.65   194410030.54    1946 10038.9    1948 10047.2    1950

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9710    .055 9988.71    .0310010.16    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.7110010.16              475     554     410             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.17

INPUT
Description: 7.17
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Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9950.59    1944 9955.33    1942 9960.08    1940 9967.15    1938 9978.76    1936
  9991.7    1934   10000 1934.310014.37    193410024.18    1936   10034    1938
10043.85    194010082.22    194210098.58    1944

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9950.59    .055 9978.76     .0310024.18    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.7610024.18              500     500     520             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 7.08

INPUT
Description: 7.08

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9917.61    1940 9925.72    1938 9934.65    1936 9943.58    1934 9953.07    1932
 9965.94    1930    9987    192910007.17    193010021.87    193210036.31    1934
 10051.7    1936 10067.1    1938 10082.5    1940

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9917.61    .055 9953.07     .0310021.87    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9953.0710021.87              485     500     500             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.98

INPUT
Description: 6.98
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9723.34    1934    9740    1932    9772    1930    9797    1930    9900    1932
    9935    1932 9944.17    1930 9975.97    1928  9985.4    1926 9994.24    1924
10004.06    192410020.09    192610031.62    192810071.11    193010085.11    1932
10100.97    1934

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9723.34    .055 9975.97     .0310031.62    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.9710031.62              400     437     470             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.9

INPUT
Description: 6.9

Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9598.79    1930    9625    1926    9705    1926    9770    1928    9800    1928
 9822.48    1928 9857.37    1926 9954.17    1924 9987.42    192210000.76    1920
10011.02    192010014.22    192210017.39    192410020.56    192610023.72    1928
10026.89    1930

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9598.79    .055 9954.17     .0310017.39    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.1710017.39              490     529     560             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.8

INPUT
Description: 6.8

Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9660    1924    9705    1920    9725    1919    9755    1920    9800    1920
 9880.75    1920 9901.03    1920 9976.63    1918 9976.81    1918 9982.58    1916
 9982.91    1916  9988.6    1914 9988.73    191410004.27    191410004.41    1914
10010.43    191610010.46    1916 10016.4    191810016.52    191810022.44    1920
10022.57    192010028.44    1922   10040  1923.7

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9660    .055 9976.63     .0310016.52    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.6310016.52              500     495     400             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.71
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INPUT
Description: 6.71 -- Approximate Joy Ranch Road Alignment
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9970    1918 9977.71 1914.04 9981.63 1912.03    9990    1908   10000  1907.5
   10010    1908   10025    1912   10045    1914   10090    1916   10225    1918

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9970    .055 9981.63     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.63   10025               425     390     350             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.63

INPUT
Description: 6.63
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9976.91    1916 9982.13    1914 9983.41    1912 9984.66    1910 9985.91    1908
 9987.08    1906    9995    1905   10005    190510015.13    190610021.82    1908
10050.15    191010131.79    191210273.67    191410318.49    1916

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9976.91    .055 9985.91     .0310021.82    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.9110021.82               300     290     290             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.58

INPUT
Description: 6.58
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9897.27    1912 9926.14    1910 9950.13    1908  9965.1    1906 9980.22    1904
 9998.11    190210006.79    190210014.85    190410022.84    190610088.23    1908
10249.56    191010282.55    1912

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9897.27    .055  9965.1     .0310022.84    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9965.110022.84               430     430     430             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.5

INPUT
Description: 6.5
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9636.39    1910 9702.53    1908 9718.78    1906 9747.02    1904  9794.4    1904
 9947.45    1904 9967.32    1902 9987.47    1900    9995    1899   10010    1899
10019.82    190010042.69    190210071.54    190410099.13    1906 10152.4    1908
   10187    1910

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9636.39    .055 9947.45     .0310071.54    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9947.4510071.54               310     345     355             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.43

INPUT
Description: 6.43

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9655    1906    9665    1904    9680    1902    9690    1900    9925    1900
    9970    1898    9990  1896.5   10010  1896.5   10020    1898   10030    1900
   10040    1902   10120    1904   10285    1906

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9655    .055    9925     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9925   10030               475     450     360             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.32

INPUT
Description: 6.32
Station Elevation Data     num=      14
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     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9951.16     1900  9957.9     1898 9964.52     1896 9970.99     1894 9977.55     1892
 9984.06     189010006.52     189010013.72     189210020.18     189410100.18     1896
10266.52     189810293.42     189810347.28     189810412.02     1900

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9951.16    .055 9970.99     .0310020.18    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.9910020.18               410     390     350             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.25

INPUT
Description: 6.25
Station Elevation Data     num=       14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9911.34     1898 9931.58     1896 9947.24     1894 9961.84     1892 9976.08     1890
    9990     1888   10015     1888 10030.1     189010045.42     189210069.44     1892
10268.14     189210454.21     189410476.27     189610569.33     1898

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9911.34    .055 9961.84     .0310045.42    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9961.8410045.42               490     460     430             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.16

INPUT
Description: 6.16
Station Elevation Data     num=       20
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9875  1892.5 9961.21     1892  9972.1     1890 9977.65     1888  9983.3     1886
 9989.16     1884 9996.77     1883 9997.18     188310022.78     188410039.58     1886
10050.58     188810110.58     188810208.91     188610225.08     188610318.94     1888
10345.72     1890 10414.9     189210424.02     189210428.81     189210468.67 1893.08

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9875    .055 9977.65     .0310050.58    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.6510050.58               270     360     450             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.09

INPUT
Description: 6.09 -- Old New River Road
Station Elevation Data     num=       10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9815     1886     9890     1884     9935     1882     9970     1880    10010   1879.5
   10050     1880    10070     1882    10345     1884    10380     1886    10520     1888

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9815    .055     9935     .03    10070    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9935   10070               470     445     435             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.01

INPUT
Description: 6.01

Station Elevation Data     num=       17
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9750     1883     9870     1882     9920     1880     9955     1878     9980     1876
   10000   1875.5    10010     1876    10020     1878    10035     1880    10075     1880
   10160     1878    10175     1877    10190     1878    10260     1880    10280     1882
   10400     1884    10580     1886

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9750    .055     9920     .03    10035    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9920   10035               485     490     510             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 5.92

INPUT
Description: 5.92
Station Elevation Data     num=       19
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9720     1877 9854.04     1876 9948.34     1874 9975.43     1872    10000  1870.2
10006.77     187210015.55     187410024.34     187610034.96     187610094.25     1874
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10130.93    1872 10149.3    187010150.59    187010177.58    187210238.14    1874
10251.91    187410318.15    187410335.66    187610350.37    1878

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9720    .055 9948.34     .0310024.34    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.3410024.34               375     400     375             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.83

INPUT
Description: 5.83

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9500    1874    9550    1872    9650    1872    9710    1872    9735    1870
    9890    1870    9960    1868    9990    1866   10000  1865.5   10005    1866
   10030    1868   10105    1868   10120    1870   10140    1872   10155    1874
   10250    1875

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9500    .055    9960     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9960   10030               375     380     380             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.76

INPUT
Description: 5.76
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9640    1870 9674.85    1868 9704.99    1866 9712.43    1864 9741.92    1866
    9835    1866    9865    1866 9968.58    1864 9985.72    186210014.25    1862
10043.06    186410096.64    1866 10124.8    186810142.86    187010144.93    1870

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9640    .055 9968.58     .0310043.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.5810043.06               470     540     570             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.66

INPUT
Description: 5.66
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9504.86    1864 9505.03    1864  9622.9    1862 9622.94    1862 9802.24    1862
 9802.28    1862 9805.57    1862 9805.58    1862 9814.49    1860 9838.73    1858
 9838.74    1858 9839.05    1858 9857.77    1860 9980.02    1860 9995.33    1854
 10003.7    185410014.57    1858   10030    1859 10136.3    186010136.31    1860
10169.16    1862   10210  1862.5   10615    1863

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9504.86    .055 9980.02     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.02   10030               460     440     320             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.64

INPUT
Description: 5.64 -- Cloud Road
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9650    1862    9775    1860    9870    1858    9955    185610037.94    1855
   10170    1856   10275    1858   10365    1860   10575  1862.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9650    .055    9955     .03   10170    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9955   10170               370     345     320             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.57

INPUT
Description: 5.57

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400    1859    9520    1858    9700    1856    9731    1858    9800    1858
    9812    1856    9824    1854    9977    1854    9985    1852    9993    1850
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   10005    1850   10014    1852   10024    1854   10035    1856   10170    1858
   10299    1860

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .055    9977     .03   10035    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9977   10035              400     450     450             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.48

INPUT
Description: 5.48
Station Elevation Data     num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9300    1855    9440    1854    9750    1854    9790    1852    9895    1852
 9929.89    1850 9978.41    185010000.42    1846 10004.4    184610044.06    1850
10141.09    185210147.22    185210418.73    185210547.75    185410626.53    1856

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9300    .055 9978.41     .0310044.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110044.06              530     500     500             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.38

INPUT
Description: 5.38

Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9815    1850    9880    1848    9900    1846    9910    1844    9985    1844
   10000    1841   10015    1844   10030    1846   10110    1846   10255    1848
   10460    1850

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9815    .055    9985     .03   10015    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9985   10015              350     375     425             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.31

INPUT
Description: 5.31
Station Elevation Data     num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9325    1847 9444.34    1846 9557.15    1844 9887.76    1844 9911.33    1840
 9919.33    1840 9919.34    1840 9933.33    1842 9933.43    1842 9988.23    1842
 9988.24    1842 9997.67    183810005.97    1838 10024.7    184210044.49    1844
 10044.5    184410061.08    184410218.05    1844   10565    1846

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9325    .055 9988.23     .0310044.49    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.2310044.49              500     500     480             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.21

INPUT
Description: 5.21

Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1842    9780    1840    9860    1838    9885    1836    9890    1836
    9915    1838    9970    1838    9985    1836   10000    1834   10015    1836
   10030    1838   10085    1838   10110    1837   10120    1838   10135    1840
   10150    1840   10245    1838   10310    1838   10355    1840   10400    1840
   10525    1842

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9970     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10030              330     310     300             .1       .3
Right Levee     Station=   10135      Elevation=    1840

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.15

INPUT
Description: 5.15

Station Elevation Data     num=      14
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     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9870    1839    9945    1838    9978    1836    9988    1834   10000    1830
   10010    1830   10025    1834   10130    1834   10170    1836   10200    1836
   10320    1835   10495    1836   10522    1838   10780    1840

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9870    .055    9978     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10025              350     352     355            .1        .3
Right Levee     Station=   10170      Elevation=    1836

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1            RS: 5.09

INPUT
Description: 5.09

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9480    1835    9515    1834    9550    1832    9970    1832    9985    1830
   10000    1831   10025    1832   10075    1834   10120    1830   10145    1832
   10255    1832   10320    1834   10435    1834   10780    1836

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9480    .055    9970     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10025              300     300     310            .1        .3
Right Levee     Station=   10075      Elevation=    1834

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1            RS: 5.03

INPUT
Description: 5.03
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9515    1833 9590.59    1832 9640.88    1830 9975.12    1830 9992.06    1826
10001.75    182610012.26    1830 10053.1    183010133.33    183010188.37    1828
10281.59    1828   10620    1832   10750  1832.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9515    .055 9975.12     .0310012.26    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.1210012.26              345     365     340            .1        .3
Right Levee     Station=10133.33      Elevation=    1830

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1            RS: 4.96

INPUT
Description: 4.96
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9716.18    1828 9717.02    1828 9800.79    1826 9974.19    1826 9995.82    1822
10000.05    182210011.03    182610011.04    182610156.72    182610156.73    1826
   10310    182410344.97    182410425.12    182610592.76    182710594.98    1827
   10670    1828   10790    1830

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9716.18    .055 9974.19     .0310011.03    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9974.1910011.03              400     320     200            .1        .3
Right Levee     Station=10156.63      Elevation=    1826

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1            RS: 4.9

INPUT
Description: 4.9
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9757    1826    9850    1824    9881    1822    9910    1820    9912    1820
    9922    1822    9936    1824    9966    1824    9978    1822    9986    1820
   10014    1820   10023    1822   10032    1824   10049    1824   10175    1822
   10199    1822   10235  1823.2   10274    1822   10294    1822   10305    1820
   10320    1820   10334    1822   10374    1822   10386    1824   10805    1826

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9757    .055    9966     .03   10032    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9966   10032              220     200     160            .1        .3
Left Levee      Station=    9966      Elevation=    1824
Right Levee     Station=   10032      Elevation=    1824

CROSS SECTION           RIVER: Apache Wash
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REACH: Reach 1            RS: 4.82

INPUT
Description: 4.82
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9480    1826 9740.85    1824 9830.85    1822 9875.16    1820 9888.17    1818
 9903.71    1818 9930.33    1820 9930.34    1820 9974.99    1820    9975    1820
 9990.22    181810005.12    181810009.43    1820 10013.6    182210024.29    1822
10070.59    1820   10100    181810126.15    182010181.41    182010189.94    1818
   10200  1817.110207.92    181810217.21    182010264.85    1820   10280    1818
   10315    1820   10435    1822   10565    1824

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9480    .055 9875.16     .0310009.43    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9875.1610009.43              480     480     480            .1        .3
Left Levee      Station=    9975      Elevation=    1820
Right Levee     Station= 10013.6      Elevation=    1822

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1            RS: 4.78

INPUT
Description: 4.78
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9743.69    1820 9905.26    1818 9905.48    1818 9964.87    1818 9964.88    1818
 9983.35    1816 9995.72    181310010.03    181310021.41    181610211.72    1816
10230.89    181610317.17    181410376.07    1813 10488.8    1814 10508.5    1814
   10540    1816   10640    1818

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9743.69    .055 9964.87     .0310021.41    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.8710021.41              300     200     100            .1        .3
Right Levee     Station=10211.72      Elevation=    1816

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1            RS: 4.74

INPUT
Description: 4.74
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9500.14    1818 9960.29    1816 9979.29    1814 9986.69    1812    9994    1810
 9994.01    1810 9999.53    1810 9999.55    181010010.02    181210029.03    1814
10029.36    181410136.55    1814   10140    1813   10160    1814   10380    1814
   10400    1811   10425    1814   10440    1814   10485    1813   10530    1814
   10590    1815   10700    1815

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9500.14    .055 9960.29     .0310029.03    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9960.2910029.03              400     500     500            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1            RS: 4.65

INPUT
Description: 4.65

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400  1815.5    9600    1814 9830.73    1810 9982.47    1808 9997.03    1806
10002.86    180610014.29    180810049.57    180810059.42    180610060.51    1806
10093.98    180810250.89    1808   10270    1810   10360    1810

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .055 9982.47     .0310093.98    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.4710093.98              260     280     260            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1            RS: 4.6

INPUT
Description: 4.6

Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9675    1812 9812.65    1810 9836.34    1810 9875.78    1808 9883.17    1808
 9966.89    1806  9971.4    1806  9987.4    1802 9998.69    1802 9998.98    1802
10015.98    180610022.46    1806   10123    180610130.11    180410281.42    1804
10322.77    180610440.24    180610500.19    1808

Manning's n Values        num=       3
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```
     Sta   n Val     Sta   n Val     Sta   n Val
    9675    .055  9971.4     .0310015.98    .055

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9971.410015.98                 83      83      83             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.58

INPUT
Description: Geometry data points 6 and 7 are adjusted to account for the 3
             barrel 10' x 5' cbc.  The stationing for both points is increased
             by 5'.  The right bank and ineffective flow areas are adjusted
             accordingly.  The elevations of points 5 and 6 are changed from
             1802 to 1801.3 to match the surveyed invert of the box culvert
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1810    9790    1808    9945    1806    9983    1804    9984  1801.3
   10015  1801.3   10016    1804   10250    1804   10320    1806   10500    1808

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9983     .03   10016    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9983  10016                180     180     170             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9685    9983    1808   10016   10500    1808

CULVERT                 RIVER: Apache Wash
REACH: Reach 1             RS: 4.575

INPUT
Description: Culvert #1 (3 10' x 5' Boxes)

Distance from Upstream XS =       5
Deck/Roadway Width        =   114.1
Weir Coefficient          =     3.1
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9685    1810    1800    9790    1808    1800    9945    1808    1800
    9983    1808    1800    9983    1808    1800    9984    1808    1800
   10010    1808    1800   10011    1808    1800   10011    1808    1800
   10250    1807    1800   10320    1807    1800   10500    1808    1800

Upstream Bridge Cross Section Data
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1810    9790    1806    9945    1806    9983    1804    9984  1801.3
   10015  1801.3   10016    1804   10250    1804   10320    1806   10500    1808

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9983     .03   10015    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
           9983  10016              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9685    9983    1808   10016   10500    1808

Downstream  Deck/Roadway Coordinates
    num=      13
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9685    1808    1798    9790    1808    1798    9945    1808    1798
    9980    1808    1798    9980    1808    1798    9983    1808    1798
    9984    1808    1798   10010    1808    1798   10011    1808    1798
   10011    1808    1798   10250    1807    1798   10320    1807    1798
   10500    1808    1798

Downstream Bridge Cross Section Data
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9550    1812    9730    1810    9915    1808    9945    1806    9960    1804
    9975    1802    9985    1800   10000    1799   10035    1800   10115    1802
   10150    1804   10215    1806   10240    1808

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9550    .055    9975     .03   10115    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
           9975  10115              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9550    9950    1808   10050   10240    1808

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =    1807
Energy head used in spillway design         =
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Spillway height used in design                =
Weir crest shape                              = Broad Crested

 umber of Culverts =  1

Culvert Name      Shape      Rise    Span
Box1                Box       5      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  0   114.1       .015                  .5                1
Number of Barrels =  3
Upstream   Elevation =  1801.3
Centerline Stations
    Sta.    Sta.    Sta.
    9989  9999.5   10010
Downstream Elevation =  1800.67
Centerline Stations
    Sta.    Sta.    Sta.
  9989.5   10000 10010.5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.56

INPUT
Description: Geometry data point 8 is adjusted to account for the 3 barrel 10'
             x 5' cbc.  The culvert was extended and cross section 4.57 of the
             FIS was eliminated.  This cross section is the first downstream
             cross section of the culvert.  The elevation of data point 8 is
             adjusted from 1799 to 1800.  The right bank station is moved from
             station 10035 to 10150.
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9550    1812    9730    1810    9915    1808    9945    1806    9960    1804
    9975    1802    9985    1800   10000    1799   10035    1800   10115    1802
   10150    1804   10215    1806   10240    1808

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9550    .055    9975     .03   10115    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10115              365     365     350              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9550    9950    1808   10050   10240    1808

:ROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.49

INPUT
Description: 4.49

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9821.99    1806 9901.91    1804 9916.74    1802  9954.9    1800 9973.89    1798
 9983.53    1796 10011.1    179610018.97    179810053.62    180010105.02    1802
10240.68    1804   10340  1804.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9821.99    .055  9954.9     .0310053.62    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9954.910053.62              490     450     450              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.4

INPUT
Description: 4.4

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9925    1802    9940    1800    9970    1798    9990    1796    9995    1794
   10005  1792.3   10020    1794   10030    1796   10080    1796   10090  1794.3
   10110    1796   10175    1798   10210    1800   10270    1801

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9925    .055    9990     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9990   10030              475     510     490              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.31

INPUT
Description: 4.31

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9706.51    1798  9770.7    1796 9896.31    1794 9980.54    1792  9986.9    1790
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10005.88    178810009.89    178810014.81    179010019.75    179210055.21    1794
10110.95    179610150.57  1796.5

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9706.51    .055 9980.54     .0310019.75    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.5410019.75              410     420     410             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.23

INPUT
Description: 4.23

Station Elevation Data     num=       13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9520.61    1796 9614.39    1794 9762.38    1790 9933.91    1788 9961.17    1790
 9980.16    1790 9985.61    1788 9991.04    178610007.85    178610015.65    1788
10030.19    179010081.29    179210132.36    1794

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9520.61    .055 9980.16     .0310030.19    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.1610030.19              140     150     150             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.22

INPUT
Description: 4.22
Station Elevation Data     num=       13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9435    1796    9530    1794    9595    1792    9650    1790    9780    1788
    9885    1788    9975    1790    9990    1786 9999.81  1785.5   10010    1786
   10030    1790   10085    1792   10135  1792.4

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9435    .055    9975     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10030              280     280     260             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.11

INPUT
Description: 4.11

Station Elevation Data     num=       11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9954.62    1792 9972.66    1790 9978.48    1786 9982.42    1784 9988.23    1782
10014.08    1782 10019.7    1784 10107.8    1786 10273.4    178810355.58    1790
10489.42    1790

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9954.62    .055 9978.48     .03 10107.8    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.48 10107.8              240     250     300             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.05

INPUT
Description: 4.05

Station Elevation Data     num=        9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9960    1788 9981.93    1782    9990    1780   10000    1779   10015    1780
   10025    1782   10200    1782   10270    1786   10320  1786.8

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9960    .055 9981.93     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.93   10025              400     500     285             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.96

INPUT
Description: 3.96

Station Elevation Data     num=       16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9852.78    1784 9882.85    1782 9912.96    1780 9952.91    1778 9978.94    1776
 9989.34    177410006.21    177410028.53    178010057.49    178210179.95    1782
10409.79    178010418.05    1778 10422.6    177810433.36    178010548.23    1782
```

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10801.62    1784

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9852.78    .055 9882.85     .0310057.49    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9882.8510057.49              490     520     460             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.86

INPUT
Description: 3.86

Station Elevation Data     num=       15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9728.15    1780 9811.03    1778 9980.73    1776 9992.41    177010006.32    1770
10015.17    1772 10048.5    1774 10108.2    177410125.25    1776 10163.1    1778
10205.78    177810274.92    177410300.77    177410373.74    1778 10496.8    1780

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9728.15    .055 9980.73     .03 10048.5    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.73 10048.5              360     400     490             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.78

INPUT
Description: 3.78

Station Elevation Data     num=       17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9660.11    1776    9740  1774.1  9978.4    1774 9983.58    1770 9992.92    1766
 9993.96    176610036.94    177010060.68    177210120.11    177210142.25    1770
10151.27    176810155.15    176810163.26    177010225.58    177210348.04    1774
10545.54    177410650.82    1775

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9660.11    .055  9978.4     .0310060.68    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9978.410060.68              170     170     170             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.75

INPUT
Description: 3.75

Station Elevation Data     num=       14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9590    1776    9655    1774    9710    1772    9725    1772    9780    1774
    9945    1774    9975    1772 9982.65    1768 9991.06    1764   10010    1764
   10020    1768   10310    1772   10840    1772   10885    1776

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9590    .055 9982.65     .03   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.65   10020              500     500     500             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.65

INPUT
Description: 3.65
Station Elevation Data     num=        9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9358.43 1771.68    9470    1768    9580    1770    9830    1770    9970    1764
 9990.15    176210009.75    1762   10015    1764   10370    1770

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9358.43    .055    9970     .03   10015    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10015              250     280     260             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.6

INPUT
Description: 3.6
Station Elevation Data     num=        9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9378.25    1770 9475.66    1768 9891.47    1766 9979.85    1764 9990.66    1760
10010.55    176010013.99    176210247.91    176810365.75    1770

Manning's n Values          num=        3
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```
     Sta    n Val      Sta    n Val      Sta    n Val
 9378.25     .055 9979.85      .0310013.99     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9979.8510013.99                 400     420     450              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.52

INPUT
Description: 3.52

Station Elevation Data     num=       14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9669.22     1766 9704.26     1764 9883.69     1764 9945.91     1762 9977.47     1762
 9977.93     1762 9981.96     1760 9986.06     175810002.04     175610006.86     1756
10017.06     176010100.32     176210273.56     176410646.59     1766

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9669.22     .055 9981.96      .0310017.06     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9981.9610017.06                 200     200     200              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.48

INPUT
Description: 3.48
Station Elevation Data     num=       11
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9620.29     1764  9671.6     1762 9965.97     1762 9985.39     1760  9988.6     1758
 9993.36     175610009.59     175510018.81     1758 10110.6     176010298.95     1762
   10615     1764

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9620.29     .055 9985.39      .0310018.81     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9985.3910018.81                 400     400     400              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.4

INPUT
Description: 3.4
Station Elevation Data     num=       14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9462     1762     9493     1760     9714     1758     9869     1758     9914     1756
    9979     1756     9984     1754    10000     1752    10016     1754    10031     1756
   10057     1758    10212     1758    10464     1760    10809     1761

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9462     .055     9984      .03    10031     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
           9984   10031                 480     470     440              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.32

INPUT
Description: 3.32
Station Elevation Data     num=       16
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9599.26     1758 9599.45     1758 9630.94     1756 9632.14     1756 9725.16     1754
 9955.22     1754 9974.26     1752 9981.64     175010008.82     175010020.21     1754
10242.15     1754   10490  1756.7   10560  1756.2   10725  1756.2   10790  1756.5
10929.84     1758

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9599.26     .055 9955.22      .0310020.21     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9955.2210020.21                 520     520     520              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.21

INPUT
Description: 3.21
Station Elevation Data     num=       14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9595     1754     9630     1752     9660     1750     9680     1749     9710     1750
    9900     1751     9965     1750 9990.25     174610009.88     174610029.09 1749.98
   10130     1750    10315     1752    10390  1752.1 10390.1     1754

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9595     .055     9965      .0310029.09     .055
```

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Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
          996510029.09                250     310     350              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.13

INPUT
Description: 3.13
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9442.64    1752 9512.79    1748 9870.47    1748 9978.41    1746 9996.99    1742
10009.71    174210027.88    174810067.68    1750   10100  1750.2 10100.1    1752

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9442.64    .055 9978.41     .0310027.88    .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9978.4110027.88                200     280     300              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.07

INPUT
Description: 3.07
Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9625    1750    9640    1748    9665    1746 9912.66    1746 9979.95    1744
 9989.15    174210019.02    174110028.11    174410080.68    174610180.41    1748
10180.42    1750

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9625    .055 9979.95     .0310028.11    .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9979.9510028.11                  0       0       0              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 2             RS: 2.97

INPUT
Description:
Station Elevation Data     num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9934    1746    9959    1746    9974    1744    9980    1742    9984    1740
    9988    1738   10012    1738   10020    1740   10052    1742   10134    1742
   10314  1743.5   10552    1742   10718    1740   10764  1738.5   10822    1740
   10826    1738   10830    1736   10860    1736   10864    1738   10870    1740
   10927    1740   10974    1739   11044    1740   11098    1740   11354    1742
   11464    1744   11602    1746

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9934    .055    9980    .049   11098    .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
          9980   11098                270     270     280              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 2             RS: 2.92

INPUT
Description:
Station Elevation Data     num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9820    1748    9845    1746    9870    1744    9910    1742    9970    1740
    9980    1738    9990    1735   10010    1735   10014    1738   10022    1740
   10157  1741.5   10412    1740   10537    1738   10543    1736   10549    1734
   10565    1734   10585    1736   10596    1738   10660    1738   10671    1740
   10686    1742   10707    1742   10713    1740   10717    1738   10751    1738
   11007    1740   11187    1742   11377    1742   11482    1744   11602    1746

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9820    .055    9970    .048   10660    .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
          9970   10660                155     155     145              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 2             RS: 2.90

INPUT
Description:
Station Elevation Data     num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9726    1746    9756    1744    9794    1742    9826    1740    9978    1738
    9984    1736    9990    1734   10010    1734   10016    1736   10022    1738
   10100    1740   10141  1740.5   10186    1740   10301    1738   10307    1736
   10313    1734   10341    1734   10351    1736   10469    1738   10481    1740
   10494    1742   10502    1744   10513    1746   10530    1746   10536    1744
   10544    1742   10558    1740   10571    1738   10871    1738   10961    1740
   11016    1742   11076    1744
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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9726    .055    9978    .037   10469    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10469              140     200     300            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 2            RS: 2.87

INPUT
Description:
Station Elevation Data     num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9679    1746    9706    1744    9737    1742    9771    1740    9979    1738
    9983    1736    9987    1734   10013    1734   10019    1736   10031    1738
   10099  1738.5   10191    1738   10259    1736   10269    1734   10277    1732
   10314    1732   10320    1734   10327    1736   10387    1736   10417    1734
   10427    1732   10439    1732   10452    1734   10485    1736   10560    1738
   10627    1740   10666    1742   10698    1744

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9679    .055    9979    .036   10485    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9979   10485              240     260     250            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 2            RS: 2.82

INPUT
Description:
Station Elevation Data     num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9654    1744    9680    1742    9705    1740    9724    1738    9764    1736
    9884  1735.5    9934    1736    9978    1736    9982    1734    9994    1731
   10006    1731   10024    1734   10034    1736   10140    1736   10210    1736
   10248    1734   10254    1732   10260    1730   10282    1730   10288    1732
   10294    1734   10324    1736   10340    1738   10355    1740   10370    1742
   10387    1744

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9654    .055    9978    .043   10294    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10294              250     430     470            .3        .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 2            RS: 2.73

INPUT
Description: 2.73
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9756.45    1740 9787.82    1738 9811.88    1736 9971.87    1732 9986.23    1728
10019.94    172810036.42    173210071.17    173410101.17    173810127.41 1740.05

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9756.45    .055 9971.87    .0310036.42    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.8710036.42                0       0       0            .3        .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.60

INPUT
Description: 2.6

Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9750    1736    9820    1732    9935    1732    9945    1730    9960    1724
    9965    1724   10020    172610028.92  1729.5   10265    173210415.66    1732
10462.65 1736.15

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9750    .055    9945    .0310028.92    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          994510028.92              390     430     450            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.52

INPUT
Description: 2.52
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9805.03    1736 9840.17    1734 9866.23    1732 9886.43    1728 9957.59    1726
 9970.16    172210021.48    172110028.76    172610120.86    172810316.87    1728
10363.84    173010395.26    173210419.34    173410459.58    1736
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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9805.03    .055 9957.59     .0310028.76    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.5910028.76               270     260     250             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.47

INPUT
Description: 2.47

Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9920.54    1734 9942.57    1732 9962.26    1724  9972.1    1720 9990.76    1720
10013.06    172210027.81    1724 10090.1    172610200.41    172610300.68    1728
   10340    1730   10360    1734

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9920.54    .055 9962.26     .0310027.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9962.2610027.81               340     400     450             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.40

INPUT
Description: 2.4

Station Elevation Data     num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9795    1732    9800    1730    9840    1724    9940    1720    9980    1718
   10020    1718 10024.1 1719.9710048.34 1732.03

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9795    .055    9940     .03 10024.1    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940 10024.1               300     360     370             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.33

INPUT
Description: 2.33

Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9778    1730    9840    1724    9870    1722    9890    1720    9945    1720
    9960    1718   10000    1717   10028    1718   10030    1720   10045    1730

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9778    .055    9945     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9945   10030               450     450     450             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.24

INPUT
Description: 2.24

Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9781.96    1726 9796.25    1724 9855.35    1720 9939.57    1718 9973.56    1714
10001.06    171410055.42    171810148.55    172010188.25    172410215.72    1726

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9781.96    .055 9939.57     .0310055.42    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.5710055.42               380     380     390             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.17

INPUT
Description: 2.17

Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9809.96    1722 9833.72    1720 9889.63    1716 9892.16    1716 9948.16    1716
 9962.44    171410027.88    171410055.88    1716 10199.6    171610234.24    1718
10416.55    172010468.74    1722

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
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```
 9809.96    .055 9948.16     .0310055.88    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.1610055.88              500     520     350             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.08

INPUT
Description: 2.08
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9967.02    1718 9971.03    1716 9983.46    171010015.75    1710 10034.4    1714
10080.47    171610200.63    1717   10300    1716   10360    1714   10450    1712
   10490    1710   10510    1710   10545    1712   10580    1714   10700    1716
   10745    1718

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9967.02    .055 9971.03     .0310080.47    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.0310080.47              440     440     270             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.00

INPUT
Description: 2

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9964.46 1715.98    9980    1710    9985  1708.5   10020  1708.5   10115    1710
   10150    1712   10360  1713.8   10535    1712   10590    1710   10610  1708.5
   10675  1708.5   10700    1710   10805    1714   10830    1716

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9964.46    .055    9980     .03   10115    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   10115              550     490     230             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.88

INPUT
Description: 1.88

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9767.17 1713.01    9790    1708    9890    1708    9950    1706    9975    1704
    9990  1702.1   10010  1702.1   10040    1706   10085    1710   10210    1710
   10300    1708   10340    1706   10370    1706   10390    1708   10455    1710
10479.52 1713.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9767.17    .055    9950     .03   10040    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9950   10040              190     200     230             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.85

INPUT
Description: 1.85
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9819.07    1712 9828.06    1710 9836.36    1708 9915.83    1706 9954.99    1704
10002.05    170010011.48    170010041.54    170410064.87    170610129.94    1708
10187.04    170810294.81    170610368.04    170610414.01    170810424.61    1710
10451.94    1712

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9819.07    .055 9954.99     .0310041.54    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.9910041.54              210     190     150             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.81

INPUT
Description: 1.81
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9944.51    1712 9965.71    1704 9971.05    1702 9975.82    170010012.24    1700
   10031    170210060.69    170410188.05    170610206.68    170610298.14    1704
10327.71    170410350.59    170610431.76    170810486.49    1712

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
 9944.51    .055 9971.05     .03   10031    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.05   10031              300     300     240            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.75

INPUT
Description: 1.75

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9951.17    1710 9965.64    1704 9970.05    1702 9974.47    1700 9978.76    1698
10016.76    169810034.19    170010072.31    170210151.35    170410320.71    1706
10429.93    170810503.73    1710

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9951.17    .055 9970.05     .0310072.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.0510072.31              480     500     520            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.66

INPUT
Description: 1.66

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9744.33    1708 9829.76    1704 9931.63    1702 9952.11    1700 9967.65    1698
 9993.88    169610014.03    169610029.43    1698   10034    170010204.97 1700.01
10212.95    170210237.12    170410277.66    170610306.08    1708

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9744.33    .055 9952.11     .03   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9952.11   10034              300     250     240            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.60

INPUT
Description: 1.6

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9416.18    1706 9448.11    1704 9518.79    1702 9799.12    1700 9907.12    1698
 9959.73    1696 9980.66    1694  9995.9    1692 10008.9    169210012.95    1694
10016.94    169610031.18    170410062.39    1706

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9416.18    .055 9959.73     .0310016.94    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.7310016.94              190     180     180            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.56

INPUT
Description: 1.56

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9426.84    1706 9453.43    1704 9496.71    1702 9564.46    1700 9690.11    1700
 9951.37    1698 9973.37    1696 9983.09    169210014.85    169210028.61    1698
10039.18    170210058.37    170410091.18    1706

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9426.84    .055 9951.37     .0310028.61    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.3710028.61              400     500     540            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.47

INPUT
Description: 1.47
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9462.33    1702 9530.85    1700 9560.22    1698 9800.63    1698 9911.62    1696
 9964.37    1694 9980.91    169010017.61    169010032.41    169410056.56    1698
10067.04    170010103.76    1702

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9462.33    .055 9964.37     .0310032.41    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.3710032.41               490     500     520              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.37

INPUT
Description: 1.37
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9493.05    1698 9549.07    1696 9580.08    1694 9932.08    1692 9963.31    1690
 9978.48    1688 10013.4    168810022.33    1690 10030.2    169210053.61    1698

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9493.05    .055 9932.08     .03 10030.2    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9932.08 10030.2               400     500     440              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.27

INPUT
Description: 1.27
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9673    1698    9745    1696    9795    1694    9817    1692    9842    1690
    9917    1688    9925    1686    9950    1684    9975    1684   10020    1686
   10077    1688   10163    1690   10260    1692   10395    1694   10505    1696
   10800    1698

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9673    .055    9917     .03   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9917   10020              450     460     500              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.18

INPUT
Description: 1.18
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9840    1694    9875    1692    9902    1690    9920    1688    9936    1686
    9947    1684    9957    1682   10015    1680   10020    1680   10025    1682
   10030    1684   10061    1686   10102    1688   10180    1690   10270    1690
   10390    1689   10460  1689.9   10600  1688.2   10670    1690   10863    1692
   10903  1693.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9840    .055    9947     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9947   10030              500     500     350              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.09

INPUT
Description: 1.09
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9920    1690    9926    1688    9932    1686    9938    1684    9968    1682
    9974    1680   10026    1680   10034    1682   10098    1682   10120    1684
   10185    1686   10335    1684   10362    1684   10582    1686   10770    1685
   10920    1686   11621    1688   11652    1690

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9920    .055    9968     .03   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9968   10034              500     500     460              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 0.99

INPUT
Description: 0.99
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9925.53    1686 9950.02    1682 9969.66    1680 9977.26    167810017.26    1678
10026.04    168010147.08    1682 10189.7    168210277.01    168010326.93    1678
10418.53    167810542.32    168010764.47    168210913.43    168210917.62    1682
   11420    1684   11790    168411823.04 1685.99

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9925.53    .055 9969.66     .0310026.04    .055
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.6610026.04              890     900     550              .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.84

INPUT
Description: 0.84
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9854.82 1679.99    9910    1676    9975    1672 9980.41   167010019.82    1670
   10030    1672   10080  1673.8   10110    1672   10125    1670   10150    1674
   10230    1674   10290    1678   10320    1678   10380    1676   10400    1676
   10460    1678   10590    1680   10840    1680   10945    1678   11010    1678
   11067    1680

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9854.82    .055    9975     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9975   10030              420     440     430              .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.75

INPUT
Description: 0.75
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9452.11 1676.99 9623.97    1674 9849.05    1674 9850.71    1674 9883.74    1672
 9884.15    1672 9943.61    1670 9943.82    1670 9967.12    1668 9967.18    1668
 9978.88    166610014.77    166610027.72    167010080.45    167010080.56    1670
10093.84    1672   10094    167210119.59    167210119.71    167210128.45    1670
 10128.5    1670 10145.7    167010145.78    1670 10173.1    167210173.36    1672
10214.32    1674 10214.6    167410391.18    167410391.21    167410479.43    1676
10479.48    167610512.05 1676.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9452.11    .055 9943.82     .0310027.72    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.8210027.72              180     200     210              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.71

INPUT
Description: 0.71
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9410.74    1676 9517.84    1674 9806.35    1672 9806.66    1672 9929.72    1670
 9930.71    1670 9973.93    1668 9973.94    1668 9979.82    1666  9979.9    1666
 9985.76    1664  9985.8    166410015.71    1664 10015.9    166410024.34    1666
10024.46    166610029.59    166810030.23    166810045.83    166810045.97    1668
10052.42    166610052.62    166610063.21    1666 10063.3    166610070.56    1668
10070.63    1668 10092.7    167010201.55    167610201.61    1676

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9410.74    .055 9973.94     .0310029.59    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.9410029.59              370     400     440              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.63

INPUT
Description: 0.63
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9246.69    1673    9300    1672 9467.58    1672 9467.59    1672 9524.47    1670
 9524.59    1670 9661.89    1670 9662.28    1670 9798.92    1668 9967.22    1668
 9967.27    1668 9971.89    1666 9971.91    1666 9976.44    1664 9976.56    1664
10025.48    166410033.05    166610033.09    166610044.06    166810044.68    1668
10151.63    1668   10188    167210227.11 1673.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9246.69    .055 9967.27     .0310044.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.2710044.06              300     500     600              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.54

INPUT
Description: 0.54
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9600    1670    9840    1668    9875    1664    9965    1664 9975.73    1660
10018.71    166010027.02    166410027.05    166410027.06    166410068.43    1666
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10068.89    166610360.71    166610418.56    166410470.56    166410510.35    1666
10530.78    166810614.05    1670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9600    .055    9965     .0310027.02    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          996510027.02               800     640     400              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.43

INPUT
Description: 0.43

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9730    1666    9900    1664    9940    1662    9985    1655   10015    1655
   10050  1661.8   10120  1661.8   10190    1660   10240    1658   10270    1660
   10290    1662   10350    1662   10405    1660   10430    1660   10500    1662
   10535    1664   10620    1666

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9730    .055    9940     .03   10050    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940   10050               505     500     440              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.33

INPUT
Description: 0.33

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9631.93 1663.06    9645    1662    9722    1660    9820    1660    9900    1661
 9945.78 1658.03    9980  1652.2   10020  1652.2   10090    1658   10135    1658
   10150  1652.6   10170    1656   10220    1658   10250    1660   10305    1662
   10375    1664

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9631.93    .055 9945.78     .03   10090    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9945.78   10090               350     650     700              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.20

INPUT
Description: 0.2

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9288.16    1660 9525.13    1658 9606.89    1658 9642.09    1656 9827.21    1656
 9904.07    1654 9967.74    1650  9981.5    1646 10015.7    1646 10039.4    1656
10160.82    165610191.81    1660

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9288.16    .055 9967.74     .03 10039.4    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.74 10039.4                 0       0       0              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.23

INPUT
Description: 2.23

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9916.62    1834 9941.49    1832 9962.82    1830 9979.43    1828 9994.11    1826
10007.33    182610023.07    182810034.76    1830   10373    1832   10480    1832
   10620    1834

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9916.62    .055 9979.43     .0310023.07    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.4310023.07               435     440     445              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.14

INPUT
Description: 2.14
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
 9961.98    1828 9969.94    1826 9979.01    1824 9981.08    182410020.87    1824
10025.81    182410218.97    182610361.55    182610637.58    182610689.74    1828

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9961.98    .055 9979.01     .0310025.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.0110025.81               385     380     380            .1        .3

CROSS SECTION            RIVER: Paradise Wash
REACH: Reach 1             RS: 2.07

INPUT
Description: 2.07

Station Elevation Data     num=        7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9955.42    1824 9969.04    1822    9980    1821   10020    1821   10060    1822
10667.15    182210737.75    1824

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9955.42    .055 9969.04     .03   10060    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.04   10060               415     390     260            .1        .3

CROSS SECTION            RIVER: Paradise Wash
REACH: Reach 1             RS: 2.00

INPUT
Description: 2.00 -- Approximate Alignment of Carefree Hwy
Station Elevation Data     num=       15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9956.92    1822 9973.16    1818 9974.89    1818 9981.08    1816 9983.46    1816
 9989.77    1814 9993.01    181410005.51    181410007.19    181410022.29    1816
10025.64    181610088.76    181810488.79    1820 10588.7    182010637.44    1822

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9956.92    .055 9983.46     .0310022.29    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.4610022.29               390     400     390            .1        .3

CROSS SECTION            RIVER: Paradise Wash
REACH: Reach 1             RS: 1.92

INPUT
Description: 1.92

Station Elevation Data     num=       11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9925    1816    9935    1814    9945    1812    9965    1810   10010    1810
   10015    1812   10025    1814   10050    1812   10100    1814   10340    1814
   10380    1816

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9925    .055    9935     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9935   10025               460     455     450            .1        .3

CROSS SECTION            RIVER: Paradise Wash
REACH: Reach 1             RS: 1.83

INPUT
Description: 1.83

Station Elevation Data     num=       10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9956.91    1812 9974.62    1810 9983.67    1808 9990.95    180610005.18    1806
10038.99    180810189.64    181010254.89    181010359.32    180810422.67    1812

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9956.91    .055 9983.67     .0310038.99    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.6710038.99               440     445     450            .1        .3

CROSS SECTION            RIVER: Paradise Wash
REACH: Reach 1             RS: 1.75

INPUT
Description: 1.75

Station Elevation Data     num=       10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9923.03    1806 9964.44    1804 9975.68    1802  9998.4    180010003.69    1800
10022.87    180410187.38    180410279.87    180210305.65    180210358.49    1806

Manning's n Values          num=        3
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     Sta   n Val     Sta   n Val     Sta   n Val
 9923.03    .055 9964.44     .0310022.87    .055

3ank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.4410022.87               485     490     500             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.65

INPUT
Description: 1.65
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9893    1806    9901    1804    9909    1802    9915    1800    9923    1798
    9971  1797.8    9988    1796   10012    1796   10020    1798   10273    1800
 10273.1    1802

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9893    .055    9971     .03   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9971   10020               600     600     575             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.54

INPUT
Description: 1.54
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9735.34    1796 9972.06    1794 9986.03    1792 9993.93    1790 10012.3    1790
10020.15    179210029.59    179210124.43    179010160.57    179010181.54    1792
10288.06    179410495.09    179410533.67    1796

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9735.34    .055 9986.03     .0310020.15     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.0310020.15               400     400     400             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.46

INPUT
Description: 1.46
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9420    1794    9455    1792    9645    1790    9685    1790 9843.42    1792
 9885.29    1792 9920.09    1790 9973.03    1788 9983.48    178610027.78    1786
10028.33    178610038.59    1788 10039.2    178810295.57    179210295.61    1792
10328.92 1793.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9420    .055 9973.03     .0310038.59    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.0310038.59               260     500     670             .1       .3
Left Levee      Station= 9885.29      Elevation=    1792

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.37

INPUT
Description: 1.37
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9345    1792    9385    1790    9440    1788    9490    1788  9650.6 1789.51
 9806.04    1788 9806.97    1788 9865.72    1786 9866.07    1786  9886.2    1784
 9886.27    1784 9957.84    1784 9958.87    1784  9968.7    1782 9968.84    1782
 9990.03    178210020.46    178610055.46    178610057.12    178610069.22    1788
10069.72    178810181.45    178810258.34    179010303.11    1792

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9345    .055 9958.87     .0310020.46    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9958.8710020.46               570     500     430             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.27

INPUT
Description: 1.27

Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9347.73    1788 9366.76    1786 9787.72    1784 9788.51    1784 9960.27    1784
 9960.65    1784 9969.04    1782 9969.12    1782 9988.65    1778 9989.09    1778
10011.61    177810012.22    177810057.73    178210058.84    178210169.81    1784
10171.13    178410205.64    178810206.31    1788
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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9347.73    .055 9969.12     .0310057.73    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
     9969.1210057.73               390     350     320            .1        .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.21

INPUT
Description: 1.21
Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9421    1784 9440.23    1780  9538.2    1780 9595.38    1782 9618.31    1782
 9801.74    1780 9802.59    1780 9835.89    1780 9836.44    1780 9877.07    1782
 9886.63    1782 9977.68    1780 9982.64    1778 9983.14    1778 9988.45    1776
10013.85    177610020.25    1778 10020.6    177810096.24    177810106.85    1780
10131.31    178210206.15    1784

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9421    .055 9983.14     .03 10020.6    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.14 10020.6             400     440     450            .1        .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.12

INPUT
Description: 1.12

Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9323.43    1782 9323.49    1782 9334.19    1780 9334.29    1780 9344.65    1778
 9345.18    1778    9460    1778  9546.2    1776 9547.35    1776 9660.25    1776
 9661.37    1776 9701.23    1778 9701.63    1778 9764.83    1780 9764.91    1780
 9845.43    1780 9943.46    1776 9981.99    177410002.99    177210010.59    1772
10023.31    177610036.17    178010084.32    1782

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9323.43    .055 9943.46     .0310023.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.4610023.31             320     420     470            .1        .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 1.04

INPUT
Description: 1.04
Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9371.44    1778 9371.87    1778 9547.56    1774 9547.64    1774 9676.69    1774
 9678.18    1774 9732.85    1772  9985.5    1772 9991.67    177010013.58    1770
10029.11    177210053.67    177610108.42    1778

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9371.44    .055  9985.5     .0310029.11    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9985.510029.11             500     400     300            .1        .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.95

INPUT
Description: 0.95

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9590.3    1774  9590.4    1774 9688.06    1772 9688.13    1772 9982.32    1772
 9984.49    1770 9986.77    176810001.77    176610019.78    176610036.54    1768
10070.19    177010159.61    177210232.27    1774

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9590.3    .055 9984.49     .0310070.19    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9984.4910070.19             250     275     310            .1        .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.89

INPUT
Description: 0.89

Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9582.26    1772 9582.35    1772 9640.11    1770 9921.21    1770 9981.01    1768
 9985.21    176410009.58    176410018.11    176610021.69    176810163.03    1770
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10270.58    1772

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9582.26    .055 9981.01     .0310021.69    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.0110021.69              520     500     480             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.80

INPUT
Description: 0.8
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9593.82    1768 9646.26    1766 9785.49    1766 9982.14    1764 9989.01    1762
10010.62    176210020.71    1764 10104.6    176410291.13    1766 10321.7    1768

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9593.82    .055 9982.14     .0310020.71    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.1410020.71              420     350     330             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.72

INPUT
Description: 0.72
Station Elevation Data     num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9396    1766    9427    1764    9473    1762    9526    1761    9616    1762
    9682    1760    9721  1758.5    9758    1760    9796  1760.5    9886    1760
    9978    1760    9988    1758   10012    1758   10018    1760   10066    1762
   10106    1764   10141    1766

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9396    .055    9978     .03   10018    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10018             400     420     425             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.62

INPUT
Description: 0.62
Station Elevation Data     num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9548    1762    9586    1760    9657    1758    9688  1757.5    9750    1758
    9798  1756.5    9938    1758    9967    1756    9983    1754   10018    1754
   10031    1756   10085    1758   10218    1756   10245    1760   10263    1762

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9548    .055    9967     .03   10031    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9967   10031             420     450     460             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.53

INPUT
Description: 0.53
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9511    1758    9574    1756    9729    1754    9976    1752    9983    1750
   10018    1750   10028    1752   10099    1754   10115    1756   10131    1758

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9511    .055    9976     .03   10028    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9976   10028             475     495     500             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.44

INPUT
Description: 0.44
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9603.04    1752 9682.28    1750 9992.46    174810001.98    1746   10007    1746
10019.54    174810028.31    174910052.71    174910105.67    1748 10138.9    1746
10140.02    174610149.52    174810159.12    1750 10170.1    1752

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9603.04    .055 9992.46     .0310028.31    .055
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9992.4610028.31              500     450     380             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.34

INPUT
Description: 0.34
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9749.69    1750 9772.57    1748 9799.65    1746 9969.75    1744 9988.37    1744
10012.01    174410014.83    174410073.32    174610188.93    174610285.92    1744
10293.88    174410324.22    1748 10351.7    1750

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9749.69    .055 9969.75     .0310014.83    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.7510014.83              290     300     340             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.28

INPUT
Description: 0.28
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9761    1746    9780    1744    9817    1742    9891    1740    9974    1742
    9982    1740    9991    1738   10008    1738   10017    1740   10038    1742
   10151    1744   10229    1743   10243    1744   10289    1746

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9761    .055    9974     .03   10038    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9974   10038              550     550     550             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.17

INPUT
Description: 0.17
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9957.91    1740 9974.51    1734  9980.5    173210003.82    173210022.71    1734
10084.24    173610128.49    173810423.55    173810511.08    173610520.92    1736
10528.63    173810535.83    1740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9957.91    .055 9974.51     .0310022.71    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9974.5110022.71              225     225     200             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.13

INPUT
Description: 0.13
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9952.71 1738.99 9978.41    1734 9988.85    173210019.25    173210047.54    1734
 10172.1    1736 10543.1    173610553.61 1738.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9952.71    .055 9978.41     .0310047.54    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110047.54              425     390     465             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.04

INPUT
Description: 0.04
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9680    1738    9765    1734    9850    1732 9946.82    1732 9970.15    1730
 9998.41    172610018.18    172610032.22    173010090.04    173210255.73    1736
10279.91    1738

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9680    .055 9970.15     .0310032.22    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.1510032.22                0       0       0             .1       .3


SUMMARY OF MANNING'S N VALUES
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River:Desert Hills Was

Reach	River Sta.	n1	n2	n3
Reach 1	0.99	.055	.03	.055
Reach 1	0.90	.055	.03	.055
Reach 1	0.81	.055	.03	.055
Reach 1	0.72	.055	.03	.055
Reach 1	0.64	.055	.03	.055
Reach 1	0.56	.055	.03	.055
Reach 1	0.48	.055	.03	.055
Reach 1	0.40	.055	.03	.055
Reach 1	0.386	.055	.03	.055

River:Apache Wash

Reach	River Sta.	n1	n2	n3
Reach 1	8.02	.055	.03	.055
Reach 1	7.98	.055	.03	.055
Reach 1	7.89	.055	.03	.055
Reach 1	7.84	.055	.03	.055
Reach 1	7.74	.055	.03	.055
Reach 1	7.65	.055	.03	.055
Reach 1	7.55	.055	.03	.055
Reach 1	7.46	.055	.03	.055
Reach 1	7.36	.055	.03	.055
Reach 1	7.28	.055	.03	.055
Reach 1	7.17	.055	.03	.055
Reach 1	7.08	.055	.03	.055
Reach 1	6.98	.055	.03	.055
Reach 1	6.9	.055	.03	.055
Reach 1	6.8	.055	.03	.055
Reach 1	6.71	.055	.03	.055
Reach 1	6.63	.055	.03	.055
Reach 1	6.58	.055	.03	.055
Reach 1	6.5	.055	.03	.055
Reach 1	6.43	.055	.03	.055
Reach 1	6.32	.055	.03	.055
Reach 1	6.25	.055	.03	.055
Reach 1	6.16	.055	.03	.055
Reach 1	6.09	.055	.03	.055
Reach 1	6.01	.055	.03	.055
Reach 1	5.92	.055	.03	.055
Reach 1	5.83	.055	.03	.055
Reach 1	5.76	.055	.03	.055
Reach 1	5.66	.055	.03	.055
Reach 1	5.64	.055	.03	.055
Reach 1	5.57	.055	.03	.055
Reach 1	5.48	.055	.03	.055
Reach 1	5.38	.055	.03	.055
Reach 1	5.31	.055	.03	.055
Reach 1	5.21	.055	.03	.055
Reach 1	5.15	.055	.03	.055
Reach 1	5.09	.055	.03	.055
Reach 1	5.03	.055	.03	.055
Reach 1	4.96	.055	.03	.055
Reach 1	4.9	.055	.03	.055
Reach 1	4.82	.055	.03	.055
Reach 1	4.78	.055	.03	.055
Reach 1	4.74	.055	.03	.055
Reach 1	4.65	.055	.03	.055
Reach 1	4.6	.055	.03	.055
Reach 1	4.58	.055	.03	.055
Reach 1	4.575	Culvert		
Reach 1	4.56	.055	.03	.055
Reach 1	4.49	.055	.03	.055
Reach 1	4.4	.055	.03	.055
Reach 1	4.31	.055	.03	.055
Reach 1	4.23	.055	.03	.055
Reach 1	4.22	.055	.03	.055
Reach 1	4.11	.055	.03	.055
Reach 1	4.05	.055	.03	.055
Reach 1	3.96	.055	.03	.055
Reach 1	3.86	.055	.03	.055
Reach 1	3.78	.055	.03	.055
Reach 1	3.75	.055	.03	.055
Reach 1	3.65	.055	.03	.055
Reach 1	3.6	.055	.03	.055
Reach 1	3.52	.055	.03	.055
Reach 1	3.48	.055	.03	.055
Reach 1	3.4	.055	.03	.055
Reach 1	3.32	.055	.03	.055
Reach 1	3.21	.055	.03	.055
Reach 1	3.13	.055	.03	.055
Reach 1	3.07	.055	.03	.055
Reach 2	2.97	.055	.049	.055
Reach 2	2.92	.055	.048	.055
Reach 2	2.90	.055	.037	.055
Reach 2	2.87	.055	.036	.055
Reach 2	2.82	.055	.043	.055
Reach 2	2.73	.055	.03	.055
Reach 3	2.60	.055	.03	.055

Reach 3	2.52	.055	.03	.055
Reach 3	2.47	.055	.03	.055
Reach 3	2.40	.055	.03	.055
Reach 3	2.33	.055	.03	.055
Reach 3	2.24	.055	.03	.055
Reach 3	2.17	.055	.03	.055
Reach 3	2.08	.055	.03	.055
Reach 3	2.00	.055	.03	.055
Reach 3	1.88	.055	.03	.055
Reach 3	1.85	.055	.03	.055
Reach 3	1.81	.055	.03	.055
Reach 3	1.75	.055	.03	.055
Reach 3	1.66	.055	.03	.055
Reach 3	1.60	.055	.03	.055
Reach 3	1.56	.055	.03	.055
Reach 3	1.47	.055	.03	.055
Reach 3	1.37	.055	.03	.055
Reach 3	1.27	.055	.03	.055
Reach 3	1.18	.055	.03	.055
Reach 3	1.09	.055	.03	.055
Reach 3	0.99	.055	.03	.055
Reach 3	0.84	.055	.03	.055
Reach 3	0.75	.055	.03	.055
Reach 3	0.71	.055	.03	.055
Reach 3	0.63	.055	.03	.055
Reach 3	0.54	.055	.03	.055
Reach 3	0.43	.055	.03	.055
Reach 3	0.33	.055	.03	.055
Reach 3	0.20	.055	.03	.055

River:Paradise Wash

Reach	River Sta.	n1	n2	n3
Reach 1	2.23	.055	.03	.055
Reach 1	2.14	.055	.03	.055
Reach 1	2.07	.055	.03	.055
Reach 1	2.00	.055	.03	.055
Reach 1	1.92	.055	.03	.055
Reach 1	1.83	.055	.03	.055
Reach 1	1.75	.055	.03	.055
Reach 1	1.65	.055	.03	.055
Reach 1	1.54	.055	.03	.03
Reach 1	1.46	.055	.03	.055
Reach 1	1.37	.055	.03	.055
Reach 1	1.27	.055	.03	.055
Reach 1	1.21	.055	.03	.055
Reach 1	1.12	.055	.03	.055
Reach 1	1.04	.055	.03	.055
Reach 1	0.95	.055	.03	.055
Reach 1	0.89	.055	.03	.055
Reach 1	0.80	.055	.03	.055
Reach 1	0.72	.055	.03	.055
Reach 1	0.62	.055	.03	.055
Reach 1	0.53	.055	.03	.055
Reach 1	0.44	.055	.03	.055
Reach 1	0.34	.055	.03	.055
Reach 1	0.28	.055	.03	.055
Reach 1	0.17	.055	.03	.055
Reach 1	0.13	.055	.03	.055
Reach 1	0.04	.055	.03	.055

SUMMARY OF REACH LENGTHS

River: Desert Hills Was

Reach	River Sta.	Left	Channel	Right
Reach 1	0.99	490	470	440
Reach 1	0.90	500	491	480
Reach 1	0.81	550	492	400
Reach 1	0.72	340	373	325
Reach 1	0.64	270	450	450
Reach 1	0.56	320	436	450
Reach 1	0.48	410	380	340
Reach 1	0.40	180	260	320
Reach 1	0.386	0	0	0

River: Apache Wash

Reach	River Sta.	Left	Channel	Right
Reach 1	8.02	215	235	245
Reach 1	7.98	280	465	520
Reach 1	7.89	300	300	220
Reach 1	7.84	575	500	425
Reach 1	7.74	425	500	475
Reach 1	7.65	520	500	470
Reach 1	7.55	510	500	480
Reach 1	7.46	490	500	510

Reach 1	7.36	420	446	470
Reach 1	7.28	475	554	410
Reach 1	7.17	500	500	520
Reach 1	7.08	485	500	500
Reach 1	6.98	400	437	470
Reach 1	6.9	490	529	560
Reach 1	6.8	500	495	400
Reach 1	6.71	425	390	350
Reach 1	6.63	300	290	290
Reach 1	6.58	430	430	430
Reach 1	6.5	310	345	355
Reach 1	6.43	475	450	360
Reach 1	6.32	410	390	350
Reach 1	6.25	490	460	430
Reach 1	6.16	270	360	450
Reach 1	6.09	470	445	435
Reach 1	6.01	485	490	510
Reach 1	5.92	375	400	375
Reach 1	5.83	375	380	380
Reach 1	5.76	470	540	570
Reach 1	5.66	460	440	320
Reach 1	5.64	370	345	320
Reach 1	5.57	400	450	450
Reach 1	5.48	530	500	500
Reach 1	5.38	350	375	425
Reach 1	5.31	500	500	480
Reach 1	5.21	330	310	300
Reach 1	5.15	350	352	355
Reach 1	5.09	300	300	310
Reach 1	5.03	345	365	340
Reach 1	4.96	400	320	200
Reach 1	4.9	220	200	160
Reach 1	4.82	480	480	480
Reach 1	4.78	300	200	100
Reach 1	4.74	400	500	500
Reach 1	4.65	260	280	260
Reach 1	4.6	83	83	83
Reach 1	4.58	180	180	170
Reach 1	4.575	Culvert		
Reach 1	4.56	365	365	350
Reach 1	4.49	490	450	450
Reach 1	4.4	475	510	490
Reach 1	4.31	410	420	410
Reach 1	4.23	140	150	150
Reach 1	4.22	280	280	260
Reach 1	4.11	240	250	300
Reach 1	4.05	400	500	285
Reach 1	3.96	490	520	460
Reach 1	3.86	360	400	490
Reach 1	3.78	170	170	170
Reach 1	3.75	500	500	500
Reach 1	3.65	250	280	260
Reach 1	3.6	400	420	450
Reach 1	3.52	200	200	200
Reach 1	3.48	400	400	400
Reach 1	3.4	480	470	440
Reach 1	3.32	520	520	520
Reach 1	3.21	250	310	350
Reach 1	3.13	200	280	300
Reach 1	3.07	0	0	0
Reach 2	2.97	270	270	280
Reach 2	2.92	155	155	145
Reach 2	2.90	140	200	300
Reach 2	2.87	240	260	250
Reach 2	2.82	250	430	470
Reach 2	2.73	0	0	0
Reach 3	2.60	390	430	450
Reach 3	2.52	270	260	250
Reach 3	2.47	340	400	450
Reach 3	2.40	300	360	370
Reach 3	2.33	450	450	450
Reach 3	2.24	380	380	390
Reach 3	2.17	500	520	350
Reach 3	2.08	440	440	270
Reach 3	2.00	550	490	230
Reach 3	1.88	190	200	230
Reach 3	1.85	210	190	150
Reach 3	1.81	300	300	240
Reach 3	1.75	480	500	520
Reach 3	1.66	300	250	240
Reach 3	1.60	190	180	180
Reach 3	1.56	400	500	540
Reach 3	1.47	490	500	520
Reach 3	1.37	400	500	440
Reach 3	1.27	450	460	500
Reach 3	1.18	500	500	350
Reach 3	1.09	500	500	460
Reach 3	0.99	890	900	550
Reach 3	0.84	420	440	430
Reach 3	0.75	180	200	210
Reach 3	0.71	370	400	440
Reach 3	0.63	300	500	600
Reach 3	0.54	800	640	400
Reach 3	0.43	505	500	440
Reach 3	0.33	350	650	700

Reach 3	0.20	0	0	0

iver: Paradise Wash

Reach	River Sta.	Left	Channel	Right
Reach 1	2.23	435	440	445
Reach 1	2.14	385	380	380
Reach 1	2.07	415	390	260
Reach 1	2.00	390	400	390
Reach 1	1.92	460	455	450
Reach 1	1.83	440	445	450
Reach 1	1.75	485	490	500
Reach 1	1.65	600	600	575
Reach 1	1.54	400	400	400
Reach 1	1.46	260	500	670
Reach 1	1.37	570	500	430
Reach 1	1.27	390	350	320
Reach 1	1.21	400	440	450
Reach 1	1.12	320	420	470
Reach 1	1.04	500	400	300
Reach 1	0.95	250	275	310
Reach 1	0.89	520	500	480
Reach 1	0.80	420	350	330
Reach 1	0.72	400	420	425
Reach 1	0.62	420	450	460
Reach 1	0.53	475	495	500
Reach 1	0.44	500	450	380
Reach 1	0.34	290	300	340
Reach 1	0.28	550	550	550
Reach 1	0.17	225	225	200
Reach 1	0.13	425	390	465
Reach 1	0.04	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Desert Hills Was

Reach	River Sta.	Contr.	Expan.
Reach 1	0.99	.1	.3
Reach 1	0.90	.1	.3
Reach 1	0.81	.1	.3
Reach 1	0.72	.1	.3
Reach 1	0.64	.1	.3
Reach 1	0.56	.1	.3
Reach 1	0.48	.1	.3
Reach 1	0.40	.1	.3
Reach 1	0.386	.3	.5

River: Apache Wash

Reach	River Sta.	Contr.	Expan.
Reach 1	8.02	.1	.3
Reach 1	7.98	.1	.3
Reach 1	7.89	.1	.3
Reach 1	7.84	.1	.3
Reach 1	7.74	.1	.3
Reach 1	7.65	.1	.3
Reach 1	7.55	.1	.3
Reach 1	7.46	.1	.3
Reach 1	7.36	.1	.3
Reach 1	7.28	.3	.5
Reach 1	7.17	.1	.3
Reach 1	7.08	.1	.3
Reach 1	6.98	.3	.5
Reach 1	6.9	.1	.3
Reach 1	6.8	.1	.3
Reach 1	6.71	.1	.3
Reach 1	6.63	.1	.3
Reach 1	6.58	.1	.3
Reach 1	6.5	.1	.3
Reach 1	6.43	.1	.3
Reach 1	6.32	.1	.3
Reach 1	6.25	.1	.3
Reach 1	6.16	.1	.3
Reach 1	6.09	.1	.3
Reach 1	6.01	.1	.3
Reach 1	5.92	.1	.3
Reach 1	5.83	.1	.3
Reach 1	5.76	.1	.3
Reach 1	5.66	.1	.3
Reach 1	5.64	.1	.3
Reach 1	5.57	.1	.3
Reach 1	5.48	.1	.3
Reach 1	5.38	.3	.5
Reach 1	5.31	.3	.5
Reach 1	5.21	.1	.3
Reach 1	5.15	.1	.3

Reach 1	5.09	.1	.3
Reach 1	5.03	.1	.3
Reach 1	4.96	.1	.3
Reach 1	4.9	.1	.3
Reach 1	4.82	.1	.3
Reach 1	4.78	.1	.3
Reach 1	4.74	.1	.3
Reach 1	4.65	.1	.3
Reach 1	4.6	.1	.3
Reach 1	4.58	.3	.5
Reach 1	4.575 Culvert		
Reach 1	4.56	.1	.3
Reach 1	4.49	.1	.3
Reach 1	4.4	.1	.3
Reach 1	4.31	.1	.3
Reach 1	4.23	.1	.3
Reach 1	4.22	.1	.3
Reach 1	4.11	.1	.3
Reach 1	4.05	.3	.5
Reach 1	3.96	.1	.3
Reach 1	3.86	.1	.3
Reach 1	3.78	.3	.5
Reach 1	3.75	.1	.3
Reach 1	3.65	.1	.3
Reach 1	3.6	.1	.3
Reach 1	3.52	.1	.3
Reach 1	3.48	.1	.3
Reach 1	3.4	.1	.3
Reach 1	3.32	.1	.3
Reach 1	3.21	.1	.3
Reach 1	3.13	.1	.3
Reach 1	3.07	.3	.5
Reach 2	2.97	.1	.3
Reach 2	2.92	.1	.3
Reach 2	2.90	.1	.3
Reach 2	2.87	.1	.3
Reach 2	2.82	.3	.5
Reach 2	2.73	.3	.5
Reach 3	2.60	.1	.3
Reach 3	2.52	.1	.3
Reach 3	2.47	.3	.5
Reach 3	2.40	.1	.3
Reach 3	2.33	.1	.3
Reach 3	2.24	.1	.3
Reach 3	2.17	.1	.3
Reach 3	2.08	.1	.3
Reach 3	2.00	.1	.3
Reach 3	1.88	.1	.3
Reach 3	1.85	.1	.3
Reach 3	1.81	.1	.3
Reach 3	1.75	.1	.3
Reach 3	1.66	.1	.3
Reach 3	1.60	.1	.3
Reach 3	1.56	.1	.3
Reach 3	1.47	.1	.3
Reach 3	1.37	.1	.3
Reach 3	1.27	.3	.5
Reach 3	1.18	.3	.5
Reach 3	1.09	.1	.3
Reach 3	0.99	.3	.5
Reach 3	0.84	.3	.5
Reach 3	0.75	.1	.3
Reach 3	0.71	.1	.3
Reach 3	0.63	.1	.3
Reach 3	0.54	.1	.3
Reach 3	0.43	.1	.3
Reach 3	0.33	.1	.3
Reach 3	0.20	.1	.3

River: Paradise Wash

Reach	River Sta.	Contr.	Expan.
Reach 1	2.23	.1	.3
Reach 1	2.14	.1	.3
Reach 1	2.07	.1	.3
Reach 1	2.00	.1	.3
Reach 1	1.92	.1	.3
Reach 1	1.83	.1	.3
Reach 1	1.75	.1	.3
Reach 1	1.65	.1	.3
Reach 1	1.54	.1	.3
Reach 1	1.46	.1	.3
Reach 1	1.37	.1	.3
Reach 1	1.27	.1	.3
Reach 1	1.21	.1	.3
Reach 1	1.12	.1	.3
Reach 1	1.04	.1	.3
Reach 1	0.95	.1	.3
Reach 1	0.89	.1	.3
Reach 1	0.80	.1	.3
Reach 1	0.72	.1	.3
Reach 1	0.62	.1	.3
Reach 1	0.53	.1	.3

Reach 1	0.44	.1	.3
Reach 1	0.34	.1	.3
Reach 1	0.28	.1	.3
Reach 1	0.17	.1	.3
Reach 1	0.13	.1	.3
Reach 1	0.04	.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/ft)	E.G. Slope (ft/s)	Vel Chnl (sq ft)	Flow Area (ft)	Top Width	Froude # Chl	
Paradise Wash	Reach 1	2.23		5401.00	1826.00	1833.07	1833.07	1834.03	0.003806	10.46	1300.71	626.90	0.73
Paradise Wash	Reach 1	2.14		5401.00	1824.00	1827.41	1827.31	1828.01	0.008069	10.08	1268.84	710.10	0.96
Paradise Wash	Reach 1	2.07		5401.00	1821.00	1823.42	1823.42	1824.08	0.013749	9.64	1100.12	757.95	1.16
Paradise Wash	Reach 1	2.00		5401.00	1814.00	1820.79	1820.79	1821.66	0.003984	10.52	1356.57	646.16	0.74
Paradise Wash	Reach 1	1.92		5401.00	1810.00	1815.46	1815.46	1816.53	0.005146	9.64	966.37	441.41	0.80
Paradise Wash	Reach 1	1.83		5401.00	1806.00	1811.30	1811.30	1812.30	0.006296	10.76	1039.15	448.53	0.89
Paradise Wash	Reach 1	1.75		5401.00	1800.00	1805.67	1805.67	1806.68	0.007682	10.94	969.30	424.16	0.96
Paradise Wash	Reach 1	1.65		5401.00	1796.00	1801.12	1801.12	1802.24	0.006968	11.46	938.34	361.42	0.94
Paradise Wash	Reach 1	1.54		5992.00	1790.00	1794.11	1793.82	1795.21	0.011197	12.31	813.01	538.83	1.14
Paradise Wash	Reach 1	1.46		5992.00	1786.00	1792.04	1792.04	1792.85	0.003445	9.27	1543.35	841.98	0.68
Paradise Wash	Reach 1	1.37		5992.00	1782.00	1787.96	1787.96	1789.68	0.008226	12.75	785.37	260.97	1.02
Paradise Wash	Reach 1	1.27		5992.00	1778.00	1785.13	1785.13	1786.31	0.003790	9.64	1094.23	630.23	0.71
Paradise Wash	Reach 1	1.21		5992.00	1776.00	1782.26	1782.26	1783.14	0.004808	11.11	1416.42	711.53	0.80
Paradise Wash	Reach 1	1.12		5992.00	1772.00	1778.83	1778.83	1779.89	0.005209	10.10	1157.23	545.52	0.81
Paradise Wash	Reach 1	1.04		5992.00	1770.00	1775.61	1773.89	1776.07	0.003478	8.61	1584.37	574.38	0.67
Paradise Wash	Reach 1	0.95		5992.00	1766.00	1773.26	1773.26	1774.41	0.003874	9.68	1127.72	578.81	0.72
Paradise Wash	Reach 1	0.89		5992.00	1764.00	1771.75	1771.75	1772.70	0.003695	10.68	1458.25	667.45	0.71
Paradise Wash	Reach 1	0.80		5992.00	1762.00	1766.99	1766.99	1767.77	0.007003	11.29	1346.36	685.92	0.93
Paradise Wash	Reach 1	0.72		5992.00	1758.00	1762.48	1762.48	1763.30	0.008536	11.59	1237.58	613.74	1.01
Paradise Wash	Reach 1	0.62		5992.00	1754.00	1759.74	1759.74	1760.67	0.004482	10.03	1336.95	646.29	0.77
Paradise Wash	Reach 1	0.53		5992.00	1750.00	1755.48	1755.48	1756.60	0.006034	11.41	1151.14	496.70	0.89
Paradise Wash	Reach 1	0.44		5992.00	1746.00	1751.31	1750.83	1751.87	0.006308	9.98	1320.74	536.07	0.87
Paradise Wash	Reach 1	0.34		5992.00	1744.00	1747.21	1747.21	1748.07	0.012081	11.85	1079.23	534.98	1.17
Paradise Wash	Reach 1	0.28		5992.00	1738.00	1744.17	1744.17	1745.31	0.006748	11.06	1027.09	468.66	0.92
Paradise Wash	Reach 1	0.17		5992.00	1732.00	1739.29	1739.29	1740.28	0.003463	10.38	1366.03	573.42	0.70
Paradise Wash	Reach 1	0.13		5992.00	1732.00	1737.56	1737.56	1738.48	0.004742	9.94	1277.41	588.47	0.78
Paradise Wash	Reach 1	0.04		5992.00	1726.00	1737.07	1733.98	1737.29	0.000517	5.08	2547.13	568.87	0.29
Apache Wash	Reach 1	8.02		7408.00	1985.10	1992.64	1992.64	1994.02	0.004828	11.80	1247.79	425.56	0.82
Apache Wash	Reach 1	7.98		7408.00	1981.80	1988.85	1988.85	1990.07	0.006342	11.72	1286.08	499.24	0.91
Apache Wash	Reach 1	7.89		7408.00	1977.00	1984.45	1984.45	1985.85	0.005058	11.44	1177.53	471.52	0.83
Apache Wash	Reach 1	7.84		7408.00	1974.40	1981.02	1981.02	1982.37	0.006877	13.25	1177.84	379.72	0.97
Apache Wash	Reach 1	7.74		7408.00	1969.10	1974.86	1974.86	1976.14	0.008346	12.80	1135.33	379.84	1.03
Apache Wash	Reach 1	7.65		7408.00	1961.80	1968.60	1968.60	1970.16	0.007024	13.42	1057.17	322.10	0.97
Apache Wash	Reach 1	7.55		7408.00	1956.70	1963.71	1963.71	1965.51	0.006753	13.22	946.98	255.23	0.96
Apache Wash	Reach 1	7.46		7408.00	1951.50	1957.80	1957.80	1959.70	0.006215	12.38	888.43	262.49	0.92
Apache Wash	Reach 1	7.36		7408.00	1944.50	1952.25	1952.25	1953.91	0.005332	11.96	1015.47	303.08	0.86
Apache Wash	Reach 1	7.28		7408.00	1940.80	1948.28	1945.42	1948.66	0.002172	8.32	1732.66	315.75	0.56
Apache Wash	Reach 1	7.17		7408.00	1934.00	1943.34	1943.34	1946.27	0.005186	15.08	718.12	141.06	0.90
Apache Wash	Reach 1	7.08		7408.00	1929.00	1937.10	1937.10	1939.96	0.006114	14.12	637.86	130.41	0.94
Apache Wash	Reach 1	6.98		7408.00	1924.00	1933.08	1933.08	1934.68	0.004119	12.08	1163.49	362.75	0.78
Apache Wash	Reach 1	6.9		7408.00	1920.00	1928.71	1928.71	1930.08	0.004306	11.41	1249.84	417.59	0.78
Apache Wash	Reach 1	6.8		7408.00	1914.00	1922.72	1922.72	1924.22	0.004914	13.02	1215.80	359.01	0.84
Apache Wash	Reach 1	6.71		7408.00	1907.50	1918.90	1918.90	1920.89	0.003341	12.94	1025.85	255.00	0.72
Apache Wash	Reach 1	6.63		7408.00	1905.00	1915.11	1915.11	1916.87	0.003867	13.36	1176.80	319.28	0.77
Apache Wash	Reach 1	6.58		7408.00	1902.00	1910.99	1910.99	1912.65	0.004319	12.20	1129.98	354.18	0.79
Apache Wash	Reach 1	6.5		7408.00	1899.00	1905.96	1905.96	1907.39	0.005881	10.52	1021.49	379.30	0.86
Apache Wash	Reach 1	6.43		7408.00	1896.50	1902.40	1902.40	1903.78	0.006995	11.05	1055.40	379.01	0.93
Apache Wash	Reach 1	6.32		7408.00	1890.00	1899.28	1899.28	1900.78	0.003659	12.00	1299.81	435.04	0.74
Apache Wash	Reach 1	6.25		7408.00	1888.00	1894.55	1894.55	1895.72	0.005321	10.72	1312.04	517.36	0.83
Apache Wash	Reach 1	6.16		7408.00	1883.00	1889.83	1889.83	1891.22	0.006715	11.86	1111.18	370.82	0.93
Apache Wash	Reach 1	6.09		7408.00	1879.50	1884.66	1884.66	1885.93	0.005673	10.01	1135.56	491.11	0.84
Apache Wash	Reach 1	6.01		7403.00	1875.50	1881.46	1881.46	1882.78	0.007902	10.91	1046.76	391.15	0.97
Apache Wash	Reach 1	5.92		7403.00	1870.20	1875.85	1875.85	1877.17	0.012495	12.52	1059.09	457.78	1.19
Apache Wash	Reach 1	5.83		7403.00	1865.50	1871.68	1871.68	1873.08	0.007065	12.07	1144.18	422.90	0.96
Apache Wash	Reach 1	5.76		7403.00	1862.00	1867.87	1867.87	1869.15	0.005768	11.35	1230.44	446.23	0.87
Apache Wash	Reach 1	5.66		7403.00	1854.00	1861.88	1861.88	1864.39	0.012908	16.34	900.74	361.03	1.27
Apache Wash	Reach 1	5.64		7403.00	1855.00	1859.90	1858.64	1860.41	0.002249	6.31	1662.70	580.55	0.53
Apache Wash	Reach 1	5.57		7403.00	1850.00	1857.66	1857.66	1859.06	0.006607	12.38	1158.22	520.63	0.93
Apache Wash	Reach 1	5.48		7403.00	1846.00	1853.63	1853.63	1854.63	0.004520	10.62	1633.82	766.17	0.78
Apache Wash	Reach 1	5.38		7403.00	1841.00	1849.03	1849.03	1850.37	0.006848	14.13	1322.25	513.89	0.97
Apache Wash	Reach 1	5.31		7403.00	1838.00	1845.66	1845.66	1846.45	0.005742	10.66	1829.73	1043.10	0.85
Apache Wash	Reach 1	5.21		7403.00	1834.00	1840.61	1840.61	1841.59	0.006986	11.41	1484.34	687.61	0.94
Apache Wash	Reach 1	5.15		7403.00	1830.00	1837.57	1837.57	1838.58	0.006373	11.87	1422.76	564.03	0.90
Apache Wash	Reach 1	5.09		7403.00	1830.00	1834.24	1834.01	1834.73	0.008114	9.56	1762.12	969.87	0.95
Apache Wash	Reach 1	5.03		7403.00	1826.00	1831.27	1831.27	1831.96	0.010164	11.90	1625.63	949.78	1.08
Apache Wash	Reach 1	4.96		7403.00	1822.00	1828.12	1827.51	1828.47	0.004643	8.82	2120.60	960.81	0.75
Apache Wash	Reach 1	4.9		7403.00	1820.00	1824.15	1824.15	1825.95	0.023583	15.48	985.33	575.31	1.59
Apache Wash	Reach 1	4.82		7403.00	1818.00	1822.01	1822.01	1822.92	0.009687	9.88	1264.34	604.98	1.02
Apache Wash	Reach 1	4.78		7403.00	1813.00	1817.38	1816.89	1817.87	0.009317	9.29	1486.44	638.12	0.99
Apache Wash	Reach 1	4.74		7403.00	1810.00	1815.85	1815.85	1816.60	0.010777	10.88	1433.92	738.26	1.09
Apache Wash	Reach 1	4.65		7403.00	1806.00	1810.88	1810.88	1811.91	0.007925	10.36	1276.32	579.77	0.96
Apache Wash	Reach 1	4.6		7403.00	1802.00	1809.47	1807.60	1809.69	0.001523	6.29	2494.30	653.44	0.45
Apache Wash	Reach 1	4.58		7403.00	1801.30	1809.37	1808.01	1809.58	0.001212	6.41	2834.31	781.85	0.40
Apache Wash	Reach 1	4.575		Culvert									
Apache Wash	Reach 1	4.56		7403.00	1799.00	1808.01	1808.01	1808.51	0.001024	6.09	1602.46	325.70	0.39
Apache Wash	Reach 1	4.49		7403.00	1796.00	1803.54	1803.54	1805.39	0.005369	11.57	881.97	303.99	0.85
Apache Wash	Reach 1	4.4		7403.00	1792.30	1800.01	1800.01	1802.19	0.009015	15.60	914.62	270.72	1.11
Apache Wash	Reach 1	4.31		7403.00	1788.00	1797.36	1797.36	1798.76	0.004326	12.65	1332.59	423.51	0.79
Apache Wash	Reach 1	4.23		7403.00	1786.00	1792.58	1792.38	1793.75	0.007157	12.26	1224.97	429.19	0.96
Apache Wash	Reach 1	4.22		7403.00	1785.50	1791.43	1791.37	1792.57	0.009242	12.35	1185.33	458.73	1.06
Apache Wash	Reach 1	4.11		7403.00	1782.00	1788.85	1788.85	1790.44	0.006201	10.77	926.82	334.17	0.88
Apache Wash	Reach 1	4.05		7403.00	1779.00	1785.66	1785.66	1787.24	0.008222	13.93	1019.65	295.44	1.04

Apache Wash	Reach 1	3.96	7403.00	1774.00	1782.31	1782.31	1783.38	0.005501	9.07	1258.75	708.77	0.81
Apache Wash	Reach 1	3.86	7403.00	1770.00	1777.98	1777.84	1779.28	0.005162	11.37	1273.58	517.39	0.83
Apache Wash	Reach 1	3.78	7727.00	1766.00	1773.70	1773.70	1776.02	0.011186	14.29	900.17	351.02	1.17
Apache Wash	Reach 1	3.75	7727.00	1764.00	1773.38	1773.38	1774.25	0.003003	10.89	2153.17	992.46	0.66
Apache Wash	Reach 1	3.65	7727.00	1762.00	1769.32	1769.05	1770.41	0.004475	11.76	1545.84	596.53	0.80
Apache Wash	Reach 1	3.6	7727.00	1760.00	1768.19	1768.19	1769.21	0.004336	12.16	1782.69	793.14	0.78
Apache Wash	Reach 1	3.52	7727.00	1756.00	1765.61	1765.61	1766.64	0.003651	11.89	1973.18	897.50	0.73
Apache Wash	Reach 1	3.48	7727.00	1755.00	1763.67	1763.67	1764.59	0.004334	11.97	1973.89	933.57	0.78
Apache Wash	Reach 1	3.4	7727.00	1752.00	1760.07	1760.07	1760.99	0.004352	11.24	1957.83	995.86	0.78
Apache Wash	Reach 1	3.32	7727.00	1750.00	1756.34	1756.34	1757.17	0.005326	10.46	1788.73	1047.38	0.82
Apache Wash	Reach 1	3.21	7727.00	1746.00	1752.62	1752.62	1753.53	0.005248	10.74	1690.45	770.84	0.83
Apache Wash	Reach 1	3.13	7727.00	1742.00	1750.26	1750.26	1751.32	0.004701	11.50	1579.22	626.90	0.80
Apache Wash	Reach 1	3.07	7727.00	1741.00	1748.43	1748.43	1749.56	0.004867	11.86	1502.08	543.63	0.82
Apache Wash	Reach 2	2.97	13890.00	1736.00	1743.76	1742.25	1743.97	0.004150	3.80	3847.29	1493.53	0.41
Apache Wash	Reach 2	2.92	13890.00	1734.00	1742.78	1741.02	1742.97	0.003199	3.92	4160.49	1523.53	0.38
Apache Wash	Reach 2	2.90	13890.00	1734.00	1742.52	1740.19	1742.69	0.001192	3.81	4720.79	1201.60	0.31
Apache Wash	Reach 2	2.87	13890.00	1732.00	1742.31	1738.80	1742.50	0.000677	3.66	4607.46	938.90	0.26
Apache Wash	Reach 2	2.82	13890.00	1730.00	1742.12	1737.90	1742.30	0.000839	3.82	4384.65	692.65	0.25
Apache Wash	Reach 2	2.73	13890.00	1728.00	1738.30	1738.30	1740.92	0.005078	15.49	1576.58	321.87	0.89
Apache Wash	Reach 3	2.60	17944.00	1724.00	1734.94	1734.94	1736.74	0.003952	13.62	2717.53	680.34	0.78
Apache Wash	Reach 3	2.52	17944.00	1721.00	1733.25	1731.78	1734.38	0.002247	11.45	3194.70	560.34	0.61
Apache Wash	Reach 3	2.47	17944.00	1720.00	1731.46	1731.12	1733.52	0.004183	14.86	2287.29	403.40	0.82
Apache Wash	Reach 3	2.40	17944.00	1718.00	1730.12	1728.03	1732.17	0.002722	13.19	2016.56	244.82	0.68
Apache Wash	Reach 3	2.33	17944.00	1717.00	1727.14	1727.14	1730.67	0.006088	17.01	1523.41	233.19	0.98
Apache Wash	Reach 3	2.24	17944.00	1714.00	1723.46	1723.46	1726.07	0.005602	14.71	1856.48	378.56	0.92
Apache Wash	Reach 3	2.17	17944.00	1714.00	1720.95	1720.95	1722.78	0.006495	13.97	2383.09	618.98	0.96
Apache Wash	Reach 3	2.08	17944.00	1710.00	1717.46	1716.82	1719.05	0.010944	14.32	2379.05	764.64	1.17
Apache Wash	Reach 3	2.00	17944.00	1708.50	1714.67	1714.67	1716.10	0.006481	12.58	2722.87	845.45	0.94
Apache Wash	Reach 3	1.88	17944.00	1702.10	1711.73	1711.73	1713.44	0.004766	13.65	2686.21	695.75	0.85
Apache Wash	Reach 3	1.85	17944.00	1700.00	1711.26	1710.32	1712.44	0.002710	11.51	3109.59	619.40	0.66
Apache Wash	Reach 3	1.81	17944.00	1700.00	1710.70	1709.56	1711.94	0.002942	12.65	2959.61	520.71	0.69
Apache Wash	Reach 3	1.75	17944.00	1698.00	1708.50	1708.50	1710.85	0.004414	14.19	2170.37	493.70	0.83
Apache Wash	Reach 3	1.66	17944.00	1696.00	1705.52	1705.52	1707.88	0.005913	15.49	2114.50	470.60	0.95
Apache Wash	Reach 3	1.60	17944.00	1692.00	1704.31	1704.31	1706.31	0.004138	15.23	2652.40	592.90	0.82
Apache Wash	Reach 3	1.56	17944.00	1692.00	1703.49	1703.39	1705.36	0.004344	14.15	2565.94	588.87	0.82
Apache Wash	Reach 3	1.47	17944.00	1690.00	1701.34	1701.34	1703.43	0.003994	14.79	2598.61	606.80	0.81
Apache Wash	Reach 3	1.37	17944.00	1688.00	1696.96	1696.96	1699.04	0.005837	14.46	2254.37	527.43	0.93
Apache Wash	Reach 3	1.27	17944.00	1684.00	1693.46	1693.21	1695.54	0.004452	13.79	2351.44	557.75	0.83
Apache Wash	Reach 3	1.18	17944.00	1680.00	1692.11	1692.11	1693.67	0.002706	12.50	3359.53	992.91	0.67
Apache Wash	Reach 3	1.09	17944.00	1680.00	1688.09	1688.09	1689.05	0.004071	12.44	4293.57	1696.66	0.78
Apache Wash	Reach 3	0.99	17944.00	1678.00	1684.78	1683.43	1685.13	0.002871	9.18	5441.04	1869.86	0.64
Apache Wash	Reach 3	0.84	17944.00	1670.00	1677.91	1677.91	1680.95	0.010423	19.47	1927.94	539.96	1.24
Apache Wash	Reach 3	0.75	17944.00	1666.00	1677.02	1676.19	1677.92	0.002212	10.55	4075.94	1059.94	0.60
Apache Wash	Reach 3	0.71	17944.00	1664.00	1675.40	1675.40	1677.25	0.004097	15.01	2898.60	747.56	0.81
Apache Wash	Reach 3	0.63	17944.00	1664.00	1672.69	1672.69	1674.16	0.004935	13.67	3105.81	950.47	0.86
Apache Wash	Reach 3	0.54	17944.00	1660.00	1669.07	1669.07	1670.71	0.005420	14.87	2946.40	863.07	0.90
Apache Wash	Reach 3	0.43	17944.00	1655.00	1664.50	1664.31	1666.17	0.005427	13.24	2547.25	698.63	0.88
Apache Wash	Reach 3	0.33	17944.00	1652.20	1661.62	1661.57	1663.67	0.004837	12.95	2203.47	635.19	0.84
Apache Wash	Reach 3	0.20	17944.00	1646.00	1659.30	1659.30	1661.25	0.003293	13.95	2942.73	815.17	0.73
Desert Hills Was	Reach 1	0.99	10761.00	1748.00	1757.63	1756.61	1757.99	0.002886	9.54	3154.62	1021.68	0.59
Desert Hills Was	Reach 1	0.90	10761.00	1748.00	1755.64	1755.00	1756.26	0.004807	12.50	2463.61	829.20	0.82
Desert Hills Was	Reach 1	0.81	10761.00	1746.00	1753.47	1752.77	1754.00	0.004351	10.58	2613.74	899.01	0.73
Desert Hills Was	Reach 1	0.72	10761.00	1744.00	1751.05	1750.71	1751.73	0.006128	12.32	2397.25	970.28	0.88
Desert Hills Was	Reach 1	0.64	10761.00	1742.00	1749.47	1748.84	1750.00	0.004115	10.44	2761.18	1023.44	0.74
Desert Hills Was	Reach 1	0.56	10761.00	1740.00	1748.27	1747.32	1748.68	0.003005	9.74	3217.74	1154.14	0.64
Desert Hills Was	Reach 1	0.48	10761.00	1740.00	1747.36	1745.99	1747.66	0.002193	8.39	3379.96	1002.58	0.56
Desert Hills Was	Reach 1	0.40	10761.00	1738.00	1746.01	1745.16	1746.60	0.003528	9.89	2663.93	891.88	0.70
Desert Hills Was	Reach 1	0.386	10761.00	1738.00	1745.18	1743.86	1745.70	0.003707	10.71	2803.79	962.70	0.72

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Fu-100

River: Desert Hills Was Reach: Reach 1 RS: 0.99 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.90 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.81 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.72 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.64 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.56 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.48 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.386 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Apache Wash Reach: Reach 1 RS: 8.02 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

'iver: Apache Wash Reach: Reach 1 RS: 7.98 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 7.89 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 7.84 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 7.74 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 7.65 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 7.55 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 7.46 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 7.36 Profile: 100-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

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

River: Apache Wash Reach: Reach 1 RS: 7.28 Profile: 100-year

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 1 RS: 7.17 Profile: 100-year

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

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

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

River: Apache Wash Reach: Reach 1 RS: 7.08 Profile: 100-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 1 RS: 6.98 Profile: 100-year

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

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.9 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.8 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.71 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.63 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.58 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.5 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.43 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.32 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.25 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.16 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.09 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.01 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.92 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.83 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.76 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.66 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.64 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 5.57 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.48 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.38 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.31 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.21 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

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

River: Apache Wash Reach: Reach 1 RS: 5.15 Profile: 100-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 1 RS: 5.09 Profile: 100-year

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

Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1 RS: 5.03 Profile: 100-year

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

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

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

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

River: Apache Wash Reach: Reach 1 RS: 4.96 Profile: 100-year

Warning:The cross-section end points had to be extended vertically for the computed water surface.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

River: Apache Wash Reach: Reach 1 RS: 4.9 Profile: 100-year

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

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

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

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: Apache Wash Reach: Reach 1 RS: 4.82 Profile: 100-year

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

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

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

Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1 RS: 4.78 Profile: 100-year

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

River: Apache Wash Reach: Reach 1 RS: 4.74 Profile: 100-year

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

Warning:The cross-section end points had to be extended vertically for the computed water surface.

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

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

River: Apache Wash Reach: Reach 1 RS: 4.65 Profile: 100-year

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

Warning:The cross-section end points had to be extended vertically for the computed water surface.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

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

River: Apache Wash Reach: Reach 1 RS: 4.6 Profile: 100-year

Warning:The cross-section end points had to be extended vertically for the computed water surface.

River: Apache Wash Reach: Reach 1 RS: 4.58 Profile: 100-year

Warning:The cross section had to be extended vertically during the critical depth calculations.

Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1 RS: 4.56 Profile: 100-year

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

Warning:The cross-section end points had to be extended vertically for the computed water surface.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Apache Wash Reach: Reach 1 RS: 4.49 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.4 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.31 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.23 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 4.22 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 4.11 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.05 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.96 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.86 Profile: 100-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 3.78 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.75 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.65 Profile: 100-year
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.

River: Apache Wash Reach: Reach 1 RS: 3.6 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.52 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.48 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.4 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.32 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.21 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.13 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.07 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 2 RS: 2.92 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.90 Profile: 100-year
Warning:Divided flow computed for this cross-section.
River: Apache Wash Reach: Reach 2 RS: 2.82 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.73 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.60 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.52 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.47 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.40 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.33 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.24 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.17 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.08 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.00 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.88 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.81 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.75 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.66 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.60 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.56 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.47 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.37 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.27 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.18 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.09 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.99 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.84 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.75 Profile: 100-year
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.71 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.63 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.54 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.43 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.33 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.20 Profile: 100-year
Warning:Slope too steep for slope area to converge during supercritical flow calculations (normal depth is below critical depth). Water surface set to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 2.23 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 2.14 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Paradise Wash Reach: Reach 1 RS: 2.07 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 2.00 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.92 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.83 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.75 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.65 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.54 Profile: 100-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.46 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.37 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.27 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.21 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Paradise Wash Reach: Reach 1 RS: 1.12 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.04 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.95 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.89 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.80 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.72 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.62 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.53 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.44 Profile: 100-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.34 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.28 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.17 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.13 Profile: 100-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.04 Profile: 100-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

APPENDIX F.8

Apache Wash: 10-year Future Conditions

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Apache Wash WMP
Project File : Apache1.prj
Run Date and Time: 12/29/99 3:05:38 PM

Project in English units

Project Description:
Upper Cave Creek and Apache Wash Watercourse Master Plan

For Apache Wash
above Cave Buttes Dam
by Stantec Consulting Inc. for the Flood Control
District of Maricopa County
FCD:

March 1999

PLAN DATA

Plan Title: Future Condition 10-year
Plan File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.p04

Geometry Title: Revised Geometry 10-year
Geometry File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.g01

Flow Title : Future Condition 10-year
Flow File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.f02

Plan Summary Information:
Number of: Cross Sections = 146 Mulitple Openings = 0
Culverts = 1 Inline Weirs = 0
Bridges = 0

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

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Future Condition 10-year
Flow File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.f02

Flow Data (cfs)

River	Reach	RS	10-year
Desert Hills Was	Reach 1	0.99	2140
Apache Wash	Reach 1	8.02	1187
Apache Wash	Reach 1	6.01	1262
Apache Wash	Reach 1	3.78	1482
Apache Wash	Reach 2	2.73	3085
Apache Wash	Reach 3	2.60	3573
Paradise Wash	Reach 1	2.23	1075
Paradise Wash	Reach 1	1.54	1219

Boundary Conditions

River	Reach	Profile	Upstream	Downstream

GEOMETRY DATA

Geometry Title: Revised Geometry 10-year
Geometry File : p:\28900077\design calculations\HecRas\Apache Wash\Apache1.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Desert Hills Was	Reach 1		DH & A Wash
Apache Wash	Reach 1		DH & A Wash
Apache Wash	Reach 2	DH & A Wash	P & A Wash
Apache Wash	Reach 3	P & A Wash	
Paradise Wash	Reach 1		P & A Wash

JUNCTION INFORMATION

Name: DH & A Wash
Description: Confluence of Desert Hills Wash with Apache Wash
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Apache Wash	Reach 1	to Apache Wash	Reach 2	430	
Desert Hills Was	Reach 1	to Apache Wash	Reach 2	470	

Name: P & A Wash
Description: Confluence of Paradise Wash with Apache Wash
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Apache Wash	Reach 2	to Apache Wash	Reach 3	360	
Paradise Wash	Reach 1	to Apache Wash	Reach 3	205	

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.99

INPUT
Description: 0.99
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9333.68	1762	9403.72	1760	9486.25	1758	9487.32	1758	9640.92	1756
9732.38	1754	9737.95	1754	9814.01	1754	9988.19	1752	9989.38	1750
9990.31	1750	9991.34	1752	9992.23	1752	9994.34	1750	9996.33	1748
10004.96	174810008.87		175010012.73		175210163.12		175410423.96		1756
10451.19	175610470.06		175610553.26		175810641.18		1760		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9333.68	.055	9988.19	.0310012.73		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.19	10012.73	490	470	440	.1	.3

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.90

INPUT
Description: 0.9
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9300	1760	9357.07	1760	9449.84	1760	9643.57	1760	9698.3	1758
9729.54	1756	9766.39	1754	9766.58	1754	9831.51	1752	9950.49	1751
9996.49	175010000.96		174810013.62		174810013.64		174810017.63		1750
10021.66	175210021.74		175210038.07		175210038.12		175210235.65		1752
10411.03	175410599.65		1756	10800	1758				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9300	.055	9996.49	.0310017.63		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9996.49	10017.63	500	491	480	.1	.3

CROSS SECTION RIVER: Desert Hills Was
REACH: Reach 1 RS: 0.81

INPUT
Description: 0.81
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9680	1755.3	9730	1754	9779.07	1752	9805.44	1752	9883.96	1750
9884.14	1750	9983.58	1750	9983.71	1750	9988.29	1750	9989.3	1748
9990.31	1746	9990.32	1746	10011.7	174610014.89		174810014.94		1748
10017.9	175010018.03		175010035.47		175010035.57		1750	10105	1748.5
10270	1750	10535	1752	10680	1754	10740	1756		

Manning's n Values num= 3

```
     Sta    n Val      Sta    n Val      Sta    n Val
    9680     .055 9983.58      .0310018.03     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9983.5810018.03                550     492     400              .1       .3

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.72

INPUT
Description: 0.72
Station Elevation Data     num=       21
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9365     1756     9470     1754     9625     1752     9800     1750 9986.71     1748
 9986.75     1748 9991.03     1746 9991.08     1746 9995.08     1744 9995.12     1744
10010.29     174410013.39     1746 10016.5     174810081.37     1748    10315   1746.2
   10380     1748    10510     1750    10610     1750    10740     1752    10800     1754
   10835     1756

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9365     .055 9986.71      .03 10016.5     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9986.71 10016.5                340     373     325              .3       .3

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.64

INPUT
Description: 0.64
Station Elevation Data     num=       10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9420     1750     9590     1748     9825     1746 9977.76     1746 9993.02     1742
10006.33     1742 10006.4     174210018.06     1746    10305     1746    10517     1750

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9420     .055 9977.76      .0310018.06     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9977.7610018.06                270     450     450              .3       .5

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.56

INPUT
Description: 0.56  -- First XS within WMP Study Limit
Station Elevation Data     num=       16
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    8940     1750     9000     1749     9200     1748     9475     1746     9600     1744
    9615     1744     9730     1745 9986.89     1744 9998.14     174010012.68     1740
10012.77     174010019.47     174410081.48     174410085.66     174410292.39     1748
   10350     1750

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    8940     .055 9986.89      .0310019.47     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9986.8910019.47                320     436     450              .3       .5

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.48

INPUT
Description: 0.48
Station Elevation Data     num=       12
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    8900   1750.2     9100     1750     9415     1748     9560     1746 9979.98     1742
 9985.27     174010007.03     174010013.02     1742    10335     1744    10440     1746
   10475     1748    10500     1750

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    8900     .055 9979.98      .0310013.02     .055

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9979.9810013.02                410     380     340              .3       .5

CROSS SECTION           RIVER: Desert Hills Was
REACH: Reach 1             RS: 0.40

INPUT
Description:
Station Elevation Data     num=       20
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9000     1748     9100     1748 9402.16     1746 9610.77     1744 9720.22     1742
 9949.58     1742 9966.56     1742 9976.95     1740 9988.11     1738 9999.42     1738
10008.13     174010016.94     174210021.82     174210103.85     174210240.84     1744
10290.98     174610292.67     174610324.41     174810327.05     174810352.56     1750

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9000     .055 9966.56      .0310021.82     .055
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.5610021.82               180     260     320            .3       .5

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.386

INPUT
Description:
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9162    1748    9382    1746    9604    1744    9712    1742    9982    1740
    9988    1738   10012    1738   10014    1740   10212    1742   10235    1744
   10262    1742   10330    1744   10509    1746

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9162    .055    9982     .03   10014    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9982   10014             405     400     380            .3       .5

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.31

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9469  1743.5    9707    1742    9873    1740    9919  1738.5    9977    1740
    9981    1738    9985    1736   10015    1736   10019    1738   10025    1740
   10082    1740   10129    1739   10199    1740   10253    1740   10509    1742
   10639    1744   10757    1746

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9469    .055    9977     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9977   10025             280     280     280            .1       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.22

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9600  1741.5    9855    1740    9980    1738    9986    1736    9992    1734
   10008    1734   10028    1736   10039    1738   10103    1738   10114    1740
   10129    1742   10150    1742   10156    1740   10160    1738   10194    1738
   10450    1740   10630    1742   10820    1742   10925    1744   11045    1746

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9600    .055    9980     .03   10039    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   10039             130     145     180            .1       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.19

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9818  1740.5    9863    1740    9978    1738    9984    1736    9990    1734
   10018    1734   10028    1736   10146    1738   10158    1740   10171    1742
   10179    1744   10190    1746   10207    1746   10213    1744   10221    1742
   10235    1740   10248    1738   10548    1738   10638    1740   10693    1742
   10753    1744

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9818    .055    9978     .03   10028    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10028             240     300     380            .1       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.09

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9803  1738.5    9895    1738    9963    1736    9973    1734    9981    1732
   10018    1732   10024    1734   10031    1736   10091    1736   10121    1734
   10131    1732   10143    1732   10156    1734   10189    1736   10264    1738
   10331    1740   10370    1742   10402    1744

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9803    .055    9963     .03   10031    .055
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9963   10031              250     250     280            .1       .3

CROSS SECTION          RIVER: Desert Hills Was
REACH: Reach 1            RS: 0.04

INPUT
Description:
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9869    1736    9939    1736    9977    1734    9983    1732    9989    1730
   10011    1730   10017    1732   10023    1734   10053    1736   10069    1738
   10084    1740   10099    1742   10116    1744

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9869    .055    9977     .03   10023    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9977   10023                0       0       0            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 8.02

INPUT
Description: 8.02

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9610    1996    9700    1992    9765  1991.9    9862    1990    9894    1988
    9897    1988    9951  1989.2    9977    1988    9989    1986   10000  1985.1
   10020    1986   10037    1988   10077    1990   10109    1992   10116    1994
   10125    1996

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9610    .055    9977     .03   10037    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9977   10037              215     235     245            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.98

INPUT
Description: 7.98

 tation Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9500    1992    9570    1990    9630    1988    9740    1986    9773    1986
    9859    1986    9898  1986.4    9927    1986    9950    1986    9975    1986
    9982    1984    9991    1982   10000  1981.8   10005    1982   10017    1984
   10039    1986   10075    1988   10097  1988.2   10116    1990   10127    1992

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9500    .055    9975     .03   10039    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10039              280     465     520            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.89

INPUT
Description: 7.89

Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9756    1986    9764    1984    9845    1984    9878    1984    9978    1982
    9983    1982    9987    1980    9992    1978   10000    1977   10020    1978
   10054    1980   10082    1980   10149  1981.8   10170    1982   10189    1982
   10219    1982   10224    1984   10256  1985.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9756    .055    9983     .03   10054    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9983   10054              300     300     220            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.84

INPUT
Description: 7.84

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9793    1984    9828    1982    9841    1980    9908    1978    9916    1976
    9918    1976    9941    1976    9975    1976    9984    1976   10000  1974.4
   10025    1976   10036    1978   10073    1978   10206    1980   10222    1982
   10267    1983
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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9793    .055    9984     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9984   10025              575     500     425            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.74

INPUT
Description: 7.74

Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9733    1978    9744    1976    9754    1974    9765    1972    9800    1972
    9836  1972.3    9888    1972    9915    1972    9968  1972.4    9981    1972
 9983.74 1970.96    9987    1970   10000  1969.1   10010    197010035.24    1971
   10062    1972   10086  1972.3   10097    1972   10123    1972   10127    1974
   10133    1976   10138    1978

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9733    .055 9983.74     .0310035.24    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.7410035.24              425     500     475            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.65

INPUT
Description: 7.65 -- Approximate Study Limit
Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9787    1970    9805    1966    9882  1965.5    9917    1964 9977.37    1964
 9986.15    1962   10000  1961.810010.39    196210016.47    196410022.56    1966
10109.69    196810128.52    1970   10165    1971

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9787    .055 9977.37     .0310022.56    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.3710022.56              520     500     470            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.55

INPUT
Description: 7.55

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9877.72    1968 9895.81    1966 9913.89    1964 9929.39    1962 9970.07    1960
 9981.49    1958   10000  1956.710024.51    195810028.16    196010145.16    1960
10158.57    196210173.58    1964 10182.6    196610293.44    1968

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9877.72    .055 9970.07     .0310028.16    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.0710028.16              510     500     480            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.46

INPUT
Description: 7.46

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9830.45    1960 9861.07    1958 9923.22    1956 9969.47    1954 9976.86    1952
    9990  1951.5 10000.7    195210032.17    195210051.31    195310081.59    1954
 10119.3    195610130.99    1958 10142.8    1960

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9830.45    .055 9969.47     .0310051.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.4710051.31              490     500     510            .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.36

INPUT
Description: 7.36

Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9725    1954    9740    1952    9800    1950 9835.52    1950 9949.32    1948
 9977.98    1946    9998  1944.510011.65    194610023.48    194810033.89    1950
10040.39    195210046.86    1954
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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9725    .055 9949.32    .0310023.48    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.3210023.48              420     446     470             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.28

INPUT
Description: 7.28

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9710    1950    9760    1944    9800    1942 9836.63    1942 9849.74  1941.8
 9874.17  1941.8 9924.41    1942 9988.71    1942    9998 1940.810010.16    1942
10021.65    194410030.54    1946 10038.9    1948 10047.2    1950

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9710    .055 9988.71    .0310010.16    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.7110010.16              475     554     410             .3       .5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.17

INPUT
Description: 7.17

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9950.59    1944 9955.33    1942 9960.08    1940 9967.15    1938 9978.76    1936
  9991.7    1934   10000 1934.310014.37    193410024.18    1936   10034    1938
10043.85    194010082.22    194210098.58    1944

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9950.59    .055 9978.76    .0310024.18    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.7610024.18              500     500     520             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 7.08

INPUT
Description: 7.08

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9917.61    1940 9925.72    1938 9934.65    1936 9943.58    1934 9953.07    1932
 9965.94    1930    9987    192910007.17    193010021.87    193210036.31    1934
 10051.7    1936 10067.1    1938 10082.5    1940

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9917.61    .055 9953.07    .0310021.87    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9953.0710021.87              485     500     500             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.98

INPUT
Description: 6.98

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9723.34    1934    9740    1932    9900    1932    9935    1932 9944.17    1930
 9975.97    1928  9985.4    1926 9994.24    192410004.06    192410020.09    1926
10031.62    192810071.11    193010085.11    193210100.97    1934

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9723.34    .055 9975.97    .0310031.62    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.9710031.62              400     437     470             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.9

INPUT
Description: 6.9

Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9598.79    1930    9625    1926    9705    1926    9770    1928    9800    1928
 9822.48    1928 9857.37    1926 9954.17    1924 9987.42    192210000.76    1920
10011.02    192010014.22    192210017.39    192410020.56    192610023.72    1928
```

```
10026.89    1930

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9598.79    .055 9954.17     .0310017.39    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.1710017.39              490     529     560            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.8

INPUT
Description: 6.8

Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9660    1924    9705    1920    9725    1919    9755    1920    9800    1920
 9880.75    1920 9901.03    1920 9976.63    1918 9976.81    1918 9982.58    1916
 9982.91    1916  9988.6    1914 9988.73    191410004.27    191410004.41    1914
10010.43    191610010.46    1916 10016.4    191810016.52    191810022.44    1920
10022.57    192010028.44    1922   10040  1923.7

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9660    .055 9976.63     .0310016.52    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.6310016.52              500     495     400            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.71

INPUT
Description: 6.71 -- Approximate Joy Ranch Road Alignment
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9970    1918 9977.71 1914.04 9981.63 1912.03    9990    1908   10000  1907.5
   10010    1908   10025    1912   10045    1914   10090    1916   10225    1918

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9970    .055 9981.63     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.63   10025              425     390     350            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.63

INPUT
Description: 6.63
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9976.91    1916 9982.13    1914 9983.41    1912 9984.66    1910 9985.91    1908
 9987.08    1906    9995    1905   10005    190510015.13    190610021.82    1908
10050.15    191010131.79    191210273.67    191410318.49    1916

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9976.91    .055 9985.91     .0310021.82    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.9110021.82              300     290     290            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.58

INPUT
Description: 6.58
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9897.27    1912 9926.14    1910 9950.13    1908  9965.1    1906 9980.22    1904
 9998.11    190210006.79    190210014.85    190410022.84    190610088.23    1908
10249.56    191010282.55    1912

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9897.27    .055  9965.1     .0310022.84    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9965.110022.84              430     430     430            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 6.5

INPUT
Description: 6.5
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9636.39    1910 9702.53    1908 9718.78    1906 9747.02    1904  9794.4    1904
 9947.45    1904 9967.32    1902 9987.47    1900    9995    1899   10010    1899
10019.82    190010042.69    190210071.54    190410099.13    1906 10152.4    1908
   10187    1910
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```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9636.39    .055 9947.45     .0310071.54    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9947.4510071.54               310     345     355            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.43

INPUT
Description: 6.43

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9655    1906    9665    1904    9680    1902    9690    1900    9925    1900
    9970    1898    9990  1896.5   10010  1896.5   10020    1898   10030    1900
   10040    1902   10120    1904   10285    1906

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9655    .055    9925     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9925   10030               475     450     360            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.32

INPUT
Description: 6.32
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9951.16    1900  9957.9    1898 9964.52    1896 9970.99    1894 9977.55    1892
 9984.06    189010006.52    189010013.72    189210020.18    189410100.18    1896
10266.52    189810293.42    189810347.28    189810412.02    1900

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9951.16    .055 9970.99     .0310020.18    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.9910020.18               410     390     350            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.25

INPUT
Description: 6.25
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9911.34    1898 9931.58    1896 9947.24    1894 9961.84    1892 9976.08    1890
    9990    1888   10015    1888 10030.1    189010045.42    189210069.44    1892
10268.14    189210454.21    189410476.27    189610569.33    1898

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9911.34    .055 9961.84     .0310045.42    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9961.8410045.42               490     460     430            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.16

INPUT
Description: 6.16
Station Elevation Data     num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9875  1892.5 9961.21    1892  9972.1    1890 9977.65    1888  9983.3    1886
 9989.16    1884 9996.77    1883 9997.18    188310022.78    188410039.58    1886
10050.58    188810110.58    188810208.91    188610225.08    188610318.94    1888
10345.72    1890 10414.9    189210424.02    189210428.81    189210468.67 1893.08

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9875    .055 9977.65     .0310050.58    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.6510050.58               270     360     450            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 6.09

INPUT
Description: 6.09 -- Old New River Road
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9815    1886    9890    1884    9935    1882    9970    1880   10010  1879.5
   10050    1880   10070    1882   10345    1884   10380    1886   10520    1888

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9815    .055    9935     .03   10070    .055
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9935   10070              470     445     435              .1       .3

 ROSS SECTION          RIVER: Apache Wash
.EACH: Reach 1            RS: 6.01

INPUT
Description: 6.01

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9750    1883    9870    1882    9920    1880    9955    1878    9980    1876
   10000  1875.5   10010    1876   10020    1878   10035    1880   10075    1880
   10160    1878   10175    1877   10190    1878   10260    1880   10280    1882
   10400    1884   10580    1886

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9750    .055    9920     .03   10035    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9920   10035              485     490     510              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.92

INPUT
Description: 5.92
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9720    1877 9854.04    1876 9948.34    1874 9975.43    1872   10000  1870.2
10006.77    187210015.55    187410024.34    187610034.96    187610094.25    1874
10130.93    1872 10149.3    187010150.59    187010177.58    187210238.14    1874
10251.91    187410318.15    187410335.66    187610350.37    1878

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9720    .055 9948.34     .0310024.34    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.3410024.34              375     400     375              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.83

INPUT
Description: 5.83

 tation Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9500    1874    9550    1872    9650    1872    9710    1872    9735    1870
    9890    1870    9960    1868    9990    1866   10000  1865.5   10005    1866
   10030    1868   10105    1868   10120    1870   10140    1872   10155    1874
   10250    1875

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9500    .055    9960     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9960   10030              375     380     380              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.76

INPUT
Description: 5.76
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9640    1870 9674.85    1868 9704.99    1866 9712.43    1864 9741.92    1866
    9835    1866    9865    1866 9968.58    1864 9985.72    186210014.25    1862
10043.06    186410096.64    1866 10124.8    186810142.86    187010144.93    1870

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9640    .055 9968.58     .0310043.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.5810043.06              470     540     570              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.66

INPUT
Description: 5.66
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9504.86    1864 9505.03    1864  9622.9    1862 9622.94    1862 9802.24    1862
 9802.28    1862 9805.57    1862 9805.58    1862 9814.49    1860 9838.73    1858
 9838.74    1858 9839.05    1858 9857.77    1860 9980.02    1860 9995.33    1854
 10003.7    185410014.57    1858   10030    1859 10136.3    186010136.31    1860
10169.16    1862   10210  1862.5   10615    1863

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
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```
 9504.86    .055 9980.02     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.02   10030               460     440     320             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 5.64

INPUT
Description: 5.64 -- Cloud Road
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9650    1862    9775    1860    9870    1858    9955    185610037.94    1855
   10170    1856   10275    1858   10365    1860   10575  1862.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9650    .055    9955     .03   10170    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9955   10170               370     345     320             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 5.57

INPUT
Description: 5.57

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400    1859    9520    1858    9700    1856    9731    1858    9800    1858
    9812    1856    9824    1854    9977    1854    9985    1852    9993    1850
   10005    1850   10014    1852   10024    1854   10035    1856   10170    1858
   10299    1860

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .055    9977     .03   10035    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9977   10035               400     450     450             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 5.48

INPUT
Description: 5.48
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9300    1855    9440    1854    9750    1854    9790    1852    9895    1852
 9929.89    1850 9978.41    185010000.42    1846 10004.4    184610044.06    1850
10141.09    185210147.22    185210418.73    185210547.75    185410626.53    1856

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9300    .055 9978.41     .0310044.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110044.06               530     500     500             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 5.38

INPUT
Description: 5.38

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9815    1850    9880    1848    9900    1846    9910    1844    9985    1844
   10000    1841   10015    1844   10030    1846   10110    1846   10255    1848
   10460    1850

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9815    .055    9985     .03   10015    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9985   10015               350     375     425             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 5.31

INPUT
Description: 5.31
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9325    1847 9444.34    1846 9557.15    1844 9887.76    1844 9911.33    1840
 9919.33    1840 9919.34    1840 9933.33    1842 9933.43    1842 9988.23    1842
 9988.24    1842 9997.67    183810005.97    1838 10024.7    184210044.49    1844
 10044.5    184410061.08    184410218.05    1844   10565    1846

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9325    .055 9988.23     .0310044.49    .055
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9988.2310044.49               500     500     480            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.21

INPUT
Description: 5.21

Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1842    9780    1840    9860    1838    9885    1836    9890    1836
    9915    1838    9970    1838    9985    1836   10000    1834   10015    1836
   10030    1838   10085    1838   10110    1837   10120    1838   10135    1840
   10150    1840   10245    1838   10310    1838   10355    1840   10400    1840
   10525    1842

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9970     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10030             330     310     300            .1        .3
Right Levee     Station=   10135      Elevation=    1840

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.15

INPUT
Description: 5.15

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9870    1839    9945    1838    9978    1836    9988    1834   10000    1830
   10010    1830   10025    1834   10130    1834   10170    1836   10200    1836
   10320    1835   10495    1836   10522    1838   10780    1840

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9870    .055    9978     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9978   10025             350     352     355            .3        .5
Right Levee     Station=   10170      Elevation=    1836

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.09

INPUT
Description: 5.09

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9480    1835    9515    1834    9550    1832    9970    1832    9985    1830
   10000    1831   10025    1832   10075    1834   10120    1830   10145    1832
   10255    1832   10320    1834   10435    1834   10780    1836

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9480    .055    9970     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10025             300     300     310            .3        .5
Right Levee     Station=   10075      Elevation=    1834

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 5.03

INPUT
Description: 5.03
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9515    1833 9590.59    1832 9640.88    1830 9975.12    1830 9992.06    1826
10001.75    182610012.26    1830 10053.1    183010133.33    183010188.37    1828
10281.59    1828   10620    1832   10750  1832.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9515    .055 9975.12     .0310012.26    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.1210012.26              345     365     340            .1        .3
Right Levee     Station=10133.33      Elevation=    1830

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.96

INPUT
Description: 4.96
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9716.18    1828 9717.02    1828 9800.79    1826 9974.19    1826 9995.82    1822
10000.05    182210011.03    182610011.04    182610156.72    182610156.73    1826
   10310    182410344.97    182410425.12    182610592.76    182710594.98    1827
   10670    1828   10790    1830
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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9716.18    .055 9974.19     .0310011.03    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9974.1910011.03              400     320     200            .1        .3
Right Levee     Station=10156.63      Elevation=    1826

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.9

INPUT
Description: 4.9
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9730    1826    9825    1824    9940    1824  9961.4  182210007.63    1822
   10018    1824   10030    1824   10155    1822   10290    1822   10310    1822
   10330    1822   10405    1824   10560    1826   10750    1828

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9730    .055    9940     .03   10018    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940   10018              220     200     160            .1        .3
Left Levee      Station=    9940      Elevation=    1824
Right Levee     Station=   10018      Elevation=    1824

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.82

INPUT
Description: 4.82
Station Elevation Data     num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9480    1826 9740.85    1824 9830.85    1822 9875.16    1820 9888.17    1818
 9903.71    1818 9930.33    1820 9930.34    1820 9974.99    1820    9975    1820
 9990.22    181810005.12    181810009.43    1820 10013.6    182210024.29    1822
10070.59    1820   10100    181810126.15    182010181.41    182010189.94    1818
   10200  1817.110207.92    181810217.21    182010264.85    1820   10280    1818
   10315    1820   10435    1822   10565    1824

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9480    .055    9975     .0310009.43    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          997510009.43              480     480     480            .3        .5
Left Levee      Station=    9975      Elevation=    1820
Right Levee     Station= 10013.6      Elevation=    1822

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.78

INPUT
Description: 4.78
Station Elevation Data     num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9743.69    1820 9905.26    1818 9905.48    1818 9964.87    1818 9964.88    1818
 9983.35    1816 9995.72    181310010.03    181310021.41    181610211.72    1816
10230.89    181610317.17    181410376.07    1813 10488.8    1814 10508.5    1814
   10540    1816   10640    1818

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9743.69    .055 9964.87     .0310021.41    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.8710021.41              300     200     100            .1        .3
Right Levee     Station=10211.72      Elevation=    1816

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.74

INPUT
Description: 4.74
Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9500.14    1818 9960.29    1816 9979.29    1814 9986.69    1812    9994    1810
 9994.01    1810 9999.53    1810 9999.55    181010010.02    181210029.03    1814
10029.36    181410136.55    1814   10140    1813   10160    1814   10380    1814
   10400    1811   10425    1814   10440    1814   10485    1813   10530    1814
   10590    1815   10700    1815

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9500.14    .055 9960.29     .0310029.03    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9960.2910029.03              400     500     500            .1        .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.65
```

```
INPUT
Description: 4.65

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9400  1815.5    9600    1814 9830.73    1810 9982.47    1808 9997.03    1806
10002.86    180610014.29    180810049.57    180810059.42    180610060.51    1806
10093.98    180810250.89    1808   10270    1810   10360    1810

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9400    .055 9982.47     .0310093.98    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.4710093.98               260     280     260              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.6

INPUT
Description: 4.6

Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9675    1812 9812.65    1810 9836.34    1810 9875.78    1808 9883.17    1808
 9966.89    1806  9971.4    1806  9987.4    1802 9998.69    1802 9998.98    1802
10015.98    180610022.46    1806   10123    180610130.11    180410281.42    1804
10322.77    180610440.24    180610500.19    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9675    .055  9971.4     .0310015.98    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9971.410015.98                83      83      83              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.58

INPUT
Description: Geometry data points 6 and 7 are adjusted to account for the 3
             barrel 10' x 5' cbc.  The stationing for both points is increased
             by 5'.  The right bank and ineffective flow areas are adjusted
             accordingly.  The elevations of points 5 and 6 are changed from
             1802 to 1801.3 to match the surveyed invert of the box culvert
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1810    9790    1808    9945    1806    9983    1804    9984  1801.3
   10015  1801.3   10016    1804   10250    1804   10320    1806   10500    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9983     .03   10016    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9983  10016               180     180     170              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9685    9983    1808   10016   10500    1808

CULVERT                 RIVER: Apache Wash
REACH: Reach 1             RS: 4.575

INPUT
Description: Culvert #1 (3 10' x 5' Boxes)

Distance from Upstream XS =       5
Deck/Roadway Width        =   114.1
Weir Coefficient          =     3.1
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9685    1810    1800    9790    1808    1800    9945    1808    1800
    9983    1808    1800    9983    1808    1800    9984    1808    1800
   10010    1808    1800   10011    1808    1800   10011    1808    1800
   10250    1807    1800   10320    1807    1800   10500    1808    1800

Upstream Bridge Cross Section Data
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9685    1810    9790    1808    9945    1806    9983    1804    9984  1801.3
   10015  1801.3   10016    1804   10250    1804   10320    1806   10500    1808

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9685    .055    9983     .03   10015    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
           9983  10016              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9685    9983    1808   10016   10500    1808

Downstream  Deck/Roadway Coordinates
```

```
    num=      13
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9685    1808    1798    9790    1808    1798    9945    1808    1798
    9980    1808    1798    9980    1808    1798    9983    1808    1798
    9984    1808    1798   10010    1808    1798   10011    1808    1798
   10011    1808    1798   10250    1807    1798   10320    1807    1798
   10500    1808    1798

Downstream Bridge Cross Section Data
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9550    1812    9730    1810    9915    1808    9945    1806    9960    1804
    9975    1802    9985    1800   10000    1799   10035    1800   10115    1802
   10150    1804   10215    1806   10240    1808

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9550    .055    9975     .03   10115    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9975   10115            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9550    9950    1808   10050   10240    1808

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =    1807
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Box1                Box       5      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  0   114.1       .015                   .5                1
Number of Barrels =  3
Upstream   Elevation =  1801.3
Centerline Stations
    Sta.    Sta.    Sta.
    9989  9999.5   10010
Downstream Elevation =  1800.67
Centerline Stations
    Sta.    Sta.    Sta.
  9989.5   10000 10010.5

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.56

INPUT
Description: Geometry data point 8 is adjusted to account for the 3 barrel 10'
             x 5' cbc.  The culvert was extended and cross section 4.57 of the
             FIS was eliminated.  This cross section is the first downstream
             cross section of the culvert.  The elevation of data point 8 is
             adjusted from 1799 to 1800.  The right bank station is moved from
             station 10035 to 10150.
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9550    1812    9730    1810    9915    1808    9945    1806    9960    1804
    9975    1802    9985    1800   10000    1799   10035    1800   10115    1802
   10150    1804   10215    1806   10240    1808

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9550    .055    9975     .03   10115    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10115              365     365     350              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    9550    9950    1808   10050   10240    1808

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.49

INPUT
Description: 4.49

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9821.99    1806 9901.91    1804 9916.74    1802  9954.9    1800 9973.89    1798
 9983.53    1796 10011.1    179610018.97    179810053.62    180010105.02    1802
10240.68    1804   10340  1804.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9821.99    .055  9954.9     .0310053.62    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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```
        9954.910053.62                490     450     450              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.4

INPUT
Description: 4.4

Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9925    1802    9940    1800    9970    1798    9990    1796    9995    1794
   10005  1792.3   10020    1794   10030    1796   10080    1796   10090  1794.3
   10110    1796   10175    1798   10210    1800   10270    1801

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9925    .055    9990     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9990   10030               475     510     490              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.31

INPUT
Description: 4.31

Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9706.51    1798  9770.7    1796 9896.31    1794 9980.54    1792  9986.9    1790
10005.88    178810009.89    178810014.81    179010019.75    179210055.21    1794
10110.95    179610150.57  1796.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9706.51    .055 9980.54     .0310019.75    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.5410019.75               410     420     410              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.23

INPUT
Description: 4.23

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9520.61    1796 9614.39    1794 9762.38    1790 9933.91    1788 9961.17    1790
 9980.16    1790 9985.61    1788 9991.04    178610007.85    178610015.65    1788
10030.19    179010081.29    179210132.36    1794

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9520.61    .055 9980.16     .0310030.19    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.1610030.19               140     150     150              .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.22

INPUT
Description: 4.22
Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9435    1796    9530    1794    9595    1792    9650    1790    9780    1788
    9885    1788    9975    1790    9990    1786 9999.81  1785.5   10010    1786
   10030    1790   10085    1792   10135  1792.4

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9435    .055    9975     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10030               280     280     260              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 4.11

INPUT
Description: 4.11

Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9954.62    1792 9972.66    1790 9978.48    1786 9982.42    1784 9988.23    1782
10014.08    1782 10019.7    1784 10107.8    1786 10273.4    178810355.58    1790
10489.42    1790

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9954.62    .055 9978.48     .03 10107.8    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.48 10107.8               240     250     300              .1       .3
```

```
CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 4.05

INPUT
Description: 4.05

Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9960    1788 9981.93    1782    9990    1780   10000    1779   10015    1780
   10025    1782   10200    1782   10270    1786   10320  1786.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9960    .055 9981.93     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.93   10025              400     500     285             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.96

INPUT
Description: 3.96

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9852.78    1784 9882.85    1782 9912.96    1780 9952.91    1778 9978.94    1776
 9989.34    177410006.21    177410028.53    178010057.49    178210179.95    1782
10409.79    178010418.05    1778 10422.6    177810433.36    178010548.23    1782
10801.62    1784

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9852.78    .055 9882.85     .0310057.49    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9882.8510057.49              490     520     460             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.86

INPUT
Description: 3.86

Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9728.15    1780 9811.03    1778 9980.73    1776 9992.41    177010006.32    1770
.0015.17    1772 10048.5    1774 10108.2    177410125.25    1776 10163.1    1778
10205.78    177810274.92    177410300.77    177410373.74    1778 10496.8    1780

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9728.15    .055 9980.73     .03 10048.5    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.73 10048.5             360     400     490             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.78

INPUT
Description: 3.78

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9660.11    1776    9740  1774.1  9978.4    1774 9983.58    1770 9992.92    1766
 9993.96    176610036.94    177010060.68    177210120.11    177210142.25    1770
10151.27    176810155.15    176810163.26    177010225.58    177210348.04    1774
10545.54    177410650.82    1775

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9660.11    .055  9978.4     .0310060.68    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9978.410060.68              170     170     170             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.75

INPUT
Description: 3.75

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9590    1776    9655    1774    9710    1772    9725    1772    9780    1774
    9945    1774    9975    1772 9982.65    1768 9991.06    1764   10010    1764
   10020    1768   10310    1772   10840    1772   10885    1776

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9590    .055 9982.65     .03   10020    .055

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

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       9982.65   10020                500     500     500              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.65

INPUT
Description: 3.65
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9358.43 1771.68    9470    1768    9580    1770    9830    1770    9970    1764
 9990.15    176210009.75    1762   10015    1764   10370    1770

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9358.43    .055    9970     .03   10015    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10015               250     280     260              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.6

INPUT
Description: 3.6
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9378.25    1770 9475.66    1768 9891.47    1766 9979.85    1764 9990.66    1760
10010.55    176010013.99    176210247.91    176810365.75    1770

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9378.25    .055 9979.85     .0310013.99    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.8510013.99               400     420     450              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.52

INPUT
Description: 3.52

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9669.22    1766 9704.26    1764 9883.69    1764 9945.91    1762 9977.47    1762
 9977.93    1762 9981.96    1760 9986.06    175810002.04    175610006.86    1756
10017.06    176010100.32    176210273.56    176410646.59    1766

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9669.22    .055 9981.96     .0310017.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.9610017.06               200     200     200              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.48

INPUT
Description: 3.48
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9620.29    1764  9671.6    1762 9965.97    1762 9985.39    1760  9988.6    1758
 9993.36    175610009.59    175510018.81    1758 10110.6    176010298.95    1762
   10615    1764

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9620.29    .055 9985.39     .0310018.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.3910018.81               360     450     435              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.4

INPUT
Description: 3.4

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9460    1762    9500    1760    9725    1758    9865    1758    9920    1756
    9985    1756   10000    1752   10030    1756   10060    1758   10215    1758
   10465    1760   10700  1760.2   10850    1761

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9460    .055    9985     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9985   10030               490     470     430              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 1            RS: 3.32
```

```
INPUT
Description: 3.32
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9599.26    1758 9599.45    1758 9630.94    1756 9632.14    1756 9725.16    1754
 9955.22    1754 9974.26    1752 9981.64    175010008.82    175010020.21    1754
10242.15    1754   10490  1756.7   10560  1756.2   10725  1756.2   10790  1756.5
10929.84    1758

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9599.26    .055 9955.22     .0310020.21    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9955.2210020.21               520     520     520              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.21

INPUT
Description: 3.21
Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9595    1754    9630    1752    9660    1750    9680    1749    9710    1750
    9900    1751    9965    1750 9990.25    174610009.88    174610029.09 1749.98
   10130    1750   10315    1752   10390  1752.1

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9595    .055    9965     .0310029.09    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          996510029.09               250     310     350              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.13

INPUT
Description: 3.13

Station Elevation Data     num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9442.64    1752 9512.79    1748 9870.47    1748 9978.41    1746 9996.99    1742
10009.71    174210027.88    174810067.68    1750   10100  1750.2

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9442.64    .055 9978.41     .0310027.88    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110027.88               200     280     300              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 3.07

INPUT
Description: 3.07
Station Elevation Data     num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9640    1748    9665    1746 9912.66    1746 9979.95    1744 9989.15    1742
10019.02    174110028.11    174410080.68    174610180.41    1748

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9640    .055 9979.95     .0310028.11    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.9510028.11               560     520     480              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 2.97

INPUT
Description:
Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9934    1748    9959    1746    9974    1744    9980    1742    9984    1740
    9988    1738   10012    1738   10020    1740   10052    1742   10134    1742
   10314  1743.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9934    .055    9980     .03   10052    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   10052               270     270     270              .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 1             RS: 2.92

INPUT
Description:
Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9820    1748    9845    1746    9870    1744    9910    1742    9970    1740
```

```
    9980    1738    9990    1735   10010    1735   10014    1738   10022    1740
   10157  1741.5

 Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9820    .055    9970     .03   10022    .055

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9970   10022              155     155     155              .1       .3

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1            RS: 2.90

 INPUT
 Description:
 Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9726    1746    9756    1744    9794    1742    9826    1740    9978    1738
    9984    1736    9990    1734   10010    1734   10016    1736   10022    1738
   10100    1740   10141  1740.5

 Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9726    .055    9978     .03   10022    .055

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9978   10022              140     200     250              .1       .3

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1            RS: 2.87

 INPUT
 Description:
 Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9679    1746    9706    1744    9737    1742    9771    1740    9979    1738
    9983    1736    9987    1734   10013    1734   10019    1736   10031    1738
   10099  1738.5

 Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9679    .055    9979     .03   10031    .055

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9979   10031              240     260     270              .1       .3

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 1            RS: 2.82

 INPUT
 Description:
 Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9654    1744    9680    1742    9705    1740    9724    1738    9764    1736
    9884  1735.5    9934    1736    9978    1736    9982    1734    9994    1731
   10006    1731   10024    1734   10034    1736   10140    1736

 Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9654    .055    9978     .03   10034    .055

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9978   10034                0       0       0              .1       .3

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 2            RS: 2.73

 INPUT
 Description: 2.73
 Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9756.45    1740 9787.82    1738 9811.88    1736 9971.87    1732 9986.23    1728
10019.94    172810036.42    173210071.17    173410101.17    173810127.41 1740.05

 Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9756.45    .055 9971.87     .0310036.42    .055

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.8710036.42               190     190     190              .1       .3

 CROSS SECTION          RIVER: Apache Wash
 REACH: Reach 2            RS: 2.70

 INPUT
 Description:
 Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9700    1746    9740    1744    9780    1742    9820    1740    9850    1738
    9875    1736    9905    1734    9960    1732    9970    1730    9980    1728
   10020    1728   10025    1730   10115    1732   10165    1734   10185    1736
   10215    1738   10235    1740   10260    1742

 Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
    9700    .055    9960     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9960   10025              160     160      90            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 2            RS: 2.67

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9784.5    1746  9809.5    1744  9834.5    1742  9854.5    1740  9879.5    1738
  9904.5    1736  9924.5    1734  9969.5    1732  9979.5    1730  9980.5    1728
 10019.5    1728 10024.5    1730 10069.5    1732 10279.5    1732 10294.5    1734
 10314.5    1736 10334.5    1738 10354.5    1740

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9784.5    .055  9969.5     .03 10069.5    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9969.5 10069.5                 0       0       0            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.60

INPUT
Description: 2.6

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9750    1736    9820    1732    9935    1732    9945    1730    9960    1724
    9965    1724   10020    172610028.92  1729.5   10265    173210415.66    1732
10462.65 1736.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9750    .055    9945     .0310028.92    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          994510028.92              390     430     450            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.52

INPUT
Description: 2.52
 tation Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9805.03    1736 9840.17    1734 9866.23    1732 9886.43    1728 9957.59    1726
 9970.16    172210021.48    172110028.76    172610120.86    172810316.87    1728
10363.84    173010395.26    173210419.34    173410459.58    1736

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9805.03    .055 9957.59     .0310028.76    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.5910028.76              270     260     250            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.47

INPUT
Description: 2.47

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9920.54    1734 9942.57    1732 9962.26    1724  9972.1    1720 9990.76    1720
10013.06    172210027.81    1724 10090.1    172610200.41    172610300.68    1728
   10340    1730   10360    1734

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9920.54    .055 9962.26     .0310027.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9962.2610027.81              340     400     450            .1        .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.40

INPUT
Description: 2.4

Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9795    1732    9800    1730    9840    1724    9940    1720    9980    1718
   10020    1718 10024.1 1719.9710048.34 1732.03

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9795    .055    9940     .03 10024.1    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940 10024.1              300     360     370              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.33

INPUT
Description: 2.33

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9778    1730    9840    1724    9870    1722    9890    1720    9945    1720
    9960    1718   10000    1717   10028    1718   10030    1720   10045    1730

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9778    .055    9945     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9945   10030              450     450     450              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.24

INPUT
Description: 2.24

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9781.96    1726 9796.25    1724 9855.35    1720 9939.57    1718 9973.56    1714
10001.06    171410055.42    171810148.55    172010188.25    172410215.72    1726

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9781.96    .055 9939.57     .0310055.42    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.5710055.42              380     380     390              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.17

INPUT
Description: 2.17

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9809.96    1722 9833.72    1720 9889.63    1716 9892.16    1716 9948.16    1716
 9962.44    171410027.88    171410055.88    1716 10199.6    171610234.24    1718
10416.55    172010468.74    1722

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9809.96    .055 9948.16     .0310055.88    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.1610055.88              500     520     350              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.08

INPUT
Description: 2.08
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9967.02    1718 9971.03    1716 9983.46    171010015.75    1710 10034.4    1714
10080.47    171610200.63    1717   10300    1716   10360    1714   10450    1712
   10490    1710   10510    1710   10545    1712   10580    1714   10700    1716
   10745    1718

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9967.02    .055 9971.03     .0310080.47    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.0310080.47              440     440     270              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 2.00

INPUT
Description: 2

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9964.46 1715.98    9980    1710    9985  1708.5   10020  1708.5   10115    1710
   10150    1712   10360  1713.8   10535    1712   10590    1710   10610  1708.5
   10675  1708.5   10700    1710   10805    1714   10830    1716

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9964.46    .055    9980     .03   10115    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9980   10115              550     490     230              .3       .5
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CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.88

INPUT
Description: 1.88

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9767.17 1713.01    9790    1708    9890    1708    9950    1706    9975    1704
    9990  1702.1   10010  1702.1   10040    1706   10085    1710   10210    1710
   10300    1708   10340    1706   10370    1706   10390    1708   10455    1710
10479.52 1713.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9767.17    .055    9950     .03   10040    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9950   10040               190     200     230             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.85

INPUT
Description: 1.85
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9819.07    1712 9828.06    1710 9836.36    1708 9915.83    1706 9954.99    1704
10002.05    170010011.48    170010041.54    170410064.87    170610129.94    1708
10187.04    170810294.81    170610368.04    170610414.01    170810424.61    1710
10451.94    1712

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9819.07    .055 9954.99     .0310041.54    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.9910041.54               210     190     150             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.81

INPUT
Description: 1.81
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9944.51    1712 9965.71    1704 9971.05    1702 9975.82    170010012.24    1700
   10031    170210060.69    170410188.05    170610206.68    170610298.14    1704
10327.71    170410350.59    170610431.76    170810486.49    1712

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9944.51    .055 9971.05     .03   10031    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.05   10031               300     300     240             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.75

INPUT
Description: 1.75

Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9951.17    1710 9965.64    1704 9970.05    1702 9974.47    1700 9978.76    1698
10016.76    169810034.19    170010072.31    170210151.35    170410320.71    1706
10429.93    170810503.73    1710

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9951.17    .055 9970.05     .0310072.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.0510072.31               480     500     520             .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 1.66

INPUT
Description: 1.66

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9744.33    1708 9829.76    1704 9931.63    1702 9952.11    1700 9967.65    1698
 9993.88    169610014.03    169610029.43    1698   10034    170010204.97 1700.01
10212.95    170210237.12    170410277.66    170610306.08    1708

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9744.33    .055 9952.11     .03   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9952.11   10034               300     250     240             .1       .3
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CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.60

INPUT
Description: 1.6

Station Elevation Data     num=      13
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9416.18     1706 9448.11     1704 9518.79     1702 9799.12     1700 9907.12     1698
 9959.73     1696 9980.66     1694  9995.9     1692 10008.9     169210012.95     1694
10016.94     169610031.18     170410062.39     1706

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9416.18     .055 9959.73      .0310016.94     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.7310016.94               190     180     180             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.56

INPUT
Description: 1.56

Station Elevation Data     num=      13
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9426.84     1706 9453.43     1704 9496.71     1702 9564.46     1700 9690.11     1700
 9951.37     1698 9973.37     1696 9983.09     169210014.85     169210028.61     1698
10039.18     170210058.37     170410091.18     1706

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9426.84     .055 9951.37      .0310028.61     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.3710028.61               400     500     540             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.47

INPUT
Description: 1.47
Station Elevation Data     num=      12
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9462.33     1702 9530.85     1700 9560.22     1698 9800.63     1698 9911.62     1696
 9964.37     1694 9980.91     169010017.61     169010032.41     169410056.56     1696
10067.04     170010103.76     1702

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9462.33     .055 9964.37      .0310032.41     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.3710032.41               490     500     520             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.37

INPUT
Description: 1.37
Station Elevation Data     num=      10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9493.05     1698 9549.07     1696 9580.08     1694 9932.08     1692 9963.31     1690
 9978.48     1688 10013.4     168810022.33     1690 10030.2     169210053.61     1698

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9493.05     .055 9932.08      .03 10030.2     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9932.08 10030.2               400     500     440             .1       .3

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.27

INPUT
Description: 1.27
Station Elevation Data     num=      16
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9673     1698     9745     1696     9795     1694     9817     1692     9842     1690
    9917     1688     9925     1686     9950     1684     9975     1684    10020     1686
   10077     1688    10163     1690    10260     1692    10395     1694    10505     1696
   10800     1698

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
    9673     .055     9917      .03    10020     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           9917   10020               450     460     500             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.18
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INPUT
Description: 1.18
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9840    1694    9875    1692    9902    1690    9920    1688    9936    1686
    9947    1684    9957    1682   10015    1680   10020    1680   10025    1682
   10030    1684   10061    1686   10102    1688   10180    1690   10270    1690
   10390    1689   10460  1689.9   10600  1688.2   10670    1690   10863    1692
   10903  1693.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9840    .055    9947     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9947   10030              500     500     350             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 1.09

INPUT
Description: 1.09
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9920    1690    9926    1688    9932    1686    9938    1684    9968    1682
    9974    1680   10026    1680   10034    1682   10098    1682   10120    1684
   10185    1686   10335    1684   10362    1684   10582    1686   10770    1685
   10920    1686   11621    1688   11652    1690

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9920    .055    9968     .03   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9968   10034              500     500     460             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 0.99

INPUT
Description: 0.99
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9925.53    1686 9950.02    1682 9969.66    1680 9977.26    167810017.26    1678
10026.04    168010147.08    1682 10189.7    168210277.01    168010326.93    1678
10418.53    167810542.32    168010764.47    168210913.43    168210917.62    1682
   11420    1684   11790    168411823.04 1685.99

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9925.53    .055 9969.66     .0310026.04    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.6610026.04              890     900     550             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 0.84

INPUT
Description: 0.84
Station Elevation Data     num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9854.82 1679.99    9910    1676    9975    1672 9980.41    167010019.82    1670
   10030    1672   10080  1673.8   10110    1672   10125    1670   10150    1674
   10230    1674   10290    1676   10320    1678   10380    1676   10400    1676
   10460    1678   10590    1680

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9854.82    .055    9975     .03   10030    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9975   10030              420     440     430             .3       .5

CROSS SECTION           RIVER: Apache Wash
REACH: Reach 3             RS: 0.75

INPUT
Description: 0.75
Station Elevation Data     num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9452.11 1676.99 9623.97    1674 9849.05    1674 9850.71    1674 9883.74    1672
 9884.15    1672 9943.61    1670 9943.82    1670 9967.12    1668 9967.18    1668
 9978.88    166610014.77    166610027.72    167010080.45    167010080.56    1670
10093.84    1672   10094    167210119.59    167210119.71    167210128.45    1670
 10128.5    1670 10145.7    167010145.78    1670 10173.1    167210173.36    1672
10214.32    1674 10214.6    167410391.18    167410391.21    167410479.43    1676
10479.48    167610512.05 1676.99

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9452.11    .055 9943.82     .0310027.72    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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      9943.8210027.72                180     200     210              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.71

INPUT
Description: 0.71
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9410.74    1676 9517.84    1674 9806.35    1672 9806.66    1672 9929.72    1670
 9930.71    1670 9973.93    1668 9973.94    1668 9979.82    1666  9979.9    1666
 9985.76    1664  9985.8    166410015.71    1664 10015.9    166410024.34    1666
10024.46    166610029.59    166810030.23    166810045.83    166810045.97    1668
10052.42    166610052.62    166610063.21    1666 10063.3    166610070.56    1668
10070.63    1668 10092.7    167010201.55    167610201.61    1676

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9410.74    .055 9973.94     .0310029.59    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.9410029.59               370     400     440              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.63

INPUT
Description: 0.63
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9246.69    1673     9300    1672 9467.58    1672 9467.59    1672 9524.47    1670
 9524.59    1670 9661.89    1670 9662.28    1670 9798.92    1668 9967.22    1668
 9967.27    1668 9971.89    1666 9971.91    1666 9976.44    1664 9976.56    1664
10025.48    166410033.05    166610033.09    166610044.06    166810044.68    1668
10151.63    1668   10188    167210227.11 1673.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9246.69    .055 9967.27     .0310044.06    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.2710044.06               300     500     600              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.54

INPUT
Description: 0.54
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9600    1670     9840    1668     9875    1664     9965    1664 9975.73    1660
10016.71    166010027.02    166410027.05    166410027.06    166410068.43    1666
10068.89    166610360.71    166610418.56    166410470.56    166410510.35    1666
10530.78    166810614.05    1670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9600    .055    9965     .0310027.02    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          996510027.02               800     640     400              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.43

INPUT
Description: 0.43

Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9730    1666     9900    1664     9940    1662     9985    1655   10015    1655
   10050  1661.8   10120  1661.8   10190    1660   10240    1658   10270    1660
   10290    1662   10350    1662   10405    1660   10430    1660   10500    1662
   10535    1664   10620    1666

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9730    .055    9940     .03   10050    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940   10050               505     500     440              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.33

INPUT
Description: 0.33

Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9631.93 1663.06     9645    1662     9722    1660     9820    1660     9900    1661
 9945.78 1658.03     9980  1652.2    10020  1652.2    10090    1658   10135    1658
   10150  1652.6   10170    1656   10220    1658   10250    1660   10305    1662
   10375    1664
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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9631.93    .055 9945.78     .03   10090    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9945.78   10090              350     650     700              .1       .3

CROSS SECTION          RIVER: Apache Wash
REACH: Reach 3            RS: 0.20

INPUT
Description: 0.2

Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9288.16    1660 9525.13    1658 9606.89    1658 9642.09    1656 9827.21    1656
 9904.07    1654 9967.74    1650  9981.5    1646 10015.7    1646 10039.4    1656
10160.82    165610191.81    1660

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9288.16    .055 9967.74     .03 10039.4    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.74 10039.4                 0       0       0              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.23

INPUT
Description: 2.23

Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9916.62    1834 9941.49    1832 9962.62    1830 9979.43    1828 9994.11    1826
10007.33    182610023.07    182810034.76    1830   10373    1832   10480    1832
   10620    1834

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9916.62    .055 9979.43    .0310023.07    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.4310023.07                435     440     445              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.14

INPUT
Description: 2.14
Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9961.96    1826 9969.94    1826 9979.01    1824 9981.08    182410020.87    1824
10025.81    182410218.97    182610361.55    182610637.58    182610689.74    1828

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9961.96    .055 9979.01    .0310025.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.0110025.81                385     380     380              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.07

INPUT
Description: 2.07

Station Elevation Data     num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9955.42    1824 9969.04    1822    9980    1821   10020    1821   10060    1822
10667.15    182210737.75    1824

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9955.42    .055 9969.04     .03   10060    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.04   10060              415     390     260              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 2.00

INPUT
Description: 2.00 -- Approximate Alignment of Carefree Hwy
Station Elevation Data     num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9956.92    1822 9973.16    1818 9974.89    1818 9981.08    1816 9983.46    1816
 9989.77    1814 9993.01    181410005.51    181410007.19    181410022.29    1816
10025.64    181610088.76    181810488.79    1820 10588.7    182010637.44    1822

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9956.92    .055 9983.46    .0310022.29    .055
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.4610022.29              390     400     390             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.92

INPUT
Description: 1.92

Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9925    1816    9935    1814    9945    1812    9965    1810   10010    1810
   10015    1812   10025    1814   10050    1812   10100    1814   10340    1814
   10380    1816

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9925    .055    9935     .03   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9935   10025              460     455     450             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.83

INPUT
Description: 1.83

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9956.91    1812 9974.62    1810 9983.67    1808 9990.95    180610005.18    1806
10038.99    180810189.64    181010254.89    181010359.32    180810422.67    1812

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9956.91    .055 9983.67     .0310038.99    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.6710038.99              440     445     450             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.75

INPUT
Description: 1.75

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9923.03    1806 9964.44    1804 9975.68    1802  9998.4    180010003.69    1800
10022.87    180410187.38    180410279.87    180210305.65    180210358.49    1806

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9923.03    .055 9964.44     .0310022.87    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.4410022.87              485     490     500             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.65

INPUT
Description: 1.65
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9893    1806    9901    1804    9909    1802    9915    1800    9923    1798
    9971  1797.8    9988    1796   10012    1796   10020    1798   10273    1800
 10273.1    1802

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9893    .055    9971     .03   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9971   10020              600     600     575             .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.54

INPUT
Description: 1.54
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9735.34    1796 9972.06    1794 9986.03    1792 9993.93    1790 10012.3    1790
10020.15    179210029.59    179210124.43    179010160.57    179010181.54    1792
10288.06    179410495.09    179410533.67    1796

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9735.34    .055 9986.03     .0310020.15    .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.0310020.15              400     400     400             .1       .3

CROSS SECTION          RIVER: Paradise Wash
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REACH: Reach 1              RS: 1.46

INPUT
Description: 1.46
Station Elevation Data     num=      16
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9420     1794     9455     1792     9645     1790     9685     1790  9843.42     1792
 9885.29     1792  9920.09     1790  9973.03     1788  9983.48   178610027.78     1786
10028.33   178610038.59     1788  10039.2   178810295.57   179210295.61     1792
10328.92  1793.96

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
    9420     .055  9973.03     .0310038.59     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9973.0310038.59               260     500     670              .1        .3
Left Levee       Station= 9885.29       Elevation=    1792

CROSS SECTION            RIVER: Paradise Wash
REACH: Reach 1              RS: 1.37

INPUT
Description: 1.37
Station Elevation Data     num=      24
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9345     1792     9385     1790     9440     1788     9490     1788   9650.6  1789.51
 9806.04     1788  9806.97     1788  9865.72     1786  9866.07     1786   9886.2     1784
 9886.27     1784  9957.84     1784  9958.87     1784   9968.7     1782  9968.84     1782
 9990.03   178210020.46   178610055.46   178610057.12   178610069.22     1788
10069.72   178810161.45   178810258.34   179010303.11     1792

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
    9345     .055  9958.87     .0310020.46     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9958.8710020.46               570     500     430              .1        .3

CROSS SECTION            RIVER: Paradise Wash
REACH: Reach 1              RS: 1.27

INPUT
Description: 1.27

Station Elevation Data     num=      18
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9347.73     1788  9366.76     1786  9787.72     1784  9788.51     1784  9960.27     1784
 9960.65     1784  9969.04     1782  9969.12     1782  9988.65     1778  9989.09     1778
10011.61   177810012.22   177810057.73   178210058.84   178210169.81     1784
10171.13   178410205.64   178810206.31     1788

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9347.73     .055  9969.12     .0310057.73     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9969.1210057.73               390     350     320              .1        .3

CROSS SECTION            RIVER: Paradise Wash
REACH: Reach 1              RS: 1.21

INPUT
Description: 1.21
Station Elevation Data     num=      22
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9421     1784  9440.23     1780   9538.2     1780  9595.38     1782  9618.31     1782
 9801.74     1780  9802.59     1780  9835.89     1780  9836.44     1780  9877.07     1782
 9886.63     1782  9977.68     1780  9982.64     1778  9983.14     1778  9988.45     1776
10013.85   177610020.25     1778  10020.6   177810096.24   177810106.85     1780
10131.31   178210206.15     1784

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
    9421     .055  9983.14     .03 10020.6     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9983.14 10020.6               400     440     450              .1        .3

CROSS SECTION            RIVER: Paradise Wash
REACH: Reach 1              RS: 1.12

INPUT
Description: 1.12

Station Elevation Data     num=      23
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9323.43     1782  9323.49     1782  9334.19     1780  9334.29     1780  9344.65     1778
 9345.18     1778     9460     1778   9546.2     1776  9547.35     1776  9660.25     1776
 9661.37     1776  9701.23     1778  9701.63     1778  9764.83     1780  9764.91     1780
 9845.43     1780  9943.46     1776  9981.99   177410002.99   177210010.59     1772
10023.31   177610036.17   178010084.32     1782

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
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 9323.43    .055 9943.46     .0310023.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.4610023.31               320     420     470              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 1.04

INPUT
Description: 1.04
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9371.44    1778 9371.87    1778 9547.56    1774 9547.64    1774 9676.69    1774
 9678.18    1774 9732.85    1772  9985.5    1772 9991.67    177010013.58    1770
10029.11    177210053.67    177610108.42    1778

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9371.44    .055  9985.5     .0310029.11    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.510029.11               500     400     300              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.95

INPUT
Description: 0.95

Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9590.3    1774  9590.4    1774 9688.06    1772 9688.13    1772 9982.32    1772
 9984.49    1770 9986.77    176810001.77    176610019.78    176610036.54    1768
10070.19    177010159.61    177210232.27    1774

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9590.3    .055 9984.49     .0310070.19    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9984.4910070.19               250     275     310              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.89

INPUT
Description: 0.89

 tation Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9582.26    1772 9582.35    1772 9640.11    1770 9921.21    1770 9981.01    1768
 9985.21    176410009.58    176410018.11    176610021.69    176810163.03    1770
10270.58    1772

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9582.26    .055 9981.01     .0310021.69    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.0110021.69               520     500     480              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.80

INPUT
Description: 0.8
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9593.82    1768 9646.26    1766 9785.49    1766 9982.14    1764 9989.01    1762
10010.62    176210020.71    1764 10104.6    176410291.13    1766 10321.7    1768

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9593.82    .055 9982.14     .0310020.71    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.1410020.71               420     350     330              .1       .3

CROSS SECTION          RIVER: Paradise Wash
REACH: Reach 1            RS: 0.72

INPUT
Description: 0.72
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9396    1766    9427    1764    9473    1762    9526    1761    9616    1762
    9682    1760    9721  1758.5    9758    1760    9796  1760.5    9886    1760
    9978    1760    9988    1758   10012    1758   10018    1760   10066    1762
   10106    1764   10141    1766

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9396    .055    9978     .03   10018    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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          9978   10018                400      420      425                .1        .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.62

INPUT
Description: 0.62
Station Elevation Data     num=       18
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9548     1762     9586     1760     9657     1758     9688   1757.5     9750     1758
    9798   1758.5     9938     1758     9967     1756     9983     1754    10018     1754
   10031     1756    10047     1754    10056     1754    10069     1756    10085     1758
   10218     1758    10245     1760    10263     1762

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9548    .055     9967     .03    10031    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          9967   10031               420      450      460               .1        .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.53

INPUT
Description: 0.53
Station Elevation Data     num=       10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9511     1758     9574     1756     9729     1754     9976     1752     9983     1750
   10018     1750    10028     1752    10099     1754    10115     1756    10131     1758

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9511    .055     9976     .03    10028    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          9976   10028               475      495      500               .3        .5

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.44

INPUT
Description: 0.44
Station Elevation Data     num=       14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9603.04     1752  9682.28     1750  9992.46   174810001.98     1746    10007     1746
10019.54   174810028.31   174910052.71   174910105.67     1748  10138.9     1746
10140.02   174610149.52   174810159.12     1750  10170.1     1752

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9603.04    .055  9992.46     .0310028.31    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9992.4610028.31               500      450      380               .3        .5

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.34

INPUT
Description: 0.34
Station Elevation Data     num=       13
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9749.69     1750  9772.57     1748  9799.65     1746  9969.75     1744  9988.37     1744
10012.01   174410014.83   174410073.32   174610188.93   174610285.92     1744
10293.88   174410324.22     1746  10351.7     1750

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
 9749.69    .055  9969.75     .0310014.83    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9969.7510014.83               290      300      340               .3        .5

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.28

INPUT
Description: 0.28
Station Elevation Data     num=       14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9761     1746     9780     1744     9817     1742     9891     1740     9974     1742
    9982     1740     9991     1738    10008     1738    10017     1740    10038     1742
   10151     1744    10229     1743    10243     1744    10289     1746

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9761    .055     9974     .03    10038    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          9974   10038               550      550      550               .1        .3

CROSS SECTION           RIVER: Paradise Wash
REACH: Reach 1             RS: 0.17
```

INPUT
Description: 0.17
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9957.91	1740	9974.51	1734	9980.5	173210003.82		173210022.71		1734
10084.24	173610128.49		173810423.55		173810511.08		173610520.92		1736
10528.63	173810535.83		1740						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9957.91	.055	9974.51	.0310022.71		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9974.5	110022.71	225	225	200	.1	.3

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 0.13

INPUT
Description: 0.13
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9952.71	1738.99	9978.41	1734	9988.85	173210019.25		173210047.54		1734
10172.1	1736	10543.1	173610553.61	1738.99					

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9952.71	.055	9978.41	.0310047.54		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9978.4	110047.54	425	390	465	.1	.3

CROSS SECTION RIVER: Paradise Wash
REACH: Reach 1 RS: 0.04

INPUT
Description: 0.04
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9680	1736	9765	1734	9850	1732	9946.82	1732	9970.15	1730
9996.41	172610018.18		172610032.22		173010090.04		173210255.73		1736
10279.91	1736								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9680	.055	9970.15	.0310032.22		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9970.1	510032.22	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Desert Hills Was

Reach	River Sta.	n1	n2	n3
Reach 1	0.99	.055	.03	.055
Reach 1	0.90	.055	.03	.055
Reach 1	0.81	.055	.03	.055
Reach 1	0.72	.055	.03	.055
Reach 1	0.64	.055	.03	.055
Reach 1	0.56	.055	.03	.055
Reach 1	0.46	.055	.03	.055
Reach 1	0.40	.055	.03	.055
Reach 1	0.386	.055	.03	.055
Reach 1	0.31	.055	.03	.055
Reach 1	0.22	.055	.03	.055
Reach 1	0.19	.055	.03	.055
Reach 1	0.09	.055	.03	.055
Reach 1	0.04	.055	.03	.055

River:Apache Wash

Reach	River Sta.	n1	n2	n3
Reach 1	8.02	.055	.03	.055
Reach 1	7.98	.055	.03	.055
Reach 1	7.89	.055	.03	.055
Reach 1	7.84	.055	.03	.055
Reach 1	7.74	.055	.03	.055
Reach 1	7.65	.055	.03	.055
Reach 1	7.55	.055	.03	.055
Reach 1	7.46	.055	.03	.055
Reach 1	7.36	.055	.03	.055
Reach 1	7.26	.055	.03	.055
Reach 1	7.17	.055	.03	.055
Reach 1	7.08	.055	.03	.055
Reach 1	6.98	.055	.03	.055
Reach 1	6.9	.055	.03	.055
Reach 1	6.8	.055	.03	.055
Reach 1	6.71	.055	.03	.055
Reach 1	6.63	.055	.03	.055

Reach 1	6.58	.055	.03	.055
Reach 1	6.5	.055	.03	.055
Reach 1	6.43	.055	.03	.055
Reach 1	6.32	.055	.03	.055
Reach 1	6.25	.055	.03	.055
Reach 1	6.16	.055	.03	.055
Reach 1	6.09	.055	.03	.055
Reach 1	6.01	.055	.03	.055
Reach 1	5.92	.055	.03	.055
Reach 1	5.83	.055	.03	.055
Reach 1	5.76	.055	.03	.055
Reach 1	5.66	.055	.03	.055
Reach 1	5.64	.055	.03	.055
Reach 1	5.57	.055	.03	.055
Reach 1	5.48	.055	.03	.055
Reach 1	5.38	.055	.03	.055
Reach 1	5.31	.055	.03	.055
Reach 1	5.21	.055	.03	.055
Reach 1	5.15	.055	.03	.055
Reach 1	5.09	.055	.03	.055
Reach 1	5.03	.055	.03	.055
Reach 1	4.96	.055	.03	.055
Reach 1	4.9	.055	.03	.055
Reach 1	4.82	.055	.03	.055
Reach 1	4.78	.055	.03	.055
Reach 1	4.74	.055	.03	.055
Reach 1	4.65	.055	.03	.055
Reach 1	4.6	.055	.03	.055
Reach 1	4.58	.055	.03	.055
Reach 1	4.575	Culvert		
Reach 1	4.56	.055	.03	.055
Reach 1	4.49	.055	.03	.055
Reach 1	4.4	.055	.03	.055
Reach 1	4.31	.055	.03	.055
Reach 1	4.23	.055	.03	.055
Reach 1	4.22	.055	.03	.055
Reach 1	4.11	.055	.03	.055
Reach 1	4.05	.055	.03	.055
Reach 1	3.96	.055	.03	.055
Reach 1	3.86	.055	.03	.055
Reach 1	3.78	.055	.03	.055
Reach 1	3.75	.055	.03	.055
Reach 1	3.65	.055	.03	.055
Reach 1	3.6	.055	.03	.055
Reach 1	3.52	.055	.03	.055
Reach 1	3.46	.055	.03	.055
Reach 1	3.4	.055	.03	.055
Reach 1	3.32	.055	.03	.055
Reach 1	3.21	.055	.03	.055
Reach 1	3.13	.055	.03	.055
Reach 1	3.07	.055	.03	.055
Reach 1	2.97	.055	.03	.055
Reach 1	2.92	.055	.03	.055
Reach 1	2.90	.055	.03	.055
Reach 1	2.87	.055	.03	.055
Reach 1	2.82	.055	.03	.055
Reach 2	2.73	.055	.03	.055
Reach 2	2.70	.055	.03	.055
Reach 2	2.67	.055	.03	.055
Reach 3	2.60	.055	.03	.055
Reach 3	2.52	.055	.03	.055
Reach 3	2.47	.055	.03	.055
Reach 3	2.40	.055	.03	.055
Reach 3	2.33	.055	.03	.055
Reach 3	2.24	.055	.03	.055
Reach 3	2.17	.055	.03	.055
Reach 3	2.08	.055	.03	.055
Reach 3	2.00	.055	.03	.055
Reach 3	1.88	.055	.03	.055
Reach 3	1.85	.055	.03	.055
Reach 3	1.81	.055	.03	.055
Reach 3	1.75	.055	.03	.055
Reach 3	1.66	.055	.03	.055
Reach 3	1.60	.055	.03	.055
Reach 3	1.56	.055	.03	.055
Reach 3	1.47	.055	.03	.055
Reach 3	1.37	.055	.03	.055
Reach 3	1.27	.055	.03	.055
Reach 3	1.18	.055	.03	.055
Reach 3	1.09	.055	.03	.055
Reach 3	0.99	.055	.03	.055
Reach 3	0.84	.055	.03	.055
Reach 3	0.75	.055	.03	.055
Reach 3	0.71	.055	.03	.055
Reach 3	0.63	.055	.03	.055
Reach 3	0.54	.055	.03	.055
Reach 3	0.43	.055	.03	.055
Reach 3	0.33	.055	.03	.055
Reach 3	0.20	.055	.03	.055

River:Paradise Wash

Reach	River Sta.	n1	n2	n3

Reach 1	2.23	.055	.03	.055
Reach 1	2.14	.055	.03	.055
Reach 1	2.07	.055	.03	.055
Reach 1	2.00	.055	.03	.055
Reach 1	1.92	.055	.03	.055
Reach 1	1.83	.055	.03	.055
Reach 1	1.75	.055	.03	.055
Reach 1	1.65	.055	.03	.055
Reach 1	1.54	.055	.03	.03
Reach 1	1.46	.055	.03	.055
Reach 1	1.37	.055	.03	.055
Reach 1	1.27	.055	.03	.055
Reach 1	1.21	.055	.03	.055
Reach 1	1.12	.055	.03	.055
Reach 1	1.04	.055	.03	.055
Reach 1	0.95	.055	.03	.055
Reach 1	0.89	.055	.03	.055
Reach 1	0.80	.055	.03	.055
Reach 1	0.72	.055	.03	.055
Reach 1	0.62	.055	.03	.055
Reach 1	0.53	.055	.03	.055
Reach 1	0.44	.055	.03	.055
Reach 1	0.34	.055	.03	.055
Reach 1	0.28	.055	.03	.055
Reach 1	0.17	.055	.03	.055
Reach 1	0.13	.055	.03	.055
Reach 1	0.04	.055	.03	.055

SUMMARY OF REACH LENGTHS

River: Desert Hills Was

Reach	River Sta.	Left	Channel	Right
Reach 1	0.99	490	470	440
Reach 1	0.90	500	491	480
Reach 1	0.81	550	492	400
Reach 1	0.72	340	373	325
Reach 1	0.64	270	450	450
Reach 1	0.56	320	436	450
Reach 1	0.48	410	380	340
Reach 1	0.40	180	260	320
Reach 1	0.366	405	400	380
Reach 1	0.31	280	280	280
Reach 1	0.22	130	145	180
Reach 1	0.19	240	300	380
Reach 1	0.09	250	250	280
Reach 1	0.04	0	0	0

River: Apache Wash

Reach	River Sta.	Left	Channel	Right
Reach 1	8.02	215	235	245
Reach 1	7.96	280	465	520
Reach 1	7.89	300	300	220
Reach 1	7.84	575	500	425
Reach 1	7.74	425	500	475
Reach 1	7.65	520	500	470
Reach 1	7.55	510	500	480
Reach 1	7.46	490	500	510
Reach 1	7.36	420	446	470
Reach 1	7.28	475	554	410
Reach 1	7.17	500	500	520
Reach 1	7.08	485	500	500
Reach 1	6.98	400	437	470
Reach 1	6.9	490	529	560
Reach 1	6.8	500	495	400
Reach 1	6.71	425	390	350
Reach 1	6.63	300	290	290
Reach 1	6.58	430	430	430
Reach 1	6.5	310	345	355
Reach 1	6.43	475	450	360
Reach 1	6.32	410	390	350
Reach 1	6.25	490	460	430
Reach 1	6.16	270	360	450
Reach 1	6.09	470	445	435
Reach 1	6.01	485	490	510
Reach 1	5.92	375	400	375
Reach 1	5.83	375	380	380
Reach 1	5.76	470	540	570
Reach 1	5.66	460	440	320
Reach 1	5.64	370	345	320
Reach 1	5.57	400	450	450
Reach 1	5.48	530	500	500
Reach 1	5.38	350	375	425
Reach 1	5.31	500	500	480
Reach 1	5.21	330	310	300
Reach 1	5.15	350	352	355
Reach 1	5.09	300	300	310
Reach 1	5.03	345	365	340

Reach 1	4.96	400	320	200
Reach 1	4.9	220	200	160
Reach 1	4.82	480	480	480
Reach 1	4.78	300	200	100
Reach 1	4.74	400	500	500
Reach 1	4.65	260	280	260
Reach 1	4.6	83	83	83
Reach 1	4.58	180	180	170
Reach 1	4.575	Culvert		
Reach 1	4.56	365	365	350
Reach 1	4.49	490	450	450
Reach 1	4.4	475	510	490
Reach 1	4.31	410	420	410
Reach 1	4.23	140	150	150
Reach 1	4.22	280	280	260
Reach 1	4.11	240	250	300
Reach 1	4.05	400	500	285
Reach 1	3.96	490	520	460
Reach 1	3.86	360	400	490
Reach 1	3.78	170	170	170
Reach 1	3.75	500	500	500
Reach 1	3.65	250	280	260
Reach 1	3.6	400	420	450
Reach 1	3.52	200	200	200
Reach 1	3.48	360	450	435
Reach 1	3.4	490	470	430
Reach 1	3.32	520	520	520
Reach 1	3.21	250	310	350
Reach 1	3.13	200	280	300
Reach 1	3.07	560	520	480
Reach 1	2.97	270	270	270
Reach 1	2.92	155	155	155
Reach 1	2.90	140	200	250
Reach 1	2.87	240	260	270
Reach 1	2.82	0	0	0
Reach 2	2.73	190	190	190
Reach 2	2.70	160	160	90
Reach 2	2.67	0	0	0
Reach 3	2.60	390	430	450
Reach 3	2.52	270	260	250
Reach 3	2.47	340	400	450
Reach 3	2.40	300	360	370
Reach 3	2.33	450	450	450
Reach 3	2.24	380	380	390
Reach 3	2.17	500	520	350
Reach 3	2.08	440	440	270
Reach 3	2.00	550	490	230
Reach 3	1.88	190	200	230
Reach 3	1.85	210	190	150
Reach 3	1.81	300	300	240
Reach 3	1.75	480	500	520
Reach 3	1.66	300	250	240
Reach 3	1.60	190	180	180
Reach 3	1.56	400	500	540
Reach 3	1.47	490	500	520
Reach 3	1.37	400	500	440
Reach 3	1.27	450	460	500
Reach 3	1.18	500	500	350
Reach 3	1.09	500	500	460
Reach 3	0.99	890	900	550
Reach 3	0.84	420	440	430
Reach 3	0.75	180	200	210
Reach 3	0.71	370	400	440
Reach 3	0.63	300	500	600
Reach 3	0.54	800	640	400
Reach 3	0.43	505	500	440
Reach 3	0.33	350	650	700
Reach 3	0.20	0	0	0

River: Paradise Wash

Reach	River Sta.	Left	Channel	Right
Reach 1	2.23	435	440	445
Reach 1	2.14	385	380	380
Reach 1	2.07	415	390	260
Reach 1	2.00	390	400	390
Reach 1	1.92	460	455	450
Reach 1	1.83	440	445	450
Reach 1	1.75	485	490	500
Reach 1	1.65	600	600	575
Reach 1	1.54	400	400	400
Reach 1	1.46	260	500	670
Reach 1	1.37	570	500	430
Reach 1	1.27	390	350	320
Reach 1	1.21	400	440	450
Reach 1	1.12	320	420	470
Reach 1	1.04	500	400	300
Reach 1	0.95	250	275	310
Reach 1	0.89	520	500	480
Reach 1	0.80	420	350	330
Reach 1	0.72	400	420	425
Reach 1	0.62	420	450	460
Reach 1	0.53	475	495	500

Reach 1	0.44	500	450	380
Reach 1	0.34	290	300	340
Reach 1	0.28	550	550	550
Reach 1	0.17	225	225	200
Reach 1	0.13	425	390	465
Reach 1	0.04	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Desert Hills Was

Reach	River Sta.	Contr.	Expan.
Reach 1	0.99	.1	.3
Reach 1	0.90	.1	.3
Reach 1	0.81	.1	.3
Reach 1	0.72	.3	.3
Reach 1	0.64	.3	.5
Reach 1	0.56	.3	.5
Reach 1	0.48	.3	.5
Reach 1	0.40	.3	.5
Reach 1	0.386	.3	.5
Reach 1	0.31	.1	.3
Reach 1	0.22	.1	.3
Reach 1	0.19	.1	.3
Reach 1	0.09	.1	.3
Reach 1	0.04	.1	.3

River: Apache Wash

Reach	River Sta.	Contr.	Expan.
Reach 1	8.02	.1	.3
Reach 1	7.98	.1	.3
Reach 1	7.89	.1	.3
Reach 1	7.84	.1	.3
Reach 1	7.74	.1	.3
Reach 1	7.65	.1	.3
Reach 1	7.55	.1	.3
Reach 1	7.46	.1	.3
Reach 1	7.36	.3	.5
Reach 1	7.28	.3	.5
Reach 1	7.17	.1	.3
Reach 1	7.08	.1	.3
Reach 1	6.98	.1	.3
Reach 1	6.9	.1	.3
Reach 1	6.8	.1	.3
Reach 1	6.71	.1	.3
Reach 1	6.63	.1	.3
Reach 1	6.58	.1	.3
Reach 1	6.5	.1	.3
Reach 1	6.43	.1	.3
Reach 1	6.32	.1	.3
Reach 1	6.25	.1	.3
Reach 1	6.16	.1	.3
Reach 1	6.09	.1	.3
Reach 1	6.01	.1	.3
Reach 1	5.92	.1	.3
Reach 1	5.83	.1	.3
Reach 1	5.76	.1	.3
Reach 1	5.66	.3	.5
Reach 1	5.64	.3	.5
Reach 1	5.57	.1	.3
Reach 1	5.48	.1	.3
Reach 1	5.38	.1	.3
Reach 1	5.31	.1	.3
Reach 1	5.21	.1	.3
Reach 1	5.15	.3	.5
Reach 1	5.09	.3	.5
Reach 1	5.03	.1	.3
Reach 1	4.96	.1	.3
Reach 1	4.9	.1	.3
Reach 1	4.82	.3	.5
Reach 1	4.78	.1	.3
Reach 1	4.74	.1	.3
Reach 1	4.65	.3	.5
Reach 1	4.6	.3	.5
Reach 1	4.58	.3	.5
Reach 1	4.575	Culvert	
Reach 1	4.56	.1	.3
Reach 1	4.49	.1	.3
Reach 1	4.4	.1	.3
Reach 1	4.31	.3	.5
Reach 1	4.23	.3	.5
Reach 1	4.22	.1	.3
Reach 1	4.11	.1	.3
Reach 1	4.05	.1	.3
Reach 1	3.96	.1	.3
Reach 1	3.86	.1	.3
Reach 1	3.78	.1	.3
Reach 1	3.75	.1	.3

Reach 1	3.65	.1	.3
Reach 1	3.6	.1	.3
Reach 1	3.52	.1	.3
Reach 1	3.48	.1	.3
Reach 1	3.4	.1	.3
Reach 1	3.32	.1	.3
Reach 1	3.21	.1	.3
Reach 1	3.13	.1	.3
Reach 1	3.07	.1	.3
Reach 1	2.97	.1	.3
Reach 1	2.92	.1	.3
Reach 1	2.90	.1	.3
Reach 1	2.87	.1	.3
Reach 1	2.82	.1	.3
Reach 2	2.73	.1	.3
Reach 2	2.70	.1	.3
Reach 2	2.67	.1	.3
Reach 3	2.60	.1	.3
Reach 3	2.52	.1	.3
Reach 3	2.47	.1	.3
Reach 3	2.40	.1	.3
Reach 3	2.33	.1	.3
Reach 3	2.24	.1	.3
Reach 3	2.17	.1	.3
Reach 3	2.08	.1	.3
Reach 3	2.00	.3	.5
Reach 3	1.88	.1	.3
Reach 3	1.85	.1	.3
Reach 3	1.81	.1	.3
Reach 3	1.75	.1	.3
Reach 3	1.66	.1	.3
Reach 3	1.60	.1	.3
Reach 3	1.56	.1	.3
Reach 3	1.47	.1	.3
Reach 3	1.37	.1	.3
Reach 3	1.27	.3	.5
Reach 3	1.18	.3	.5
Reach 3	1.09	.3	.5
Reach 3	0.99	.3	.5
Reach 3	0.84	.3	.5
Reach 3	0.75	.1	.3
Reach 3	0.71	.1	.3
Reach 3	0.63	.1	.3
Reach 3	0.54	.1	.3
Reach 3	0.43	.1	.3
Reach 3	0.33	.1	.3
Reach 3	0.20	.1	.3

River: Paradise Wash

Reach	River Sta.	Contr.	Expan.
Reach 1	2.23	.1	.3
Reach 1	2.14	.1	.3
Reach 1	2.07	.1	.3
Reach 1	2.00	.1	.3
Reach 1	1.92	.1	.3
Reach 1	1.83	.1	.3
Reach 1	1.75	.1	.3
Reach 1	1.65	.1	.3
Reach 1	1.54	.1	.3
Reach 1	1.46	.1	.3
Reach 1	1.37	.1	.3
Reach 1	1.27	.1	.3
Reach 1	1.21	.1	.3
Reach 1	1.12	.1	.3
Reach 1	1.04	.1	.3
Reach 1	0.95	.1	.3
Reach 1	0.89	.1	.3
Reach 1	0.80	.1	.3
Reach 1	0.72	.1	.3
Reach 1	0.62	.1	.3
Reach 1	0.53	.3	.5
Reach 1	0.44	.3	.5
Reach 1	0.34	.3	.5
Reach 1	0.28	.1	.3
Reach 1	0.17	.1	.3
Reach 1	0.13	.1	.3
Reach 1	0.04	.1	.3

Profile Output Table - Standard Table 1

River	Reach	River Sta (cfs)	Q Total (ft)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft/ft)	E.G. Slope (ft/s)	Vel Chnl (sq ft)	Flow Area (ft)	Top Width	Froude # Chl	
Paradise Wash	Reach 1	2.23		1075.00	1826.00	1829.45	1829.38	1830.60	0.008097	8.71	134.87	64.13	0.93
Paradise Wash	Reach 1	2.14		1075.00	1824.00	1825.82	1825.80	1826.39	0.010426	7.54	252.52	230.77	0.98
Paradise Wash	Reach 1	2.07		1075.00	1821.00	1822.51	1822.51	1822.76	0.008406	5.21	426.74	719.57	0.83
Paradise Wash	Reach 1	2.00		1075.00	1814.00	1817.48	1817.48	1818.54	0.007378	8.64	159.91	95.76	0.89
Paradise Wash	Reach 1	1.92		1075.00	1810.00	1812.45	1812.33	1813.27	0.008729	7.26	151.37	91.41	0.91
Paradise Wash	Reach 1	1.83		1075.00	1806.00	1809.12	1809.12	1809.81	0.006542	7.11	224.87	221.37	0.81
Paradise Wash	Reach 1	1.75		1075.00	1800.00	1803.50	1803.50	1804.18	0.008563	7.43	216.79	168.28	0.91
Paradise Wash	Reach 1	1.65		1075.00	1796.00	1798.98	1798.98	1799.64	0.006178	7.15	237.49	225.05	0.80

Paradise Wash	Reach 1	1.54	1219.00	1790.00	1792.06	1791.77	1792.43	0.006853	5.55	252.33	199.10	0.77
Paradise Wash	Reach 1	1.46	1219.00	1786.00	1788.75	1788.62	1789.59	0.006998	7.46	185.00	133.75	0.84
Paradise Wash	Reach 1	1.37	1219.00	1782.00	1785.15	1785.15	1785.94	0.008303	7.80	216.84	139.44	0.91
Paradise Wash	Reach 1	1.27	1219.00	1778.00	1781.52	1781.09	1782.20	0.006068	6.64	183.55	80.78	0.78
Paradise Wash	Reach 1	1.21	1219.00	1776.00	1779.49	1779.31	1780.21	0.005431	7.76	239.85	125.16	0.77
Paradise Wash	Reach 1	1.12	1219.00	1772.00	1775.96	1775.96	1776.93	0.010631	7.92	153.84	78.85	1.00
Paradise Wash	Reach 1	1.04	1219.00	1770.00	1772.90	1772.90	1773.40	0.006462	7.10	346.72	326.49	0.81
Paradise Wash	Reach 1	0.95	1219.00	1766.00	1770.23	1769.34	1770.70	0.003438	5.46	224.62	96.45	0.60
Paradise Wash	Reach 1	0.89	1219.00	1764.00	1767.92	1767.67	1769.25	0.007744	9.24	131.96	40.46	0.90
Paradise Wash	Reach 1	0.80	1219.00	1762.00	1765.24	1765.24	1765.78	0.005504	7.24	360.29	360.54	0.76
Paradise Wash	Reach 1	0.72	1219.00	1758.00	1760.82	1760.82	1761.26	0.006113	6.93	385.21	382.97	0.78
Paradise Wash	Reach 1	0.62	1219.00	1754.00	1756.45	1756.33	1757.23	0.009792	7.74	193.63	112.01	0.97
Paradise Wash	Reach 1	0.53	1219.00	1750.00	1753.11	1753.11	1753.88	0.005849	7.46	243.67	229.19	0.79
Paradise Wash	Reach 1	0.44	1219.00	1746.00	1749.45	1749.26	1749.76	0.005734	6.35	419.13	389.52	0.75
Paradise Wash	Reach 1	0.34	1219.00	1744.00	1745.63	1745.63	1746.13	0.012656	7.73	313.86	331.31	1.07
Paradise Wash	Reach 1	0.28	1219.00	1738.00	1741.70	1741.70	1742.39	0.007802	7.38	245.45	192.89	0.87
Paradise Wash	Reach 1	0.17	1219.00	1732.00	1736.21	1735.30	1736.74	0.002711	6.13	263.45	140.64	0.56
Paradise Wash	Reach 1	0.13	1219.00	1732.00	1734.76	1734.76	1735.70	0.008827	7.85	171.44	120.32	0.93
Paradise Wash	Reach 1	0.04	1219.00	1726.00	1732.01	1729.57	1732.25	0.000876	4.04	370.67	240.63	0.33
Apache Wash	Reach 1	8.02	1187.00	1985.10	1988.68	1988.68	1989.63	0.007916	7.93	171.49	132.78	0.90
Apache Wash	Reach 1	7.98	1187.00	1981.80	1985.83	1985.83	1986.97	0.010306	8.57	138.46	61.47	1.01
Apache Wash	Reach 1	7.89	1187.00	1977.00	1980.59	1980.59	1981.49	0.008769	7.75	171.58	118.04	0.92
Apache Wash	Reach 1	7.84	1187.00	1974.40	1977.51	1977.51	1978.33	0.009745	8.53	208.25	123.35	0.99
Apache Wash	Reach 1	7.74	1187.00	1969.10	1972.73	1972.73	1973.23	0.004660	6.47	347.16	363.51	0.70
Apache Wash	Reach 1	7.65	1187.00	1961.80	1965.27	1965.27	1966.12	0.007207	8.14	213.22	132.94	0.87
Apache Wash	Reach 1	7.55	1187.00	1956.70	1960.41	1960.41	1961.22	0.006215	7.38	203.32	186.21	0.80
Apache Wash	Reach 1	7.46	1187.00	1951.50	1954.02	1954.02	1954.88	0.009896	7.51	170.31	113.05	0.96
Apache Wash	Reach 1	7.36	1187.00	1944.50	1948.20	1948.20	1949.20	0.010488	8.01	149.28	86.67	1.00
Apache Wash	Reach 1	7.28	1187.00	1940.80	1943.34	1943.08	1943.67	0.009053	7.31	329.88	244.77	0.92
Apache Wash	Reach 1	7.17	1187.00	1934.00	1937.37	1937.37	1938.66	0.008905	9.21	136.70	60.05	0.97
Apache Wash	Reach 1	7.08	1187.00	1929.00	1932.35	1932.20	1933.26	0.008230	7.68	155.21	72.95	0.90
Apache Wash	Reach 1	6.98	1187.00	1924.00	1928.17	1927.98	1929.22	0.007907	8.23	144.62	61.59	0.90
Apache Wash	Reach 1	6.9	1187.00	1920.00	1924.22	1924.22	1925.32	0.010171	8.41	142.29	74.28	0.99
Apache Wash	Reach 1	6.8	1187.00	1914.00	1918.27	1918.27	1919.75	0.009152	9.75	123.16	50.97	0.98
Apache Wash	Reach 1	6.71	1187.00	1907.50	1912.26	1911.77	1913.33	0.005984	8.30	143.37	46.44	0.81
Apache Wash	Reach 1	6.63	1187.00	1905.00	1908.99	1908.99	1910.50	0.008667	9.93	125.60	50.50	0.96
Apache Wash	Reach 1	6.58	1187.00	1902.00	1905.99	1905.99	1907.19	0.010254	8.78	135.20	57.64	1.01
Apache Wash	Reach 1	6.5	1187.00	1899.00	1902.65	1902.27	1903.29	0.006506	6.40	185.55	91.21	0.79
Apache Wash	Reach 1	6.43	1187.00	1896.50	1899.49	1899.49	1900.37	0.011190	7.54	157.51	90.97	1.01
Apache Wash	Reach 1	6.32	1187.00	1890.00	1894.14	1893.63	1895.10	0.005823	7.86	151.45	55.36	0.79
Apache Wash	Reach 1	6.25	1187.00	1888.00	1891.05	1891.05	1892.11	0.010553	8.23	144.15	69.59	1.01
Apache Wash	Reach 1	6.16	1187.00	1883.00	1886.69	1886.69	1887.58	0.007744	7.72	182.20	144.81	0.88
Apache Wash	Reach 1	6.09	1187.00	1879.50	1881.97	1881.52	1882.38	0.005220	5.14	231.07	134.20	0.69
Apache Wash	Reach 1	6.01	1262.00	1875.50	1878.83	1878.75	1879.49	0.008026	6.85	232.42	180.51	0.87
Apache Wash	Reach 1	5.92	1262.00	1870.20	1873.22	1873.21	1873.92	0.016881	8.37	220.18	158.92	1.21
Apache Wash	Reach 1	5.83	1262.00	1865.50	1868.89	1868.89	1869.61	0.007721	7.25	234.34	182.76	0.87
Apache Wash	Reach 1	5.76	1262.00	1862.00	1864.78	1864.78	1865.65	0.008435	7.59	190.52	150.11	0.91
Apache Wash	Reach 1	5.66	1262.00	1854.00	1859.64	1859.64	1860.61	0.006702	8.15	196.32	152.80	0.84
Apache Wash	Reach 1	5.64	1262.00	1855.00	1856.93	1856.52	1857.17	0.003986	5.97	348.48	303.33	0.58
Apache Wash	Reach 1	5.57	1262.00	1850.00	1854.67	1854.67	1855.42	0.005372	7.38	253.79	207.72	0.76
Apache Wash	Reach 1	5.48	1262.00	1846.00	1850.26	1850.26	1851.24	0.008215	7.97	171.69	131.58	0.91
Apache Wash	Reach 1	5.38	1262.00	1841.00	1845.62	1845.62	1846.51	0.007454	9.01	231.59	125.26	0.90
Apache Wash	Reach 1	5.31	1262.00	1838.00	1842.77	1842.77	1843.57	0.007180	8.05	232.90	137.37	0.86
Apache Wash	Reach 1	5.21	1262.00	1834.00	1838.38	1838.38	1838.97	0.006269	6.94	298.61	277.86	0.79
Apache Wash	Reach 1	5.15	1262.00	1830.00	1835.01	1835.01	1835.79	0.005501	7.79	249.44	167.14	0.77
Apache Wash	Reach 1	5.09	1262.00	1830.00	1832.75	1832.75	1833.09	0.008850	6.51	416.72	506.75	0.89
Apache Wash	Reach 1	5.03	1262.00	1826.00	1830.01	1830.01	1830.27	0.004315	5.91	510.48	810.75	0.66
Apache Wash	Reach 1	4.96	1262.00	1822.00	1826.13	1826.13	1826.48	0.006142	6.75	467.08	651.13	0.77
Apache Wash	Reach 1	4.9	1262.00	1822.00	1824.02	1824.01	1824.09	0.002092	3.10	683.09	581.91	0.43
Apache Wash	Reach 1	4.82	1262.00	1818.00	1820.09	1820.09	1822.71	0.057544	15.58	132.82	136.56	2.22
Apache Wash	Reach 1	4.78	1262.00	1813.00	1816.01	1816.01	1816.11	0.002853	4.24	669.03	557.10	0.52
Apache Wash	Reach 1	4.74	1262.00	1810.00	1813.95	1813.95	1814.90	0.013311	9.05	216.40	201.43	1.12
Apache Wash	Reach 1	4.65	1262.00	1806.00	1808.72	1808.72	1809.19	0.009235	6.12	298.26	329.85	0.89
Apache Wash	Reach 1	4.6	1262.00	1802.00	1808.16	1805.27	1808.17	0.000152	1.68	1651.27	627.48	0.14
Apache Wash	Reach 1	4.58	1262.00	1801.30	1807.31	1804.94	1807.95	0.001830	6.46	195.50	593.76	0.47
Apache Wash	Reach 1	4.575	Culvert									
Apache Wash	Reach 1	4.56	1262.00	1799.00	1802.08	1801.88	1802.95	0.007843	7.50	168.28	142.02	0.88
Apache Wash	Reach 1	4.49	1262.00	1796.00	1799.89	1799.35	1800.48	0.005551	6.12	206.15	95.88	0.74
Apache Wash	Reach 1	4.4	1262.00	1792.30	1796.91	1796.91	1797.77	0.006380	8.24	238.96	158.79	0.83
Apache Wash	Reach 1	4.31	1262.00	1788.00	1792.86	1792.86	1794.17	0.007220	9.30	154.64	90.52	0.89
Apache Wash	Reach 1	4.23	1262.00	1786.00	1790.19	1789.85	1790.58	0.004036	6.06	378.56	279.88	0.65
Apache Wash	Reach 1	4.22	1262.00	1785.50	1789.22	1789.22	1789.78	0.006818	7.22	325.77	287.81	0.82
Apache Wash	Reach 1	4.11	1262.00	1782.00	1785.52	1785.52	1786.35	0.011577	7.28	173.25	107.35	1.01
Apache Wash	Reach 1	4.05	1262.00	1779.00	1782.98	1782.98	1783.61	0.005602	7.40	305.28	238.88	0.77
Apache Wash	Reach 1	3.96	1262.00	1774.00	1778.21	1777.90	1779.07	0.007535	7.46	170.10	79.55	0.86
Apache Wash	Reach 1	3.86	1262.00	1770.00	1774.46	1774.46	1775.30	0.006992	7.49	205.31	170.75	0.84
Apache Wash	Reach 1	3.78	1482.00	1766.00	1770.83	1770.83	1771.84	0.009105	8.48	214.30	120.26	0.95
Apache Wash	Reach 1	3.75	1482.00	1764.00	1768.98	1768.98	1770.37	0.006317	9.62	184.70	110.13	0.85
Apache Wash	Reach 1	3.65	1482.00	1762.00	1766.28	1765.81	1766.82	0.003239	6.72	381.47	233.04	0.61
Apache Wash	Reach 1	3.6	1482.00	1760.00	1764.48	1764.48	1765.56	0.006311	9.26	252.16	151.65	0.84
Apache Wash	Reach 1	3.52	1482.00	1756.00	1761.49	1761.49	1762.87	0.006124	9.69	192.85	100.30	0.84
Apache Wash	Reach 1	3.48	1482.00	1755.00	1760.20	1760.20	1761.39	0.006489	9.56	241.34	145.73	0.86
Apache Wash	Reach 1	3.4	1482.00	1752.00	1757.50	1757.26	1758.23	0.004529	7.59	301.96	173.54	0.72
Apache Wash	Reach 1	3.32	1482.00	1750.00	1753.83	1753.83	1755.13	0.009897	9.16	161.87	62.90	1.01
Apache Wash	Reach 1	3.21	1482.00	1746.00	1750.33	1750.33	1751.11	0.005279	7.34	284.11	334.39	0.75
Apache Wash	Reach 1	3.13	1482.00	1742.00	1747.02	1746.95	1748.28	0.006894	9.13	185.75	101.30	0.87
Apache Wash	Reach 1	3.07	1482.00	1741.00	1745.34	1745.25	1746.43	0.006079	8.59	216.43	128.73	0.83
Apache Wash	Reach 1	2.97	1482.00	1738.00	1742.38	1742.22	1743.21	0.006053	7.40	234.57	200.23	0.79
Apache Wash	Reach 1	2.92	1482.00	1735.00	1739.73	1739.65	1741.18	0.008887	9.67	153.20	49.55	0.97
Apache Wash	Reach 1	2.90	1482.00	1734.00	1739.86	1738.63	1740.34	0.001900	6.00	408.70	257.87	0.48
Apache Wash	Reach 1	2.87	1482.00	1734.00	1738.04	1738.04	1739.51	0.009643	9.76	152.01	60.58	1.01
Apache Wash	Reach 1	2.82	1482.00	1731.00	1736.10	1735.49	1736.99	0.005122	7.73	257.48	377.91	0.75
Apache Wash	Reach 2	2.73	3085.00	1728.00	1733.98	1733.32	1735.15	0.003861	8.93	436.81	178.15	0.70
Apache Wash	Reach 2	2.70	3085.00	1728.00	1733.76	1732.73	1734.41	0.002503	7.25	658.72	247.32	0.57
Apache Wash	Reach 2	2.67	3085.00	1728.00	1733.05	1732.94	1733.87	0.005199	7.87	569.39	341.36	0.76

Apache Wash	Reach 3	2.60	3573.00	1724.00	1729.37	1729.37	1731.33	0.008693	11.24	317.91	82.03	1.01
Apache Wash	Reach 3	2.52	3573.00	1721.00	1728.09	1726.53	1729.02	0.002507	7.98	618.93	433.02	0.58
Apache Wash	Reach 3	2.47	3573.00	1720.00	1725.84	1725.84	1727.87	0.007510	11.62	353.48	127.39	0.96
Apache Wash	Reach 3	2.40	3573.00	1718.00	1723.78	1722.38	1724.51	0.002342	7.22	634.98	186.22	0.55
Apache Wash	Reach 3	2.33	3573.00	1717.00	1721.59	1721.59	1723.08	0.007276	10.19	423.82	158.26	0.92
Apache Wash	Reach 3	2.24	3573.00	1714.00	1719.34	1718.69	1720.27	0.004209	7.83	522.46	235.02	0.71
Apache Wash	Reach 3	2.17	3573.00	1714.00	1717.44	1717.38	1718.29	0.006410	8.33	652.29	355.07	0.84
Apache Wash	Reach 3	2.08	3573.00	1710.00	1714.15	1713.82	1714.93	0.008183	9.29	655.42	296.19	0.94
Apache Wash	Reach 3	2.00	3573.00	1708.50	1711.41	1710.98	1712.04	0.007296	7.47	675.92	348.77	0.86
Apache Wash	Reach 3	1.88	3573.00	1702.10	1707.54	1707.54	1708.86	0.006274	9.57	476.06	230.04	0.86
Apache Wash	Reach 3	1.85	3573.00	1700.00	1706.64	1705.63	1707.55	0.003120	7.91	600.59	317.83	0.63
Apache Wash	Reach 3	1.81	3573.00	1700.00	1705.53	1705.53	1706.81	0.004505	9.84	586.31	313.46	0.77
Apache Wash	Reach 3	1.75	3573.00	1698.00	1703.74	1702.87	1704.69	0.003769	7.96	500.05	174.68	0.68
Apache Wash	Reach 3	1.66	3573.00	1696.00	1701.28	1701.28	1702.42	0.005470	9.23	559.64	271.04	0.81
Apache Wash	Reach 3	1.60	3573.00	1692.00	1700.11	1698.78	1701.01	0.002333	8.19	670.00	240.97	0.57
Apache Wash	Reach 3	1.56	3573.00	1692.00	1698.73	1698.36	1700.31	0.005798	10.13	384.76	174.64	0.84
Apache Wash	Reach 3	1.47	3573.00	1690.00	1695.77	1695.48	1697.45	0.005614	10.53	381.18	125.54	0.84
Apache Wash	Reach 3	1.37	3573.00	1688.00	1693.20	1693.20	1694.44	0.005935	9.18	497.42	313.47	0.83
Apache Wash	Reach 3	1.27	3573.00	1684.00	1688.35	1688.25	1689.69	0.007216	9.55	435.08	187.81	0.91
Apache Wash	Reach 3	1.18	3573.00	1680.00	1686.78	1685.23	1687.64	0.002456	7.57	538.05	147.21	0.57
Apache Wash	Reach 3	1.09	3573.00	1680.00	1684.42	1684.42	1685.71	0.006243	10.14	537.54	301.83	0.87
Apache Wash	Reach 3	0.99	3573.00	1678.00	1681.23	1680.44	1681.59	0.005266	7.33	1018.85	598.38	0.75
Apache Wash	Reach 3	0.84	3573.00	1670.00	1674.35	1673.91	1676.07	0.009222	12.03	521.57	298.35	1.05
Apache Wash	Reach 3	0.75	3573.00	1666.00	1671.32	1671.31	1672.65	0.006002	9.66	479.01	226.08	0.85
Apache Wash	Reach 3	0.71	3573.00	1664.00	1670.60	1669.76	1671.69	0.003429	9.16	581.54	210.93	0.67
Apache Wash	Reach 3	0.63	3573.00	1664.00	1669.15	1669.15	1670.11	0.004328	8.64	706.77	442.05	0.73
Apache Wash	Reach 3	0.54	3573.00	1660.00	1665.57	1665.57	1666.71	0.004450	9.44	628.00	327.20	0.75
Apache Wash	Reach 3	0.43	3573.00	1655.00	1660.51	1660.51	1661.78	0.006655	9.49	488.22	255.19	0.88
Apache Wash	Reach 3	0.33	3573.00	1652.20	1656.85	1656.54	1657.96	0.006947	8.71	465.57	176.60	0.87
Apache Wash	Reach 3	0.20	3573.00	1646.00	1652.48	1651.92	1654.11	0.005003	10.40	382.42	102.87	0.80
Desert Hills Was	Reach 1	0.99	2140.00	1748.00	1754.82	1754.49	1755.18	0.002744	7.03	850.14	575.73	0.54
Desert Hills Was	Reach 1	0.90	2140.00	1748.00	1753.10	1753.03	1753.61	0.004093	8.64	724.22	535.94	0.70
Desert Hills Was	Reach 1	0.81	2140.00	1746.00	1750.83	1750.77	1751.36	0.005158	8.09	655.28	527.84	0.73
Desert Hills Was	Reach 1	0.72	2140.00	1744.00	1748.76	1748.57	1749.17	0.004508	7.69	700.72	512.93	0.70
Desert Hills Was	Reach 1	0.64	2140.00	1742.00	1747.09	1747.09	1747.61	0.004283	7.68	731.09	665.65	0.70
Desert Hills Was	Reach 1	0.56	2140.00	1740.00	1745.52	1745.52	1746.01	0.003557	7.68	779.40	659.36	0.64
Desert Hills Was	Reach 1	0.48	2140.00	1740.00	1744.58	1744.08	1744.80	0.002067	5.81	1005.25	655.93	0.50
Desert Hills Was	Reach 1	0.40	2140.00	1738.00	1743.19	1743.07	1743.68	0.003882	6.96	670.31	530.84	0.66
Desert Hills Was	Reach 1	0.386	2140.00	1738.00	1742.46	1742.16	1742.79	0.002811	6.69	832.23	552.44	0.57
Desert Hills Was	Reach 1	0.31	2140.00	1736.00	1740.71	1740.71	1741.35	0.004113	7.71	614.76	530.32	0.69
Desert Hills Was	Reach 1	0.22	2140.00	1734.00	1739.10	1739.10	1739.94	0.004534	8.03	450.98	374.53	0.73
Desert Hills Was	Reach 1	0.19	2140.00	1734.00	1738.60	1738.60	1739.23	0.003841	7.55	587.65	537.46	0.67
Desert Hills Was	Reach 1	0.09	2140.00	1732.00	1737.51	1735.48	1737.73	0.001147	4.56	808.55	333.70	0.38
Desert Hills Was	Reach 1	0.04	2140.00	1730.00	1735.83	1735.30	1737.11	0.004501	9.27	277.49	108.34	0.75

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Fu-10

River: Desert Hills Was Reach: Reach 1 RS: 0.99 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.90 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.81 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.72 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.64 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Desert Hills Was Reach: Reach 1 RS: 0.56 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.48 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Desert Hills Was Reach: Reach 1 RS: 0.386 Profile: 10-year
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.

River: Desert Hills Was Reach: Reach 1 RS: 0.31 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Desert Hills Was Reach: Reach 1 RS: 0.22 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The

program defaulted to critical depth.
River: Desert Hills Was Reach: Reach 1 RS: 0.19 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Desert Hills Was Reach: Reach 1 RS: 0.09 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Desert Hills Was Reach: Reach 1 RS: 0.04 Profile: 10-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 8.02 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.98 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.89 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.84 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.74 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.65 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.55 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.46 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.36 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.28 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 7.17 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 7.08 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 6.98 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 6.9 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.8 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.71 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 6.63 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.56 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.5 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 6.43 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.32 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 6.25 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.16 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 6.09 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 6.01 Profile: 10-year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 5.92 Profile: 10-year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 5.83 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.76 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.66 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.64 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 5.57 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.48 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.38 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.31 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 5.21 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 5.15 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Apache Wash Reach: Reach 1 RS: 5.09 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: Apache Wash Reach: Reach 1 RS: 5.03 Profile: 10-year

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

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

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

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1 RS: 4.96 Profile: 10-year

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

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

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

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

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1 RS: 4.9 Profile: 10-year

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1 RS: 4.82 Profile: 10-year

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

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

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

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: Apache Wash Reach: Reach 1 RS: 4.78 Profile: 10-year

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

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

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

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

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

River: Apache Wash Reach: Reach 1 RS: 4.74 Profile: 10-year

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

Warning: 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.

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

River: Apache Wash Reach: Reach 1 RS: 4.65 Profile: 10-year

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

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

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

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

River: Apache Wash Reach: Reach 1 RS: 4.6 Profile: 10-year

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

River: Apache Wash Reach: Reach 1 RS: 4.575 Profile: 10-year Culv: Box1

Note: During supercritical analysis, the culvert direct step method went to normal depth. The program then assumed normal depth at the outlet.

Note: The flow in the culvert is entirely supercritical.

River: Apache Wash Reach: Reach 1 RS: 4.56 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 4.49 Profile: 10-year

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

River: Apache Wash Reach: Reach 1 RS: 4.4 Profile: 10-year

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

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.31 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.22 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.11 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 4.05 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.96 Profile: 10-year
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.
River: Apache Wash Reach: Reach 1 RS: 3.86 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: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.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.78 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: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.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.75 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.65 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 3.6 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.52 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.48 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.4 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 3.32 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.21 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 3.13 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 3.07 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 2.97 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 2.92 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 2.90 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 1 RS: 2.87 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 1 RS: 2.82 Profile: 10-year
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.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.73 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.70 Profile: 10-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 2 RS: 2.67 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.60 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.52 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.47 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.40 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.33 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 2.24 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.17 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 2.08 Profile: 10-year
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.
River: Apache Wash Reach: Reach 3 RS: 2.00 Profile: 10-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.88 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.85 Profile: 10-year
Warning:Divided flow computed for this cross-section.
River: Apache Wash Reach: Reach 3 RS: 1.81 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.75 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.66 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.60 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.56 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.47 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.37 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 1.27 Profile: 10-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 1.18 Profile: 10-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: Apache Wash Reach: Reach 3 RS: 1.09 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.99 Profile: 10-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.84 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.75 Profile: 10-year
Warning:Divided flow computed for this cross-section.
River: Apache Wash Reach: Reach 3 RS: 0.71 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Apache Wash Reach: Reach 3 RS: 0.63 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.54 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.43 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Apache Wash Reach: Reach 3 RS: 0.33 Profile: 10-year
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 2.23 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 2.14 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 2.07 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 2.00 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.92 Profile: 10-year
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.
River: Paradise Wash Reach: Reach 1 RS: 1.83 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.75 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.65 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.54 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.46 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.37 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.27 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.21 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 1.12 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 1.04 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.95 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.89 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.80 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.72 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.62 Profile: 10-year
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.53 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.44 Profile: 10-year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.34 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.28 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.17 Profile: 10-year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Paradise Wash Reach: Reach 1 RS: 0.13 Profile: 10-year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Paradise Wash Reach: Reach 1 RS: 0.04 Profile: 10-year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.