FLOODPLAIN DELINEATION STUDY
FOR
DISTRIBUTARY FLOW AREA: WASH 6a

August 5, 1994

Prepared by:

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Floodplain Delineation Study
for
Distributary Flow Area: Wash 6a

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Wash 6a: Floodplain Delineation Study: Workmaps
Flood Hazards of Distributary-Flow Areas in Southwestern Arizona (Hjalmarson and Kemna, 1991)

1.0 Introduction

Coe & Van Loo Consultants, Inc., (CVL) has been contracted to prepare a Letter of Map Revision (LOMR) submittal for Wash 6a located in northeast Phoenix. Wash 6a is currently delineated as Zone AO Alluvial Fan (FIRM Panels 04013C1210E, 04013C1230E, 04013C0815F, and 04013C0820E). The purpose of this report is to document the hydrologic and hydraulic analyses used to redelineate Wash 6a. It is the goal of this report to remove the alluvial fan designation from Wash 6a and redelineate the wash as a system of Zone A floodplains, as shown in the Wash 6a Work Maps (14 sheets). The documentation for determining that Wash 6a is not an alluvial fan is provided in a separate report.

This report also documents an approach for applying the HEC-1 computer model to a watershed with distributary flow areas. The approach presented herein has been developed for a specific watershed located in northeast Phoenix and is not necessarily intended to be applicable to all watersheds with distributary-flow areas.

2.0 Hydrologic Analyses

2.1 Summary

The HEC-1 model for this study has been based on the HEC-1 model prepared by WRA, submitted to FEMA as part of the map appeal in February 1992, and adopted by FEMA for the current FIS (FEMA, 1993). The watershed boundaries and HEC-1 schematic for the study area are shown in Plate 1. Plate 1 shows the upper watershed area, which has predominantly tributary flow patterns, and the lower watershed area which exhibits both tributary and distributary flow patterns. The sub-basins within the lower watershed area have been incorporated into the HEC-1 for the current FIS.

Plate 2 illustrates the lower portion of the watershed for Wash 6a, and schematically shows the multiple channels within the distributary flow areas (DFAs). Wash 6a begins to exhibit significant distributary-flow characteristics approximately 4500 feet downstream of Scottsdale Road, as indicated in Plate 2. This distributary-flow pattern complicates the application HEC-1, since HEC-1 is typically applied to watersheds with a single main channel and strictly tributary flow patterns. Analysis of the numerous flow splits, within the distributary-flow network, with HEC-1 is impracticable. Yet, to delineate floodplains for the wash system it can be important to compute the runoff from the watershed areas within and adjacent to the distributary-flow network and to route these flows down the watershed.

In general, the approach described herein for applying HEC-1 to watersheds with distributary-flow areas involves:

a) delineating watershed boundaries for a group of washes that emanate from a Primary Diffluence (PD as shown in Plates 1 and 2);

b) routing the hydrograph for the group of washes based on composite channel geometry; and

c) using normal depth analysis to evaluate flow diversions within the channel system, and flow diversions for channels entering or exiting the group of washes.

2.2 HEC-1 Model

The HEC-1 model for Wash 6a is given in Appendix B. Plate 1 illustrates the HEC-1 schematic for Wash 6a. The HEC-1 model documented in this report is based on:

a) 100-year, 6-hour rainfall event based on NOAA Atlas rainfall data;

b) HEC-1 hypothetical distribution;

c) kinematic wave routing of excess precipitation to the sub-basin outlet; and

d) normal depth channel routing.

The HEC-1 model has the following general characteristics:

a) the upper drainage basins (i.e., sub-basins 1430, 1440, 1380, 1390S, 1390N, 15A, 1470, 1471, & 1475) are identical to those submitted to FEMA by Water Resources and Associates (WRA) in February 1992 and were used by FEMA to generate the FIRM dated December 3, 1993;

b) the lower drainage basins parameters and routing parameters are consistent with those submitted by WRA in the aforementioned study;

c) composite channel configurations are used in normal depth routings R110, R120, R130, R140, R210A, R210B, R220, R230, & R230 (see Section 2.3); and

d) normal depth computations have been used to compute diversion rating data.

2.2.1 Watershed Boundary Delineation

Plate 2 shows schematically the flow network for Wash 6a, within the study reach. Plate 2 also shows watershed boundaries for Wash 6a consistent with the general approach described above. As shown in Plate 2, all of the washes emanating from the PDA for Wash 6a, and branches thereof, are included within the watershed boundaries. In the HEC-1 model, the group of washes emanating from the PDA are treated as a single channel in the hydrograph routings.

Identifying PDA's is an important aspect of this approach and not necessarily a simple task. In the report titled *Flood Hazards of Distributary-Flow Areas in Southwestern Arizona* (Hjalmarson and Kemna, 1991), the authors present a detailed procedure for identifying PDA's.

It is consistent with this approach to have isolated channels diverting flow into and out of the main watershed at specific locations. Within the study area, Plate 2 shows two locations where flow is diverted into Wash 6a from adjacent watersheds with distributary-flow patterns and one location where flow is diverted from Wash 6a. Hence, to compute hydrographs and peak discharges for Wash 6a, portions of the adjacent watersheds have also been evaluated with HEC-1.

It is also consistent with the approach presented herein to have significant tributary drainage basins. Within the study area, Wash 6a has several significant tributary basins (i.e., sub-basins T11, T12 & T13) that direct significant amounts of runoff to specific locations along the Wash 6a channel system.

2.2.2 Sub-basin Parameters

Development of the HEC-1 model for the study area involved the calculation and/or estimation of numerous input parameters. The following are descriptions of the methods and sources of information used to calculate and/or estimate key input parameters:

a) Rainfall Data: PH-Card

The PH-card specifies depth/duration and storm area data used by HEC-1 to compute the distribution of rainfall and the depth-area rainfall reduction factor for each sub-basin, respectively.

For this study, the depth/duration data is based on NOAA Atlas 2, Vol. VIII isopluvials. The PH data for the upper sub-basins (i.e., sub-basins 1380, 1391S, 1391N, 1430, 1440, 1441, 1470, 15A, & 1471) correspond to those used in the HEC-1 model for the current FIS (1993). An additional set of depth/duration values have been computed for the lower watershed area (Table B-1a, Appendix B). The depth/duration computations are given in Appendix B.

A purpose of this study is to delineate the Zone A wash corridors through specific project sites impacted by Wash 6a. Hence, the storm area data, specified on the PH-card, corresponds to the contributing drainage area at the upstream limit of the project sites for each of the wash systems (i.e., washes 6a, 6b/c, & 5a). Storm area computations for each wash system are given in Table B-1b in Appendix B.

b) Curve Numbers

The weighted curve number (CN) for each sub-basin has been computed based on a) a Soil Conservation Service (SCS) soils study which identifies the hydrologic soil group (i.e., A, B, C, or D soils) for the soils within each sub-basin (SCS, 1985), and b) the Curve Number table published by the SCS in TR-55, assuming "Desert Shrub" under poor conditions. These curve number computations are consistent with the values specified in the HEC-1 model for the current FIS. The curve number computations for each of the sub-basins are given in Table B2 in Appendix B.

c) Routing Parameters for Sub-basins

Each sub-basin requires the measurement of kinematic wave routing parameters specified on UK and RK-Cards. The routing parameters are based on field investigations and measurements from USGS quadrangle mapping or detailed topographic mapping. The kinematic wave routing parameters are listed in Tables B-3 through B-5 in Appendix B.

2.2.3 Normal Depth Routing Parameters/Composite Channel Routings

Normal depth routing parameters, for hydrograph routings shown schematically in Plate 1, are based on detailed topographic mapping, USGS maps, aerial photographs, and field measurements. Routing parameters and "NSTPS" value computations are summarized in Table B-6 (Appendix B).

HEC-1 input variable "NSTPS" specifies the number of time steps to be used in normal depth routing computations. As indicated in Table B-6, "NSTPS" is a function of the reach length, the number of minutes in a computational interval (~~IT~~ RS-Card: field 1), and average flow velocity (HEC, 1990). Average flow velocities have been estimated using normal depth computations based on typical flow depths of approximately 1.75 to 2 feet in the main channel. The normal depth computations are given in Appendix B following Table B-6.

As indicated in the HEC-1 output (Appendix B), several of channel routings are for "composite" channel configurations. In general, a "composite" channel has been used to represent several individual channels within a distributary flow area with a single eight-point cross section. Figure 1 illustrates the concept of a "composite" channel.

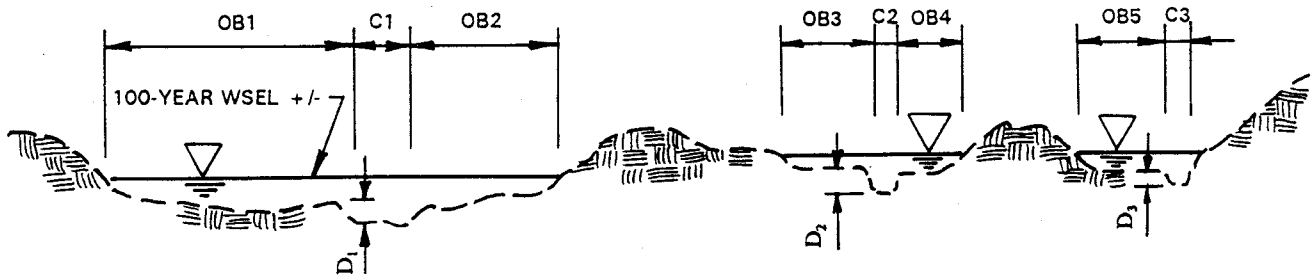
The applicability of the Normal Depth Routing option to stable multi-channel systems was evaluated by comparing a computed hydrograph based on two individual channel routings with a single routing based on a "composite" channel section. The tests were performed using channel configurations based on detailed topographic mapping, which is available for Wash 6a downstream of Scottsdale Road.

The results of this analysis indicate that the "composite" channel routings can preserve the peak discharge, the time to peak, and the general hydrograph shape. However, it is important that the "composite" channel preserves the channel/overbank topwidths and the general flow depths of the individual channels. To preserve the multiple channel characteristics, it is important that the computed composite channel sections have: a) overbank and main channel topwidths equal to the sum of the overbank and main channel topwidths of the individual channel sections; and b) a main channel depth equal to the average main channel depth of the individual channel sections. The concept of the composite channel is illustrated in Figure 1.

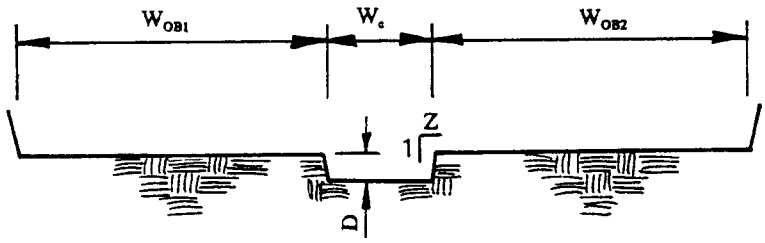
Two sets of HEC-1 output are given in Appendix A. One set of these output printouts presents the calculations corresponding to channel routings of two individual channels; while, the second presents the calculations corresponding to a composite channel routing. As indicated in the HEC-1 printouts, the composite channel routing preserved the time to peak, the peak discharge, and the shape of the hydrograph.

FIGURE 1: COMPOSITE CHANNEL ROUTINGS

A) SIMPLIFIED CROSS SECTION OF NATURAL CHANNEL SYSTEM



B) COMPOSITE CHANNEL FOR NORMAL DEPTH ROUTING



where: $W_c \cong \sum_i C_i$

$W_{OB1} + W_{OB2} \cong \sum_i OB_i$

$D \cong D_1 \cong D_2 \cong D_3$

$Z \cong$ representative bank slope based on mapping and field observations

2.2.4 Flow Diversion Analysis

The HEC-1 model for the study area includes several flow diversions. These flow diversions have been evaluated based on normal depth computations and in one case broadcrested weir computations. The following procedure has been used to compute rating tables for the flow diversions in the HEC-1 model.

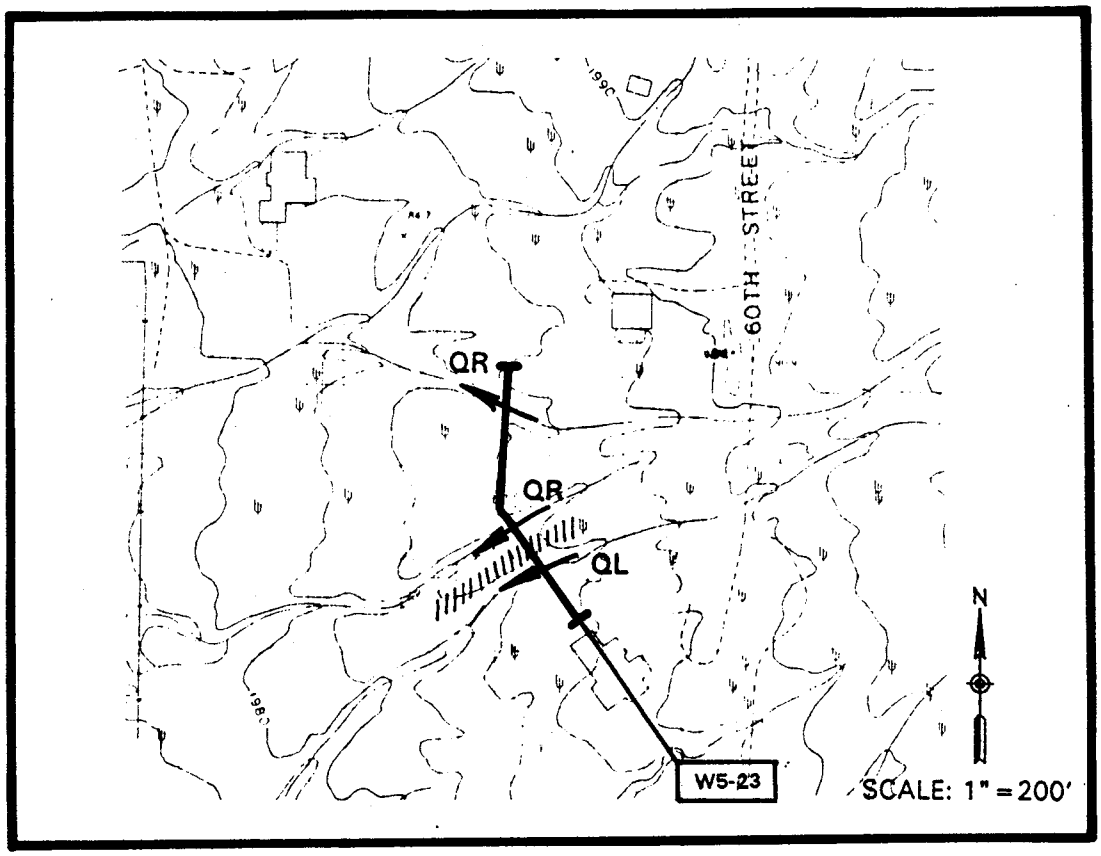
a) Select the cross section location just upstream of the diffluence (see Figure 2). The cross section should be oriented perpendicular to flow, in accordance with standard practice. In most cases, the actual location of the diffluence will vary to some degree as a function of flow depth. In this study, sections have been located corresponding to a flow depth in the general range of the 100-year event flow depth.

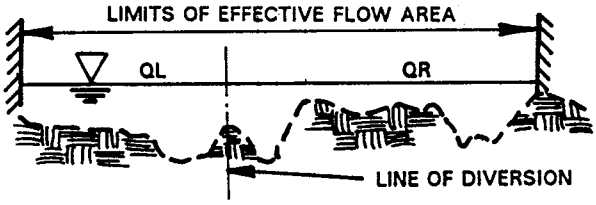
b) Identify the boundary between the diverging flow channels.

c) Estimate the discharges in the two channels corresponding to various water surface elevations using normal depth (i.e., Manning Equation) computations. In this study, the normal depth computations have been performed using software programmed by the author and WSPRO (FHA, 1990). Computations demonstrating that WSPRO and the software programmed by the author produce very similar results are given in Appendix C).

d) Rating tables for the diversions are computed based on the assumption that the sum of the computed discharges, for a given water surface elevation, equals the total discharge for the single channel upstream of the diffluence.

FIGURE 2: FLOW DIVERSION ANALYSES





SCHEMATIC REPRESENTATION OF SECTION W5-23

NTS

The use of normal depth computations is based on the assumption that backwater conditions are not prevalent. The normal depth computations, for the channels at slopes ranging from 1.5 to 2.7%, indicate that flows are typically at or near critical depth throughout the study area. Hence the assumption that backwater conditions are not prevalent is reasonable. The normal depth computations for the flow diversions modeled in HEC-1 are given in Appendix B. The numerous flow diversion analyses for Washes 5a & 5b are the basis for HEC-1 diversions "DIV210" and "DIV300". The location of the Wash 5 flow diversions are shown in Plates 2a and 2b and Plates 3a & 3b.

2.3 Results and Conclusions

The applicability of the approach, presented in this report, for using HEC-1 to compute hydrographs for watersheds with distributary channel patterns is dependent on the physical characteristics of the watercourses. The approach implicitly assumes that the distributary channel system is relatively stable. In addition, the use of composite channel geometry for hydrograph routings may only be adequate when:

a) the main channel depth, and consequently typical flow depths, of the individual channels do not vary significantly; and

b) the channel lengths, bed slopes, and appropriate roughness coefficients of the individual channels do not vary significantly.

At a given elevation, the individual channels that comprise Wash 6a are very similar in physical characteristics. Typical main channel depths vary from approximately 1.5 to 2.5 feet. The channel lengths, bed slopes, and roughness characteristics also do not appear to vary significantly. Therefore, the study area of Wash 6a does exhibit the physical characteristics required for the appropriate application of HEC-1 using

composite channel routings. The HEC-1 model for the study area is given in Appendix B.

As initially stated, the HEC-1 model has not been used to identify the specific peak discharge in an individual channel within the distributary channel network. However, detailed flow diversion analyses in conjunction with the HEC-1 model have been used to estimate the 100-year peak discharge in each of the Wash 6a channels (Plate 2).

3.0 Floodplain Delineation/Hydraulic Analyses

3.1 Summary

Within the distributary flow areas of Wash 6a, the results of the HEC-1 analysis simply denotes the total stormwater discharge for all of the channels that comprise Wash 6a. Normal depth computations and the results of the HEC-1 analyses have been used to evaluate the specific discharge within each channel. The results of these analyses are summarized in Table 1. WSPRO has been used to evaluate flow depths and delineate floodplain limits. The following sections of this report describe the methodologies used to delineate the Zone A floodplain shown on the Wash 6a Floodplain Maps (Attachments).

3.2 Peak Discharge Identification

In this study, identification of the peak 100-year discharges in each of the flow channels, within the Wash 6a system of channels, involves the following basic steps.

TABLE 1: 100 YEAR–6 HOUR PEAK DISCHARGES
FLOODPLAIN DELINEATION STUDY FOR WASH 6A:
100 YEAR PEAK DISCHARGES IN THE WASH 6A DISTRIBUTARY FLOW CHANNELS

SECTION ID	WASH 6A: CHANNEL ID NUMBERS & 100 YEAR DISCHARGES 1.00 Q(cfs)	1.10 Q(cfs)	1.11 Q(cfs)	1.12 Q(cfs)	1.20 Q(cfs)	2.00 Q(cfs)	2.10 Q(cfs)	2.20 Q(cfs)	2.30 Q(cfs)	3.00 Q(cfs)	3.10 Q(cfs)	4.00 Q(cfs)	TOTAL DISCHARGE (cfs)	HEC–1 COMPUTATION NODE	HEC–1 Q100 (cfs)	EFFECTIVE Q100 (**) (cfs)	COMMENT
2122*	2843												2843	C110	2843		BEGIN DISTRIBUTARY
2108	2843												2843				FLOW AREA
2090	2843												2843				
2084	2048					795							2843				
2079	2048					824							2872		214	29	FROM T11 INTO 2.00
2074	2048					824							2872				
2064	2048					824							2872				
2054	2048					824							2872				
2046	763	1285				824							2872				
2040	763	1285				824							2872				
2030	763	1285				824							2872				
2020	763	1285				824							2872				
2000	763	1285				838							2886		100	14	FROM T12 INTO 2.00
2000*	656	1104				720							2480	C121	2480		PEAK ADJUSTMENT
1980	656	1104				720							2480				
1970	656	993	111			720							2480				
1962	656	993	111			720							2480				
1956	656	993	111			720							2480				
1954	656	757	111	256		1146							2926		415+11	426	INFLOW FROM WASH 5 &
1946	656	757	111	256		579	568						2926				FROM T13 INTO 2.00
1938	656	757	111	256		579	568						2926				
1924	1413			256		690	568						2926				
1914	1413			256		461	568	75	154				2926				
1900*	393			287	831	399	492		133				2534	C130	2534		PEAK ADJUSTMENT
1888	393				1117	399	625						2534				
1864	1510					399	85		540				2534				
1850	943	567				399	1391		540				3840		1306	1306	INFLOW FROM WASH 5
1836	749		411		350	399	288		540	1103			3840				(NET INFLOW OF 136CFS)
1821	749	251	411		99	375	288	24	540	1103			3840				SEE NOTE "(1)"
1809*	848	251	435			375	288		540	1177			3914	C220	105	105	PEAK ADJUSTMENT
1801	–	–				–	288		540	1177			2004				TO CHAN 3
1787	–	–				–	828			1177			2004				ADJUSTMENT OF 2.6%
1776	–	–				–	828			1135	42	450	2454				SEE NOTE "(2)"
1766	–	–				–	828			1135	42	450	2454				
1751	–	–				–	828			1177		450	2454				
1740	–	–				–	217		611	1177		450	2454				
1734	–	–				–	217		–	1177		450	1843				
1724	–	–				–	217		–	833	344	450	1843				
1719	–	–				–	–		–	–	344	450	794				
1709	–	–				–	–		–	–	344	–	344				

(1) NOTE: Channel 3.00 is more accurately a channel of Wash 5; however, Channel 3.00 impacts the Tatum Highlands project site and can convey stormwater from Wash 6a.

(2) NOTE: The flow in Channel 3.1 represents historic conditons when Channel 4 did not divert flow to the east. The flow in channel 4 was estimated as 450 cfs.

(*) Elevation of HEC–1 computation node.
(**) Effective discharge is the portion of the peak discharge of the inflow that contributes to the peak discharge in the specified Wash 6a channel, based on the HEC–1 model.

STEP A

Identify the peak discharge upstream of the primary diffluence. In the case of Wash 6a, the peak discharge entering the distributary flow network corresponds to HEC-1 computation node "C110."

STEP B

Based on the upstream peak discharge, evaluate flow diversions of the peak discharge using normal depth computations, as presented in Section 2.2.4 of this report, progressing from upstream to downstream along the channel system. The flow diversion analyses for the Wash 6a channel system are given in Appendix C. The location of the flow diversion cross sections are shown on the floodplain delineation maps (see Attachments).

STEP C

As identified in the HEC-1 analysis, there are several locations where point discharges enter into the Wash 6a channel system. These point discharges are from significant tributary basins (i.e., T11, T12, & T13) or from adjacent wash systems, as illustrated in Plates 2a & 2b. Based on the results of the HEC-1 analysis, the portion of the point discharges that contributes to the peak discharge in Wash 6a is identified and added to the peak discharge in the appropriate channel, as identified and summarized in Table #1.

STEP D

The computation nodes/elevations for the Wash 6a HEC-1 model are as follows:

HEC-1 ID	Approximate Elevation of HEC-1 Computation Node
C110	2122
C121	2000
C130	1900
C220	1809

At these locations, the peak discharge for each of the channels was adjusted by a factor to account for attenuation and runoff from the HEC-1 sub-basin encompassing the distributary channel system (i.e., local runoff). The following equations have been used to adjust peak discharges for attenuation and local runoff.

Eq. (1) $Q_{DSi} = F*Q_{usi}$

where Q_{DSi} = Peak discharge downstream of HEC-1 node in channel "*i*"

Q_{USi} = Peak discharge just upstream of HEC-1 node in channel "*i*"

$F = Q_{Tj}/Q_{T(j-1)}$ = ratio of total peak discharge

Q_{Tj} = Total peak discharge at HEC-1 node in question

$= \sum_{i} Q_{DSi}$

$Q_{T(j-1)}$ = Sum of the peak discharges in the individual channels upstream of HEC-1 node in question

$= \sum_{i} Q_{USi}$

There are two very important assumptions associated with Equation (1). These assumptions are as follows:

Assumption #1: Local runoff is proportionally distributed between the individual channels within the distributary channel system. That is, more local runoff is directed into the larger channels. This assumption is minor or reasonable when local runoff has an insignificant effect on the peak discharge in the individual channels, due to differences in time of peak.

Wash 6a: As indicated in the floodplain delineation maps (Attachments), the washes with higher peak discharges typically have larger floodplains, more deeply incised main channels, and tend to collect more of the local drainage. In addition, the results of the HEC-1 analyses indicate that only 3 to 9% ± of the peak runoff from the local drainage basins (i.e., sub-basins 120, 130 & 140) contributes to the peak discharge in the channel system. Hence, Assumption #1 is reasonable for Wash 6a.

Assumption #2: Peak flow attenuation is proportionally distributed, between the individual channels within the channel system, as a function of the total discharge. Assumption #2 can be reasonable when a) peak attenuation is relatively minor, b) flow is somewhat evenly distributed between the individual channels and/or c) there are numerous flow diversions that diffuse the errors associated with this assumption.

Conditions: The results of the composite channel tests, given in Appendix A and summarized in Table A-1, indicate that the percentage of attenuation in the individual channels is within plus or minus 2.3% of that for the composite channel; even though, the peak discharge in the right channel is three times greater than that in the left channel. Hence, the results of the composite channel tests are consistent with Assumption #2. As indicated in the HEC-1 output (Appendix B), normal depth routings R120, R130 & R140 result in peak attenuations of approximately 13 to 17%

during the 100-year event. With the exception of the first 2000 feet of R120, the Wash 6a channel system is comprised of 3 to 7 individual channels. As indicated in Table 1, the discharges in the individual channels, at any given elevation, do vary significantly; however, the Wash 6a system does have numerous flow diversions that have the tendency to diffuse any errors introduced by this assumption. Hence, Assumption #2 is reasonable for Wash 6a.

3.3 WSPRO Model for Wash 6a

The WSPRO computer program was developed by the USGS and FHA to analyze one dimensional, gradually varied, steady flow in open channels (FHA, 1990). The software can also be used to compute critical velocity, and the corresponding discharge for individual segments of a cross section for a range of flow depths. In other words, the software can be used to generate rating tables for segments of a cross section based on critical flow conditions.

The floodplain delineation maps (see attachments) show the locations of the cross sections used to delineate floodplains and evaluate flow diversions for Wash 6a. WSPRO cross sections used for flow diversion analyses, given in Appendix C, are shown with the rectangles. It is important to note that the cross sections shown on the floodplain delineate maps have been oriented perpendicular to the general flow direction within the designated floodplains; however, portions of the cross sections outside of the floodplain limits may not be completely oriented perpendicular to flow. In addition, some of the cross sections do not include data points for those portions of the sections that are not within floodplains.

The flow diversion analyses for Wash 6a are given in Appendix C. The critical depth computations and section plots for the cross sections, shown on the floodplain delineation maps (see Attachments), are given in Appendix D. These computations were used to estimate flow depths and the corresponding floodplain limits for each of the individual channels.

As indicated in the floodplain mapping and in the flow diversion analyses, bed slopes vary between approximately 1.5 to 2.7 percent. As a result, stormwater flows in the Wash 6a system are predominantly at critical depth or within the transition zone (i.e., Froude number between approximately 0.86 and 1.14).

3.4 Results

The results of the flow diversion analyses and the HEC-1 model are summarized in Table 1. Table 1 lists the computed 100-year discharge in each of the channels at each of the WSPRO cross sections. The corresponding floodplain limits, based on critical depth, are shown on the floodplain delineation maps (see Attachments).

4.0 Conclusions and Recommendations

In summary, the HEC-1 computer program has been used to compute the 100-year, 6-hour event peak discharges for the Wash 6a channel system and for adjacent wash systems. The results of the HEC-2 analysis and normal depth computations have been used to estimate the peak discharge in each channel of the Wash 6a system. WSPRO's critical depth computations have been used to estimate the 100-year flood depth and corresponding floodplain limits. The floodplain limits for the Wash 6a system have been matched into the effective floodplain boundaries at the upstream and downstream limits of this study.

It is recommended that the Wash 6a channel system be delineated as Zone A: Non-alluvial fan. Since the flow depths and discharges have been estimated based on critical and normal depth computations, a Zone AE or floodway designation is inappropriate. The analyses presented herein has been based on the understanding that Wash 6a is not an active alluvial fan and that the flow paths of the Wash 6a channel system are relatively stable. The stability of the Wash 6a channel system is addressed in a separate report.

5.0 References

1. Federal Highway Administration (FHA)/U.S. Department of Transportation, *WSPRO (HY-7) Water-Surface Profile Computational Model*, March 1990.

2. Hjalmarson and Kemna, *Flood Hazards of Distributary-Flow Areas in Southwestern Area: U.S. Geological Survey: Water-Resources Investigation Report 91-4121*, U.S. Department of the Interior, December 1991.

3. Hydrologic Engineering Center (HEC), U.S. Army Corps of Engineers, *HEC-1 Flood Hydrograph Package, Users Manual*, 1990.

4. Soil Conservation Service (SCS), *Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona*, U.S. Government Printing Office, 1985.

Appendix A
Composite Channel Routing Tests

Table A-1: Summary of Test Results

	Left	Right	Composite	Comments
Bottom Width (BW)	20′	20′	40′	
Overbank Width (OBW)	150′	450′	600′	
Top Width (TW)	180	480′	650′	10′ narrow due to sideslopes
Depth (D)	2′	2′	2′	
Sideslope (z:1)	1	1	1	
Percent of Q_{100}	24%	76%	100%	
Station	R110		R110	
Q_{100} Peak	2683		2683	no difference
@ Time	4.42		4.42	no difference
Station	R110L	R110R	R110	
Q_{100}	626 cfs	2057	2683	
@ Time	4.42	4.42	4.42	
Max. Stage	2.69	3.07	2.97	
OB Depth	0.69	1.07	0.97	
Flow Areas in Channel	147.9 sf	526.6	666.9 sf	(7.6 sf short)
Q Before Routings				
Station	D110L	D110	C110	
Q_{100}	750	2376 cfs	3127 cfs	
@ Time	4.08	4.08	4.09	
Attenuation (cfs) (%)	124 cfs 16.5%	319 cfs 13.4%	444 cfs 14.2%	

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*             VERSION 4.0              *
*                                      *
*  RUN DATE  09/17/1993  TIME  09:18:31 *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

Composite Channel Routing

```
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

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

  1           ID        COMPOSITE CHANNEL TESTS
  2           ID        *************** COMPOSITE  CHANNEL ROUTING **********************
  3           ID        TEST 2 - 24/76 % SPLIT D/S BASIN 110
  4           ID        W6TST2C: CLOMR STUDY
  5           ID        ____________________________________________________________
  6           ID        NORTH SCOTTSDALE FLOOD INSURANCE STUDY, EXISTING CONDITIONS
  7           ID        100-YEAR, 6-HOUR STORM, USING HEC-1 HYPOTHETICAL DISTRIBUTION
  8           ID        RAINFALL FROM NOAA ATLAS
  9           ID
              *DIAGRAM
 10           IT       5                0     100
 11           IO       5       0

 12           KK    1430     SUB
 13           KM        RUNOFF FROM SUB 1430
 14           BA  1.4319
 15           PH            3.32     .71    1.39    2.44    2.81    3.05    3.52
 16           LS              81
 17           UK     240   .0555     .20     100
 18           RK   25800   .0271    .045            TRAP      30       3

 19           KK    1440     SUB
 20           KM        RUNOFF FROM SUB 1440
 21           BA  1.8882
 22           LS              81
 23           UK     240   .0555     .20     100
 24           RK   24800   .0258    .045            TRAP      30       3

 25           KK    1441      CP
 26           KM        COMBINE SUB 1430 & SUB 1440 - APEX
 27           HC       2

 28           KK   R1441
 29           KM        ROUTE SUB 1441 TO CP 100:BW=50' & OB = 50'
 30           RS       2    FLOW      -1
 31           RC    .055    .040    .055    4300   .0158
 32           RX       7      16      66      75     125     134     184     193
 33           RY       6       3       3       0       0       3       3       6

 34           KK     100     SUB
 35           KM        RUNOFF FROM SUB 100
 36           BA   .1060
 37           LS              81
 38           UK     240   .0555     .20     100
 39           RK    4300   .0158    .045            TRAP      50       3

 40           KK     100      CP
 41           KM        COMBINE
 42           HC       2
```

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

  43          KK    R100
  44          KM        ROUTE BW=70' & OB = 50'
  45          RS       8    FLOW      -1
  46          RC    .055    .040    .055   15800   .0195
  47          RX       7      16      66      75     145     154     204     213
  48          RY       6       3       3       0       0       3       3       6

  49          KK     110     SUB
  50          KM        RUNOFF FROM SUB 110
  51          BA   .5780
  52          LS              81
  53          UK     240   .0555     .20     100
  54          RK   15800   .0195    .045            TRAP      70       3

  55          KK    C110      CP
  56          KM        COMBINE
  57          HC       2

  58          KK    R110
  59          KM        COMPOSITE CHANNEL ROUTING ***********************************
  60          KM        ROUTE CHANNEL BW=40',D = 2', & OB = 600'
  61          KO       1       2     400
  62          RS       3    FLOW      -1
  63          RC    .065    .060    .065    6200   .0190
  64          RX     675     678     978     980    1020    1022    1322    1325
  65          RY       5       2       2       0       0       2       2       5
  66          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

 NO.       (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

  12        1430
               .
               .
  19           .        1440
               .           .
               .           .
  25        1441............
               V
               V
  28       R1441
               .
               .
  34           .         100
               .           .
               .           .
  40         100............
               V
               V
  43        R100
               .
               .
  49           .         110
               .           .
               .           .
  55        C110............
               V
               V
  58        R110
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*             VERSION 4.0              *
*                                      *
*  RUN DATE  09/17/1993  TIME  09:18:31 *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

```
                    COMPOSITE CHANNEL TESTS
                    *************** COMPOSITE  CHANNEL ROUTING **********************
                    TEST 2 - 24/76 % SPLIT D/S BASIN 110
                    W6TST2C: CLOMR STUDY

                    ____________________________________________________________
                    NORTH SCOTTSDALE FLOOD INSURANCE STUDY, EXISTING CONDITIONS
                    100-YEAR, 6-HOUR STORM, USING HEC-1 HYPOTHETICAL DISTRIBUTION
                    RAINFALL FROM NOAA ATLAS


 11 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        100  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE     1    0  ENDING DATE
                   NDTIME       0815  ENDING TIME
                   ICENT          19  CENTURY MARK

                COMPUTATION INTERVAL     .08 HOURS
                     TOTAL TIME BASE    8.25 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


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


            **************
            *            *
 58 KK      *     R110   *
            *            *
            **************

 61 KO        OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          2  PLOT CONTROL
                    QSCAL       400.  HYDROGRAPH PLOT SCALE
```

HYDROGRAPH ROUTING DATA

```
62 RS        STORAGE ROUTING
                  NSTPS          3  NUMBER OF SUBREACHES
                   ITYP       FLOW  TYPE OF INITIAL CONDITION
                 RSVRIC      -1.00  INITIAL CONDITION
                      X        .00 WORKING R AND D COEFFICIENT

63 RC        NORMAL DEPTH CHANNEL
                    ANL       .065  LEFT OVERBANK N-VALUE
                   ANCH       .060  MAIN CHANNEL N-VALUE
                    ANR       .065  RIGHT OVERBANK N-VALUE
                  RLNTH      6200.  REACH LENGTH
                    SEL      .0190  ENERGY SLOPE
                  ELMAX         .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION
```

CROSS-SECTION DATA

		--- LEFT OVERBANK ---		+ ------ MAIN CHANNEL		------- +	--- RIGHT OVERBANK ---		
65 RY	ELEVATION	5.00	2.00	2.00	.00	.00	2.00	2.00	5.00
64 RX	DISTANCE	675.00	678.00	978.00	980.00	1020.00	1022.00	1322.00	1325.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	1.51	3.04	4.58	6.15	7.74	9.34	10.97	21.61	45.75
OUTFLOW	.00	14.78	46.86	92.00	148.46	215.17	291.38	376.53	516.61	938.24
ELEVATION	.00	.26	.53	.79	1.05	1.32	1.58	1.84	2.11	2.37
STORAGE	69.90	94.08	118.28	142.50	166.74	191.00	215.27	239.57	263.89	288.22
OUTFLOW	1576.36	2393.78	3370.92	4494.81	5755.93	7146.88	8661.62	10295.12	12043.08	13901.77
ELEVATION	2.63	2.89	3.16	3.42	3.68	3.95	4.21	4.47	4.74	5.00

****

HYDROGRAPH AT STATION R110

****

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	1		0250	35	0.	.0	.0	1		0540	69	839.	13.4	2.3
1		0005	2	0.	.0	.0	1		0255	36	0.	.0	.0	1		0545	70	799.	12.6	2.3
1		0010	3	0.	.0	.0	1		0300	37	0.	.0	.0	1		0550	71	760.	11.9	2.3
1		0015	4	0.	.0	.0	1		0305	38	0.	.0	.0	1		0555	72	723.	11.1	2.2
1		0020	5	0.	.0	.0	1		0310	39	1.	.0	.0	1		0600	73	687.	10.4	2.2
1		0025	6	0.	.0	.0	1		0315	40	2.	.1	.0	1		0605	74	653.	9.8	2.2
1		0030	7	0.	.0	.0	1		0320	41	9.	.3	.2	1		0610	75	622.	9.2	2.2
1		0035	8	0.	.0	.0	1		0325	42	38.	.9	.5	1		0615	76	593.	8.7	2.2
1		0040	9	0.	.0	.0	1		0330	43	118.	1.8	.9	1		0620	77	567.	8.2	2.1
1		0045	10	0.	.0	.0	1		0335	44	229.	2.7	1.4	1		0625	78	544.	7.7	2.1
1		0050	11	0.	.0	.0	1		0340	45	323.	3.3	1.7	1		0630	79	524.	7.3	2.1
1		0055	12	0.	.0	.0	1		0345	46	382.	3.8	1.9	1		0635	80	507.	7.0	2.1
1		0100	13	0.	.0	.0	1		0350	47	424.	4.9	1.9	1		0640	81	493.	6.6	2.1
1		0105	14	0.	.0	.0	1		0355	48	530.	7.5	2.1	1		0645	82	479.	6.2	2.0
1		0110	15	0.	.0	.0	1		0400	49	782.	12.3	2.3	1		0650	83	464.	5.9	2.0
1		0115	16	0.	.0	.0	1		0405	50	1221.	18.8	2.5	1		0655	84	449.	5.5	2.0
1		0120	17	0.	.0	.0	1		0410	51	1783.	25.3	2.7	1		0700	85	432.	5.1	1.9
1		0125	18	0.	.0	.0	1		0415	52	2282.	30.3	2.9	1		0705	86	410.	4.5	1.9
1		0130	19	0.	.0	.0	1		0420	53	2594.	33.0	2.9	1		0710	87	385.	3.9	1.9
1		0135	20	0.	.0	.0	1		0425	54	2683.	33.7	3.0	1		0715	88	333.	3.4	1.7
1		0140	21	0.	.0	.0	1		0430	55	2588.	33.0	2.9	1		0720	89	290.	3.1	1.6
1		0145	22	0.	.0	.0	1		0435	56	2393.	31.4	2.9	1		0725	90	268.	3.0	1.5
1		0150	23	0.	.0	.0	1		0440	57	2188.	29.3	2.8	1		0730	91	252.	2.8	1.4
1		0155	24	0.	.0	.0	1		0445	58	1966.	27.1	2.8	1		0735	92	237.	2.7	1.4

1	0200	25	0.	.0	.0	*	1	0450	59	1760.	25.1	2.7	*	1	0740	93	224.	2.6	1.3
1	0205	26	0.	.0	.0	*	1	0455	60	1583.	23.4	2.6	*	1	0745	94	213.	2.6	1.3
1	0210	27	0.	.0	.0	*	1	0500	61	1455.	21.8	2.6	*	1	0750	95	203.	2.5	1.3
1	0215	28	0.	.0	.0	*	1	0505	62	1334.	20.2	2.5	*	1	0755	96	194.	2.4	1.2
1	0220	29	0.	.0	.0	*	1	0510	63	1221.	18.8	2.5	*	1	0800	97	186.	2.3	1.2
1	0225	30	0.	.0	.0	*	1	0515	64	1121.	17.6	2.4	*	1	0805	98	178.	2.3	1.2
1	0230	31	0.	.0	.0	*	1	0520	65	1038.	16.5	2.4	*	1	0810	99	169.	2.2	1.1
1	0235	32	0.	.0	.0	*	1	0525	66	970.	15.6	2.4	*	1	0815	100	161.	2.1	1.1
1	0240	33	0.	.0	.0	*	1	0530	67	919.	14.9	2.4	*						
1	0245	34	0.	.0	.0	*	1	0535	68	879.	14.1	2.3	*						
						*							*						

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	8.25-HR
+ (CFS)	(HR)					
		(CFS)				
+ 2683.	4.42		675.	491.	491.	491.
		(INCHES)	1.567	1.567	1.567	1.567
		(AC-FT)	335.	335.	335.	335.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	8.25-HR
+ (AC-FT)	(HR)				
34.	4.42	9.	7.	7.	7.

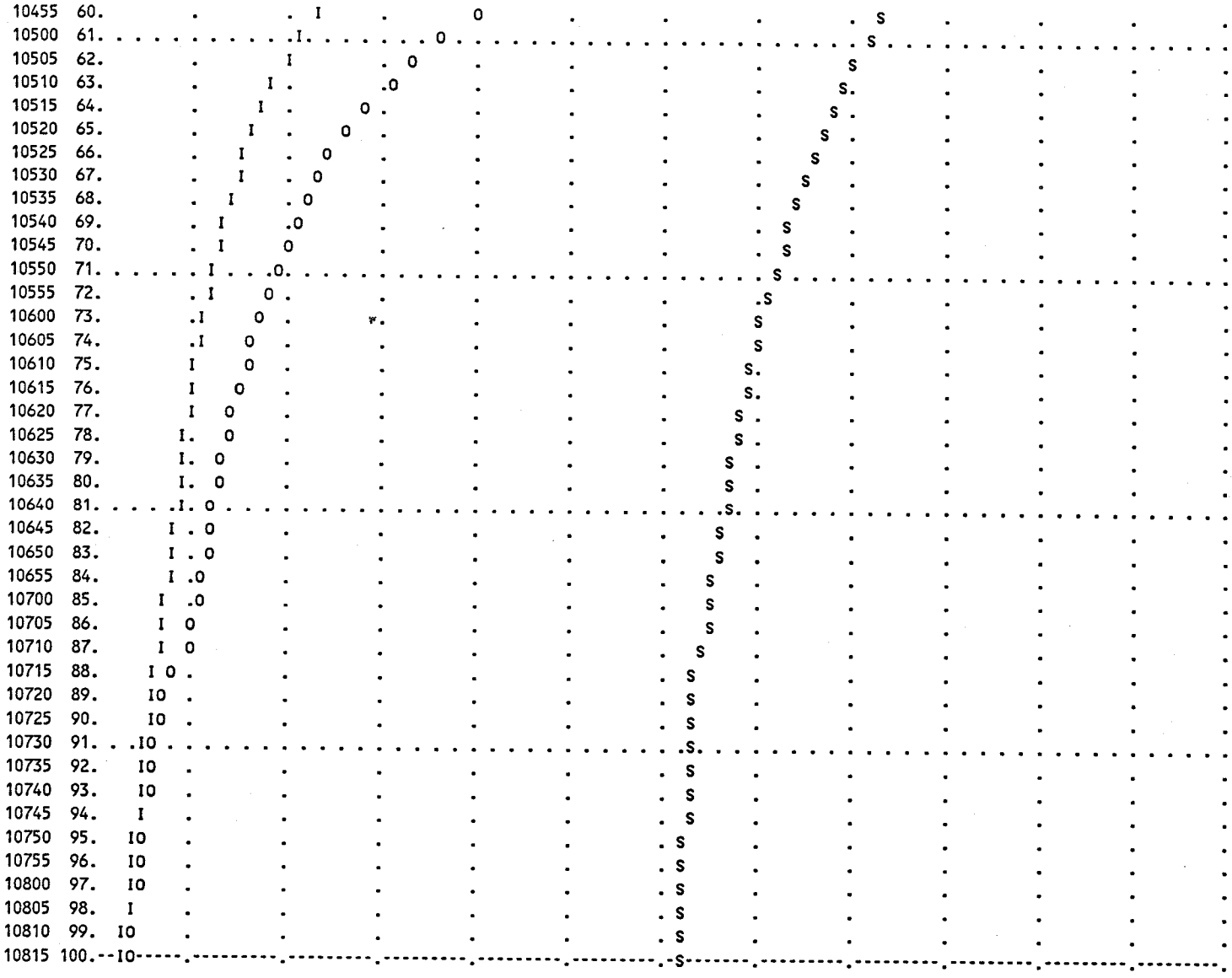
PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	8.25-HR
+ (FEET)	(HR)				
2.97	4.42	1.67	1.21	1.21	1.21

CUMULATIVE AREA = 4.00 SQ MI

STATION R110

(I) INFLOW, (O) OUTFLOW

	0.	400.	800.	1200.	1600.	2000.	2400.	2800.	3200.	0.	0.	0.	0.
								(S) STORAGE					
	0.	0.	0.	0.	0.	0.	0.	10.	20.	30.	40.	0.	0.
DAHRMN	PER												
10000	1	I					S						
10005	2	I					S						
10010	3	I					S						
10015	4	I					S						
10020	5	I					S						
10025	6	I					S						
10030	7	I					S						
10035	8	I					S						
10040	9	I					S						
10045	10	I					S						
10050	11	I					S						
10055	12	I					S						
10100	13	I					S						
10105	14	I					S						
10110	15	I					S						
10115	16	I					S						
10120	17	I					S						
10125	18	I					S						
10130	19	I					S						
10135	20	I					S						
10140	21	I					S						
10145	22	I					S						
10150	23	I					S						
10155	24	I					S						
10200	25	I					S						
10205	26	I					S						
10210	27	I					S						
10215	28	I					S						
10220	29	I					S						
10225	30	I					S						
10230	31	I					S						
10235	32	I					S						
10240	33	I					S						
10245	34	I					S						
10250	35	I					S						
10255	36	I					S						
10300	37	I					S						
10305	38	OI					S						
10310	39	O I					S						
10315	40	I					S						
10320	41	I					S						
10325	42.0	I					S						
10330	43.	O I					S						
10335	44.	O I					S						
10340	45.	O	I				S						
10345	46.	O				I	S						
10350	47.	O					S	I					
10355	48.	O					S	I					
10400	49.		O				S	I					
10405	50.			O			S	I					
10410	51.				O		I	S					
10415	52.					O	I	S					
10420	53.					I	O	S					
10425	54.				I		O	S					
10430	55.			I			O	S					
10435	56.			I			O	S					
10440	57.			I		O		S					
10445	58.		I		O			S					
10450	59.	I		O				S					



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	1430	1423.	3.58	255.	185.	185.	1.43		
+	HYDROGRAPH AT	1440	2050.	3.50	337.	245.	245.	1.89		
+	2 COMBINED AT	1441	3382.	3.50	592.	430.	430.	3.32		
+	ROUTED TO	R1441	3192.	3.67	588.	428.	428.	3.32		
+									4.10	3.67
+	HYDROGRAPH AT	100	153.	3.33	19.	14.	14.	.11		
+	2 COMBINED AT	100	3259.	3.67	607.	442.	442.	3.43		
+	ROUTED TO	R100	2875.	4.08	586.	426.	426.	3.43		
+									3.29	4.08
+	HYDROGRAPH AT	110	501.	3.67	102.	74.	74.	.58		
+	2 COMBINED AT	C110	3127.	4.08	687.	500.	500.	4.00		
+	ROUTED TO	R110	2683.	4.42	675.	491.	491.	4.00		
+									2.97	4.42

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
1430	MANE	3.52	1431.76	216.06	1.65	5.00	1422.98	215.00	1.65

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1299E+03 OUTFLOW= .1263E+03 BASIN STORAGE= .2746E+01 PERCENT ERROR= .7

1440	MANE	3.40	2084.02	211.40	1.66	5.00	2049.52	210.00	1.66

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1713E+03 OUTFLOW= .1673E+03 BASIN STORAGE= .2899E+01 PERCENT ERROR= .7

100	MANE	3.14	156.22	198.37	1.67	5.00	152.92	200.00	1.67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .9617E+01 OUTFLOW= .9442E+01 BASIN STORAGE= .9879E-01 PERCENT ERROR= .8

110	MANE	3.68	502.74	219.09	1.64	5.00	501.09	220.00	1.63

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5244E+02 OUTFLOW= .5042E+02 BASIN STORAGE= .1658E+01 PERCENT ERROR= .7

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

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            SEPTEMBER 1990             *
*             VERSION 4.0               *
*                                       *
*  RUN DATE  09/17/1993  TIME  09:19:52 *
*                                       *
*****************************************
```

```
*******************************
*                             *
*   U.S. ARMY CORPS OF ENGINEERS  *
*   HYDROLOGIC ENGINEERING CENTER *
*         609 SECOND STREET     *
*      DAVIS, CALIFORNIA 95616  *
*          (916) 756-1104       *
*                             *
*******************************
```

Individual Channel Routings

```
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

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

  1           ID        COMPOSITE CHANNEL TESTS
  2           ID        ************ TWO CHANNELS ROUTED *********************
  3           ID        TEST 2 - 24/76 % SPLIT D/S BASIN 110
  4           ID        ____________________________________________________
  5           ID        NORTH SCOTTSDALE FLOOD INSURANCE STUDY, EXISTING CONDITIONS
  6           ID        100-YEAR, 6-HOUR STORM, USING HEC-1 HYPOTHETICAL DISTRIBUTION
  7           ID        RAINFALL FROM NOAA ATLAS
  8           ID
              *DIAGRAM
  9           IT      5              0     100
 10           IO      5      0

 11           KK   1430     SUB
 12           KM        RUNOFF FROM SUB 1430
 13           BA  1.4319
 14           PH           3.32     .71    1.39    2.44    2.81    3.05    3.52
 15           LS             81
 16           UK    240   .0555     .20     100
 17           RK  25800   .0271    .045            TRAP      30       3

 18           KK   1440     SUB
 19           KM        RUNOFF FROM SUB 1440
 20           BA  1.8882
 21           LS             81
 22           UK    240   .0555     .20     100
 23           RK  24800   .0258    .045            TRAP      30       3

 24           KK   1441      CP
 25           KM        COMBINE SUB 1430 & SUB 1440 - APEX
 26           HC      2

 27           KK  R1441
 28           KM        ROUTE SUB 1441 TO CP 100:BW=50' & OB = 50'
 29           RS      2    FLOW      -1
 30           RC   .055    .040    .055    4300   .0158
 31           RX      7      16      66      75     125     134     184     193
 32           RY      6       3       3       0       0       3       3       6

 33           KK    100     SUB
 34           KM        RUNOFF FROM SUB 100
 35           BA   .1060
 36           LS             81
 37           UK    240   .0555     .20     100
 38           RK   4300   .0158    .045            TRAP      50       3

 39           KK    100      CP
 40           KM        COMBINE
 41           HC      2

 42           KK   R100
 43           KM        ROUTE BW=70' & OB = 50'
 44           RS      8    FLOW      -1
 45           RC   .055    .040    .055   15800   .0195
 46           RX      7      16      66      75     145     154     204     213
 47           RY      6       3       3       0       0       3       3       6
```

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

  48          KK     110     SUB
  49          KM        RUNOFF FROM SUB 110
  50          BA   .5780
  51          LS              81
  52          UK     240   .0555     .20     100
  53          RK   15800   .0195    .045            TRAP      70       3

  54          KK    C110      CP
  55          KM        COMBINE
  56          HC       2

  57          KK    D110
  58          KM        DIVERT CHANNEL LEFT 24%
  59          DT   D110L
  60          DI       0     100    1000    2000    4000
  61          DQ       0      24     240     480     960

  62          KK   R110R
  63          KM        INDIVIDUAL CHANNEL ROUTING ********************
  64          KM        ROUTE CHANNEL RIGHT BW=20',D = 2', & OB = 450'
  65          RS       3    FLOW      -1
  66          RC    .065    .060    .065    6200   .0190
  67          RX     760     763     988     990    1010    1012    1237    1240
  68          RY       5       2       2       0       0       2       2       5

  69          KK      RL
  70          KM        RETRIEVE CHANNEL LEFT
  71          DR   D110L

  72          KK   R110L
  73          KM        INDIVIDUAL CHANNEL ROUTING ********************
  74          KM        ROUTE CHANNEL LEFT BW=20',D = 2', & OB = 150'
  75          RS       3    FLOW      -1
  76          RC    .065    .060    .065    6200   .0190
  77          RX     910     913     988     990    1010    1012    1087    1090
  78          RY       5       2       2       0       0       2       2       5

  79          KK    R110
  80          KM        COMBINE R110L & R110R
  81          KO       1       2     400
  82          HC       2
  83          ZZ
```

```
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   11        1430
                .
                .
   18           .        1440
                .           .
                .           .
   24        1441............
                V
                V
   27       R1441
                .
                .
   33           .         100
                .           .
                .           .
   39         100............
                V
                V
   42        R100
                .
                .
   48           .         110
                .           .
                .           .
   54        C110............
                .
                .
   59           .-------->   D110L
   57        D110
                V
                V
   62       R110R
                .
                .
   71           .           .<-------   D110L
   69           .          RL
                .           V
                .           V
   72           .       R110L
                .           .
                .           .
   79        R110............

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*             VERSION 4.0              *
*                                      *
*  RUN DATE  09/17/1993  TIME  09:19:52 *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

```
                    COMPOSITE CHANNEL TESTS
                    ************* TWO CHANNELS ROUTED **********************
                    TEST 2 - 24/76 % SPLIT D/S BASIN 110
                    ____________________________________________________
                    NORTH SCOTTSDALE FLOOD INSURANCE STUDY, EXISTING CONDITIONS
                    100-YEAR, 6-HOUR STORM, USING HEC-1 HYPOTHETICAL DISTRIBUTION
                    RAINFALL FROM NOAA ATLAS


 10 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        100  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1   0  ENDING DATE
                   NDTIME       0815  ENDING TIME
                    ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL     .08 HOURS
                   TOTAL TIME BASE    8.25 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


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


          **************
          *            *
 79 KK    *     R110   *
          *            *
          **************

 81 KO        OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          2  PLOT CONTROL
                    QSCAL       400.  HYDROGRAPH PLOT SCALE

 82 HC        HYDROGRAPH COMBINATION
```

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION R110
SUM OF 2 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		0205	26	0.	1		0410	51	1829.	1		0615	76	555.
1		0005	2	0.	1		0210	27	0.	1		0415	52	2307.	1		0620	77	533.
1		0010	3	0.	1		0215	28	0.	1		0420	53	2597.	1		0625	78	512.
1		0015	4	0.	1		0220	29	0.	1		0425	54	2683.	1		0630	79	492.
1		0020	5	0.	1		0225	30	0.	1		0430	55	2596.	1		0635	80	473.
1		0025	6	0.	1		0230	31	0.	1		0435	56	2402.	1		0640	81	456.
1		0030	7	0.	1		0235	32	0.	1		0440	57	2176.	1		0645	82	439.
1		0035	8	0.	1		0240	33	0.	1		0445	58	1970.	1		0650	83	424.
1		0040	9	0.	1		0245	34	0.	1		0450	59	1773.	1		0655	84	409.
1		0045	10	0.	1		0250	35	0.	1		0455	60	1594.	1		0700	85	395.
1		0050	11	0.	1		0255	36	0.	1		0500	61	1445.	1		0705	86	382.
1		0055	12	0.	1		0300	37	0.	1		0505	62	1333.	1		0710	87	369.
1		0100	13	0.	1		0305	38	0.	1		0510	63	1237.	1		0715	88	357.
1		0105	14	0.	1		0310	39	1.	1		0515	64	1145.	1		0720	89	347.
1		0110	15	0.	1		0315	40	3.	1		0520	65	1058.	1		0725	90	336.
1		0115	16	0.	1		0320	41	11.	1		0525	66	979.	1		0730	91	328.
1		0120	17	0.	1		0325	42	48.	1		0530	67	909.	1		0735	92	318.
1		0125	18	0.	1		0330	43	116.	1		0535	68	846.	1		0740	93	309.
1		0130	19	0.	1		0335	44	185.	1		0540	69	790.	1		0745	94	298.
1		0135	20	0.	1		0340	45	242.	1		0545	70	735.	1		0750	95	287.
1		0140	21	0.	1		0345	46	298.	1		0550	71	689.	1		0755	96	275.
1		0145	22	0.	1		0350	47	392.	1		0555	72	657.	1		0800	97	260.
1		0150	23	0.	1		0355	48	539.	1		0600	73	629.	1		0805	98	243.
1		0155	24	0.	1		0400	49	797.	1		0605	74	603.	1		0810	99	218.
1		0200	25	0.	1		0405	50	1269.	1		0610	75	578.	1		0815	100	179.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	8.25-HR
+ (CFS)	(HR)					
		(CFS)				
+ 2683.	4.42		674.	491.	491.	491.
		(INCHES)	1.566	1.566	1.566	1.566
		(AC-FT)	334.	334.	334.	334.

CUMULATIVE AREA = 4.00 SQ MI

STATION R110

(O) OUTFLOW

DAHRMN	PER	0.	400.	800.	1200.	1600.	2000.	2400.	2800.	0.	0.	0.	0.	0.
10000	10													
10005	20													
10010	30													
10015	40													
10020	50													
10025	60													
10030	70													
10035	80													
10040	90													
10045	100													
10050	110													
10055	120													
10100	130													
10105	140													
10110	150													
10115	160													
10120	170													
10125	180													
10130	190													
10135	200													
10140	210													
10145	220													
10150	230													
10155	240													
10200	250													
10205	260													
10210	270													
10215	280													
10220	290													
10225	300													
10230	310													
10235	320													
10240	330													
10245	340													
10250	350													
10255	360													
10300	370													
10305	380													
10310	390													
10315	400													
10320	410													
10325	42.0													
10330	43.	O												
10335	44.		O											
10340	45.			O										
10345	46.				O									
10350	47.					O								
10355	48.						O							
10400	49.							O						
10405	50.								O					
10410	51.									O				
10415	52.										O			
10420	53.											O		
10425	54.												O	
10430	55.											O		
10435	56.										O			
10440	57.									O				
10445	58.								O					
10450	59.							O						
10455	60.						O							
10500	61.					O								

```
10505  62.        .        .        . O      .        .        .        .        .        .        .        .        .
10510  63.        .        .        .O       .        .        .        .        .        .        .        .        .
10515  64.        .        .       O.        .        .        .        .        .        .        .        .        .
10520  65.        .        .     O   .        .        .        .        .        .        .        .        .        .
10525  66.        .        .   O     .        .        .        .        .        .        .        .        .        .
10530  67.        .        . O       .        .        .        .        .        .        .        .        .        .
10535  68.        .       .O         .        .        .        .        .        .        .        .        .        .
10540  69.        .       O          .        .        .        .        .        .        .        .        .        .
10545  70.        .     O .          .        .        .        .        .        .        .        .        .        .
10550  71. . . . . . . .O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
10555  72.        .    O   .        .        .        .        .        .        .        .        .        .        .
10600  73.        .    O   .        .        .        .        .        .        .        .        .        .        .
10605  74.        .   O    .        .        .        .        .        .        .        .        .        .        .
10610  75.        .  O     .        .        .        .        .        .        .        .        .        .        .
10615  76.        .  O     .        .        .        .        .        .        .        .        .        .        .
10620  77.        . O      .        .        .        .        .        .        .        .        .        .        .
10625  78.        . O      .        .        .        .        .        .        .        .        .        .        .
10630  79.        .O       .        .        .        .        .        .        .        .        .        .        .
10635  80.        .O       .        .        .        .        .        .        .        .        .        .        .
10640  81. . . . .O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
10645  82.        .O       .        .        .        .        .        .        .        .        .        .        .
10650  83.        .O       .        .        .        .        .        .        .        .        .        .        .
10655  84.        O        .        .        .        .        .        .        .        .        .        .        .
10700  85.        O        .        .        .        .        .        .        .        .        .        .        .
10705  86.        O        .        .        .        .        .        .        .        .        .        .        .
10710  87.       O.        .        .        .        .        .        .        .        .        .        .        .
10715  88.       O.        .        .        .        .        .        .        .        .        .        .        .
10720  89.       O.        .        .        .        .        .        .        .        .        .        .        .
10725  90.      O .        .        .        .        .        .        .        .        .        .        .        .
10730  91. . . . O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
10735  92.      O .        .        .        .        .        .        .        .        .        .        .        .
10740  93.      O .        .        .        .        .        .        .        .        .        .        .        .
10745  94.     O  .        .        .        .        .        .        .        .        .        .        .        .
10750  95.     O  .        .        .        .        .        .        .        .        .        .        .        .
10755  96.     O  .        .        .        .        .        .        .        .        .        .        .        .
10800  97.    O   .        .        .        .        .        .        .        .        .        .        .        .
10805  98.    O   .        .        .        .        .        .        .        .        .        .        .        .
10810  99.   O    .        .        .        .        .        .        .        .        .        .        .        .
10815 100.---O-----.--------.--------.--------.--------.--------.--------.--------.--------.--------.--------.--------.
```

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	1430	1423.	3.58	255.	185.	185.	1.43		
+	HYDROGRAPH AT	1440	2050.	3.50	337.	245.	245.	1.89		
+	2 COMBINED AT	1441	3382.	3.50	592.	430.	430.	3.32		
+	ROUTED TO	R1441	3192.	3.67	588.	428.	428.	3.32		
+									4.10	3.67
+	HYDROGRAPH AT	100	153.	3.33	19.	14.	14.	.11		
+	2 COMBINED AT	100	3259.	3.67	607.	442.	442.	3.43		
+	ROUTED TO	R100	2875.	4.08	586.	426.	426.	3.43		
+									3.29	4.08
+	HYDROGRAPH AT	110	501.	3.67	102.	74.	74.	.58		
+	2 COMBINED AT	C110	3127.	4.08	687.	500.	500.	4.00		
+	DIVERSION TO	D110L	750.	4.08	165.	120.	120.	4.00		
+	HYDROGRAPH AT	D110	2376.	4.08	522.	380.	380.	4.00		
+	ROUTED TO	R110R	2057.	4.42	514.	374.	374.	4.00		
+									3.07	4.42
+	HYDROGRAPH AT	RL	750.	4.08	165.	120.	120.	.00		
+	ROUTED TO	R110L	626.	4.42	161.	117.	117.	.00		
+									2.69	4.42
+	2 COMBINED AT	R110	2683.	4.42	674.	491.	491.	4.00		

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
1430	MANE	3.52	1431.76	216.06	1.65	5.00	1422.98	215.00	1.65

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1299E+03 OUTFLOW= .1263E+03 BASIN STORAGE= .2746E+01 PERCENT ERROR= .7

1440	MANE	3.40	2084.02	211.40	1.66	5.00	2049.52	210.00	1.66

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1713E+03 OUTFLOW= .1673E+03 BASIN STORAGE= .2899E+01 PERCENT ERROR= .7

100	MANE	3.14	156.22	198.37	1.67	5.00	152.92	200.00	1.67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .9617E+01 OUTFLOW= .9442E+01 BASIN STORAGE= .9879E-01 PERCENT ERROR= .8

110	MANE	3.68	502.74	219.09	1.64	5.00	501.09	220.00	1.63

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5244E+02 OUTFLOW= .5042E+02 BASIN STORAGE= .1658E+01 PERCENT ERROR= .7

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

Appendix B
Hydrologic Computation Sheets & HEC-1 Model for Wash 6a

N:\930064\ADMIN\64-059RP.WP5

CVL

Appendix B
PH-Card Data

N:\930064\ADMIN\64-059RP.WP5

COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Wash 6a
Project No.
Sheet No. of
Calculated by Date
Checked by DWD Date 1/94

Table B1-a
PRECIPITATION VALUES : RETURN PERIOD VS DURATION

DURATION	RETURN PERIOD 2 YR	10 YR	25 YR	50 YR	100 YR *
5 min	0.35"	0.54"	0.64"	0.73"	0.83"
15 min	0.64"	0.98"	1.17"	1.33"	1.52"
30 min	0.85"	1.30"	1.55"	1.76"	2.01"
1 hr	1.04"	1.58"	1.89"	2.15"	2.45"
2 hr	1.18"	1.79"	2.14"	2.43"	2.75"
3 hr	1.27"	1.94"	2.30"	2.62"	2.95"
6 hr	1.44"	2.21"	2.61"	2.98"	3.33"

* Data for PH-Cards used for Sub-basins:

COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Wash 6a

Project No.

Sheet No. of

Calculated by Date

Checked by DWD Date 1/94

1-HOUR VALUES :

$$Y_2 = -0.011 + 0.942 \left(\frac{X_1^2}{X_2}\right) = 2\text{YR} - 1\text{HR}$$

$$Y_{100} = 0.494 + 0.755 \left(\frac{X_3^2}{X_4}\right) = 100\text{YR} - 1\text{HR}$$

X_1 = 2 YR - 6 HR = 1.44"
X_2 = 2 YR - 24 HR = 1.85"

X_3 = 100 YR - 6 HR = 3.33"
X_4 = 100 YR - 24 HR = 4.29"

$$Y_2 = -0.011 + 0.942 \left(\frac{1.44^2}{1.85}\right) = 1.04''$$

$$Y_{100} = 0.494 + 0.755 \left(\frac{3.33^2}{4.29}\right) = 2.45''$$

APPENDIX A

Steps for Determination of Precipitation Values for Various Durations and Return Periods.

Sheet 1 of 3

(Source: Addendum to "Hydrologic Design for Highway Drainage in Arizona," April 1975, and ADOT, April 17, 1987)

Step 1: From the precipitation maps, Figures 2.2-1 through 2.2-12, determine the precipitation values for the six and twenty four hour durations storms for return periods of 2, 5, 10, 25, 50, and 100 years. Tabulate these values in Table 1 in the column headed "Map Values."

Table 1

Return Period (Years)	Precipitaton Values (Inches)			
	6 hour duration		24 hour duration	
	Map Value	Corrected Value	Map Value	Corrected Value
2	1.42"	1.44"	1.80"	1.85"
5	1.87"	1.89"	2.50"	2.48"
10	2.20"	2.21"	2.85"	2.86"
25	2.68"	2.61"	3.40"	3.38"
50	2.97"	2.98"	3.84"	3.84"
100	3.30"	3.33"	4.30"	4.29"

NOTE: There is a possibility of making an error while reading the maps because: (1) a site is not easy to locate precisely on a series of 12 maps, (2) there may be some slight registration differences in printing, and (3) precise interpolation between isolines is difficult. In order to minimize any errors in reading the maps, these values should be plotted on the diagram "Precipitation Depth versus Return Period," Appendix A, Figure 1.

Step 2: Plot these values on the diagram "Precipitation Depth versus Return Period," Appendix A, Figure 1.

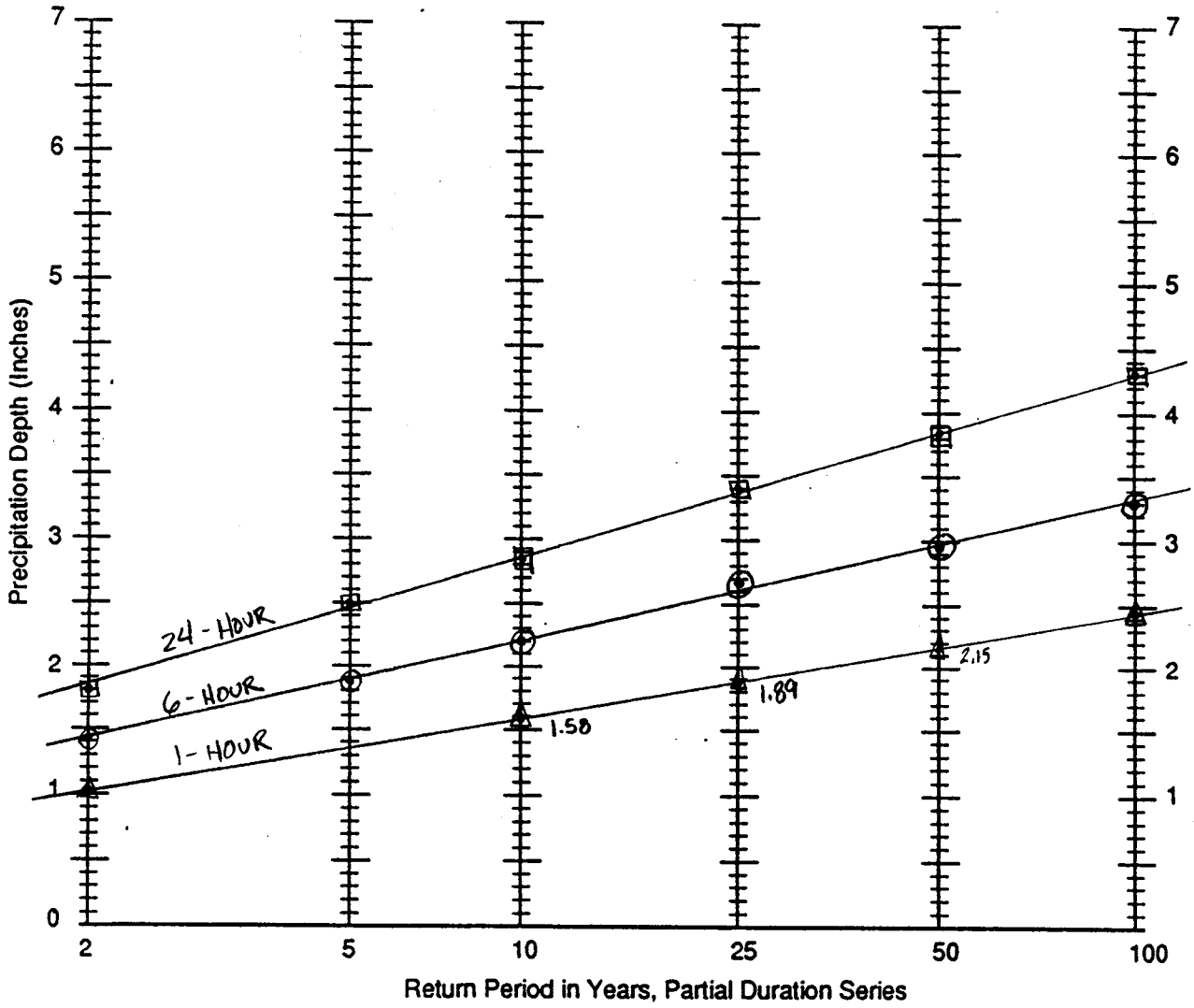
Step 3: Draw a line of best fit through the 6 hour precipitation values and another line through the 24 hour precipitation values.

Step 4: Tabulate the values represented by the lines of best fit, obtained in Step 3, in the column of Table 1 entitled "Corrected Value."

NOTE: The 1 hour precipitation value is needed to determine the 2 and 3 hour values as well as the 5, 10, 15, and 30 minute values.

APPENDIX A

Figure 1
Precipitation Depth Versus Return Period for Partial - Duration Series
Sheet 2 of 3
(Source: Addendum to "Hydrologic Design for Highway Drainage in Arizona," April 1975)



Project: TATUM RANCH - PHASE 4 Station: _____

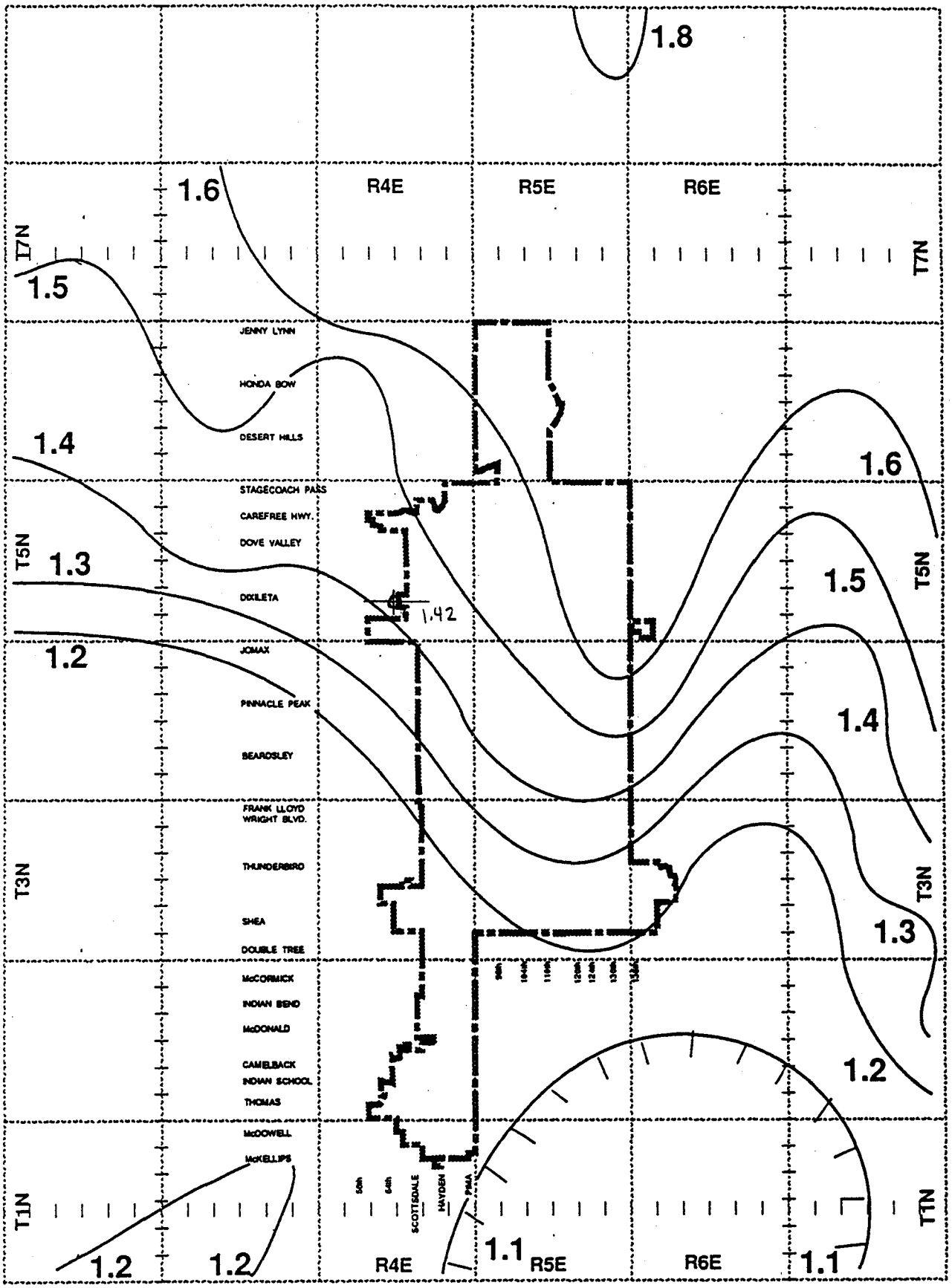


FIGURE 2.2-1

Isopluvials 2 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

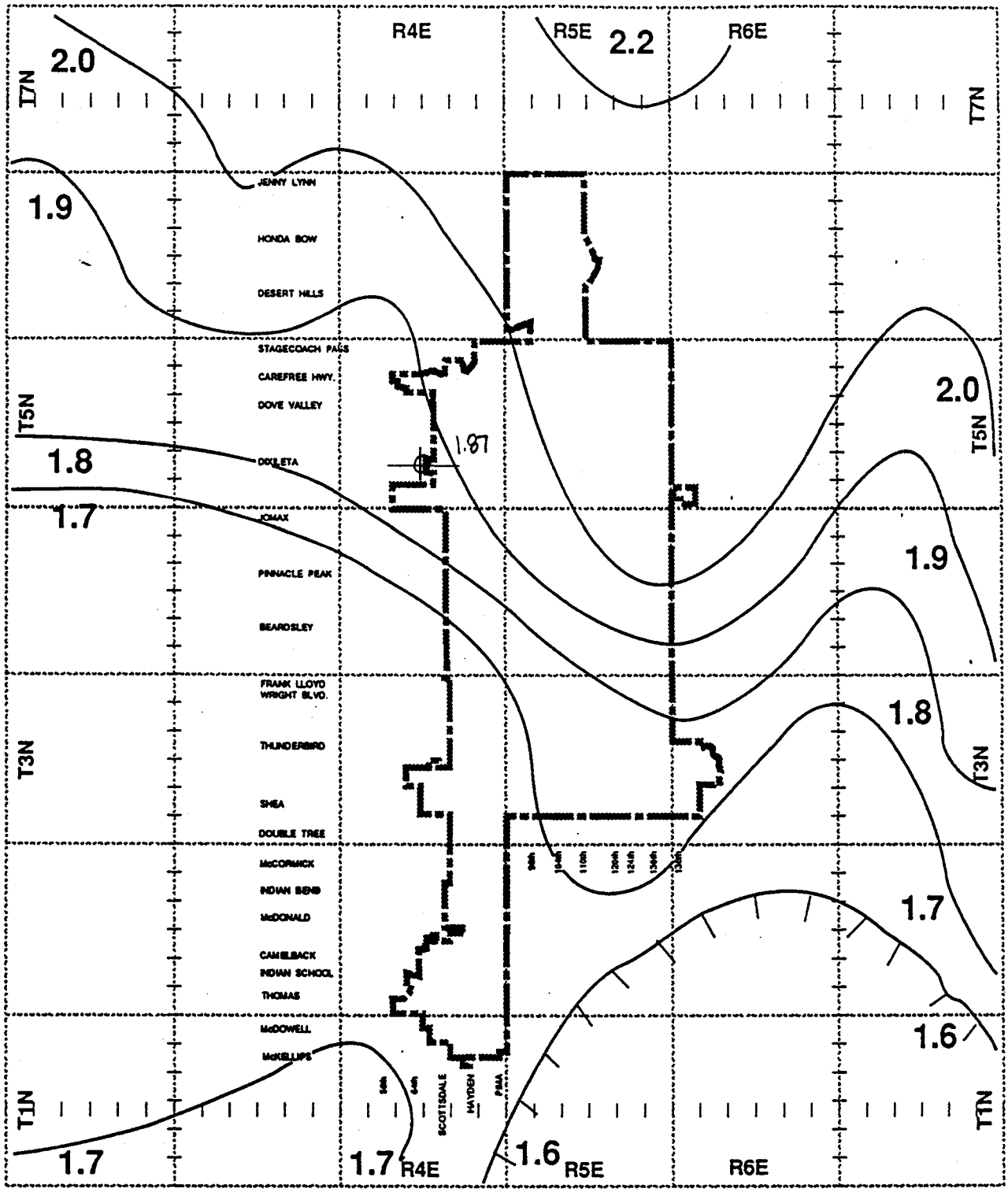


FIGURE 2.2-2

Isopluvials 5 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

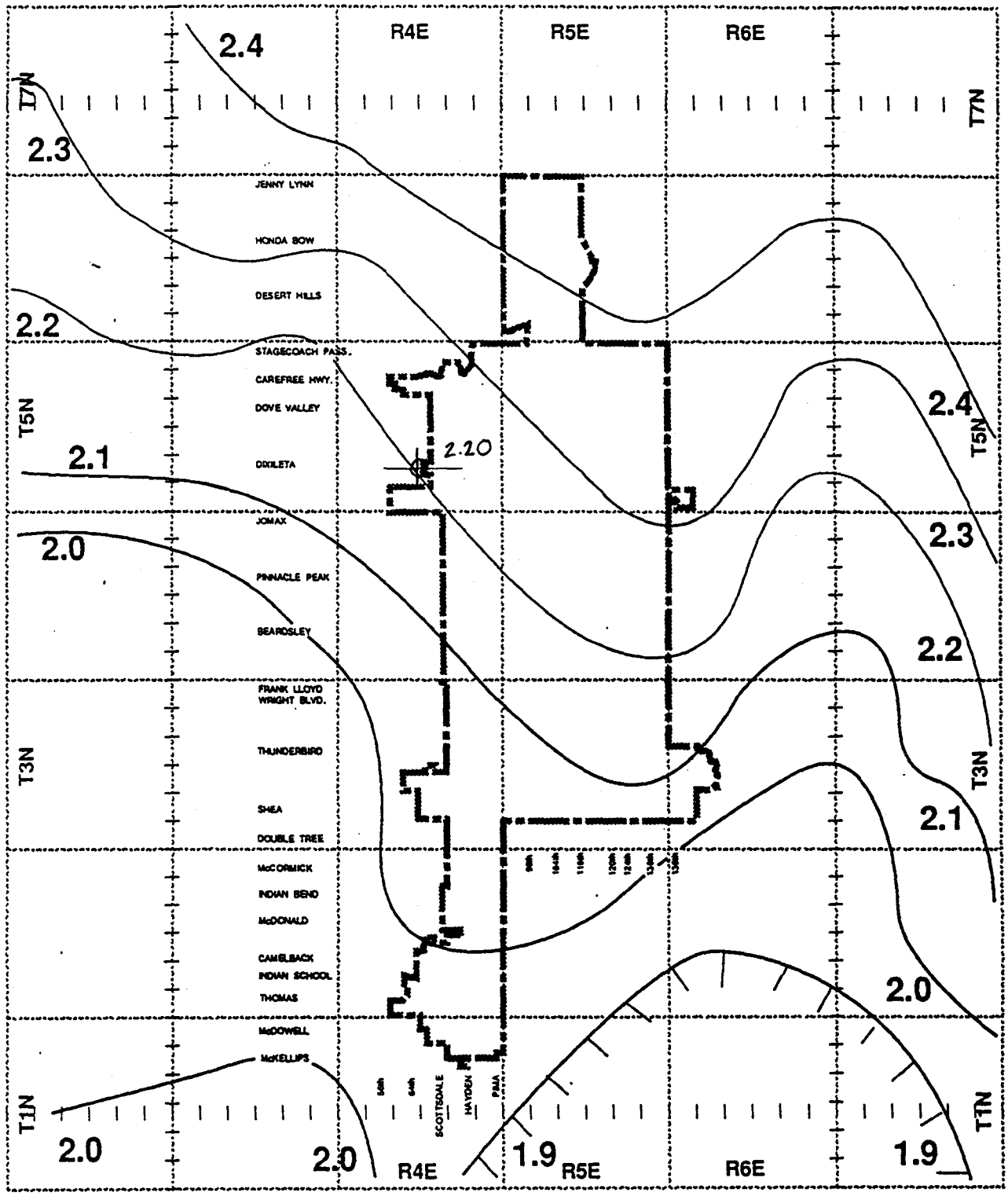


FIGURE 2.2-3

Isopluvials 10 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

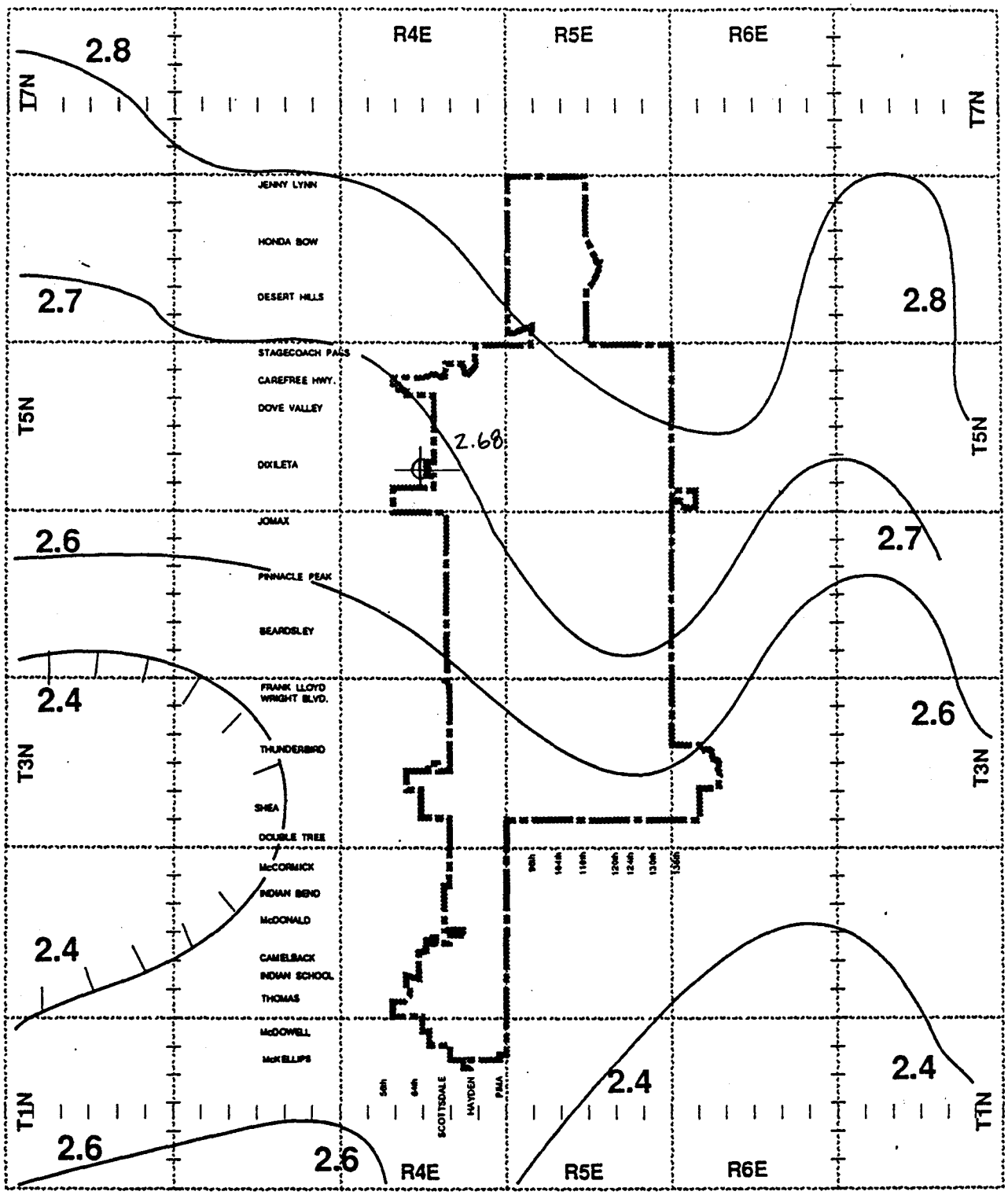


FIGURE 2.2-4

Isopluvials 25 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

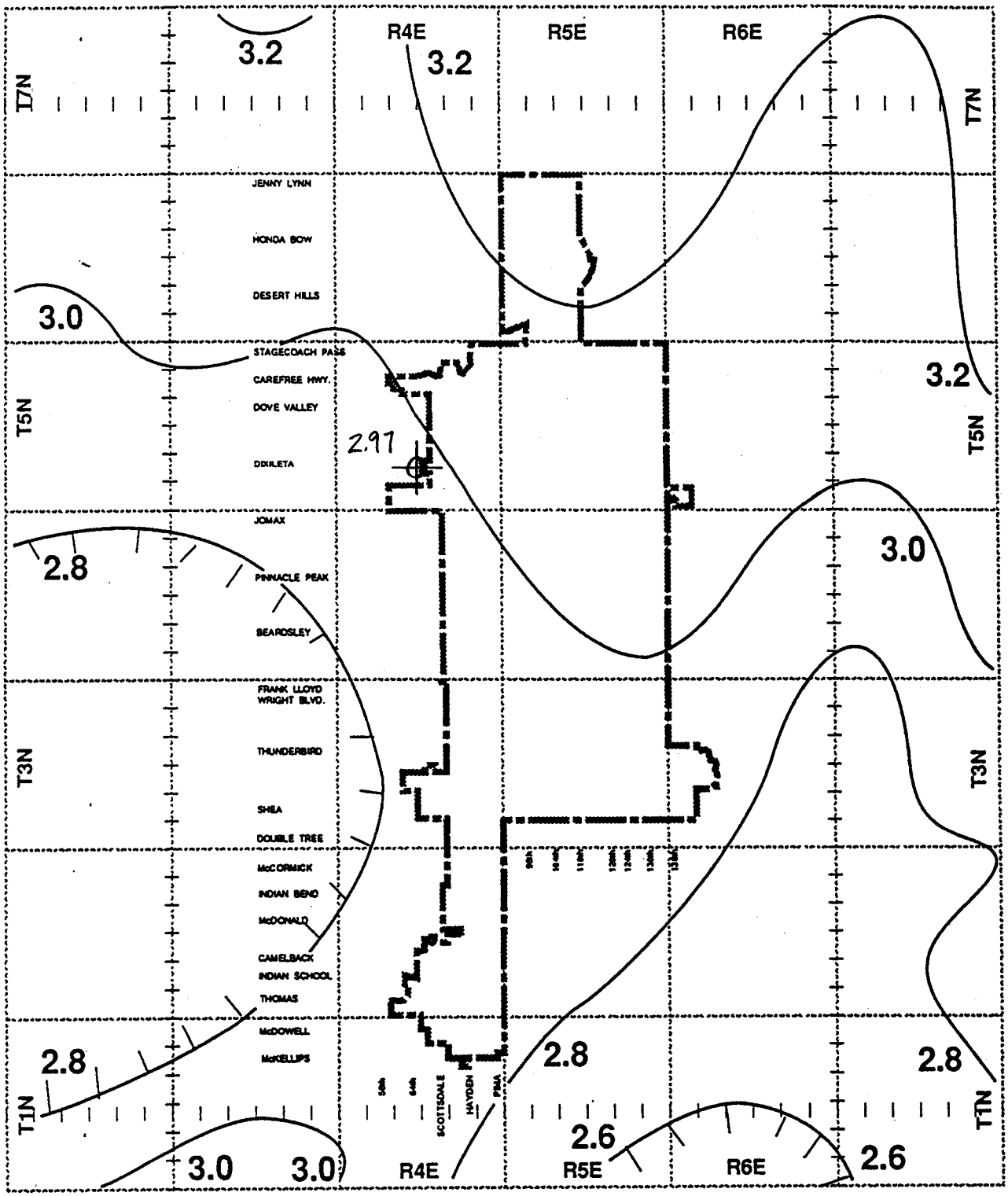


FIGURE 2.2-5

Isopluvials 50 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

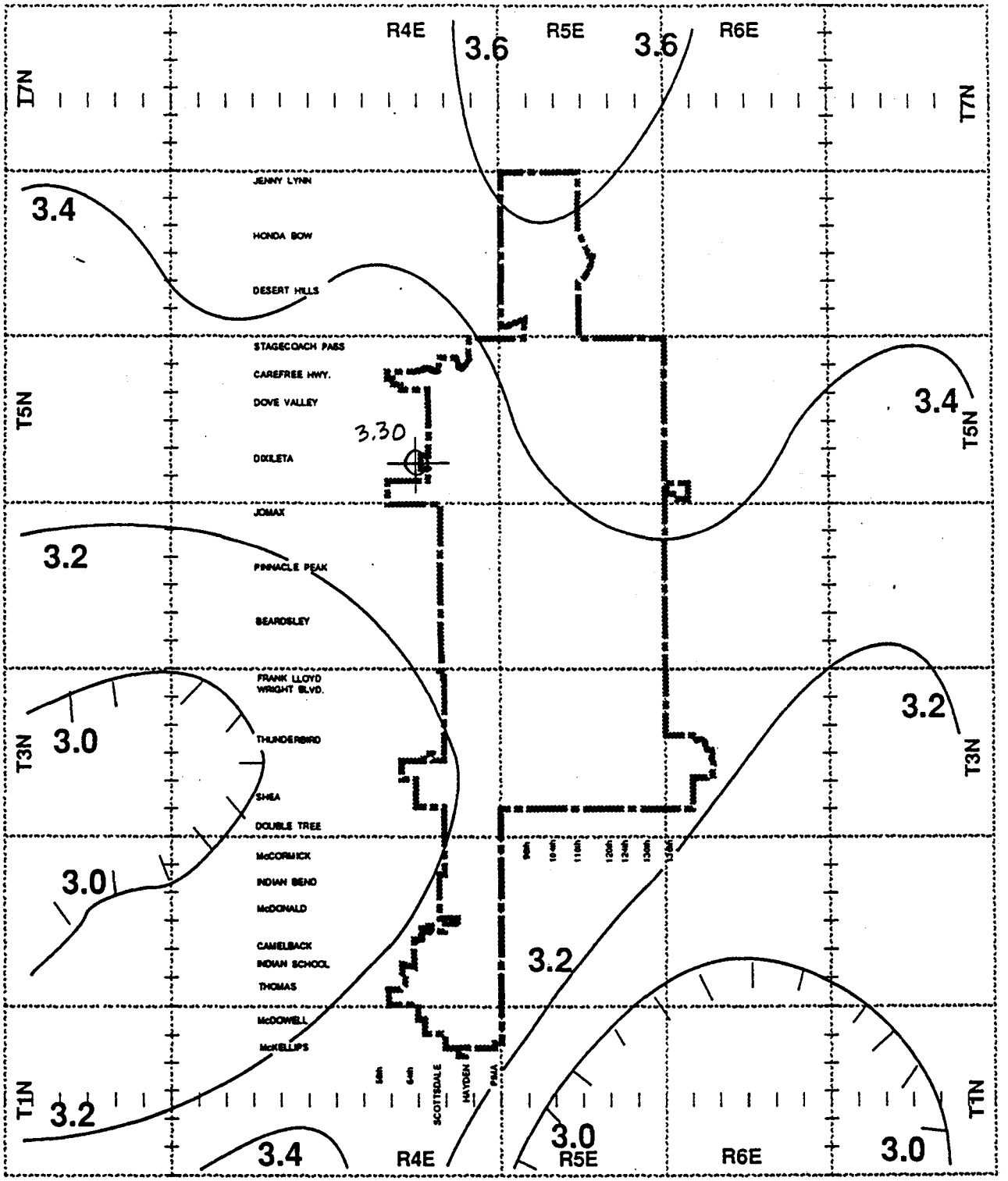


FIGURE 2.2-6

Isopluvials 100 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

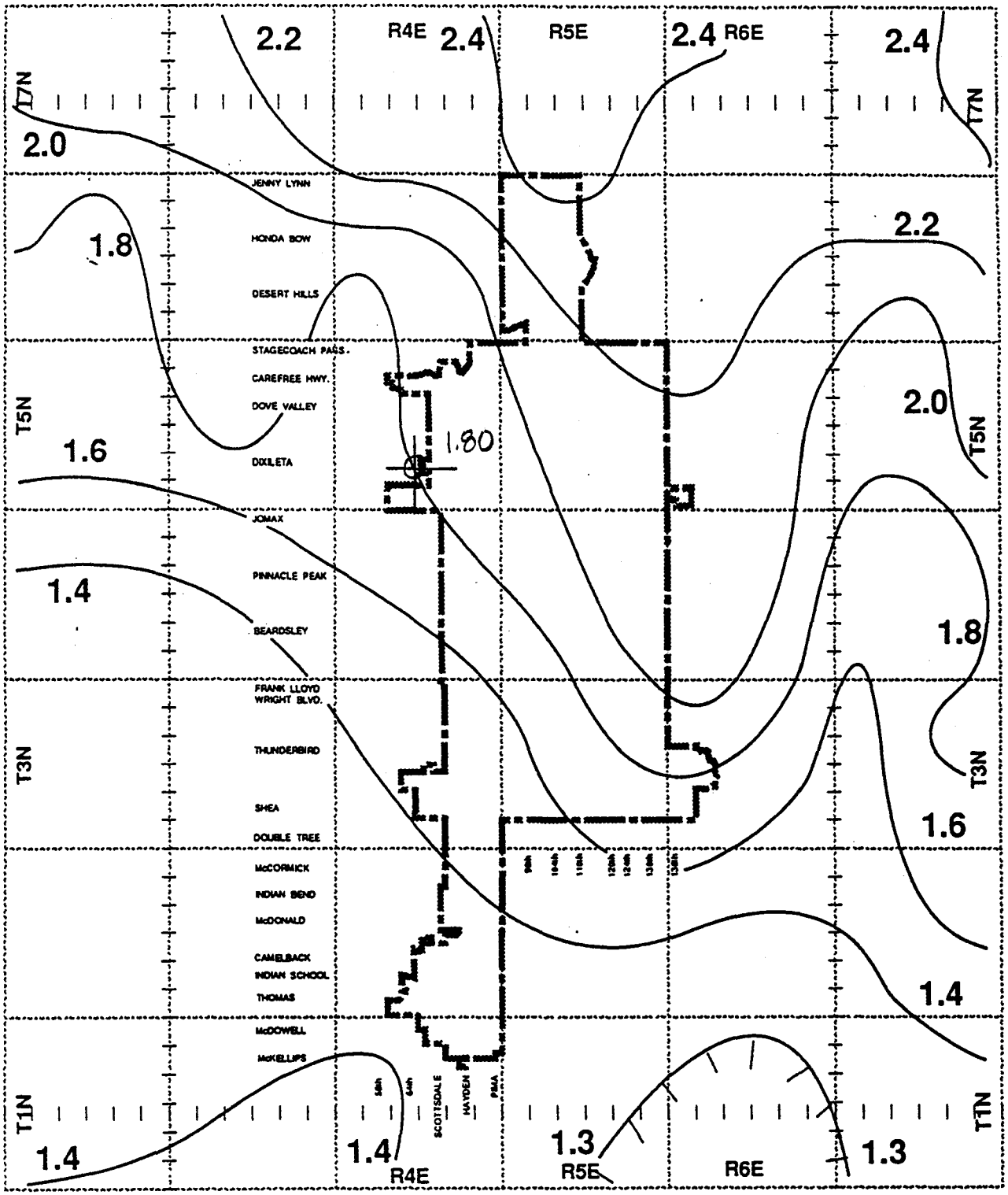


FIGURE 2.2-7

Isopluvials 2 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

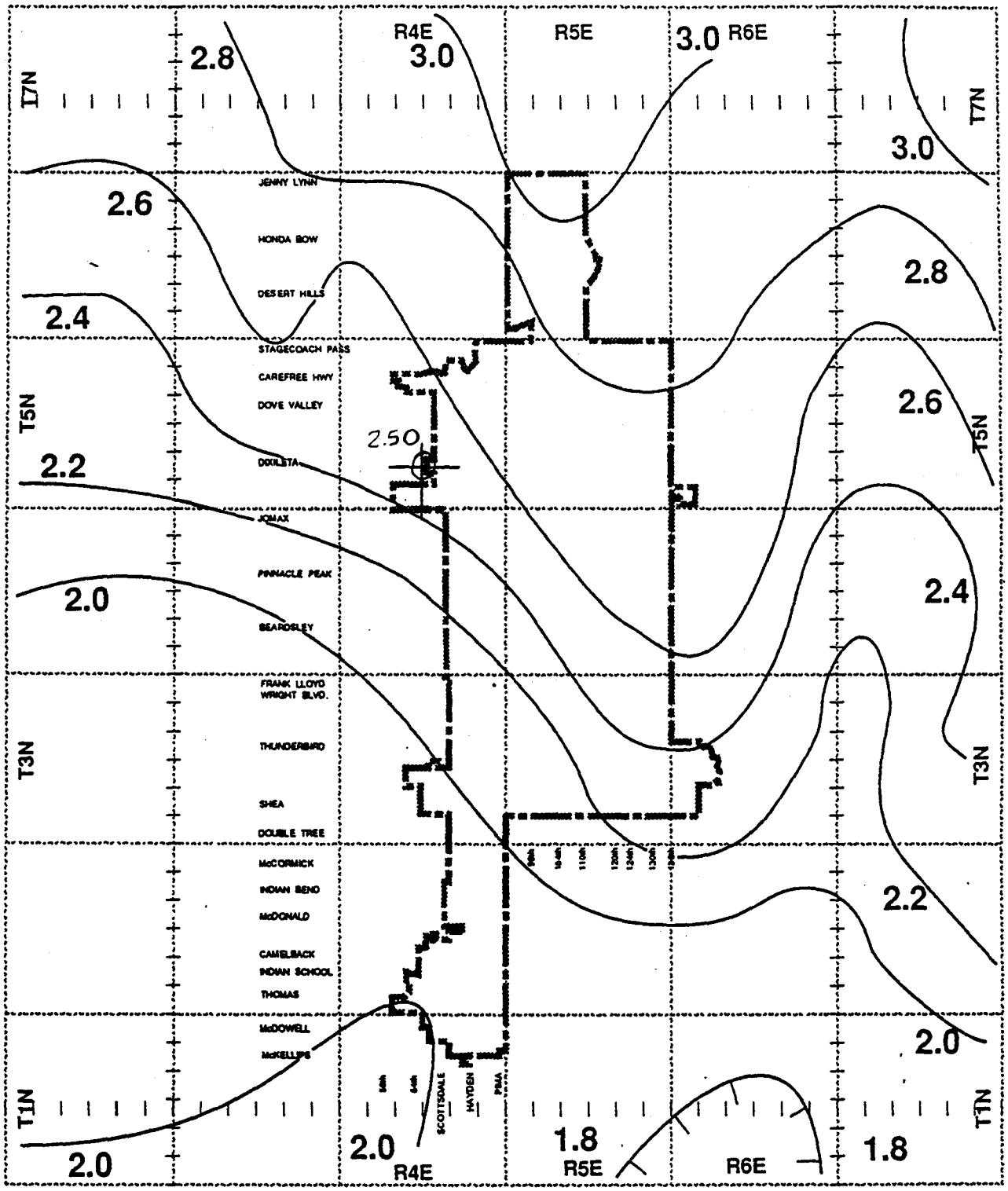


FIGURE 2.2-8

Isopluvials 5 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

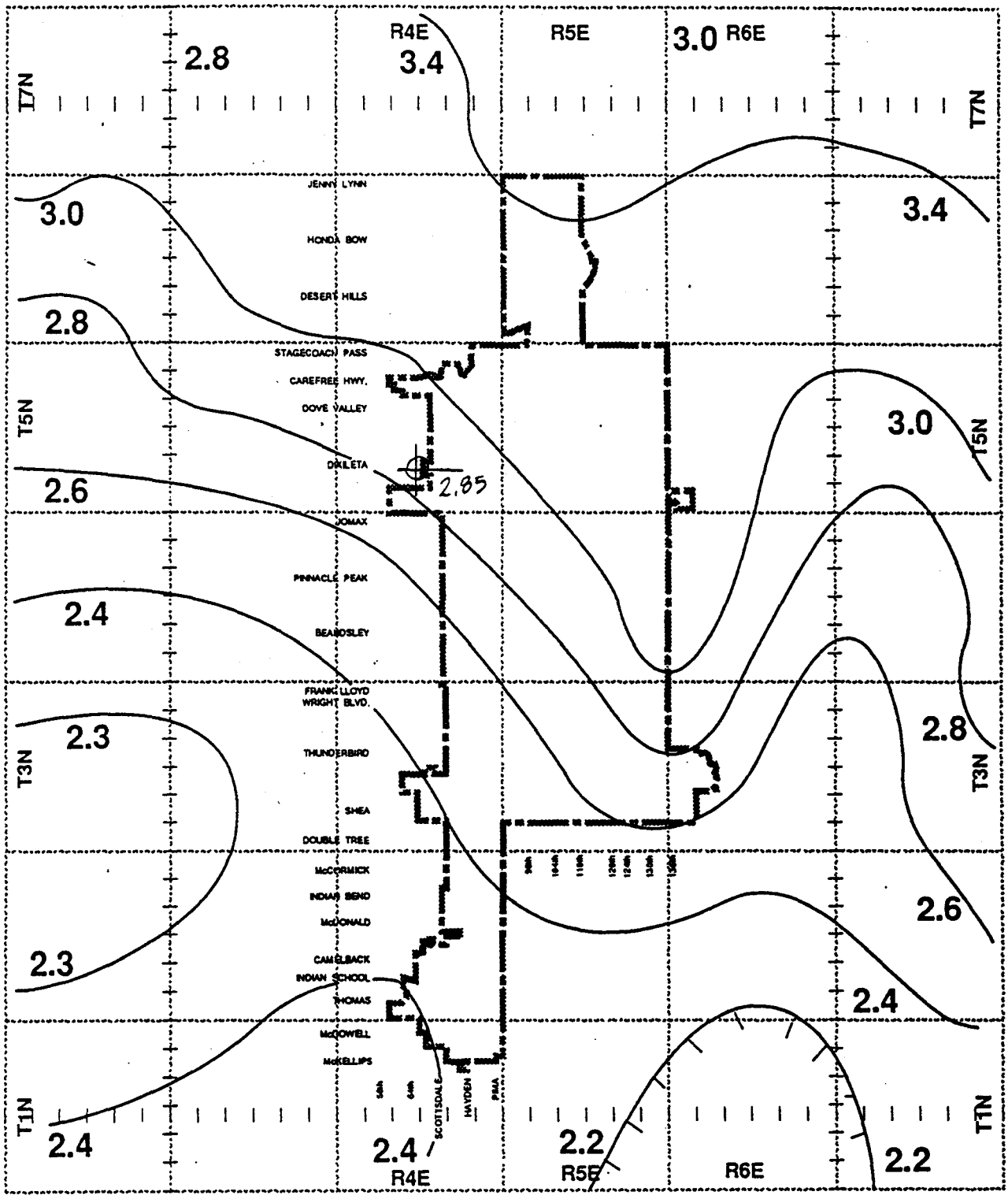


FIGURE 2.2-9

Isopluvials 10 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

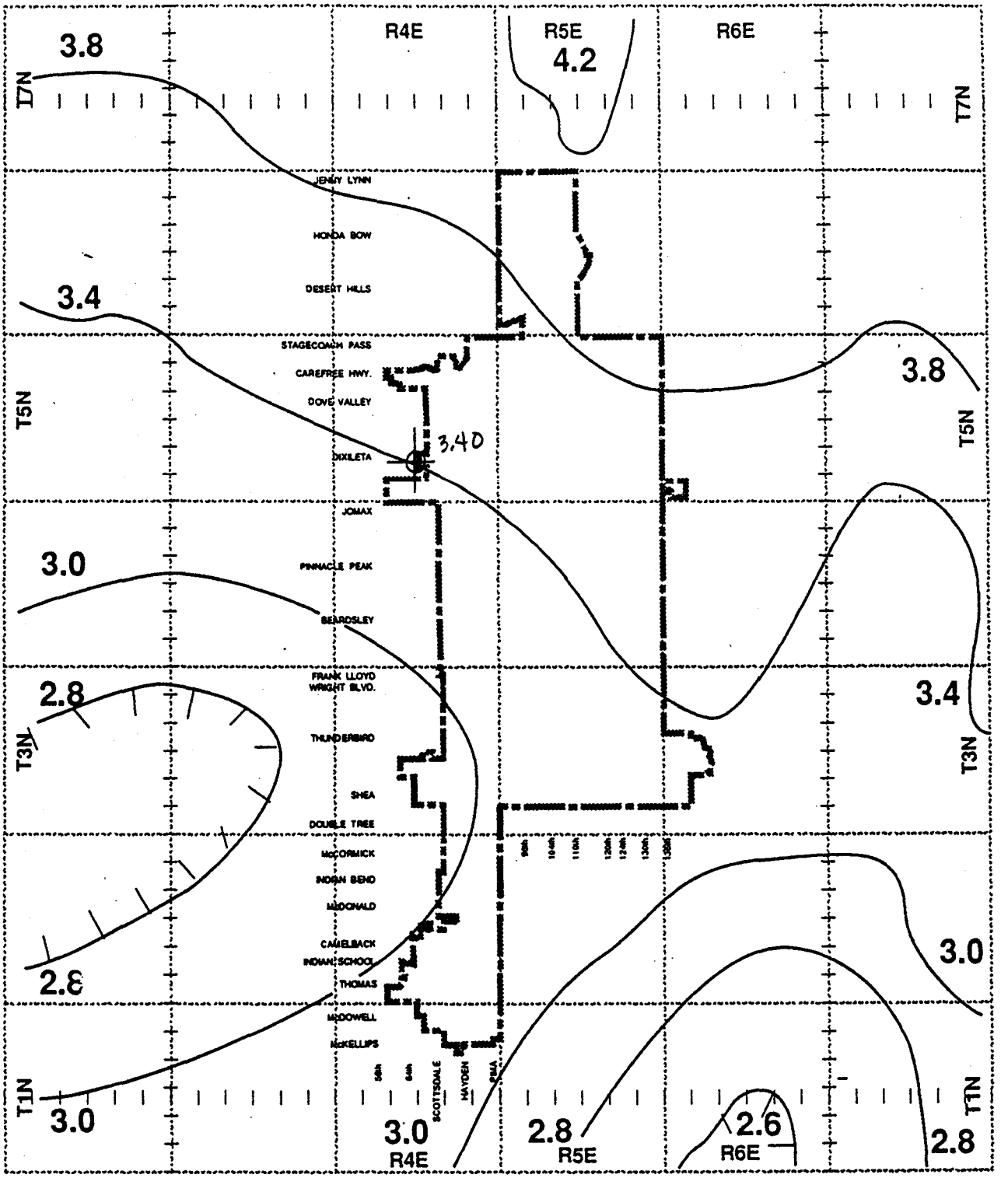


FIGURE 2.2-10

Isopluvials 25 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

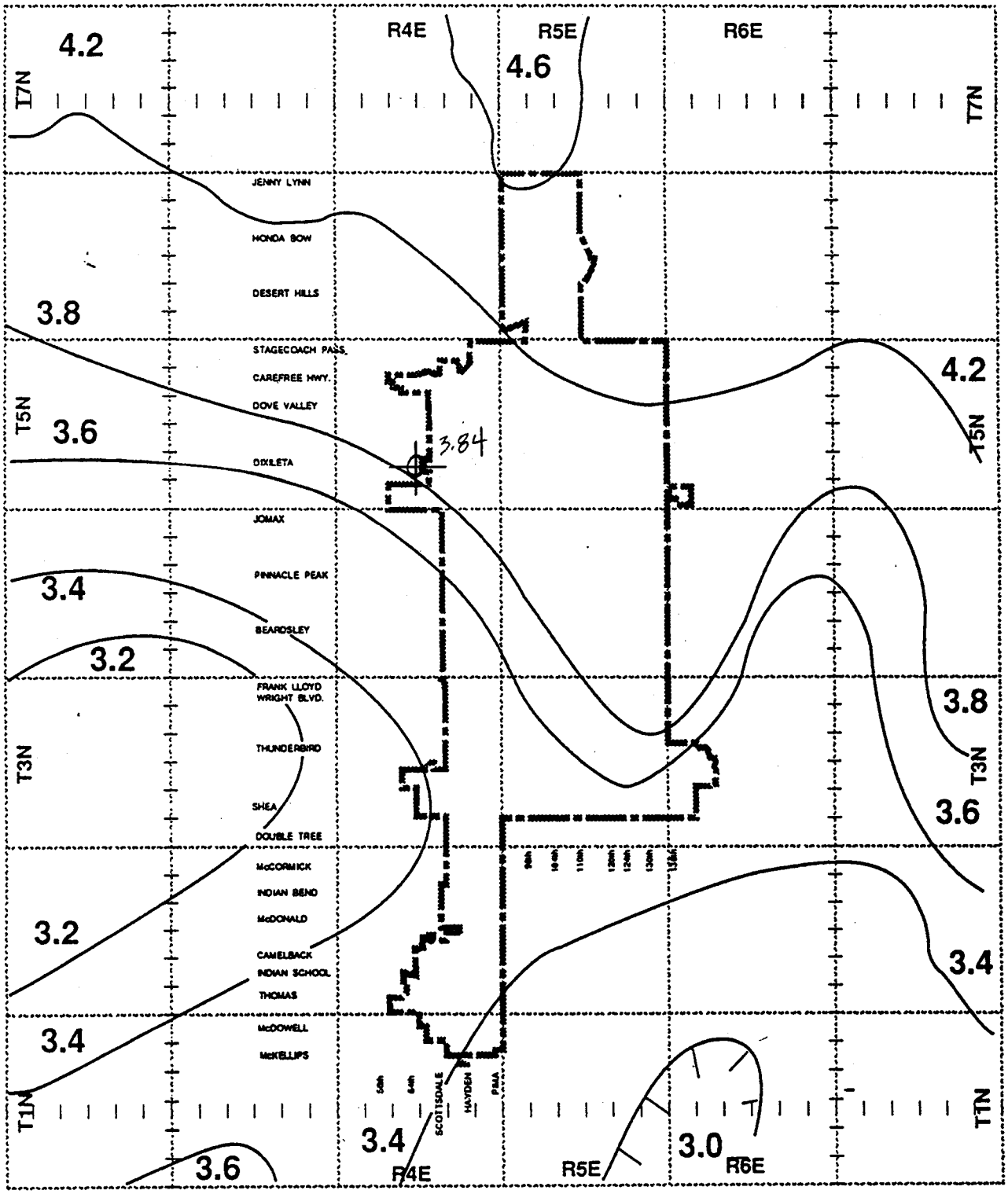


FIGURE 2.2-11

Isopluvials 50 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

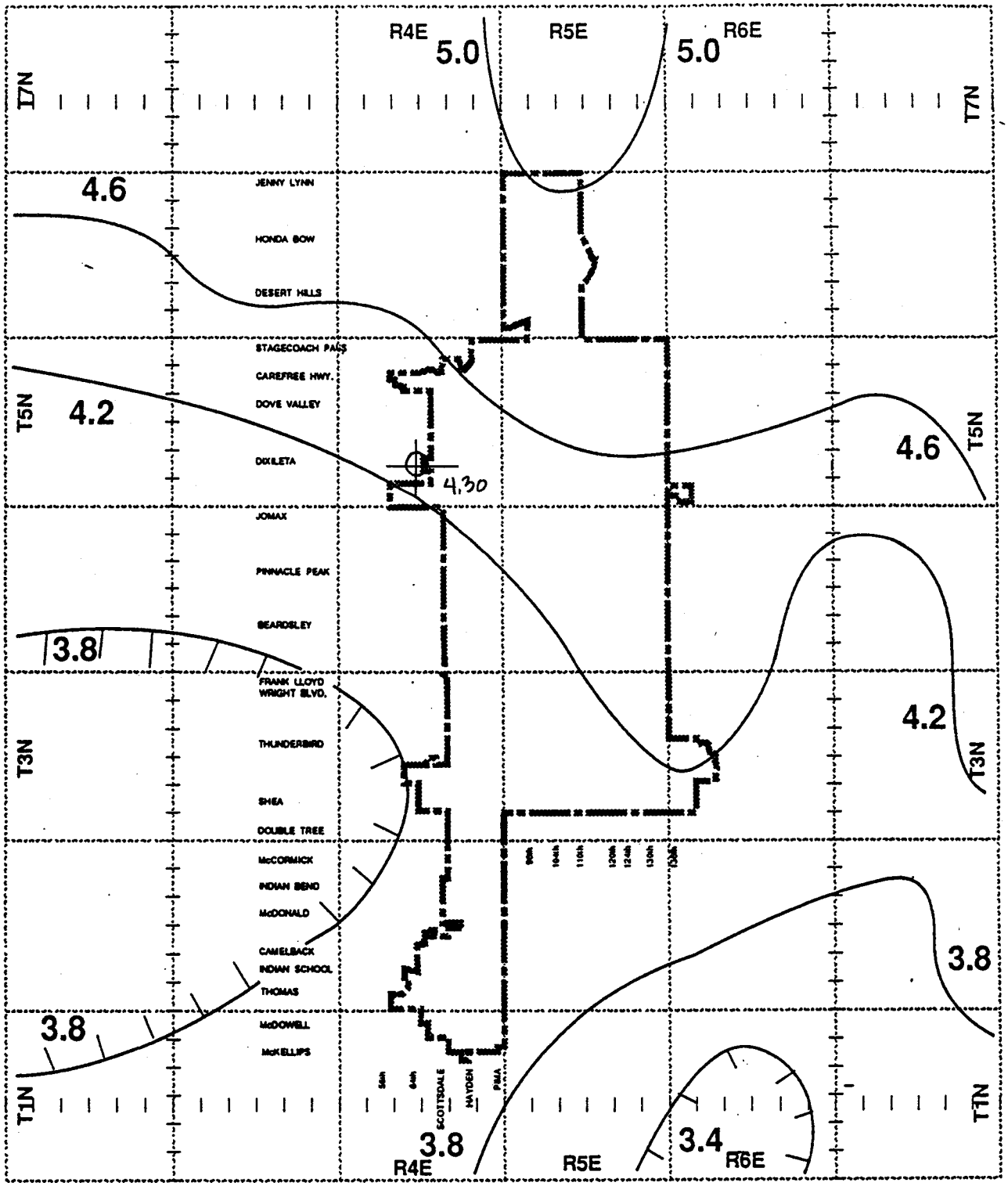


FIGURE 2.2-12

Isopluvials 100 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

TABLE B-1b: PH-CARD DATA
ACCUMULATIVE SUB-BASIN AREAS FOR EACH WASH SYSTEM

WASH 6 B/C SYSTEM

SUB-BASIN ID	AREA (SQ. MI.)	ACCUMULATIVE AREA (SQ.MI.)	LOCATION
1380	0.9305	0.93	
1390N	0.5610	1.49	
1390S	0.4347	1.93	
10	0.3344	2.26	
20	0.0609	2.32	
30	0.0766	2.40	
40	0.3094	2.71	
50	0.2866	2.99	
65	0.1076	3.10	TATUM RANCH
70	0.4000	3.50	

WASH 6 A SYSTEM

SUB-BASIN ID	AREA (SQ. MI.)	ACCUMULATIVE AREA (SQ.MI.)	LOCATION
1430	1.4319	1.43	
1440	1.8882	3.32	
100	0.2934	3.61	
110	0.5645	4.18	
T11	0.1933	4.37	
T12	0.1198	4.49	
120	0.3598	4.85	
T13	0.2016	5.05	
130	0.5567	5.61	TATUM RANCH
140	1.0475	6.66	

WASH 5 A SYSTEM

SUB-BASIN ID	AREA (SQ. MI.)	ACCUMULATIVE AREA (SQ.MI.)	LOCATION
1470	0.2977	0.30	
15A	1.1048	1.40	
1475	1.6895	3.09	
200	0.1280	3.22	
202	0.6660	3.89	
210	0.9891	4.88	
220	0.8298	5.70	TATUM RIDGE
230	0.7528	6.46	

WASH 5 B SYSTEM

SUB-BASIN ID	AREA (SQ. MI.)	ACCUMULATIVE AREA (SQ.MI.)	LOCATION
1470	0.2977	0.30	
15A	1.1048	1.40	
1475	1.6895	3.09	
200	0.1280	3.22	
205	0.3360	3.56	
300	1.0480	4.60	END OF STUDY

Appendix B
Model Parameters

TABLE B-2: WEIGHTED CURVE NUMBER COMPUTATIONS

SUB-BASIN ID	PERCENT "A" SOIL (CN=63)	PERCENT "B" SOIL (CN=77)	PERCENT "C" SOIL (CN=85)	PERCENT "D" SOIL (CN=88)	WEIGHTED CN
10	10			90	86
20	25		75		80
30	5	10	85		83
40		77	23		79
50		100			77
60		62	38		80
65		62	38		80
70		100			77
100	30		10	60	80
110	10	20	55	15	82
120		100			77
130		100			77
140		100			77
T11		80	20		79
T12		100			77
T13		100			77
200	15	10		75	83
202	15	10		75	83
205	15	10		75	83
210	5	95			76
220		100			77
230		100			77
T22		100			77
300		55	40	5	81

NOTES:

1) Soil information based on: "Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona," by the Soil Conservation Service, U.S. Government Printing Office: 1985--167-s/20007.
2) Curve Number values based SCS TR-55 & poor vegetation condition.

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LANDSCAPE ARCHITECTURE

Project Wash 6a
Project No.
Sheet No. of
Calculated by DWD Date 11/93
Checked by Date

Table B-3

Sub-basin Characteristics - Wash 6A

ID	UK:L	UK:S	UK:n	RK:S	RK:n	RK:WD	RK:Z	CN	RK:L
1430	240	0.0555	0.20	0.0271	0.045	30	3	81	25800
1440	240	0.0553	0.20	0.0258	0.045	30	3	81	24800
100	240	0.0555	0.20	0.0158	0.045	50	3	81	6400
110	200	0.040	0.20	0.0195	0.045	70	3	80	16200
120	200	0.018	0.20	0.0190	0.060	60	3	82	6200
130	200	0.018	0.20	0.0185	0.060	50	3	77	5800
140	200	0.018	0.20	0.0160	0.060	50	3	77	9750
T11	200	0.018	0.20	0.0180	0.045	20	3	79	7100
T12	200	0.018	0.20	0.0180	0.045	20	3	77	7400
T13	200	0.018	0.20	0.0185	0.045	30	3	77	8600

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Project Wash6a
Project No.
Sheet No. of 3
Calculated by DWD Date 11/93
Checked by Date

Table B-4

Sub-basin Characteristics - Wash 5

ID	UK:L	UK:S	UK:n	RK:S	RK:n	RK:WD	RK:Z	CN	RK:L
1470	200	0.05	0.20	0.0293	0.045	20	3	84	15000
15A	217	0.0581	0.20	0.0262	0.045	25	3	82	13000
1475	285	0.0419	0.20	0.0188	0.045	46	7	84	17600
200	240	0.040	0.20	0.0175	0.045	60	3	83	7500
210	200	0.018	0.20	0.0192	0.060	90	3	76	15400
220	200	0.018	0.20	0.0193	0.060	90	3	77	9500
300	200	0.018	0.20	0.0170	0.060	60	3	81	11200
230	200	0.018	0.20	0.0140	0.060	90	3	77	5900
T22	200	0.018	0.20	0.0181	0.045	30	3	77	10,700

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Project Wash6a
Project No.
Sheet No. of
Calculated by Date
Checked by DWD Date 6/94

Table B-5
Sub-basin Characteristics – Wash 6b/c

ID	UK:L	UK:S	UK:n	RK:S	RK:n	RK:WD	RK:Z	CN	RK:L
1380	240	0.0555	0.20	0.0311	.045	20	3	82	18,000
1390N	300	0.0333	0.20	0.0190	.045	30	7	84	13900
1390S	300	0.0333	0.20	0.0187	.045	25	3	85	12500
10	300	0.0300	0.20	0.016	.045	70	3	86	6200
20	250	0.0300	0.20	0.017	0.045	40	3	80	3200
30	300	0.0300	0.20	0.019	0.045	15	3	83	3800
40	200	0.025	0.20	0.021	0.045	30	3	79	11100
50	200	0.025	0.20	0.20	0.045	15	3	77	11200
60	200	0.025	0.20	0.019	0.045	10	3	80	12100
70	200	0.020	0.20	0.016	0.045	25	3	77	8100

TABLE B–6: ROUTING PARAMETERS – NORMAL DEPTH ROUTING
NMIN = 5 MIN

NSTPS = ((L)/(V*NMIN))(1 MIN/60 SEC)
WHERE: NSTPS = NUMBER OF TIME STEPS
L = REACH LENGTH (ft)
V = AVERAGE VELOCITY (fps)
NMIN = NO. OF MINUTES IN EACH TIME STEP

ROUTE ID	SLOPE (ft/ft)	REACH LENGTH(ft)	BOT. WIDTH OF CHAN.(FT)	TOTAL OVERBANK WIDTHS(ft)	TYPICAL SIDE SLOPE (Z:1)	ESTIMATED AVERAGE VEL.(fps)	NSTPS
WASH 6A							
R1441	0.016	6400	50	100	3	6.0	4
R110	0.020	16200	70	100	3	7.0	8
R120	0.019	6200	60	700	1	6.5	3
R130	0.019	5800	50	980	1	6.5	3
R140	0.016	9750	50	980	1	6.0	5
WASH 6B/C							
1391N	0.019	13900	30	80	1	6.5	7
R10	0.016	6200	70	100	1	6.0	3
R20	0.017	3200	40	80	1	6.0	2
R40	0.018	3300	10	50	1	5.5	2
R41	0.017	1600	10	50	1	5.5	1
R42	0.019	9500	20	120	1	6.0	5
R50	0.019	7800	15	50	1	6.0	4
R71	0.016	6200	15	50	1	5.5	4
R70	0.016	6200	10	40	1	5.5	4
WASH 5							
1476	0.019	17600	46	80	1	6.5	9
R200	0.018	4500	60	80	1	6.5	2
R202	0.018	3000	15	60	1	6.5	2
R205	0.018	3000	40	60	1	6.5	2
R210A	0.019	11700	90	700	1	6.5	6
R210B	0.019	3700	90	700	1	6.5	2
R220	0.019	9500	90	700	1	6.5	5
R230	0.014	5900	90	750	1	6.0	3
R300	0.017	11200	60	500	1	6.0	6

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6A (R1441)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0160
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	3.00
Channel Side Slope - Right Side (horizontal/vertical)...	3.00
Channel Bottom Width (feet).....	50.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	212.6	4.01	0.727	0.250	1.250	53.0	56.0
1.5	422.1	5.16	0.773	0.414	1.914	81.7	59.0
2.0	689.1	6.15	0.807	0.588	2.588	112.0	62.0
2.5	1010.8	7.03	0.833	0.768	3.268	143.8	65.0
3.0	1385.8	7.83	0.855	0.952	3.952	177.0	68.0
3.5	1813.3	8.56	0.874	1.139	4.639	211.7	71.0

==========

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(713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6A (R110)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0200
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	3.00
Channel Side Slope - Right Side (horizontal/vertical)...	3.00
Channel Bottom Width (feet).....	70.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)	
1.0	330.9	4.53	0.815	0.319	1.319	73.0	76.0	
1.5	654.9	5.86	0.868	0.533	2.033	111.7	79.0	
2.0	1065.5	7.01	0.907	0.763	2.763	152.0	82.0	*
2.5	1557.3	8.04	0.938	1.003	3.503	193.8	85.0	
3.0	2126.8	8.97	0.964	1.250	4.250	237.0	88.0	
3.5	2772.1	9.84	0.985	1.503	5.003	281.7	91.0	
4.0	3491.8	10.65	1.004	1.760	5.760	328.0	94.0	

==========

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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6A (R120)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0190
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	60.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)	
1.0	272.2	4.46	0.793	0.309	1.309	61.0	62.0	
1.5	534.5	5.79	0.844	0.521	2.021	92.2	63.0	1.75%
2.0	862.4	6.95	0.880	0.751	2.751	124.0	64.0	V≈6.5fps
2.5	1249.9	8.00	0.909	0.994	3.494	156.3	65.0	
3.0	1692.6	8.96	0.933	1.245	4.245	189.0	66.0	
3.5	2187.4	9.84	0.952	1.504	5.004	222.2	67.0	

==========

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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6A (R130)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0190
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	50.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)	
1.0	226.8	4.45	0.791	0.307	1.307	51.0	52.0	
1.5	445.1	5.76	0.841	0.515	2.015	77.2	53.0	D≈1.75'
2.0	718.2	6.91	0.877	0.740	2.740	104.0	54.0	V≈6.5+/-
2.5	1040.9	7.93	0.905	0.977	3.477	131.3	55.0	
3.0	1409.8	8.87	0.927	1.221	4.221	159.0	56.0	
3.5	1822.2	9.73	0.946	1.471	4.971	187.2	57.0	

==========

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(713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6A (R140)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0160
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	50.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	208.1	4.08	0.726	0.258	1.258	51.0	52.0
1.5	408.4	5.29	0.772	0.434	1.934	77.2	53.0
2.0	659.0	6.34	0.805	0.624	2.624	104.0	54.0
2.5	955.2	7.28	0.830	0.822	3.322	131.3	55.0
3.0	1293.7	8.14	0.851	1.028	4.028	159.0	56.0
3.5	1672.2	8.93	0.868	1.238	4.738	187.2	57.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6B/C (1391N)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0190
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	30.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	135.8	4.38	0.784	0.298	1.298	31.0	32.0
1.5	266.6	5.64	0.831	0.494	1.994	47.2	33.0
2.0	430.3	6.72	0.864	0.702	2.702	64.0	34.0
2.5	624.0	7.68	0.888	0.916	3.416	81.3	35.0
3.0	846.0	8.55	0.908	1.134	4.134	99.0	36.0
3.5	1094.9	9.34	0.924	1.354	4.854	117.2	37.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6B/C (R10)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0160
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	70.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	291.6	4.11	0.729	0.262	1.262	71.0	72.0
1.5	572.5	5.34	0.776	0.442	1.942	107.2	73.0
2.0	923.8	6.42	0.810	0.639	2.639	144.0	74.0
2.5	1338.9	7.39	0.837	0.847	3.347	181.3	75.0
3.0	1813.1	8.28	0.859	1.064	4.064	219.0	76.0
3.5	2342.9	9.11	0.878	1.288	4.788	257.2	77.0

$\bar{D} \approx 1.75$ +/-
$\bar{V} \approx 6.0$ +/-

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6B/C (R20)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0170
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	40.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)	
1.0	171.5	4.18	0.746	0.272	1.272	41.0	42.0	
1.5	336.5	5.41	0.792	0.454	1.954	62.2	43.0	D ≈ 1.75'
2.0	543.0	6.46	0.825	0.649	2.649	84.0	44.0	V ≈ 6.0'
2.5	787.2	7.41	0.850	0.852	3.352	106.3	45.0	
3.0	1066.4	8.27	0.870	1.061	4.061	129.0	46.0	
3.5	1379.0	9.06	0.887	1.274	4.774	152.2	47.0	

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6B/C (R40)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0180
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	10.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	44.0	4.00	0.736	0.248	1.248	11.0	12.0
1.5	86.8	5.03	0.770	0.393	1.893	17.2	13.0
2.0	141.4	5.89	0.793	0.539	2.539	24.0	14.0
2.5	207.2	6.63	0.809	0.683	3.183	31.3	15.0
3.0	284.2	7.29	0.823	0.825	3.825	39.0	16.0
3.5	372.6	7.89	0.834	0.965	4.465	47.2	17.0

$\bar{D} = 1.75'$
$\bar{V} = 5.5$ fps

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6B/C (R41)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0170
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	10.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	42.7	3.89	0.715	0.234	1.234	11.0	12.0
1.5	84.4	4.89	0.748	0.372	1.872	17.2	13.0
2.0	137.4	5.72	0.770	0.509	2.509	24.0	14.0
2.5	201.3	6.44	0.787	0.645	3.145	31.3	15.0
3.0	276.2	7.08	0.799	0.779	3.779	39.0	16.0
3.5	362.1	7.66	0.810	0.912	4.412	47.2	17.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6B/C (R42)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0190
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	20.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)	
1.0	90.4	4.31	0.777	0.288	1.288	21.0	22.0	
1.5	177.6	5.51	0.819	0.471	1.971	32.2	23.0	$\bar{D} \approx 1.75$
2.0	286.9	6.52	0.849	0.660	2.660	44.0	24.0	$\bar{V} \approx 6.0$
2.5	416.9	7.41	0.871	0.853	3.353	56.3	25.0	
3.0	566.5	8.21	0.888	1.047	4.047	69.0	26.0	
3.5	735.0	8.94	0.902	1.240	4.740	82.2	27.0	

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6B/C (R50)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0190
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	15.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)	
1.0	67.8	4.24	0.769	0.278	1.278	16.0	17.0	
1.5	133.2	5.38	0.809	0.450	1.950	24.7	18.0	D≐1.75
2.0	215.7	6.35	0.836	0.625	2.625	34.0	19.0	V≐6.0
2.5	314.2	7.18	0.856	0.801	3.301	43.8	20.0	
3.0	428.2	7.93	0.871	0.976	3.976	54.0	21.0	
3.5	557.3	8.61	0.884	1.150	4.650	64.7	22.0	

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6B/C (R71)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0160
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	15.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)	
1.0	62.2	3.89	0.706	0.235	1.235	16.0	17.0	
1.5	122.3	4.94	0.742	0.379	1.879	24.7	18.0	$\bar{D} \approx 1.75'$
2.0	198.0	5.82	0.767	0.527	2.527	34.0	19.0	$\bar{V} \approx 5.5$ fps
2.5	288.4	6.59	0.785	0.675	3.175	43.8	20.0	
3.0	392.9	7.28	0.800	0.822	3.822	54.0	21.0	
3.5	511.5	7.90	0.811	0.969	4.469	64.7	22.0	

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 6B/C (R70)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0160
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	10.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	41.5	3.77	0.694	0.221	1.221	11.0	12.0
1.5	81.9	4.75	0.726	0.350	1.850	17.2	13.0
2.0	133.3	5.55	0.747	0.479	2.479	24.0	14.0
2.5	195.3	6.25	0.763	0.607	3.107	31.3	15.0
3.0	268.0	6.87	0.776	0.733	3.733	39.0	16.0
3.5	351.3	7.43	0.786	0.858	4.358	47.2	17.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 5 (1476)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0190
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	46.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)	
1.0	208.6	4.44	0.790	0.306	1.306	47.0	48.0	
1.5	409.4	5.75	0.840	0.513	2.013	71.2	49.0	D≈1.75
2.0	660.5	6.88	0.875	0.735	2.735	96.0	50.0	
2.5	957.4	7.90	0.902	0.968	3.468	121.2	51.0	V̄ ≈ 6.5 fps
3.0	1296.8	8.82	0.925	1.208	4.208	147.0	52.0	
3.5	1676.4	9.68	0.943	1.454	4.954	173.2	53.0	

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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(713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 5 (R200)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0180
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	60.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	265.0	4.34	0.772	0.293	1.293	61.0	62.0
1.5	520.2	5.64	0.821	0.494	1.994	92.2	63.0
2.0	839.4	6.77	0.857	0.712	2.712	124.0	64.0
2.5	1216.5	7.79	0.885	0.941	3.441	156.3	65.0
3.0	1647.5	8.72	0.908	1.180	4.180	189.0	66.0
3.5	2129.1	9.58	0.927	1.425	4.925	222.2	67.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 5 (R202)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0180
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	15.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	66.0	4.12	0.749	0.264	1.264	16.0	17.0
1.5	129.7	5.24	0.787	0.426	1.926	24.7	18.0
2.0	210.0	6.18	0.814	0.592	2.592	34.0	19.0
2.5	305.9	6.99	0.833	0.759	3.259	43.8	20.0
3.0	416.8	7.72	0.848	0.925	3.925	54.0	21.0
3.5	542.5	8.38	0.861	1.090	4.590	64.7	22.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 5 (R205)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0180
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	40.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	176.4	4.30	0.768	0.288	1.288	41.0	42.0
1.5	346.3	5.56	0.815	0.481	1.981	62.2	43.0
2.0	558.8	6.65	0.848	0.687	2.687	84.0	44.0
2.5	810.0	7.62	0.874	0.902	3.402	106.3	45.0
3.0	1097.4	8.51	0.895	1.124	4.124	129.0	46.0
3.5	1419.0	9.32	0.913	1.349	4.849	152.2	47.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 5 (R210)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0190
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	90.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)	
1.0	408.8	4.49	0.796	0.313	1.313	91.0	92.0	
1.5	802.7	5.85	0.848	0.531	2.031	137.2	93.0	$\bar{D} \approx 1.75$
2.0	1295.4	7.04	0.887	0.770	2.770	184.0	94.0	$\bar{V} \approx 6.5$ fps
2.5	1877.6	8.12	0.917	1.024	3.524	231.3	95.0	
3.0	2542.6	9.11	0.942	1.290	4.290	279.0	96.0	
3.5	3285.5	10.04	0.963	1.565	5.065	327.2	97.0	

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092 (713) 895-8322. A manual with equations & flow chart is available.

TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 5 (R220)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0190
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	90.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	408.8	4.49	0.796	0.313	1.313	91.0	92.0
1.5	802.7	5.85	0.848	0.531	2.031	137.2	93.0
2.0	1295.4	7.04	0.887	0.770	2.770	184.0	94.0
2.5	1877.6	8.12	0.917	1.024	3.524	231.3	95.0
3.0	2542.6	9.11	0.942	1.290	4.290	279.0	96.0
3.5	3285.5	10.04	0.963	1.565	5.065	327.2	97.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 5 (R230)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0140
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	90.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)
1.0	350.9	3.86	0.683	0.231	1.231	91.0	92.0
1.5	689.0	5.02	0.728	0.391	1.891	137.2	93.0
2.0	1112.0	6.04	0.761	0.567	2.567	184.0	94.0
2.5	1611.7	6.97	0.787	0.754	3.254	231.3	95.0
3.0	2182.5	7.82	0.809	0.950	3.950	279.0	96.0
3.5	2820.3	8.62	0.827	1.153	4.653	327.2	97.0

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
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TRAPEZOIDAL CHANNEL ANALYSIS
RATING CURVE COMPUTATION

July 21, 1994
ROUTE ID: WASH 5 (R300)

==========

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Channel Bottom Slope (feet per foot).....	0.0170
Manning's Roughness Coefficient (n-value).....	0.0450
Channel Side Slope - Left Side (horizontal/vertical)....	1.00
Channel Side Slope - Right Side (horizontal/vertical)...	1.00
Channel Bottom Width (feet).....	60.0

==========

PROGRAM RESULTS:

Depth (ft)	Flow Rate (cfs)	Velocity (fps)	Froude Number	Velocity Head(ft)	Energy Head(ft)	Flow Area (sq ft)	Top Width (ft)	
1.0	257.5	4.22	0.750	0.277	1.277	61.0	62.0	
1.5	505.5	5.48	0.798	0.466	1.966	92.2	63.0	D ≈ 1.75
2.0	815.7	6.58	0.833	0.672	2.672	124.0	64.0	V ≈ 6.0 fps
2.5	1182.2	7.57	0.860	0.889	3.389	156.3	65.0	
3.0	1601.0	8.47	0.882	1.114	4.114	189.0	66.0	
3.5	2069.1	9.31	0.901	1.346	4.846	222.2	67.0	

==========

TRAPEZOIDAL CHANNEL ANALYSIS COMPUTER PROGRAM, Version 1.3 (c) 1986
Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092
(713) 895-8322. A manual with equations & flow chart is available.

Appendix B
Flow Diversion Analyses

N:\930064\ADMIN\64-059RP.WP5

CVL

NUMERICAL BASIS FOR UNIFORM FLOW COMPUTATIONS

EQ. (1): $Q = \frac{1.486}{Ne} S^{1/2} R^{2/3} A$ SOURCE: (CHOW, 1959)

EQ. (2): $Ne = \left[\frac{\sum A_i (n_i^{1.5})}{A}\right]^{2/3}$ SOURCE: (FRENCH, 1985)

EQ. (3): $A = \sum A_i$

EQ. (4): $D = \frac{A}{Tw}$ SOURCE: (CHOW, 1959)

WHERE:

Q = DISCHARGE (cfs)

S = SLOPE OF HYDRAULIC GRADE LINE (ESTIMATED WITH BED SLOPE) (ft/ft)

R = HYDRAULIC RADIUS (ft) = A/WP

A = FLOW AREA (ft^2)

A_i = INCREMENTAL FLOW AREA (ft^2)

WP = WETTED PERIMETER (ft)

D = HYDRAULIC DEPTH (ft)

Ne = EQUIVALENT MANNING - n VALUE

T_w = TOPWIDTH (ft)

SOURCE: CHOW, *OPEN CHANNEL HYDRAULICS*, McGRAW HILL, NEW YORK, 1959.

SOURCE: FRENCH, *OPEN-CHANNEL HYDRAULICS*, McGRAW HILL, NEW YORK, 1985.

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DIVERSION 10 - FLOW DIVERSION ANALYSIS

STAGE	FLOW LEFT (cfs)	FLOW RIGHT (cfs)	Q TOTAL (cfs)
10.0	0	0	0
10.5	0	12.9	12.9
11.15	0	149.2	149.2
11.5	10.2	298.6	308.8
12.0	47.9	634.7	682.6
12.5	105.6	1182.6	1288.2
13.0	177.7	1863.9	2041.6
13.25	218.3	2249.5	2467.8

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WEIR FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

DIV10 : Left

CROSS SECTION PARAMETERS: FILENAME: DIV10L.SEC

No. of Cross Section Points:	18	Bed Slope:	0.01680	Max Elev.:	12.00
Bank Stations.....Left:	0.0	Right....:	30.5	Min Elev.:	11.15
Encroachment Stations..Left:	0.0	Right....:	31.0	Weir Coef:	2.600

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	12.00	0.00	2)	11.15	9.00	3)	11.15	21.50
4)	11.40	30.50	5)	11.40	31.00	6)	11.40	32.00
7)	10.40	35.00	8)	10.80	56.00	9)	11.50	59.00
10)	11.60	86.00	11)	10.75	107.00	12)	10.30	109.00
13)	10.00	124.00	14)	10.90	126.50	15)	10.90	128.50
16)	10.30	129.00	17)	10.40	138.00	18)	12.30	142.00

COMPUTED PARAMETERS:

WSEL	Q(cfs)	H:max(ft)	H:ave(ft)	TW(ft)	A(sf)
11.50	10.2	0.35	0.28	25.7	7.1
12.00	47.9	0.85	0.69	31.0	21.3
12.50	105.6	1.35	1.19	31.0	36.8
13.00	177.7	1.85	1.69	31.0	52.3
13.25	218.3	2.10	1.94	31.0	60.0

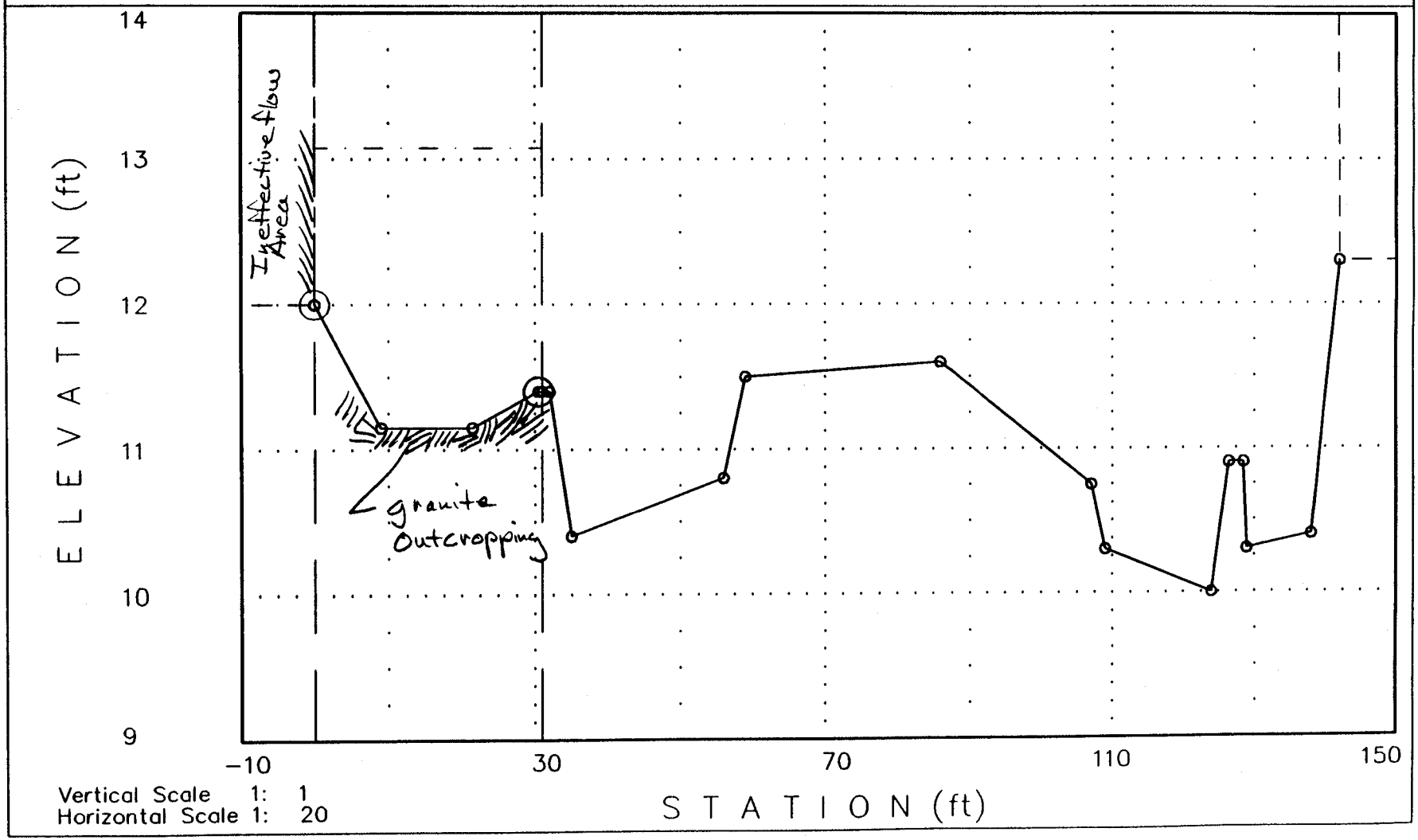
NOTES:

At this location, flow spills over a granite rock outcropping and drops approximately 8' in 20'; therefore, broad crested weir computation used to estimate flow diversion

<<<<<< Cross Section: DIV10L: (FN = DIV10L.SEC) >>>>>>

Q1= 191cfs WS1= 13.08

WEIR FLOW COMPUTATIONS: Weir Coefficient = 2.6



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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

DIV 10 Right

CROSS SECTION PARAMETERS: FILENAME: DIV10R.SEC

No. of Cross Section Points:	18	Bed Slope:	0.01680	Max Elev.:	12.30
Bank Stations.....Left:	35.0	Right....:	56.0	Min Elev.:	10.00
Encroachment Stations..Left:	31.0	Right....:	142.0		
Manning-n Values.....LOB:	0.040	CHANNEL..:	0.030	ROB.....:	0.041

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	12.00	0.00	2)	11.15	9.00	3)	11.15	21.50
4)	11.40	30.50	5)	11.40	31.00	6)	11.40	32.00
7)	10.40	35.00	8)	10.80	56.00	9)	11.50	59.00
10)	11.60	86.00	11)	10.75	107.00	12)	10.30	109.00
13)	10.00	124.00	14)	10.90	126.50	15)	10.90	128.50
16)	10.30	129.00	17)	10.40	138.00	18)	12.30	142.00

COMPUTED PARAMETERS:

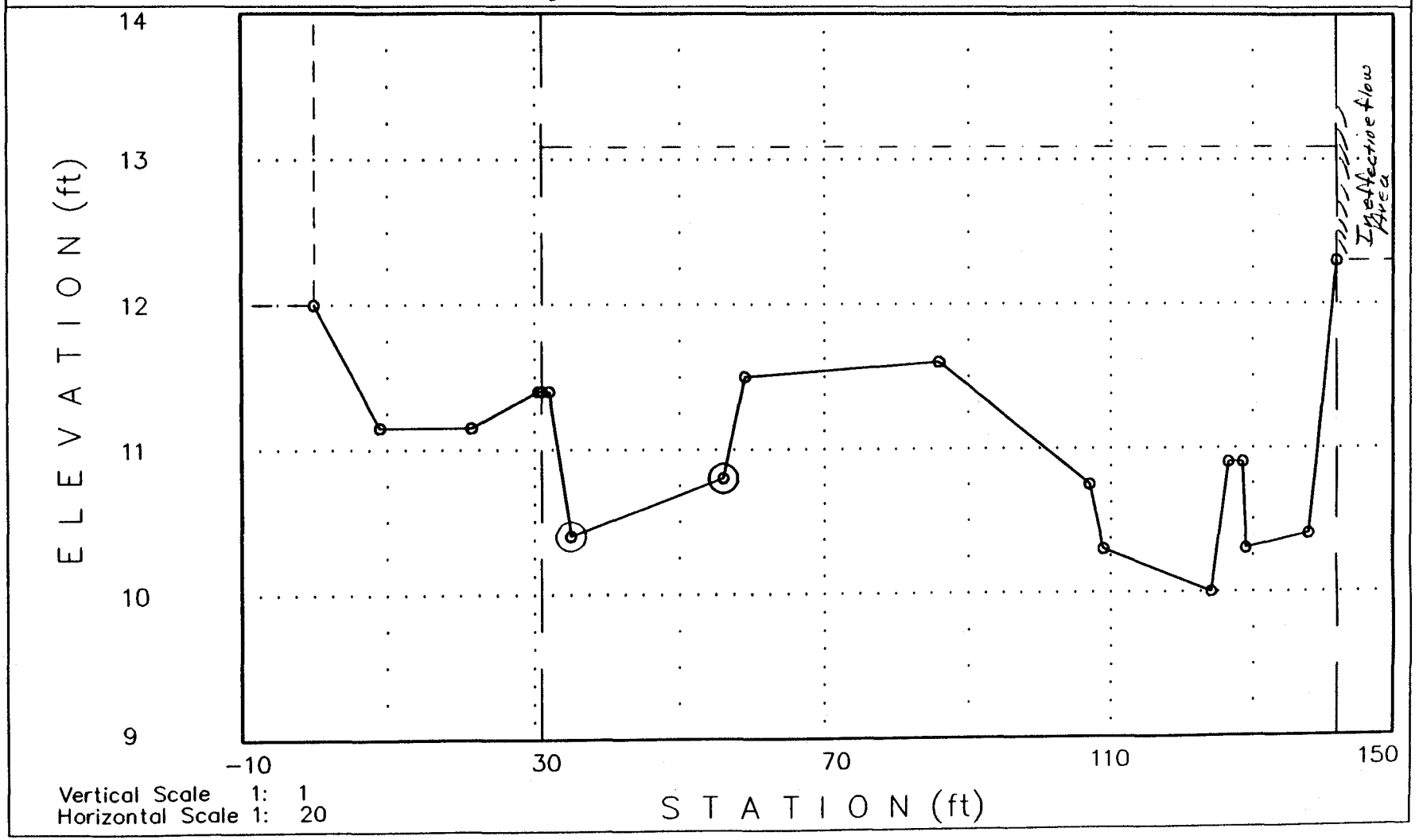
WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
10.50	12.9	1.8	0.650	0.041	0.2	32.2	7.3	32.5
11.15	149.2	3.6	0.815	0.038	0.6	67.2	41.2	68.0
11.50	298.6	4.5	0.859	0.038	0.8	79.8	66.9	80.8
12.00	634.7	5.3	0.890	0.038	1.1	110.4	120.3	111.5
13.00	1863.9	8.1	0.984	0.039	2.1	111.0	231.3	112.2
13.25	2249.5	8.7	1.002	0.039	2.3	111.0	259.0	112.2

NOTES:

<<<<<< Cross Section: DIV10R: (FN = DIV10R.SEC) >>>>>>

Q1= 1994cfs WS1= 13.09

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .04 CH: .03 ROB: .041: S= .0168



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DIVERSION 30 - FLOW DIVERSION ANALYSIS

STAGE	FLOW LEFT (cfs)	FLOW RIGHT (cfs)	Q TOTAL (cfs)
2198.0	0	0	0
2198.5	4.4	0	4.4
2199.0	30.5	0	30.5
2199.5	88.8	0	88.8
2200.0	188.5	0	188.5
2200.4	265.3	35.5	300.8
2200.5	311.2	68.2	379.4
2201.0	592.4	338.3	930.7
2201.5	949.5	749.8	1699.3
2202.0	1407.9	1295.1	2703.0
2202.5	2091.7	1881.1	3972.8

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

DIV 30 Left

CROSS SECTION PARAMETERS: FILENAME: DIV30L.SEC

No. of Cross Section Points: 19 Bed Slope:0.02230 Max Elev.:2202.00
Bank Stations.....Left: 98.0 Right....: 102.0 Min Elev.:2198.20
Encroachment Stations..Left: 40.0 Right....: 140.0
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.030 ROB.....: 0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2202.00	40.00	2)	2201.00	65.00	3)	2200.00	84.00
4)	2198.20	98.00	5)	2198.20	100.00	6)	2198.20	102.00
7)	2200.00	120.00	8)	2200.40	140.00	9)	2200.00	155.00
10)	2200.00	165.00	11)	2200.30	175.00	12)	2200.30	200.00
13)	2200.10	206.00	14)	2200.10	211.00	15)	2201.00	229.00
16)	2202.00	254.00	17)	2202.50	280.00	18)	2203.20	310.00
19)	2204.00	340.00						

COMPUTED PARAMETERS:

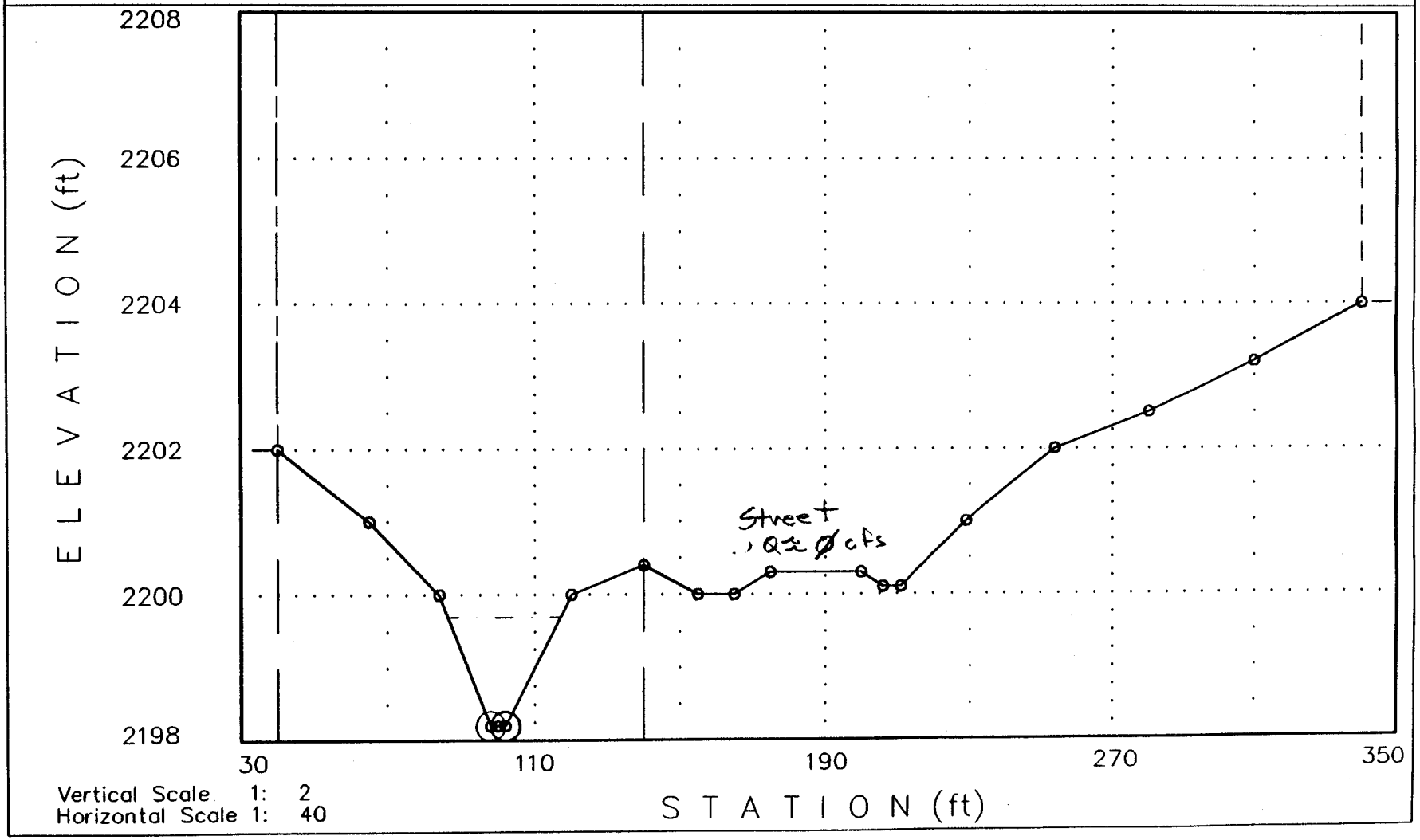
WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
2198.50	4.4	2.2	0.830	0.036	0.2	9.3	2.0	9.4
2199.00	30.5	3.4	0.866	0.040	0.5	18.2	8.9	18.3
2199.50	88.8	4.4	0.896	0.041	0.7	27.1	20.2	27.3
2200.00	188.5	5.2	0.923	0.042	1.0	36.0	36.0	36.2
2200.40	265.3	4.7	0.892	0.043	0.9	63.6	55.9	63.8
2200.50	311.2	5.0	0.901	0.043	1.0	65.5	62.4	65.7

NOTES:

<<<<<< Cross Section: DIV30L: (FN = DIV30L.SEC) >>>>>>

Q1= 123cfs WS1= 2199.7

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .045 CH: .03 ROB: .045: S= .0223



Vertical Scale 1: 2
Horizontal Scale 1: 40

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

DIV 30 – Right

CROSS SECTION PARAMETERS: FILENAME: DIV30R.SEC

No. of Cross Section Points: 19 Bed Slope:0.01850 Max Elev.:2204.00
Bank Stations.....Left: 155.0 Right....: 211.0 Min Elev.:2200.00
Encroachment Stations..Left: 140.0 Right....: 340.0
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.025 ROB.....: 0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2202.00	40.00	2)	2201.00	65.00	3)	2200.00	84.00
4)	2198.20	98.00	5)	2198.20	100.00	6)	2198.20	102.00
7)	2200.00	120.00	8)	2200.40	140.00	9)	2200.00	155.00
10)	2200.00	165.00	11)	2200.30	175.00	12)	2200.30	200.00
13)	2200.10	206.00	14)	2200.10	211.00	15)	2201.00	229.00
16)	2202.00	254.00	17)	2202.50	280.00	18)	2203.20	310.00
19)	2204.00	340.00						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
2200.40	35.5	2.3	0.892	0.031	0.2	77.0	15.6	77.0
2200.50	68.2	2.9	0.943	0.031	0.3	79.0	23.4	79.0
2201.00	338.3	5.2	1.064	0.032	0.7	89.0	65.4	89.0
2201.50	749.8	6.6	1.108	0.033	1.1	101.5	113.0	101.5
2202.00	1295.1	7.8	1.130	0.034	1.5	114.0	166.9	114.1
2202.50	1881.1	8.2	1.122	0.034	1.6	140.0	230.4	140.1

NOTES:

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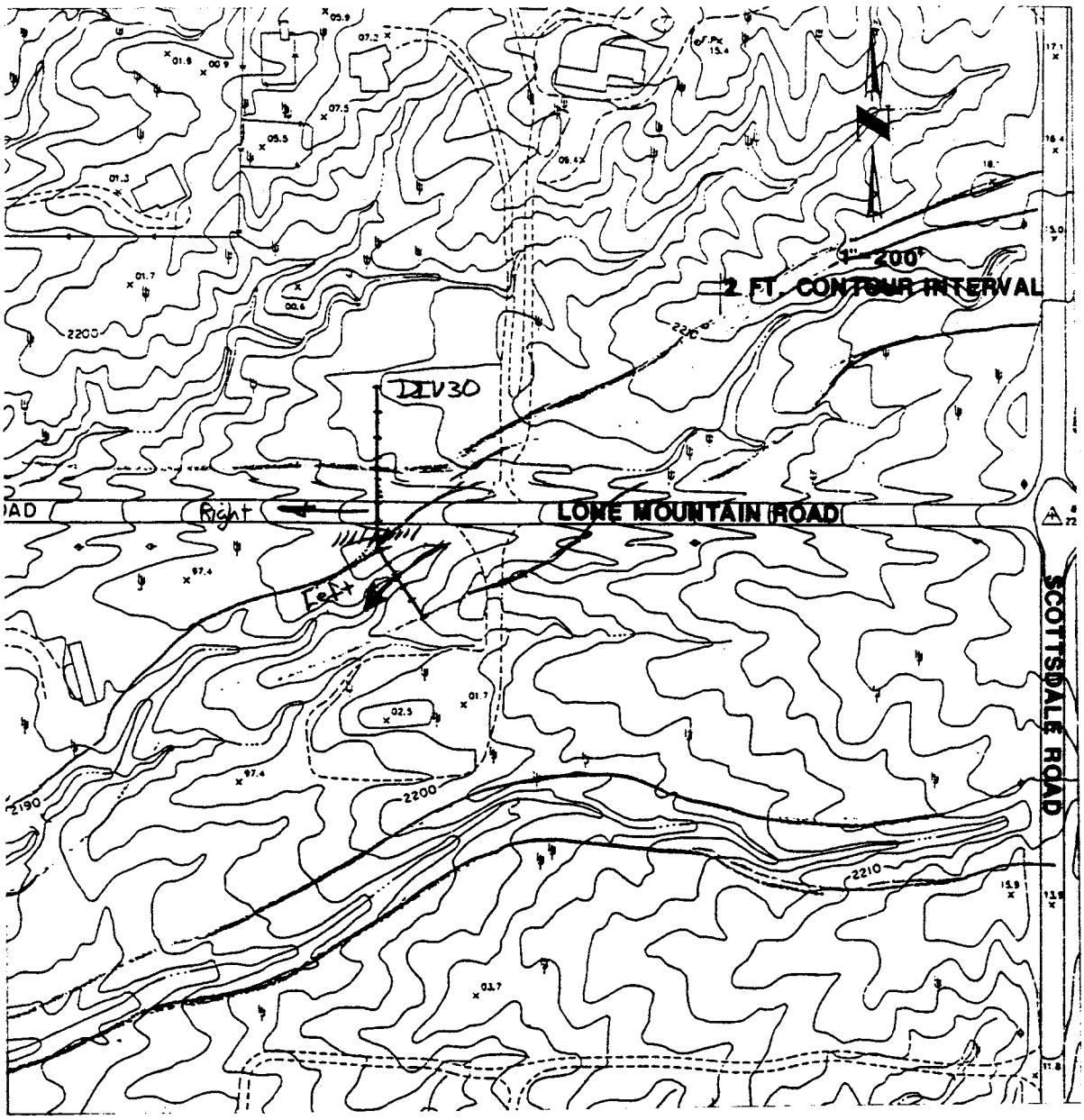
DIVERSION 30



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DIVERSION 40 - FLOW DIVERSION ANALYSIS

STAGE	FLOW LEFT (cfs)	FLOW RIGHT (cfs)	Q TOTAL (cfs)
2021.0	0	0	0
2021.5	0	1.5	1.5
2022.0	0	28.0	28.0
2022.2	0	57.0	57.0
2022.5	10.6	207.7	218.3
2023.0	97.9	725.6	823.5
2023.5	359.7	1463.2	1822.9
2024.0	962.1	2384.8	3346.9

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

DIV 40 - Left

CROSS SECTION PARAMETERS: FILENAME: DIV40L.SEC

No. of Cross Section Points: 24 Bed Slope:0.01970 Max Elev.:2024.00
Bank Stations.....Left: 466.0 Right....: 471.0 Min Elev.:2022.20
Encroachment Stations..Left: 301.0 Right....: 500.0
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.030 ROB.....: 0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2024.00	301.00	2)	2023.00	338.00	3)	2023.10	372.00
4)	2023.20	420.00	5)	2022.80	450.00	6)	2022.20	466.00
7)	2022.20	471.00	8)	2022.50	500.00	9)	2022.40	520.00
10)	2030.50	520.10	11)	2030.50	530.00	12)	2022.40	530.10
13)	2022.00	556.00	14)	2021.90	565.00	15)	2021.40	573.00
16)	2021.40	583.00	17)	2022.00	594.00	18)	2022.30	612.00
19)	2030.30	612.10	20)	2030.30	652.00	21)	2022.30	652.10
22)	2021.90	668.00	23)	2022.10	690.00	24)	2022.20	725.00

COMPUTED PARAMETERS:

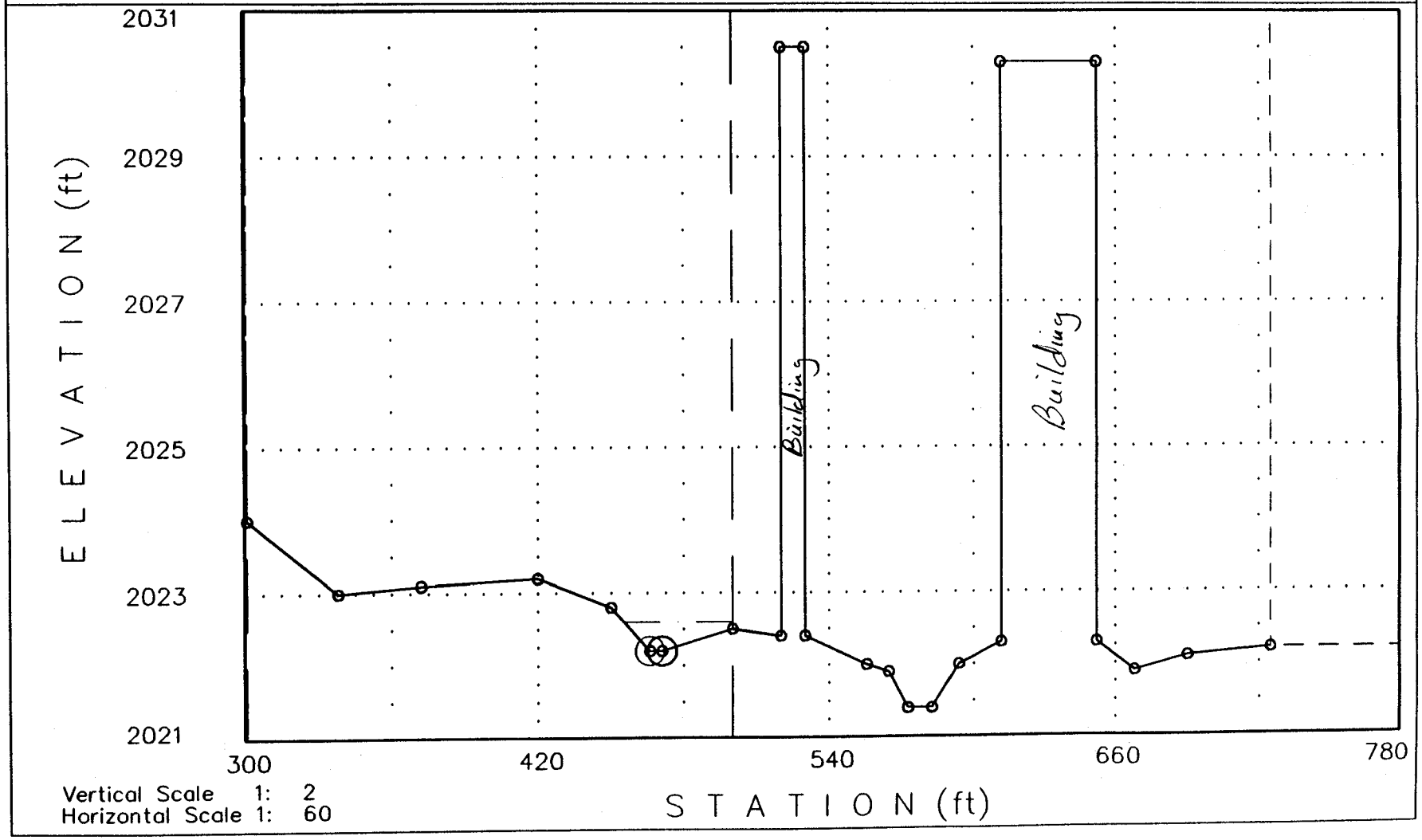
WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
2022.50	10.6	1.5	0.649	0.042	0.2	42.0	7.1	42.0
2023.00	97.9	3.0	0.756	0.043	0.5	65.0	32.4	65.0
2023.50	359.7	3.3	0.763	0.044	0.6	180.5	107.6	180.5
2024.00	962.1	4.8	0.830	0.044	1.0	199.0	202.5	199.0

NOTES:

<<<<<< Cross Section: DIV40L: (FN = DIV40L.SEC) >>>>>>

Q1= 23cfs WS1= 2022.6

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .045 CH: .03 ROB: .045: S= .0197



Vertical Scale 1: 2
Horizontal Scale 1: 60

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

DIV 40-Right

CROSS SECTION PARAMETERS: FILENAME: DIV40R.SEC

No. of Cross Section Points: 24 Bed Slope:0.01890 Max Elev.:2030.50
Bank Stations.....Left: 573.0 Right....: 583.0 Min Elev.:2021.40
Encroachment Stations..Left: 500.0 Right....: 725.0
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.030 ROB.....: 0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2024.00	301.00	2)	2023.00	338.00	3)	2023.10	372.00
4)	2023.20	420.00	5)	2022.80	450.00	6)	2022.20	466.00
7)	2022.20	471.00	8)	2022.50	500.00	9)	2022.40	520.00
10)	2030.50	520.10	11)	2030.50	530.00	12)	2022.40	530.10
13)	2022.00	556.00	14)	2021.90	565.00	15)	2021.40	573.00
16)	2021.40	583.00	17)	2022.00	594.00	18)	2022.30	612.00
19)	2030.30	612.10	20)	2030.30	652.00	21)	2022.30	652.10
22)	2021.90	668.00	23)	2022.10	690.00	24)	2022.20	725.00

COMPUTED PARAMETERS:

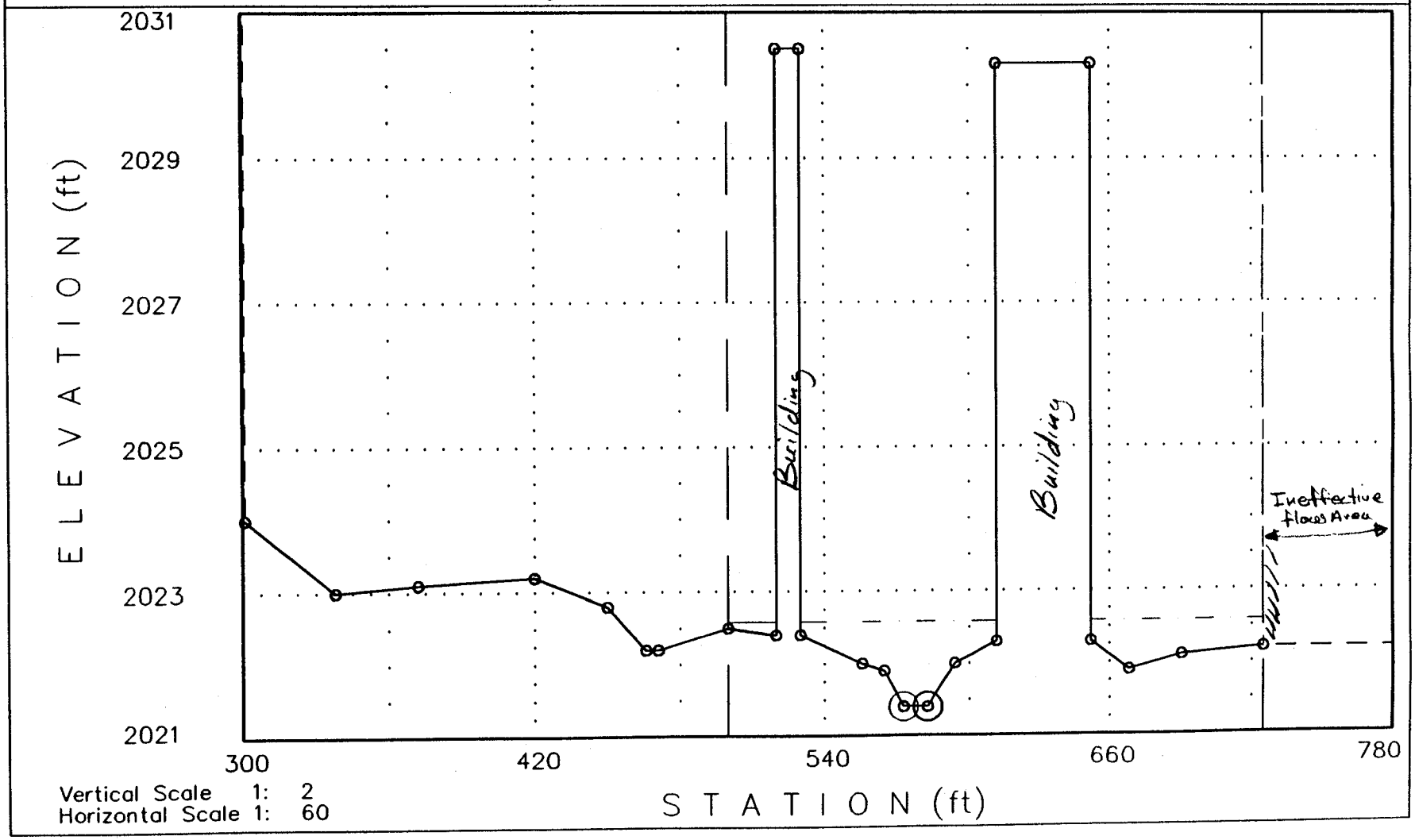
WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
2021.50	1.5	1.2	0.74	0.032	0.1	13.4	1.2	13.4	2021.48
2022.00	28.0	2.1	0.74	0.039	0.3	53.0	13.3	53.0	2021.90
2022.20	57.0	1.9	0.68	0.041	0.2	131.9	30.6	131.9	2022.19
2022.50	207.7	2.7	0.73	0.043	0.4	174.8	76.2	175.4	2022.49
2023.00	725.6	4.4	0.81	0.044	0.9	174.8	163.6	177.4	2022.99
2023.50	1463.2	5.8	0.86	0.044	1.4	174.9	251.1	179.4	2023.49

NOTES:

<<<<<<< Cross Section: DIV40R: (FN = DIV40R.SEC) >>>>>>>

Q1= 281.9cfs WS1= 2022.59

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .045 CH: .03 ROB: .045: S= .0189



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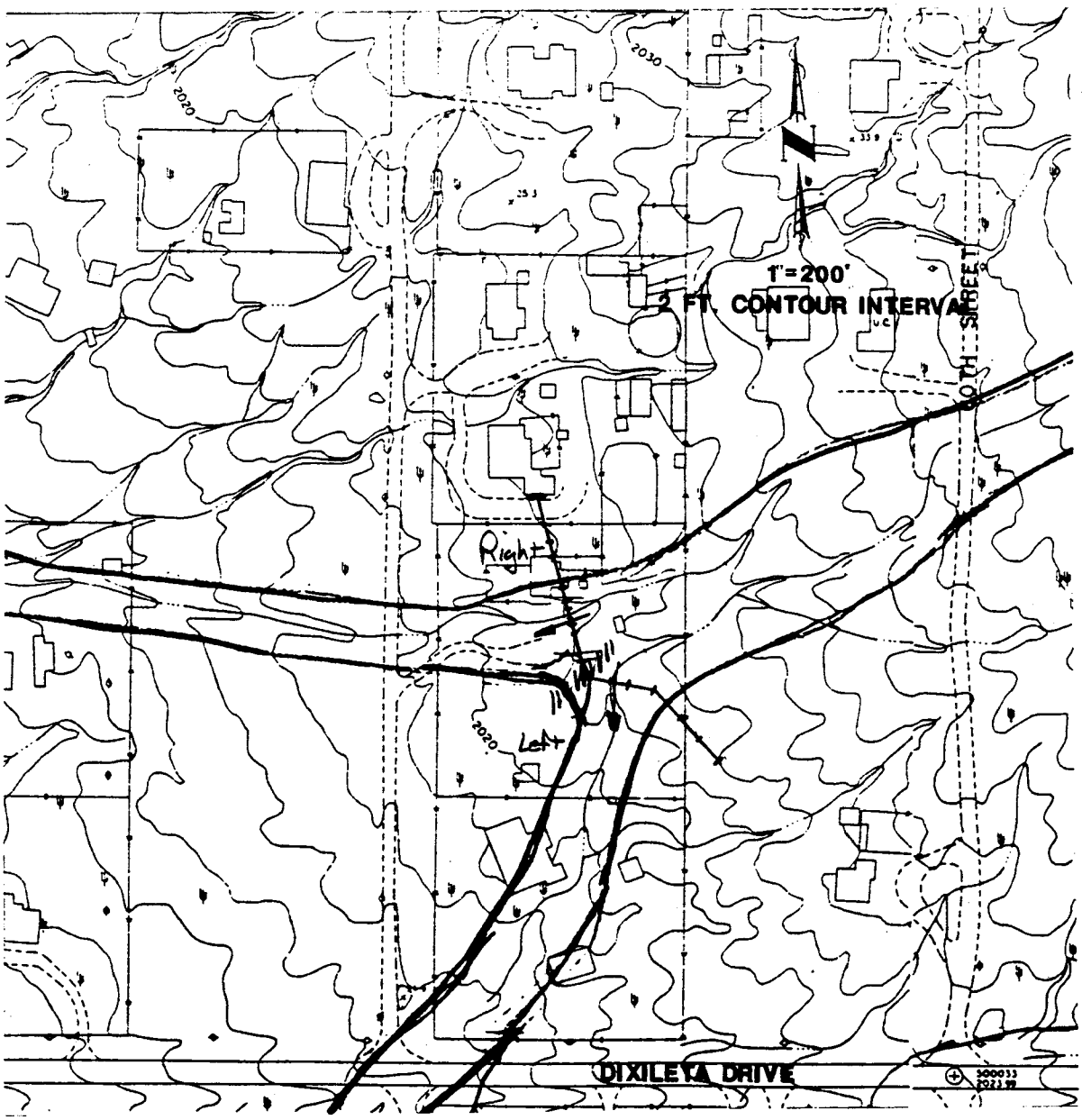
DIVERSION 40



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DIVERSION 100 - FLOW DIVERSION ANALYSIS

STAGE	FLOW LEFT (cfs)	FLOW RIGHT (cfs)	Q TOTAL (cfs)
10.0	0	0	0
10.5	67.4	0	67.4
10.85	220.7	0	220.7
11.5	664.3	34.2	698.5
12.0	1211.0	96.4	1307.4
12.5	1882.0	182.2	2064.2
13.0	2666.5	289.6	2956.1
13.25	3098.9	351.1	3450.0

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

DIV 100 – Left

CROSS SECTION PARAMETERS: FILENAME: DIV100L.SEC

No. of Cross Section Points:	15	Bed Slope:	0.02010	Max Elev.:	11.50
Bank Stations.....Left:	8.0	Right....:	68.0	Min Elev.:	10.00
Encroachment Stations..Left:	0.0	Right....:	88.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	11.50	0.00	2)	10.50	6.00	3)	10.00	8.00
4)	10.15	38.00	5)	10.35	68.00	6)	11.05	71.00
7)	11.50	77.00	8)	10.40	80.00	9)	10.55	84.00
10)	11.25	87.00	11)	11.25	88.00	12)	11.25	89.00
13)	10.90	91.00	14)	10.85	101.50	15)	13.35	107.50

COMPUTED PARAMETERS:

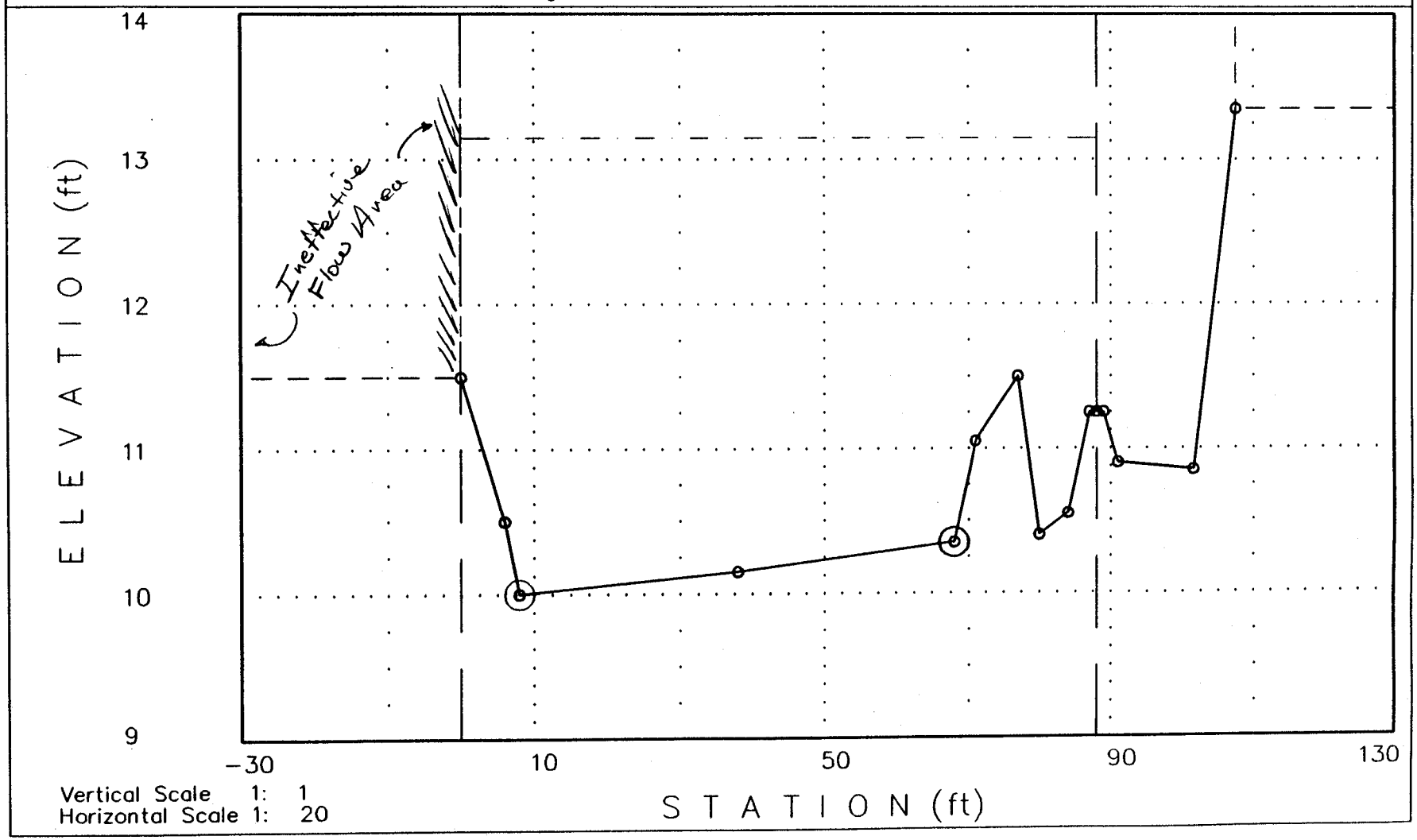
WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
10.50	67.4	3.2	1.004	0.031	0.3	65.6	20.9	65.7
10.85	220.7	4.9	1.087	0.031	0.6	72.8	45.3	73.0
11.50	664.3	6.8	1.144	0.033	1.1	88.0	97.3	88.5
12.00	1211.0	8.6	1.192	0.034	1.6	88.0	141.3	88.5
13.00	2666.5	11.6	1.270	0.034	2.6	88.0	229.3	88.5
13.25	3098.9	12.3	1.286	0.034	2.9	88.0	251.3	88.5

NOTES:

<<<<<< Cross Section: DIV100L: (FN = DIV100L.SEC) >>>>>>

Q1= 2928cfs WS1= 13.15

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .045 CH: .03 ROB: .045: S= .0201



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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

DIV 100 Right

CROSS SECTION PARAMETERS: FILENAME: DIV100R.SEC

No. of Cross Section Points:	15	Bed Slope:	0.02010	Max Elev.:	13.35
Bank Stations.....Left:	91.0	Right....:	101.5	Min Elev.:	10.85
Encroachment Stations..Left:	88.0	Right....:	107.5		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	11.50	0.00	2)	10.50	6.00	3)	10.00	8.00
4)	10.15	38.00	5)	10.35	68.00	6)	11.05	71.00
7)	11.50	77.00	8)	10.40	80.00	9)	10.55	84.00
10)	11.25	87.00	11)	11.25	88.00	12)	11.25	89.00
13)	10.90	91.00	14)	10.85	101.50	15)	13.35	107.50

COMPUTED PARAMETERS:

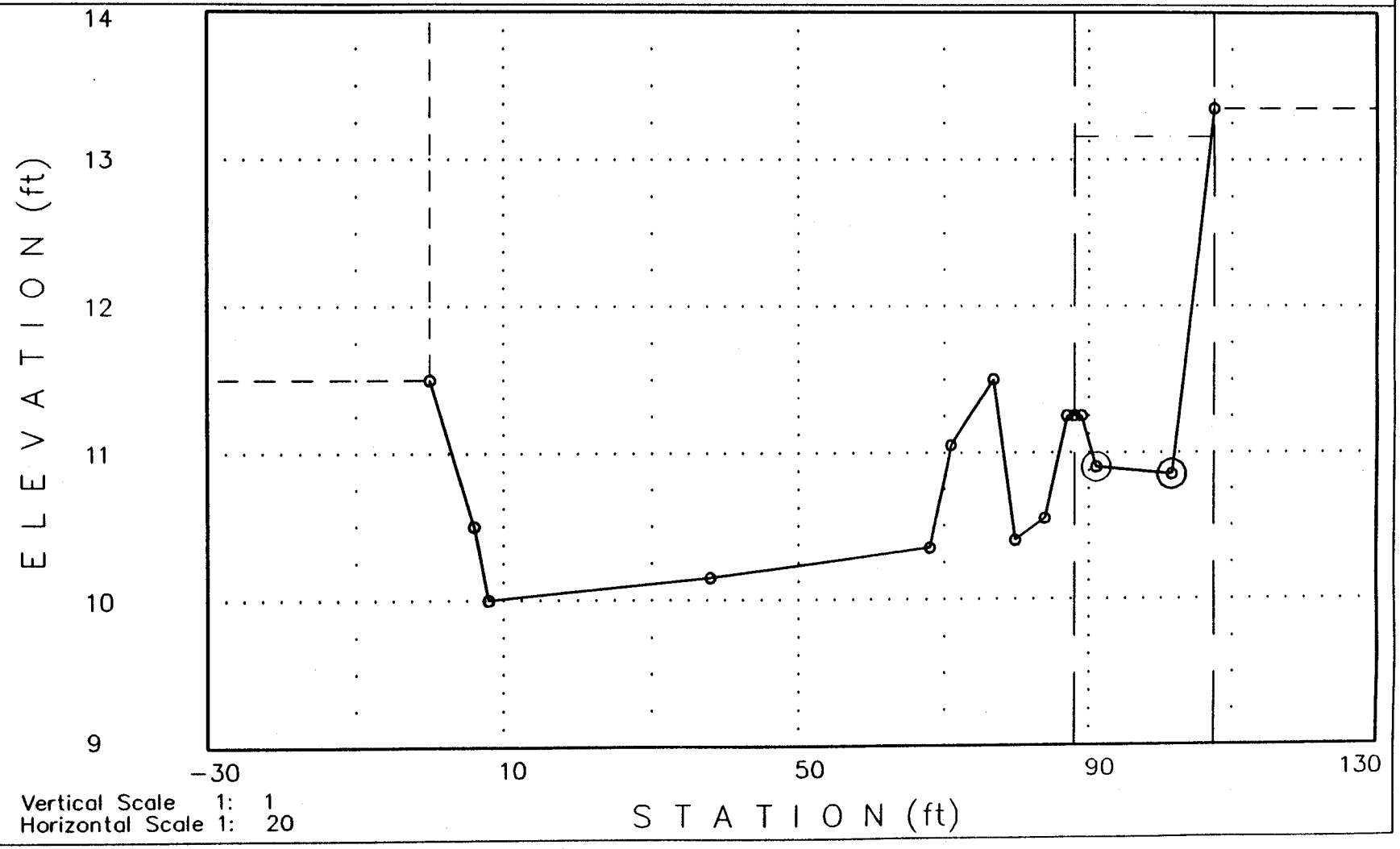
WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
11.50	34.2	4.2	1.003	0.033	0.5	15.1	8.2	15.2
12.00	96.4	6.0	1.070	0.034	1.0	16.3	16.0	16.5
13.00	289.6	8.7	1.139	0.035	1.8	18.7	33.5	19.1
13.25	351.1	9.2	1.150	0.036	2.0	19.3	38.2	19.8

NOTES:

<<<<<< Cross Section: DIV100R: (FN = DIV100R.SEC) >>>>>>

Q1= 327cfs WS1= 13.16

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .045 CH: .03 ROB: .045: S= .0201



Vertical Scale 1: 1
Horizontal Scale 1: 20

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Project: Wash 6a
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DIV 200
Rating: Wash 5:

WSEL	Q Right (W4S15A)	Q Left W4S15B	Total
7.5	85	248	333
8.5	352	724	1,076
9.5	751	1426	2,177
10.5	1262	2306	3,568
11.5	1873	3347	5,220

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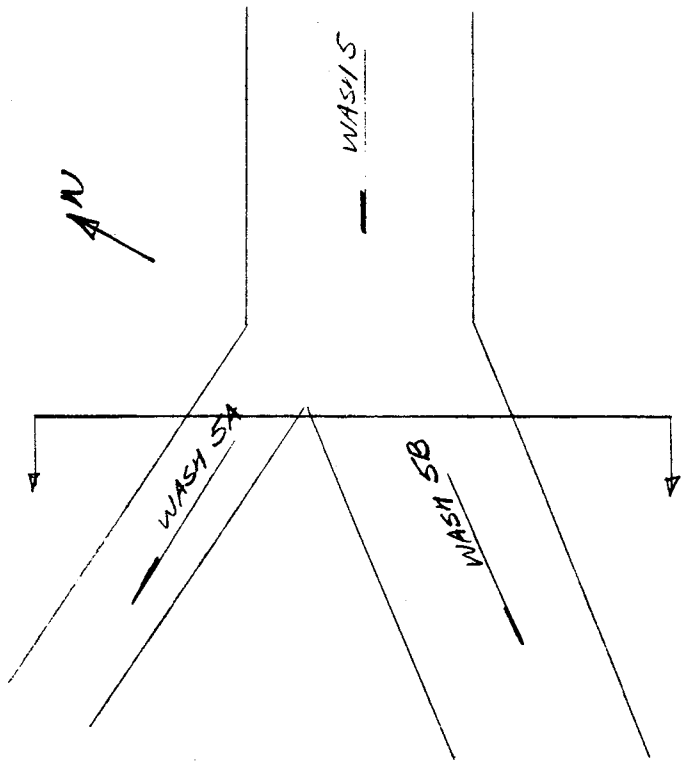
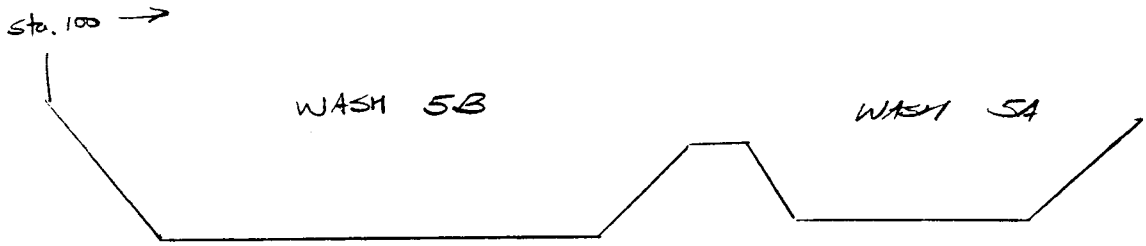
Wash 5 — Split Ratings
Div: 200 : HEC-1 Model





section — Field Measured

Elev	8.03	7.58	6.03	6.37	6.33	7.08	7.21	6.83	6.71	6.50
STA	100,	103,	105,	111,	133,	135,	138,	141,	144,	150

6.75	6.88	7.54
156,	159,	162

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

Div 200 WASH 5B
Left

CROSS SECTION PARAMETERS: FILENAME: WASH5BSP.SEC

No. of Cross Section Points:	13	Bed Slope:	0.01800	Max Elev.:	8.08
Bank Stations.....Left:	103.0	Right....:	135.0	Min Elev.:	6.08
Encroachment Stations..Left:	100.0	Right....:	138.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	8.08	100.00	2)	7.58	103.00	3)	6.08	105.00
4)	6.37	111.00	5)	6.33	133.00	6)	7.08	135.00
7)	7.21	138.00	8)	6.83	141.00	9)	6.71	144.00
10)	6.50	150.00	11)	6.75	156.00	12)	6.88	159.00
13)	7.54	162.00						

COMPUTED PARAMETERS:

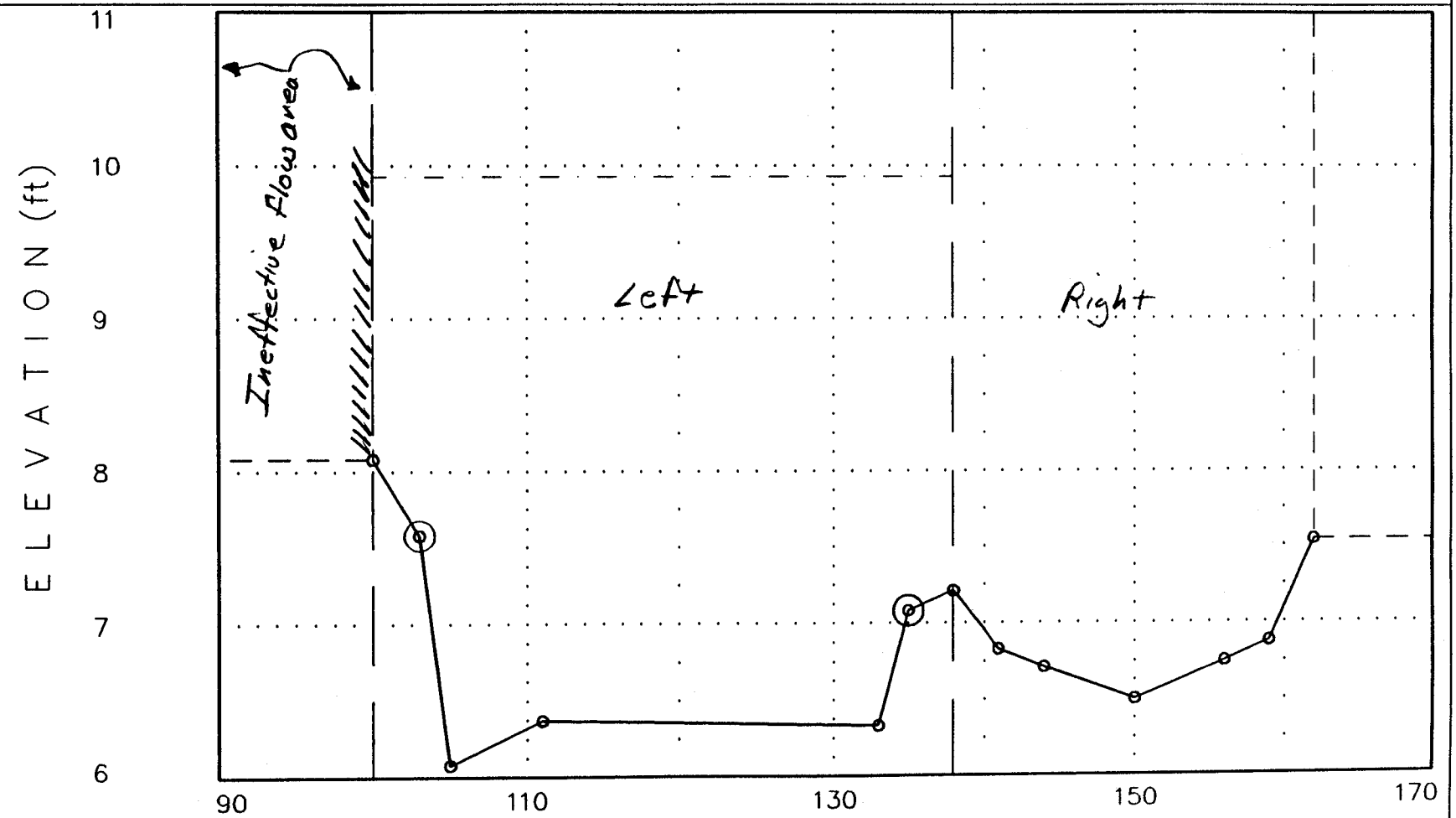
WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
7.50	248.2	6.7	1.150	0.030	1.1	34.9	36.9	35.5
8.50	724.2	9.8	1.237	0.031	1.9	38.0	74.0	38.7
9.50	1426.3	12.7	1.308	0.032	2.9	38.0	112.0	38.7
10.50	2306.3	15.4	1.364	0.032	3.9	38.0	150.0	38.7
11.50	3347.8	17.8	1.411	0.032	4.9	38.0	188.0	38.7
12.50	4538.8	20.1	1.452	0.032	5.9	38.0	226.0	38.7

NOTES:

<<<<<< Cross Section: DIV200L: (FN = DIV200L.SEC) >>>>>>

Q1= 1784.9cfs WS1= 9.93

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .045 CH: .03 ROB: .045: S= .018



Vertical Scale 1: 1
Horizontal Scale 1: 10

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

Div 200: 1/1321 5A

Right

CROSS SECTION PARAMETERS: FILENAME: WASH5ASP.SEC

No. of Cross Section Points:	13	Bed Slope:	0.01800	Max Elev.:	7.54
Bank Stations.....Left:	141.0	Right....:	159.0	Min Elev.:	6.50
Encroachment Stations..Left:	138.0	Right....:	162.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	8.08	100.00	2)	7.58	103.00	3)	6.08	105.00
4)	6.37	111.00	5)	6.33	133.00	6)	7.08	135.00
7)	7.21	138.00	8)	6.83	141.00	9)	6.71	144.00
10)	6.50	150.00	11)	6.75	156.00	12)	6.88	159.00
13)	7.54	162.00						

COMPUTED PARAMETERS:

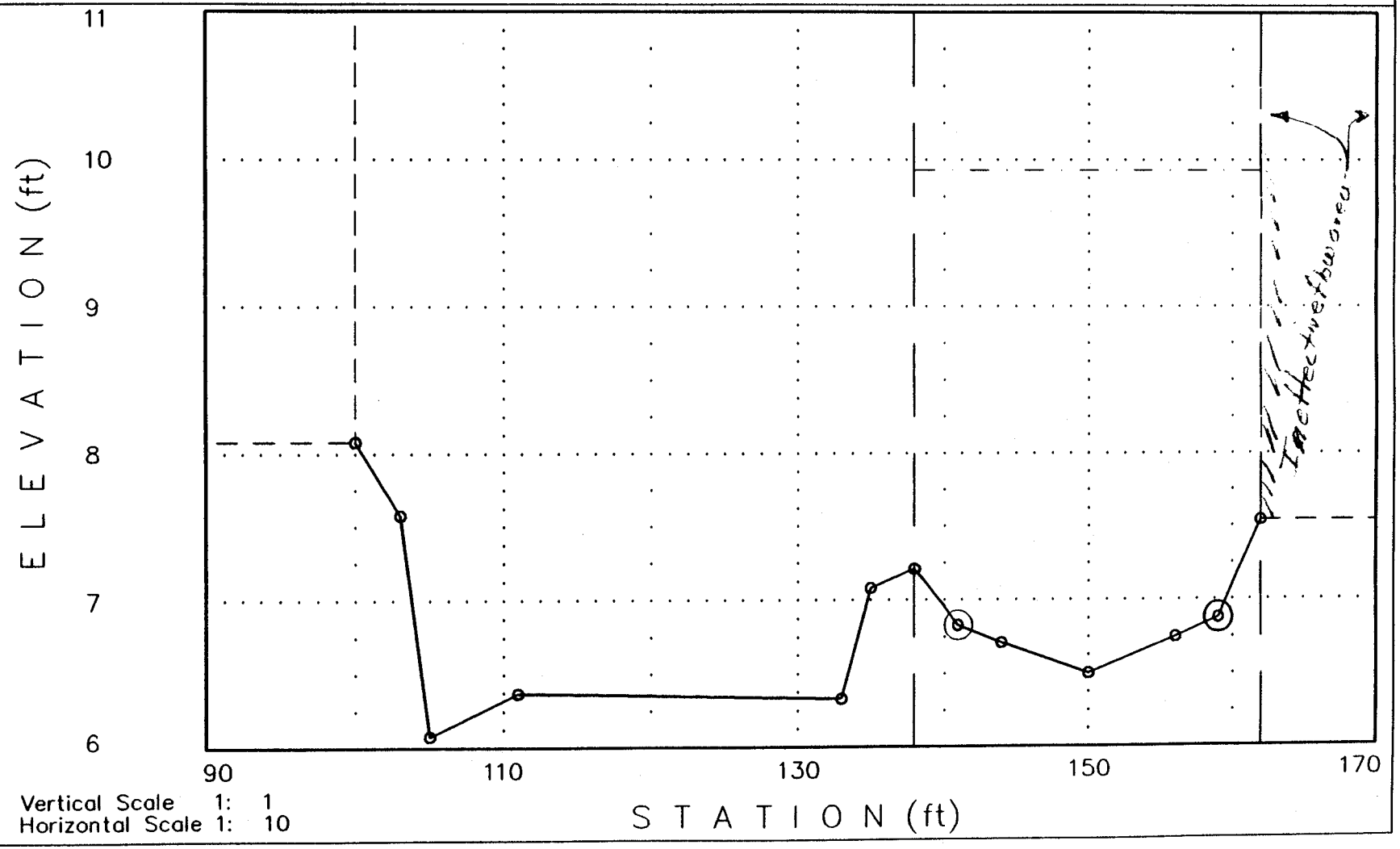
WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
7.50	85.3	5.0	1.030	0.032	0.7	23.8	17.2	23.9
8.50	352.3	8.6	1.151	0.033	1.7	24.0	41.2	24.1
9.50	751.1	11.5	1.232	0.034	2.7	24.0	65.2	24.1
10.50	1261.7	14.1	1.293	0.034	3.7	24.0	89.2	24.1
11.50	1872.9	16.5	1.343	0.034	4.7	24.0	113.2	24.1
12.50	2576.9	18.8	1.385	0.034	5.7	24.0	137.2	24.1

NOTES:

<<<<<< Cross Section: DIV200R: (FN = DIV200R.SEC) >>>>>>

Q1= 959cfs WS1= 9.93

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .045 CH: .03 ROB: .045: S= .018



Vertical Scale 1: 1
Horizontal Scale 1: 10

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Rating Table: DIV205

Stage	Q Left (DQ) (cfs)	Q right (cfs)	Q Total (DI) (cfs)
9.6	0	0	0
10	0	8	8
10.5	72	58	130
11	236	174	410
11.5	362	346	708
12	758	573	1331
12.5	1265	858	2123
13	1873	1206	3079

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

DIV205 (LEFT CHANNEL)

CROSS SECTION PARAMETERS: FILENAME: DIV205L.SEC

No. of Cross Section Points:	14	Bed Slope:	0.02000	Max Elev.:	14.50
Bank Stations.....Left:	961.5	Right....:	995.0	Min Elev.:	10.00
Encroachment Stations..Left:	906.0	Right....:	1000.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.050

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	14.50	906.00	2)	11.50	915.00	3)	11.00	960.00
4)	10.00	961.50	5)	10.00	995.00	6)	10.50	1000.00
7)	9.80	1003.00	8)	9.80	1015.00	9)	10.30	1015.50
10)	10.30	1025.00	11)	9.60	1026.00	12)	9.80	1031.00
13)	10.50	1035.00	14)	13.50	1075.00			

COMPUTED PARAMETERS:

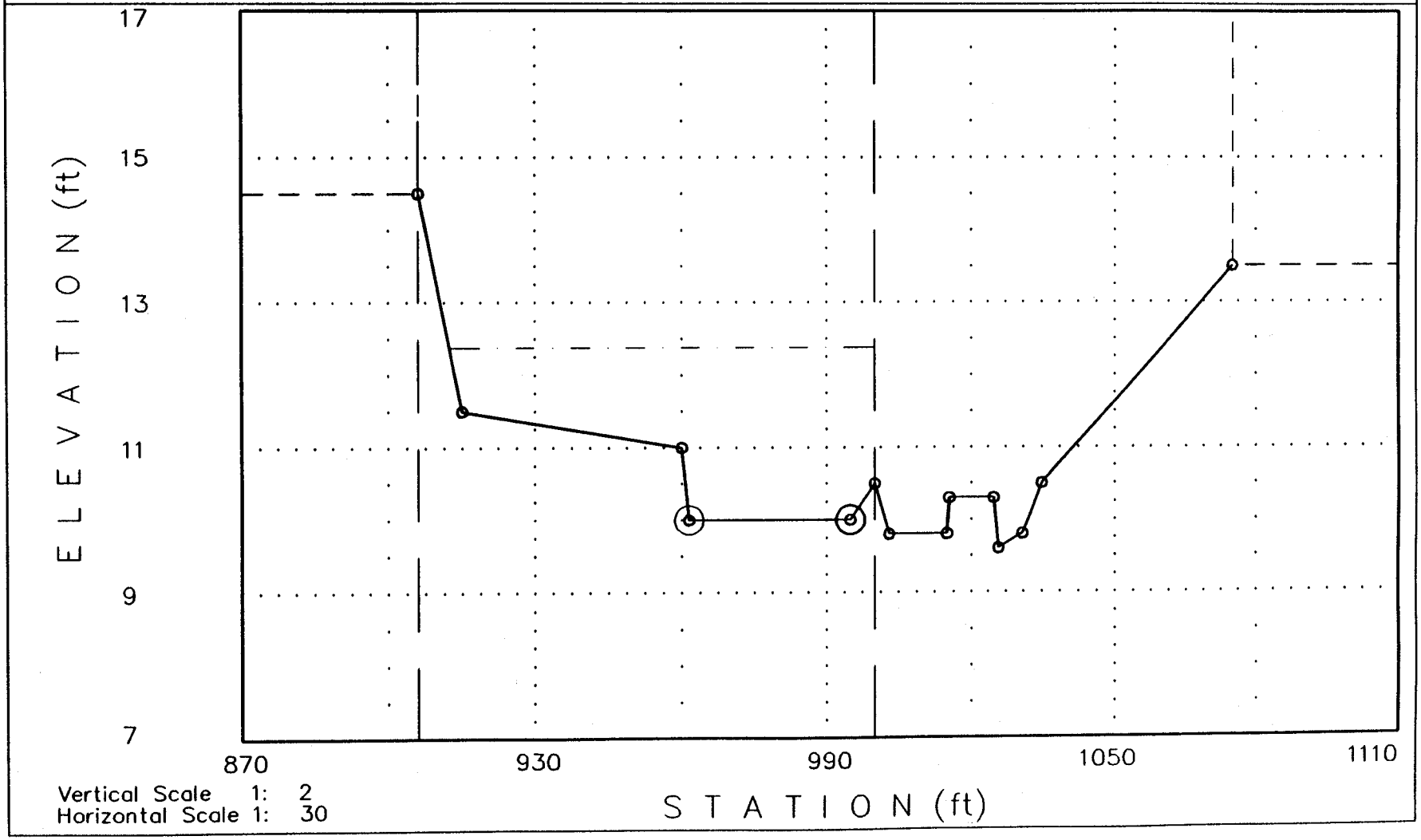
WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.50	71.9	4.0	1.02	0.032	0.5	39.3	18.2	39.4	10.52
11.00	235.8	6.2	1.12	0.033	0.9	40.0	38.0	40.3	11.13
11.50	362.2	5.2	1.02	0.035	0.8	85.0	69.3	85.3	11.58
12.00	757.8	6.8	1.05	0.037	1.3	86.5	112.1	86.9	12.24
12.50	1265.0	8.1	1.08	0.038	1.8	88.0	155.8	88.5	12.85
13.00	1873.3	9.4	1.10	0.038	2.2	89.5	200.1	90.1	13.47

NOTES:

<<<<<< Cross Section: DIV205L: (FN = DIV205L.SEC) >>>>>>

Q1= 1133cfs WS1= 12.38

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .045 CH: .03 ROB: .05: S= .02



Vertical Scale 1: 2
Horizontal Scale 1: 30

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

DIV205 (RIGHT CHANNEL)

CROSS SECTION PARAMETERS: FILENAME: DIV205R.SEC

No. of Cross Section Points: 14 Bed Slope: 0.02200 Max Elev.: 13.50
Bank Stations.....Left: 1003.0 Right....: 1031.0 Min Elev.: 9.60
Encroachment Stations..Left: 1000.0 Right....: 1075.0
Manning-n Values.....LOB: 0.050 CHANNEL..: 0.040 ROB.....: 0.050

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	14.50	906.00	2)	11.50	915.00	3)	11.00	960.00
4)	10.00	961.50	5)	10.00	995.00	6)	10.50	1000.00
7)	9.80	1003.00	8)	9.80	1015.00	9)	10.30	1015.50
10)	10.30	1025.00	11)	9.60	1026.00	12)	9.80	1031.00
13)	10.50	1035.00	14)	13.50	1075.00			

COMPUTED PARAMETERS:

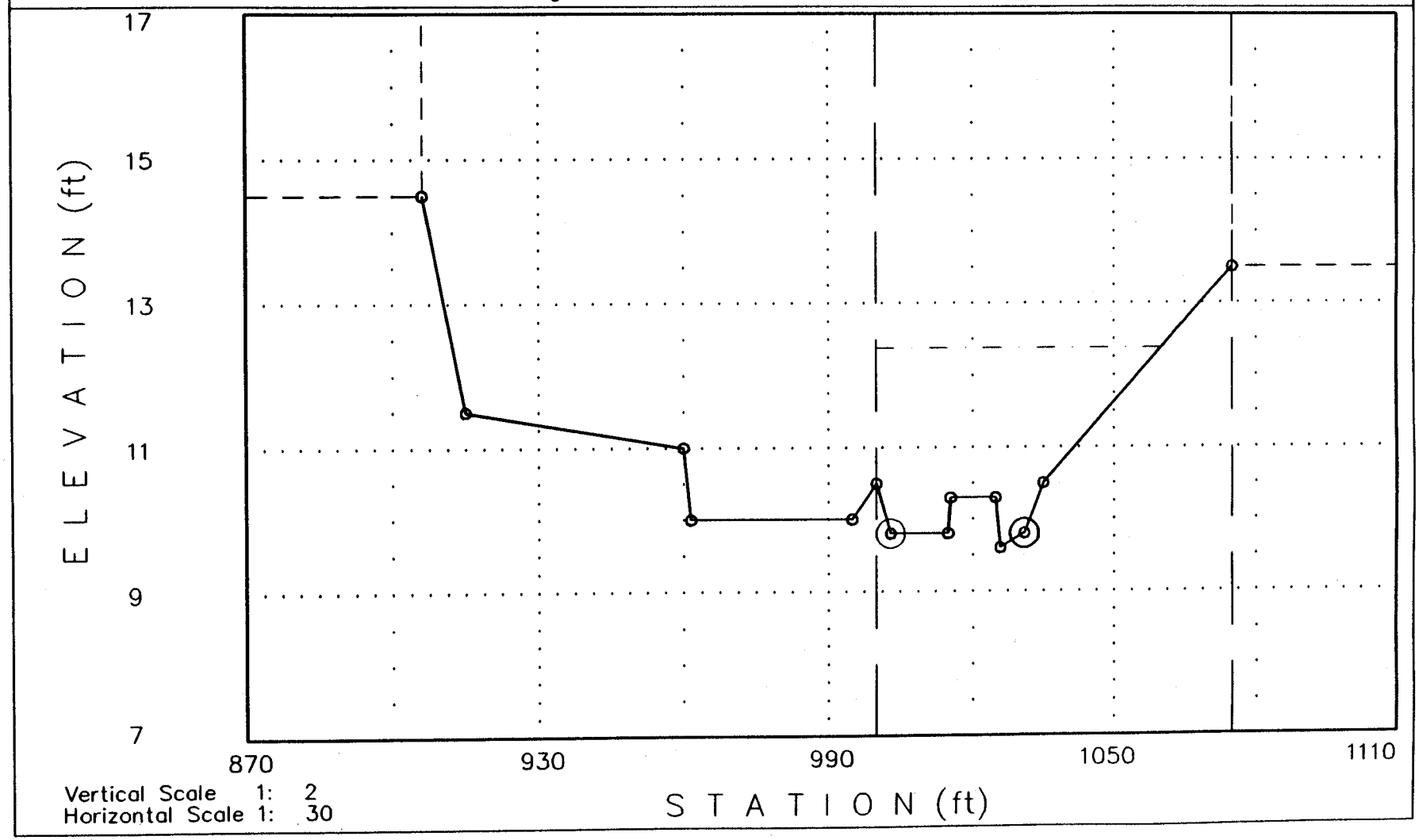
WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.00	8.2	1.9	0.74	0.040	0.2	19.8	4.2	20.0	9.96
10.50	58.1	3.3	0.83	0.041	0.5	35.0	17.5	35.6	10.44
11.00	174.5	4.8	0.89	0.042	0.9	41.7	36.7	42.3	10.95
11.50	345.7	5.8	0.93	0.043	1.2	48.3	59.2	48.9	11.48
12.00	572.8	6.7	0.95	0.043	1.5	55.0	85.0	55.6	11.99
12.50	858.4	7.5	0.97	0.044	1.9	61.7	114.2	62.3	12.49

NOTES:

<<<<<< Cross Section: DIV205R: (FN = DIV205R.SEC) >>>>>>

Q1= 784cfs WS1= 12.38

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .05 CH: .04 ROB: .05: S= .022



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DIV 210

DISCHARGE RATING FOR FLOW DIVERSION
(Q_{C210} VS Q_{DIV210})

$Q_{WASH-5A}$	Q_{C210}	Q_{DIV210}
0	0	0
—	500	79
$\boxed{2492}$ (1)	$\boxed{2612}$	$\boxed{415}$
—	3000	477

WHERE:

$Q_{C210} = Q_{WASH-5A} \times FACTOR1$

$Q_{DIV210} = Q_{C210} \times FACTOR2$

$FACTOR1 = 2612/2492 = 1.048$

$FACTOR2 = 415/2612 = 0.1589$

Notes:
(1) DIV 210 is based on diversion analyses for Wash 5a. The results of these analyses indicated that 559 cfs +/- is diverted.

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DIV 300

DISCHARGE RATING FOR FLOW DIVERSION

(Q_{C300} VS Q_{DIV300})

Q_{WS-18}	Q_{C300}	Q_{DIV300}
0	0	0
340	296	55
1038	903	167
1253	1090	201
1760	1531	283

WHERE:

$Q_{C300} = Q_{WS-18} \times$ FACTOR 1

$Q_{DIV300} = Q_{C300} \times$ FACTOR 2

FACTOR 1 = 0.8699 = 1090/1253 =

FACTOR 2 = 0.1844 = 201/1090 = (DIV300/C300)

Note: DIV300 is based on diversion analyses for Wash 5a

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Appendix B: Wash 5 - Flow Diversion.

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Appendix B
Wash 5 Flow Diversion Analyses

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CVL

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Project: Washba
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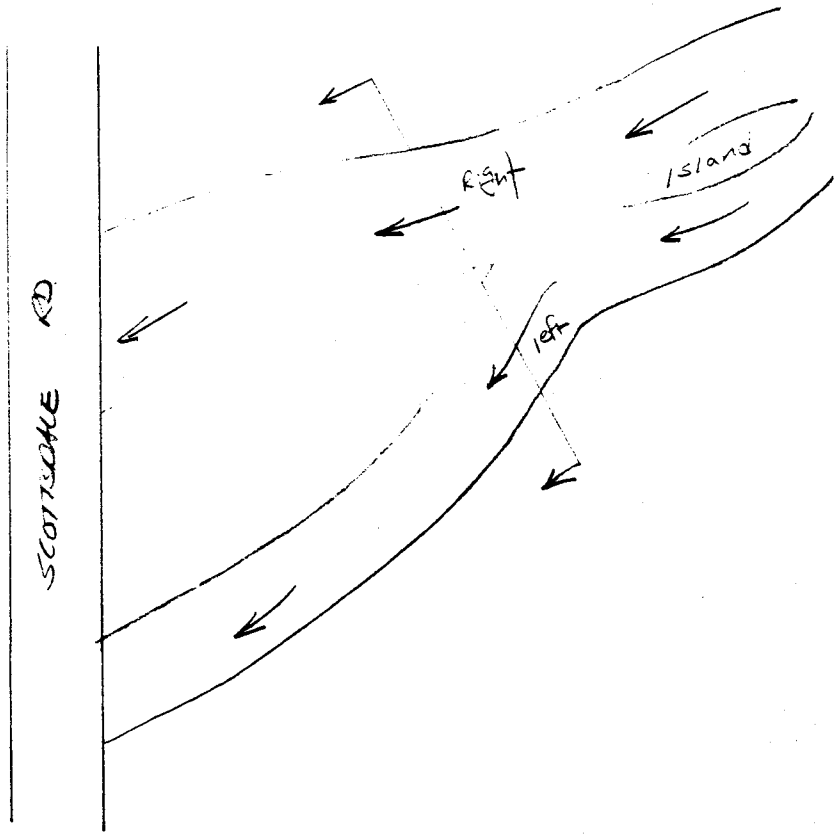
Wash5 W5-5
Split Ratings



Elev	Q cfs Flow (Left)	Q cfs Flow (right)	Q (cfs) Total Flow
11.5	15	288	303
12.0	68	473	541
12.5	161	758	919
13.0	311	1095	1406
13.5	496	1479	1975

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

Sec W5-5 Left

CROSS SECTION PARAMETERS: FILENAME: W5S2LEFT.SEC

No. of Cross Section Points:	14	Bed Slope:	0.01900	Max Elev:	12.3
Bank Stations.....Left:	19.0	Right....:	31.0	Min Elev:	11.0
Encroachment Stations..Left:	10.0	Right....:	39.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	12.3	10.0	2)	12.3	13.0	3)	11.2	19.0	4)	11.2	25.0
5)	11.0	31.0	6)	11.6	34.0	7)	11.6	39.0	8)	11.6	44.0
9)	11.4	46.0	10)	10.3	48.0	11)	10.0	60.0	12)	10.1	73.0
13)	11.1	77.0	14)	11.7	81.0						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
11.50	14.7	2.9	0.912	0.033	0.3	16.0	5.0	16.0
12.00	68.1	4.3	0.939	0.036	0.7	24.4	15.9	24.5
12.50	161.7	5.5	0.973	0.037	1.0	29.0	29.2	29.2
13.00	310.7	7.1	1.021	0.038	1.5	29.0	43.7	29.2
13.50	496.2	8.5	1.060	0.038	2.0	29.0	58.2	29.2
14.00	714.9	9.8	1.094	0.038	2.5	29.0	72.7	29.2

NOTES:

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W5-5 Right

CROSS SECTION PARAMETERS: FILENAME: W5S2RGHT.SEC

No. of Cross Section Points:	14	Bed Slope:	0.01900	Max Elev:	11.7
Bank Stations.....Left:	48.0	Right....:	73.0	Min Elev:	10.0
Encroachment Stations..Left:	39.0	Right....:	81.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	12.3	10.0	2)	12.3	13.0	3)	11.2	19.0	4)	11.2	25.0
5)	11.0	31.0	6)	11.6	34.0	7)	11.6	39.0	8)	11.6	44.0
9)	11.4	46.0	10)	10.3	48.0	11)	10.0	60.0	12)	10.1	73.0
13)	11.1	77.0	14)	11.7	81.0						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
11.00	142.4	5.7	1.106	0.031	0.8	29.9	24.9	30.2
11.50	287.9	7.1	1.142	0.032	1.2	34.4	40.8	34.8
12.00	473.2	7.8	1.137	0.034	1.5	42.0	60.9	42.5
12.50	758.1	9.3	1.168	0.034	2.0	42.0	81.9	42.5
13.00	1094.7	10.6	1.198	0.035	2.5	42.0	102.9	42.5
13.50	1479.4	11.9	1.225	0.035	3.0	42.0	123.9	42.5

NOTES:

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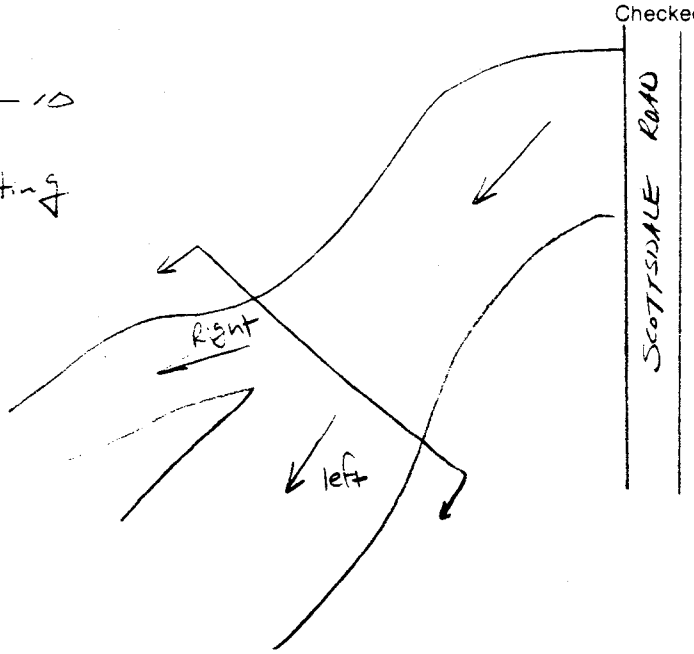
Calculated by: [illegible] Date: 3/9/84
Checked by: DWD Date: 6/84

Split WE – 10

Split Rating



Elev.	Q left (cfs)	Q right (cfs)	Total Q
78.0	59	12	71
78.2	142	33	175
78.4	325	106	431
78.6	585	228	813
78.8	943	393	1,336
79.0	1399	600	1,999

Project Wash 6a
Project No.
Sheet No. 2 of 3
Calculated by DWD Date 8/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-10 Left

CROSS SECTION PARAMETERS: FILENAME: WS5-10LT.SEC

No. of Cross Section Points:	18	Bed Slope:	0.01650	Max Elev:	80.5
Bank Stations.....Left:	1030.0	Right....:	1250.0	Min Elev:	77.5
Encroachment Stations..Left:	1000.0	Right....:	1290.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	80.5	1000.0	2)	78.0	1030.0	3)	77.5	1042.0	4)	78.2	1070.0
5)	78.1	1090.0	6)	78.7	1110.0	7)	78.0	1175.0	8)	77.6	1190.0
9)	78.2	1210.0	10)	77.5	1250.0	11)	78.3	1290.0	12)	78.0	1333.0
13)	77.5	1342.0	14)	78.0	1352.0	15)	78.3	1370.0	16)	78.0	1390.0
17)	78.0	1405.0	18)	78.7	1435.0						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
78.00	58.7	2.2	0.784	0.034	0.2	113.9	27.1	113.9
78.20	141.8	2.5	0.816	0.034	0.3	194.3	56.7	194.4
78.40	325.4	3.3	0.876	0.033	0.4	226.9	99.1	227.0
78.60	585.1	4.0	0.921	0.033	0.6	254.6	147.2	254.7
78.80	943.1	4.7	0.963	0.033	0.7	269.6	200.3	269.7
79.00	1398.7	5.5	1.002	0.033	0.9	272.0	254.5	272.1

NOTES:

Project Wash6a
Project No.
Sheet No. 3 of 3
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-10' Right

CROSS SECTION PARAMETERS: FILENAME: WS5-10RT.SEC

No. of Cross Section Points:	18	Bed Slope:	0.01650	Max Elev:	78.7
Bank Stations.....Left:	1333.0	Right....:	1405.0	Min Elev:	77.5
Encroachment Stations..Left:	1290.0	Right....:	1435.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	80.5	1000.0	2)	78.0	1030.0	3)	77.5	1042.0	4)	78.2	1070.0
5)	78.1	1090.0	6)	78.7	1110.0	7)	78.0	1175.0	8)	77.6	1190.0
9)	78.2	1210.0	10)	77.5	1250.0	11)	78.3	1290.0	12)	78.0	1333.0
13)	77.5	1342.0	14)	78.0	1352.0	15)	78.3	1370.0	16)	78.0	1390.0
17)	78.0	1405.0	18)	78.7	1435.0						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
78.00	12.0	2.5	0.889	0.030	0.3	19.0	4.8	19.0
78.20	33.0	1.9	0.760	0.033	0.2	96.6	17.8	96.6
78.40	105.5	2.5	0.785	0.035	0.3	132.1	42.0	132.2
78.60	227.8	3.3	0.825	0.036	0.5	140.7	69.3	140.8
78.80	393.0	4.0	0.858	0.037	0.7	145.0	98.1	145.0
79.00	600.6	4.7	0.889	0.037	0.9	145.0	127.1	145.0

NOTES:

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Project LOMC

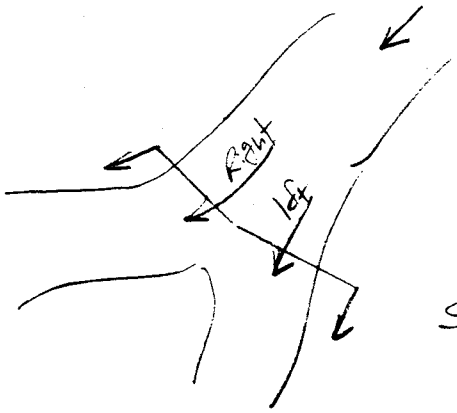
Project No.

Sheet No. 1 of 3

Calculated by Date

Checked by DWD Date 6/94

split WS-11



Schematic

Elev.	Q left cfs	Q right cfs	Q total
68.4	147	68	215
68.6	254	123	377
68.8	397	202	599
69.0	567	299	866
69.2	788	429	1217
69.4	1038	578	1616

Project Wash Ga
Project No.
Sheet No. 2 of 3
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-11 : Right

CROSS SECTION PARAMETERS: FILENAME: WS5-11RT.SEC

No. of Cross Section Points:	9	Bed Slope:	0.02100	Max Elev:	69.0
Bank Stations.....Left:	1170.0	Right....:	1190.0	Min Elev:	67.4
Encroachment Stations..Left:	1140.0	Right....:	1220.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	69.0	1000.0	2)	68.0	1042.0	3)	67.6	1070.0	4)	68.0	1105.0
5)	68.5	1140.0	6)	68.0	1170.0	7)	67.4	1180.0	8)	68.0	1190.0
9)	69.0	1220.0									

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
68.40	67.4	3.2	0.910	0.035	0.4	56.0	21.2	56.0
68.60	122.6	3.6	0.903	0.037	0.5	68.0	33.9	68.1
68.80	201.7	4.2	0.917	0.039	0.7	74.0	48.1	74.1
69.00	298.8	4.7	0.931	0.039	0.8	80.0	63.5	80.1
69.20	429.4	5.4	0.955	0.040	1.0	80.0	79.5	80.1
69.40	578.4	6.1	0.977	0.040	1.2	80.0	95.5	80.1

NOTES:

Project Wash Ga
Project No.
Sheet No. 3 of 3
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS 5-11 : Left

CROSS SECTION PARAMETERS: FILENAME: WS5-11LT.SEC

No. of Cross Section Points:	9	Bed Slope:	0.01500	Max Elev:	69.0
Bank Stations.....Left:	1042.0	Right....:	1105.0	Min Elev:	67.6
Encroachment Stations..Left:	1000.0	Right....:	1140.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	69.0	1000.0	2)	68.0	1042.0	3)	67.6	1070.0	4)	68.0	1105.0
5)	68.5	1140.0	6)	68.0	1170.0	7)	67.4	1180.0	8)	68.0	1190.0
9)	69.0	1220.0									

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
68.40	147.2	3.1	0.842	0.033	0.4	107.8	46.8	107.8
68.60	254.2	3.6	0.845	0.035	0.6	123.2	70.2	123.2
68.80	396.9	4.1	0.857	0.035	0.7	131.6	95.7	131.6
69.00	567.1	4.6	0.868	0.036	0.9	140.0	122.9	140.0
69.20	788.3	5.2	0.887	0.037	1.1	140.0	150.8	140.0
69.40	1037.9	5.8	0.905	0.037	1.3	140.0	178.9	140.0

NOTES:

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Project LOMR
Project No.
Sheet No. 1 of 3
Calculated by US Date 3/10/94
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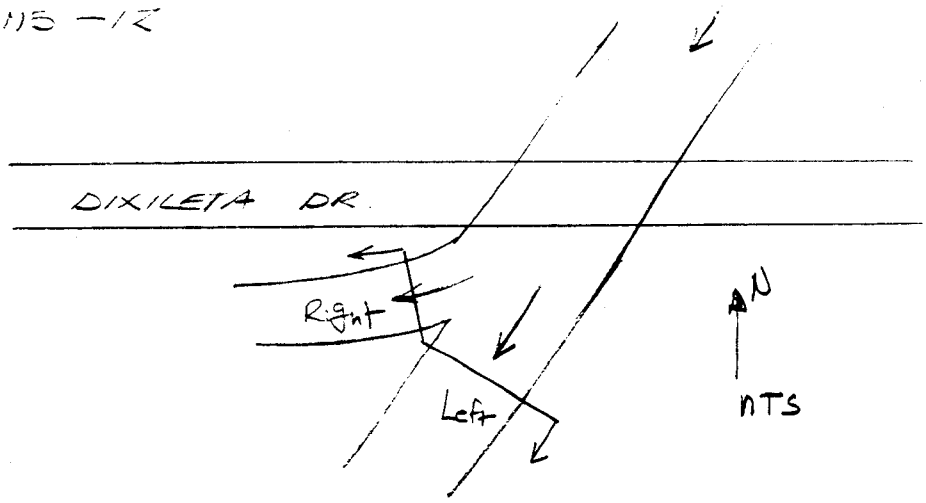
Split NS-12



Split ratings

Elev	Q left (cfs)	Q right (cfs)	Q total (cfs)
11.8	31	1	32
12.2	61	11	72
12.6	152	77	229
13.0	389	230	619
13.4	761	448	1209

Project Wash6a
Project No.
Sheet No. 2 of 3
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-12
Left

CROSS SECTION PARAMETERS: FILENAME: WS5-12LT.SEC

No. of Cross Section Points:	11	Bed Slope:	0.02000	Max Elev:	13.0
Bank Stations.....Left:	1050.0	Right....:	1070.0	Min Elev:	10.8
Encroachment Stations..Left:	1000.0	Right....:	1115.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	13.0	1000.0	2)	12.2	1025.0	3)	12.7	1040.0	4)	12.0	1050.0
5)	10.8	1060.0	6)	12.0	1070.0	7)	12.5	1115.0	8)	12.0	1165.0
9)	11.6	1170.0	10)	12.0	1175.0	11)	13.5	1195.0			

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
11.40	8.0	2.7	0.862	0.035	0.3	10.0	3.0	10.1
11.80	31.4	3.8	0.938	0.035	0.5	16.7	8.3	16.8
12.20	60.8	3.4	0.890	0.036	0.4	40.9	18.1	41.0
12.60	151.9	3.2	0.817	0.040	0.5	98.1	47.2	98.3
13.00	389.2	4.3	0.854	0.042	0.8	115.0	90.5	115.2
13.40	761.3	5.6	0.902	0.042	1.2	115.0	136.5	115.2

NOTES:

Project Washoe
Project No.
Sheet No. 3 of 3
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-12
Right

CROSS SECTION PARAMETERS: FILENAME: WS5-12RT.SEC

No. of Cross Section Points:	11	Bed Slope:	0.02000	Max Elev:	13.5
Bank Stations.....Left:	1165.0	Right....:	1175.0	Min Elev:	11.6
Encroachment Stations..Left:	1115.0	Right....:	1195.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	13.0	1000.0	2)	12.2	1025.0	3)	12.7	1040.0	4)	12.0	1050.0
5)	10.8	1060.0	6)	12.0	1070.0	7)	12.5	1115.0	8)	12.0	1165.0
9)	11.6	1170.0	10)	12.0	1175.0	11)	13.5	1195.0			

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
11.80	0.6	1.3	0.719	0.035	0.1	5.0	0.5	5.0
12.20	11.3	1.8	0.725	0.039	0.2	32.7	6.3	32.7
12.60	76.6	2.7	0.755	0.042	0.4	68.0	27.9	68.1
13.00	229.8	4.1	0.824	0.043	0.8	73.3	56.2	73.4
13.40	448.1	5.2	0.870	0.043	1.1	78.7	86.6	78.8

NOTES:

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Project: Wash 6a
Project No.
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Calculated by _____ Date _____
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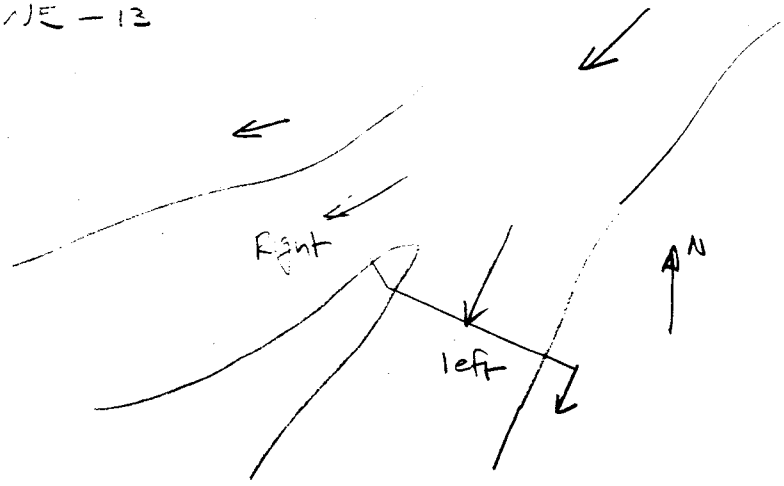
Spit NE-13



Spit Rating

Elev	Q left (cfs)	Q right (cfs)	Q total (cfs)
9.0	12	6	18
9.4	96	64	160
9.8	370	210	580
10.2	847	586	1,433
10.6	1577	1253	2,830
11.0	2483	2109	4592
	1477	1161	2638

0.1274

Project Wash 6a
Project No.
Sheet No. 2 of 3
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-13
Left

CROSS SECTION PARAMETERS: FILENAME: WS5-13LT.SEC

No. of Cross Section Points:	16	Bed Slope:	0.01500	Max Elev:	11.0
Bank Stations.....Left:	1025.0	Right....:	1220.0	Min Elev:	8.6
Encroachment Stations..Left:	1000.0	Right....:	1240.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	11.0	1000.0	2)	10.0	1025.0	3)	8.8	1050.0	4)	9.4	1080.0
5)	9.4	1130.0	6)	8.6	1150.0	7)	10.0	1220.0	8)	10.0	1240.0
9)	10.0	1270.0	10)	8.8	1345.0	11)	9.5	1355.0	12)	9.8	1405.0
13)	8.6	1435.0	14)	10.0	1450.0	15)	10.2	1460.0	16)	10.2	1565.0

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
9.00	11.7	1.6	0.680	0.035	0.2	44.2	7.4	44.2
9.40	96.4	2.6	0.772	0.035	0.4	102.5	36.7	102.5
9.80	370.4	3.6	0.835	0.035	0.6	180.8	103.4	180.9
10.20	846.7	4.6	0.883	0.035	0.8	220.0	184.5	220.1
10.60	1576.9	5.7	0.927	0.036	1.2	230.0	274.5	230.1
11.00	2483.3	6.7	0.958	0.036	1.5	240.0	368.5	240.1

NOTES:

Project WashGa
Project No.
Sheet No. 3 of 3
Calculated by DWD Date 6/96

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-13

Left

CROSS SECTION PARAMETERS: FILENAME: WS5-13RT.SEC

No. of Cross Section Points:	16	Bed Slope:	0.01500	Max Elev:	10.2
Bank Stations.....Left:	1270.0	Right....:	1450.0	Min Elev:	8.6
Encroachment Stations..Left:	1240.0	Right....:	1460.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	11.0	1000.0	2)	10.0	1025.0	3)	8.8	1050.0	4)	9.4	1080.0
5)	9.4	1130.0	6)	8.6	1150.0	7)	10.0	1220.0	8)	10.0	1240.0
9)	10.0	1270.0	10)	8.8	1345.0	11)	9.5	1355.0	12)	9.8	1405.0
13)	8.6	1435.0	14)	10.0	1450.0	15)	10.2	1460.0	16)	10.2	1565.0

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
9.00	6.4	1.5	0.666	0.035	0.1	29.6	4.4	29.7
9.40	63.7	2.5	0.764	0.035	0.3	74.6	25.2	74.7
9.80	209.9	3.0	0.795	0.035	0.4	165.4	71.0	165.5
10.20	585.6	3.9	0.846	0.036	0.7	220.0	148.5	220.1
10.60	1253.1	5.3	0.901	0.036	1.1	220.0	236.5	220.1
11.00	2108.9	6.5	0.943	0.036	1.5	220.0	324.5	220.1

NOTES:

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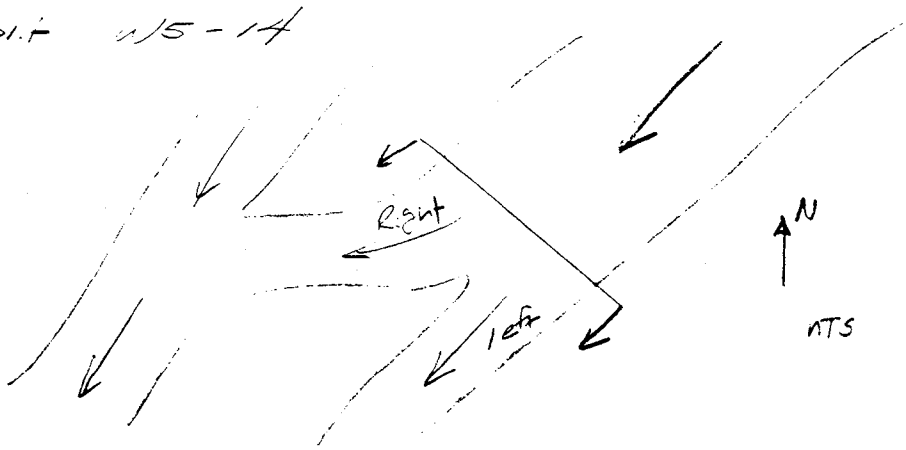
Project: 204K
Project No.:
Sheet No. 1 of 3
Calculated by: Date:
Checked by: DWD Date: 6/94

Split WS-14



Split Rating

Elev	Q_{left} (cfs)	Q_{right} (cfs)	Q_{total} (cfs)	
89.6	27	19	46	
89.8	58	41	99	
90.0	105	74	179	
90.2	168	129	297	
90.4	252	196	448	
90.6	368	274	642	
	188	145	333	0.7616

Project Wash 6a
Project No.
Sheet No. 2 of 3
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-14
Left

CROSS SECTION PARAMETERS: FILENAME: WS5-14LT.SEC

No. of Cross Section Points:	10	Bed Slope:	0.01900	Max Elev:	92.0
Bank Stations.....Left:	1058.0	Right....:	1080.0	Min Elev:	89.0
Encroachment Stations..Left:	1000.0	Right....:	1135.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.035

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	92.0	1000.0	2)	90.0	1058.0	3)	89.0	1070.0	4)	90.0	1080.0
5)	90.5	1090.0	6)	90.0	1100.0	7)	89.0	1115.0	8)	90.0	1135.0
9)	89.0	1160.0	10)	90.0	1175.0						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
89.60	26.9	2.6	0.842	0.035	0.3	34.2	10.3	34.3
89.80	57.8	3.2	0.884	0.035	0.4	45.6	18.2	45.7
90.00	104.9	3.7	0.917	0.035	0.5	57.0	28.5	57.1
90.20	167.6	4.1	0.937	0.035	0.6	70.8	41.3	71.0
90.40	251.5	4.4	0.952	0.035	0.7	84.6	56.8	84.8
90.60	367.6	4.9	0.971	0.036	0.8	94.4	74.9	94.6

NOTES:

Project Washa
Project No.
Sheet No. 3 of 3
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-14
Right

CROSS SECTION PARAMETERS: FILENAME: WS5-14RT.SEC

No. of Cross Section Points:	10	Bed Slope:	0.01900	Max Elev:	90.0
Bank Stations.....Left:	1135.0	Right....:	1175.0	Min Elev:	89.0
Encroachment Stations..Left:	1135.0	Right....:	1175.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.035

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	92.0	1000.0	2)	90.0	1058.0	3)	89.0	1070.0	4)	90.0	1080.0
5)	90.5	1090.0	6)	90.0	1100.0	7)	89.0	1115.0	8)	90.0	1135.0
9)	89.0	1160.0	10)	90.0	1175.0						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
89.60	18.9	2.6	0.843	0.035	0.3	24.0	7.2	24.0
89.80	40.6	3.2	0.884	0.035	0.4	32.0	12.8	32.0
90.00	73.7	3.7	0.918	0.035	0.5	40.0	20.0	40.1
90.20	129.1	4.6	0.971	0.035	0.7	40.0	28.0	40.1
90.40	196.2	5.5	1.012	0.035	0.9	40.0	36.0	40.1
90.60	274.2	6.2	1.047	0.035	1.1	40.0	44.0	40.1

NOTES:

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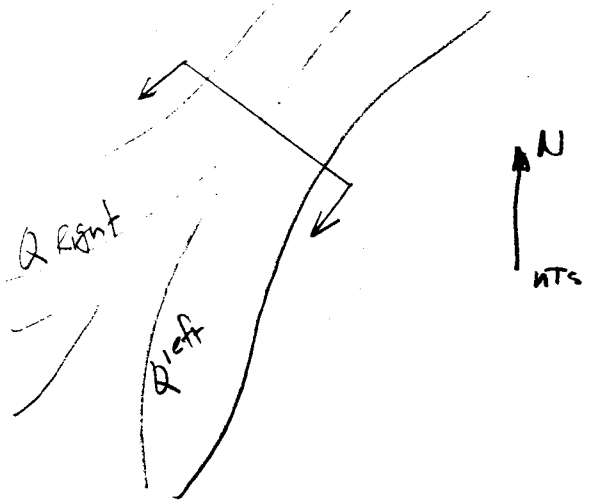
Split WS-15



Elev	Q left (cfs)	Q right (cfs)	Q total (cfs)
79.8	3	4	7
80.0	33	24	57
80.2	121	76	197
80.4	250	149	399
80.6	414	241	655

Project Wash 6a
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-15 Left

CROSS SECTION PARAMETERS: FILENAME: WS5-15LT.SEC

No. of Cross Section Points:	7	Bed Slope:	0.01600	Max Elev:	80.0
Bank Stations.....Left:	1000.0	Right....:	1120.0	Min Elev:	79.6
Encroachment Stations..Left:	1000.0	Right....:	1120.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	80.0	1000.0	2)	79.7	1060.0	3)	80.0	1080.0	4)	79.6	1100.0
5)	80.0	1120.0	6)	79.6	1160.0	7)	80.0	1185.0			

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
79.80	3.1	0.9	0.610	0.035	0.1	46.7	3.3	46.7
80.00	32.5	1.6	0.702	0.035	0.2	120.0	20.0	120.0
80.20	121.0	2.8	0.801	0.035	0.4	120.0	44.0	120.0
80.40	250.1	3.7	0.861	0.035	0.6	120.0	68.0	120.0
80.60	413.8	4.5	0.905	0.035	0.8	120.0	92.0	120.0
80.80	609.0	5.3	0.941	0.035	1.0	120.0	116.0	120.0

NOTES:

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-15 : Right

CROSS SECTION PARAMETERS: FILENAME: WS5-15RT.SEC

No. of Cross Section Points:	7	Bed Slope:	0.01600	Max Elev:	80.0
Bank Stations.....Left:	1120.0	Right....:	1185.0	Min Elev:	79.6
Encroachment Stations..Left:	1120.0	Right....:	1185.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	80.0	1000.0	2)	79.7	1060.0	3)	80.0	1080.0	4)	79.6	1100.0
5)	80.0	1120.0	6)	79.6	1160.0	7)	80.0	1185.0			

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
79.80	3.8	1.2	0.645	0.035	0.1	32.5	3.3	32.5
80.00	23.9	1.8	0.724	0.035	0.2	65.0	13.0	65.0
80.20	75.8	2.9	0.812	0.035	0.4	65.0	26.0	65.0
80.40	149.0	3.8	0.869	0.035	0.6	65.0	39.0	65.0
80.60	240.6	4.6	0.912	0.035	0.8	65.0	52.0	65.0
80.80	349.1	5.4	0.946	0.035	1.0	65.0	65.0	65.0

NOTES:

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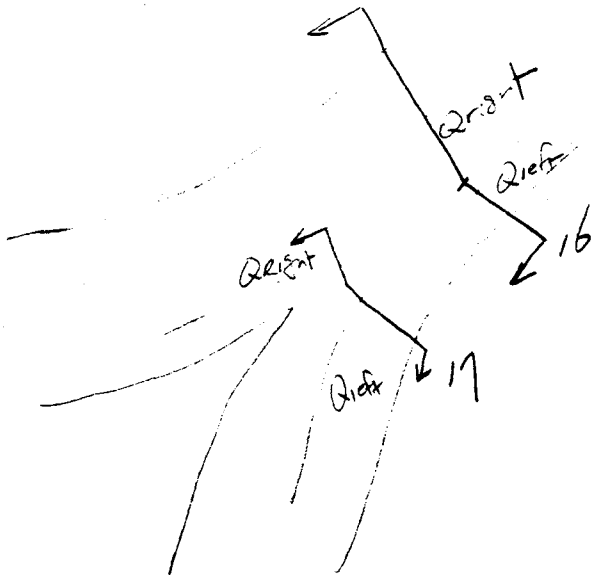
Split WS-16



Elev.	Qleft (cfs)	Qright (cfs)	Qtotal (cfs)
100.2	92	70	162
100.6	222	296	518
101.0	486	839	1325
101.4	828	1589	2414

Split WS-17

Elev.	Qleft (cfs)	Qright (cfs)	Qtotal
94.0	27	109	136
94.2	67	196	263
94.4	135	315	450
94.6	222	456	678

Project Wash6a
Project No.
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-16 : Left

CROSS SECTION PARAMETERS: FILENAME: WS5-16LT.SEC

No. of Cross Section Points:	12	Bed Slope:	0.01800	Max Elev:	100.6
Bank Stations.....Left:	1033.0	Right....:	1072.0	Min Elev:	99.1
Encroachment Stations..Left:	1000.0	Right....:	1090.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	100.6	1000.0	2)	100.0	1033.0	3)	99.1	1053.0	4)	100.0	1072.0
5)	100.5	1090.0	6)	100.0	1175.0	7)	100.0	1193.0	8)	100.6	1265.0
9)	100.0	1295.0	10)	98.7	1302.0	11)	100.0	1320.0	12)	100.2	1330.0

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
99.40	3.1	1.6	0.731	0.035	0.2	13.0	2.0	13.0
99.80	30.0	2.8	0.842	0.035	0.4	30.3	10.6	30.4
100.20	92.3	3.4	0.869	0.036	0.5	57.2	27.2	57.2
100.60	221.6	3.9	0.858	0.038	0.6	90.0	57.1	90.1
101.00	486.0	5.2	0.904	0.039	1.0	90.0	93.2	90.1
101.40	827.5	6.4	0.943	0.040	1.4	90.0	129.2	90.1

NOTES:

Project Wash6a
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-16 Right

CROSS SECTION PARAMETERS: FILENAME: WS5-16RT.SEC

No. of Cross Section Points:	12	Bed Slope:	0.01800	Max Elev:	100.6
Bank Stations.....Left:	1295.0	Right....:	1320.0	Min Elev:	98.7
Encroachment Stations..Left:	1090.0	Right....:	1330.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	100.6	1000.0	2)	100.0	1033.0	3)	99.1	1053.0	4)	100.0	1072.0
5)	100.5	1090.0	6)	100.0	1175.0	7)	100.0	1193.0	8)	100.6	1265.0
9)	100.0	1295.0	10)	98.7	1302.0	11)	100.0	1320.0	12)	100.2	1330.0

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
99.40	13.3	2.8	0.839	0.035	0.4	13.5	4.7	13.6
99.80	44.3	3.8	0.905	0.035	0.6	21.2	11.6	21.3
100.20	70.3	2.2	0.731	0.039	0.3	120.3	32.6	120.5
100.60	295.5	2.8	0.728	0.042	0.4	237.9	106.8	238.1
101.00	838.5	4.1	0.793	0.043	0.8	240.0	202.8	240.2
101.40	1588.5	5.3	0.840	0.043	1.2	240.0	298.8	240.2

NOTES:

Project Wash66
Project No.
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-17
Left

CROSS SECTION PARAMETERS: FILENAME: WS5-17LT.SEC

No. of Cross Section Points:	10	Bed Slope:	0.01500	Max Elev:	94.2
Bank Stations.....Left:	1010.0	Right....:	1063.0	Min Elev:	93.5
Encroachment Stations..Left:	1000.0	Right....:	1070.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	94.2	1000.0	2)	94.0	1010.0	3)	93.5	1040.0	4)	94.0	1063.0
5)	94.2	1070.0	6)	93.4	1080.0	7)	93.7	1115.0	8)	93.3	1150.0
9)	94.0	1165.0	10)	94.2	1170.0						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
94.00	27.3	2.1	0.727	0.035	0.3	53.0	13.3	53.0
94.20	66.5	2.6	0.759	0.036	0.4	70.0	25.5	70.0
94.40	135.3	3.4	0.802	0.036	0.6	70.0	39.6	70.0
94.60	222.2	4.2	0.836	0.037	0.8	70.0	53.5	70.0
94.80	325.7	4.8	0.865	0.037	1.0	70.0	67.6	70.0
95.00	444.3	5.4	0.890	0.037	1.2	70.0	81.6	70.0

NOTES:

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS5-17
Right

CROSS SECTION PARAMETERS: FILENAME: WS5-17RT.SEC

No. of Cross Section Points:	10	Bed Slope:	0.01500	Max Elev:	94.2
Bank Stations.....Left:	1115.0	Right....:	1165.0	Min Elev:	93.3
Encroachment Stations..Left:	1070.0	Right....:	1170.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	94.2	1000.0	2)	94.0	1010.0	3)	93.5	1040.0	4)	94.0	1063.0
5)	94.2	1070.0	6)	93.4	1080.0	7)	93.7	1115.0	8)	93.3	1150.0
9)	94.0	1165.0	10)	94.2	1170.0						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
93.60	9.0	1.2	0.590	0.039	0.1	58.5	7.5	58.5
93.80	44.0	1.9	0.653	0.039	0.3	85.7	22.9	85.7
94.00	108.5	2.7	0.707	0.040	0.4	92.5	40.8	92.5
94.20	195.6	3.3	0.742	0.040	0.6	100.0	60.0	100.1
94.40	315.0	3.9	0.776	0.040	0.8	100.0	80.0	100.1
94.60	456.2	4.6	0.804	0.040	1.0	100.0	100.0	100.1

NOTES:

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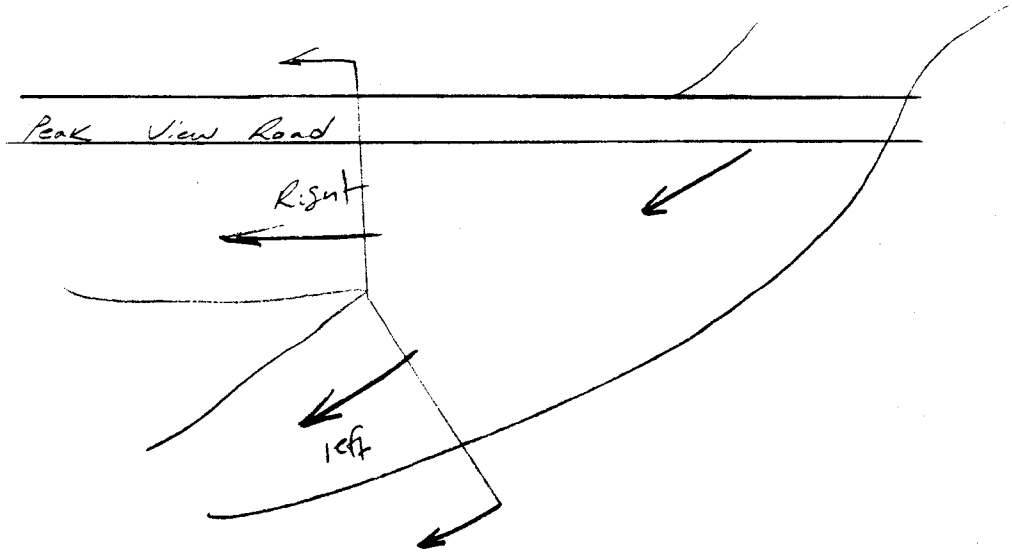
Split W5-18



Elev	Q left	Q right	Q total	
59.0	34	139	173	
59.4	91	249	340	
59.8	189	463	652	
60.2	313	725	1038	
60.6	447	1313	1760	
	379	1,014	1393	0.508

Project Wash 6a
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-18 : Left

CROSS SECTION PARAMETERS: FILENAME: WS5-18LT.SEC

No. of Cross Section Points:	19	Bed Slope:	0.01600	Max Elev:	61.0
Bank Stations.....Left:	1050.0	Right....:	1068.0	Min Elev:	57.8
Encroachment Stations..Left:	1000.0	Right....:	1210.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	61.0	1000.0	2)	60.0	1050.0	3)	57.8	1060.0	4)	60.0	1068.0
5)	60.7	1080.0	6)	60.5	1140.0	7)	58.3	1170.0	8)	61.0	1210.0
9)	60.0	1250.0	10)	59.0	1260.0	11)	60.3	1280.0	12)	58.0	1300.0
13)	58.3	1340.0	14)	60.0	1362.0	15)	60.3	1400.0	16)	60.0	1430.0
17)	59.0	1470.0	18)	60.0	1490.0	19)	61.0	1530.0			

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
59.00	33.8	2.6	0.705	0.041	0.4	29.7	12.9	30.1
59.40	91.2	3.3	0.735	0.041	0.6	44.4	27.7	44.9
59.80	189.4	3.9	0.762	0.042	0.8	59.0	48.4	59.6
60.20	313.1	4.1	0.768	0.042	0.9	85.5	76.1	86.2
60.60	446.7	3.7	0.745	0.043	0.8	152.4	119.4	153.1
61.00	817.3	4.2	0.757	0.043	0.9	210.0	196.6	210.7

NOTES:

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W5-18
Right

CROSS SECTION PARAMETERS: FILENAME: WS5-18RT.SEC

No. of Cross Section Points:	19	Bed Slope:	0.01600	Max Elev:	61.0
Bank Stations.....Left:	1250.0	Right....:	1280.0	Min Elev:	58.0
Encroachment Stations..Left:	1210.0	Right....:	1530.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	61.0	1000.0	2)	60.0	1050.0	3)	57.8	1060.0	4)	60.0	1068.0
5)	60.7	1080.0	6)	60.5	1140.0	7)	58.3	1170.0	8)	61.0	1210.0
9)	60.0	1250.0	10)	59.0	1260.0	11)	60.3	1280.0	12)	58.0	1300.0
13)	58.3	1340.0	14)	60.0	1362.0	15)	60.3	1400.0	16)	60.0	1430.0
17)	59.0	1470.0	18)	60.0	1490.0	19)	61.0	1530.0			

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
59.00	139.0	3.3	0.696	0.045	0.7	57.8	41.5	57.8
59.40	248.5	3.4	0.701	0.045	0.7	100.6	73.2	100.7
59.80	463.3	3.8	0.726	0.044	0.9	143.4	122.0	143.6
60.20	725.0	3.8	0.728	0.044	0.8	230.9	192.4	231.3
60.60	1313.6	4.4	0.756	0.044	1.0	288.0	299.9	288.3
61.00	2159.3	5.1	0.787	0.044	1.3	320.0	421.5	320.4

NOTES:

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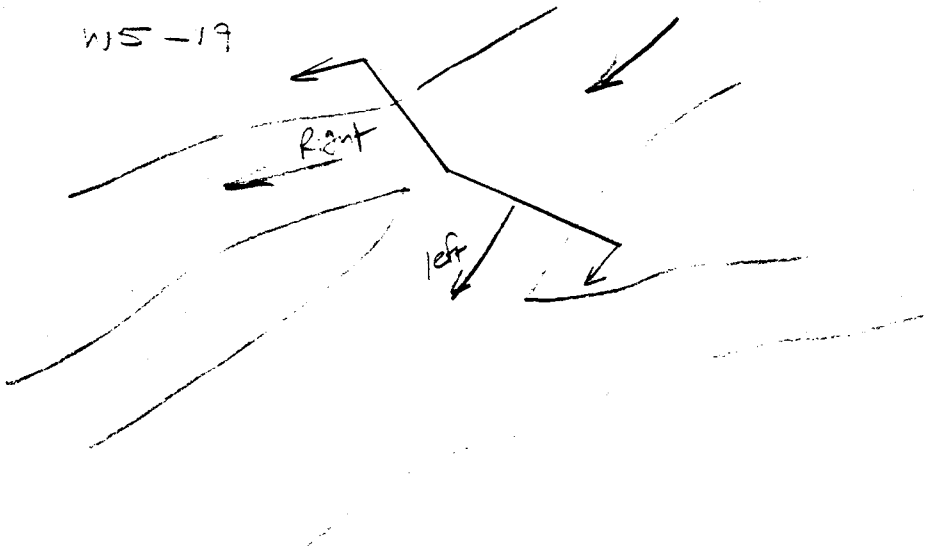
Spit WS-19



Elev.	Q_{left}	Q_{right}	Q_{total}
61.4	61	12	73
61.6	129	26	155
61.8	223	38	261

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-19 : Left

CROSS SECTION PARAMETERS: FILENAME: WS5-19LT.SEC

No. of Cross Section Points:	12	Bed Slope:	0.02000	Max Elev:	62.0
Bank Stations.....Left:	1040.0	Right....:	1080.0	Min Elev:	60.8
Encroachment Stations..Left:	1000.0	Right....:	1170.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	62.0	1000.0	2)	61.8	1020.0	3)	61.9	1040.0	4)	60.8	1065.0
5)	62.0	1080.0	6)	61.0	1110.0	7)	61.0	1150.0	8)	62.0	1170.0
9)	60.8	1185.0	10)	62.0	1200.0	11)	61.7	1220.0	12)	62.0	1240.0

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
61.20	18.8	1.6	0.654	0.043	0.2	64.1	11.8	64.1
61.40	61.2	2.3	0.719	0.043	0.3	81.1	26.3	81.2
61.60	128.5	2.9	0.761	0.043	0.5	98.2	44.3	98.3
61.80	223.1	3.4	0.794	0.042	0.6	115.2	65.6	115.3
62.00	320.2	3.4	0.791	0.042	0.6	170.0	95.3	170.1
62.20	531.6	4.1	0.831	0.043	0.8	170.0	129.3	170.1

NOTES:

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-19: Right

CROSS SECTION PARAMETERS: FILENAME: WS5-19RT.SEC

No. of Cross Section Points:	12	Bed Slope:	0.02000	Max Elev:	62.0
Bank Stations.....Left:	1170.0	Right....:	1200.0	Min Elev:	60.8
Encroachment Stations..Left:	1170.0	Right....:	1240.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	62.0	1000.0	2)	61.8	1020.0	3)	61.9	1040.0	4)	60.8	1065.0
5)	62.0	1080.0	6)	61.0	1110.0	7)	61.0	1150.0	8)	62.0	1170.0
9)	60.8	1185.0	10)	62.0	1200.0	11)	61.7	1220.0	12)	62.0	1240.0

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
61.40	12.1	2.7	0.864	0.035	0.3	15.0	4.5	15.0
61.60	26.0	3.3	0.906	0.035	0.4	20.0	8.0	20.1
61.80	38.1	2.9	0.871	0.036	0.3	38.3	13.2	38.4
62.00	65.6	2.7	0.823	0.038	0.3	70.0	24.0	70.1
62.20	136.7	3.6	0.861	0.039	0.5	70.0	38.0	70.1
62.40	227.4	4.4	0.894	0.039	0.7	70.0	52.0	70.1

NOTES:

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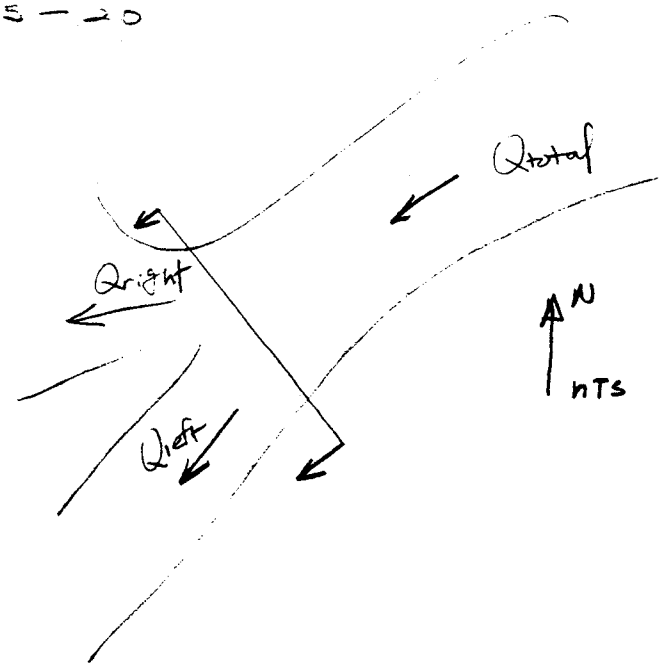
Split WS-20



split ratings

Elev.	Qleft	Qright	Qtotal
5.4	8	7	15
5.8	55	56	111
6.2	249	165	414
6.6	648	358	1,006
7.0	1191	621	1,812
7.4	1865	940	2,805

Project Wash6a
Project No.
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-20 Left

CROSS SECTION PARAMETERS: FILENAME: WS5-20LT.SEC

No. of Cross Section Points:	12	Bed Slope:	0.01800	Max Elev:	7.5
Bank Stations.....Left:	1030.0	Right....:	1118.0	Min Elev:	5.0
Encroachment Stations..Left:	1000.0	Right....:	1180.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	7.5	1000.0	2)	6.0	1030.0	3)	5.8	1075.0	4)	5.0	1100.0
5)	6.0	1118.0	6)	5.4	1152.0	7)	6.0	1180.0	8)	5.2	1185.0
9)	5.7	1200.0	10)	5.0	1220.0	11)	6.0	1235.0	12)	6.3	1250.0

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
5.40	7.7	1.9	0.767	0.035	0.2	19.7	3.9	19.7
5.80	55.3	2.3	0.744	0.039	0.3	80.7	24.0	80.8
6.20	249.3	3.2	0.799	0.039	0.5	154.0	77.5	154.1
6.60	648.3	4.6	0.871	0.039	0.9	162.0	140.7	162.1
7.00	1191.0	5.8	0.918	0.040	1.2	170.0	207.1	170.1
7.40	1865.3	6.7	0.953	0.040	1.6	178.0	276.7	178.1

NOTES:

Project Wash6a
Project No.
Sheet No. 3 of 3
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-20 Right

CROSS SECTION PARAMETERS: FILENAME: WS5-20RT.SEC

No. of Cross Section Points:	12	Bed Slope:	0.01800	Max Elev:	6.3
Bank Stations.....Left:	1200.0	Right....:	1235.0	Min Elev:	5.0
Encroachment Stations..Left:	1180.0	Right....:	1250.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	7.5	1000.0	2)	6.0	1030.0	3)	5.8	1075.0	4)	5.0	1100.0
5)	6.0	1118.0	6)	5.4	1152.0	7)	6.0	1180.0	8)	5.2	1185.0
9)	5.7	1200.0	10)	5.0	1220.0	11)	6.0	1235.0	12)	6.3	1250.0

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
5.40	6.9	1.7	0.710	0.037	0.2	24.3	4.2	24.4
5.80	55.7	2.8	0.785	0.038	0.4	50.8	20.0	50.8
6.20	164.9	3.9	0.845	0.039	0.7	65.0	42.5	65.1
6.60	357.5	5.1	0.894	0.039	1.0	70.0	70.3	70.1
7.00	621.0	6.3	0.940	0.040	1.4	70.0	98.3	70.1
7.40	939.7	7.4	0.976	0.040	1.8	70.0	126.3	70.1

NOTES:

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Project LOMR

Project No.

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Calculated by Date

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Spit WS-21

WSEL	Qleft (cfs)	Qright (cfs)	Qtotal (cfs)
99.2	14	19	33
99.4	41	39	80
99.6	86	71	157
99.80	154	113	267
100.00	251	199	450
100.20	415	309	724

Project Wash6a
Project No.
Sheet No. 2 of 3
Calculated by Date

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-21: Left

CROSS SECTION PARAMETERS: FILENAME: WS5-21LT.SEC

No. of Cross Section Points:	7	Bed Slope:	0.01600	Max Elev:	100.0
Bank Stations.....Left:	1060.0	Right....:	1115.0	Min Elev:	98.8
Encroachment Stations..Left:	1000.0	Right....:	1142.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	100.0	1000.0	2)	99.5	1060.0	3)	98.8	1115.0	4)	100.0	1142.0
5)	98.6	1165.0	6)	99.6	1195.0	7)	99.6	1230.0			

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
99.20	13.9	1.7	0.678	0.037	0.2	40.4	8.1	40.4
99.40	41.0	2.3	0.726	0.037	0.3	60.6	18.2	60.7
99.60	86.0	2.6	0.752	0.038	0.4	85.0	32.5	85.0
99.80	153.5	2.9	0.760	0.038	0.5	113.5	52.4	113.5
100.00	250.8	3.2	0.765	0.039	0.5	142.0	77.9	142.0
100.20	414.9	3.9	0.794	0.040	0.7	142.0	106.3	142.0

NOTES:

Project Wash 6a
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-21 : Right

CROSS SECTION PARAMETERS: FILENAME: WS5-21RT.SEC

No. of Cross Section Points:	7	Bed Slope:	0.01600	Max Elev:	100.0
Bank Stations.....Left:	1165.0	Right....:	1195.0	Min Elev:	98.6
Encroachment Stations..Left:	1142.0	Right....:	1230.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	100.0	1000.0	2)	99.5	1060.0	3)	98.8	1115.0	4)	100.0	1142.0
5)	98.6	1165.0	6)	99.6	1195.0	7)	99.6	1230.0			

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
99.20	18.2	2.2	0.700	0.039	0.3	27.9	8.4	27.9
99.40	39.2	2.6	0.735	0.039	0.4	37.1	14.9	37.2
99.60	71.0	3.1	0.762	0.039	0.5	46.4	23.2	46.5
99.80	113.4	2.8	0.732	0.040	0.5	84.7	39.8	84.8
100.00	198.9	3.5	0.762	0.040	0.6	88.0	57.1	88.1
100.20	308.9	4.1	0.791	0.041	0.8	88.0	74.7	88.1

NOTES:

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Project: LOMR
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split WS-23

Elev	Q left (cfs)	Q right (cfs)	Q total (cfs)
84.6	23	14	37
85.0	89	48	137
85.4	218	143	361
85.8	435	345	780
86.2	769	633	1402

Project Wash 6a
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-23 Left

CROSS SECTION PARAMETERS: FILENAME: WS5-23LT.SEC

No. of Cross Section Points:	8	Bed Slope:	0.01900	Max Elev:	86.0
Bank Stations.....Left:	1000.0	Right....:	1090.0	Min Elev:	84.0
Encroachment Stations..Left:	1000.0	Right....:	1090.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	86.0	1000.0	2)	84.0	1070.0	3)	85.5	1090.0	4)	84.0	1120.0
5)	86.0	1140.0	6)	86.0	1200.0	7)	84.8	1255.0	8)	86.0	1290.0

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
84.60	22.8	2.6	0.843	0.035	0.3	29.0	8.7	29.0
85.00	89.0	3.7	0.918	0.035	0.5	48.3	24.2	48.4
85.40	218.4	4.6	0.971	0.035	0.7	67.7	47.4	67.7
85.80	434.9	5.6	1.019	0.035	0.9	83.0	77.7	83.1
86.20	769.2	6.8	1.071	0.035	1.3	90.0	113.0	90.1
86.60	1219.6	8.2	1.121	0.035	1.7	90.0	149.0	90.1

NOTES:

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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-23: Right

CROSS SECTION PARAMETERS: FILENAME: WS5-23RT.SEC

No. of Cross Section Points:	8	Bed Slope:	0.01900	Max Elev:	86.0
Bank Stations.....Left:	1090.0	Right....:	1140.0	Min Elev:	84.0
Encroachment Stations..Left:	1090.0	Right....:	1290.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	86.0	1000.0	2)	84.0	1070.0	3)	85.5	1090.0	4)	84.0	1120.0
5)	86.0	1140.0	6)	86.0	1200.0	7)	84.8	1255.0	8)	86.0	1290.0

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
84.60	14.1	2.6	0.842	0.035	0.3	18.0	5.4	18.0
85.00	48.1	2.9	0.848	0.036	0.4	45.0	16.5	45.1
85.40	143.1	3.3	0.837	0.038	0.5	87.0	42.9	87.1
85.80	345.1	4.1	0.858	0.040	0.7	123.0	85.2	123.2
86.20	633.3	4.2	0.846	0.041	0.8	200.0	151.5	200.2
86.60	1263.0	5.5	0.894	0.041	1.2	200.0	231.5	200.2

NOTES:

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Project: LOHR
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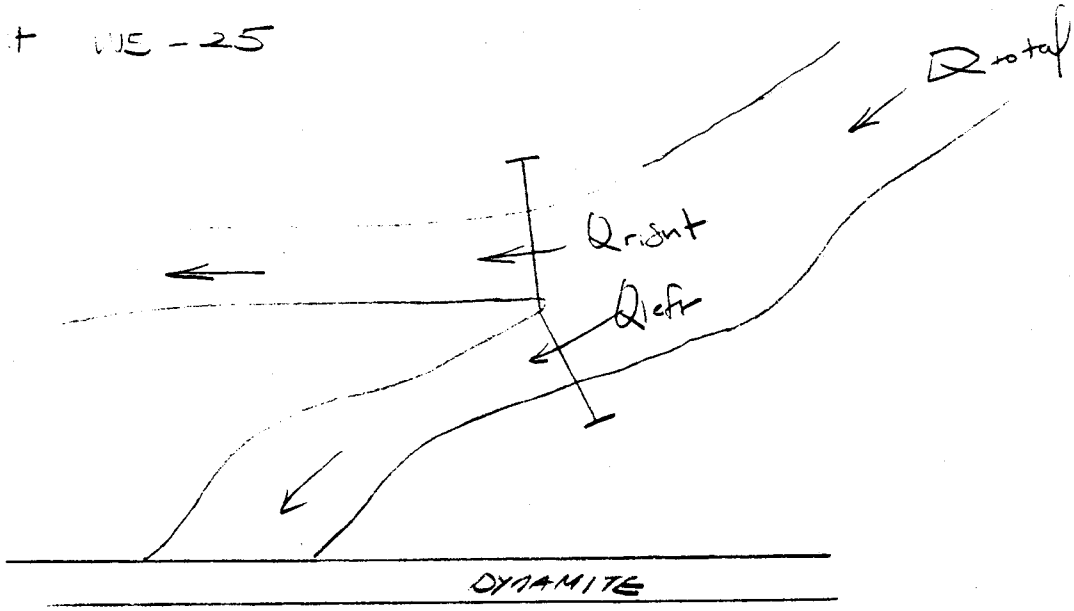
Checked by: DWD Date: 6/94

split WE-25



Elev.	Q left (cfs)	Q right (cfs)	Q total (cfs)
66.6	236	50	286
66.8	379	124	503
67.0	548	236	784
67.2	741	410	1151
67.4	957	624	1581

Project Wash 6a
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-25 : Left

CROSS SECTION PARAMETERS: FILENAME: WS5-25LT.SEC

No. of Cross Section Points:	10	Bed Slope:	0.01800	Max Elev:	66.5
Bank Stations.....Left:	1021.0	Right....:	1072.0	Min Elev:	65.6
Encroachment Stations..Left:	1000.0	Right....:	1110.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	66.5	1000.0	2)	66.0	1021.0	3)	65.6	1052.0	4)	66.0	1072.0
5)	66.3	1110.0	6)	66.3	1142.0	7)	67.0	1170.0	8)	66.2	1210.0
9)	66.2	1220.0	10)	68.0	1280.0						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
66.40	125.7	2.9	0.795	0.038	0.4	105.8	43.5	105.8
66.60	236.1	3.6	0.828	0.039	0.6	110.0	65.2	110.0
66.80	379.2	4.3	0.860	0.039	0.8	110.0	87.3	110.0
67.00	548.1	5.0	0.887	0.040	1.0	110.0	109.2	110.0
67.20	741.1	5.6	0.911	0.040	1.2	110.0	131.2	110.0
67.40	956.7	6.2	0.932	0.040	1.4	110.0	153.3	110.0

NOTES:

Project Wash 6a
Project No.
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-25: Right

CROSS SECTION PARAMETERS: FILENAME: WS5-25RT.SEC

No. of Cross Section Points:	10	Bed Slope:	0.01800	Max Elev:	68.0
Bank Stations.....Left:	1170.0	Right....:	1280.0	Min Elev:	66.2
Encroachment Stations..Left:	1110.0	Right....:	1280.0		
Manning-n Values.....LOB:	0.035	CHANNEL..:	0.035	ROB.....:	0.045

CROSS SECTION POINTS:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	66.5	1000.0	2)	66.0	1021.0	3)	65.6	1052.0	4)	66.0	1072.0
5)	66.3	1110.0	6)	66.3	1142.0	7)	67.0	1170.0	8)	66.2	1210.0
9)	66.2	1220.0	10)	68.0	1280.0						

COMPUTED PARAMETERS:

WSEL	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
66.40	9.4	1.3	0.698	0.035	0.1	62.7	7.1	62.7
66.60	50.2	2.3	0.798	0.035	0.3	87.3	22.1	87.3
66.80	124.4	3.0	0.852	0.035	0.4	112.0	42.0	112.0
67.00	236.5	3.5	0.891	0.035	0.5	136.7	66.9	136.7
67.20	410.3	4.3	0.937	0.035	0.7	143.3	94.9	143.4
67.40	623.7	5.0	0.973	0.035	0.8	150.0	124.2	150.0

NOTES:

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Project: WashGA
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Flow Split: WS-30

Stage	Q Left (cfs)	Q Right (cfs)	Q Total (cfs)
10.0	0	0	0
10.5	12	0.7	12.7
11.0	46	39	85
11.5	201	121	322
11.8	365	181	546
12.0	495	219	714
12.2	640	277	917

Project Wash6a
Project No.
Sheet No. 2 of 3
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W5-30 : Left

CROSS SECTION PARAMETERS: FILENAME: W5-30LT.SEC

No. of Cross Section Points: 13 Bed Slope: 0.01860 Max Elev.: 11.30
Bank Stations.....Left: 105.0 Right....: 111.0 Min Elev.: 10.00
Encroachment Stations..Left: 65.0 Right....: 138.0
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.030 ROB.....: 0.035

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	11.30	65.00	2)	10.80	85.00	3)	10.60	100.00
4)	10.00	105.00	5)	10.00	111.00	6)	10.40	111.10
7)	10.80	115.00	8)	11.10	130.00	9)	11.25	138.00
10)	10.50	142.00	11)	10.40	157.80	12)	11.70	164.00
13)	12.10	174.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.50	12.3	3.0	0.87	0.034	0.4	11.2	4.1	11.6	10.47
11.00	46.3	2.7	0.78	0.039	0.4	48.0	17.4	48.4	10.99
11.50	200.9	4.0	0.84	0.040	0.7	73.0	50.5	73.4	11.49
11.80	364.6	5.0	0.89	0.040	1.0	73.0	72.4	73.4	11.80
12.00	494.5	5.7	0.92	0.040	1.2	73.0	87.0	73.4	11.99
12.20	639.6	6.3	0.94	0.040	1.4	73.0	101.6	73.4	12.19

NOTES:

Project Wash 6a
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

WS-30 Right

CROSS SECTION PARAMETERS: FILENAME: W5-30RT.SEC

No. of Cross Section Points:	13	Bed Slope:	0.01900	Max Elev.:	12.10
Bank Stations.....Left:	142.0	Right....:	157.8	Min Elev.:	10.40
Encroachment Stations..Left:	138.0	Right....:	174.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	11.30	65.00	2)	10.80	85.00	3)	10.60	100.00
4)	10.00	105.00	5)	10.00	111.00	6)	10.40	111.10
7)	10.80	115.00	8)	11.10	130.00	9)	11.25	138.00
10)	10.50	142.00	11)	10.40	157.80	12)	11.70	164.00
13)	12.10	174.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.50	0.7	0.9	0.72	0.030	0.1	16.3	0.8	16.3	10.49
11.00	39.3	3.9	0.98	0.032	0.5	21.3	10.2	21.4	10.99
11.50	120.8	5.5	1.03	0.034	0.9	25.0	22.0	25.2	11.58
11.80	181.0	6.1	1.05	0.035	1.0	28.5	29.8	28.7	11.90
12.00	219.3	6.1	1.04	0.035	1.1	33.5	36.0	33.7	12.17
12.20	277.3	6.4	1.04	0.036	1.2	36.0	43.1	36.2	12.38

NOTES:

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Project: Wash 6a
Project No.:
Sheet No. 1 of 3
Calculated by: Date:
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Flow split: W5-31

Stage	Q Left (cfs)	Q Right (cfs)	Q Total (cfs)
10.0	0	0	0
10.5	0	6.7	6.7
10.6	0	9.8	9.8
11.0	5.0	29	34
11.50	37	66	103
12.0	125	103	228
12.1	152	113	265

Project Wash Ga
Project No.
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Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W5-31: Right

CROSS SECTION PARAMETERS: FILENAME: W5-31RT.SEC

No. of Cross Section Points:	12	Bed Slope:	0.01600	Max Elev.:	12.30
Bank Stations.....Left:	114.4	Right....:	119.4	Min Elev.:	10.00
Encroachment Stations..Left:	110.0	Right....:	150.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	11.70	70.00	2)	11.20	90.00	3)	11.00	100.00
4)	10.60	102.50	5)	10.80	107.20	6)	10.80	110.00
7)	10.70	112.00	8)	10.20	114.40	9)	10.00	119.40
10)	11.40	123.00	11)	11.80	130.00	12)	12.30	150.00

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.50	6.7	2.6	0.81	0.033	0.3	7.7	2.5	7.9	10.46
10.60	9.8	2.9	0.82	0.034	0.4	8.5	3.3	8.6	10.56
11.00	28.6	3.8	0.83	0.036	0.6	12.0	7.6	12.2	10.99
11.50	66.1	4.7	0.85	0.038	0.9	14.8	14.0	15.1	11.40
12.00	102.5	4.3	0.81	0.039	0.9	28.0	24.0	28.3	11.93
12.10	113.1	4.2	0.80	0.040	0.8	32.0	27.0	32.3	12.10

NOTES:

Project Wash 6a
Project No.
Sheet No. 3 of 3
Calculated by TND Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W5-31 Left

CROSS SECTION PARAMETERS: FILENAME: W5-31LT.SEC

No. of Cross Section Points:	12	Bed Slope:	0.01600	Max Elev.:	11.70
Bank Stations.....Left:	102.5	Right....:	107.2	Min Elev.:	10.60
Encroachment Stations..Left:	70.0	Right....:	110.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	11.70	70.00	2)	11.20	90.00	3)	11.00	100.00
4)	10.60	102.50	5)	10.80	107.20	6)	10.80	110.00
7)	10.70	112.00	8)	10.20	114.40	9)	10.00	119.40
10)	11.40	123.00	11)	11.80	130.00	12)	12.30	150.00

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
11.00	5.0	2.0	0.71	0.037	0.2	10.0	2.5	10.0	10.96
11.50	33.8	2.5	0.70	0.041	0.4	32.0	13.3	32.0	11.47
12.00	125.2	3.9	0.75	0.042	0.8	40.0	32.5	40.0	11.99
12.10	151.6	4.2	0.77	0.042	0.9	40.0	36.5	40.0	12.10

NOTES:

Appendix B
HEC-1 Model

N:\930064\ADMIN\64-059RP.WP5

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*             VERSION 4.0              *
*                                      *
*  RUN DATE  08/01/1994  TIME  11:31:16 *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

```
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

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

  1           ID        HEC-1 MODEL FOR TATUM RIDGE/RANCH LOMR SUBMITTAL
  2           ID        COE & VAN LOO CONSULTANTS (CVL)
  3           ID        BASED ON THE FOLLOWING PREVIOUS STUDY:
  4           ID          NORTH SCOTTSDALE FLOOD INSURANCE STUDY, EXISTING CONDITIONS
  5           ID        COMPUTATION PARAMETERS:
  6           ID          100 YEAR - 6 HOUR STORM: HEC-1 HYPOTHETICAL DISTRIBUTION
  7           ID          RAINFALL FROM NOAA ATLAS: REDUCTION OF POINT RAINFALL PER TP-40
  8           ID          KINEMATIC WAVE ROUTING OF EXCESS PRECIPITATION TO THE SUB-BASIN CP
  9           ID          NORMAL DEPTH CHANNEL ROUTING
 10           ID          COMPOSITE CHANNEL ROUTINGS IN DISTRIBUTARY FLOW AREAS
 11           ID          CN'S BASED ON POOR VEGETATION COND., TR55, & SCS SOIL DATA
 12           ID
 13           ID
 14           ID        FILE NAME : H1LOMR25
 15           ID
              *DIAGRAM
 16           IT       5                0     300
 17           IO       5       0

 18           KK    1470     SUB
 19           KM        BEGINNING OF WASH 5 SYSTEM
 20           KM        RUNOFF FROM SUB 1470
 21           BA   .2977
 22           PH            5.70     .69    1.36    2.39    2.75    2.99    3.45
 23           LS              84
 24           UK     200   .0500     .20     100
 25           RK   15000   .0293    .045            TRAP      20       3

 26           KK     15A     SUB
 27           KM        RUNOFF FROM SUB 15A
 28           BA  1.1048
 29           PH            5.70     .69    1.36    2.39    2.75    2.99    3.45
 30           LS              82
 31           UK     217   .0581     .20     100
 32           RK   13000   .0262    .045            TRAP      25       3

 33           KK    1471      CP
 34           KM        COMBINE SUB 1470 & SUB 15A
 35           HC       2

 36           KK    1476      CP
 37           KM        ROUTE CP 1471 TO CP 1476
 38           RS       9    FLOW      -1
 39           RC    .055    .040    .055   17600   .0188
 40           RX       0       3      43      46      92      95     135     138
 41           RY       6       3       3       0       0       3       3       6

 42           KK    1475     SUB
 43           KM        RUNOFF FROM SUB 1475
 44           BA  1.6895
 45           PH            5.70     .69    1.36    2.39    2.75    2.99    3.45
 46           LS              84
 47           UK     285   .0419     .20     100
 48           RK   17600   .0188    .045            TRAP      46       7
```

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

 49           KK    1477
 50           KM        COMBINE SUB 1475 & CP 1476
 51           HC       2

 52           KK    R200
 53           KM        ROUTE CP 1476 TO CP 200
 54           RS       2    FLOW      -1
 55           RC    .055    .040    .055    4500   .0175
 56           RX       0       3      43      46     106     109     149     152
 57           RY       6       3       3       0       0       3       3       6

 58           KK     200
 59           KM        RUNOFF FROM SUB 200
 60           BA   0.128
 61           PH            5.70     .69    1.36    2.39    2.75    2.99    3.45
 62           LS              83
 63           UK     240   .0400     .20     100
 64           RK    4500   .0175    .045            TRAP      60       3

 65           KK    C200
 66           KM        COMBINE SUB 200 & R200
 67           HC       2

 68           KK    D200
 69           KM        FLOW DIVERSION TO WASH 5B
 70           DT  DIV200
 71           DI       0     333    1076    2177    3568    5220
 72           DQ       0     248     724    1426    2306    3347

 73           KK    R202
 74           KM        ROUTE CP 200 TO CP 202
 75           KM        SINGLE CHANNEL: D=2', BW=15', OVERBANK=60, Z=1
 76           RS       2    FLOW      -1
 77           RC   0.045    0.03   0.045    3000   0.018
 78           RX     954     958     988     990    1005    1007    1037    1041
 79           RY       6       2       2       0       0       2       2       6

 80           KK     202
 81           KM        RUNOFF FROM SUB  202
 82           BA   0.666
 83           PH            5.70     .69    1.36    2.39    2.75    2.99    3.45
 84           LS              83
 85           UK     240   .0400     .20     100
 86           RK   12000   .0175    .045            TRAP      60       3

 87           KK   RT200
 88           KM        RETRIEVE FLOW FROM MAIN FLOW SPLIT
 89           DR  DIV200
```

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

 90           KK    R205
 91           KM        ROUTE CP 200 TO CP 205
 92           KM        SINGLE CHANNEL: D=2', BW=40', OVERBANK=60', Z=1
 93           RS       2    FLOW      -1
 94           RC   0.045    0.03   0.045    3000   0.017
 95           RX     952     958     978     980    1020    1022    1052    1056
 96           RY       6       2       2       0       0       2       2       6

 97           KK     205
 98           KM        RUNOFF FROM SUB  205
 99           BA   0.336
100           PH            4.60     .69    1.36    2.39    2.75    2.99    3.45
101           LS              83
102           UK     240   .0400     .20     100
103           RK    8500   .0175    .045            TRAP      60       3

104           KK    C205
105           HC       2

106           KK    D205
107           KM        DIVERT FLOW TO WASH5B
108           DT  DIV205
109           DI       0       8     130     410     708    1331    2123    3079
110           DQ       0       0      72     236     362     758    1265    1873

111           KK    C202
112           HC       3

113           KK   R210A
114           KM        COMPOSITE CHANNEL
115           KM        ROUTE SUB CHAN(90') OVERBANK(700') & DBAR = 2.00'(Z=1)
116           RS       6    FLOW      -1
117           RC    .065    .040    .065   11700   .0192
118           RX     600     603     953     955    1045    1047    1397    1400
119           RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00

120           KK   RT205
121           KM        RETRIEVE DIV205
122           DR  DIV205

123           KK    R300
124           KM        COMPOSITE CHANNEL
125           KM        ROUTE SUB CHAN(60') OVERBANK(500') & DBAR = 1.5'(Z=1)
126           RS       6    FLOW      -1
127           RC    .065    .040    .065   11200   .0170
128           RX   715.5   718.5   968.5     970    1030  1031.5  1281.5  1284.5
129           RY    4.50    1.50    1.50       0       0    1.50    1.50    4.50

130           KK    S300
131           KM       RUNOFF FROM SUB S300
132           BA   1.048
133           PH            4.60     .69    1.36    2.39    2.75    2.99    3.45
134           LS              81
135           UK     200   .0180     .20     100
```

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

 136          RK   11200   .0170    .060            TRAP      60       3

 137          KK    C300
 138          KM        COMBINE @ CP 300
 139          HC       2

 140          KK    D300
 141          KM        DIVERT FLOW TO WASH5B
 142          DT  DIV300
 143          DI       0     296     903    1090    1531
 144          DQ       0      55     167     201     283

 145          KK   C210A
 146          KM        COMBINE D300 AND R210A
 147          HC       2

 148          KK   R210B
 149          KM        COMPOSITE CHANNEL
 150          KM        ROUTE SUB CHAN(90') OVERBANK(700') & DBAR = 2.00'(Z=1)
 151          RS       2    FLOW      -1
 152          RC    .065    .040    .065    3700   .0192
 153          RX     600     603     953     955    1045    1047    1397    1400
 154          RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00

 155          KK     210
 156          KM        RUNOFF FROM SUB 210
 157          BA   .9891
 158          PH            5.70     .83    1.52    2.45    2.75    2.95    3.33
 159          LS              76
 160          UK     200   .0180     .20     100
 161          RK   15400   .0192    .060            TRAP      90       3

 162          KK    C210
 163          KM        COMBINE @ CP 210
 164          HC       2

 165          KK    D210
 166          KM        DIVERT FROM WASH 5A TO WASH 6A
 167          DT  DIV210
 168          DI       0     500    2612    3000
 169          DQ       0      79     415     477

 170          KK    R220
 171          KM        COMPOSITE CHANNEL
 172          KM        ROUTE SUB CHAN(90') OVERBANK(700') & DBAR = 2.00'(Z=1)
 173          RS       5    FLOW      -1
 174          RC    .065    .040    .065    9500   .0193
 175          RX     600     603     953     955    1045    1047    1397    1400
 176          RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00
```

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

 177          KK     220
 178          KM        RUNOFF FROM SUB 220
 179          BA   .7937
 180          PH            5.70     .83    1.52    2.45    2.75    2.95    3.33
 181          LS              77
 182          UK     200   .0180     .20     100
 183          RK    9500   .0193    .060            TRAP      90       3

 184          KK    C220
 185          KM        COMBINE @ CP 220
 186          HC       2

 187          KK    R230
 188          KM        COMPOSITE CHANNEL
 189          KM        ROUTE SUB CHAN(90') OVERBANK(800') & DBAR = 2.00'(Z=1)
 190          RS       5    FLOW      -1
 191          RC    .065    .040    .065    5900   .0140
 192          RX     575     578     953     955    1045    1047    1422    1425
 193          RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00

 194          KK     230
 195          KM        RUNOFF FROM SUB 230
 196          BA   .7528
 197          PH            5.70     .83    1.52    2.45    2.75    2.95    3.33
 198          LS              77
 199          UK     200   .0180     .20     100
 200          RK    5900   .0140    .045            TRAP      90       3

 201          KK    C230
 202          KM        COMBINE
 203          HC       2

 204          KK     T22     SUB
 205          KM        RUNOFF FROM SUB T22: WASH A
 206          BA   .2656
 207          PH             .266     .83    1.52    2.45    2.75    2.95    3.33
 208          LS              77
 209          UK     200   .0180     .20     100
 210          RK   10700   .0180    .045            TRAP      30       3

 211          KK    1430     SUB
 212          KM        BEGINNING OF WASH 6A SYSTEM
 213          KM        RUNOFF FROM SUB 1430
 214          BA  1.4319
 215          PH            5.61     .71    1.39    2.44    2.81    3.05    3.52
 216          LS              81
 217          UK     240   .0555     .20     100
 218          RK   25800   .0271    .045            TRAP      30       3
```

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

 219          KK    1440     SUB
 220          KM        RUNOFF FROM SUB 1440
 221          BA  1.8882
 222          PH            5.61     .71    1.39    2.44    2.81    3.05    3.52
 223          LS              81
 224          UK     240   .0555     .20     100
 225          RK   24800   .0258    .045            TRAP      30       3

 226          KK    1441
 227          KM        COMBINE SUB 1430 & SUB 1440 - APEX
 228          HC       2

 229          KK   R1441
 230          KM        ROUTE SUB 1441 TO CP 100:BW=50' & OB = 50'
 231          RS       4    FLOW      -1
 232          RC    .055    .040    .055    6400   .0158
 233          RX       7      16      66      75     125     134     184     193
 234          RY       6       3       3       0       0       3       3       6

 235          KK     100     SUB
 236          KM        RUNOFF FROM SUB 100
 237          BA   .2934
 238          PH            5.61     .71    1.39    2.44    2.81    3.05    3.52
 239          LS              81
 240          UK     240   .0555     .20     100
 241          RK    6400   .0158    .045            TRAP      50       3

 242          KK    C100
 243          KM        COMBINE @ CP 100
 244          HC       2

 245          KK    D100
 246          KM        FLOW DIVERSION:
 247          DT  DIV100
 248          DI       0    67.4   220.7   698.5  1307.4  2064.2  2956.1    3450
 249          DQ       0       0       0    34.2    96.4   182.2   289.6   351.1

 250          KK    R110
 251          KM        ROUTE BW=70' & OB = 50'
 252          RS       8    FLOW      -1
 253          RC    .055    .040    .055   16200   .0195
 254          RX       7      16      66      75     145     154     204     213
 255          RY       6       3       3       0       0       3       3       6

 256          KK     110     SUB
 257          KM        RUNOFF FROM SUB 110
 258          BA   .5645
 259          PH            5.61     .83    1.52    2.45    2.75    2.95    3.33
 260          LS              80
 261          UK     200   .0400     .20     100
 262          RK   16000   .0195    .045            TRAP      70       3
```

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

 263          KK    C110
 264          KM        COMBINE @ CP 110
 265          HC       2

 266          KK    R120
 267          KM        COMPOSITE CHANNEL
 268          KM        ROUTE SUB CHAN(60') OVERBANK(700') & DBAR = 1.80'(Z=1)
 269          RS       3    FLOW      -1
 270          RC    .065    .040    .065    6200   .0190
 271          RX     615     618     968     970    1030    1032    1382    1385
 272          RY     4.8     1.8     1.8       0       0     1.8     1.8     4.8

 273          KK     120     SUB
 274          KM        RUNOFF FROM SUB 120
 275          BA   .3598
 276          PH            5.61     .83    1.52    2.45    2.75    2.95    3.33
 277          LS              82
 278          UK     200   .0180     .20     100
 279          RK    6200   .0190    .060            TRAP      60       3

 280          KK     T11     SUB
 281          KM        RUNOFF FROM SUB T11
 282          BA   .1933
 283          PH            5.61     .83    1.52    2.45    2.75    2.95    3.33
 284          LS              79
 285          UK     200   .0180     .20     100
 286          RK    7100   .0180    .045            TRAP      20       3

 287          KK     T12     SUB
 288          KM        RUNOFF FROM SUB T12
 289          BA   .1198
 290          PH            5.61     .83    1.52    2.45    2.75    2.95    3.33
 291          LS              77
 292          UK     200   .0180     .20     100
 293          RK    7400   .0180    .045            TRAP      20       3

 294          KK    C120
 295          KM        COMBINE @ CP 120
 296          HC       4

 297          KK    1380     SUB
 298          KM        BEGINNING OF WASH 6BC SYSTEMS
 299          KM        RUNOFF FROM SUB 1380
 300          BA   .9305
 301          PH            3.10     .70    1.38    2.42    2.78    3.03    3.49
 302          LS              82
 303          UK     240   .0555     .20     100
 304          RK   18000   .0311    .045            TRAP      20       3
```

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

 305          KK   1391N      CP
 306          KM        ROUTE SUB 1380 TO CP 1391N
 307          RS       7    FLOW      -1
 308          RC    .055    .040    .055   13900   .0190
 309          RX       0       3      43      46      76      79     119     122
 310          RY       6       3       3       0       0       3       3       6

 311          KK   1390N     SUB
 312          KM        RUNOFF FROM SUB 1390N
 313          BA   .5610
 314          PH            3.10     .70    1.38    2.42    2.78    3.03    3.49
 315          LS              84
 316          UK     300   .0333     .20     100
 317          RK   13900   .0190    .045            TRAP      30       7

 318          KK   1392N      CP
 319          KM        COMBINE SUB 1390N & CP 1391N - APEX
 320          HC       2

 321          KK   1390S     SUB
 322          KM        RUNOFF FROM SUB 1390S - APEX
 323          BA   .4347
 324          PH            3.10     .68    1.33    2.33    2.69    2.93    3.39
 325          LS              85
 326          UK     300   .0333     .20     100
 327          RK   12500   .0187    .045            TRAP      25       3

 328          KK   RT100
 329          KM        RETRIEVE FLOW FROM DIVERT 100
 330          DR  DIV100

 331          KK      C5
 332          KM        COMBINE  @ CP 5
 333          HC       3

 334          KK     R10
 335          KM        WASH 6BC SYSTEM
 336          KM        ROUTE CHAN(70') OVERBANK(100') DC=2' & Z=1:1
 337          RS       3    FLOW      -1
 338          RC    .065    .040    .065    5200   .0160
 339          RX     910     913     963     965    1035    1037    1087    1090
 340          RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00

 341          KK      10     SUB
 342          KM        RUNOFF FROM SUB 10
 343          BA   .3344
 344          PH            3.10     .83    1.52    2.45    2.75    2.95    3.33
 345          LS              86
 346          UK     300   .0300     .20     100
 347          RK    6200   0.016   0.045            TRAP      70       3
```

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

 348          KK     C10
 349          KM        COMBINE  @ CP 10
 350          HC       2

 351          KK     D10
 352          KM        FLOW DIVERSION:
 353          DT   DIV10
 354          DI       0    12.9   149.2   308.8   682.6  1288.2  2041.6  2467.8
 355          DQ       0    12.9   149.2   298.6   634.7  1182.6  1863.9  2249.5

 356          KK     R20
 357          KM        WASH 6B SYSTEM
 358          KM        ROUTE CHAN(40') OVERBANK(80') & DC = 2'(Z=1)
 359          RS       2    FLOW      -1
 360          RC    .065    .040    .065    3200   .0170
 361          RX     935     938     978     980    1020    1022    1062    1065
 362          RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00

 363          KK      20     SUB
 364          KM        RUNOFF FROM SUB 20
 365          BA   .0609
 366          PH            3.10     .83    1.52    2.45    2.75    2.95    3.33
 367          LS              80
 368          UK     250  0.0300     .20     100
 369          RK    3200   0.017   0.045            TRAP      40       3

 370          KK     C20
 371          KM        COMBINE  @ CP 20
 372          HC       2

 373          KK     R40
 374          KM        WASH 6B LEFT SYSTEM
 375          KM        ROUTE CHAN(10') OVERBANK(50') & DBAR = 2'(Z=1)
 376          RS       2    FLOW      -1
 377          RC    .065    .040    .065    3300   .0176
 378          RX     965     968     993     995    1005    1007    1032    1035
 379          RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00

 380          KK      30     SUB
 381          KM        RUNOFF FROM SUB 30
 382          BA   .0766
 383          PH            3.10     .83    1.52    2.45    2.75    2.95    3.33
 384          LS              83
 385          UK     300  0.0300     .20     100
 386          RK    3800   0.019   0.045            TRAP      15       3

 387          KK     D30
 388          KM        FLOW DIVERSION
 389          DT   DIV30
 390          DI       0    30.5   188.5   300.8   379.4   930.7  1699.3  2703.0
 391          DQ       0       0       0    35.5    68.2   338.3   749.8  1295.1
```

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

 392          KK     R41
 393          KM        WASH 6A RIGHT SYSTEM
 394          KM        ROUTE CHAN(10') OVERBANK(50') & DBAR = 2'(Z=1)
 395          RS       1    FLOW      -1
 396          RC    .065    .040    .065    1600   .0166
 397          RX     965     968     993     995    1005    1007    1032    1035
 398          RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00

 399          KK     C40
 400          KM        COMBINE  @ D/S SCOTTSDALE RD
 401          HC       2

 402          KK     R42
 403          KM        ROUTE CHAN(20') OVERBANK(120') & DBAR = 2'(Z=1)
 404          RS       5    FLOW      -1
 405          RC    .065    .040    .065    9500   .0190
 406          RX     925     928     988     990    1010    1012    1072    1075
 407          RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00

 408          KK      40     SUB
 409          KM        RUNOFF FROM SUB 40
 410          BA   .3094
 411          PH            3.10     .83    1.52    2.45    2.75    2.95    3.33
 412          LS              79
 413          UK     200   0.025     .20     100
 414          RK   11100   0.021   0.045            TRAP      30       3

 415          KK     C41
 416          KM        COMBINE  @ CP 40
 417          HC       2

 418          KK     D40
 419          KM        FLOW DIVERSION:
 420          DT   DIV40
 421          DI       0     1.5    28.0    57.0   218.3   823.5  1822.9  3346.9
 422          DQ       0     1.5    28.0    57.0   207.7   725.6  1463.2  2384.8

 423          KK    C121
 424          KM        COMBINE  @ CP 120
 425          HC       2

 426          KK    R130
 427          KM        CONTINUE WASH 6A SYSTEM
 428          KM        COMPOSITE CHANNEL
 429          KM        ROUTE SUB CHAN(50') OVERBANK(980') & DBAR = 1.75'(Z=1)
 430          RS       3    FLOW      -1
 431          RC    .065    .040    .065    5800   .0185
 432          RX     480     483     973     975    1025    1027    1517    1520
 433          RY    4.75    1.75    1.75       0       0    1.75    1.75    4.75
```

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

 434          KK     130     SUB
 435          KM        RUNOFF FROM SUB 130
 436          BA   .5567
 437          PH            5.61     .83    1.52    2.45    2.75    2.95    3.33
 438          LS              77
 439          UK     200   .0180     .20     100
 440          RK    5800   .0185    .060            TRAP      50       3

 441          KK     T13     SUB
 442          KM        RUNOFF FROM SUB T13
 443          BA   .2016
 444          PH            5.61     .83    1.52    2.45    2.75    2.95    3.33
 445          LS              77
 446          UK     200   .0180     .20     100
 447          RK    8600   .0185    .045            TRAP      30       3

 448          KK   RT210
 449          KM        RETRIEVE DIVERSION FROM WASH5A
 450          DR  DIV210

 451          KK    C130
 452          KM        COMBINE  @ CP 130
 453          HC       4

 454          KK    R140
 455          KM        COMPOSITE CHANNEL
 456          KM        ROUTE SUB CHAN(50') OVERBANK(980') & DBAR = 1.75'(Z=1)
 457          RS       5    FLOW      -1
 458          RC    .065    .040    .065    9750   .0160
 459          RX     480     483     973     975    1025    1027    1517    1520
 460          RY    4.75    1.75    1.75       0       0    1.75    1.75    4.75

 461          KK     140     SUB
 462          KM        RUNOFF FROM SUB 140
 463          BA   .7250
 464          LS              81
 465          UK     200   .0180     .20     100
 466          RK    6800   .0160    .060            TRAP      50       3

 467          KK    C140
 468          KM        COMBINE @ CP 140
 469          HC       2

 470          KK    RT40
 471          KM        CONTINUE WASH 6B RIGHT
 472          KM        RETRIEVE FLOW FROM DIVERT 40
 473          DR   DIV40

 474          KK     R50
 475          KM        ROUTE CHAN(15') OVERBANK(50') & DBAR = 2'(Z=1)
 476          RS       4    FLOW      -1
 477          RC    .065    .040    .065    7800   .0190
 478          RX     965     968     993     995    1010    1012    1037    1040
 479          RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00
```

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

 480          KK      50     SUB
 481          KM        RUNOFF FROM SUB 50
 482          BA  0.2866
 483          PH            3.10     .83    1.52    2.45    2.75    2.95    3.33
 484          LS              77
 485          UK     200   0.025     .20     100
 486          RK   11200    0.20   0.045            TRAP      15       3

 487          KK      65
 488          KM        RUNOFF FROM SUB 65
 489          BA  0.1076
 490          PH            3.10     .83    1.52    2.45    2.75    2.95    3.33
 491          LS              80
 492          UK     200   0.025    0.20     100
 493          RK    5500   0.019   0.045            TRAP      10       3

 494          KK     C50
 495          KM        COMBINE @ 50
 496          HC       3

 497          KK     R71
 498          KM        ROUTE CHAN(15') OVERBANK(50') & DBAR = 2'(Z=1)
 499          RS       4    FLOW      -1
 500          RC    .065    .040    .065    6200   .0160
 501          RX     965     968     993     995    1010    1012    1037    1040
 502          RY    5.00    2.00    2.00       0       0    2.00    2.00    5.00

 503          KK      70     SUB
 504          KM        RUNOFF FROM SUB  70
 505          BA  0.1248
 506          PH            3.10     .83    1.52    2.45    2.75    2.95    3.33
 507          LS              77
 508          UK     200   0.020     .20     100
 509          RK    6000   0.016   0.045            TRAP      25       3

 510          KK     C70
 511          KM        COMBINE  @ CP 70
 512          HC       2

 513          KK     D70
 514          KM        FLOW DIVERSION: ESTIMATED AS 10 %
 515          DT   DIV70
 516          DI       0     100    1000    2000    3000    4000
 517          DQ       0      10     100     200     300     400

 518          KK    C141
 519          KM        COMBINE  @ CP 140
 520          HC       2
 521          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

 NO.       (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

  18         1470
                .
                .
  26            .         15A
                .           .
                .           .
  33         1471............
                V
                V
  36         1476
                .
                .
  42            .        1475
                .           .
                .           .
  49         1477............
                V
                V
  52         R200
                .
                .
  58            .         200
                .           .
                .           .
  65         C200............
                .
                .
  70            .-------> DIV200
  68         D200
                V
                V
  73         R202
                .
                .
  80            .         202
                .           .
                .           .
  89            .           .          .<-------  DIV200
  87            .           .      RT200
                .           .          V
                .           .          V
  90            .           .       R205
                .           .          .
                .           .          .
  97            .           .          .        205
                .           .          .          .
                .           .          .          .
 104            .           .       C205............
                .           .          .
                .           .          .
 108            .           .          .-------> DIV205
 106            .           .       D205
                .           .          .
                .           .          .
 111         C202........................
                V
                V
 113         R210A
                .
                .
 122            .           .<-------  DIV205
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```
120          .       RT205
             .          V
             .          V
123          .       R300
             .          .
             .          .
130          .          .       S300
             .          .          .
             .          .          .
137          .       C300............
             .          .
             .          .
142          .          .-------> DIV300
140          .       D300
             .          .
             .          .
145      C210A............
             V
             V
148      R210B
             .
             .
155          .        210
             .          .
             .          .
162       C210............
             .
             .
167          .-------> DIV210
165       D210
             V
             V
170       R220
             .
             .
177          .        220
             .          .
             .          .
184       C220............
             V
             V
187       R230
             .
             .
194          .        230
             .          .
             .          .
201       C230............
             .
             .
204          .        T22
             .          .
             .          .
211          .          .       1430
             .          .          .
             .          .          .
219          .          .          .       1440
             .          .          .          .
             .          .          .          .
226          .          .       1441............
             .          .          V
             .          .          V
229          .          .      R1441
             .          .          .
             .          .          .
235          .          .          .        100
             .          .          .          .
             .          .          .          .
242          .          .       C100............
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                .          .          .
                .          .          .
247             .          .          .-------> DIV100
245             .          .       D100
                .          .          V
                .          .          V
250             .          .       R110
                .          .          .
                .          .          .
256             .          .          .        110
                .          .          .          .
                .          .          .          .
263             .          .       C110............
                .          .          V
                .          .          V
266             .          .       R120
                .          .          .
                .          .          .
273             .          .          .        120
                .          .          .          .
                .          .          .          .
280             .          .          .          .        T11
                .          .          .          .          .
                .          .          .          .          .
287             .          .          .          .          .        T12
                .          .          .          .          .          .
                .          .          .          .          .          .
294             .          .       C120.................................
                .          .          .
                .          .          .
297             .          .          .       1380
                .          .          .          V
                .          .          .          V
305             .          .          .      1391N
                .          .          .          .
                .          .          .          .
311             .          .          .          .      1390N
                .          .          .          .          .
                .          .          .          .          .
318             .          .          .      1392N............
                .          .          .          .
                .          .          .          .
321             .          .          .          .      1390S
                .          .          .          .          .
                .          .          .          .          .
330             .          .          .          .          .          .<-------  DIV100
328             .          .          .          .          .      RT100
                .          .          .          .          .          .
                .          .          .          .          .          .
331             .          .          .         C5.........................
                .          .          .          V
                .          .          .          V
334             .          .          .        R10
                .          .          .          .
                .          .          .          .
341             .          .          .          .          10
                .          .          .          .          .
                .          .          .          .          .
348             .          .          .        C10............
                .          .          .          .
                .          .          .          .
353             .          .          .          .------->   DIV10
351             .          .          .        D10
                .          .          .          V
                .          .          .          V
356             .          .          .        R20
                .          .          .          .
                .          .          .          .
363             .          .          .          .          20
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                .         .         .         .         .
                .         .         .         .         .
370             .         .         .       C20.........
                .         .         .         V
                .         .         .         V
373             .         .         .       R40
                .         .         .         .
                .         .         .         .
380             .         .         .         .        30
                .         .         .         .         .
                .         .         .         .         .
389             .         .         .         .         .-------> DIV30
387             .         .         .         .       D30
                .         .         .         .         V
                .         .         .         .         V
392             .         .         .         .       R41
                .         .         .         .         .
                .         .         .         .         .
399             .         .         .       C40.........
                .         .         .         V
                .         .         .         V
402             .         .         .       R42
                .         .         .         .
                .         .         .         .
408             .         .         .         .        40
                .         .         .         .         .
                .         .         .         .         .
415             .         .         .       C41.........
                .         .         .         .
                .         .         .         .
420             .         .         .         .-------> DIV40
418             .         .         .       D40
                .         .         .         .
                .         .         .         .
423             .         .     C121.........
                .         .        V
                .         .        V
426             .         .     R130
                .         .        .
                .         .        .
434             .         .         .       130
                .         .         .         .
                .         .         .         .
441             .         .         .         .       T13
                .         .         .         .         .
                .         .         .         .         .
450             .         .         .         .         .         .<------- DIV210
448             .         .         .         .         .     RT210
                .         .         .         .         .         .
                .         .         .         .         .         .
451             .         .     C130.............................
                .         .        V
                .         .        V
454             .         .     R140
                .         .        .
                .         .        .
461             .         .         .       140
                .         .         .         .
                .         .         .         .
467             .         .     C140.........
                .         .        .
                .         .        .
473             .         .         .         .<------- DIV40
470             .         .         .      RT40
                .         .         .         V
                .         .         .         V
474             .         .         .       R50
                .         .         .         .
                .         .         .         .
```

```
480          .          .          .          .          50
             .          .          .          .           .
             .          .          .          .           .
487          .          .          .          .           .          65
             .          .          .          .           .           .
             .          .          .          .           .           .
494          .          .          .        C50.......................
             .          .          .          V
             .          .          .          V
497          .          .          .        R71
             .          .          .          .
             .          .          .          .
503          .          .          .          .          70
             .          .          .          .           .
             .          .          .          .           .
510          .          .          .        C70............
             .          .          .          .
             .          .          .          .
515          .          .          .          .-------->  DIV70
513          .          .          .        D70
             .          .          .          .
             .          .          .          .
518          .          .       C141............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*             VERSION 4.0              *
*                                      *
*  RUN DATE  08/01/1994  TIME  11:31:16 *
*                                      *
****************************************
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****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
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                    HEC-1 MODEL FOR TATUM RIDGE/RANCH LOMR SUBMITTAL
                    COE & VAN LOO CONSULTANTS (CVL)
                    BASED ON THE FOLLOWING PREVIOUS STUDY:
                      NORTH SCOTTSDALE FLOOD INSURANCE STUDY, EXISTING CONDITIONS
                    COMPUTATION PARAMETERS:
                      100 YEAR - 6 HOUR STORM: HEC-1 HYPOTHETICAL DISTRIBUTION
                      RAINFALL FROM NOAA ATLAS: REDUCTION OF POINT RAINFALL PER TP-40
                      KINEMATIC WAVE ROUTING OF EXCESS PRECIPITATION TO THE SUB-BASIN CP
                      NORMAL DEPTH CHANNEL ROUTING
                      COMPOSITE CHANNEL ROUTINGS IN DISTRIBUTARY FLOW AREAS
                      CN'S BASED ON POOR VEGETATION COND., TR55, & SCS SOIL DATA


                    FILE NAME : H1LOMR25


 17 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        300  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      2   0  ENDING DATE
                   NDTIME       0055  ENDING TIME
                   ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL     .08 HOURS
                   TOTAL TIME BASE   24.92 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


       *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  2
```

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	1470	372.	3.50	58.	15.	14.	.30		
HYDROGRAPH AT	15A	1640.	3.33	199.	50.	48.	1.10		
2 COMBINED AT	1471	1950.	3.33	258.	65.	62.	1.40		
ROUTED TO	1476	1509.	3.83	254.	65.	62.	1.40	3.05	3.83
HYDROGRAPH AT	1475	1996.	3.50	330.	84.	81.	1.69		
2 COMBINED AT	1477	2809.	3.67	582.	149.	143.	3.09		
ROUTED TO	R200	2686.	3.83	579.	149.	143.	3.09	3.63	3.83
HYDROGRAPH AT	200	191.	3.33	24.	6.	6.	.13		
2 COMBINED AT	C200	2744.	3.83	603.	155.	149.	3.22		
DIVERSION TO	DIV200	1785.	3.83	410.	105.	102.	3.22		
HYDROGRAPH AT	D200	959.	3.83	193.	49.	47.	3.22		
ROUTED TO	R202	941.	3.92	192.	49.	47.	3.22	3.01	3.92
HYDROGRAPH AT	202	773.	3.50	124.	32.	30.	.67		
HYDROGRAPH AT	RT200	1785.	3.83	410.	105.	102.	.00		
ROUTED TO	R205	1766.	3.92	409.	105.	102.	.00	2.92	3.92
HYDROGRAPH AT	205	435.	3.42	63.	16.	15.	.34		
2 COMBINED AT	C205	1917.	3.92	471.	121.	117.	.34		
DIVERSION TO	DIV205	1133.	3.92	267.	68.	65.	.34		
HYDROGRAPH AT	D205	784.	3.92	205.	54.	52.	.34		
3 COMBINED AT	C202	2048.	3.83	521.	134.	129.	4.22		
ROUTED TO	R210A	1740.	4.58	513.	134.	129.	4.22	2.14	4.58
HYDROGRAPH AT	RT205	1133.	3.92	267.	68.	65.	.00		
ROUTED TO	R300	808.	4.83	262.	68.	65.	.00	1.69	4.83
HYDROGRAPH AT	S300	1088.	3.50	180.	46.	44.	1.05		
2 COMBINED AT	C300	1090.	3.50	439.	113.	109.	1.05		
DIVERSION TO	DIV300	201.	3.50	81.	21.	20.	1.05		
HYDROGRAPH AT	D300	889.	3.50	358.	92.	89.	1.05		
2 COMBINED AT	C210A	2512.	4.67	867.	227.	218.	5.27		
ROUTED TO	R210B	2452.	4.83	864.	227.	218.	5.27	2.39	4.83
HYDROGRAPH AT	210	492.	3.92	122.	32.	31.	.99		

2 COMBINED AT	C210	2612.	4.83	985.	259.	249.	6.26		
DIVERSION TO	DIV210	415.	4.83	156.	41.	40.	6.26		
HYDROGRAPH AT	D210	2197.	4.83	829.	218.	210.	6.26		
ROUTED TO	R220	2069.	5.33	820.	218.	210.	6.26	2.25	5.33
HYDROGRAPH AT	220	595.	3.58	105.	27.	26.	.79		
2 COMBINED AT	C220	2141.	5.33	916.	244.	235.	7.05		
ROUTED TO	R230	2094.	5.75	911.	244.	235.	7.05	2.38	5.75
HYDROGRAPH AT	230	731.	3.42	100.	25.	24.	.75		
2 COMBINED AT	C230	2144.	5.75	1000.	270.	260.	7.81		
HYDROGRAPH AT	T22	207.	3.58	36.	9.	9.	.27		
HYDROGRAPH AT	1430	1392.	3.58	254.	64.	62.	1.43		
HYDROGRAPH AT	1440	2002.	3.50	336.	85.	82.	1.89		
2 COMBINED AT	1441	3301.	3.50	589.	149.	144.	3.32		
ROUTED TO	R1441	3082.	3.75	587.	149.	144.	3.32	4.03	3.75
HYDROGRAPH AT	100	413.	3.33	52.	13.	13.	.29		
2 COMBINED AT	C100	3255.	3.67	638.	163.	157.	3.61		
DIVERSION TO	DIV100	327.	3.67	45.	11.	11.	3.61		
HYDROGRAPH AT	D100	2928.	3.67	594.	152.	146.	3.61		
ROUTED TO	R110	2624.	4.17	583.	151.	146.	3.61	3.16	4.17
HYDROGRAPH AT	110	408.	3.75	86.	22.	21.	.56		
2 COMBINED AT	C110	2843.	4.08	664.	174.	167.	4.18		
ROUTED TO	R120	2359.	4.50	661.	174.	167.	4.18	2.41	4.50
HYDROGRAPH AT	120	459.	3.42	61.	15.	15.	.36	$\Delta Q = 2465 - 2359 = 106$ cfs	
HYDROGRAPH AT	T11	214.	3.42	29.	7.	7.	.19	$\Sigma Q_i = 459 + 214 + 100 = 773$ cfs	
HYDROGRAPH AT	T12	100.	3.50	16.	4.	4.	.12	$\therefore$	
4 COMBINED AT	C120	2465.	4.50	760.	200.	193.	4.85	$T_{11}: \left(214\right)\left(\frac{106}{773}\right) = 29$ cfs	
HYDROGRAPH AT	1380	1214.	3.42	172.	43.	42.	.93	$T_{12}: \left(100\right)\left(\frac{106}{773}\right) = 14$ cfs	
ROUTED TO	1391N	969.	3.83	170.	43.	42.	.93	3.00	3.83
HYDROGRAPH AT	1390N	645.	3.58	112.	29.	27.	.56		
2 COMBINED AT	1392N	1461.	3.67	281.	72.	69.	1.49		
HYDROGRAPH AT	1390S	551.	3.50	87.	22.	21.	.43		
HYDROGRAPH AT	RT100	327.	3.67	45.	11.	11.	.00		
3 COMBINED AT	C5	2175.	3.67	413.	105.	101.	1.93		
ROUTED TO	R10	2014.	3.83	410.	105.	101.	1.93	2.77	3.83
HYDROGRAPH AT	10	567.	3.33	68.	17.	17.	.33		

2 COMBINED AT	C10	2185.	3.83	477.	122.	118.	2.26			
DIVERSION TO	DIV10	1994.	3.83	445.	114.	110.	2.26			
HYDROGRAPH AT	D10	191.	3.83	32.	8.	8.	2.26			
ROUTED TO	R20	184.	4.00	32.	8.	8.	2.26	.96	4.00	
HYDROGRAPH AT	20	82.	3.33	10.	2.	2.	.06			
2 COMBINED AT	C20	201.	4.00	41.	10.	10.	2.32			
ROUTED TO	R40	188.	4.17	41.	10.	10.	2.32	2.14	4.17	
HYDROGRAPH AT	30	123.	3.33	14.	3.	3.	.08			
DIVERSION TO	DIV30	0.	3.33	0.	0.	0.	.08			
HYDROGRAPH AT	D30	123.	3.33	14.	3.	3.	.08			
ROUTED TO	R41	112.	3.33	14.	3.	3.	.08	1.66	3.33	
2 COMBINED AT	C40	207.	4.17	55.	14.	13.	2.40			
ROUTED TO	R42	202.	4.42	55.	14.	13.	2.40	1.50	4.42	
HYDROGRAPH AT	40	297.	3.50	46.	12.	11.	.31			
2 COMBINED AT	C41	305.	3.75	101.	25.	25.	2.71			
DIVERSION TO	DIV40	282.	3.75	96.	24.	23.	2.71			
HYDROGRAPH AT	D40	23.	3.75	5.	1.	1.	2.71			
2 COMBINED AT	C121	2480.	4.50	765.	201.	194.	7.56			
ROUTED TO	R130	2068.	5.00	762.	201.	194.	7.56	2.28	5.00	
HYDROGRAPH AT	130	555.	3.42	74.	19.	18.	.56	$\Delta Q = 2534 - 2068 - 415 = 51$		
HYDROGRAPH AT	T13	160.	3.50	27.	7.	7.	.20	$\Sigma Q_i = 555 + 160 = 715$ cfs		
HYDROGRAPH AT	RT210	415.	4.83	156.	41.	40.	.00	$T13 = 160 \left(\frac{51}{715}\right) = 11$ cfs		
4 COMBINED AT	C130	2534.	5.00	1015.	268.	258.	8.32	Pt Inflo $415 + 11 = 426$ cfs		
ROUTED TO	R140	2196.	5.75	1007.	268.	258.	8.32	2.34	5.75	
HYDROGRAPH AT	140	907.	3.33	117.	30.	28.	.73			
2 COMBINED AT	C140	2251.	5.67	1113.	298.	287.	9.04			
HYDROGRAPH AT	RT40	282.	3.75	96.	24.	23.	.00			
ROUTED TO	R50	271.	4.17	95.	24.	23.	.00	2.10	4.17	
HYDROGRAPH AT	50	347.	3.33	39.	10.	9.	.29			
HYDROGRAPH AT	65	150.	3.33	17.	4.	4.	.11			
3 COMBINED AT	C50	500.	3.33	150.	38.	37.	.39			
ROUTED TO	R71	406.	3.83	149.	38.	37.	.39	2.55	3.83	
HYDROGRAPH AT	70	116.	3.42	17.	4.	4.	.12			
2 COMBINED AT	C70	467.	3.75	166.	43.	41.	.52			

DIVERSION TO	DIV70	47.	3.75	17.	4.	4.	.52
HYDROGRAPH AT	D70	420.	3.75	149.	38.	37.	.52
2 COMBINED AT	C141	2380.	5.67	1262.	336.	324.	9.56

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
1470	MANE	3.04	374.25	209.82	1.84	5.00	372.26	210.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .2942E+02 OUTFLOW= .2926E+02 BASIN STORAGE= .1185E-01 PERCENT ERROR= .5

15A	MANE	3.33	1665.65	199.58	1.69	5.00	1639.98	200.00	1.69

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1003E+03 OUTFLOW= .9957E+02 BASIN STORAGE= .2978E-01 PERCENT ERROR= .7

1475	MANE	3.94	1999.70	210.10	1.84	5.00	1995.76	210.00	1.84

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1669E+03 OUTFLOW= .1658E+03 BASIN STORAGE= .1021E+00 PERCENT ERROR= .6

200	MANE	3.10	191.99	200.45	1.76	5.00	191.24	200.00	1.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1213E+02 OUTFLOW= .1203E+02 BASIN STORAGE= .6480E-02 PERCENT ERROR= .7

202	MANE	3.34	810.18	207.77	1.76	5.00	772.71	210.00	1.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6309E+02 OUTFLOW= .6263E+02 BASIN STORAGE= .5222E-01 PERCENT ERROR= .6

205	MANE	3.61	437.66	204.73	1.77	5.00	435.39	205.00	1.77

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3196E+02 OUTFLOW= .3172E+02 BASIN STORAGE= .2099E-01 PERCENT ERROR= .7

S300	MANE	4.08	1096.38	210.58	1.62	5.00	1088.02	210.00	1.62

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .9147E+02 OUTFLOW= .9058E+02 BASIN STORAGE= .8889E-01 PERCENT ERROR= .9

210	MANE	4.64	492.38	235.22	1.19	5.00	491.54	235.00	1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6386E+02 OUTFLOW= .6298E+02 BASIN STORAGE= .1703E+00 PERCENT ERROR= 1.1

220	MANE	3.91	600.93	213.73	1.26	5.00	595.08	215.00	1.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5384E+02 OUTFLOW= .5314E+02 BASIN STORAGE= .7987E-01 PERCENT ERROR= 1.1

230	MANE	3.89	763.72	203.07	1.25	5.00	730.97	205.00	1.25

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5106E+02 OUTFLOW= .5033E+02 BASIN STORAGE= .4533E-01 PERCENT ERROR= 1.3

```
          T22  MANE        4.24    207.93    214.57      1.29      5.00    207.16    215.00        1.29

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1847E+02 OUTFLOW= .1824E+02 BASIN STORAGE= .1846E-01 PERCENT ERROR=   1.1

         1430  MANE        3.54   1403.24    216.31      1.67      5.00   1392.40    215.00        1.67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1287E+03 OUTFLOW= .1278E+03 BASIN STORAGE= .9304E-01 PERCENT ERROR=    .6

         1440  MANE        3.42   2040.65    211.61      1.67      5.00   2001.52    210.00        1.67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1697E+03 OUTFLOW= .1686E+03 BASIN STORAGE= .1092E+00 PERCENT ERROR=    .6

          100  MANE        2.75    414.88    198.83      1.67      5.00    413.27    200.00        1.67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .2638E+02 OUTFLOW= .2619E+02 BASIN STORAGE= .1170E-01 PERCENT ERROR=    .7

          110  MANE        3.65    411.40    224.48      1.45      5.00    408.16    225.00        1.45

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .4417E+02 OUTFLOW= .4375E+02 BASIN STORAGE= .6911E-01 PERCENT ERROR=    .8

          120  MANE        2.98    472.33    203.41      1.59      5.00    459.13    205.00        1.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3082E+02 OUTFLOW= .3050E+02 BASIN STORAGE= .2384E-01 PERCENT ERROR=   1.0

          T11  MANE        2.58    214.93    203.75      1.39      5.00    213.65    205.00        1.39

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1444E+02 OUTFLOW= .1430E+02 BASIN STORAGE= .8738E-02 PERCENT ERROR=    .9

          T12  MANE        4.20    100.33    212.66      1.26      5.00     99.67    210.00        1.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .8129E+01 OUTFLOW= .8031E+01 BASIN STORAGE= .6219E-02 PERCENT ERROR=   1.1

         1380  MANE        3.06   1223.83    203.23      1.74      5.00   1213.84    205.00        1.73

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .8695E+02 OUTFLOW= .8615E+02 BASIN STORAGE= .3248E-01 PERCENT ERROR=    .9

        1390N  MANE        3.68    653.79    212.00      1.89      5.00    644.96    215.00        1.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5699E+02 OUTFLOW= .5657E+02 BASIN STORAGE= .3934E-01 PERCENT ERROR=    .7

        1390S  MANE        3.42    564.98    209.00      1.88      5.00    550.86    210.00        1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .4401E+02 OUTFLOW= .4369E+02 BASIN STORAGE= .2833E-01 PERCENT ERROR=    .7

           10  MANE        3.07    574.18    201.60      1.91      5.00    566.79    200.00        1.91
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CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3435E+02 OUTFLOW= .3398E+02 BASIN STORAGE= .2381E-01 PERCENT ERROR=   1.0

                20  MANE        2.69     82.10    201.15      1.47      5.00     81.94    200.00        1.47

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .4815E+01 OUTFLOW= .4766E+01 BASIN STORAGE= .2914E-02 PERCENT ERROR=   1.0

                30  MANE        2.92    127.87    196.63      1.68      5.00    122.92    200.00        1.68

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6925E+01 OUTFLOW= .6858E+01 BASIN STORAGE= .3401E-02 PERCENT ERROR=    .9

                40  MANE        2.54    301.97    212.04      1.40      5.00    296.54    210.00        1.40

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .2336E+02 OUTFLOW= .2315E+02 BASIN STORAGE= .1799E-01 PERCENT ERROR=    .8

               130  MANE        3.03    575.10    202.93      1.26      5.00    554.98    205.00        1.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3778E+02 OUTFLOW= .3733E+02 BASIN STORAGE= .3006E-01 PERCENT ERROR=   1.1

               T13  MANE        3.67    162.63    214.24      1.26      5.00    159.77    210.00        1.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1368E+02 OUTFLOW= .1352E+02 BASIN STORAGE= .1246E-01 PERCENT ERROR=   1.1

               140  MANE        3.12    951.30    201.15      1.52      5.00    907.14    200.00        1.52

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5937E+02 OUTFLOW= .5872E+02 BASIN STORAGE= .3941E-01 PERCENT ERROR=   1.0

                50  MANE        2.85    367.89    197.99      1.27      5.00    347.14    200.00        1.28

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1967E+02 OUTFLOW= .1947E+02 BASIN STORAGE= .8240E-02 PERCENT ERROR=   1.0

                65  MANE        3.00    150.64    200.61      1.47      5.00    149.75    200.00        1.47

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .8507E+01 OUTFLOW= .8435E+01 BASIN STORAGE= .3102E-02 PERCENT ERROR=    .8

                70  MANE        3.36    119.15    207.80      1.27      5.00    115.65    205.00        1.27

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .8565E+01 OUTFLOW= .8473E+01 BASIN STORAGE= .6366E-02 PERCENT ERROR=   1.0


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

Appendix C
Flow Diversion Computations

NUMERICAL BASIS FOR UNIFORM FLOW COMPUTATIONS

EQ. (1): $Q = \frac{1.486}{Ne} S^{1/2} R^{2/3} A$ SOURCE: (CHOW, 1959)

EQ. (2): $Ne = \left[\frac{\sum A_i (n_i^{1.5})}{A}\right]^{2/3}$ SOURCE: (FRENCH, 1985)

EQ. (3): $A = \sum A_i$

EQ. (4): $D = \frac{A}{Tw}$ SOURCE: (CHOW, 1959)

WHERE:

Q = DISCHARGE (cfs)
S = SLOPE OF HYDRAULIC GRADE LINE (ESTIMATED WITH BED SLOPE) (ft/ft)
R = HYDRAULIC RADIUS (ft) = A/WP
A = FLOW AREA (ft^2)
A_i = INCREMENTAL FLOW AREA (ft^2)
WP = WETTED PERIMETER (ft)
D = HYDRAULIC DEPTH (ft)
Ne = EQUIVALENT MANNING - n VALUE
T_w = TOPWIDTH (ft)

SOURCE: CHOW, *OPEN CHANNEL HYDRAULICS*, McGRAW HILL, NEW YORK, 1959.

SOURCE: FRENCH, *OPEN-CHANNEL HYDRAULICS*, McGRAW HILL, NEW YORK, 1985.

The following are comparisons of Normal Depth computations with software programmed by author with WSPRO

Project Wash 6a
Project No.
Sheet No. of
Calculated by DWD Date 7/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

Section 2122 : Run # 1

CROSS SECTION PARAMETERS: FILENAME: VER1.SEC

No. of Cross Section Points: 8 Bed Slope: 0.01400 Max Elev.: 2122.00
Bank Stations.....Left: 80.0 Right....: 150.0 Min Elev.: 2117.00
Encroachment Stations..Left: Right....:
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.040 ROB.....: 0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2122.00	0.00	2)	2120.00	25.00	3)	2120.00	70.00
4)	2119.00	80.00	5)	2117.00	90.00	6)	2117.00	140.00
7)	2120.00	150.00	8)	2122.00	180.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
2121.32	2843.0	7.5	0.86	0.041	2.4	161.4	379.5	162.2	2121.21

NOTES:

Varying "n" values & 3 subsections

Normal Dept WSPRO (Slope-Conveyance)

WSEL = 2121.32 ≈ 2121.26

CRWS = 2121.21 ≈ 2121.22

∴ Very similar results

Run #1

Sn-12

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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

           *** RUN DATE & TIME: 07-31-94  19:00

  T1          SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2          COE & VAN LOO CONSULTANTS
  T3          SECTION 2122
  *
  *           FILENAME: VERIFY1
  *           SECTION 2122 USED TO VERIFY SOFTWARE BY AUTHOR
  *           REGARDING NORMAL AND CRITICAL DEPTH COMPUTATIONS
  Q           2843
*** Q-DATA FOR SEC-ID, ISEQ =            1
  SK          0.01

WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION 2122
           *** RUN DATE & TIME: 07-31-94  19:00

*** START PROCESSING CROSS SECTION - " 2122"
  XS    2122 1
  GR          0,2122  25,2120 70,2120  80,2119 90,2117
  GR          140,2117   150,2120   180,2122
  N             .045  .040   .045
  SA              80       150
  *
  EX

*** FINISH PROCESSING CROSS SECTION - " 2122"
*** CROSS SECTION " 2122" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID " 2122" AT SRD =      1.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =   8):
       X      Y          X      Y          X      Y          X      Y
       .0 2122.00      25.0 2120.00      70.0 2120.00      80.0 2119.00
     90.0 2117.00     140.0 2117.00     150.0 2120.00     180.0 2122.00

 X-Y MAX-MIN POINTS:
     XMIN      Y          X    YMIN      XMAX      Y          X    YMAX
       .0 2122.00      90.0 2117.00     180.0 2122.00        .0 2122.00

SUBAREA BREAKPOINTS (NSA =  3):
         80.    150.

ROUGHNESS COEFFICIENTS (NSA =  3):
         .045    .040    .045
```

Run #1

Sn 2/2

+++ BEGINNING PROFILE CALCULATIONS -- 1

WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION 2122
*** RUN DATE & TIME: 07-31-94 19:00

XSID:CODE	SRDL	LEW	AREA	VHD	HF	EGL	CRWS	Q	WSEL
SRD	FLEN	REW	K	ALPH	HO	ERR	FR#	VEL	
2122:XS	******	9.	369.	1.18	*****	2122.43	2121.22	2843.	2121.26
1.	******	169.	28422.	1.27	*****	*******	1.01	7.71	

ER

NORMAL END OF WSPRO EXECUTION.

Project Washoe
Project No.
Sheet No. of
Calculated by Date 7/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

Section 2122: Verification Run #1A

CROSS SECTION PARAMETERS: FILENAME: VER1A.SEC

No. of Cross Section Points: 8 Bed Slope:0.01000 Max Elev.:2122.00
Bank Stations.....Left: 0.0 Right....: 180.0 Min Elev.:2117.00
Encroachment Stations..Left: Right....:
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.045 ROB.....: 0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2122.00	0.00	2)	2120.00	25.00	3)	2120.00	70.00
4)	2119.00	80.00	5)	2117.00	90.00	6)	2117.00	140.00
7)	2120.00	150.00	8)	2122.00	180.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
2121.77	2842.8	6.3	0.68	0.045	2.6	173.7	454.7	174.6	2121.05

NOTES:

Single Channel - no subdivisions
"WSEL" are equal to hundreth
"CRWS" are equal to hundreth

Verification Run # 1A

Sr /2

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

           *** RUN DATE & TIME: 07-31-94  19:05

  T1          SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2          COE & VAN LOO CONSULTANTS
  T3          SECTION 2122
  *
  *           FILENAME: VERIFY1A
  *           SECTION 2122 USED TO VERIFY SOFTWARE BY AUTHOR
  *           REGARDING NORMAL AND CRITICAL DEPTH COMPUTATIONS
  Q           2843
*** Q-DATA FOR SEC-ID, ISEQ =            1
  SK          0.01

WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION 2122
           *** RUN DATE & TIME: 07-31-94  19:05

*** START PROCESSING CROSS SECTION - " 2122"
  XS    2122 1
  GR          0,2122  25,2120 70,2120  80,2119 90,2117
  GR          140,2117   150,2120   180,2122
  N             .045  .045   .045
  SA              0       180
  *
  EX

*** FINISH PROCESSING CROSS SECTION - " 2122"
*** CROSS SECTION " 2122" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID " 2122" AT SRD =      1.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =   8):
       X      Y          X      Y          X      Y          X      Y
       .0 2122.00      25.0 2120.00      70.0 2120.00      80.0 2119.00
     90.0 2117.00     140.0 2117.00     150.0 2120.00     180.0 2122.00

 X-Y MAX-MIN POINTS:
     XMIN      Y          X    YMIN      XMAX      Y          X    YMAX
       .0 2122.00      90.0 2117.00     180.0 2122.00        .0 2122.00

SUBAREA BREAKPOINTS (NSA =  3):
          0.    180.

ROUGHNESS COEFFICIENTS (NSA =  3):
         .045    .045    .045
```

Run 1A

Sht 2/2

```
+++ BEGINNING PROFILE CALCULATIONS --   1

WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION 2122
          *** RUN DATE & TIME: 07-31-94  19:05

XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS      Q    WSEL
     SRD    FLEN    REW        K  ALPH    HO     ERR     FR#    VEL

2122:XS   ******     3.     454.   .61 ***** 2122.38 2121.05  2843. 2121.77
       1. ******   176.   28416.  1.00 ***** *******     .68   6.27
 ER

NORMAL  END  OF  WSPRO  EXECUTION.
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Normal & Critical depths

Project Wash6a
Project No.
Sheet No. of
Calculated by Date 8/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

Run #2: Section 2084

CROSS SECTION PARAMETERS: FILENAME: VER2.SEC

No. of Cross Section Points: 16 Bed Slope:0.02000 Max Elev.:2084.50
Bank Stations.....Left: 1000.0 Right....: 1035.0 Min Elev.:2081.70
Encroachment Stations..Left: Right....:
Manning-n Values.....LOB: 0.040 CHANNEL..: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2083.80	920.00	2)	2083.10	945.00	3)	2082.90	955.00
4)	2083.30	960.00	5)	2083.00	970.00	6)	2082.70	985.00
7)	2082.90	1000.00	8)	2082.40	1025.00	9)	2082.30	1035.00
10)	2083.60	1045.00	11)	2082.00	1060.00	12)	2081.70	1065.00
13)	2082.00	1070.00	14)	2084.40	1098.00	15)	2084.50	1110.00
16)	2084.50	1120.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
2083.54	500.1	4.3	0.88	0.040	0.8	152.8	115.1	153.1	2083.51

NOTES:

Two subdivisions

Normal Depth WSPRO (slope Conveyance

WSEL = 2083.54 ≈ 2083.52

CRWS = 2083.51 = 2083.51

∴ Very similar Results

Run #2

Sht 1/2

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          *** RUN DATE & TIME: 08-01-94  06:51

  T1          SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2          COE & VAN LOO CONSULTANTS
  T3          SECTION 2084 - PORTION THERE OF
  *
  *           FILENAME: VERIFY2
  *           PORTION OF SECTION 2084 USED TO VERIFY SOFTWARE BY AUTHOR
  *           REGARDING NORMAL AND CRITICAL DEPTH COMPUTATIONS
  Q           500
*** Q-DATA FOR SEC-ID, ISEQ =            1
  SK          0.02

WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION 2084 - PORTION THERE OF
           *** RUN DATE & TIME: 08-01-94  06:51

*** START PROCESSING CROSS SECTION - "2084 "
  XS   2084 1
  GR          920,2083.8  945,2083.1
  GR          955,2082.9  960,2083.3  970,2083    985,2082.7 1000,2082.9
  GR          1025,2082.4 1035,2082.3 1045,2083.6 1060,2082   1065,2081.7
  GR          1070,2082   1090,2084.4 1110,2084.5 1120,2084.5
  *
  N           .04   .04   .04
  SA             1000   1120
  *
  *
  EX

*** FINISH PROCESSING CROSS SECTION - "2084 "
*** CROSS SECTION "2084 " WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID "2084 " AT SRD =      1.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =  16):
       X      Y          X      Y          X      Y          X      Y
    920.0 2083.80     945.0 2083.10     955.0 2082.90     960.0 2083.30
    970.0 2083.00     985.0 2082.70    1000.0 2082.90    1025.0 2082.40
   1035.0 2082.30    1045.0 2083.60    1060.0 2082.00    1065.0 2081.70
   1070.0 2082.00    1090.0 2084.40    1110.0 2084.50    1120.0 2084.50

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    920.0 2083.80    1065.0 2081.70    1120.0 2084.50    1110.0 2084.50

 SUBAREA BREAKPOINTS (NSA =  3):
       1000.   1120.

 ROUGHNESS COEFFICIENTS (NSA =  3):
         .040    .040    .040
```

Run #2

Run 2/2

```
+++ BEGINNING PROFILE CALCULATIONS --   1

WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION 2084 - PORTION THERE OF
          *** RUN DATE & TIME: 08-01-94  06:51

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS      Q    WSEL
       SRD   FLEN    REW        K  ALPH    HO     ERR     FR#    VEL

2084 :XS   ******   930.     111.   .34 ***** 2083.86 2083.51    500. 2083.52
        1. ******  1083.    3533.  1.09 ***** *******     .97   4.50
  ER

 NORMAL  END  OF  WSPRO  EXECUTION.
```

Appendix C
Wash 6a Flow Diversion Analyses

N:\930064\ADMIN\64-059RP.WP5

CVL

TABLE 1: 100 YEAR-6 HOUR PEAK DISCHARGES
FLOODPLAIN DELINEATION STUDY FOR WASH 6A:
100 YEAR PEAK DISCHARGES IN THE WASH 6A DISTRIBUTARY FLOW CHANNELS

SECTION ID	WASH 6A: CHANNEL ID NUMBERS & 100 YEAR DISCHARGES 1.00 Q(cfs)	1.10 Q(cfs)	1.11 Q(cfs)	1.12 Q(cfs)	1.20 Q(cfs)	2.00 Q(cfs)	2.10 Q(cfs)	2.20 Q(cfs)	2.30 Q(cfs)	3.00 Q(cfs)	3.10 Q(cfs)	4.00 Q(cfs)	TOTAL DISCHARGE (cfs)	HEC-1 COMPUTATION NODE	HEC-1 Q100 (cfs)	EFFECTIVE Q100 (**) (cfs)	COMMENT
2122*	2843												2843	C110	2843		BEGIN DISTRIBUTARY
2108	2843												2843				FLOW AREA
2090	2843												2843				
2084	2048					795							2843				
2079	2048					824							2872		214	29	FROM T11 INTO 2.00
2074	2048					824							2872				
2064	2048					824							2872				
2054	2048					824							2872				
2046	763	1285				824							2872				
2040	763	1285				824							2872				
2030	763	1285				824							2872				
2020	763	1285				824							2872				
2000	763	1285				838							2886		100	14	FROM T12 INTO 2.00
2000*	656	1104				720							2480	C121	2480		PEAK ADJUSTMENT
1980	656	1104				720							2480				
1970	656	993	111			720							2480				
1962	656	993	111			720							2480				
1956	656	993	111			720							2480				
1954	656	757	111	256		1146							2926		415+11	426	INFLOW FROM WASH 5 &
1946	656	757	111	256		579	568						2926				FROM T13 INTO 2.00
1938	656	757	111	256		579	568						2926				
1924	1413			256		690	568						2926				
1914	1413			256		461	568	75	154				2926				
1900*	393			287	831	399	492		133				2534	C130	2534		PEAK ADJUSTMENT
1888	393				1117	399	625						2534				
1864	1510					399	85		540				2534				
1850	943	567				399	1391		540				3840		1306	1306	INFLOW FROM WASH 5
1836	749		411		350	399	288		540	1103			3840				(NET INFLOW OF 136CFS)
1821	749	251	411		99	375	288	24	540	1103			3840				SEE NOTE "(1)"
1809*	848	251	435			375	288		540	1177			3914	C220	105	105	PEAK ADJUSTMENT
1801	–	–				–	288		540	1177			2004				TO CHAN 3
1787	–	–				–	828			1177			2004				ADJUSTMENT OF 2.6%
1776	–	–				–	828			1135	42	450	2454				SEE NOTE "(2)"
1766	–	–				–	828			1135	42	450	2454				
1751	–	–				–	828			1177		450	2454				
1740	–	–				–	217		611	1177		450	2454				
1734	–	–				–	217		–	1177		450	1843				
1724	–	–				–	217		–	833	344	450	1843				
1719	–	–				–	–		–	–	344	450	794				
1709	–	–				–	–		–	–	344	–	344				

(1) NOTE: Channel 3.00 is more accurately a channel of Wash 5; however, Channel 3.00 impacts the Tatum Highlands project site and can convey stormwater from Wash 6a.

(2) NOTE: The flow in Channel 3.1 represents historic conditons when Channel 4 did not divert flow to the east. The flow in channel 4 was estimated as 450 cfs.

(*) Elevation of HEC-1 computation node.
(**) Effective discharge is the portion of the peak discharge of the inflow that contributes to the peak discharge in the specified Wash 6a channel, based on the HEC-1 model.

Sec 2090 1/4

-------- Q:\510024\HYDRO\WSPRO\DIVS\X2090A.O

```
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

           *** RUN DATE & TIME: 08-02-94  10:28

   T1         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
   T2         COE & VAN LOO CONSULTANTS
   T3         SECTIONS 2090
   *
   *          FILENAME: X2090A
   *
   Q          2843
 *** Q-DATA FOR SEC-ID, ISEQ =            1
   SK         0.020
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS 2090
           *** RUN DATE & TIME: 08-02-94  10:28

 *** START PROCESSING CROSS SECTION - " 2090"
   XS    2090 19690
   GR        0,2091    20,2090.2  25,2090    45,2088     55,2087.6
   GR        75,2087.1 105,2087.6  110,2088    120,2089.4   150,2088.9
   GR        175,2089.2  190,2088
   GR        205,2087.7  217,2088   230,2089.4   245,2088.8  285,2089.1
   GR        315,2089.9  355,2089.5  370,2088.1  390,2088.3  410,2088.7
   GR        430,2088.7  450,2089.6  515,2088.7  540,2089.1  585,2089.3
   GR        596,2089.1  620,2089.5  640,2089.3  660,2089.6  685,2088.9
   GR        700,2090    735,2092    760,2092.6
   N            .04   .04    .04
   SA              120   315
   *
   HP 1  2090 2089.8,.01,2089.85

 *** FINISH PROCESSING CROSS SECTION - " 2090"
 *** CROSS SECTION " 2090" WRITTEN TO DISK, RECORD NO. =  1

 --- DATA SUMMARY FOR SECID " 2090" AT SRD =  19690.  ERR-CODE =      0

      SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

 X-Y COORDINATE PAIRS  (NGP =  35):
        X      Y          X      Y          X      Y          X      Y
       .0 2091.00      20.0 2090.20      25.0 2090.00      45.0 2088.00
     55.0 2087.60      75.0 2087.10     105.0 2087.60     110.0 2088.00
    120.0 2089.40     150.0 2088.90     175.0 2089.20     190.0 2088.00
    205.0 2087.70     217.0 2088.00     230.0 2089.40     245.0 2088.80
    285.0 2089.10     315.0 2089.90     355.0 2089.50     370.0 2088.10
    390.0 2088.30     410.0 2088.70     430.0 2088.70     450.0 2089.60
    515.0 2088.70     540.0 2089.10     585.0 2089.30     596.0 2089.10
    620.0 2089.50     640.0 2089.30     660.0 2089.60     685.0 2088.90
    700.0 2090.00     735.0 2092.00     760.0 2092.60

  X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
       .0 2091.00      75.0 2087.10     760.0 2092.60     760.0 2092.60
```

```
SUBAREA BREAKPOINTS (NSA =  3):
        120.    315.

ROUGHNESS COEFFICIENTS (NSA =  3):
        .040    .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS 2090
          *** RUN DATE & TIME: 08-02-94  10:28
    CROSS-SECTION PROPERTIES:  ISEQ =  1;  SECID =  2090;  SRD =   19690.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     180.    10368.    93.    93.                        1417.
            2     177.     6252.   191.   191.                         965.
            3     257.     7482.   372.   372.                        1213.
  2089.80         614.    24102.   657.   657.  1.31    27.   697.   2943.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     181.    10450.    93.    93.                        1428.
            2     179.     6357.   192.   192.                         980.
            3     261.     7648.   373.   374.                        1237.
  2089.81         620.    24455.   658.   659.  1.30    27.   697.   2992.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     182.    10533.    93.    93.                        1438.
            2     181.     6463.   192.   192.                         995.
            3     265.     7816.   375.   375.                        1262.
  2089.82         627.    24812.   660.   660.  1.30    27.   698.   3041.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     182.    10615.    93.    94.                        1448.
            2     183.     6569.   192.   193.                        1010.
            3     268.     7986.   376.   376.                        1287.
  2089.83         634.    25170.   661.   662.  1.30    27.   698.   3091.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     183.    10698.    93.    94.                        1459.
            2     185.     6677.   193.   193.                        1025.
            3     272.     8157.   377.   377.                        1312.
  2089.84         640.    25532.   663.   664.  1.29    27.   698.   3141.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     184.    10782.    94.    94.                        1469.
            2     187.     6785.   193.   193.                        1040.
            3     276.     8330.   378.   378.                        1338.
  2089.85         647.    25896.   665.   665.  1.29    26.   698.   3191.
1
  *
  EX

 +++ BEGINNING PROFILE CALCULATIONS --   1
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS 2090
          *** RUN DATE & TIME: 08-02-94  10:28

 ===015 WSI IN WRONG FLOW REGIME AT SECID " 2090":  USED WSI = CRWS.
                            WSI,CRWS =  2089.68    2089.82

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
```

%K
.425 x 2843 = 1207 > 1948
.260 x 2843 = 741

— WSEL

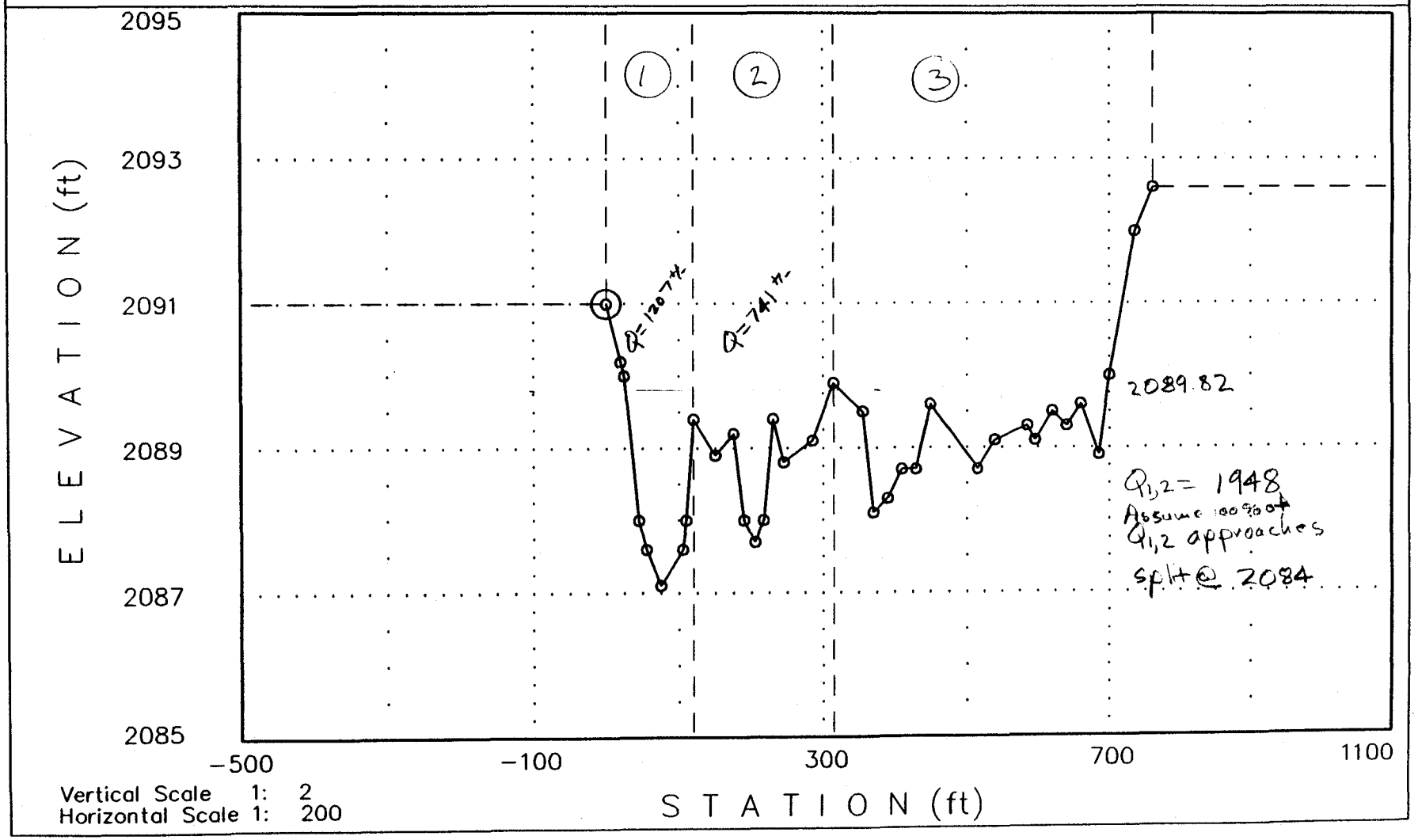
3/4

```
        SRD    FLEN     REW        K  ALPH     HO      ERR      FR#      VEL

  2090:XS    ******     27.      625.   .42 ***** 2090.24 2089.82    2843. 2089.82
     19690.  ******    698.    24698.  1.30 ***** *******      .94     4.55
   ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
```

<<<<<< Cross Section: 2090: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 200

08-02-1994

4/4

Section 2084 Sht 1/4

```
-------- Q:\510024\HYDRO\WSPRO\DIVS\X2084E.O


1
 WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

           *** RUN DATE & TIME: 08-02-94  10:48

   T1         SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
   T2         COE & VAN LOO CONSULTANTS
   T3         SECTION 2084
   *
   *          FILENAME: X2084E - portion
   *
   Q          1948
 *** Q-DATA FOR SEC-ID, ISEQ =            1
   SK         0.02041
   *          THE SLOPE = 0.02041 GIVES A SUPERCRITICAL FLOW
1
 WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
          COE & VAN LOO CONSULTANTS
          SECTION 2084
            *** RUN DATE & TIME: 08-02-94  10:48

 *** START PROCESSING CROSS SECTION - " 2084"
   XS    2084 1
   GR         920,2083.8  945,2083.1
   GR         955,2082.9  960,2083.3  970,2083    985,2082.7 1000,2082.9
   GR        1025,2082.4 1035,2082.3 1045,2083.6 1060,2082   1065,2081.7
   GR        1070,2082   1090,2084.4 1110,2084.5 1120,2084.5  1122,2090
   GR        1135,2084
   GR        1145,2083   1150,2084   1160,2084   1175,2084   1235,2084.2
   GR        1250,2084.6 1275,2084.5 1285,2084.9
   *
   N          .04   .04
   SA            1000
   *
   HP 1  2084 2084.5,.01,2084.60

 *** FINISH PROCESSING CROSS SECTION - " 2084"
 *** CROSS SECTION " 2084" WRITTEN TO DISK, RECORD NO. =  1

 --- DATA SUMMARY FOR SECID " 2084" AT SRD =      1.  ERR-CODE =      0

      SKEW     IHFNO    VSLOPE        EK        CK
        .0        0. *********       .50       .00

 X-Y COORDINATE PAIRS  (NGP =  26):
        X       Y          X       Y          X       Y          X       Y
     920.0 2083.80      945.0 2083.10      955.0 2082.90      960.0 2083.30
     970.0 2083.00      985.0 2082.70     1000.0 2082.90     1025.0 2082.40
    1035.0 2082.30     1045.0 2083.60     1060.0 2082.00     1065.0 2081.70
    1070.0 2082.00     1090.0 2084.40     1110.0 2084.50     1120.0 2084.50
    1122.0 2090.00     1135.0 2084.00     1145.0 2083.00     1150.0 2084.00
    1160.0 2084.00     1175.0 2084.00     1235.0 2084.20     1250.0 2084.60
    1275.0 2084.50     1285.0 2084.90

  X-Y MAX-MIN POINTS:
      XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
     920.0 2083.80     1065.0 2081.70     1285.0 2084.90     1122.0 2090.00
```

SUBAREA BREAKPOINTS (NSA = 2):
1000.

ROUGHNESS COEFFICIENTS (NSA = 2):
.040 .040

1
WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION 2084
*** RUN DATE & TIME: 08-02-94 10:48
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = 2084; SRD = 1.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	112.	5189.	80.	81.				752.
	2	216.	7861.	222.	223.				1206.
2084.50		328.	13050.	302.	304.	1.04	920.	1246.	1896.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	113.	5251.	80.	81.				760.
	2	218.	7703.	235.	236.				1191.
2084.51		331.	12954.	315.	317.	1.06	920.	1275.	1870.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	114.	5313.	80.	81.				768.
	2	220.	7774.	239.	239.				1202.
2084.52		334.	13087.	319.	320.	1.06	920.	1276.	1885.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	114.	5375.	80.	81.				776.
	2	223.	7847.	242.	242.				1214.
2084.53		337.	13222.	322.	323.	1.06	920.	1276.	1901.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	115.	5437.	80.	81.				784.
	2	225.	7922.	245.	246.				1226.
2084.54		340.	13359.	325.	326.	1.07	920.	1276.	1916.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	116.	5500.	80.	81.				793.
	2	228.	7999.	248.	249.				1238.
2084.55		344.	13499.	328.	330.	1.07	920.	1276.	1932.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR	%K
	1	117.	5563.	80.	81.				801.	.408 x 1948 = 795
	2	230.	8077.	251.	252.				1251.	.592 x 1948 = 1153
2084.56		347.	13640.	331.	333.	1.07	920.	1277.	1948.	— CRWS

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	118.	5626.	80.	81.				809.
	2	233.	8158.	254.	255.				1263.
2084.57		350.	13784.	334.	336.	1.07	920.	1277.	1964.

Q_R Total = 1153 + (2843 - 1948)
= 2048 cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	118.	5690.	80.	81.				817.
	2	235.	8240.	258.	258.				1276.
2084.58		354.	13930.	338.	339.	1.08	920.	1277.	1981.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	119.	5753.	80.	81.				826.
	2	238.	8324.	261.	261.				1290.
2084.59		357.	14077.	341.	342.	1.08	920.	1277.	1998.

1
WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

```
          SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
          COE & VAN LOO CONSULTANTS
          SECTION 2084
            *** RUN DATE & TIME: 08-02-94  10:48
     CROSS-SECTION PROPERTIES:  ISEQ =  1;  SECID =  2084;  SRD =       1.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     120.    5817.    80.    81.                        834.
             2     241.    8410.   264.   265.                       1303.
   2084.60         361.   14228.   344.   345.  1.08   920.  1278.   2015.
1
   *
   EX

 +++ BEGINNING PROFILE CALCULATIONS --   1
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          SITE 6A  -  HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
          COE & VAN LOO CONSULTANTS
          SECTION 2084
            *** RUN DATE & TIME: 08-02-94  10:48

  XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
        SRD   FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

  2084:XS   ******   920.     347.   .53 ***** 2085.08 2084.47   1948. 2084.56
         1. ******  1276.   13626.  1.07 ***** *******    1.00    5.62
   ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
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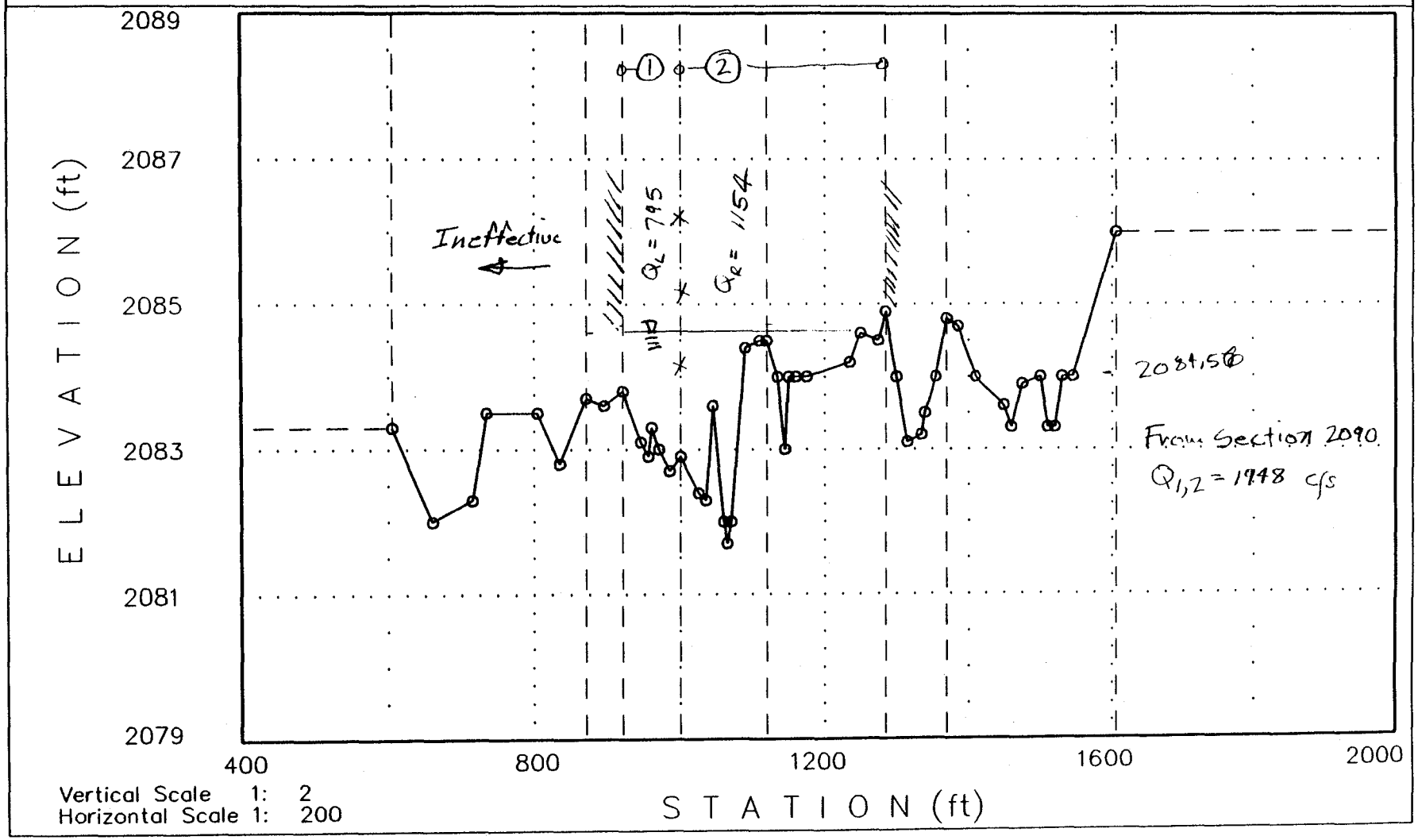
CRWS

<<<<<< Cross Section: 2084: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 200

06-02-1994

-------- Q:\510024\HYDRO\WSPRO\DIVS\X2046.O

Sec 2046

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1
 WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

           *** RUN DATE & TIME: 08-02-94  11:17

   T1          WASH 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
   T2          COE & VAN LOO CONSULTANTS
   T3          SECTION 2046
   *
   *           FILENAME:X2046B.SEC
   *
   Q           2048
 *** Q-DATA FOR SEC-ID, ISEQ =            1
   SK          0.01800
   *           THE SLOPE = 0.01800 GIVES A SUBCRITICAL FLOW
1
 WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          WASH 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
          COE & VAN LOO CONSULTANTS
          SECTION 2046
            *** RUN DATE & TIME: 08-02-94  11:17

 *** START PROCESSING CROSS SECTION - "2046 "
   XS   2046 1
   GR        165,2046.9 180,2046 195,2045.9 203,2046 225,2046.2
   GR        249,2046 265,2045.8 290,2046 310,2046.5 338,2046
   GR        410,2046 470,2046.2 490,2046 512,2045.8 520,2046 545,2046.5
   GR        548,2046.2 608,2046.8 620,2046 635,2044.8 672,2045
   GR        690,2046 750,2048
   *
   N          .040   .040
   SA             545
   *
   HP 1 2046 2046.80,.01,2046.9

 *** FINISH PROCESSING CROSS SECTION - "2046 "
 *** CROSS SECTION "2046 " WRITTEN TO DISK, RECORD NO. =  1

 --- DATA SUMMARY FOR SECID "2046 " AT SRD =      1.  ERR-CODE =      0

      SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

 X-Y COORDINATE PAIRS  (NGP =  23):
        X      Y          X      Y          X      Y          X      Y
     165.0 2046.90     180.0 2046.00     195.0 2045.90     203.0 2046.00
     225.0 2046.20     249.0 2046.00     265.0 2045.80     290.0 2046.00
     310.0 2046.50     338.0 2046.00     410.0 2046.00     470.0 2046.20
     490.0 2046.00     512.0 2045.80     520.0 2046.00     545.0 2046.50
     548.0 2046.20     608.0 2046.80     620.0 2046.00     635.0 2044.80
     672.0 2045.00     690.0 2046.00     750.0 2048.00

  X-Y MAX-MIN POINTS:
      XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
     165.0 2046.90     635.0 2044.80     750.0 2048.00     750.0 2048.00

 SUBAREA BREAKPOINTS (NSA =  2):
        545.
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```
ROUGHNESS COEFFICIENTS (NSA =  2):
        .040    .040
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        WASH 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION 2046
          *** RUN DATE & TIME: 08-02-94  11:17
    CROSS-SECTION PROPERTIES:  ISEQ =  1;  SECID = 2046 ;  SRD =       1.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     275.     8268.  378.   378.                        1329.
             2     148.     5070.  169.   169.                         790.
   2046.80         423.    13338.  547.   548.  1.01   167.   714.   2100.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     279.     8457.  379.   379.                        1356.
             2     150.     5160.  169.   169.                         802.
   2046.81         429.    13617.  548.   548.  1.01   166.   714.   2140.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     282.     8647.  379.   379.                        1383.
             2     152.     5251.  170.   170.                         815.
   2046.82         434.    13898.  548.   548.  1.01   166.   715.   2181.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     286.     8838.  379.   379.                        1411.
             2     154.     5343.  170.   170.                         828.
   2046.83         440.    14182.  549.   549.  1.01   166.   715.   2222.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     290.     9032.  379.   379.                        1439.
             2     155.     5436.  170.   170.                         841.
   2046.84         445.    14468.  549.   549.  1.01   166.   715.   2263.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     294.     9227.  379.   379.                        1467.
             2     157.     5530.  171.   171.                         855.
   2046.85         451.    14757.  550.   550.  1.01   166.   716.   2305.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     298.     9424.  379.   379.                        1495.
             2     159.     5624.  171.   171.                         868.
   2046.86         456.    15047.  550.   550.  1.01   166.   716.   2347.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     301.     9622.  380.   380.                        1523.   0.6272 x 2048 = 1285  1.10
             2     160.     5718.  171.   171.                         881.   0.3727 x 2048 =  763  1.0
   2046.87         462.    15341.  551.   551.  1.01   165.   716.   2389.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     305.     9823.  380.   380.                        1552.
             2     162.     5814.  171.   172.                         894.
   2046.88         467.    15636.  551.   551.  1.01   165.   716.   2431.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     309.    10024.  380.   380.                        1581.
             2     164.     5910.  172.   172.                         908.
   2046.89         473.    15934.  552.   552.  1.01   165.   717.   2473.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        WASH 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION 2046
```

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          *** RUN DATE & TIME: 08-02-94  11:17
    CROSS-SECTION PROPERTIES:  ISEQ =  1;  SECID = 2046 ;  SRD =       1.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     313.   10226.   380.   380.                      1609.
             2     166.    6006.   172.   172.                       921.
  2046.90          478.   16231.   552.   552.  1.01   165.   717.   2516.
1
  *
  EX

 +++ BEGINNING PROFILE CALCULATIONS --   1
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         WASH 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION 2046
           *** RUN DATE & TIME: 08-02-94  11:17

  XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
       SRD    FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

 2046 :XS   ******   166.     460.   .31 ***** 2047.18 2046.79   2048. 2046.87
        1. ******   716.   15265.  1.01 ***** *******     .86    4.45
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1  NORMAL  END  OF  WSPRO  EXECUTION.
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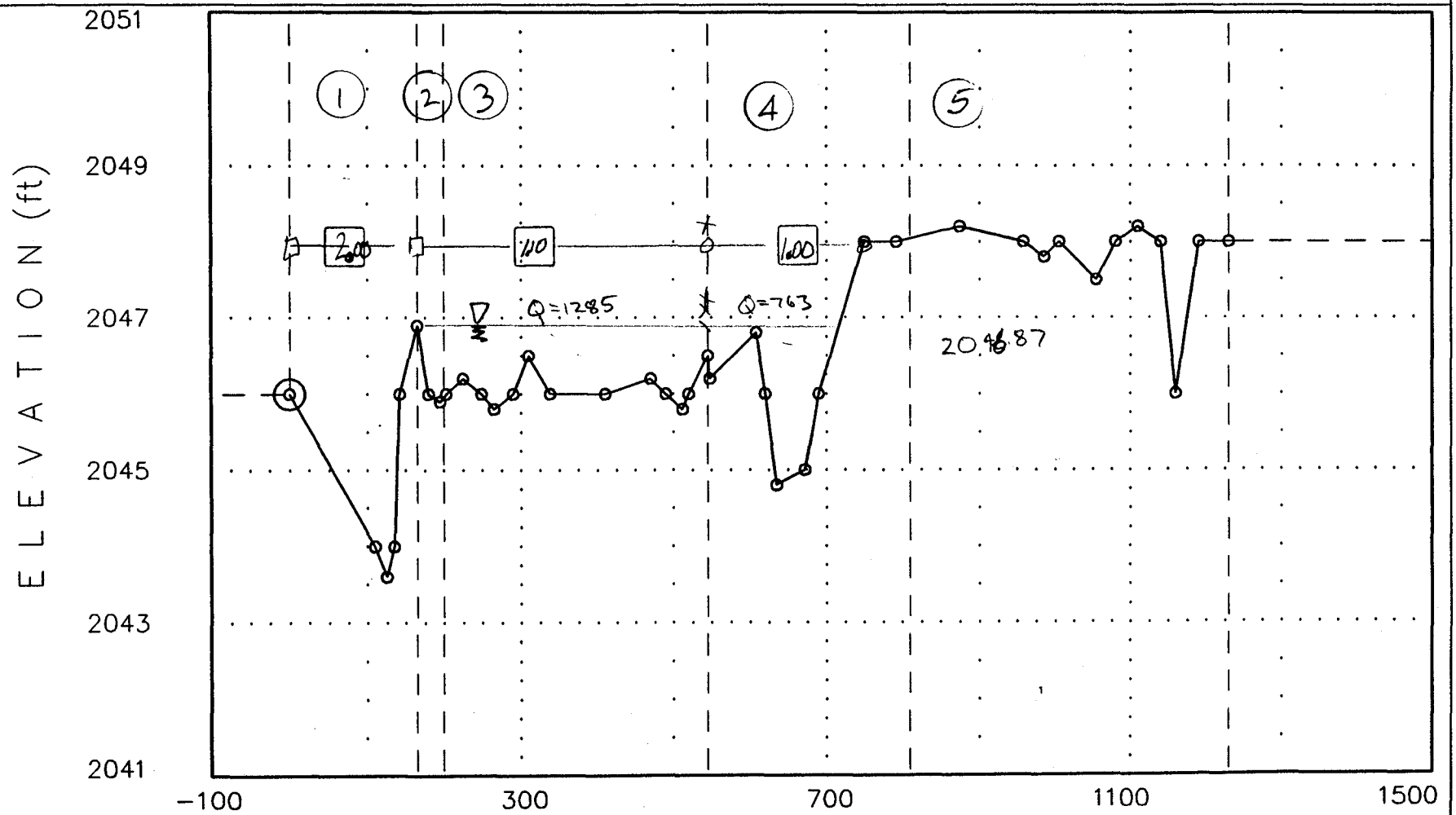
<<<<<< Cross Section: 2046: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 200

08-02-1994

4/4

1/4

Section 1980

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-------- Q:\510024\HYDRO\WSPRO\DIVS\X1980A.O


1
 WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

           *** RUN DATE & TIME: 08-02-94  13:38

   T1         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
   T2         COE & VAN LOO CONSULTANTS
   T3         SECTION 1980
   *
   *
   *          FILENAME: X1980
   Q          1104
 *** Q-DATA FOR SEC-ID, ISEQ =            1
   SK         0.0220
   *
1
 WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
          COE & VAN LOO CONSULTANTS
          SECTION 1980
            *** RUN DATE & TIME: 08-02-94  13:38

 *** START PROCESSING CROSS SECTION - " 1980"
   XS    1980 14300
   GR        910,1980.7 955,1980 995,1979.5 1055,1979.4
   GR        1085,1979 1115,1978.9 1141,1979 1156,1979 1176,1979.5
   GR        1196,1979.5 1256,1979.5 1316,1979.4 1356,1978 1386,1976
   GR        1416,1980 1481,1982 1521,1981.5 1546,1982 1596,1981.4
   GR        1626,1982 1666,1982.8 1701,1982 1711,1981.5 1721,1982
   GR        1741,1982.9
   N         .040  .040 .040  .040
   SA           1196 1495 1590
   *
   HP 1  1980 1979.6,.01,1979.7

 *** FINISH PROCESSING CROSS SECTION - " 1980"
 *** CROSS SECTION " 1980" WRITTEN TO DISK, RECORD NO. =  1

 --- DATA SUMMARY FOR SECID " 1980" AT SRD =  14300.  ERR-CODE =      0

      SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

 X-Y COORDINATE PAIRS  (NGP =  25):
       X      Y          X      Y          X      Y          X      Y
    910.0 1980.70     955.0 1980.00     995.0 1979.50    1055.0 1979.40
   1085.0 1979.00    1115.0 1978.90    1141.0 1979.00    1156.0 1979.00
   1176.0 1979.50    1196.0 1979.50    1256.0 1979.50    1316.0 1979.40
   1356.0 1978.00    1386.0 1976.00    1416.0 1980.00    1481.0 1982.00
   1521.0 1981.50    1546.0 1982.00    1596.0 1981.40    1626.0 1982.00
   1666.0 1982.80    1701.0 1982.00    1711.0 1981.50    1721.0 1982.00
   1741.0 1982.90

  X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    910.0 1980.70    1386.0 1976.00    1741.0 1982.90    1741.0 1982.90

 SUBAREA BREAKPOINTS (NSA =  4):
```

1196. 1495. 1590.

ROUGHNESS COEFFICIENTS (NSA = 4):
.040 .040 .040 .040

WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION 1980
*** RUN DATE & TIME: 08-02-94 13:38
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = 1980; SRD = 14300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	76.	1436.	209.	209.				259.
	2	178.	5782.	217.	217.				912.
1979.60		253.	7218.	426.	426.	1.13	987.	1413.	1041.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	78.	1499.	210.	210.				269.
	2	180.	5899.	217.	217.				928.
1979.61		258.	7398.	427.	427.	1.13	986.	1413.	1067.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	80.	1563.	211.	211.				280.
	2	182.	6017.	217.	217.				945.
1979.62		262.	7580.	428.	428.	1.13	985.	1413.	1094.

% K
0.206 x 1104=228 cfs :—
0.794 x 1104=876
WSEL +/-

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	82.	1628.	211.	211.				290.
	2	184.	6136.	217.	218.				962.
1979.63		266.	7764.	429.	429.	1.13	985.	1413.	1120.

∴ Q_{W110A} = 228 cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	84.	1694.	212.	212.				301.
	2	186.	6256.	217.	218.				979.
1979.64		271.	7950.	430.	430.	1.13	984.	1413.	1147.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	86.	1762.	213.	213.				312.
	2	188.	6377.	217.	218.				996.
1979.65		275.	8139.	430.	431.	1.13	983.	1413.	1175.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	88.	1831.	214.	214.				323.
	2	191.	6498.	217.	218.				1013.
1979.66		279.	8329.	431.	432.	1.12	982.	1413.	1202.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	91.	1900.	215.	215.				334.
	2	193.	6621.	218.	218.				1030.
1979.67		283.	8521.	432.	432.	1.12	981.	1414.	1230.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	93.	1971.	215.	215.				346.
	2	195.	6744.	218.	218.				1047.
1979.68		288.	8716.	433.	433.	1.12	981.	1414.	1258.

1

WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION 1980
*** RUN DATE & TIME: 08-02-94 13:38
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = 1980; SRD = 14300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR

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```
            1      95.    2043.   216.   216.                          357.
            2     197.    6869.   218.   218.                         1065.
  1979.69          292.    8912.   434.   434.  1.12   980.  1414.   1286.

    WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      97.    2116.   217.   217.                          369.
            2     199.    6993.   218.   218.                         1082.
  1979.70          296.    9108.   435.   435.  1.12   979.  1414.   1314.
1
  *
  EX

 +++ BEGINNING PROFILE CALCULATIONS --   1
1
 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION 1980
           *** RUN DATE & TIME: 08-02-94  13:38

  ===015 WSI IN WRONG FLOW REGIME AT SECID " 1980":  USED WSI = CRWS.
                              WSI,CRWS =  1979.61    1979.63

  XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS      Q    WSEL
       SRD    FLEN    REW        K  ALPH    HO     ERR     FR#    VEL

  1980:XS   ******   985.     266.   .30 ***** 1979.93 1979.63   1104. 1979.63
     14300. ******  1413.    7764.  1.13 ***** *******     .99    4.15
   ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
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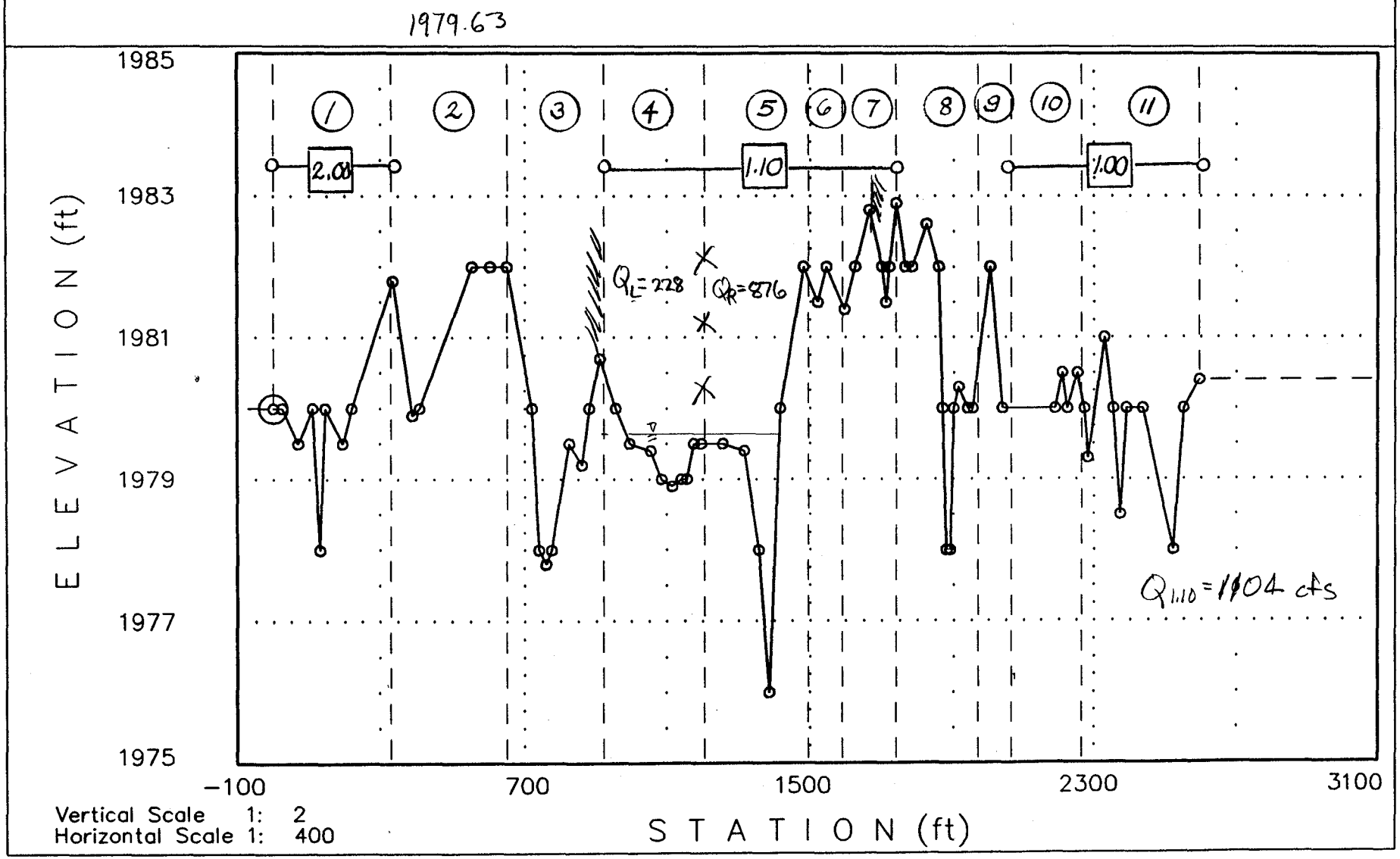
CRWS

<<<<<< Cross Section: 1980: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 400

07-20-1994

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Sect. W1.10A

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-------- Q:\510024\HYDRO\WSPRO\DIVS\W110A.O


1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

           *** RUN DATE & TIME: 08-02-94  14:06

  T1         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2         COE & VAN LOO CONSULTANTS
  T3         SECTION W110A
  *
  *
  *          FILENAME: W110A
  *
  Q          228
*** Q-DATA FOR SEC-ID, ISEQ =            1
  SK         0.016
  *
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION W110A
           *** RUN DATE & TIME: 08-02-94  14:06

*** START PROCESSING CROSS SECTION - "W110A"
  XS   W110A 14300
  GR         1000,78.3   1030,78    1095,76.3   1110,76.9   1140,76.6
  GR         1163,77.2   1188,76.8  1215,78
  N         .040   .040
  SA            1110
  *
  HP 1 W110A 77.3,.01,77.4

*** FINISH PROCESSING CROSS SECTION - "W110A"
*** CROSS SECTION "W110A" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID "W110A" AT SRD =  14300.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =   8):
       X      Y          X      Y          X      Y          X      Y
   1000.0   78.30     1030.0   78.00     1095.0   76.30     1110.0   76.90
   1140.0   76.60     1163.0   77.20     1188.0   76.80     1215.0   78.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
   1000.0   78.30     1095.0   76.30     1215.0   78.00     1000.0   78.30

SUBAREA BREAKPOINTS (NSA =  2):
       1110.

ROUGHNESS COEFFICIENTS (NSA =  2):
        .040    .040

WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS
```

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W110A
*** RUN DATE & TIME: 08-02-94 14:06
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W110A; SRD = 14300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	30.	746.	53.	53.				125.
	2	36.	732.	89.	89.				130.
77.30		66.	1478.	142.	143.	1.03	1057.	1199.	248.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	30.	765.	54.	54.				128.
	2	37.	762.	89.	89.				135.
77.31		67.	1527.	143.	143.	1.03	1056.	1199.	256.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	31.	784.	54.	54.				131.
	2	38.	791.	90.	90.				139.
77.32		68.	1576.	144.	144.	1.03	1056.	1200.	264.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	31.	804.	54.	54.				134.
	2	39.	822.	90.	90.				144.
77.33		70.	1625.	144.	144.	1.03	1056.	1200.	272.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	32.	823.	55.	55.				137.
	2	40.	852.	90.	90.				149.
77.34		71.	1676.	145.	145.	1.03	1055.	1200.	281.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	32.	843.	55.	55.				140.
	2	41.	883.	90.	90.				154.
77.35		73.	1727.	146.	146.	1.02	1055.	1200.	289.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	33.	863.	56.	56.				144.
	2	41.	915.	91.	91.				159.
77.36		74.	1779.	146.	146.	1.02	1054.	1201.	297.

%K
.485 x 228 = 111 cfs to Chan 1,11
WSEL

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	33.	884.	56.	56.				147.
	2	42.	947.	91.	91.				164.
77.37		76.	1831.	147.	147.	1.02	1054.	1201.	306.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	34.	905.	56.	56.				150.
	2	43.	980.	91.	91.				169.
77.38		77.	1884.	147.	147.	1.02	1054.	1201.	314.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	35.	926.	57.	57.				153.
	2	44.	1013.	91.	91.				174.
77.39		79.	1938.	148.	148.	1.02	1053.	1201.	323.

1
WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W110A
*** RUN DATE & TIME: 08-02-94 14:06
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W110A; SRD = 14300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	35.	947.	57.	57.				156.
	2	45.	1046.	92.	92.				179.
77.40		80.	1993.	149.	149.	1.02	1053.	1202.	332.

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1
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  EX

+++ BEGINNING PROFILE CALCULATIONS --   1
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION W110A
           *** RUN DATE & TIME: 08-02-94  14:06

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS      Q    WSEL
      SRD    FLEN    REW        K  ALPH    HO     ERR     FR#    VEL

W110A:XS   ******  1054.      75.   .15 *****   77.51   77.29    228.   77.36
    14300. ******  1201.    1802.  1.02 ***** *******     .76    3.04
  ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
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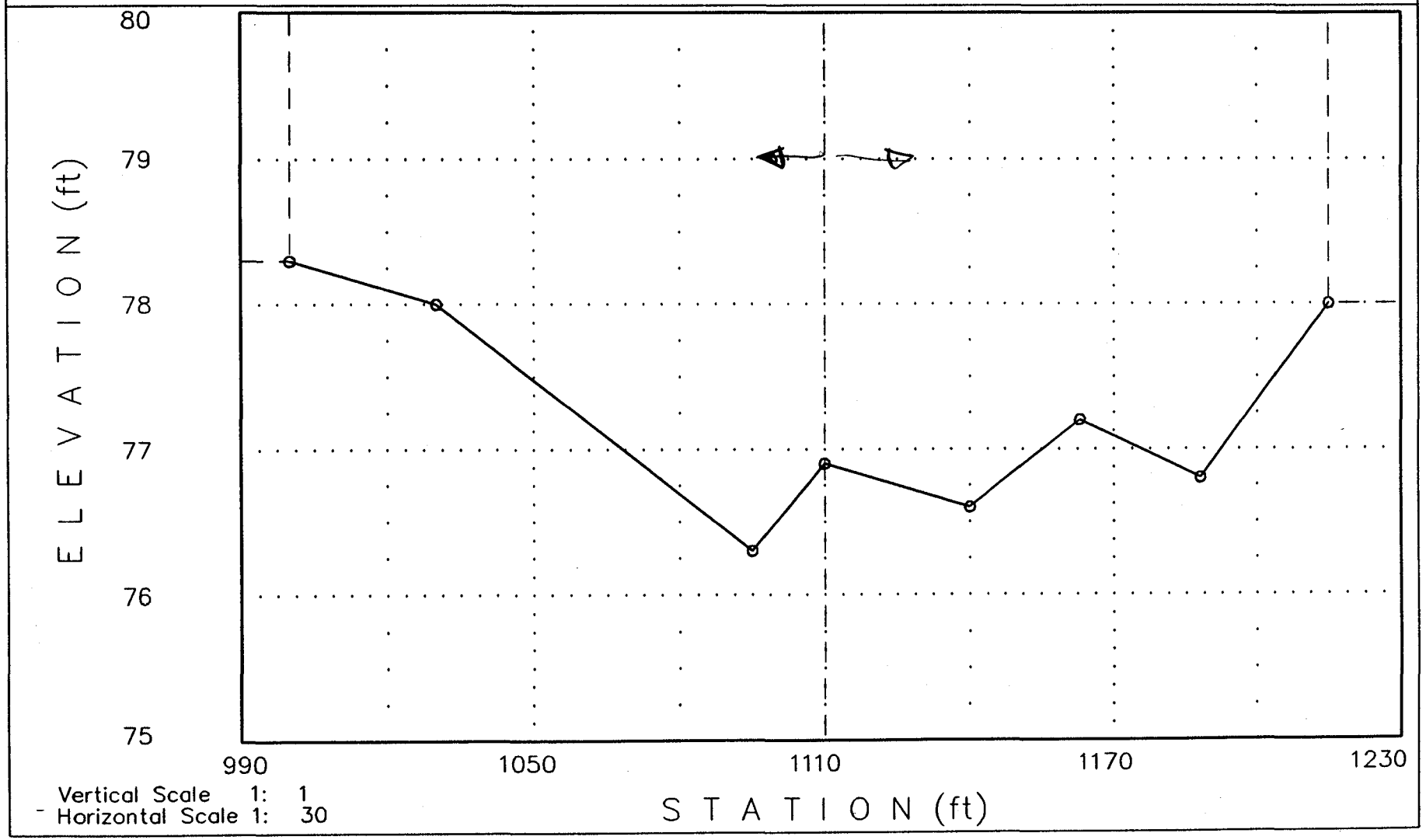
Subcritical

<<<<<< Cross Section: 1.10A: (FN = WLOMR) >>>>>>



08-02-1994

Sect. W110B

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-------- Q:\510024\HYDRO\WSPRO\DIVS\W110B.O

1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

           *** RUN DATE & TIME: 08-02-94  14:59

  T1         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2         COE & VAN LOO CONSULTANTS
  T3         SECTION W110B
  *
  *
  *          FILENAME: W110B
  *
  Q          993
*** Q-DATA FOR SEC-ID, ISEQ =            1
  SK         0.016
  *
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION W110B
           *** RUN DATE & TIME: 08-02-94  14:59

*** START PROCESSING CROSS SECTION - "W110B"
  XS   W110B 14300
  GR          0,1954.6   55,1954.7   85,1954    100,1953   110,1954
  GR        145,1955.1  170,1954.8  210,1954.7  245,1954   275,1952.4
  GR        320,1954    340,1954.7
  N        .040   .040
  SA           145
  *
  HP 1 W110B 1954.9,0.01,1955

*** FINISH PROCESSING CROSS SECTION - "W110B"
*** CROSS SECTION "W110B" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID "W110B" AT SRD =  14300.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =  12):
       X      Y          X      Y          X      Y          X      Y
       .0 1954.60      55.0 1954.70      85.0 1954.00     100.0 1953.00
    110.0 1954.00     145.0 1955.10     170.0 1954.80     210.0 1954.70
    245.0 1954.00     275.0 1952.40     320.0 1954.00     340.0 1954.70

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
       .0 1954.60     275.0 1952.40     340.0 1954.70     145.0 1955.10

SUBAREA BREAKPOINTS (NSA =  2):
       145.

ROUGHNESS COEFFICIENTS (NSA =  2):
        .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
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P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W110B
*** RUN DATE & TIME: 08-02-94 14:59
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W110B; SRD = 14300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	78.	1982.	139.	139.				333.
	2	164.	5781.	178.	179.				894.
1954.90		242.	7763.	317.	318.	1.06	0.	340.	1168.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	80.	2038.	139.	139.				341.
	2	166.	5868.	179.	179.				906.
1954.91		245.	7906.	318.	319.	1.06	0.	340.	1190.

Q
0.2578 * 993 = 256 cfs
0.7422 * 993 = 737 cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	81.	2095.	139.	140.				350.
	2	168.	5955.	180.	180.				919.
1954.92		249.	8050.	319.	320.	1.06	0.	340.	1212.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	82.	2152.	140.	140.				359.
	2	170.	6044.	181.	181.				932.
1954.93		252.	8196.	320.	321.	1.05	0.	340.	1234.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	84.	2210.	140.	140.				367.
	2	171.	6133.	182.	182.				945.
1954.94		255.	8343.	322.	322.	1.05	0.	340.	1257.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	85.	2268.	140.	141.				376.
	2	173.	6223.	183.	183.				957.
1954.95		258.	8491.	323.	324.	1.05	0.	340.	1279.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	87.	2327.	141.	141.				385.
	2	175.	6313.	183.	184.				970.
1954.96		262.	8641.	324.	325.	1.05	0.	340.	1302.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	88.	2387.	141.	141.				394.
	2	177.	6405.	184.	185.				984.
1954.97		265.	8792.	325.	326.	1.05	0.	340.	1325.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	89.	2448.	141.	142.				403.
	2	179.	6497.	185.	185.				997.
1954.98		268.	8944.	326.	327.	1.05	0.	340.	1348.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	91.	2509.	142.	142.				412.
	2	181.	6590.	186.	186.				1010.
1954.99		271.	9098.	327.	328.	1.05	0.	340.	1371.

1
WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W110B
*** RUN DATE & TIME: 08-02-94 14:59
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W110B; SRD = 14300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	92.	2570.	142.	142.				422.

3/4

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          2     182.    6682.   187.   187.                        1023.
  1955.00 |     275.    9252.   328.   329.  1.04     0.   340.   1394.
1
  *
  EX

+++ BEGINNING PROFILE CALCULATIONS --   1
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W110B
          *** RUN DATE & TIME: 08-02-94  14:59

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
      SRD    FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

W110B:XS   ******     0.     244.   .27 ***** 1955.18 1954.84    993. 1954.91
    14300. ******   340.    7850.  1.06 ***** *******     .84    4.07
  ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
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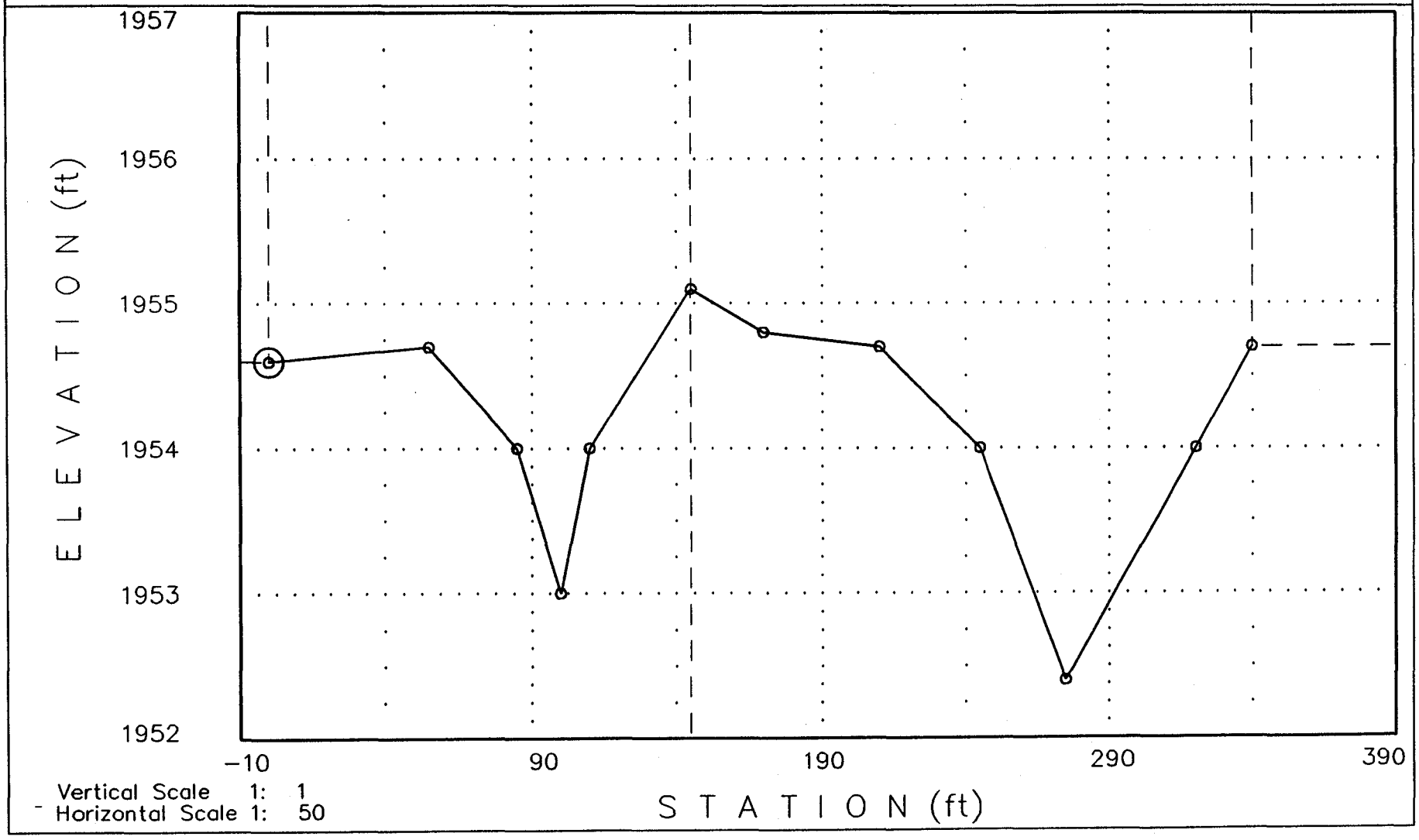
<<<<<< Cross Section: 1.10B: (FN = WLOMR) >>>>>>



08-02-1994

Sht 1/4

SECT W 2.00A

@1946

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-------- Q:\510024\HYDRO\WSPRO\DIVS\W200A.O

1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

           *** RUN DATE & TIME: 08-03-94  09:42

  T1          SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2          COE & VAN LOO CONSULTANTS
  T3          SECTION W200A
  *
  *
  *           FILENAME: W200A
  *
  Q           1146
*** Q-DATA FOR SEC-ID, ISEQ =            1
  SK          0.0118
  *
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION W200A
           *** RUN DATE & TIME: 08-03-94  09:42

*** START PROCESSING CROSS SECTION - "W200A"
  XS   W200A 1
  GR          1000,1946.0   1015,1946.3  1038,1944.8  1057,1946    1070,1946.1
  GR          1085,1946.0   1100,1945.5  1110,1946   1125,1946.1   1135,1946
  GR          1150,1945.2   1162,1946.0  1205,1947
  N          .040   .047
  SA             1070
  *
  HP 1 W200A 1946.9,.01,1947

*** FINISH PROCESSING CROSS SECTION - "W200A"
*** CROSS SECTION "W200A" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID "W200A" AT SRD =      1.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =  13):
       X      Y          X      Y          X      Y          X      Y
   1000.0 1946.00    1015.0 1946.30    1038.0 1944.80    1057.0 1946.00
   1070.0 1946.10    1085.0 1946.00    1100.0 1945.50    1110.0 1946.00
   1125.0 1946.10    1135.0 1946.00    1150.0 1945.20    1162.0 1946.00
   1205.0 1947.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
   1000.0 1946.00    1038.0 1944.80    1205.0 1947.00    1205.0 1947.00

SUBAREA BREAKPOINTS (NSA =  2):
       1070.

ROUGHNESS COEFFICIENTS (NSA =  2):
         .040    .047
1
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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W200A
*** RUN DATE & TIME: 08-03-94 09:42
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W200A; SRD = 1.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	82.	3352.	70.	71.				502.
	2	115.	3359.	131.	131.				614.
1946.90		197.	6712.	201.	202.	1.09	1000.	1201.	1062.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	83.	3400.	70.	71.				509.
	2	117.	3416.	131.	131.				624.
1946.91		199.	6816.	201.	202.	1.09	1000.	1201.	1077.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	83.	3448.	70.	71.				515.
	2	118.	3473.	132.	132.				633.
1946.92		201.	6921.	202.	203.	1.09	1000.	1202.	1092.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	84.	3496.	70.	71.				522.
	2	119.	3530.	132.	132.				643.
1946.93		203.	7026.	202.	203.	1.09	1000.	1202.	1108.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	85.	3545.	70.	71.				528.
	2	121.	3588.	132.	133.				653.
1946.94		205.	7132.	202.	204.	1.09	1000.	1202.	1123.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	85.	3593.	70.	71.				535.
	2	122.	3646.	133.	133.				662.
1946.95		207.	7239.	203.	204.	1.09	1000.	1203.	1138.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	86.	3642.	70.	71.				541.
	2	123.	3704.	133.	133.				672.
1946.96		209.	7347.	203.	204.	1.09	1000.	1203.	1154.

0.4957 × 1146 = 568 cfs
0.5042 × 1146 = 579 cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	87.	3691.	70.	71.				548.
	2	125.	3764.	134.	134.				682.
1946.97		211.	7455.	204.	205.	1.09	1000.	1204.	1169.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	87.	3741.	70.	71.				555.
	2	126.	3823.	134.	134.				692.
1946.98		213.	7564.	204.	205.	1.09	1000.	1204.	1185.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	88.	3791.	70.	71.				561.
	2	127.	3883.	135.	135.				702.
1946.99		215.	7674.	205.	206.	1.09	1000.	1205.	1201.

1

WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W200A
*** RUN DATE & TIME: 08-03-94 09:42
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W200A; SRD = 1.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR

```
            1      89.    3840.    70.    71.                          568.
            2     129.    3943.   135.   135.                          712.
  1947.00         217.    7783.   205.   206.  1.09  1000.  1205.    1216.
1
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  EX

 +++ BEGINNING PROFILE CALCULATIONS --   1
1
 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION W200A
           *** RUN DATE & TIME: 08-03-94  09:42

  ===025 SLOPE-CONVEYANCE DISCHARGE OUT OF RANGE.
            WSMIN,QMIN,WSMAX,QMAX =  1945.05         1. 1946.98       822.

  ===010 WSI BELOW YMIN AT SECID "W200A":  USED WSI = CRWS.
                        YMIN,WSI,CRWS =   1944.8    1844.80    1946.96

  XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
       SRD    FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

 W200A:XS   ******  1000.     209.   .51 ***** 1947.47 1946.96   1146. 1946.96
        1. ******  1203.    7344.  1.09 ***** *******     .99    5.48
   ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
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Section
W2.00C

-------- Q:\510024\HYDRO\WSPRO\DIVS\W200C.O

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1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          *** RUN DATE & TIME: 08-02-94  16:12

  T1        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2        COE & VAN LOO CONSULTANTS
  T3        SECTION W200C
  *
  *
  *         FILENAME: W200C
  *
  Q         690
*** Q-DATA FOR SEC-ID, ISEQ =          1
  SK        0.012
  *
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W200C
          *** RUN DATE & TIME: 08-02-94  16:12

*** START PROCESSING CROSS SECTION - "W200C"
  XS   W200C 1
  GR        1000,1923.8   1060,1923.3  1082,1922   1090,1922.3   1110,1922.3
  GR        1125,1922.2   1145,1922    1155,1921.7 1170,1922     1220,1922.6
  N        .040   .040
  SA           1110
  *
  HP 1 W200C 1923.2,.01,1923.3

*** FINISH PROCESSING CROSS SECTION - "W200C"
*** CROSS SECTION "W200C" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID "W200C" AT SRD =      1.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =  10):
       X      Y          X      Y          X      Y          X      Y
   1000.0 1923.80    1060.0 1923.30    1082.0 1922.00    1090.0 1922.30
   1110.0 1922.30    1125.0 1922.20    1145.0 1922.00    1155.0 1921.70
   1170.0 1922.00    1220.0 1922.60

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
   1000.0 1923.80    1155.0 1921.70    1220.0 1922.60    1000.0 1923.80

SUBAREA BREAKPOINTS (NSA =  2):
       1110.

ROUGHNESS COEFFICIENTS (NSA =  2):
        .040    .040

WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS
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SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W200C
*** RUN DATE & TIME: 08-02-94 16:12
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W200C; SRD = 1.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	39.	1236.	48.	48.				196.
	2	115.	4396.	110.	111.				667.
1923.20		154.	5632.	158.	159.	1.02	1062.	1220.	852.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	39.	1259.	48.	49.				199.
	2	116.	4466.	110.	111.				677.
1923.21		155.	5726.	158.	159.	1.02	1062.	1220.	864.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	40.	1283.	49.	49.				202.
	2	117.	4537.	110.	111.				686.
1923.22		157.	5819.	159.	159.	1.02	1061.	1220.	877.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	40.	1306.	49.	49.				206.
	2	118.	4608.	110.	111.				696.
1923.23		158.	5914.	159.	159.	1.02	1061.	1220.	890.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	41.	1330.	49.	49.				209.
	2	119.	4679.	110.	111.				706.
1923.24		160.	6009.	159.	160.	1.02	1061.	1220.	903.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	41.	1354.	49.	49.				213.
	2	121.	4751.	110.	111.				716.
1923.25		162.	6105.	159.	160.	1.02	1061.	1220.	916.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	42.	1378.	49.	49.				216.
	2	122.	4823.	110.	111.				726.
1923.26		163.	6201.	159.	160.	1.02	1061.	1220.	929.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	42.	1402.	49.	50.				220.
	2	123.	4896.	110.	111.				735.
1923.27		165.	6298.	159.	160.	1.02	1061.	1220.	942.

0.2226 x 690 = 154 cfs into 2.30
0.7774 x 690 = 536 cfs into 2.00

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	43.	1426.	50.	50.				223.
	2	124.	4969.	110.	111.				745.
1923.28		166.	6395.	160.	160.	1.02	1060.	1220.	955.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	43.	1451.	50.	50.				227.
	2	125.	5043.	110.	111.				755.
1923.29		168.	6494.	160.	161.	1.02	1060.	1220.	969.

1
WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W200C
*** RUN DATE & TIME: 08-02-94 16:12
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W200C; SRD = 1.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	44.	1476.	50.	50.				230.
	2	126.	5117.	110.	111.				765.
1923.30		170.	6593.	160.	161.	1.02	1060.	1220.	982.

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1
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  EX

+++ BEGINNING PROFILE CALCULATIONS --   1

WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W200C
          *** RUN DATE & TIME: 08-02-94  16:12

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS      Q    WSEL
       SRD   FLEN    REW        K  ALPH    HO     ERR     FR#    VEL

W200C:XS   ******  1061.     165.   .28 ***** 1923.55 1923.07    690. 1923.27
        1. ******  1220.    6301.  1.02 ***** *******     .73    4.19
  ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
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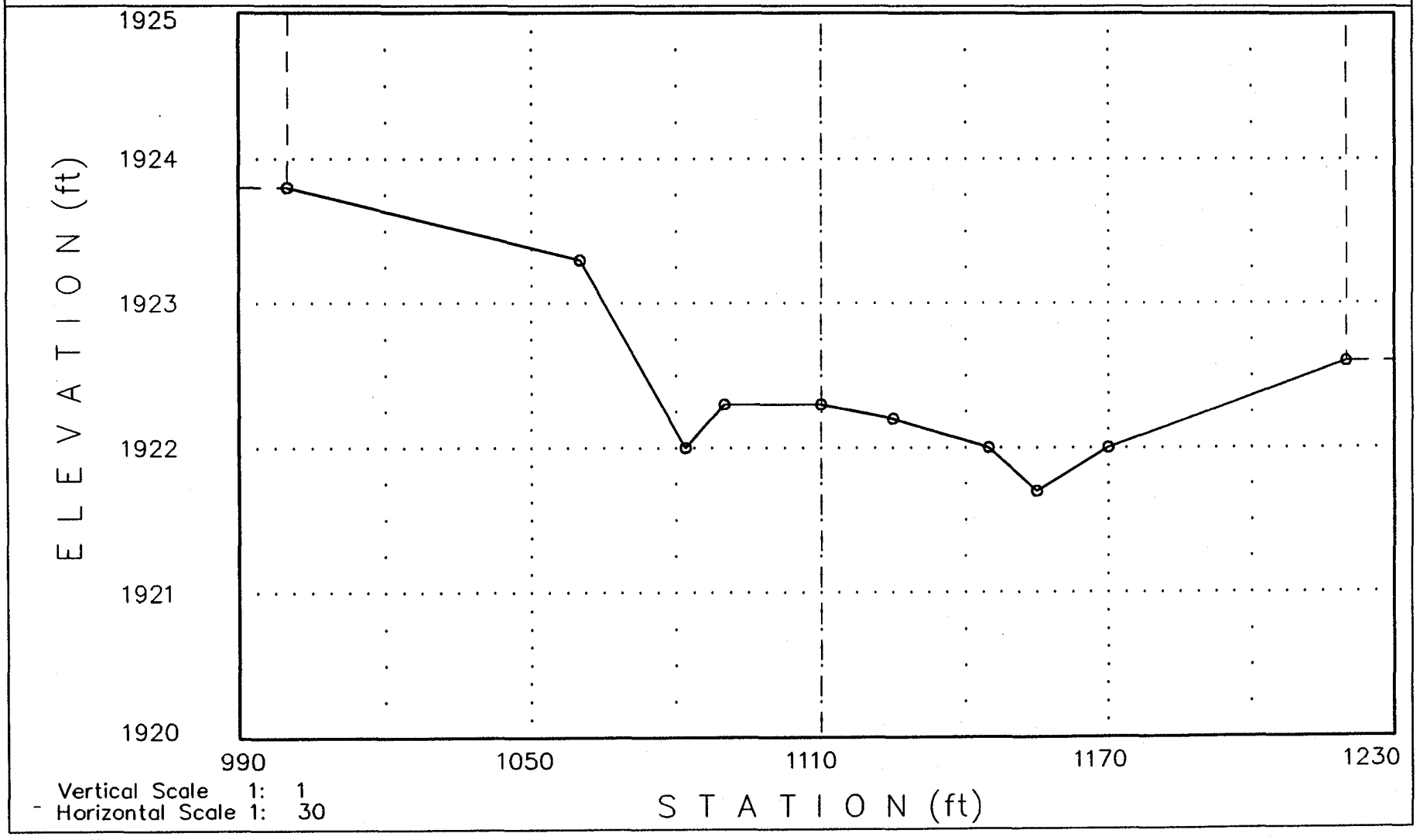
Sub critical

<<<<<< Cross Section: 2.00C: (FN = WLOMR) >>>>>>



08-02-1994

Section
W2.20A

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-------- Q:\510024\HYDRO\WSPRO\DIVS\W220A.O

1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          *** RUN DATE & TIME: 08-02-94  16:24

  T1        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2        COE & VAN LOO CONSULTANTS
  T3        SECTION W220A
  *
  *
  *         FILENAME: W220A
  *
  Q         536
*** Q-DATA FOR SEC-ID, ISEQ =           1
  SK        0.016
  *
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W220A
          *** RUN DATE & TIME: 08-02-94  16:24

*** START PROCESSING CROSS SECTION - "W220A"
  XS   W220A 14300
  GR          0,1916.6    20,1916.6   30,1916     70,1914.9  110,1916.0
  GR        125,1916.24  140,1916.1  155,1916.1  175,1916.2  220,1917
  N        .040   .040
  SA           125
  *
  HP 1 W220A 1916.6,.01,1916.7

*** FINISH PROCESSING CROSS SECTION - "W220A"
*** CROSS SECTION "W220A" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID "W220A" AT SRD =  14300.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =  10):
       X      Y          X      Y          X      Y          X      Y
       .0 1916.60      20.0 1916.60      30.0 1916.00      70.0 1914.90
    110.0 1916.00     125.0 1916.24     140.0 1916.10     155.0 1916.10
    175.0 1916.20     220.0 1917.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
       .0 1916.60      70.0 1914.90     220.0 1917.00     220.0 1917.00

SUBAREA BREAKPOINTS (NSA =  2):
       125.

ROUGHNESS COEFFICIENTS (NSA =  2):
        .040    .040
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS
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SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W220A
*** RUN DATE & TIME: 08-02-94 16:24
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W220A; SRD = 14300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	102.	3738.	105.	105.				572.
	2	27.	535.	73.	73.				96.
1916.60		130.	4273.	178.	178.	1.12	20.	198.	594.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	103.	3396.	125.	125.				534.
	2	28.	556.	73.	73.				99.
1916.61		132.	3952.	198.	198.	1.09	0.	198.	584.

%K
.859 x536 = 461 Chan 2.00
.141 x536 = 75.4 Chan 2.20

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	105.	3464.	125.	125.				544.
	2	29.	578.	74.	74.				103.
1916.62		134.	4042.	199.	199.	1.09	0.	199.	596.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	106.	3533.	125.	125.				554.
	2	30.	599.	74.	74.				106.
1916.63		136.	4133.	199.	199.	1.09	0.	199.	609.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	107.	3603.	125.	125.				563.
	2	30.	622.	75.	75.				110.
1916.64		138.	4224.	200.	200.	1.09	0.	200.	621.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	108.	3673.	125.	125.				573.
	2	31.	644.	75.	75.				114.
1916.65		140.	4317.	200.	200.	1.09	0.	200.	634.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	110.	3744.	125.	125.				583.
	2	32.	667.	76.	76.				117.
1916.66		142.	4411.	201.	201.	1.09	0.	201.	647.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	111.	3815.	125.	125.				593.
	2	33.	690.	76.	76.				121.
1916.67		144.	4505.	201.	202.	1.09	0.	201.	660.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	112.	3887.	125.	125.				603.
	2	33.	714.	77.	77.				125.
1916.68		146.	4601.	202.	202.	1.09	0.	202.	673.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	113.	3959.	125.	125.				613.
	2	34.	738.	78.	78.				129.
1916.69		148.	4697.	203.	203.	1.09	0.	203.	686.

1
WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W220A
*** RUN DATE & TIME: 08-02-94 16:24
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W220A; SRD = 14300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	115.	4031.	125.	125.				623.
	2	35.	763.	78.	78.				133.

```
  1916.70          150.    4793.   203.   203.  1.09     0.   203.    699.
1
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+++ BEGINNING PROFILE CALCULATIONS --   1
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION W220A
           *** RUN DATE & TIME: 08-02-94  16:24

 ===015 WSI IN WRONG FLOW REGIME AT SECID "W220A":  USED WSI = CRWS.
                            WSI,CRWS =  1916.60    1916.61

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
      SRD    FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

W220A:XS   ******     0.     132.   .28 ***** 1916.89 1916.61    536. 1916.61
   14300. ******   198.    3950.  1.09 ***** *******     .92    4.07
  ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
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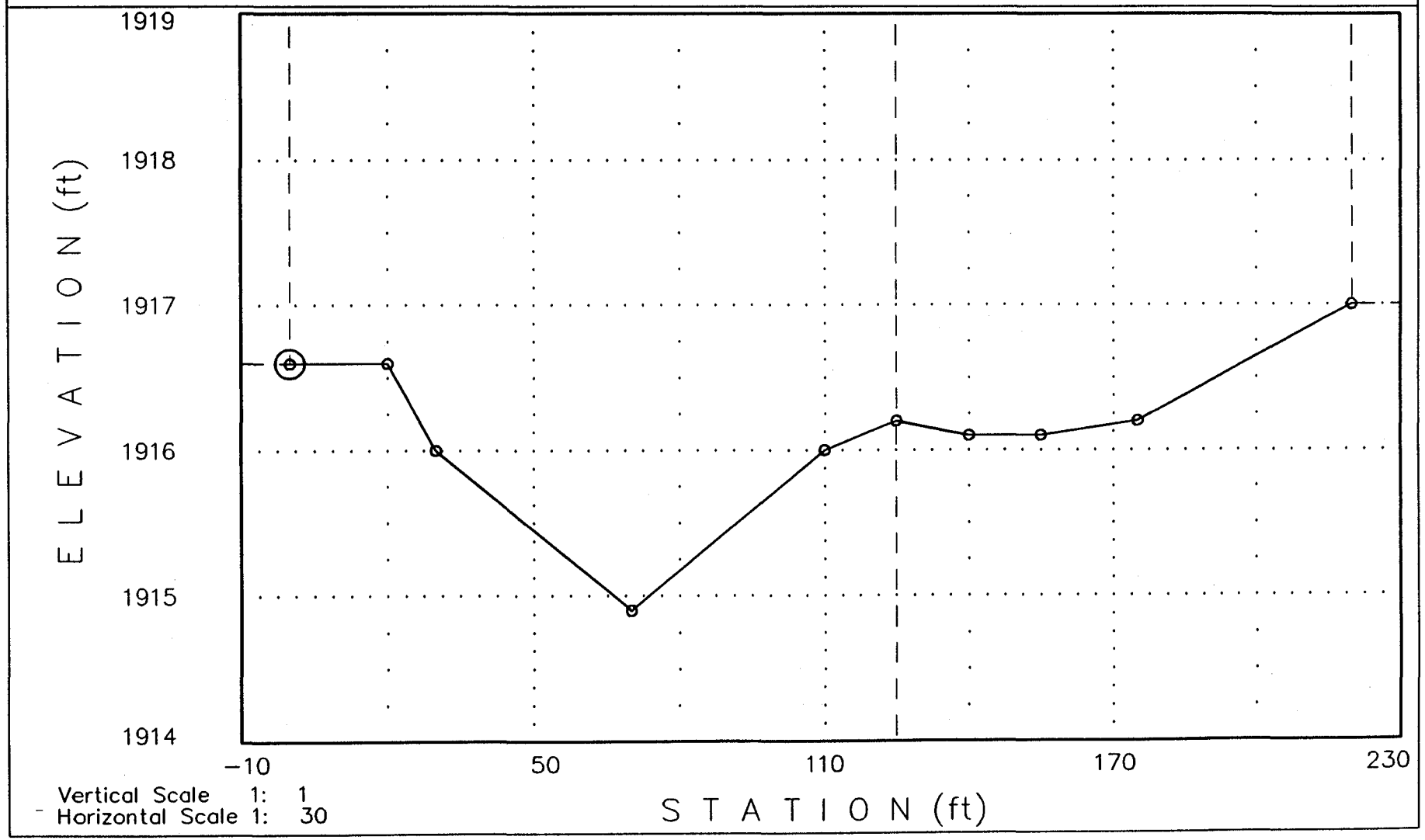
CRWS

<<<<<< Cross Section: 2.20A: (FN = WLOMR) >>>>>>



08-02-1994

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Project Wash6a
Project No.
Sheet No. of
Calculated by DWD Date 6/94
Checked by Date

Flow split W1.00A

WSEl	Channel Left (South) (cfs)	Channel (North) middle (cfs)	Right (cfs)	Q_{Total} (cfs)
55.4	123	77	188	388
55.7	232	159	287	-
55.8	276	192	326	794
56.0	397	275	423	1095
56.5	773	534	706	2013
57.0	1243	856	1082	-

Q_{100} = 1510 cfs : stage ≈ 56.2

Qsouth ≅ 567 cfs chan 1.10
Qnorth ≅ 943 cfs chan 1.00

Project Wash Ga
Project No.
Sheet No. of
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

Left

CROSS SECTION PARAMETERS: FILENAME: w1-00al.SEC

No. of Cross Section Points: 28 Bed Slope: 0.01700 Max Elev.: 55.80
Bank Stations.....Left: 1044.0 Right....: 1049.0 Min Elev.: 54.28
Encroachment Stations..Left: 1000.0 Right....: 1093.0
Manning-n Values.....LOB: 0.050 CHANNEL..: 0.030 ROB.....: 0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	55.80	1000.00	2)	55.00	1039.00	3)	54.28	1044.00
4)	54.28	1049.00	5)	55.00	1058.00	6)	55.12	1063.00
7)	55.00	1068.00	8)	54.40	1078.00	9)	54.38	1080.00
10)	54.40	1082.00	11)	55.00	1090.00	12)	55.10	1093.00
13)	55.00	1096.00	14)	54.30	1106.00	15)	54.30	1108.00
16)	54.30	1110.00	17)	55.00	1114.00	18)	55.20	1120.00
19)	55.00	1127.00	20)	55.00	1132.00	21)	55.80	1145.00
22)	55.00	1155.00	23)	54.10	1170.00	24)	54.10	1180.00
25)	54.10	1185.00	26)	55.00	1190.00	27)	56.00	1211.00
28)	57.00	1240.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
55.40	123.1	3.0	0.70	0.044	0.6	73.5	41.2	73.6	55.38
55.70	231.7	3.5	0.72	0.045	0.7	88.1	65.5	88.3	55.66
55.80	276.1	3.7	0.73	0.045	0.8	93.0	74.5	93.1	55.76
56.00	397.4	4.3	0.75	0.045	1.0	93.0	93.1	93.1	55.98
56.50	773.3	5.5	0.80	0.046	1.5	93.0	139.6	93.1	56.46
57.00	1242.7	6.7	0.83	0.046	2.0	93.0	186.1	93.1	56.95

NOTES:

Project Washoe
Project No.
Sheet No. of
Calculated by JWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

Middle

CROSS SECTION PARAMETERS: FILENAME: w1-00am.SEC

No. of Cross Section Points:	28	Bed Slope:	0.01800	Max Elev.:	55.80
Bank Stations.....Left:	1106.0	Right....:	1110.0	Min Elev.:	54.30
Encroachment Stations..Left:	1093.0	Right....:	1145.0		
Manning-n Values.....LOB:	0.040	CHANNEL..:	0.030	ROB.....:	0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	55.80	1000.00	2)	55.00	1039.00	3)	54.28	1044.00
4)	54.28	1049.00	5)	55.00	1058.00	6)	55.12	1063.00
7)	55.00	1068.00	8)	54.40	1078.00	9)	54.38	1080.00
10)	54.40	1082.00	11)	55.00	1090.00	12)	55.10	1093.00
13)	55.00	1096.00	14)	54.30	1106.00	15)	54.30	1108.00
16)	54.30	1110.00	17)	55.00	1114.00	18)	55.20	1120.00
19)	55.00	1127.00	20)	55.00	1132.00	21)	55.80	1145.00
22)	55.00	1155.00	23)	54.10	1170.00	24)	54.10	1180.00
25)	54.10	1185.00	26)	55.00	1190.00	27)	56.00	1211.00
28)	57.00	1240.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
55.40	76.9	3.3	0.82	0.038	0.5	45.5	23.2	45.6	55.40
55.70	159.1	4.2	0.87	0.039	0.7	50.4	37.5	50.5	55.69
55.80	192.4	4.5	0.88	0.039	0.8	52.0	42.6	52.1	55.79
56.00	275.9	5.2	0.91	0.039	1.0	52.0	53.1	52.1	55.99
56.50	534.1	6.8	0.97	0.039	1.5	52.0	79.1	52.1	56.49
57.00	856.2	8.2	1.01	0.039	2.0	52.0	105.1	52.1	57.13

NOTES:

Project Washga
Project No.
Sheet No. of
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

Right

CROSS SECTION PARAMETERS: FILENAME: w1-00ar.SEC

No. of Cross Section Points:	28	Bed Slope:	0.01800	Max Elev.:	57.00
Bank Stations.....Left:	1170.0	Right....:	1185.0	Min Elev.:	54.10
Encroachment Stations..Left:	1145.0	Right....:	1240.0		
Manning-n Values.....LOB:	0.040	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	55.80	1000.00	2)	55.00	1039.00	3)	54.28	1044.00
4)	54.28	1049.00	5)	55.00	1058.00	6)	55.12	1063.00
7)	55.00	1068.00	8)	54.40	1078.00	9)	54.38	1080.00
10)	54.40	1082.00	11)	55.00	1090.00	12)	55.10	1093.00
13)	55.00	1096.00	14)	54.30	1106.00	15)	54.30	1108.00
16)	54.30	1110.00	17)	55.00	1114.00	18)	55.20	1120.00
19)	55.00	1127.00	20)	55.00	1132.00	21)	55.80	1145.00
22)	55.00	1155.00	23)	54.10	1170.00	24)	54.10	1180.00
25)	54.10	1185.00	26)	55.00	1190.00	27)	56.00	1211.00
28)	57.00	1240.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
55.40	188.0	4.8	0.94	0.036	0.8	48.4	39.2	48.5	55.40
55.70	286.7	5.2	0.94	0.037	0.9	58.5	55.2	58.6	55.69
55.80	325.9	5.3	0.94	0.037	1.0	61.8	61.2	62.0	55.79
56.00	422.8	5.7	0.95	0.038	1.1	66.0	74.0	66.2	55.99
56.50	706.2	6.4	0.96	0.039	1.4	80.5	110.6	80.7	56.49
57.00	1082.3	7.0	0.97	0.039	1.6	95.0	154.5	95.2	56.99

NOTES:

51-0024

Scale

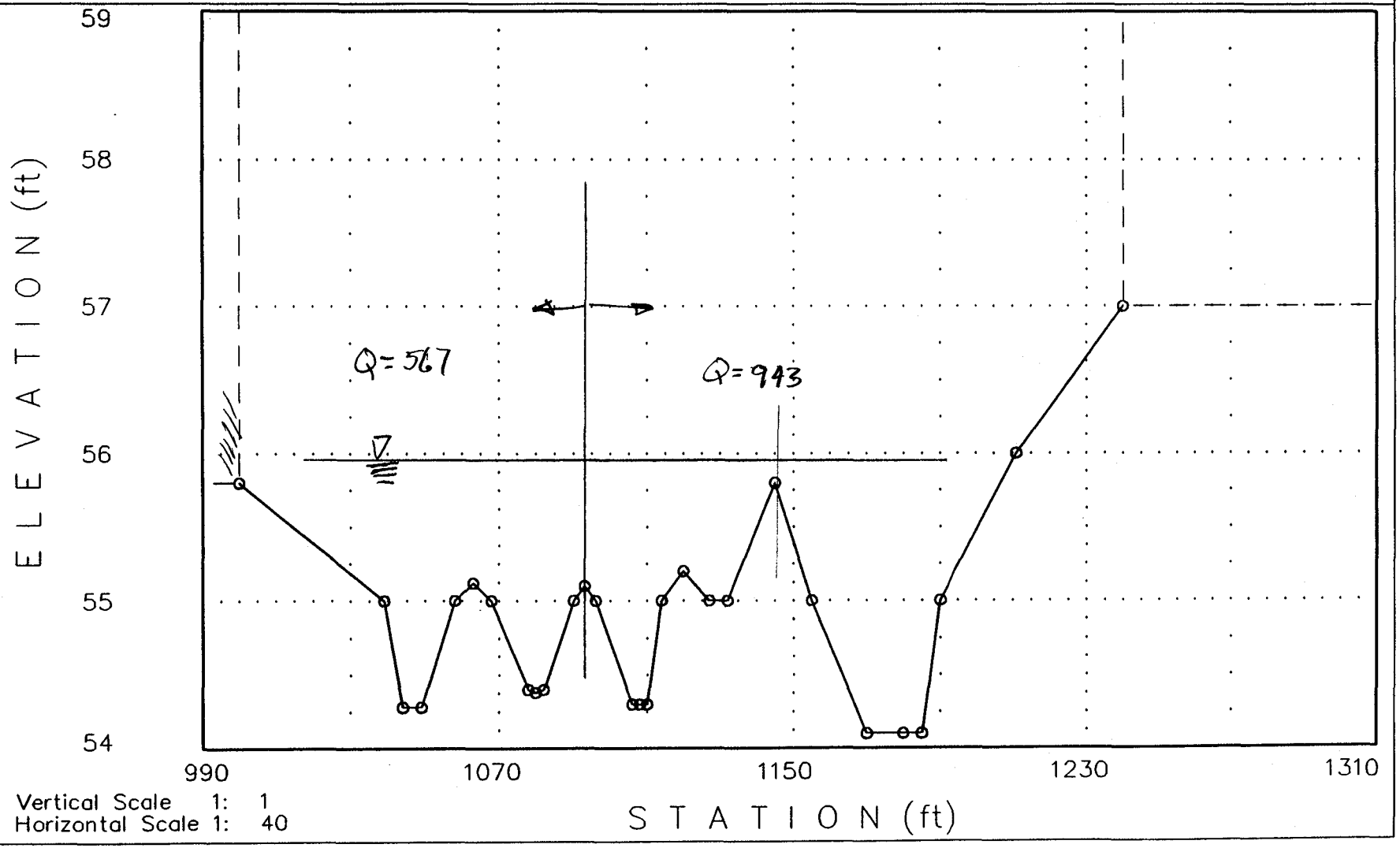
100

6000N

5500N

<<<<<< Cross Section: W1-00AL: (FN = W1-00AL.SEC) >>>>>>

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .05 CH: .03 ROB: .045: S= .017



Vertical Scale 1: 1
Horizontal Scale 1: 40

08-03-1994

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Project Wash 6a

Project No.

Sheet No. of

Calculated by DWD Date 6/94

Checked by Date

Flow split Into Channels 1.20 and 1.00 @ 1847
W1.00-B

Stage	Q_L (cfs)	Q_R (cfs)	Q_{Total} (cfs)
47.0	0	0	0
47.5	0	46	46
48.0	2	159	161
48.5	19	307	326
49.0	294	763	1057
49.2	493	1026	1519

Q_{100} = 943 fs ⇒ Chan. 1.2 $Q_{100} = Q_L$ = 251 fs to W1.20A

Stage 48.9 Chan. 1.0 $Q_{100} = Q_R$ = 692 fs

Project Wash 6a
Project No.
Sheet No. of
Calculated by DWD Date 6/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W1.00B — Left

CROSS SECTION PARAMETERS: FILENAME: SPSECT8L.SEC

No. of Cross Section Points:	20	Bed Slope:	0.01300	Max Elev.:	48.80
Bank Stations.....Left:	296.0	Right....:	301.0	Min Elev.:	47.80
Encroachment Stations..Left:	90.0	Right....:	340.0		
Manning-n Values.....LOB:	0.055	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	48.80	90.00	2)	48.60	105.00	3)	48.50	130.00
4)	48.40	220.00	5)	48.60	265.00	6)	48.00	295.00
7)	47.80	296.00	8)	47.80	301.00	9)	48.00	305.00
10)	48.50	315.00	11)	48.80	340.00	12)	48.30	365.00
13)	48.00	395.00	14)	47.00	415.00	15)	47.00	435.00
16)	48.00	440.00	17)	48.20	450.00	18)	48.20	460.00
19)	48.50	485.00	20)	50.00	585.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
48.00	2.0	1.3	0.60	0.036	0.2	10.0	1.5	10.0	47.95
48.50	18.8	0.9	0.44	0.049	0.1	157.5	20.9	157.5	48.34
49.00	293.9	2.2	0.51	0.053	0.5	250.0	136.5	250.0	48.93
49.20	493.1	2.6	0.54	0.053	0.7	250.0	186.5	250.0	49.08

NOTES:

Project Washoe
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W1.00-B : Right

CROSS SECTION PARAMETERS: FILENAME: SPSECT8R.SEC

No. of Cross Section Points:	20	Bed Slope:	0.02000	Max Elev.:	50.00
Bank Stations.....Left:	415.0	Right....:	435.0	Min Elev.:	47.00
Encroachment Stations..Left:	340.0	Right....:	585.0		
Manning-n Values.....LOB:	0.040	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	48.80	90.00	2)	48.60	105.00	3)	48.50	130.00
4)	48.40	220.00	5)	48.60	265.00	6)	48.00	295.00
7)	47.80	296.00	8)	47.80	301.00	9)	48.00	305.00
10)	48.50	315.00	11)	48.80	340.00	12)	48.30	365.00
13)	48.00	395.00	14)	47.00	415.00	15)	47.00	435.00
16)	48.00	440.00	17)	48.20	450.00	18)	48.20	460.00
19)	48.50	485.00	20)	50.00	585.00			

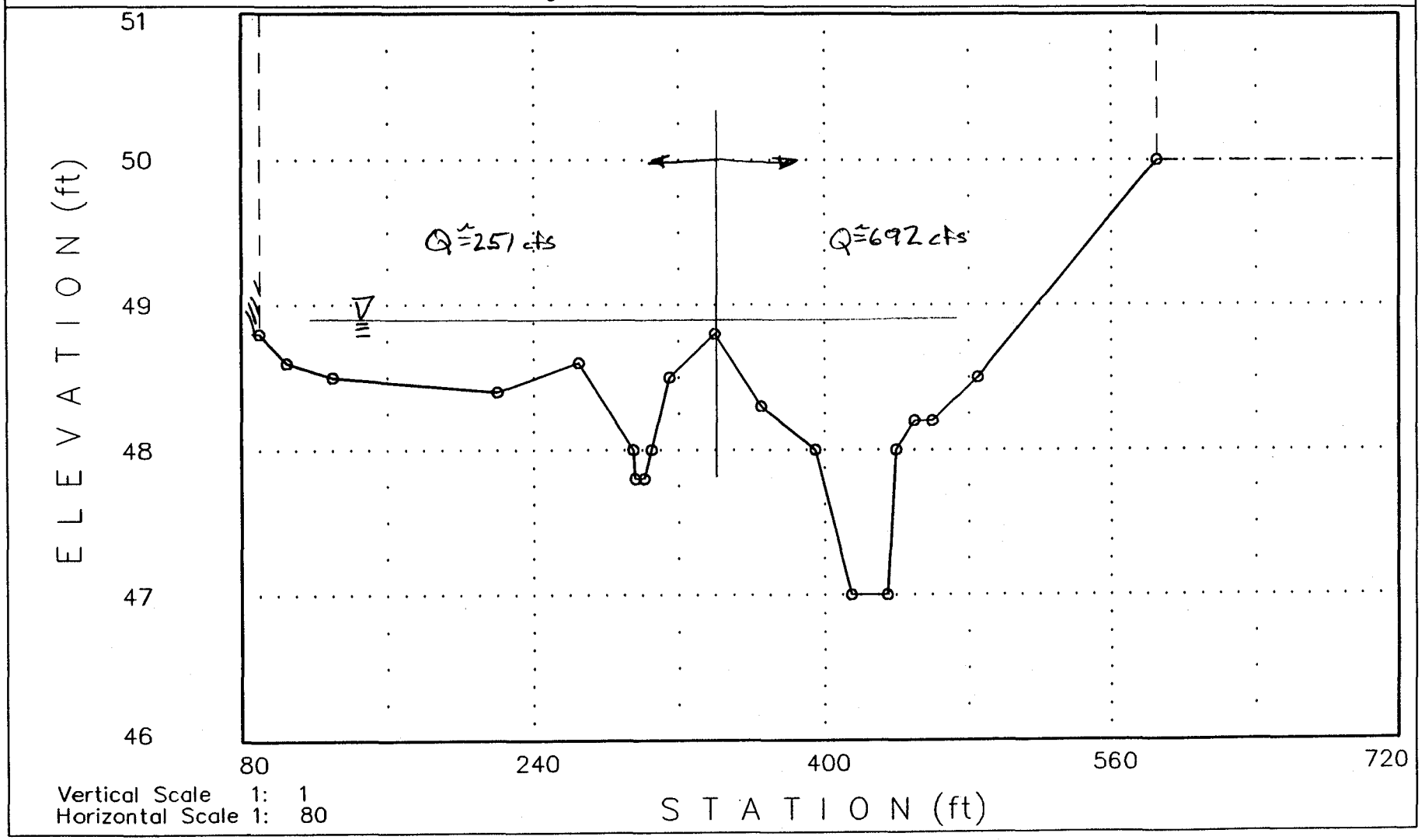
COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
47.50	45.9	3.5	0.97	0.033	0.4	32.5	13.1	32.6	47.49
48.00	159.3	4.9	1.02	0.034	0.7	45.0	32.5	45.1	48.01
48.50	306.8	4.0	0.91	0.037	0.6	130.0	77.3	130.1	48.49
49.00	762.8	4.9	0.92	0.039	0.9	178.3	155.8	178.5	48.99
49.20	1025.5	5.3	0.93	0.040	1.0	191.7	192.8	191.8	49.19

NOTES:

<<<<<<< Cross Section: W1-00BL: (FN = W1-00BL.SEC) >>>>>>>

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .055 CH: .03 ROB: .045: S= .013



Vertical Scale 1: 1
Horizontal Scale 1: 80

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Project Wash 6a

Project No.

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Flow splits into Channels 1.20 & 1.00 @ 1845
W1.20-A

Stage	Q_L (cfs)	Q_R (cfs)	Q_{total} (cfs)
45.1	0	0	0
45.2	2	0	2
46.0	51	30	81
46.3	178	53	231
46.5	316	86	402
47.0	815	331	1146

from W1.00B Left
Q_{100} = 251 cfs ⇒ Chan 1.2 $Q_{100} = Q_L = 194$ cfs
Chan 1.0 $Q_{100} = Q_R = 57$ cfs

∴ Chan 1.0 $Q_{100} = 57 + 692 = 749$ cfs

Project Wash6a
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Calculated by DWD Date 8/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W1.20A Left

CROSS SECTION PARAMETERS: FILENAME: SPSECT9L.SEC

No. of Cross Section Points:	17	Bed Slope:	0.01500	Max Elev.:	46.80
Bank Stations.....Left:	300.0	Right....:	305.0	Min Elev.:	45.00
Encroachment Stations..Left:	120.0	Right....:	320.0		
Manning-n Values.....LOB:	0.055	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	46.80	120.00	2)	46.00	140.00	3)	45.80	160.00
4)	45.80	250.00	5)	46.30	275.00	6)	46.00	290.00
7)	45.00	300.00	8)	45.00	305.00	9)	46.00	315.00
10)	46.50	320.00	11)	46.00	335.00	12)	45.20	345.00
13)	45.20	350.00	14)	46.00	355.00	15)	46.50	380.00
16)	46.60	465.00	17)	47.00	500.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
45.20	2.0	1.4	0.65	0.036	0.2	9.0	1.4	9.0	45.16
46.00	51.2	1.4	0.50	0.051	0.2	145.0	36.0	145.1	45.99
46.30	177.5	2.1	0.54	0.052	0.5	185.5	85.6	185.6	46.29
46.50	316.1	2.6	0.56	0.053	0.6	192.5	123.4	192.6	46.48
47.00	815.4	3.7	0.61	0.053	1.1	200.0	222.3	200.1	46.89

NOTES:

Project Washoe
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

U91.20-A : Right

CROSS SECTION PARAMETERS: FILENAME: spsect9r.SEC

No. of Cross Section Points:	17	Bed Slope:	0.01500	Max Elev.:	47.00
Bank Stations.....Left:	345.0	Right....:	350.0	Min Elev.:	45.20
Encroachment Stations..Left:	320.0	Right....:	500.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	46.80	120.00	2)	46.00	140.00	3)	45.80	160.00
4)	45.80	250.00	5)	46.30	275.00	6)	46.00	290.00
7)	45.00	300.00	8)	45.00	305.00	9)	46.00	315.00
10)	46.50	320.00	11)	46.00	335.00	12)	45.20	345.00
13)	45.20	350.00	14)	46.00	355.00	15)	46.50	380.00
16)	46.60	465.00	17)	47.00	500.00			

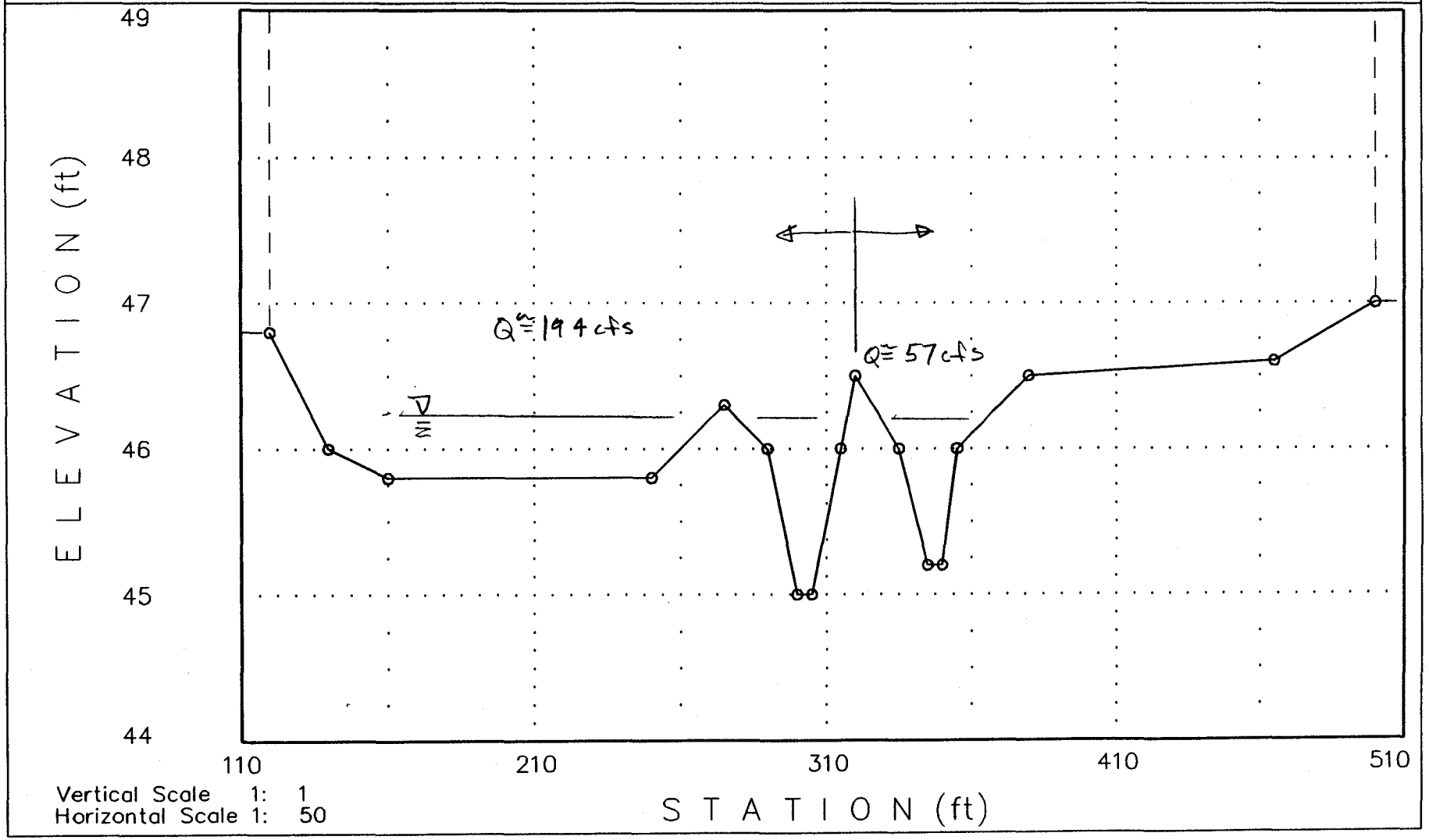
COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
46.00	29.8	3.0	0.74	0.038	0.5	20.0	10.0	20.1	45.96
46.30	52.5	2.7	0.71	0.040	0.4	44.0	19.6	44.1	46.29
46.50	85.5	2.9	0.71	0.040	0.5	60.0	30.0	60.1	46.49
47.00	331.1	3.1	0.73	0.040	0.6	180.0	105.3	180.1	46.99

NOTES:

<<<<<< Cross Section: W1-20AL: (FN = W1-20AL.SEC) >>>>>>

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .055 CH: .03 ROB: .045: S= .015



Vertical Scale 1: 1
Horizontal Scale 1: 50

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Project: WashGa
Project No.:
Sheet No. ____ of ____
Calculated by: DWD Date: 6/94
Checked by: ____ Date: ____

Flow Splits into Channels 1.11 & 1.10 @ 1846
W1.1DC

Stage	Q_{Right} (cfs)	Q_{Left} (cfs)	Q_{Total} (cfs)
44.80	0	0	0
45.00	0	5	5
46.00	0	111	111
46.50	24	210	234
47.00	94	360	454
47.80	413	619	1032
48.00	557	823	1380

$Q_{100} = 567$ cfs $\Rightarrow$ Chan 1.11 $Q_{100} \cong Q_L \cong 411$ cfs

Chan 1.10 $Q_{100} \cong Q_R \cong 156$ cfs

Q_T in 1.10 $\cong 156 + 194 \cong 350$ cfs

Project Wash6a
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Calculated by Date

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W1.10c - Right

CROSS SECTION PARAMETERS: FILENAME: SPSECT7L.SEC

No. of Cross Section Points:	16	Bed Slope:	0.02200	Max Elev.:	48.50
Bank Stations.....Left:	300.0	Right....:	310.0	Min Elev.:	46.00
Encroachment Stations..Left:	265.0	Right....:	360.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	47.80	155.00	2)	47.50	190.00	3)	46.00	205.00
4)	44.80	215.00	5)	44.80	225.00	6)	46.00	230.00
7)	47.00	240.00	8)	47.50	265.00	9)	47.00	290.00
10)	46.00	300.00	11)	46.00	310.00	12)	47.50	325.00
13)	46.50	335.00	14)	46.50	340.00	15)	48.00	350.00
16)	48.50	360.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
46.50	24.3	3.2	0.93	0.035	0.4	20.0	7.5	20.0	46.49
47.00	94.4	3.8	0.90	0.039	0.6	43.3	24.6	43.5	46.99
47.80	413.0	5.1	0.92	0.042	1.0	83.7	80.6	83.9	47.79
48.00	557.4	5.7	0.94	0.042	1.1	85.0	97.5	85.3	47.99

NOTES:

Project Washoe
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W1.10C - Left

CROSS SECTION PARAMETERS: FILENAME: SPSECT7R.SEC

No. of Cross Section Points:	16	Bed Slope:	0.02200	Max Elev.:	47.80
Bank Stations.....Left:	215.0	Right....:	225.0	Min Elev.:	44.80
Encroachment Stations..Left:	155.0	Right....:	265.0		
Manning-n Values.....LOB:	0.045	CHANNEL..:	0.030	ROB.....:	0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	47.80	155.00	2)	47.50	190.00	3)	46.00	205.00
4)	44.80	215.00	5)	44.80	225.00	6)	46.00	230.00
7)	47.00	240.00	8)	47.50	265.00	9)	47.00	290.00
10)	46.00	300.00	11)	46.00	310.00	12)	47.50	325.00
13)	46.50	335.00	14)	46.50	340.00	15)	48.00	350.00
16)	48.50	360.00						

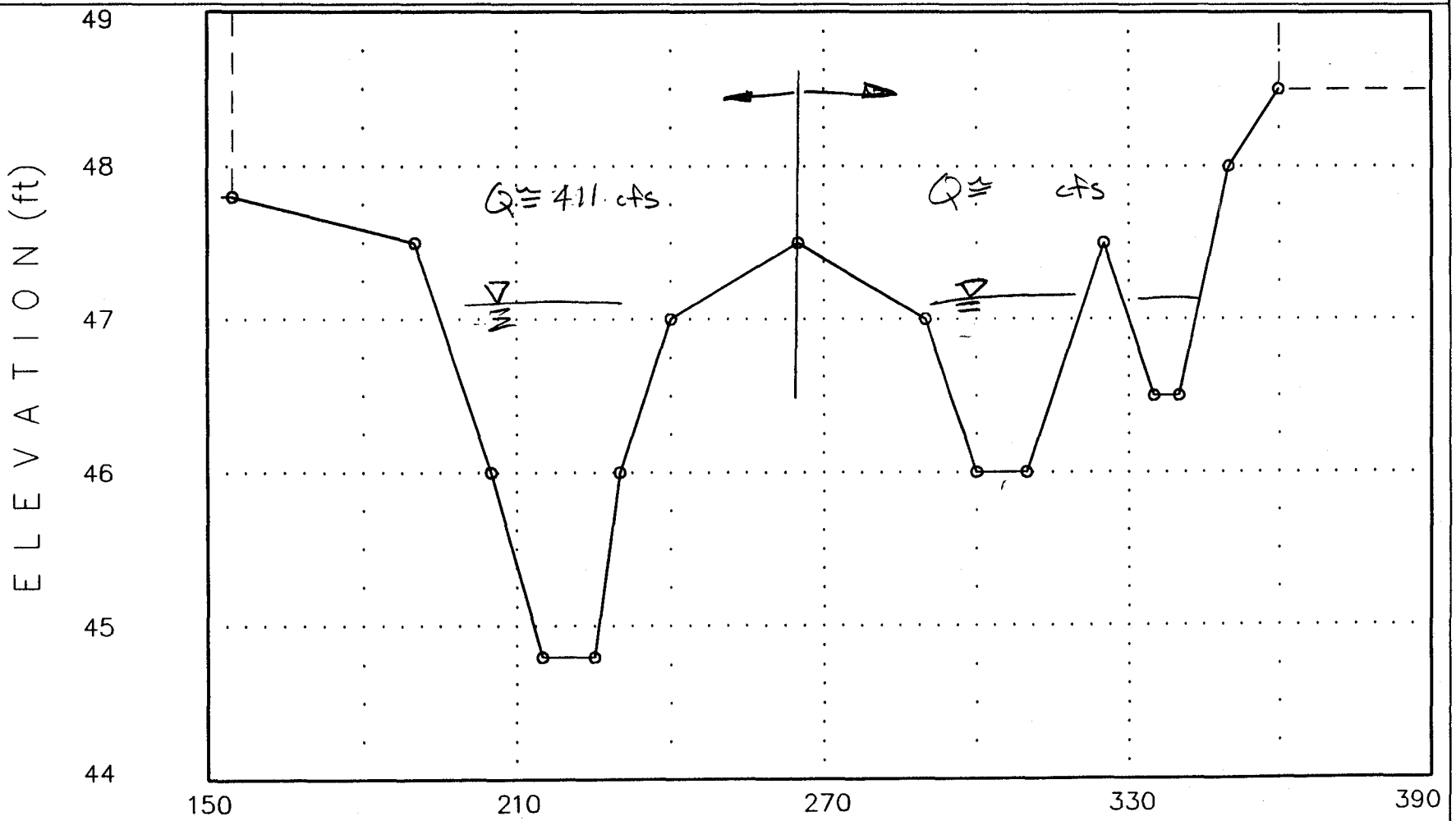
COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
45.00	5.0	2.2	0.92	0.032	0.2	12.5	2.3	12.5	44.99
46.00	111.3	5.3	1.02	0.037	0.8	25.0	21.0	25.2	46.11
46.50	210.1	5.8	1.01	0.038	1.0	35.0	36.0	35.3	46.71
47.00	360.3	6.4	1.02	0.039	1.2	45.0	56.0	45.3	47.38
47.80	619.2	5.4	0.94	0.041	1.0	110.0	113.7	110.3	47.79
48.00	823.5	6.1	0.96	0.042	1.2	110.0	135.8	110.3	47.99

NOTES:

<<<<<< Cross Section: W1-10CL: (FN = W1-10CL.SEC) >>>>>>

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .045 CH: .03 ROB: .045: S= .022



Vertical Scale 1: 1
Horizontal Scale 1: 30

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Project Wash 6a

Project No.

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Flow Split W1.10D

Stage	Q Left (cfs)	Q right (cfs)	Q Total (cfs)
26.5	0	3	3
27.0	1	22	23
27.5	92	64	156
28.0	461	144	605
28.5	1132	223	1355

$Q_{100} = 350$ cfs

$Q_R \cong 99$ cfs
$Q_L \cong 251$ cfs

Q chan 1.00 = 749+99
@ 1809 = 848 cfs

Project Wash 6a
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W1.10D : Left

CROSS SECTION PARAMETERS: FILENAME: W1-10DL.SEC

No. of Cross Section Points:	8	Bed Slope:	0.01100	Max Elev.:	30.00
Bank Stations.....Left:	880.0	Right....:	1000.0	Min Elev.:	26.90
Encroachment Stations..Left:	790.0	Right....:	1000.0		
Manning-n Values.....LOB:	0.020	CHANNEL..:	0.020	ROB.....:	0.020

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	30.00	790.00	2)	28.00	880.00	3)	26.90	950.00
4)	27.50	1000.00	5)	26.20	1015.00	6)	26.20	1019.00
7)	28.00	1030.00	8)	29.00	1055.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
27.00	0.8	1.1	0.83	0.020	0.1	14.7	0.7	14.7	27.00
27.50	92.4	3.5	1.12	0.020	0.3	88.2	26.5	88.2	27.52
28.00	460.9	5.9	1.28	0.020	0.7	120.0	78.5	120.0	28.12
28.50	1131.5	7.9	1.38	0.020	1.0	142.5	144.1	142.5	28.77
29.00	2092.4	9.5	1.44	0.020	1.3	165.0	221.0	165.0	29.44

NOTES:

Project Wash6a
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UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

W1.10D Right

CROSS SECTION PARAMETERS: FILENAME: W1-10DR.SEC

No. of Cross Section Points: 8 Bed Slope:0.00700 Max Elev.: 29.00
Bank Stations.....Left: 1015.0 Right....: 1019.0 Min Elev.: 26.20
Encroachment Stations..Left: 1000.0 Right....: 1055.0
Manning-n Values.....LOB: 0.025 CHANNEL..: 0.030 ROB.....: 0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	30.00	790.00	2)	28.00	880.00	3)	26.90	950.00
4)	27.50	1000.00	5)	26.20	1015.00	6)	26.20	1019.00
7)	28.00	1030.00	8)	29.00	1055.00			

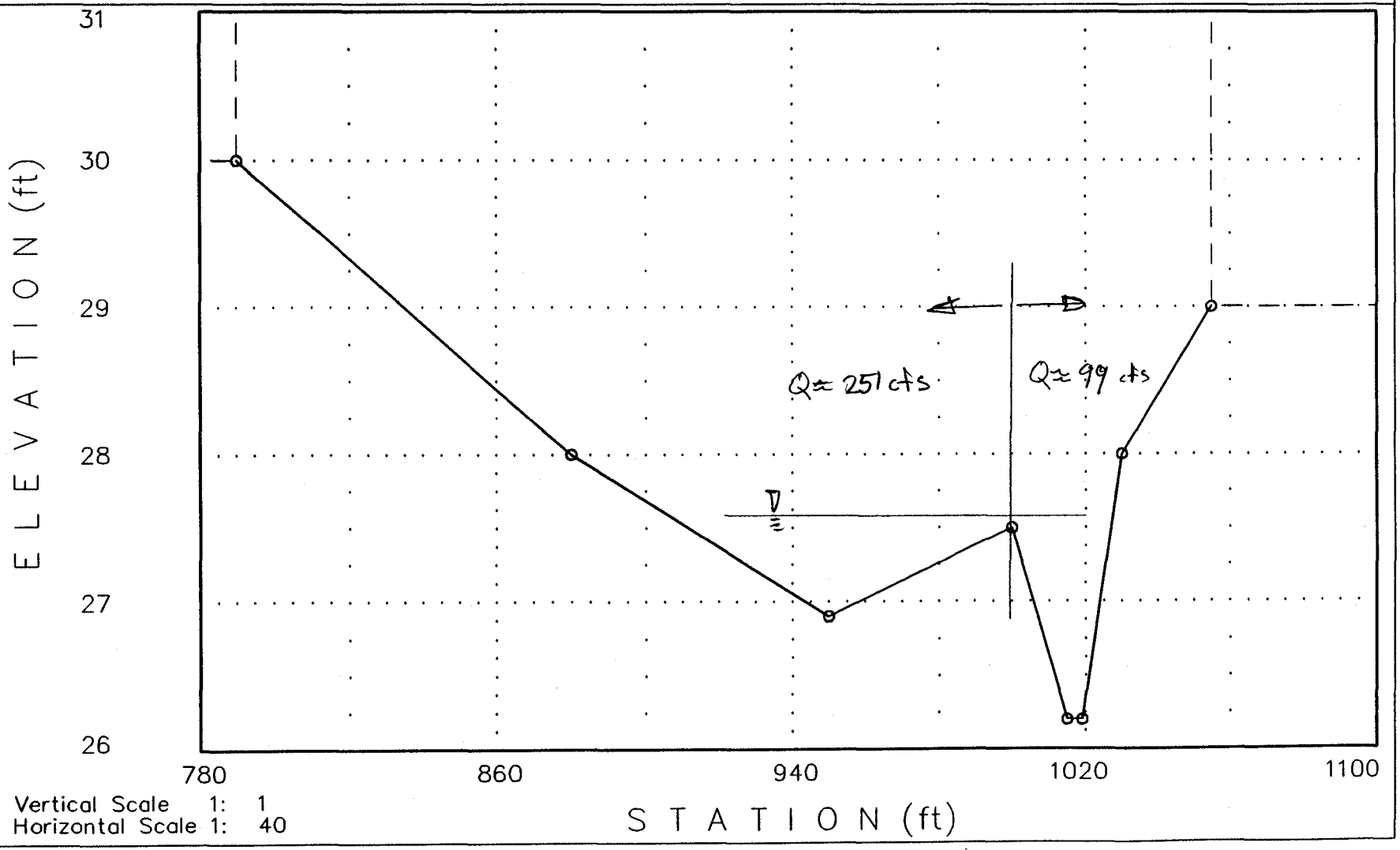
COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
26.50	2.9	1.4	0.54	0.031	0.2	9.3	2.0	9.3	26.42
27.00	21.5	2.4	0.61	0.032	0.5	18.1	8.8	18.2	26.86
27.50	64.2	3.2	0.65	0.032	0.7	26.9	20.1	27.1	27.32
28.00	143.7	4.2	0.69	0.032	1.1	30.0	34.3	30.2	27.79
28.50	223.1	4.3	0.67	0.034	1.2	42.5	52.5	42.7	28.07
29.00	339.7	4.4	0.66	0.035	1.4	55.0	76.8	55.2	28.67

NOTES:

<<<<<< Cross Section: W1-10DL: (FN = W1-10DL.SEC) >>>>>>

UNIFORM FLOW COMPUTATIONS: Manning-n Values: LOB: .02 CH: .02 ROB: .02: S= .011



Vertical Scale 1: 1
Horizontal Scale 1: 40

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SECTION W2.10A

Note: Section W2.10A Represents street flow along Dynamite Blvd. Flow in Dynamite overtops south bank and weirs into 2.10. Sec W2.10A was used to estimate flow depth and estimate Average flow depth for weir crest.

```
-------- Q:\510024\HYDRO\WSPRO\DIVS\W210A.O

1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          *** RUN DATE & TIME: 08-03-94  10:01

  T1        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2        COE & VAN LOO CONSULTANTS
  T3        SECTION W210A
  *
  *
  *         FILENAME: W210A
  *
  Q         625
*** Q-DATA FOR SEC-ID, ISEQ =          1
  SK        0.013
  *
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W210A
          *** RUN DATE & TIME: 08-03-94  10:01

*** START PROCESSING CROSS SECTION - "W210A"
  XS   W210A 1
  GR        1000,1984   1020,1983.2   1042,1983.7 1070,1982.8    1076,1984
  GR        1082,1986
  N        .040   .040
  SA           1042
  *
  HP 1 W210A 1984.9,.01,1985.0

*** FINISH PROCESSING CROSS SECTION - "W210A"
*** CROSS SECTION "W210A" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID "W210A" AT SRD =      1.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =   6):
       X      Y          X      Y          X      Y          X      Y
   1000.0 1984.00    1020.0 1983.20    1042.0 1983.70    1070.0 1982.80
   1076.0 1984.00    1082.0 1986.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
   1000.0 1984.00    1070.0 1982.80    1082.0 1986.00    1082.0 1986.00

SUBAREA BREAKPOINTS (NSA =  2):
       1042.

ROUGHNESS COEFFICIENTS (NSA =  2):
        .040    .040

WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS
```

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W210A
*** RUN DATE & TIME: 08-03-94 10:01
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W210A; SRD = 1.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	58.	2633.	42.	43.				386.
	2	56.	2785.	37.	37.				397.
1984.90		114.	5418.	79.	80.	1.01	1000.	1079.	780.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	58.	2665.	42.	43.				390.
	2	57.	2814.	37.	37.				401.
1984.91		115.	5479.	79.	80.	1.00	1000.	1079.	788.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	59.	2697.	42.	43.				394.
	2	57.	2842.	37.	37.				404.
1984.92		116.	5539.	79.	80.	1.00	1000.	1079.	796.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	59.	2728.	42.	43.				398.
	2	58.	2871.	37.	37.				408.
1984.93		117.	5600.	79.	80.	1.00	1000.	1079.	804.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	60.	2760.	42.	43.				403.
	2	58.	2900.	37.	37.				412.
1984.94		117.	5661.	79.	80.	1.00	1000.	1079.	812.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	60.	2792.	42.	43.				407.
	2	58.	2930.	37.	37.				416.
1984.95		118.	5722.	79.	80.	1.00	1000.	1079.	820.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	60.	2825.	42.	43.				411.
	2	59.	2959.	37.	37.				419.
1984.96		119.	5784.	79.	80.	1.00	1000.	1079.	828.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	61.	2857.	42.	43.				416.
	2	59.	2988.	37.	37.				423.
1984.97		120.	5845.	79.	80.	1.00	1000.	1079.	836.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	61.	2890.	42.	43.				420.
	2	59.	3018.	37.	37.				427.
1984.98		121.	5908.	79.	80.	1.00	1000.	1079.	844.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	62.	2922.	42.	43.				424.
	2	60.	3048.	37.	37.				431.
1984.99		121.	5970.	79.	80.	1.00	1000.	1079.	853.

1
WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W210A
*** RUN DATE & TIME: 08-03-94 10:01
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = W210A; SRD = 1.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	62.	2955.	42.	43.				429.
	2	60.	3077.	37.	37.				435.
1985.00		122.	6032.	79.	80.	1.00	1000.	1079.	861.

3/5

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1
  *
  EX

+++ BEGINNING PROFILE CALCULATIONS --   1

WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W210A
          *** RUN DATE & TIME: 08-03-94  10:01

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
       SRD   FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

W210A:XS   ******  1000.     115.   .46 ***** 1985.37 1984.70    625. 1984.91
        1. ******  1079.    5479.  1.00 ***** *******     .79    5.43
  ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
```

COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Wash6a

Project No.

Sheet No. 4 of 5

Calculated by Date

Checked by DWD Date 8/94

Section W2.10A
Estimate Flow into channel 2.10 as broadcrested Weir flow

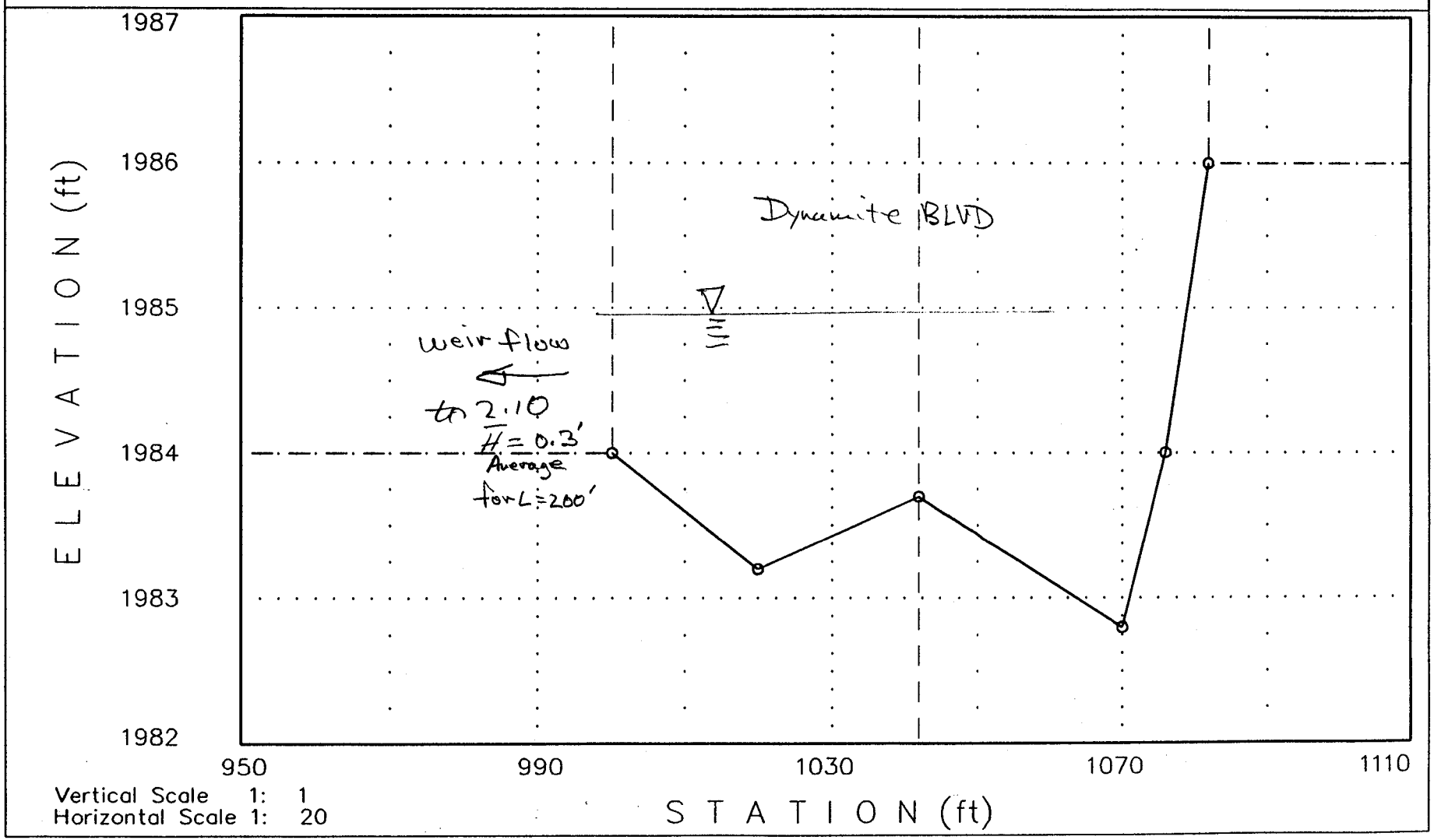
$Q_{WEIR} = C L H^{3/2}$; where $C = 2.6$
$L = 200'$ +/-

$H = 0.30'$ $= (1984.9 - 1984)/3$

$Q_{WEIR} = 2.6 (200)(0.3)^{3/2} = 85$ cfs (Into 2.10)

<<<<<< Cross Section: 210: (FN = WLOMR) >>>>>>

SECTION W2.10A



Vertical Scale 1: 1
Horizontal Scale 1: 20

08-03-1994

-------- Q:\510024\HYDRO\WSPRO\DIVS\W210C1.O

Section W210C

```
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          *** RUN DATE & TIME: 08-03-94  17:01

  T1        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2        COE & VAN LOO CONSULTANTS
  T3        SECTION W210C
  *
  *
  *         FILENAME: W210C
  *
  Q         1391
*** Q-DATA FOR SEC-ID, ISEQ =          1
  SK        0.017
  *
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W210C
          *** RUN DATE & TIME: 08-03-94  17:01

*** START PROCESSING CROSS SECTION - "W210C"
  XS   W210C 1
  GR        42,3.5   52,1.5   53.5,0  95.5,0.5   97,2  100,2
  GR        103,2    104.5,0.5  113.5,0.5  114.25,1.25   124.25,3.25
  GR        274,3.75
  N        .045   .04   .04
  SA           100   124.25
  *
  HP 1 W210C 3.18,.02,3.3

*** FINISH PROCESSING CROSS SECTION - "W210C"
*** CROSS SECTION "W210C" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID "W210C" AT SRD =      1.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =  12):
       X       Y        X       Y        X       Y        X       Y
     42.0    3.50     52.0    1.50     53.5     .00     95.5     .50
     97.0    2.00    100.0    2.00    103.0    2.00    104.5     .50
    113.5     .50    114.3    1.25    124.3    3.25    274.0    3.75

 X-Y MAX-MIN POINTS:
     XMIN       Y        X    YMIN     XMAX       Y        X    YMAX
     42.0    3.50     53.5     .00    274.0    3.75    274.0    3.75

SUBAREA BREAKPOINTS (NSA =  3):
        100.    124.

ROUGHNESS COEFFICIENTS (NSA =  3):
        .045    .040    .040
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS
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        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W210C
          *** RUN DATE & TIME: 08-03-94  17:01
    CROSS-SECTION PROPERTIES:  ISEQ =  1;  SECID = W210C;  SRD =       1.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     140.    8379.    56.    58.                       1254.
            2      42.    2174.    24.    25.                        311.
     3.18         182.   10553.    80.    83.  1.01    44.   124.   1546.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     141.    8482.    57.    58.                       1268.
            2      42.    2210.    24.    25.                        316.
     3.20         183.   10692.    81.    83.  1.01    44.   124.   1564.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     142.    8585.    57.    58.                       1282.
            2      43.    2246.    24.    25.                        321.
     3.22         185.   10831.    81.    83.  1.01    43.   124.   1583.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     144.    8689.    57.    58.                       1297.
            2      43.    2283.    24.    25.                        326.
     3.24         187.   10972.    81.    83.  1.01    43.   124.   1602.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     145.    8793.    57.    58.                       1311.
            2      44.    2323.    24.    25.                        331.
            3       0.       0.     3.     3.                          0.
     3.26         188.   11116.    84.    87.  1.01    43.   127.   1592.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     146.    8899.    57.    58.                       1325.
            2      44.    2366.    24.    25.                        336.
            3       0.       0.     9.     9.                          0.
     3.28         190.   11265.    90.    93.  1.01    43.   133.   1558.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     147.    9004.    57.    58.                       1340.
            2      44.    2410.    24.    25.                        342.
            3       0.       1.    15.    15.                          0.
     3.30         192.   11415.    96.    99.  1.01    43.   139.   1529.
1
  *
  EX

 +++ BEGINNING PROFILE CALCULATIONS --   1
1
 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W210C
          *** RUN DATE & TIME: 08-03-94  17:01

  XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
       SRD    FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

 W210C:XS   ******     44.     183.   .91 *****    4.10    3.01   1391.    3.20
        1.  ******    124.   10664.  1.01 ***** *******     .89    7.60
  ER

 NORMAL  END  OF  WSPRO  EXECUTION.
```
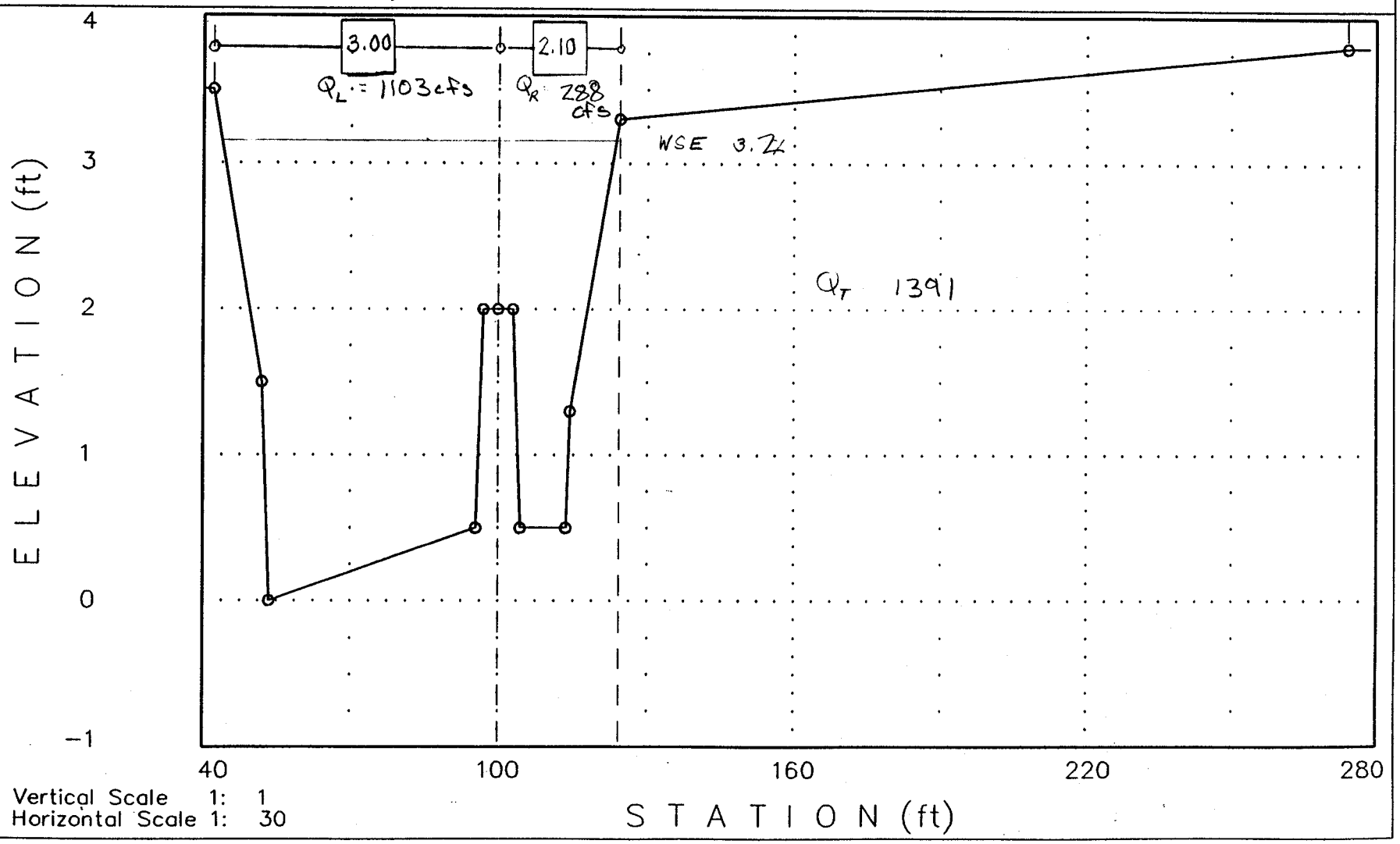

%K
.79 x 1391 = 1103 cfs Chan 3.0
.207 x 1391 = 288 cfs

<<<<<< Cross Section: 210: (FN = WLOMR) >>>>>>

SECTION W 2.10C



Vertical Scale 1: 1
Horizontal Scale 1: 30

08-03-1994

3/3

-------- Q:\510024\HYDRO\WSPRO\DIVS\W1776.O

Sec W1776

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1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          *** RUN DATE & TIME: 08-04-94  07:06

  T1        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2        COE & VAN LOO CONSULTANTS
  T3        SECTION W1776
  *
  *
  *         FILENAME: W1776
  *
  Q         1177
*** Q-DATA FOR SEC-ID, ISEQ =          1
  SK        0.015
  *
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W1776
          *** RUN DATE & TIME: 08-04-94  07:06

*** START PROCESSING CROSS SECTION - " 1776"
  XS    1776 2
  GR       180,1777  250,1776.8 280,1776   350,1774.9   400,1774   410,1773.8
  GR       420,1774   440,1774.5   510,1775.5  560,1775.7  600,1775.5
  GR       665,1776   870,1776.5
  *
  N        .04 .04
  SA         560
  *
  HP 1  1776 1775.85,.01,1776

*** FINISH PROCESSING CROSS SECTION - " 1776"
*** CROSS SECTION " 1776" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID " 1776" AT SRD =      2.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =  13):
       X      Y          X      Y          X      Y          X      Y
    180.0 1777.00     250.0 1776.80     280.0 1776.00     350.0 1774.90
    400.0 1774.00     410.0 1773.80     420.0 1774.00     440.0 1774.50
    510.0 1775.50     560.0 1775.70     600.0 1775.50     665.0 1776.00
    870.0 1776.50

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    180.0 1777.00     410.0 1773.80     870.0 1776.50     180.0 1777.00

SUBAREA BREAKPOINTS (NSA =  2):
       560.

ROUGHNESS COEFFICIENTS (NSA =  2):
         .040    .040
1
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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W1776
*** RUN DATE & TIME: 08-04-94 07:06
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = 1776; SRD = 2.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	242.	8353.	270.	270.				1297.
	2	18.	236.	85.	85.				47.
1775.85		260.	8590.	356.	356.	1.07	290.	645.	1219.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	244.	8496.	271.	271.				1317.
	2	19.	253.	87.	87.				50.
1775.86		263.	8750.	358.	358.	1.07	289.	647.	1240.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	247.	8641.	272.	272.				1337.
	2	20.	270.	88.	88.				53.
1775.87		267.	8911.	360.	360.	1.07	288.	648.	1262.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	250.	8786.	272.	272.				1358.
	2	21.	288.	89.	89.				56.
1775.88		270.	9075.	362.	362.	1.07	288.	649.	1283.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	253.	8933.	273.	273.				1379.
	2	21.	306.	91.	91.				59.
1775.89		274.	9240.	364.	364.	1.07	287.	651.	1305.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	255.	9081.	274.	274.				1400.
	2	22.	325.	92.	92.				63.
1775.90		278.	9406.	366.	366.	1.07	286.	652.	1327.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	258.	9230.	274.	274.				1420.
	2	23.	345.	93.	93.				66.
1775.91		281.	9575.	368.	368.	1.07	286.	653.	1349.

%K
.96 x 1177 = 1135 cfs 3.00
.04 x 1177 = 42 cfs 3.10
WSEL

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	261.	9380.	275.	275.				1442.
	2	24.	365.	95.	95.				70.
1775.92		285.	9745.	370.	370.	1.07	285.	655.	1372.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	264.	9531.	276.	276.				1463.
	2	25.	386.	96.	96.				73.
1775.93		289.	9916.	371.	371.	1.07	284.	656.	1395.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	266.	9683.	276.	276.				1484.
	2	26.	407.	97.	97.				77.
1775.94		293.	10090.	373.	373.	1.07	284.	657.	1417.

1

WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
COE & VAN LOO CONSULTANTS
SECTION W1776
*** RUN DATE & TIME: 08-04-94 07:06
CROSS-SECTION PROPERTIES: ISEQ = 1; SECID = 1776; SRD = 2.

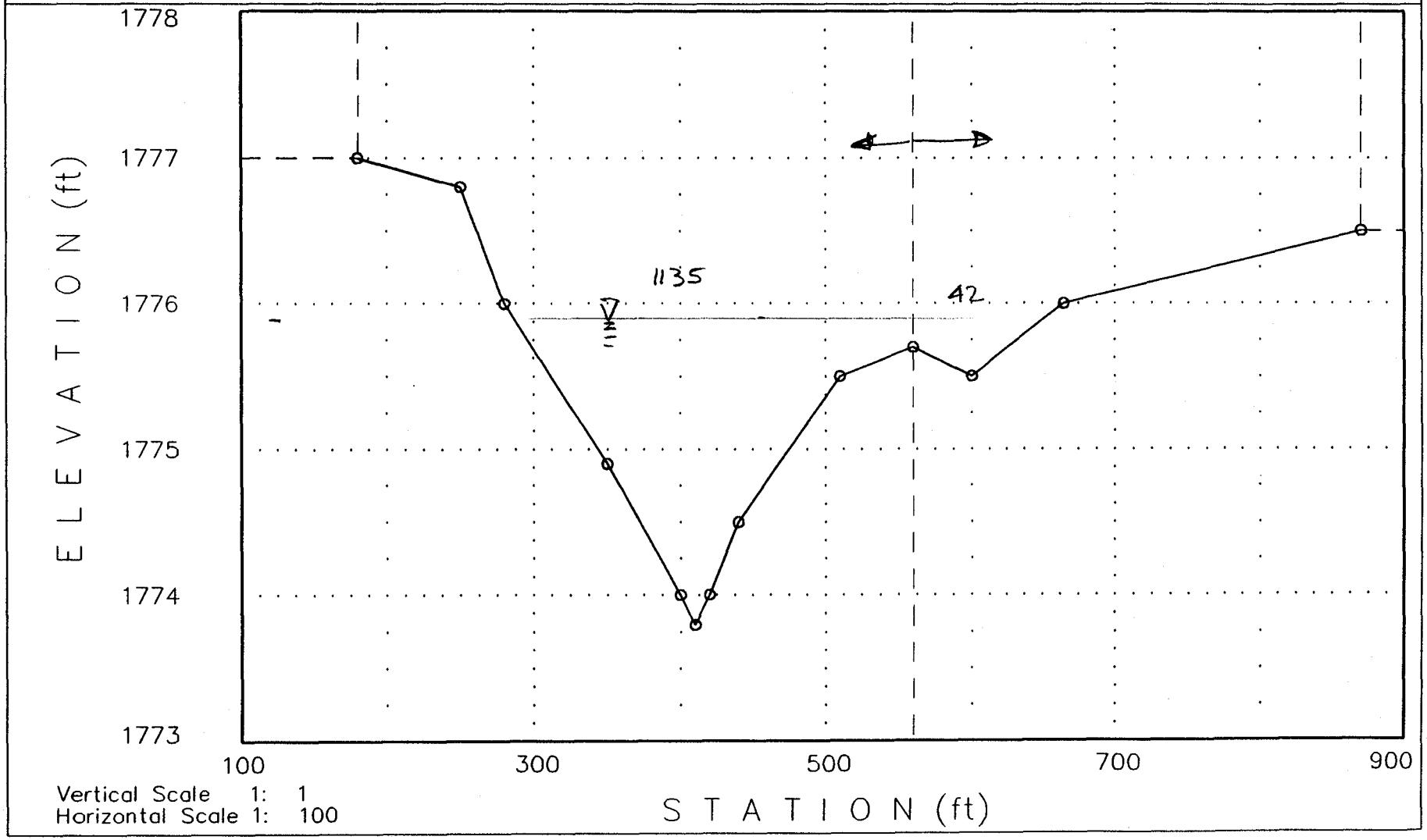
WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR

3/4

```
            1     269.    9836.   277.   277.                          1506.
            2      27.     429.    99.    99.                            81.
   1775.95         296.   10265.   375.   375.  1.08   283.   659.    1441.

      WSEL  SA#    AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     272.    9990.   277.   277.                          1527.
            2      28.     451.   100.   100.                            85.
   1775.96         300.   10441.   377.   377.  1.08   283.   660.    1464.

      WSEL  SA#    AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     275.   10145.   278.   278.                          1549.
            2      29.     474.   101.   101.                            89.
   1775.97         304.   10620.   379.   379.  1.08   282.   661.    1487.

      WSEL  SA#    AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     277.   10302.   279.   279.                          1571.
            2      30.     498.   102.   102.                            93.
   1775.98         308.   10800.   381.   381.  1.08   281.   662.    1511.

      WSEL  SA#    AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     280.   10459.   279.   279.                          1593.
            2      31.     522.   104.   104.                            97.
   1775.99         311.   10982.   383.   383.  1.08   281.   664.    1535.

      WSEL  SA#    AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     283.   10616.   280.   280.                          1614.
            2      32.     547.   105.   105.                           101.
   1776.00         315.   11163.   385.   385.  1.08   280.   665.    1559.
1
  *
  EX

 +++ BEGINNING PROFILE CALCULATIONS --   1
1
 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W1776
          *** RUN DATE & TIME: 08-04-94  07:06

  XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS      Q    WSEL
       SRD    FLEN    REW        K  ALPH    HO     ERR     FR#    VEL

  1776:XS   ******   286.     282.   .29 ***** 1776.20 1775.82   1177. 1775.91
        2. ******   654.    9606.  1.07 ***** *******     .87    4.17
  ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
```

sub

<<<<<< Cross Section: 1776: (FN = WLOMR1) >>>>>>



Vertical Scale 1: 1
Horizontal Scale 1: 100

08-04-1994

4/4

Section W1724

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-------- Q:\510024\HYDRO\WSPRO\DIVS\W1724.O

1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          *** RUN DATE & TIME: 08-04-94  08:56

  T1        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2        COE & VAN LOO CONSULTANTS
  T3        SECTION W1724
  *
  *
  *         FILENAME: W1724
  *
  Q         1177
*** Q-DATA FOR SEC-ID, ISEQ =            1
  SK        0.015
  *
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W1724
          *** RUN DATE & TIME: 08-04-94  08:56

*** START PROCESSING CROSS SECTION - "1724 "
  XS   1724 1
  GR       890,1724.2   910,1724      950,1723  960,1723  990,1724
  GR       1000,1724.1   1045,1724.1   1090,1724   1105,1723 1115,1723
  GR       1130,1724
  GR       1210,1724.1   1290,1723.9   1340,1724   1360,1724   1380,1723.9
  GR       1425,1724.7   1460,1724   1470,1724   1530,1724.6   1575,1723.9
  GR       1665,1724.7
  *
  N        .04  .05
  SA         1210
  *
  HP 1 1724  1724.52,.01,1724.58

*** FINISH PROCESSING CROSS SECTION - "1724 "
*** CROSS SECTION "1724 " WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID "1724 " AT SRD =      1.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =  22):
       X      Y          X      Y          X      Y          X      Y
    890.0 1724.20     910.0 1724.00     950.0 1723.00     960.0 1723.00
    990.0 1724.00    1000.0 1724.10    1045.0 1724.10    1090.0 1724.00
   1105.0 1723.00    1115.0 1723.00    1130.0 1724.00    1210.0 1724.10
   1290.0 1723.90    1340.0 1724.00    1360.0 1724.00    1380.0 1723.90
   1425.0 1724.70    1460.0 1724.00    1470.0 1724.00    1530.0 1724.60
   1575.0 1723.90    1665.0 1724.70

X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    890.0 1724.20     950.0 1723.00    1665.0 1724.70    1425.0 1724.70

SUBAREA BREAKPOINTS (NSA =  2):
```

```
      1210.

ROUGHNESS COEFFICIENTS (NSA =  2):
        .040    .050

WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W1724
          *** RUN DATE & TIME: 08-04-94  08:56
    CROSS-SECTION PROPERTIES:  ISEQ =  1;  SECID = 1724 ;  SRD =       1.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     223.    6531.  320.   320.                       1057.
            2     162.    2636.  403.   403.                        584.
  1724.52         385.    9168.  723.   723.  1.21   890.  1645.   1450.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     226.    6688.  320.   320.                       1080.
            2     166.    2730.  406.   406.                        603.
  1724.53         393.    9418.  726.   727.  1.21   890.  1646.   1487.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     230.    6847.  320.   320.                       1103.
            2     170.    2825.  410.   410.                        623.
  1724.54         400.    9671.  730.   731.  1.21   890.  1647.   1524.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     233.    7006.  320.   320.                       1127.
            2     174.    2921.  414.   414.                        643.
  1724.55         407.    9928.  734.   734.  1.21   890.  1648.   1562.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     236.    7168.  320.   320.                       1150.
            2     179.    3020.  418.   418.                        663.
  1724.56         415.   10188.  738.   738.  1.22   890.  1649.   1600.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     239.    7330.  320.   320.                       1173.
            2     183.    3120.  422.   422.                        683.
  1724.57         422.   10451.  742.   742.  1.22   890.  1650.   1638.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     242.    7493.  320.   320.                       1197.
            2     187.    3221.  425.   425.                        703.
  1724.58         429.   10714.  745.   746.  1.22   890.  1651.   1676.
1
  *
  EX

+++ BEGINNING PROFILE CALCULATIONS --   1
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

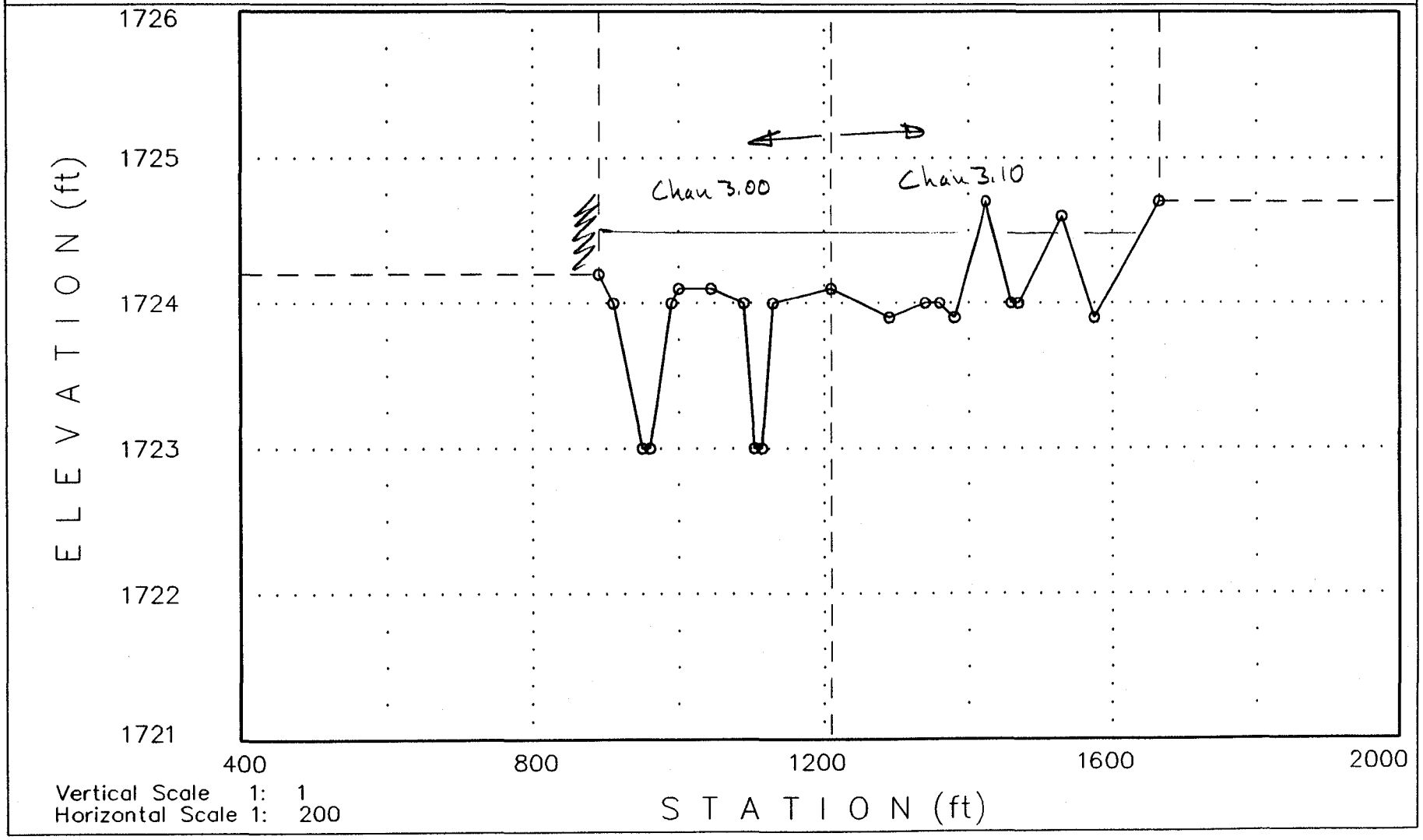
        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W1724
          *** RUN DATE & TIME: 08-04-94  08:56

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
      SRD    FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

 1724 :XS   ******   890.     398.   .17 ***** 1724.70 1724.44   1177. 1724.54
        1. ******  1647.    9606.  1.21 ***** *******     .78    2.96
  ER
```

% K		
.708 x 1177 = 833 cfs	3.00
— x 1177 = 344 cfs	3.10

<<<<<< Cross Section: 1724: (FN = WLOMR1) >>>>>>



08-04-1994

3/3

-------- Q:\510024\HYDRO\WSPRO\DIVS\W200D.O

Section: W200D

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1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

           *** RUN DATE & TIME: 08-04-94  10:55

  T1          SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
  T2          COE & VAN LOO CONSULTANTS
  T3          SECTION W2.00D
  *
  *
  *           FILENAME: W200D
  *
  Q           399
*** Q-DATA FOR SEC-ID, ISEQ =            1
  SK          0.017
  *
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
         COE & VAN LOO CONSULTANTS
         SECTION W2.00D
           *** RUN DATE & TIME: 08-04-94  10:55

*** START PROCESSING CROSS SECTION - " 200 "
  XS    200  1
  GR          70,1823.1  90,1822  98,1821.8  101,1821.8  110,1822
  GR          140,1822.9  160,1823.2  179,1822.7  181,1822.7  190,1823.6
  GR          210,1823.3  275,1823.5  320,1823.9
  N          .040   .040
  SA             160
  *
  HP 1  200  1823.37,.01,1823.42

*** FINISH PROCESSING CROSS SECTION - " 200 "
*** CROSS SECTION " 200 " WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID " 200 " AT SRD =      1.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0. *********       .50       .00

X-Y COORDINATE PAIRS  (NGP =  13):
       X      Y          X      Y          X      Y          X      Y
     70.0 1823.10      90.0 1822.00      98.0 1821.80     101.0 1821.80
    110.0 1822.00     140.0 1822.90     160.0 1823.20     179.0 1822.70
    181.0 1822.70     190.0 1823.60     210.0 1823.30     275.0 1823.50
    320.0 1823.90

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
     70.0 1823.10      98.0 1821.80     320.0 1823.90     320.0 1823.90

SUBAREA BREAKPOINTS (NSA =  2):
       160.

ROUGHNESS COEFFICIENTS (NSA =  2):
        .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
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P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W2.00D
          *** RUN DATE & TIME: 08-04-94  10:55
   CROSS-SECTION PROPERTIES:  ISEQ =  1;  SECID =  200 ;  SRD =       1.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      80.    2754.    90.    90.                       429.
            2      13.     174.    55.    55.                        34.
  1823.37          93.    2928.   145.   145.  1.12    70.   233.    396.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      81.    2806.    90.    90.                       436.
            2      13.     178.    59.    59.                        35.
  1823.38          94.    2984.   149.   149.  1.13    70.   236.    399.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      82.    2858.    90.    90.                       443.
            2      14.     184.    63.    63.                        36.
  1823.39          96.    3042.   153.   154.  1.14    70.   239.    401.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      83.    2910.    90.    90.                       451.
            2      14.     191.    67.    67.                        38.
  1823.40          97.    3101.   157.   158.  1.15    70.   243.    405.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      84.    2963.    90.    90.                       458.
            2      15.     199.    71.    71.                        39.
  1823.41          99.    3162.   161.   162.  1.16    70.   246.    408.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      85.    3016.    90.    90.                       465.
            2      16.     208.    75.    75.                        41.
  1823.42         100.    3224.   165.   166.  1.16    70.   249.    412.
1
  *
  EX

 +++ BEGINNING PROFILE CALCULATIONS --   1
1
 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        SITE 6A - HYDRAULIC ANALYSIS OF DISTRIBUTARY FLOW AREA
        COE & VAN LOO CONSULTANTS
        SECTION W2.00D
          *** RUN DATE & TIME: 08-04-94  10:55

  XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
        SRD   FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

  200 :XS   ******    70.      96.   .31 ***** 1823.70 1823.30    399. 1823.39
        1. ******   240.    3058.  1.14 ***** *******     .99    4.16
  ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
```
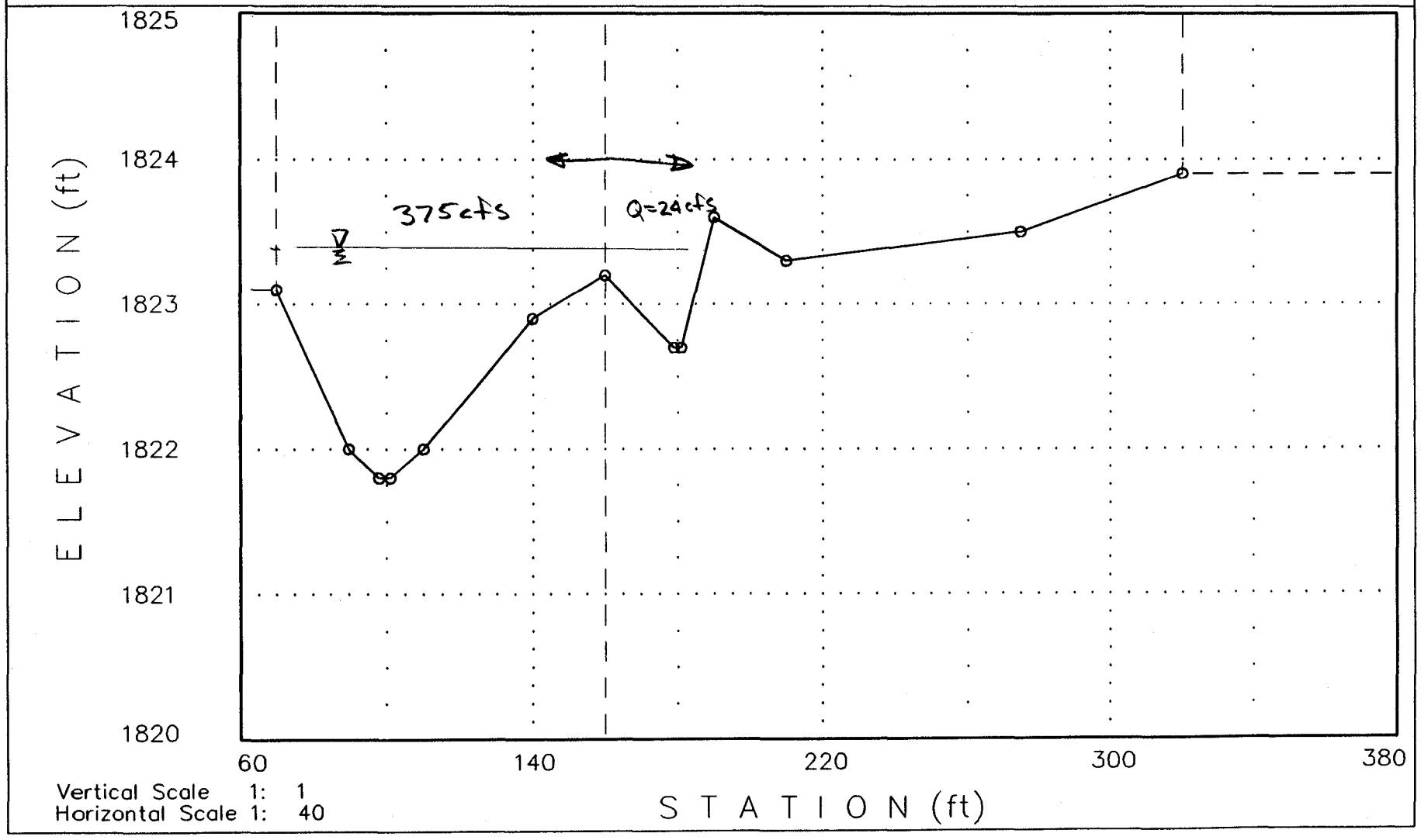

9% K × 399 = 375 cfs 2.00

.06 × 399 = 24 cfs 2.20

<<<<<< Cross Section: 200: (FN = WLOMR1) >>>>>>



08-04-1994

Appendix D
WSPRO for Wash 6a

N:\930064\ADMIN\64-059RP.WP5

CVL

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1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          *** RUN DATE & TIME: 08-04-94  14:00

  T1         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
  T2         COE & VAN LOO CONSULTANTS
  T3         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
  *          WLOMR24
  *
  *
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1708"
  XT    1708 1300,0.016
  GR        1000,1708.5   1030,1708.0   1090,1706   1092,1705.8   1097,1705.8
  GR        1100,1706.0   1150,1707.0   1200,1709
  *

*** FINISH PROCESSING CROSS SECTION - " 1708"
*** TEMPLATE CROSS SECTION " 1708" SAVED INTERNALLY.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1708"
  XS   S1708 1300
  GT
  N         .04   .04   .04
  SA         1000   1200
  *
  HP 1 S1708 1706,.5,1709.5

*** FINISH PROCESSING CROSS SECTION - "S1708"
*** CROSS SECTION "S1708" WRITTEN TO DISK, RECORD NO. =  1

--- DATA SUMMARY FOR SECID "S1708" AT SRD =   1300.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0160       .50       .00

X-Y COORDINATE PAIRS  (NGP =   8):
       X      Y          X      Y          X      Y          X      Y
   1000.0 1708.50    1030.0 1708.00    1090.0 1706.00    1092.0 1705.80
   1097.0 1705.80    1100.0 1706.00    1150.0 1707.00    1200.0 1709.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
   1000.0 1708.50    1092.0 1705.80    1200.0 1709.00    1200.0 1709.00

SUBAREA BREAKPOINTS (NSA =  3):
       1000.   1200.

ROUGHNESS COEFFICIENTS (NSA =  3):
         .040    .040    .040
1
```

```
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ =  1;  SECID = S1708;  SRD =    1300.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2      51.    1322.    90.    90.                        221.
  1707.00           51.    1322.    90.    90.  1.00  1060.  1150.    221.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2     103.    3534.   118.   118.                        550.
  1707.50          103.    3534.   118.   118.  1.00  1045.  1163.    550.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2     169.    6969.   145.   145.                       1035.
  1708.00          169.    6969.   145.   145.  1.00  1030.  1175.   1035.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2     252.   11438.   188.   188.                       1659.
  1708.50          252.   11438.   188.   188.  1.00  1000.  1188.   1659.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2     349.   18805.   200.   201.                       2616.
  1709.00          349.   18805.   200.   201.  1.00  1000.  1200.   2616.
1
  *
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1719"
  XT    1719 1400,0.016
  GR        1000,1718.0   1040,1717.0   1045,1717   1055,1718.0   1070,1718.0
  GR        1080,1717.0   1085,1717.0   1090,1718   1120,1720
  *

*** FINISH PROCESSING CROSS SECTION - " 1719"
*** TEMPLATE CROSS SECTION " 1719" SAVED INTERNALLY.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1719"
  XS   S1719 1400
  GT
  N         .04   .04   .04
  SA         1000   1120
  *
  HP 1 S1719 1717.5,.5,1720.5

*** FINISH PROCESSING CROSS SECTION - "S1719"
*** CROSS SECTION "S1719" WRITTEN TO DISK, RECORD NO. =  2

--- DATA SUMMARY FOR SECID "S1719" AT SRD =   1400.  ERR-CODE =      0
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```
     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0160       .50       .00

X-Y COORDINATE PAIRS  (NGP =   9):
      X      Y          X      Y          X      Y          X      Y
   1000.0 1718.00    1040.0 1717.00    1045.0 1717.00    1055.0 1718.00
   1070.0 1718.00    1080.0 1717.00    1085.0 1717.00    1090.0 1718.00
   1120.0 1720.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
   1000.0 1718.00    1040.0 1717.00    1120.0 1720.00    1120.0 1720.00

SUBAREA BREAKPOINTS (NSA =  3):
       1000.   1120.

ROUGHNESS COEFFICIENTS (NSA =  3):
         .040    .040    .040
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ =  2;  SECID = S1719;  SRD =    1400.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2      13.     223.    43.    43.                          41.
   1717.50          13.     223.    43.    43.  1.00  1020.  1088.     41.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2      43.    1082.    75.    75.                         182.
   1718.00          43.    1082.    75.    75.  1.00  1000.  1090.    182.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2      89.    3126.    98.    98.                         486.
   1718.50          89.    3126.    98.    98.  1.00  1000.  1098.    486.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2     140.    6268.   105.   106.                         917.
   1719.00         140.    6268.   105.   106.  1.00  1000.  1105.    917.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2     194.   10318.   113.   114.                        1450.
   1719.50         194.   10318.   113.   114.  1.00  1000.  1113.   1450.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             2     253.   15252.   120.   122.                        2078.
   1720.00         253.   15252.   120.   122.  1.00  1000.  1120.   2078.
1
   *
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1724"
  XT    1724 1600,0.016
  GR        890,1724.2   910,1724      950,1723    960,1723  990,1724
  GR        1000,1724.1   1045,1724.1   1090,1724   1105,1723   1115,1723
  GR        1130,1724
  GR        1210,1724.1   1290,1723.9   1340,1724   1360,1724   1380,1723.9
  GR        1425,1724.7   1460,1724   1470,1724   1530,1724.6   1575,1723.9
```

```
  GR        1665,1724.7   1750,1724.4   1810,1724   1835,1722   1850,1724
  GR        1940,1724.8   1965,1725.3   2065,1724   2080,1723   2100,1724
  GR        2130,1726   2200,1726.4   2240,1726.3   2340,1726.4   2370,1726
  GR        2380,1724.5   2390,1726   2420,1726.8   2560,1727.2   2610,1727
  GR        2660,1727.2  2710,1727.5   2720,1726   2770,1727.9   2800,1728
  GR        2825,1728.5   2830,1729   3380,1728.5  3410,1728
  GR        3450,1726     3460,1725.2  3480,1725.2   3520,1726   3560,1728
  *

*** FINISH PROCESSING CROSS SECTION - " 1724"
*** TEMPLATE CROSS SECTION " 1724" SAVED INTERNALLY.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1724"
  XS   S1724 1600
  GT
  N         .04  .04  .04  .04  .04   .04  .04   .04  .04  .04  .04  .04
  SA         1000 1210 1425 1665 1940  2200  2420 2560 2830 3380 3560
  *
  HP 1 S1724 1724,.5,1728.5

*** FINISH PROCESSING CROSS SECTION - "S1724"
*** CROSS SECTION "S1724" WRITTEN TO DISK, RECORD NO. =  3

--- DATA SUMMARY FOR SECID "S1724" AT SRD =   1600.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0160       .50       .00

X-Y COORDINATE PAIRS  (NGP =  55):
       X      Y          X      Y          X      Y          X      Y
    890.0 1724.20     910.0 1724.00     950.0 1723.00     960.0 1723.00
    990.0 1724.00    1000.0 1724.10    1045.0 1724.10    1090.0 1724.00
   1105.0 1723.00    1115.0 1723.00    1130.0 1724.00    1210.0 1724.10
   1290.0 1723.90    1340.0 1724.00    1360.0 1724.00    1380.0 1723.90
   1425.0 1724.70    1460.0 1724.00    1470.0 1724.00    1530.0 1724.60
   1575.0 1723.90    1665.0 1724.70    1750.0 1724.40    1810.0 1724.00
   1835.0 1722.00    1850.0 1724.00    1940.0 1724.80    1965.0 1725.30
   2065.0 1724.00    2080.0 1723.00    2100.0 1724.00    2130.0 1726.00
   2200.0 1726.40    2240.0 1726.30    2340.0 1726.40    2370.0 1726.00
   2380.0 1724.50    2390.0 1726.00    2420.0 1726.80    2560.0 1727.20
   2610.0 1727.00    2660.0 1727.20    2710.0 1727.50    2720.0 1726.00
   2770.0 1727.90    2800.0 1728.00    2825.0 1728.50    2830.0 1729.00
   3380.0 1728.50    3410.0 1728.00    3450.0 1726.00    3460.0 1725.20
   3480.0 1725.20    3520.0 1726.00    3560.0 1728.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    890.0 1724.20    1835.0 1722.00    3560.0 1728.00    2830.0 1729.00

SUBAREA BREAKPOINTS (NSA = 12):
       1000.   1210.   1425.   1665.   1940.   2200.   2420.   2560.
       2830.   3380.   3560.

ROUGHNESS COEFFICIENTS (NSA = 12):
         .040    .040    .040    .040    .040    .040    .040    .040
         .040    .040    .040    .040

WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
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COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 3; SECID = S1724; SRD = 1600.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	45.	1142.	80.	80.				192.
	2	25.	680.	40.	40.				112.
	3	6.	29.	116.	116.				7.
	4	1.	4.	18.	18.				1.
	5	40.	1485.	40.	40.				227.
	6	18.	410.	35.	35.				70.
1724.00		134.	3751.	328.	329.	1.20	910.	2100.	445.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	98.	3345.	110.	110.				521.
	2	119.	3046.	210.	210.				510.
	3	99.	2265.	204.	204.				389.
	4	56.	909.	191.	191.				170.
	5	93.	2211.	185.	185.				377.
	6	46.	1196.	81.	81.				200.
1724.50		511.	12970.	980.	981.	1.12	890.	2108.	1975.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	153.	7028.	110.	111.				1019.
	2	224.	8725.	210.	210.				1315.
	3	205.	7397.	215.	215.				1136.
	4	172.	5106.	240.	240.				823.
	5	220.	7072.	275.	275.				1118.
	6	99.	2992.	137.	137.				481.
	7	2.	24.	7.	7.				5.
1725.00		1075.	38345.	1194.	1195.	1.07	890.	2383.	5591.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	208.	11706.	110.	111.				1617.
	2	329.	16549.	210.	210.				2339.
	3	312.	14936.	215.	215.				2138.
	4	292.	12360.	240.	240.				1823.
	5	358.	15872.	275.	275.				2315.
	6	183.	6834.	183.	183.				1041.
	7	7.	155.	13.	13.				27.
	11	9.	122.	39.	39.				24.
1725.50		1697.	78535.	1285.	1287.	1.05	890.	3495.	10812.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 3; SECID = S1724; SRD = 1600.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	263.	17270.	110.	112.				2301.
	2	434.	26250.	210.	210.				3543.
	3	420.	24448.	215.	215.				3331.
	4	412.	21958.	240.	240.				3058.
	5	495.	27293.	275.	275.				3771.
	6	276.	13200.	190.	190.				1890.
	7	15.	458.	20.	20.				74.
	11	36.	861.	70.	70.				147.
1726.00		2351.	131737.	1330.	1333.	1.04	890.	3520.	17396.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	318.	23643.	110.	112.				3061.
	2	539.	37660.	210.	210.				4904.
	3	527.	35743.	215.	215.				4689.
	4	532.	33636.	240.	240.				4488.

	5	633.	41058.	275.	275.				5446.
	6	392.	19213.	260.	260.				2734.
	7	60.	964.	209.	209.				181.
	9	4.	61.	16.	17.				12.
	11	76.	2528.	90.	90.				396.
1726.50		3081.	194505.	1625.	1628.	1.08	890.	3530.	23183.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	373.	30765.	110.	113.				3890.
	2	644.	50658.	210.	210.				6403.
	3	635.	48691.	215.	215.				6193.
	4	652.	47223.	240.	240.				6091.
	5	770.	56980.	275.	275.				7315.
	6	522.	30959.	260.	260.				4200.
	7	168.	5224.	220.	220.				833.
	8	7.	56.	70.	70.				13.
	9	16.	386.	33.	33.				66.
	11	126.	5136.	110.	110.				765.
1727.00		3913.	276078.	1743.	1747.	1.09	890.	3540.	31933.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	428.	38588.	110.	113.				4782.
	2	749.	65153.	210.	210.				8031.
	3	742.	63190.	215.	215.				7830.
	4	772.	62593.	240.	240.				7849.
	5	908.	74923.	275.	275.				9359.
	6	652.	44841.	260.	260.				5862.
	7	278.	12095.	220.	220.				1773.
	8	70.	1643.	140.	140.				281.
	9	85.	1778.	199.	200.				313.
	11	186.	8792.	130.	130.				1263.
1727.50		4869.	373597.	1999.	2004.	1.11	890.	3550.	40909.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 3; SECID = S1724; SRD = 1600.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	483.	47074.	110.	114.				5734.
	2	854.	81071.	210.	210.				9777.
	3	850.	79163.	215.	215.				9590.
	4	892.	79647.	240.	240.				9750.
	5	1045.	94778.	275.	275.				11564.
	6	782.	60705.	260.	260.				7699.
	7	388.	21082.	220.	220.				2924.
	8	140.	5215.	140.	140.				794.
	9	189.	6001.	240.	240.				952.
	11	256.	13610.	150.	150.				1898.
1728.00		5879.	488346.	2060.	2065.	1.12	890.	3560.	53354.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	538.	56189.	110.	114.				6742.
	2	959.	98350.	210.	210.				11634.
	3	957.	96543.	215.	215.				11466.
	4	1012.	98305.	240.	240.				11783.
	5	1183.	116456.	275.	275.				13919.
	6	912.	78435.	260.	260.				9696.
	7	498.	31957.	220.	220.				4252.
	8	210.	10250.	140.	140.				1459.
	9	315.	13179.	265.	265.				1951.
	11	339.	19165.	180.	181.				2634.
1728.50		6922.	618830.	2115.	2121.	1.11	890.	3560.	67343.

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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1734"
  XT    1734 1800,0.016
  GR        970,1734.2
  GR        1000,1734   1035,1733   1090,1733.7   1130,1732   1140,1732
  GR        1190,1733.7   1240,1734   1265,1732.8   1290,1734   1300,1734.2
  GR        1355,1733.9   1450,1734.7   1520,1734   1570,1732.3   1585,1734
  GR        1615,1734.2   1675,1733.4   1730,1733.9   1780,1732.2   1815,1734.2
  GR        2150,1734   2174,1733   2202,1732   2208,1731.8   2215,1731.8
  GR        2222,1732   2230,1732.7   2240,1732   2250,1731.5   2260,1731.5
  GR        2270,1732   2290,1732.8   2990,1736.2   3000,1736   3030,1734
  GR        3045,1732.7   3050,1732.7   3065,1734.0   3100,1734.8   3135,1734
  GR        3140,1734.0   3180,1736.0
  *

*** FINISH PROCESSING CROSS SECTION - " 1734"
*** TEMPLATE CROSS SECTION " 1734" SAVED INTERNALLY.
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1734"
  XS   S1734 1800
  GT
  N         .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04
  SA         1240 1300 1450 1615 1730 1815 2150 2230 2290 2990 3100
  *
  HP 1 S1734 1732.5,.5,1735.5

*** FINISH PROCESSING CROSS SECTION - "S1734"
*** CROSS SECTION "S1734" WRITTEN TO DISK, RECORD NO. =  4

--- DATA SUMMARY FOR SECID "S1734" AT SRD =   1800.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0160       .50       .00

X-Y COORDINATE PAIRS  (NGP =  43):
       X      Y          X      Y          X      Y          X      Y
    970.0 1734.20    1000.0 1734.00    1035.0 1733.00    1090.0 1733.70
   1130.0 1732.00    1140.0 1732.00    1190.0 1733.70    1240.0 1734.00
   1265.0 1732.80    1290.0 1734.00    1300.0 1734.20    1355.0 1733.90
   1450.0 1734.70    1520.0 1734.00    1570.0 1732.30    1585.0 1734.00
   1615.0 1734.20    1675.0 1733.40    1730.0 1733.90    1780.0 1732.20
   1815.0 1734.20    2150.0 1734.00    2174.0 1733.00    2202.0 1732.00
   2208.0 1731.80    2215.0 1731.80    2222.0 1732.00    2230.0 1732.70
   2240.0 1732.00    2250.0 1731.50    2260.0 1731.50    2270.0 1732.00
   2290.0 1732.80    2990.0 1736.20    3000.0 1736.00    3030.0 1734.00
   3045.0 1732.70    3050.0 1732.70    3065.0 1734.00    3100.0 1734.80
   3135.0 1734.00    3140.0 1734.00    3180.0 1736.00

X-Y MAX-MIN POINTS:
    XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    970.0 1734.20    2250.0 1731.50    3180.0 1736.00    2990.0 1736.20

SUBAREA BREAKPOINTS (NSA = 12):
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        1240.   1300.   1450.   1615.   1730.   1815.   2150.   2230.
        2290.   2990.   3100.

ROUGHNESS COEFFICIENTS (NSA = 12):
        .040    .040    .040    .040    .040    .040    .040    .040
        .040    .040    .040    .040
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ =  4;  SECID = S1734;  SRD =    1800.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1      12.     202.    36.    36.                         37.
             4       1.       6.     8.     8.                          1.
             6       2.      22.    14.    14.                          5.
             8      18.     382.    40.    40.                         67.
             9      30.     794.    50.    50.                        132.
   1732.50          62.    1406.   148.   148.  1.11  1118.  2282.    217.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1      36.     944.    63.    63.                        158.
             2       1.       7.     8.     8.                          1.
             4       9.     173.    27.    27.                         31.
             6      15.     303.    38.    38.                         54.
             8      42.    1285.    56.    56.                        206.
             9      58.    2141.    60.    60.                        328.
            10       4.      33.    41.    41.                          7.
            11       3.      34.    12.    12.                          7.
   1733.00          169.    4920.   305.   305.  1.17  1106.  3053.    658.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1      89.    2370.   146.   146.                        392.
             2      10.     189.    29.    29.                         34.
             4      28.     729.    46.    46.                        121.
             5       1.       5.    18.    18.                          1.
             6      40.    1107.    61.    61.                        181.
             8      73.    2843.    68.    68.                        428.
             9      88.    4269.    60.    60.                        610.
            10      50.     933.   144.   144.                        169.
            11      11.     261.    23.    24.                         45.
   1733.50          390.   12705.   596.   597.  1.32  1018.  3059.   1557.

      WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     184.    5753.   240.   240.                        916.
             2      30.     794.    50.    50.                        132.
             3       2.       8.    30.    30.                          2.
             4      55.    1844.    65.    65.                        289.
             5      33.     580.   100.   100.                        106.
             6      76.    2692.    82.    82.                        415.
             8     110.    5056.    80.    80.                        731.
             9     118.    6943.    60.    60.                        945.
            10     148.    3928.   247.   247.                        652.
            11      26.     793.    35.    35.                        127.
   1734.00          782.   28390.   989.   989.  1.33  1000.  3065.   3420.
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WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ =  4;  SECID = S1734;  SRD =    1800.
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     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     316.   13078.   270.   270.                        1942.
             2      59.    2172.    60.    60.                         332.
             3      46.     878.   126.   126.                         158.
             4     112.    3523.   145.   145.                         560.
             5      89.    2781.   115.   115.                         442.
             6     118.    5466.    85.    85.                         789.
             7     134.    2710.   335.   335.                         481.
             8     150.    8481.    80.    80.                        1164.
             9     148.   10114.    60.    60.                        1326.
            10     297.    9943.   350.   350.                        1556.
            11      51.    1616.    64.    65.                         256.
            12      10.     168.    37.    37.                          32.
  1734.50          1532.   60932.  1728.  1728.  1.36   970.  3150.   7008.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     451.   23621.   270.   271.                        3310.
             2      89.    4309.    60.    60.                         615.
             3     119.    3786.   150.   150.                         600.
             4     193.    7960.   165.   165.                        1182.
             5     146.    6394.   115.   115.                         936.
             6     161.    9128.    85.    85.                        1252.
             7     302.   10470.   335.   335.                        1623.
             8     190.   12580.    80.    80.                        1660.
             9     178.   13744.    60.    60.                        1747.
            10     498.   19776.   453.   453.                        2965.
            11      90.    3446.    85.    85.                         521.
            12      36.     954.    60.    60.                         158.
  1735.00          2452.  116167.  1918.  1919.  1.23   970.  3160.  14196.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     586.   36493.   270.   271.                        4902.
             2     119.    6993.    60.    60.                         951.
             3     194.    8560.   150.   150.                        1250.
             4     275.   14414.   165.   165.                        2017.
             5     204.   11112.   115.   115.                        1539.
             6     203.   13502.    85.    85.                        1780.
             7     469.   21864.   335.   335.                        3149.
             8     230.   17299.    80.    80.                        2212.
             9     208.   17805.    60.    60.                        2206.
            10     750.   34144.   556.   556.                        4948.
            11     134.    6373.    93.    93.                         914.
            12      68.    2514.    70.    70.                         385.
  1735.50          3441.  191074.  2038.  2040.  1.15   970.  3170.  23643.
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WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1740"
  XT    1740 2000,0.016
  GR       840,1740.2    870,1739.2    890,1740      900,1740.2
  GR       1000,1740.2   1015,1739.6   1040,1740   1060,1740   1100,1740
  GR       1120,1739.4   1155,1739.8   1190,1739.9   1210,1739.3   1220,1740
  GR       1260,1740.6   1350,1740.3   1430,1740.8   1490,1740   1510,1739
  GR       1525,1738   1535,1738   1550,1740   1585,1741.3   2045,1740
  GR       2063,1739   2070,1739   2085,1738   2100,1737.9   2112,1737.9
  GR       2125,1738   2140,1738.5   2150,1738.5   2168,1738   2190,1736
  GR       2200,1736   2220,1736.1   2223,1736.1   2240,1736   2250,1736
  GR       2280,1738   2330,1738.9   2355,1739.1   2390,1740  2965,1740.8
  GR       3005,1740.4   3030,1740.5   3040,1740  3045,1739.6  3053,1739.6
  GR       3055,1740   3080,1740.5   3180,1740.5   3195,1740  3200,1739.5
  GR       3210,1739.5   3215,1740   3250,1741   3280,1740.5  3450,1741
```

```
  GR        3470,1741.3
  *

*** FINISH PROCESSING CROSS SECTION - " 1740"
*** TEMPLATE CROSS SECTION " 1740" SAVED INTERNALLY.

WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1740"
  XS   S1740 2000
  GT
  N         .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04
  N          .04  .04
  SA         1000 1190 1260 1430 1585 2045 2150 2223 2280 2390 2965 3080
  SA         3180
  *
  HP 1 S1740 1739.5,.5,1741.5

*** FINISH PROCESSING CROSS SECTION - "S1740"
*** CROSS SECTION "S1740" WRITTEN TO DISK, RECORD NO. =  5

--- DATA SUMMARY FOR SECID "S1740" AT SRD =   2000.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0160       .50       .00

X-Y COORDINATE PAIRS  (NGP =  60):
       X      Y          X      Y          X      Y          X      Y
    840.0 1740.20     870.0 1739.20     890.0 1740.00     900.0 1740.20
   1000.0 1740.20    1015.0 1739.60    1040.0 1740.00    1060.0 1740.00
   1100.0 1740.00    1120.0 1739.40    1155.0 1739.80    1190.0 1739.90
   1210.0 1739.30    1220.0 1740.00    1260.0 1740.60    1350.0 1740.30
   1430.0 1740.80    1490.0 1740.00    1510.0 1739.00    1525.0 1738.00
   1535.0 1738.00    1550.0 1740.00    1585.0 1741.30    2045.0 1740.00
   2063.0 1739.00    2070.0 1739.00    2085.0 1738.00    2100.0 1737.90
   2112.0 1737.90    2125.0 1738.00    2140.0 1738.50    2150.0 1738.50
   2168.0 1738.00    2190.0 1736.00    2200.0 1736.00    2220.0 1736.10
   2223.0 1736.10    2240.0 1736.00    2250.0 1736.00    2280.0 1738.00
   2330.0 1738.90    2355.0 1739.10    2390.0 1740.00    2965.0 1740.80
   3005.0 1740.40    3030.0 1740.50    3040.0 1740.00    3045.0 1739.60
   3053.0 1739.60    3055.0 1740.00    3080.0 1740.50    3180.0 1740.50
   3195.0 1740.00    3200.0 1739.50    3210.0 1739.50    3215.0 1740.00
   3250.0 1741.00    3280.0 1740.50    3450.0 1741.00    3470.0 1741.30

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    840.0 1740.20    2190.0 1736.00    3470.0 1741.30    1585.0 1741.30

SUBAREA BREAKPOINTS (NSA = 14):
       1000.   1190.   1260.   1430.   1585.   2045.   2150.   2223.
       2280.   2390.   2965.   3080.   3180.

ROUGHNESS COEFFICIENTS (NSA = 14):
        .040    .040    .040    .040    .040    .040    .040    .040
        .040    .040    .040    .040    .040    .040
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
```

CROSS-SECTION PROPERTIES: ISEQ = 5; SECID = S1740; SRD = 2000.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	2.	26.	17.	17.				5.
	2	1.	3.	12.	12.				1.
	3	1.	8.	10.	10.				2.
	5	41.	1403.	46.	46.				219.
	7	112.	4629.	96.	96.				687.
	8	192.	13580.	73.	73.				1763.
	9	169.	12937.	57.	57.				1646.
	10	68.	2098.	91.	91.				335.
1739.50		586.	34684.	401.	401.	1.28	861.	2371.	3549.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	18.	356.	44.	44.				63.
	2	32.	487.	125.	125.				93.
	3	11.	226.	30.	30.				40.
	5	68.	2714.	60.	60.				406.
	7	162.	8083.	105.	105.				1146.
	8	228.	18157.	73.	73.				2290.
	9	197.	16783.	57.	57.				2081.
	10	118.	4622.	110.	110.				696.
	12	5.	78.	15.	15.				14.
	14	8.	145.	20.	20.				26.
1740.00		847.	51650.	639.	640.	1.40	846.	3215.	4680.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	76.	1721.	160.	160.				297.
	2	127.	3604.	190.	190.				587.
	3	35.	871.	63.	63.				147.
	4	9.	74.	92.	92.				17.
	5	110.	4084.	111.	111.				624.
	6	44.	654.	177.	177.				125.
	7	215.	12893.	105.	105.				1744.
	8	265.	23251.	73.	73.				2860.
	9	226.	21018.	57.	57.				2548.
	10	173.	8735.	110.	110.				1234.
	11	90.	1328.	359.	359.				255.
	12	23.	348.	85.	85.				66.
	14	26.	591.	53.	53.				102.
1740.50		1418.	79173.	1635.	1636.	1.79	840.	3233.	5604.

1

WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 5; SECID = S1740; SRD = 2000.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	156.	5694.	160.	161.				874.
	2	222.	9156.	190.	190.				1359.
	3	69.	2576.	70.	70.				393.
	4	85.	2014.	170.	170.				344.
	5	177.	7455.	147.	147.				1102.
	6	177.	4152.	354.	354.				710.
	7	267.	18561.	105.	105.				2421.
	8	301.	28837.	73.	73.				3472.
	9	254.	25626.	57.	57.				3045.
	10	228.	13830.	110.	110.				1866.
	11	345.	9141.	575.	575.				1516.
	12	76.	2128.	115.	115.				348.
	13	50.	1173.	100.	100.				201.
	14	106.	2125.	270.	270.				378.
1741.00		2514.	132468.	2496.	2497.	1.95	840.	3450.	10248.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR

```
            1     204.    8894.   160.   161.                        1307.
            2     279.   13406.   190.   190.                        1916.
            3      91.    4000.    70.    70.                         584.
            4     137.    4393.   170.   170.                         694.
            5     222.   10518.   155.   155.                        1510.
            6     299.    8358.   460.   460.                        1368.
            7     299.   22348.   105.   105.                        2861.
            8     323.   32416.    73.    73.                        3857.
            9     271.   28565.    57.    57.                        3358.
           10     261.   17322.   110.   110.                        2285.
           11     518.   17970.   575.   575.                        2786.
           12     110.    3982.   115.   115.                         611.
           13      80.    2568.   100.   100.                         406.
           14     190.    5350.   290.   290.                         875.
  1741.30         3283.  180089.  2630.  2632.  1.79   840.  3470.  15572.
1
  *
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1751"
   XT    1751 2200,0.016
   GR        1000,1751   1070,1750.4   1110,1750   1120,1749.4   1150,1749.7
   GR        1190,1750   1240,1751     1260,1750.9   1310,1750.7   1350,1750
   GR        1360,1748.7 1370,1750     1510,1750.5   1580,1750.3   1620,1750.6
   GR        1680,1750.4 1725,1750.5   1760,1750   1790,1749.9   1830,1750
   GR        1880,1750.4   2150,1752   2160,1751.8   2182,1751   2192,1751
   GR        2207,1750.6   2219,1750.2   2229,1750   2238,1749.8   2249,1749.8
   GR        2259,1750   2269,1750.5   2287,1751.5   2297,1752   2307,1752
   GR        3000,1751.9   3050,1751.5   3130,1751.   3175,1750.2  3190,1750.2
   GR        3272,1750.7   3315,1750.2   3330,1750.2   3340,1750.6   3352,1750.6
   GR        3395,1750.2   3402,1750.2   3452,1750.1   3525,1751.9
   *

 *** FINISH PROCESSING CROSS SECTION - " 1751"
 *** TEMPLATE CROSS SECTION " 1751" SAVED INTERNALLY.
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - "S1751"
   XS   S1751 2200
   GT
   N         .04   .04   .04   .04     .04  .04  .04  .04  .04  .04
   SA         1240   1510   1725   1880 2150 2307 3000 3272 3352
   *
   HP 1 S1751 1749,.5,1751.5

 *** FINISH PROCESSING CROSS SECTION - "S1751"
 *** CROSS SECTION "S1751" WRITTEN TO DISK, RECORD NO. =  6

 --- DATA SUMMARY FOR SECID "S1751" AT SRD =   2200.  ERR-CODE =      0

      SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0160       .50       .00

 X-Y COORDINATE PAIRS  (NGP =  49):
       X      Y          X      Y          X      Y          X      Y
```

1000.0	1751.00	1070.0	1750.40	1110.0	1750.00	1120.0	1749.40
1150.0	1749.70	1190.0	1750.00	1240.0	1751.00	1260.0	1750.90
1310.0	1750.70	1350.0	1750.00	1360.0	1748.70	1370.0	1750.00
1510.0	1750.50	1580.0	1750.30	1620.0	1750.60	1680.0	1750.40
1725.0	1750.50	1760.0	1750.00	1790.0	1749.90	1830.0	1750.00
1880.0	1750.40	2150.0	1752.00	2160.0	1751.80	2182.0	1751.00
2192.0	1751.00	2207.0	1750.60	2219.0	1750.20	2229.0	1750.00
2238.0	1749.80	2249.0	1749.80	2259.0	1750.00	2269.0	1750.50
2287.0	1751.50	2297.0	1752.00	2307.0	1752.00	3000.0	1751.90
3050.0	1751.50	3130.0	1751.00	3175.0	1750.20	3190.0	1750.20
3272.0	1750.70	3315.0	1750.20	3330.0	1750.20	3340.0	1750.60
3352.0	1750.60	3395.0	1750.20	3402.0	1750.20	3452.0	1750.10
3525.0	1751.90						

X-Y MAX-MIN POINTS:

XMIN	Y	X	YMIN	XMAX	Y	X	YMAX
1000.0	1751.00	1360.0	1748.70	3525.0	1751.90	2150.0	1752.00

SUBAREA BREAKPOINTS (NSA = 10):

1240. 1510. 1725. 1880. 2150. 2307. 3000. 3272.
3352.

ROUGHNESS COEFFICIENTS (NSA = 10):

.040 .040 .040 .040 .040 .040 .040 .040
.040 .040

1

WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 6; SECID = S1751; SRD = 2200.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	2	1.	7.	5.	5.				2.
1749.00		1.	7.	5.	5.	1.00	1358.	1362.	2.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	1.	3.	12.	12.				1.
	2	5.	99.	12.	12.				18.
1749.50		6.	102.	24.	24.	1.15	1118.	1366.	14.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	23.	360.	80.	80.				68.
	2	13.	361.	20.	20.				59.
	4	3.	18.	70.	70.				4.
	6	4.	41.	30.	30.				9.
1750.00		43.	779.	200.	200.	1.47	1110.	2259.	94.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	81.	1957.	157.	157.				333.
	2	65.	1194.	189.	189.				217.
	3	13.	91.	172.	172.				21.
	4	62.	1262.	155.	155.				224.
	5	1.	4.	17.	17.				1.
	6	27.	595.	59.	59.				103.
	8	14.	170.	81.	81.				34.
	9	9.	120.	48.	48.				24.
	10	28.	423.	105.	105.				80.
1750.50		302.	5816.	983.	983.	1.15	1058.	3468.	884.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	180.	5560.	240.	240.				888.
	2	175.	4880.	270.	270.				799.
	3	119.	2978.	215.	215.				501.
	4	140.	4858.	155.	155.				753.
	5	30.	507.	101.	101.				94.

```
            6      63.    1909.    86.    86.                          306.
            8      75.    1830.   142.   142.                          310.
            9      46.    1204.    80.    80.                          201.
           10      90.    2555.   137.   137.                          417.
  1751.00         919.   26281.  1426.  1426.  1.05  1000.  3489.   4080.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ =  6;  SECID = S1751;  SRD =    2200.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     300.   12984.   240.   241.                       1908.
            2     310.   12656.   270.   270.                       1885.
            3     226.    8719.   215.   215.                       1317.
            4     217.   10135.   155.   155.                       1459.
            5     102.    2553.   186.   186.                        430.
            6     117.    4298.   119.   119.                        657.
            8     166.    5099.   222.   222.                        815.
            9      86.    3391.    80.    80.                        510.
           10     164.    6272.   157.   157.                        949.
  1751.50        1689.   66107.  1643.  1644.  1.06  1000.  3509.   9453.
1
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1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1766"
  XT    1766 2500,0.016
  GR        1000,1766   1140,1764.6   1210,1764.9   1255,1764   1280,1763.1
  GR        1300,1762.9   1330,1764   1390,1764.5   1450,1764   1560,1764.7
  GR        1620,1764   1720,1763.1   1780,1764   1800,1763.4   1835,1763.2
  GR        1930,1763.6   2180,1761.4   2210,1761.2   2250,1760   2258,1759.4
  GR        2270,1759.4   2280,1760   2310,1761   2362,1762   2430,1763.5
  GR        3250,1760.5   3305,1760   3315,1759.4   3325,1759.4   3333,1760
  GR        3365,1761   3395,1761.9   3405,1762   3415,1762.1   3420,1761.9
  GR        3470,1760.8  3493,1760.7   3520,1760.6   3545,1760   3565,1759.9
  GR        3584,1759.9   3604,1760   3654,1762
  *

*** FINISH PROCESSING CROSS SECTION - " 1766"
*** TEMPLATE CROSS SECTION " 1766" SAVED INTERNALLY.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1766"
  XS   S1766 2500
  GT
  N         .04  .04  .04  .04  .04  .040 .040 .04  .04  .04  .04
  SA         1210 1390 1560 1720 1930 2180 2310 2430 3250 3420
  *
  HP 1 S1766 1760,.5,1765.0
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*** FINISH PROCESSING CROSS SECTION - "S1766"
*** CROSS SECTION "S1766" WRITTEN TO DISK, RECORD NO. =  7

--- DATA SUMMARY FOR SECID "S1766" AT SRD =   2500.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0160       .50       .00

X-Y COORDINATE PAIRS  (NGP =  43):
       X      Y          X      Y          X      Y          X      Y
   1000.0 1766.00    1140.0 1764.60    1210.0 1764.90    1255.0 1764.00
   1280.0 1763.10    1300.0 1762.90    1330.0 1764.00    1390.0 1764.50
   1450.0 1764.00    1560.0 1764.70    1620.0 1764.00    1720.0 1763.10
   1780.0 1764.00    1800.0 1763.40    1835.0 1763.20    1930.0 1763.60
   2180.0 1761.40    2210.0 1761.20    2250.0 1760.00    2258.0 1759.40
   2270.0 1759.40    2280.0 1760.00    2310.0 1761.00    2362.0 1762.00
   2430.0 1763.50    3250.0 1760.50    3305.0 1760.00    3315.0 1759.40
   3325.0 1759.40    3333.0 1760.00    3365.0 1761.00    3395.0 1761.90
   3405.0 1762.00    3415.0 1762.10    3420.0 1761.90    3470.0 1760.80
   3493.0 1760.70    3520.0 1760.60    3545.0 1760.00    3565.0 1759.90
   3584.0 1759.90    3604.0 1760.00    3654.0 1762.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
   1000.0 1766.00    2258.0 1759.40    3654.0 1762.00    1000.0 1766.00

SUBAREA BREAKPOINTS (NSA = 11):
       1210.   1390.   1560.   1720.   1930.   2180.   2310.   2430.
       3250.   3420.

ROUGHNESS COEFFICIENTS (NSA = 11):
        .040    .040    .040    .040    .040    .040    .040    .040
        .040    .040    .040
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ =  7;  SECID = S1766;  SRD =    2500.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             7      13.     263.    30.    30.                         46.
            10      11.     233.    28.    28.                         41.
            11       4.      24.    59.    59.                          6.
  1760.00           28.     520.   117.   117.  1.18  2250.  3604.     71.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             7      36.     915.    62.    62.                        153.
            10      43.     924.    99.    99.                        162.
            11      42.     915.    92.    92.                        159.
  1760.50          120.    2754.   253.   253.  1.02  2233.  3617.    466.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             7      74.    2374.    93.    93.                        376.
             9      34.     505.   137.   137.                         97.
            10      97.    3205.   115.   115.                        503.
            11     109.    3042.   168.   168.                        498.
  1761.00          314.    9126.   513.   513.  1.09  2217.  3629.   1333.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             6       1.       3.    11.    11.                          1.
             7     130.    4816.   130.   130.                        734.
             8       7.      96.    26.    26.                         18.
             9     137.    3207.   273.   273.                        548.
            10     158.    6666.   132.   132.                        985.
            11     202.    7482.   203.   203.                       1141.
```

1761.50		634.	22270.	776.	776.	1.11	2169.	3642.	3084.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	6	20.	341.	68.	68.				64.
	7	195.	9482.	130.	130.				1351.
	8	26.	610.	52.	52.				104.
	9	308.	9455.	410.	410.				1511.
	10	229.	10926.	158.	158.				1565.
	11	312.	14084.	234.	234.				2045.
1762.00		1089.	44899.	1052.	1052.	1.12	2112.	3654.	5943.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	6	69.	1719.	125.	125.				289.
	7	260.	15329.	130.	130.				2082.
	8	58.	1808.	75.	75.				288.
	9	547.	20363.	547.	547.				3102.
	10	313.	17523.	170.	170.				2412.
	11	429.	23908.	234.	235.				3297.
1762.50		1675.	80651.	1280.	1281.	1.14	2055.	3654.	10170.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 7; SECID = S1766; SRD = 2500.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	2	1.	3.	13.	13.				1.
	6	145.	4669.	182.	182.				738.
	7	325.	22246.	130.	130.				2911.
	8	101.	3834.	97.	97.				581.
	9	854.	36921.	683.	683.				5419.
	10	398.	26148.	170.	170.				3458.
	11	546.	35683.	234.	235.				4734.
1763.00		2370.	129504.	1509.	1510.	1.16	1290.	3654.	15640.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	2	17.	323.	47.	47.				58.
	4	9.	113.	44.	44.				23.
	5	23.	265.	136.	136.				54.
	6	251.	9642.	239.	239.				1457.
	7	390.	30155.	130.	130.				3827.
	8	155.	6847.	120.	120.				1000.
	9	1230.	60038.	820.	820.				8548.
	10	483.	36099.	170.	170.				4622.
	11	663.	49244.	234.	236.				6334.
1763.50		3221.	192727.	1941.	1943.	1.19	1269.	3654.	21537.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	2	48.	1316.	75.	75.				216.
	4	45.	984.	100.	100.				171.
	5	115.	2847.	210.	210.				480.
	6	375.	18304.	250.	250.				2606.
	7	455.	38998.	130.	130.				4824.
	8	215.	11812.	120.	120.				1633.
	9	1640.	96974.	820.	820.				13161.
	10	568.	47293.	170.	170.				5894.
	11	780.	64470.	234.	236.				8082.
1764.00		4240.	282999.	2109.	2111.	1.17	1255.	3654.	31523.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	2	106.	3024.	160.	160.				493.
	3	35.	512.	139.	139.				98.
	4	106.	3222.	143.	143.				516.
	5	220.	8421.	210.	210.				1273.
	6	500.	29565.	250.	250.				4012.

```
            7     520.   48728.   130.   130.                          5895.
            8     275.   17803.   120.   120.                          2362.
            9    2050.  140660.   820.   820.                         18393.
           10     653.   59665.   170.   170.                          7265.
           11     897.   81264.   234.   237.                          9967.
  1764.50         5361.  392863.  2375.  2378.  1.16  1230.  3654.  42398.
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ =  7;  SECID = S1766;  SRD =    2500.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      26.      358.   110.   110.                          70.
            2     192.     7497.   180.   180.                        1130.
            3     117.     3373.   170.   170.                         547.
            4     184.     7523.   160.   160.                        1120.
            5     325.    16156.   210.   210.                        2289.
            6     625.    42883.   250.   250.                        5608.
            7     585.    59305.   130.   130.                        7035.
            8     335.    24737.   120.   120.                        3176.
            9    2460.   190608.   820.   820.                       24178.
           10     738.    73159.   170.   170.                        8728.
           11    1014.    99545.   234.   237.                       11980.
  1765.00         6600.   525146.  2554.  2557.  1.15  1100.  3654.  56048.
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WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1776"
  XT    1776 2600,0.0160
  GR        120,1777.5 180,1776.8  250,1776 280,1776   350,1774.9   400,1774
  GR        410,1773.8  420,1774   440,1774.5 510,1775.5
  GR        560,1775.7  600,1776  665,1776   870,1776.5   910,1776
  GR        930,1775.4   950,1775.6   970,1776   1020,1776.7   1180,1777.7
  GR        2000,1776   2140,1774 2170,1773.3   2210,1773   2260,1774
  GR        2370,1774
  GR        2480,1774.2   2530,1774   2560,1775   2635,1774   2660,1772.6
  GR        2720,1773   2905,1774   3155,1774   3340,1774.6  3475,1772.1
  GR        3515,1771  3560,1771.9   3595,1772.5   3690,1773.6   3870,1774.7
  GR        3925,1774  3950,1773.6   3990,1774   4030,1775   4335,1774
  GR        4610,1774  4670,1772.8   4720,1774   4830,1775   5130,1774
  GR        5150,1773  5190,1771   5215,1774.3   5240,1774   5520,1774.2
  GR        5610,1773.6   5675,1774   5700,1772.2   5800,1773.8   5890,1774
  GR        6020,1776
  *

*** FINISH PROCESSING CROSS SECTION - " 1776"
*** TEMPLATE CROSS SECTION " 1776" SAVED INTERNALLY.
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
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*** START PROCESSING CROSS SECTION - "S1776"
  XS   S1776 2600
  GT
  N         .04 .04 .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04
  N         .04
  SA         560 665 870 1020 2000 2140 2260 2480 2600 2905 3340 3870 4030
  SA         4830
  *
  HP 1 S1776 1772,.5,1777.5

*** FINISH PROCESSING CROSS SECTION - "S1776"
*** CROSS SECTION "S1776" WRITTEN TO DISK, RECORD NO. =  8

--- DATA SUMMARY FOR SECID "S1776" AT SRD =   2600.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0160       .50       .00

X-Y COORDINATE PAIRS  (NGP =  62):
       X      Y          X      Y          X      Y          X      Y
    120.0 1777.50     180.0 1776.80     250.0 1776.00     280.0 1776.00
    350.0 1774.90     400.0 1774.00     410.0 1773.80     420.0 1774.00
    440.0 1774.50     510.0 1775.50     560.0 1775.70     600.0 1776.00
    665.0 1776.00     870.0 1776.50     910.0 1776.00     930.0 1775.40
    950.0 1775.60     970.0 1776.00    1020.0 1776.70    1180.0 1777.70
   2000.0 1776.00    2140.0 1774.00    2170.0 1773.30    2210.0 1773.00
   2260.0 1774.00    2370.0 1774.00    2480.0 1774.20    2530.0 1774.00
   2560.0 1775.00    2635.0 1774.00    2660.0 1772.60    2720.0 1773.00
   2905.0 1774.00    3155.0 1774.00    3340.0 1774.60    3475.0 1772.10
   3515.0 1771.00    3560.0 1771.90    3595.0 1772.50    3690.0 1773.60
   3870.0 1774.70    3925.0 1774.00    3950.0 1773.60    3990.0 1774.00
   4030.0 1775.00    4335.0 1774.00    4610.0 1774.00    4670.0 1772.80
   4720.0 1774.00    4830.0 1775.00    5130.0 1774.00    5150.0 1773.00
   5190.0 1771.00    5215.0 1774.30    5240.0 1774.00    5520.0 1774.20
   5610.0 1773.60    5675.0 1774.00    5700.0 1772.20    5800.0 1773.80
   5890.0 1774.00    6020.0 1776.00

 X-Y MAX-MIN POINTS:
    XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
   120.0 1777.50    3515.0 1771.00    6020.0 1776.00    1180.0 1777.70

SUBAREA BREAKPOINTS (NSA = 15):
       560.    665.    870.   1020.   2000.   2140.   2260.   2480.
      2600.   2905.   3340.   3870.   4030.   4830.

ROUGHNESS COEFFICIENTS (NSA = 15):
        .040    .040    .040    .040    .040    .040    .040    .040
        .040    .040    .040    .040    .040    .040    .040
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WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ =  8;  SECID = S1776;  SRD =    2600.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
           12      43.     1008.    87.    87.                       173.
           15      14.      323.    28.    28.                        55.
  1772.00          57.     1331.   115.   115.  1.00  3479.  5198.    228.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
           12     100.     2957.   142.   142.                       477.
           15      34.      846.    64.    64.                       143.
  1772.50         135.     3803.   206.   206.  1.02  3453.  5719.    612.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
```

	10	13.	171.	67.	67.				34.
	12	188.	6491.	212.	212.				1008.
	14	2.	15.	18.	18.				3.
	15	80.	2300.	116.	116.				374.
1773.00		283.	8978.	414.	414.	1.07	2653.	5750.	1286.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	7	21.	342.	74.	74.				64.
	10	72.	1534.	169.	169.				269.
	12	312.	12422.	282.	282.				1861.
	14	22.	415.	64.	64.				75.
	15	151.	5212.	168.	169.				810.
1773.50		578.	19925.	757.	757.	1.14	2161.	5781.	2693.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	2.	16.	20.	20.				4.
	7	69.	1799.	120.	120.				300.
	10	182.	5211.	270.	270.				848.
	12	477.	20533.	383.	383.				3016.
	13	13.	166.	65.	65.				33.
	14	66.	1749.	110.	110.				290.
	15	281.	7949.	423.	423.				1297.
1774.00		1090.	37422.	1391.	1391.	1.16	400.	5890.	5080.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 8; SECID = S1776; SRD = 2600.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	24.	446.	68.	68.				81.
	6	9.	129.	35.	35.				25.
	7	129.	5075.	120.	120.				763.
	8	99.	2166.	220.	220.				377.
	9	24.	442.	67.	68.				80.
	10	326.	12715.	305.	305.				1915.
	11	164.	3333.	404.	404.				590.
	12	695.	32619.	492.	492.				4691.
	13	60.	1388.	124.	124.				238.
	14	310.	7513.	593.	593.				1275.
	15	671.	19930.	943.	943.				3214.
1774.50		2512.	85754.	3371.	3371.	1.24	372.	5923.	11032.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	74.	1862.	131.	131.				312.
	6	35.	821.	70.	70.				140.
	7	189.	9571.	120.	120.				1351.
	8	209.	7524.	220.	220.				1156.
	9	71.	1849.	120.	120.				308.
	10	479.	24091.	305.	305.				3405.
	11	380.	12907.	435.	435.				2011.
	12	957.	52834.	530.	530.				7294.
	13	134.	4421.	160.	160.				694.
	14	658.	21543.	800.	800.				3390.
	15	1188.	45880.	1125.	1125.				6928.
1775.00		4373.	183303.	4016.	4017.	1.15	344.	5955.	24144.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	156.	4951.	198.	198.				785.
	4	1.	3.	13.	13.				1.
	6	79.	2421.	105.	105.				387.
	7	249.	15138.	120.	120.				2041.
	8	319.	15223.	220.	220.				2180.
	9	131.	5151.	120.	120.				774.
	10	631.	38193.	305.	305.				5154.

	11	597.	27464.	435.	435.				3969.
	12	1222.	79412.	530.	530.				10526.
	13	214.	9657.	160.	160.				1402.
	14	1058.	47519.	800.	800.				6909.
	15	1759.	86558.	1158.	1158.				12301.
1775.50		6416.	331691.	4164.	4165.	1.09	312.	5988.	43331.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 8; SECID = S1776; SRD = 2600.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	283.	10616.	280.	280.				1614.
	2	6.	63.	40.	40.				13.
	4	20.	358.	60.	60.				66.
	6	140.	5215.	140.	140.				794.
	7	309.	21680.	120.	120.				2820.
	8	429.	24943.	220.	220.				3399.
	9	191.	9670.	120.	120.				1364.
	10	784.	54776.	305.	305.				7130.
	11	815.	46091.	435.	435.				6324.
	12	1487.	110148.	530.	530.				14130.
	13	294.	16405.	160.	160.				2259.
	14	1458.	81077.	800.	800.				11175.
	15	2346.	137318.	1190.	1190.				18686.
1776.00		8561.	518360.	4400.	4401.	1.07	280.	6020.	65565.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	449.	19601.	354.	354.				2870.
	2	59.	1475.	105.	105.				248.
	3	51.	758.	205.	205.				145.
	4	69.	1634.	136.	136.				279.
	5	60.	891.	241.	241.				171.
	6	210.	10250.	140.	140.				1459.
	7	369.	29128.	120.	120.				3679.
	8	539.	36489.	220.	220.				4787.
	9	251.	15256.	120.	120.				2056.
	10	936.	73666.	305.	305.				9309.
	11	1032.	68381.	435.	435.				9020.
	12	1752.	144777.	530.	530.				18072.
	13	374.	24508.	160.	160.				3241.
	14	1858.	121430.	800.	800.				16074.
	15	2941.	200101.	1190.	1191.				26229.
1776.50		10950.	748345.	5061.	5062.	1.08	206.	6020.	88074.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 8; SECID = S1776; SRD = 2600.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	637.	32487.	397.	397.				4575.
	2	111.	4291.	105.	105.				648.
	3	154.	4728.	205.	205.				756.
	4	143.	5129.	150.	150.				788.
	5	248.	5580.	530.	530.				965.
	6	280.	16555.	140.	140.				2247.
	7	429.	37431.	120.	120.				4611.
	8	649.	49727.	220.	220.				6325.
	9	311.	21816.	120.	120.				2836.

```
          10    1089.   94730.   305.   305.                        11674.
          11    1250.   94051.   435.   435.                        12017.
          12    2017.  183090.   530.   530.                        22324.
          13     454.   33861.   160.   160.                         4336.
          14    2258.  168043.   800.   800.                        21533.
          15    3536.  271963.  1190.  1191.                        34581.
  1777.00      13564. 1023481.  5408.  5409.  1.09   163.  6020. 116929.

    WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
          1      846.    48724.   440.   440.                        6657.
          2      164.     8182.   105.   105.                        1158.
          3      256.    11076.   205.   205.                        1626.
          4      218.    10378.   150.   150.                        1486.
          5      594.    17397.   852.   852.                        2814.
          6      350.    24014.   140.   140.                        3140.
          7      489.    46545.   120.   120.                        5610.
          8      759.    64553.   220.   220.                        8000.
          9      371.    29282.   120.   120.                        3697.
         10     1241.   117859.   305.   305.                       14211.
         11     1467.   122890.   435.   435.                       15287.
         12     2282.   224919.   530.   530.                       26866.
         13      534.    44385.   160.   160.                        5532.
         14     2658.   220520.   800.   800.                       27500.
         15     4131.   352350.  1190.  1192.                       43668.
  1777.50      16359. 1343075.  5772.  5774.  1.10   120.  6020. 149273.
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 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1787"
  XT    1787 3400,0.0156
  GR       360,1786.8   420,1786.9   460,1786   470,1785.5   480,1785.2
  GR       490,1785.5   505,1786   525,1786.4   550,1786   565,1785.8
  GR       575,1785.7   585,1786
  GR       680,1786.5   710,1786   730,1785.6   750,1785.5   790,1786.1
  GR       915,1784   980,1784   1060,1785.6   2000,1786.8
  GR       2025,1786.9   2175,1786.3   2200,1786   2220,1785.9   2275,1786.5
  GR       2310,1786   2345,1787   2400,1788   2450,1788.3   2500,1788
  GR       3025,1786  3190,1786.8  3320,1786   3370,1785.3   3420,1786
  GR       3440,1785.7  3545,1786  3790,1786.5   3955,1786.9   4040,1786.8
  GR       4115,1787   4380,1787.6   4700,1786   4910,1786.5   4955,1786
  GR       4995,1785   5085,1785.8   5265,1786.4   5300,1786.1   5350,1786
  GR       5410,1787.8   5455,1785.7   5520,1787.5  5570,1787.1   5660,1788
  *

 *** FINISH PROCESSING CROSS SECTION - " 1787"
 *** TEMPLATE CROSS SECTION " 1787" SAVED INTERNALLY.
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - "S1787"
  XS   S1787 3400
  GT
  N         .04 .04 .04 .04 .04  .04  .04  .04  .04  .04  .04  .04  .04  .04
  SA         420 525 680 790 1060 2025 2275 2450 3190 3545 3790 4115 4190
  HP 1 S1787 1786.0,.5,1789
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*** FINISH PROCESSING CROSS SECTION - "S1787"
*** CROSS SECTION "S1787" WRITTEN TO DISK, RECORD NO. =  9

--- DATA SUMMARY FOR SECID "S1787" AT SRD =   3400.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0156       .50       .00

X-Y COORDINATE PAIRS  (NGP =  56):
       X       Y          X       Y          X       Y          X       Y
    360.0 1786.80      420.0 1786.90      460.0 1786.00      470.0 1785.50
    480.0 1785.20      490.0 1785.50      505.0 1786.00      525.0 1786.40
    550.0 1786.00      565.0 1785.80      575.0 1785.70      585.0 1786.00
    680.0 1786.50      710.0 1786.00      730.0 1785.60      750.0 1785.50
    790.0 1786.10      915.0 1784.00      980.0 1784.00     1060.0 1785.60
   2000.0 1786.80     2025.0 1786.90     2175.0 1786.30     2200.0 1786.00
   2220.0 1785.90     2275.0 1786.50     2310.0 1786.00     2345.0 1787.00
   2400.0 1788.00     2450.0 1788.30     2500.0 1788.00     3025.0 1786.00
   3190.0 1786.80     3320.0 1786.00     3370.0 1785.30     3420.0 1786.00
   3440.0 1785.70     3545.0 1786.00     3790.0 1786.50     3955.0 1786.90
   4040.0 1786.80     4115.0 1787.00     4380.0 1787.60     4700.0 1786.00
   4910.0 1786.50     4955.0 1786.00     4995.0 1785.00     5085.0 1785.80
   5265.0 1786.40     5300.0 1786.10     5350.0 1786.00     5410.0 1787.80
   5455.0 1785.70     5520.0 1787.50     5570.0 1787.10     5660.0 1788.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
    360.0 1786.80      915.0 1784.00     5660.0 1788.00     2450.0 1788.30

SUBAREA BREAKPOINTS (NSA = 14):
        420.    525.    680.    790.   1060.   2025.   2275.   2450.
       3190.   3545.   3790.   4115.   4190.

ROUGHNESS COEFFICIENTS (NSA = 14):
         .040    .040    .040    .040    .040    .040    .040    .040
         .040    .040    .040    .040    .040    .040
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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ =  9;  SECID = S1787;  SRD =    3400.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            2      19.      407.    45.    45.                          71.
            3       5.       60.    35.    35.                          12.
            4      21.      349.    73.    73.                          65.
            5     345.    15362.   264.   264.                        2238.
            6      63.      798.   313.   313.                         159.
            7       1.        7.    29.    29.                           2.
           10      54.      771.   225.   225.                         149.
           14      83.     1666.   207.   207.                         296.
  1786.00         592.    19419.  1192.  1192.  1.51   460.  5466.   1921.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            2      53.     1430.    87.    87.                         236.
            3      54.     1004.   155.   155.                         182.
            4      69.     1861.   110.   110.                         307.
            5     480.    26215.   270.   270.                        3629.
            6     317.     6940.   705.   705.                        1208.
            7      41.      650.   150.   150.                         123.
            8      13.      194.    53.    53.                          37.
            9      59.      866.   234.   234.                         166.
           10     187.     4994.   306.   306.                         826.
           11      61.      905.   245.   245.                         174.
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	14	354.	7562.	813.	813.				1323.
1786.50		1687.	52619.	3128.	3128.	1.80	438.	5484.	5246.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	9.	94.	60.	60.				20.
	2	102.	3741.	105.	105.				573.
	3	132.	4404.	155.	155.				689.
	4	124.	4969.	110.	110.				743.
	5	615.	39629.	270.	270.				5264.
	6	756.	23918.	965.	965.				3795.
	7	146.	3810.	250.	250.				635.
	8	44.	1191.	70.	70.				196.
	9	230.	5677.	428.	428.				959.
	10	357.	13332.	355.	355.				2029.
	11	184.	5650.	245.	245.				903.
	12	70.	931.	325.	325.				183.
	14	796.	26218.	958.	958.				4119.
1787.00		3564.	133565.	4296.	4296.	1.42	360.	5502.	15467.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 9; SECID = S1787; SRD = 3400.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	39.	1082.	60.	61.				178.
	2	155.	7463.	105.	105.				1066.
	3	209.	9520.	155.	155.				1380.
	4	179.	9181.	110.	110.				1290.
	5	750.	55171.	270.	270.				7090.
	6	1238.	54465.	965.	965.				7959.
	7	271.	10668.	250.	250.				1603.
	8	86.	2925.	98.	98.				455.
	9	477.	15979.	559.	559.				2499.
	10	534.	26134.	355.	355.				3719.
	11	306.	13238.	245.	245.				1943.
	12	232.	6915.	325.	325.				1114.
	13	31.	645.	75.	75.				114.
	14	1354.	50786.	1339.	1340.				7723.
1787.50		5861.	264171.	4911.	4912.	1.25	360.	5610.	32535.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	69.	2784.	60.	61.				420.
	2	207.	12144.	105.	105.				1652.
	3	287.	16096.	155.	155.				2213.
	4	234.	14365.	110.	110.				1930.
	5	885.	72703.	270.	270.				9088.
	6	1721.	94254.	965.	965.				13039.
	7	396.	20064.	250.	250.				2831.
	8	141.	5707.	125.	125.				852.
	9	789.	32138.	690.	690.				4788.
	10	712.	42154.	355.	355.				5719.
	11	429.	23193.	245.	245.				3218.
	12	395.	16739.	325.	325.				2469.
	13	69.	2410.	75.	75.				373.
	14	2071.	96915.	1470.	1470.				13945.
1788.00		8403.	451666.	5200.	5201.	1.15	360.	5660.	56532.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	87.	4084.	60.	62.				594.
	2	239.	15374.	105.	105.				2043.
	3	333.	20678.	155.	155.				2773.
	4	267.	17906.	110.	110.				2354.
	5	966.	84133.	270.	270.				10365.
	6	2010.	122144.	965.	965.				16465.

```
            7     471.   26787.   250.   250.                          3671.
            8     186.    7232.   175.   175.                          1090.
            9    1004.   45799.   740.   740.                          6631.
           10     818.   53184.   355.   355.                          7049.
           11     502.   30192.   245.   245.                          4081.
           12     492.   24184.   325.   325.                          3438.
           13      91.    3866.    75.    75.                           570.
           14    2512.  133692.  1470.  1470.                         18630.
  1788.30        9978.  589256.  5300.  5302.  1.12   360.  5660.  73542.
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 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1801"
   XT    1801 4200,0.0167
   GR        670,1801.4   710,1801.4   760,1800   800,1801.5
   GR        860,1800.3   900,1800.9   970,1800.7   1055,1802.1
   GR        2000,1800.6   2025,1801   2040,1800   2070,1801.2   2090,1801.3
   GR        2160,1801   2245,1800.2   2360,1800.5   2390,1800   2410,1799
   GR        2440,1800   2460,1800.8   2765,1802   3170,1801.7   3500,1798.4
   GR        3525,1798   3540,1797.6   3560,1798   3595,1799.1   3910,1799.8
   GR        4210,1798.9   4230,1798   4255,1797   4270,1798   4310,1799
   GR        4490,1799.2   4605,1798   4620,1797   4645,1798   4800,1799.2
   GR        4835,1798   4840,1797.5   4850,1798   4900,1799.5   5000,1800
   GR        5140,1797.8   5315,1801   5360,1799   5400,1800   5480,1800
   GR        5500,1800.9   5530,1800   5545,1799.7   5620,1799.2   5660,1800
   GR        5835,1799.3   5890,1800   5960,1801
   *

 *** FINISH PROCESSING CROSS SECTION - " 1801"
 *** TEMPLATE CROSS SECTION " 1801" SAVED INTERNALLY.
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - "S1801"
   XS   S1801 4200
   GT
   N         .04 .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04
   N         .04  .04  .04
   SA         800 1055 2025 2090 2360 2460 3500 3595 4210 4310 4815 5000 5315
   SA         5500 5660
   *
   HP 1 S1801 1798.5,.5,1802

 *** FINISH PROCESSING CROSS SECTION - "S1801"
 *** CROSS SECTION "S1801" WRITTEN TO DISK, RECORD NO. = 10

 --- DATA SUMMARY FOR SECID "S1801" AT SRD =   4200.  ERR-CODE =      0

      SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0167       .50       .00

 X-Y COORDINATE PAIRS  (NGP =  56):
       X      Y          X      Y          X      Y          X      Y
    670.0 1801.40     710.0 1801.40     760.0 1800.00     800.0 1801.50
    860.0 1800.30     900.0 1800.90     970.0 1800.70    1055.0 1802.10
```

2000.0	1800.60	2025.0	1801.00	2040.0	1800.00	2070.0	1801.20
2090.0	1801.30	2160.0	1801.00	2245.0	1800.20	2360.0	1800.50
2390.0	1800.00	2410.0	1799.00	2440.0	1800.00	2460.0	1800.80
2765.0	1802.00	3170.0	1801.70	3500.0	1798.40	3525.0	1798.00
3540.0	1797.60	3560.0	1798.00	3595.0	1799.10	3910.0	1799.80
4210.0	1798.90	4230.0	1798.00	4255.0	1797.00	4270.0	1798.00
4310.0	1799.00	4490.0	1799.20	4605.0	1798.00	4620.0	1797.00
4645.0	1798.00	4800.0	1799.20	4835.0	1798.00	4840.0	1797.50
4850.0	1798.00	4900.0	1799.50	5000.0	1800.00	5140.0	1797.80
5315.0	1801.00	5360.0	1799.00	5400.0	1800.00	5480.0	1800.00
5500.0	1800.90	5530.0	1800.00	5545.0	1799.70	5620.0	1799.20
5660.0	1800.00	5835.0	1799.30	5890.0	1800.00	5960.0	1801.00

X-Y MAX-MIN POINTS:

XMIN	Y	X	YMIN	XMAX	Y	X	YMAX
670.0	1801.40	4255.0	1797.00	5960.0	1801.00	1055.0	1802.10

SUBAREA BREAKPOINTS (NSA = 16):

800.	1055.	2025.	2090.	2360.	2460.	3500.	3595.
4210.	4310.	4815.	5000.	5315.	5500.	5660.	

ROUGHNESS COEFFICIENTS (NSA = 16):

.040	.040	.040	.040	.040	.040	.040	.040
.040	.040	.040	.040	.040	.040	.040	.040

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 10; SECID = S1801; SRD = 4200.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	7	0.	3.	10.	10.				1.
	8	36.	815.	76.	76.				141.
	10	48.	1364.	71.	71.				222.
	11	68.	1483.	153.	153.				258.
	12	19.	393.	46.	46.				69.
	13	29.	536.	83.	83.				97.
1798.50		200.	4593.	439.	439.	1.07	3490.	5178.	743.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	7	18.	300.	60.	60.				56.
	8	78.	2601.	92.	92.				407.
	9	2.	8.	33.	33.				2.
	10	91.	3181.	100.	100.				493.
	11	174.	4783.	274.	274.				786.
	12	49.	1440.	68.	68.				232.
	13	85.	2257.	142.	142.				374.
1799.00		496.	14571.	770.	770.	1.06	3440.	5206.	2195.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	6	6.	92.	25.	25.				18.
	7	60.	1513.	110.	110.				255.
	8	125.	5609.	95.	95.				816.
	9	96.	1429.	380.	380.				274.
	10	141.	6600.	100.	100.				950.
	11	403.	12934.	505.	505.				2046.
	12	87.	3283.	85.	85.				499.
	13	171.	5714.	201.	201.				894.
	14	8.	115.	31.	31.				22.
	15	9.	95.	60.	60.				20.
	16	7.	53.	66.	66.				12.
1799.50		1114.	37437.	1658.	1658.	1.21	2400.	5851.	4699.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 10; SECID = S1801; SRD = 4200.

$Q_{2.10} = Q_4 = 288$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	6	25.	586.	50.	50.				100.
	7	128.	4109.	160.	160.				650.
	8	173.	9585.	95.	95.				1322.
	9	368.	9744.	615.	615.				1617.
	10	191.	10946.	100.	100.				1498.
	11	656.	29079.	505.	505.				4241.
	12	154.	5097.	185.	185.				800.
	13	286.	11364.	260.	260.				1704.
	14	31.	733.	63.	63.				125.
	15	60.	1316.	130.	130.				228.
	16	80.	1489.	230.	230.				270.
1800.00		2153.	84049.	2393.	2393.	1.24	2390.	5890.	10401.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	8.	115.	31.	31.				22.
	2	2.	19.	23.	23.				4.
	4	5.	74.	20.	20.				14.
	5	22.	232.	147.	147.				48.
	6	61.	1703.	92.	93.				279.
	7	220.	8485.	210.	210.				1282.
	8	220.	14369.	95.	95.				1903.
	9	676.	26802.	615.	615.				4019.
	10	241.	16128.	100.	100.				2123.
	11	908.	50041.	505.	505.				6913.
	12	247.	11145.	185.	185.				1618.
	13	423.	20400.	288.	288.				2914.
	14	108.	3038.	165.	165.				497.
	15	129.	4392.	147.	147.				684.
	16	204.	6395.	265.	265.				1017.
1800.50		3475.	163338.	2888.	2889.	1.18	742.	5925.	19925.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	31.	732.	62.	62.				125.
	2	45.	710.	163.	163.				134.
	3	55.	706.	277.	277.				141.
	4	20.	469.	40.	40.				80.
	5	109.	2699.	200.	200.				455.
	6	109.	4331.	100.	100.				650.
	7	343.	13649.	311.	311.				2045.
	8	268.	19896.	95.	95.				2551.
	9	983.	50077.	615.	615.				7055.
	10	291.	22082.	100.	100.				2817.
	11	1161.	75312.	505.	505.				9988.
	12	339.	18941.	185.	185.				2609.
	13	574.	31895.	315.	315.				4397.
	14	196.	7585.	185.	185.				1145.
	15	206.	9081.	160.	160.				1326.
	16	345.	14140.	300.	300.				2104.
1801.00		5077.	272303.	3613.	3614.	1.18	724.	5960.	31424.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 10; SECID = S1801; SRD = 4200.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	74.	1892.	130.	130.				317.

	2	140.	3895.	219.	219.				639.
	3	273.	6057.	592.	592.				1050.
	4	47.	1410.	65.	65.				327.
	5	233.	7881.	270.	270.				1230.
	6	159.	8107.	100.	100.				1143.
	7	543.	21706.	488.	488.				3248.
	8	315.	26120.	95.	95.				3259.
	9	1291.	78814.	615.	615.				10611.
	10	341.	28761.	100.	100.				3573.
	11	1413.	104548.	505.	505.				13417.
	12	432.	28305.	185.	185.				3745.
	13	731.	47778.	315.	315.				6325.
	14	288.	14448.	185.	185.				2044.
	15	286.	15690.	160.	160.				2170.
	16	495.	25760.	300.	301.				3613.
1801.50		7063.	421171.	4324.	4325.	1.20	670.	5960.	46708.

WSEL$_4$ ≤

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	139.	5396.	130.	131.				816.
	2	257.	9798.	249.	249.				1484.
	3	647.	19262.	907.	907.				3104.
	4	80.	3385.	65.	65.				499.
	5	368.	16870.	270.	270.				2440.
	6	209.	12772.	100.	100.				1721.
	7	887.	29729.	1040.	1040.				4650.
	8	363.	33004.	95.	95.				4022.
	9	1598.	112532.	615.	615.				14620.
	10	391.	36128.	100.	100.				4387.
	11	1666.	137496.	505.	505.				17169.
	12	524.	39113.	185.	185.				5010.
	13	889.	66126.	315.	315.				8475.
	14	381.	22967.	185.	185.				3103.
	15	366.	23667.	160.	160.				3141.
	16	645.	39984.	300.	301.				5373.
1802.00		9412.	608229.	5221.	5223.	1.24	670.	5960.	64319.

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 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1809"
   XT    1809 4850,0.0160
   GR        760,1809.1   870,1808.9   990,1808   1000,1807.6   1020,1807.2
   GR        1040,1807.4   1070,1808   1120,1809.3   1230,1808.1   1310,1809.2
   GR        2000,1808.6   2030,1808.5   2070,1808   2100,1809   2125,1809.2
   GR        2400,1810   2700,1808   2750,1809   2820,1809   2855,1808
   GR        2870,1807   2890,1808   2910,1808.4   3010,1811   3160,1810
   GR        3505,1810  3810,1808.4  3835,1808.2   3855,1807.6   3880,1808
   GR        3910,1809   4180,1809.8   4310,1809.5   4365,1807   4390,1811
   GR        4410,1810   4475,1810   4615,1811   4815,1810.7   5010,1809.6
   GR        5050,1809   5070,1810   5130,1810.5   5140,1810   5190,1810
   GR        5220,1808.5  5280,1809.9  5550,1810.8   5680,1810   5720,1808.5
   GR        5780,1810   5810,1810.4   5855,1810.5
   *

 *** FINISH PROCESSING CROSS SECTION - " 1809"
 *** TEMPLATE CROSS SECTION " 1809" SAVED INTERNALLY.
1
 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
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        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1809"
  XS   S1809 4850
  GT
  N          .04 .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04
  SA          870 1120 2000 2125 2750 3010 3810 3910 4180 4390 4615 5130 5550
  *
  HP 1 S1809 1809,.5,1811

*** FINISH PROCESSING CROSS SECTION - "S1809"
*** CROSS SECTION "S1809" WRITTEN TO DISK, RECORD NO. = 11

--- DATA SUMMARY FOR SECID "S1809" AT SRD =   4850.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0160       .50       .00

X-Y COORDINATE PAIRS  (NGP =  53):
       X      Y          X      Y          X      Y          X      Y
    760.0 1809.10    870.0 1808.90    990.0 1808.00   1000.0 1807.60
   1020.0 1807.20   1040.0 1807.40   1070.0 1808.00   1120.0 1809.30
   1230.0 1808.10   1310.0 1809.20   2000.0 1808.60   2030.0 1808.50
   2070.0 1808.00   2100.0 1809.00   2125.0 1809.20   2400.0 1810.00
   2700.0 1808.00   2750.0 1809.00   2820.0 1809.00   2855.0 1808.00
   2870.0 1807.00   2890.0 1808.00   2910.0 1808.40   3010.0 1811.00
   3160.0 1810.00   3505.0 1810.00   3810.0 1808.40   3835.0 1808.20
   3855.0 1807.60   3880.0 1808.00   3910.0 1809.00   4180.0 1809.80
   4310.0 1809.50   4365.0 1807.00   4390.0 1811.00   4410.0 1810.00
   4475.0 1810.00   4615.0 1811.00   4815.0 1810.70   5010.0 1809.60
   5050.0 1809.00   5070.0 1810.00   5130.0 1810.50   5140.0 1810.00
   5190.0 1810.00   5220.0 1808.50   5280.0 1809.90   5550.0 1810.80
   5680.0 1810.00   5720.0 1808.50   5780.0 1810.00   5810.0 1810.40
   5855.0 1810.50

 X-Y MAX-MIN POINTS:
     XMIN      Y          X    YMIN      XMAX      Y          X    YMAX
    760.0 1809.10    2870.0 1807.00    5855.0 1810.50    3010.0 1811.00

SUBAREA BREAKPOINTS (NSA = 14):
        870.   1120.   2000.   2125.   2750.   3010.   3810.   3910.
       4180.   4390.   4615.   5130.   5550.

ROUGHNESS COEFFICIENTS (NSA = 14):
        .040    .040    .040    .040    .040    .040    .040    .040
        .040    .040    .040    .040    .040    .040
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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 11;  SECID = S1809;  SRD =    4850.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1       3.       14.    55.    55.                          3.
            2     202.     6749.   238.   238.                       1057.
            3     159.     2412.   608.   608.                        460.
            4      59.     1524.   100.   100.                        254.
            5     100.     2346.   200.   200.                        401.
            6      93.     3035.   113.   113.                        478.
            7      34.      573.   114.   114.                        107.
            8      85.     2813.   100.   100.                        441.
           10      57.     2100.    57.    57.                        321.
           13       8.      116.    31.    31.                         22.
           14       8.      123.    33.    33.                         24.
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1809.00		806.	21804.	1650.	1651.	1.25	815.	5740.	2866.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	55.	1288.	110.	110.				221.
	2	325.	14456.	250.	250.				2108.
	3	570.	15896.	880.	880.				2603.
	4	119.	4259.	125.	125.				655.
	5	234.	6340.	378.	378.				1046.
	6	189.	6742.	202.	202.				1039.
	7	115.	2884.	210.	210.				485.
	8	135.	6104.	100.	100.				885.
	9	42.	624.	169.	169.				120.
	10	88.	3807.	71.	71.				560.
	12	11.	160.	43.	43.				31.
	13	31.	737.	63.	63.				126.
	14	33.	782.	67.	67.				134.
1809.50		1948.	64077.	2667.	2668.	1.19	760.	5760.	8648.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	110.	4075.	110.	111.				624.
	2	450.	24847.	250.	250.				3432.
	3	1010.	41243.	880.	880.				6140.
	4	181.	8629.	125.	125.				1236.
	5	485.	15256.	625.	625.				2424.
	6	295.	13314.	222.	222.				1934.
	7	244.	7832.	305.	305.				1238.
	8	185.	10336.	100.	100.				1422.
	9	162.	4293.	270.	270.				712.
	10	170.	5600.	204.	204.				880.
	12	52.	1053.	131.	131.				187.
	13	72.	1907.	120.	120.				316.
	14	75.	2305.	100.	100.				369.
1810.00		3491.	140691.	3441.	3443.	1.16	760.	5780.	18519.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 11; SECID = S1809; SRD = 4850.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	165.	7986.	110.	111.				1147.
	2	575.	37370.	250.	250.				4955.
	3	1450.	75352.	880.	880.				10562.
	4	244.	14146.	125.	125.				1929.
	5	798.	34948.	625.	625.				5112.
	6	411.	21844.	241.	241.				3045.
	7	588.	19035.	725.	725.				3003.
	8	235.	15415.	100.	100.				2038.
	9	297.	11789.	270.	270.				1768.
	10	273.	12186.	207.	207.				1775.
	11	53.	993.	145.	145.				179.
	12	155.	3888.	280.	280.				654.
	13	197.	5202.	330.	330.				864.
	14	157.	4199.	256.	256.				694.
1810.50		5595.	264353.	4543.	4546.	1.18	760.	5855.	32457.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	220.	12861.	110.	112.				1765.
	2	700.	51856.	250.	250.				6654.
	3	1890.	117196.	880.	880.				15718.
	4	306.	20702.	125.	125.				2717.
	5	1110.	60637.	625.	625.				8394.
	6	536.	32332.	260.	260.				4367.
	7	969.	41014.	800.	800.				6052.
	8	285.	21274.	100.	100.				2723.

```
            9     432.   22013.   270.   270.                        3101.
           10     377.   20696.   210.   210.                        2863.
           11     145.    4029.   225.   225.                         661.
           12     339.    9544.   515.   515.                        1559.
           13     393.   14033.   420.   420.                        2161.
           14     302.   11146.   305.   306.                        1703.
  1811.00         8004.  439333.  5095.  5098.  1.15   760.  5855.  52985.
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 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1821"
  XT    1821 5550,0.0165
  GR        820,1825.5   945,1822.5   1020,1822   1040,1821.8
  GR        1060,1820.3   1080,1821.6   1115,1822.4   1225,1821.7
  GR        2000,1821.4   2120,1821.9   2160,1821   2190,1820   2210,1822
  GR        2240,1822.5   2365,1824   2450,1824.2   2500,1822   2535,1820
  GR        2590,1822     2620,1820  2630,1819.8  2640,1820    2685,1820.7
  GR        2715,1820   2745,1819.8
  GR        2780,1819.7  2800,1820   2830,1821   3000,1823.2   3200,1822
  GR        3410,1823.9  3730,1821  3940,1822.7  3965,1822  3980,1821.7
  GR        3985,1822  4030,1823  4065,1822  4095,1822.5   4130,1822.3
  GR        4225,1822.2  4275,1821.8   4330,1821   4350,1821.8   4390,1821
  GR        4435,1822
  GR        4600,1822.4   4725,1822.3   4795,1821.8   4860,1819   4880,1820
  GR        4900,1821.5   4940,1821.2  5025,1820.6  5225,1823.2  5450,1823.8
  GR        5510,1822   5520,1820   5530,1821   5550,1822   5570,1822.8
  GR        5775,1824
  *

 *** FINISH PROCESSING CROSS SECTION - " 1821"
 *** TEMPLATE CROSS SECTION " 1821" SAVED INTERNALLY.
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - "S1821"
  XS   S1821 5550
  GT
  N         .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04
  N         .04  .04 .04   .04  .04
  SA         1115 2120 2240 2450 2590 2685 3000 3940 4030 4095 4225 4350
  SA         4435 4725 4940 5225
  *
  HP 1 S1821 1820.5,.5,1824

 *** FINISH PROCESSING CROSS SECTION - "S1821"
 *** CROSS SECTION "S1821" WRITTEN TO DISK, RECORD NO. = 12

 --- DATA SUMMARY FOR SECID "S1821" AT SRD =   5550.  ERR-CODE =      0

      SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0165       .50       .00

 X-Y COORDINATE PAIRS  (NGP =  62):
       X      Y          X      Y          X      Y          X      Y
    820.0 1825.50     945.0 1822.50    1020.0 1822.00    1040.0 1821.80
```

1060.0	1820.30	1080.0	1821.60	1115.0	1822.40	1225.0	1821.70
2000.0	1821.40	2120.0	1821.90	2160.0	1821.00	2190.0	1820.00
2210.0	1822.00	2240.0	1822.50	2365.0	1824.00	2450.0	1824.20
2500.0	1822.00	2535.0	1820.00	2590.0	1822.00	2620.0	1820.00
2630.0	1819.80	2640.0	1820.00	2685.0	1820.70	2715.0	1820.00
2745.0	1819.80	2780.0	1819.70	2800.0	1820.00	2830.0	1821.00
3000.0	1823.20	3200.0	1822.00	3410.0	1823.90	3730.0	1821.00
3940.0	1822.70	3965.0	1822.00	3980.0	1821.70	3985.0	1822.00
4030.0	1823.00	4065.0	1822.00	4095.0	1822.50	4130.0	1822.30
4225.0	1822.20	4275.0	1821.80	4330.0	1821.00	4350.0	1821.80
4390.0	1821.00	4435.0	1822.00	4600.0	1822.40	4725.0	1822.30
4795.0	1821.80	4860.0	1819.00	4880.0	1820.00	4900.0	1821.50
4940.0	1821.20	5025.0	1820.60	5225.0	1823.20	5450.0	1823.80
5510.0	1822.00	5520.0	1820.00	5530.0	1821.00	5550.0	1822.00
5570.0	1822.80	5775.0	1824.00				

X-Y MAX-MIN POINTS:

XMIN	Y	X	YMIN	XMAX	Y	X	YMAX
820.0	1825.50	4860.0	1819.00	5775.0	1824.00	820.0	1825.50

SUBAREA BREAKPOINTS (NSA = 17):

1115.	2120.	2240.	2450.	2590.	2685.	3000.	3940.
4030.	4095.	4225.	4350.	4435.	4725.	4940.	5225.

ROUGHNESS COEFFICIENTS (NSA = 17):

.040	.040	.040	.040	.040	.040	.040	.040
.040	.040	.040	.040	.040	.040	.040	.040
.040							

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 12; SECID = S1821; SRD = 5550.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	1.	5.	6.	6.				1.
	3	5.	74.	20.	20.				14.
	5	6.	83.	23.	23.				16.
	6	22.	419.	60.	60.				75.
	7	66.	1652.	121.	121.				278.
	15	48.	1503.	61.	62.				239.
	17	2.	28.	8.	8.				5.
1820.50		149.	3763.	298.	299.	1.13	1057.	5525.	563.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	7.	130.	20.	20.				24.
	3	20.	469.	40.	40.				80.
	5	23.	528.	45.	45.				90.
	6	59.	1781.	80.	80.				286.
	7	134.	4750.	145.	145.				733.
	15	83.	3178.	80.	80.				481.
	16	17.	223.	87.	87.				44.
	17	8.	175.	15.	15.				30.
1821.00		351.	11233.	512.	513.	1.12	1051.	5530.	1553.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	21.	547.	34.	35.				91.
	2	14.	71.	282.	282.				18.
	3	47.	1368.	67.	67.				222.
	5	51.	1556.	68.	68.				249.
	6	101.	4112.	88.	88.				612.
	7	216.	8993.	184.	184.				1333.
	8	29.	432.	117.	117.				83.
	12	12.	173.	47.	47.				33.
	13	12.	176.	47.	48.				34.

	15	134.	4863.	138.	138.				745.
	16	82.	2011.	154.	154.				340.
	17	18.	509.	28.	28.				83.
1821.50		736.	24811.	1254.	1254.	1.19	1044.	5540.	2929.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 12; SECID = S1821; SRD = 5550.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	45.	1187.	78.	78.				198.
	2	398.	8341.	942.	942.				1467.
	3	87.	3165.	90.	90.				485.
	5	90.	3350.	90.	90.				511.
	6	146.	7260.	95.	95.				1030.
	7	318.	15030.	222.	222.				2157.
	8	117.	2744.	234.	234.				469.
	9	3.	32.	20.	20.				7.
	12	47.	1077.	100.	100.				186.
	13	46.	1158.	85.	85.				195.
	15	208.	8742.	173.	173.				1292.
	16	169.	5762.	193.	193.				897.
	17	35.	1187.	40.	40.				186.
1822.00		1710.	59034.	2361.	2362.	1.30	1020.	5550.	7256.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	108.	2983.	170.	170.				490.
	2	888.	30444.	1005.	1005.				4735.
	3	139.	5741.	120.	120.				853.
	5	138.	6298.	101.	101.				912.
	6	194.	11601.	95.	95.				1570.
	7	439.	23103.	261.	261.				3228.
	8	298.	7964.	489.	489.				1318.
	9	23.	453.	60.	60.				81.
	10	12.	176.	48.	48.				34.
	11	27.	358.	130.	130.				71.
	12	107.	3621.	125.	125.				566.
	13	89.	3418.	85.	85.				517.
	14	68.	969.	290.	290.				188.
	15	309.	14652.	215.	215.				2102.
	16	275.	11491.	231.	231.				1701.
	17	62.	2158.	69.	69.				335.
1822.50		3177.	125429.	3495.	3496.	1.21	945.	5562.	15593.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 12; SECID = S1821; SRD = 5550.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	198.	7585.	191.	191.				1148.
	2	1390.	64294.	1005.	1005.				9279.
	3	199.	10421.	120.	120.				1460.
	4	10.	154.	42.	42.				30.
	5	191.	10137.	113.	113.				1415.
	6	241.	16718.	95.	95.				2182.
	7	579.	33444.	300.	300.				4565.
	8	601.	20061.	708.	708.				3141.
	9	62.	1789.	90.	90.				290.
	10	40.	1078.	65.	65.				178.

$Q_{2.10} = Q_3 = 288$ cfs

$WSEL_3 \approx 21.7 +/-$

	11	92.	2734.	130.	130.				441.
	12	170.	7772.	125.	125.				1125.
	13	131.	6551.	85.	85.				928.
	14	213.	6471.	290.	290.				1038.
	15	416.	24099.	215.	215.				3289.
	16	400.	19385.	270.	270.				2765.
	17	107.	3545.	127.	128.				557.
1823.00		5043.	236239.	3970.	3971.	1.14	924.	5604.	30156.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	299.	14023.	212.	212.				2017.
	2	1893.	107524.	1005.	1005.				14740.
	3	259.	16153.	120.	120.				2165.
	4	42.	978.	83.	83.				167.
	5	251.	14901.	124.	124.				2020.
	6	289.	22557.	95.	95.				2857.
	7	735.	48134.	315.	315.				6368.
	8	996.	41160.	852.	852.				6109.
	9	107.	4455.	90.	90.				660.
	10	73.	2904.	65.	65.				434.
	11	157.	6650.	130.	130.				981.
	12	232.	13097.	125.	125.				1799.
	13	174.	10448.	85.	85.				1413.
	14	358.	15364.	290.	290.				2259.
	15	524.	35333.	215.	215.				4642.
	16	541.	30895.	285.	285.				4230.
	17	213.	5792.	342.	342.				955.
1823.50		7142.	390367.	4433.	4434.	1.12	903.	5690.	48618.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 12; SECID = S1821; SRD = 5550.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	410.	22295.	233.	233.				3091.
	2	2395.	159197.	1005.	1005.				20983.
	3	319.	22846.	120.	120.				2958.
	4	94.	2883.	125.	125.				461.
	5	315.	20632.	135.	136.				2732.
	6	336.	29075.	95.	95.				3590.
	7	892.	66532.	315.	315.				8521.
	8	1448.	71942.	940.	940.				10198.
	9	152.	8006.	90.	90.				1118.
	10	105.	5384.	65.	65.				757.
	11	222.	11837.	130.	130.				1649.
	12	295.	19476.	125.	125.				2572.
	13	216.	15039.	85.	85.				1961.
	14	503.	27070.	290.	290.				3762.
	15	631.	48223.	215.	215.				6141.
	16	684.	45616.	285.	285.				6007.
	17	448.	14576.	550.	550.				2298.
1824.00		9468.	590627.	4803.	4804.	1.11	883.	5775.	71651.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

*** START PROCESSING CROSS SECTION - " 1836"

```
  XT    1836 6350,0.0172
  GR        500,1836.1   560,1835   590,1834   605,1833.7   615,1833.2
  GR        625,1833.6   640,1834   690,1834.9   765,1836.2
  GR        1000,1835.5   1125,1835.2   1155,1834.2   1170,1833.5   1180,1834.2
  GR        1205,1834.8   1210,1835   1330,1835.2   1480,1836.3   1630,1836
  GR        1660,1836.8   1700,1836   1800,1834   1835,1835   1900,1834
  GR        1920,1836   1940,1837   2070,1835.9   2335,1835.3   2590,1835.8
  GR        2745,1836.5   2810,1836   2830,1835.2   2850,1834   2870,1835.9
  GR        2905,1836.1   2960,1836.3   3060,1835.5   3230,1836.2   3260,1836
  GR        3275,1834.5   3300,1836   3325,1836   3345,1836   3355,1835.5
  GR        3370,1836   3420,1836.7   3465,1836   3475,1834.2   3490,1836
  GR        3520,1834   3545,1835.5   3690,1835.9   3795,1835.5   3850,1835.0
  GR        3865,1834   3875,1833.5   3885,1834   3910,1836   3940,1836
  GR        4090,1836.9   4300,1838   4575,1834.8   4590,1834   4600,1833.5
  GR        4620,1836   4640,1835.8   4795,1838
  *

*** FINISH PROCESSING CROSS SECTION - " 1836"
*** TEMPLATE CROSS SECTION " 1836" SAVED INTERNALLY.
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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1836"
  XS   S1836 6350
  GT
  N         .04 .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04 .04
  SA         690 1000 1210 1660 1940 2745 2960 3230 3420 3545 3795 3940 4300
  *
  HP 1 S1836 1835,.5,1838

*** FINISH PROCESSING CROSS SECTION - "S1836"
*** CROSS SECTION "S1836" WRITTEN TO DISK, RECORD NO. = 13

--- DATA SUMMARY FOR SECID "S1836" AT SRD =   6350.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0172       .50       .00

X-Y COORDINATE PAIRS  (NGP =  67):
       X       Y          X       Y          X       Y          X       Y
    500.0 1836.10     560.0 1835.00     590.0 1834.00     605.0 1833.70
    615.0 1833.20     625.0 1833.60     640.0 1834.00     690.0 1834.90
    765.0 1836.20    1000.0 1835.50    1125.0 1835.20    1155.0 1834.20
   1170.0 1833.50    1180.0 1834.20    1205.0 1834.80    1210.0 1835.00
   1330.0 1835.20    1480.0 1836.30    1630.0 1836.00    1660.0 1836.80
   1700.0 1836.00    1800.0 1834.00    1835.0 1835.00    1900.0 1834.00
   1920.0 1836.00    1940.0 1837.00    2070.0 1835.90    2335.0 1835.30
   2590.0 1835.80    2745.0 1836.50    2810.0 1836.00    2830.0 1835.20
   2850.0 1834.00    2870.0 1835.90    2905.0 1836.10    2960.0 1836.30
   3060.0 1835.50    3230.0 1836.20    3260.0 1836.00    3275.0 1834.50
   3300.0 1836.00    3325.0 1836.00    3345.0 1836.00    3355.0 1835.50
   3370.0 1836.00    3420.0 1836.70    3465.0 1836.00    3475.0 1834.20
   3490.0 1836.00    3520.0 1834.00    3545.0 1835.50    3690.0 1835.90
   3795.0 1835.50    3850.0 1835.00    3865.0 1834.00    3875.0 1833.50
   3885.0 1834.00    3910.0 1836.00    3940.0 1836.00    4090.0 1836.90
   4300.0 1838.00    4575.0 1834.80    4590.0 1834.00    4600.0 1833.50
   4620.0 1836.00    4640.0 1835.80    4795.0 1838.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    500.0 1836.10     615.0 1833.20    4795.0 1838.00    4300.0 1838.00

SUBAREA BREAKPOINTS (NSA = 14):
```

690. 1000. 1210. 1660. 1940. 2745. 2960. 3230.
3420. 3545. 3795. 3940. 4300.

ROUGHNESS COEFFICIENTS (NSA = 14):
.040 .040 .040 .040 .040 .040 .040
.040 .040 .040 .040 .040 .040

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 13; SECID = S1836; SRD = 6350.

$Q_{2.00} = Q_7 = 399$ cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	109.	3623.	130.	130.				568.
	2	0.	1.	6.	6.				0.
	3	51.	1435.	79.	79.				235.
	5	80.	1877.	160.	160.				321.
	7	14.	318.	27.	27.				55.
	9	3.	49.	13.	13.				9.
	10	20.	458.	43.	43.				79.
	12	39.	1258.	48.	48.				199.
	14	32.	847.	54.	54.				141.
1835.00		349.	9867.	560.	560.	1.07	560.	4612.	1509.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	181.	7407.	157.	157.				1102.
	2	10.	173.	35.	35.				32.
	3	112.	2743.	210.	210.				464.
	4	54.	976.	161.	161.				178.
	5	168.	5734.	190.	190.				892.
	6	19.	153.	190.	190.				34.
	7	31.	921.	43.	43.				149.
	9	13.	312.	27.	27.				53.
	10	47.	1416.	66.	66.				228.
	12	78.	2317.	109.	109.				373.
	14	71.	2089.	101.	101.				338.
1835.50		785.	24242.	1289.	1290.	1.18	533.	4616.	3202.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	267.	12682.	185.	185.				1818.
	2	77.	1374.	231.	231.				251.
	3	217.	8260.	210.	210.				1252.
	4	152.	4290.	229.	229.				700.
	5	270.	11524.	220.	220.				1697.
	6	226.	4503.	576.	576.				802.
	7	58.	1772.	78.	78.				284.
	8	46.	680.	184.	184.				130.
	9	36.	914.	65.	65.				154.
	10	84.	3206.	80.	80.				486.
	11	75.	1252.	250.	250.				233.
	12	134.	5506.	115.	115.				819.
	14	137.	4205.	182.	182.				672.
1836.00		1777.	60168.	2605.	2606.	1.28	505.	4654.	7371.

$\therefore WSEL_7 = 36.2 +/-$

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 13; SECID = S1836; SRD = 6350.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	361.	20619.	190.	190.				2827.

	2	224.	6719.	310.	310.				1081.
	3	322.	15946.	210.	210.				2263.
	4	338.	10564.	439.	439.				1681.
	5	389.	19174.	255.	255.				2724.
	6	556.	17039.	746.	746.				2726.
	7	137.	3789.	215.	215.				622.
	8	171.	4675.	270.	270.				769.
	9	112.	3096.	176.	176.				509.
	10	132.	5454.	112.	113.				811.
	11	200.	6420.	250.	250.				1015.
	12	206.	9711.	145.	145.				1396.
	13	21.	308.	83.	83.				59.
	14	247.	8903.	260.	261.				1369.
1836.50		3416.	132417.	3661.	3663.	1.22	500.	4689.	16939.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	456.	30374.	190.	191.				4012.
	2	379.	16142.	310.	310.				2378.
	3	427.	25523.	210.	210.				3455.
	4	561.	24205.	450.	450.				3554.
	5	524.	29630.	280.	280.				4068.
	6	944.	39101.	805.	805.				5801.
	7	245.	9935.	215.	215.				1482.
	8	306.	12357.	270.	270.				1844.
	9	206.	8078.	190.	190.				1215.
	10	193.	9584.	125.	125.				1361.
	11	325.	14420.	250.	250.				2103.
	12	279.	16043.	145.	145.				2193.
	13	83.	1941.	169.	169.				333.
	14	397.	16449.	339.	339.				2441.
1837.00		5325.	253783.	3948.	3950.	1.12	500.	4725.	33164.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	551.	41558.	190.	191.				5328.
	2	534.	28584.	310.	310.				3977.
	3	532.	36819.	210.	210.				4805.
	4	786.	42463.	450.	450.				5895.
	5	664.	43966.	280.	280.				5802.
	6	1346.	70673.	805.	805.				9882.
	7	352.	18227.	215.	215.				2558.
	8	441.	22740.	270.	270.				3193.
	9	301.	15208.	190.	190.				2147.
	10	256.	15297.	125.	125.				2073.
	11	450.	24804.	250.	250.				3426.
	12	351.	23585.	145.	145.				3102.
	13	192.	5769.	265.	265.				927.
	14	586.	27388.	417.	417.				3943.
1837.50		7342.	417082.	4121.	4124.	1.08	500.	4760.	53470.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 13; SECID = S1836; SRD = 6350.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	646.	54073.	190.	192.				6763.
	2	689.	43710.	310.	310.				5829.
	3	637.	49711.	210.	210.				6296.
	4	1011.	64599.	450.	450.				8599.
	5	804.	60478.	280.	280.				7731.
	6	1749.	109286.	805.	805.				14629.
	7	460.	28412.	215.	215.				3815.
	8	576.	35505.	270.	270.				4768.
	9	396.	24031.	190.	190.				3241.
	10	318.	22030.	125.	125.				2878.

```
          11     575.   37320.   250.   250.                        4948.
          12     424.   32244.   145.   145.                        4111.
          13     348.   12673.   360.   360.                        1941.
          14     814.   42230.   495.   495.                        5923.
  1838.00        9446.  616303.  4295.  4298.  1.07   500.  4795.  76915.
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WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1850"
  XT    1850 7200,0.0161
  GR       860,1851  1000,1850  1085,1849.8  1105,1850  1120,1849.9
  GR       1145,1849.6
  GR       1170,1850.4   1195,1850.5  1360,1849.8   1525,1849.8   1760,1851.4
  GR       1845,1852   1920,1851   1950,1850   1960,1847.2   1970,1848
  GR       2030,1849.8   2080,1848.1  2140,1850  2170,1848  2210,1850
  GR       2300,1848  2385,1850  2575,1851  2680,1846  2790,1850.5
  GR       2870,1849.8  2900,1850.3  2910,1850  2940,1847.8  2950,1848
  GR       2990,1850  3012,1850.2  3490,1851  3530,1850  3545,1849.5
  GR       3560,1850  3590,1851  3630,1850  3725,1849  3775,1849.3
  GR       3815,1848  3820,1847.8  3825,1848  3905,1848.5  3970,1848
  GR       4000,1847.5  4020,1848  4335,1851.5  4390,1850  4430,1847
  GR       4465,1850.2
  *

*** FINISH PROCESSING CROSS SECTION - " 1850"
*** TEMPLATE CROSS SECTION " 1850" SAVED INTERNALLY.
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1850"
  XS   S1850 7200
  GT
  N         .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04
  SA         1195 1845  2030 2140 2790 2900 3012 3490 3590 3775 3905 4335
  *
  HP 1 S1850 1849,.5,1852

*** FINISH PROCESSING CROSS SECTION - "S1850"
*** CROSS SECTION "S1850" WRITTEN TO DISK, RECORD NO. = 14

--- DATA SUMMARY FOR SECID "S1850" AT SRD =   7200.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0161       .50       .00

X-Y COORDINATE PAIRS  (NGP =  52):
      X      Y          X      Y          X      Y          X      Y
    860.0 1851.00    1000.0 1850.00    1085.0 1849.80    1105.0 1850.00
   1120.0 1849.90    1145.0 1849.60    1170.0 1850.40    1195.0 1850.50
   1360.0 1849.80    1525.0 1849.80    1760.0 1851.40    1845.0 1852.00
   1920.0 1851.00    1950.0 1850.00    1960.0 1847.20    1970.0 1848.00
   2030.0 1849.80    2080.0 1848.10    2140.0 1850.00    2170.0 1848.00
   2210.0 1850.00    2300.0 1848.00    2385.0 1850.00    2575.0 1851.00
   2680.0 1846.00    2790.0 1850.50    2870.0 1849.80    2900.0 1850.30
```

2910.0	1850.00	2940.0	1847.80	2950.0	1848.00	2990.0	1850.00
3012.0	1850.20	3490.0	1851.00	3530.0	1850.00	3545.0	1849.50
3560.0	1850.00	3590.0	1851.00	3630.0	1850.00	3725.0	1849.00
3775.0	1849.30	3815.0	1848.00	3820.0	1847.80	3825.0	1848.00
3905.0	1848.50	3970.0	1848.00	4000.0	1847.50	4020.0	1848.00
4335.0	1851.50	4390.0	1850.00	4430.0	1847.00	4465.0	1850.20

X-Y MAX-MIN POINTS:

XMIN	Y	X	YMIN	XMAX	Y	X	YMAX
860.0	1851.00	2680.0	1846.00	4465.0	1850.20	1845.0	1852.00

SUBAREA BREAKPOINTS (NSA = 13):

1195. 1845. 2030. 2140. 2790. 2900. 3012. 3490.
3590. 3775. 3905. 4335.

ROUGHNESS COEFFICIENTS (NSA = 13):

.040 .040 .040 .040 .040 .040 .040 .040
.040 .040 .040 .040 .040

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

$Q_{2.30} = Q_3 = 540$ cfs

CROSS-SECTION PROPERTIES: ISEQ = 14; SECID = S1850; SRD = 7200.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	3	36.	1099.	50.	50.				177.
	4	25.	540.	55.	55.				94.
	5	266.	10069.	259.	259.				1528.
	7	31.	873.	46.	46.				143.
	11	86.	2573.	121.	121.				415.
	12	156.	4856.	205.	205.				774.
	13	49.	1804.	49.	49.				275.
1849.00		649.	21815.	784.	785.	1.05	1954.	4452.	3269.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	3	66.	2393.	68.	69.				368.
	4	60.	1755.	85.	85.				284.
	5	416.	17632.	343.	343.				2602.
	7	58.	2050.	63.	63.				317.
	10	29.	492.	98.	98.				91.
	11	150.	6146.	130.	130.				914.
	12	270.	10586.	250.	250.				1592.
	13	76.	3271.	61.	61.				481.
1849.50		1125.	44325.	1098.	1099.	1.04	1952.	4457.	6333.

$\therefore WSEL_{3} \approx 49.8'$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	20.	188.	158.	158.				40.
	2	41.	461.	242.	242.				95.
	3	104.	4597.	80.	80.				673.
	4	110.	4065.	110.	110.				620.
	5	609.	28703.	427.	427.				4124.
	6	3.	28.	35.	35.				6.
	7	94.	3895.	80.	80.				578.
	9	8.	111.	30.	30.				21.
	10	90.	2439.	145.	145.				402.
	11	215.	11198.	130.	130.				1569.
	12	406.	18730.	295.	295.				2705.
	13	109.	5319.	73.	73.				759.
1850.00		1808.	79736.	1803.	1805.	1.10	1000.	4463.	9817.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS

SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 14; SECID = S1850; SRD = 7200.

Q2.30 = Q3 = 540 cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	121.	2682.	265.	265.				465.
	2	209.	4800.	433.	433.				825.
	3	148.	7365.	95.	95.				1046.
	4	165.	8010.	110.	110.				1142.
	5	851.	42704.	545.	545.				6041.
	6	41.	807.	110.	110.				145.
	7	146.	6507.	112.	112.				949.
	8	27.	283.	179.	179.				59.
	9	31.	714.	65.	65.				123.
	10	167.	6302.	165.	165.				958.
	11	280.	17392.	130.	130.				2332.
	12	565.	29526.	340.	340.				4133.
	13	151.	7728.	93.	94.				1091.
1850.50		2904.	134819.	2642.	2644.	1.17	930.	4465.	15994.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	271.	8777.	335.	335.				1385.
	2	444.	15153.	506.	506.				2359.
	3	199.	10975.	110.	110.				1519.
	4	220.	12955.	110.	110.				1759.
	5	1150.	62639.	650.	650.				8680.
	6	96.	3294.	110.	110.				513.
	7	202.	11167.	112.	112.				1543.
	8	191.	3867.	478.	478.				686.
	9	73.	2179.	100.	100.				350.
	10	255.	11764.	185.	185.				1699.
	11	345.	24630.	130.	130.				3189.
	12	746.	43212.	385.	385.				5896.
	13	202.	11131.	112.	113.				1546.
1851.00		4395.	221742.	3323.	3325.	1.17	860.	4465.	26489.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	439.	19544.	335.	336.				2849.
	2	715.	30681.	579.	579.				4512.
	3	263.	14409.	148.	148.				1997.
	4	275.	18805.	110.	110.				2461.
	5	1475.	94843.	650.	650.				12608.
	6	151.	6985.	110.	110.				1009.
	7	258.	16781.	112.	112.				2226.
	8	430.	14939.	478.	478.				2316.
	9	123.	5223.	100.	100.				769.
	10	347.	19705.	185.	185.				2703.
	11	410.	32840.	130.	130.				4132.
	12	950.	60025.	430.	430.				8013.
	13	263.	15521.	130.	132.				2120.
1851.50		6100.	350300.	3497.	3500.	1.13	860.	4465.	43101.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 14; SECID = S1850; SRD = 7200.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	606.	33468.	335.	336.				4628.
	2	1023.	51536.	650.	650.				7280.
	3	346.	19579.	185.	185.				2691.
	4	330.	25496.	110.	110.				3236.
	5	1800.	132171.	650.	650.				16997.
	6	206.	11705.	110.	110.				1605.
	7	314.	23274.	112.	112.				2988.

```
            8     669.   31197.   478.   478.                          4493.
            9     173.    9239.   100.   100.                          1286.
           10     440.   29201.   185.   185.                          3851.
           11     475.   41968.   130.   130.                          5152.
           12    1165.   84334.   430.   430.                         10881.
           13     328.   22377.   130.   132.                          2953.
  1852.00         7875.  515546.  3605.  3609.  1.10   860.  4465.  63076.
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 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1864"
   XT    1864 8100,0.0174
   GR        0,1864  125,1863  250,1864  280,1864.3  315,1864
   GR        345,1863  520,1863.5  575,1864  600,1863  620,1864
   GR        630,1865  680,1864  730,1864.8  920,1866  1242,1866.5
   GR        1340,1864  1450,1862.5  1475,1864  1570,1865.5  1585,1864
   GR        1595,1863.5  1605,1864  1680,1866  2130,1865.2  2250,1864
   GR        2265,1862.8  2285,1864  2350,1865  2630,1866.5  2660,1865
   GR        2710,1866.5  2790,1864  2900,1867  3150,1866  3168,1864
   GR        3175,1864  3190,1866  3300,1868
   *

 *** FINISH PROCESSING CROSS SECTION - " 1864"
 *** TEMPLATE CROSS SECTION " 1864" SAVED INTERNALLY.
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - "S1864"
   XS   S1864 8100
   GT
   N         .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04
   SA          280  520  630  730  1242 1570 1680 2130 2350 2900
   *
   HP 1 S1864 1863.0,.5,1866

 *** FINISH PROCESSING CROSS SECTION - "S1864"
 *** CROSS SECTION "S1864" WRITTEN TO DISK, RECORD NO. = 15

 --- DATA SUMMARY FOR SECID "S1864" AT SRD =   8100.  ERR-CODE =      0

      SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0174       .50       .00

 X-Y COORDINATE PAIRS  (NGP =  38):
        X      Y          X      Y          X      Y          X      Y
        .0 1864.00     125.0 1863.00     250.0 1864.00     280.0 1864.30
     315.0 1864.00     345.0 1863.00     520.0 1863.50     575.0 1864.00
     600.0 1863.00     620.0 1864.00     630.0 1865.00     680.0 1864.00
     730.0 1864.80     920.0 1866.00    1242.0 1866.50    1340.0 1864.00
    1450.0 1862.50    1475.0 1864.00    1570.0 1865.50    1585.0 1864.00
    1595.0 1863.50    1605.0 1864.00    1680.0 1866.00    2130.0 1865.20
    2250.0 1864.00    2265.0 1862.80    2285.0 1864.00    2350.0 1865.00
    2630.0 1866.50    2660.0 1865.00    2710.0 1866.50    2790.0 1864.00
    2900.0 1867.00    3150.0 1866.00    3168.0 1864.00    3175.0 1864.00
    3190.0 1866.00    3300.0 1868.00
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X-Y MAX-MIN POINTS:

XMIN	Y	X	YMIN	XMAX	Y	X	YMAX
.0	1864.00	1450.0	1862.50	3300.0	1868.00	3300.0	1868.00

SUBAREA BREAKPOINTS (NSA = 11):

280. 520. 630. 730. 1242. 1570. 1680. 2130.
2350. 2900.

ROUGHNESS COEFFICIENTS (NSA = 11):

.040 .040 .040 .040 .040 .040 .040 .040
.040 .040 .040

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

Q2.00 = 399 = Q7

CROSS-SECTION PROPERTIES: ISEQ = 15; SECID = S1864; SRD = 8100.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	6	11.	166.	45.	45.				32.
	9	1.	5.	6.	6.				1.
1863.00		12.	171.	51.	51.	1.03	1413.	2268.	32.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	31.	462.	125.	125.				89.
	2	48.	702.	190.	190.				135.
	3	6.	83.	23.	23.				16.
	6	45.	1056.	90.	90.				181.
	9	7.	132.	20.	20.				24.
1863.50		137.	2435.	448.	448.	1.16	63.	2277.	397.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	125.	2933.	250.	250.				502.
	2	146.	4349.	205.	205.				701.
	3	36.	686.	100.	100.				124.
	6	101.	3113.	135.	135.				498.
	7	5.	74.	20.	20.				14.
	9	21.	556.	35.	35.				92.
1864.00		435.	11711.	745.	745.	1.07	0.	2285.	1826.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	260.	9236.	280.	281.				1426.
	2	261.	10281.	240.	240.				1544.
	3	88.	2885.	105.	105.				453.
	4	14.	208.	56.	56.				40.
	6	182.	6648.	186.	186.				1017.
	7	21.	477.	44.	44.				82.
	9	59.	1393.	118.	118.				238.
	10	9.	127.	34.	34.				24.
	11	6.	105.	15.	15.				19.
1864.50		899.	31359.	1078.	1079.	1.07	0.	3179.	4507.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	400.	18894.	280.	281.				2718.
	2	381.	19312.	240.	240.				2724.
	3	141.	6212.	110.	110.				908.
	4	55.	1375.	100.	100.				231.
	5	3.	25.	32.	32.				6.
	6	288.	12162.	238.	238.				1795.
	7	49.	1461.	68.	68.				235.
	9	139.	4037.	200.	200.				654.
	10	34.	805.	69.	69.				138.
	11	15.	424.	24.	24.				70.
1865.00		1505.	64708.	1359.	1360.	1.10	0.	3183.	8562.

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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
   CROSS-SECTION PROPERTIES:  ISEQ = 15;  SECID = S1864;  SRD =    8100.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     540.   31102.   280.   282.                       4261.
            2     501.   30481.   240.   240.                       4108.
            3     196.   10747.   110.   110.                       1487.
            4     105.    4040.   100.   100.                        611.
            5      39.     718.   111.   111.                        130.
            6     419.   20007.   289.   289.                       2865.
            7      88.    3223.    91.    91.                        494.
            8      25.     266.   169.   169.                         56.
            9     247.    9903.   220.   220.                       1481.
           10     107.    2452.   223.   223.                        422.
           11      29.    1017.    32.    32.                        158.
  1865.50         2297.  113955.  1864.  1867.  1.15     0.  3186.  13489.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     680.   45603.   280.   282.                       6020.
            2     621.   43596.   240.   240.                       5668.
            3     251.   16223.   110.   110.                       2155.
            4     155.    7732.   100.   100.                       1095.
            5     114.    3021.   190.   190.                        501.
            6     568.   31821.   308.   308.                       4379.
            7     139.    6029.   110.   110.                        884.
            8     180.    3640.   450.   450.                        646.
            9     357.   18316.   220.   220.                       2575.
           10     257.    7425.   377.   377.                       1206.
           11      47.    1942.    40.    40.                        289.
  1866.00         3370.  185348.  2426.  2429.  1.21     0.  3190.  20479.
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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1888"
  XT    1888 9200,0.0178
  GR        0,1888   95,1885.9   140,1886   168,1884.1   190,1886
  GR        220,1886.5   250,1886   330,1885.8   425,1886  445,1886.3
  GR        460,1886.1   490,1886   549,1885.6   590,1885.5   630,1885.8
  GR        710,1885.8   780,1886.5   805,1886   870,1885   915,1884.1
  GR        945,1882.5   952,1883.5   970,1884   995,1884.2   1010,1884.5
  GR        1080,1883.9   1355,1885.4   1620,1884   1720,1883 1760,1882.1
  GR        1780,1881.3   1820,1882   1865,1883   1900,1883.1  1930,1883.6
  GR        1985,1883.4   2050,1883.7  2100,1883.8   2140,1882.7  2165,1882.5
  GR        2175,1882.8   2215,1883.6  2245,1884   2380,1881.7  2495,1884.5
  GR        2635,1882   2745,1884.5   2835,1882  2900,1882.5   2915,1882.4
  GR        2940,1882.1   2980,1879.6   3020,1882.4  3030,1882.2   3065,1881
  GR        3090,1882   3170,1884
  *

*** FINISH PROCESSING CROSS SECTION - " 1888"
*** TEMPLATE CROSS SECTION " 1888" SAVED INTERNALLY.
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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS
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WSEL, ≅ 65.3 +/-

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        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1888"
  XS   S1888 9200
  GT
  N          .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04  .04
  SA           220  445  630  780  1010 1620 1930 2050 2245 2900 3020
  *
  HP 1 S1888 1883,.5,1887

*** FINISH PROCESSING CROSS SECTION - "S1888"
*** CROSS SECTION "S1888" WRITTEN TO DISK, RECORD NO. = 16

--- DATA SUMMARY FOR SECID "S1888" AT SRD =   9200.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0178       .50       .00

X-Y COORDINATE PAIRS  (NGP =  57):
       X      Y          X      Y          X      Y          X      Y
      .0 1888.00      95.0 1885.90     140.0 1886.00     168.0 1884.10
    190.0 1886.00     220.0 1886.50     250.0 1886.00     330.0 1885.80
    425.0 1886.00     445.0 1886.30     460.0 1886.10     490.0 1886.00
    549.0 1885.60     590.0 1885.50     630.0 1885.80     710.0 1885.80
    780.0 1886.50     805.0 1886.00     870.0 1885.00     915.0 1884.10
    945.0 1882.50     952.0 1883.50     970.0 1884.00     995.0 1884.20
   1010.0 1884.50    1080.0 1883.90    1355.0 1885.40    1620.0 1884.00
   1720.0 1883.00    1760.0 1882.10    1780.0 1881.30    1820.0 1882.00
   1865.0 1883.00    1900.0 1883.10    1930.0 1883.60    1985.0 1883.40
   2050.0 1883.70    2100.0 1883.80    2140.0 1882.70    2165.0 1882.50
   2175.0 1882.80    2215.0 1883.60    2245.0 1884.00    2380.0 1881.70
   2495.0 1884.50    2635.0 1882.00    2745.0 1884.50    2835.0 1882.00
   2900.0 1882.50    2915.0 1882.40    2940.0 1882.10    2980.0 1879.60
   3020.0 1882.40    3030.0 1882.20    3065.0 1881.00    3090.0 1882.00
   3170.0 1884.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
      .0 1888.00    2980.0 1879.60    3170.0 1884.00        .0 1888.00

SUBAREA BREAKPOINTS (NSA = 12):
       220.    445.    630.    780.    1010.    1620.    1930.    2050.
      2245.   2900.   3020.

ROUGHNESS COEFFICIENTS (NSA = 12):
        .040    .040    .040    .040    .040    .040    .040    .040
        .040    .040    .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 16;  SECID = S1888;  SRD =    9200.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            5       3.      47.    13.    13.                          9.
            7     120.    3967.   145.   145.                        623.
            9      16.     262.    56.    56.                         49.
           10     201.    5374.   331.   331.                        890.
           11     193.    9859.   120.   120.                       1389.
           12     114.    4316.   110.   110.                        654.
  1883.00         647.   23826.   774.   775.  1.25   936.  3130.   3010.
```

Q2.00 = 399 cfs = Q_5

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	5	13.	301.	26.	26.				52.
	7	226.	7790.	254.	254.				1210.
	8	2.	12.	49.	49.				3.
	9	55.	1379.	99.	99.				232.
	10	396.	13566.	449.	449.				2110.
	11	253.	15480.	120.	120.				2085.
	12	174.	7832.	130.	130.				1137.
1883.50		1119.	46360.	1127.	1127.	1.26	926.	3150.	5641.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	5	33.	875.	53.	53.				145.
	6	1.	8.	30.	30.				2.
	7	368.	15384.	310.	310.				2278.
	8	57.	1283.	120.	120.				221.
	9	129.	3648.	195.	195.				595.
	10	650.	26510.	566.	567.				3948.
	11	313.	22071.	120.	120.				2869.
	12	244.	12525.	150.	150.				1760.
1884.00		1794.	82304.	1545.	1545.	1.26	917.	3170.	9779.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	2.	27.	11.	11.				5.
	5	76.	2158.	115.	115.				352.
	6	78.	1246.	275.	275.				234.
	7	523.	27628.	310.	310.				3858.
	8	117.	4270.	120.	120.				653.
	9	227.	9322.	195.	195.				1385.
	10	955.	45735.	655.	655.				6544.
	11	373.	29564.	120.	120.				3732.
	12	319.	19550.	150.	151.				2634.
1884.50		2669.	139500.	1950.	1951.	1.22	162.	3170.	16043.

$\therefore WSEL_5 \approx 84.6 +/-$

1

WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 16; SECID = S1888; SRD = 9200.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	11.	233.	24.	24.				41.
	5	140.	5212.	140.	140.				794.
	6	262.	6678.	461.	461.				1118.
	7	678.	42575.	310.	310.				5693.
	8	177.	8523.	120.	120.				1217.
	9	324.	16929.	195.	195.				2370.
	10	1283.	74760.	655.	655.				10183.
	11	433.	37907.	120.	120.				4667.
	12	394.	27750.	150.	151.				3617.
1885.00		3700.	220566.	2175.	2176.	1.18	155.	3170.	25169.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	26.	756.	37.	37.				122.
	5	218.	9496.	173.	173.				1392.
	6	537.	18359.	610.	610.				2857.
	7	833.	59997.	310.	310.				7752.
	8	237.	13873.	120.	120.				1887.
	9	422.	26245.	195.	195.				3516.
	10	1610.	109215.	655.	655.				14323.
	11	493.	47060.	120.	120.				5670.
	12	469.	37032.	150.	152.				4698.
1885.50		4844.	322033.	2369.	2372.	1.17	147.	3170.	36355.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	50.	1175.	100.	100.				201.
	2	17.	140.	175.	175.				31.

	3	44.	765.	140.	140.				141.
	4	18.	214.	100.	100.				43.
	5	313.	15412.	205.	205.				2189.
	6	842.	38863.	610.	610.				5611.
	7	988.	79729.	310.	310.				10013.
	8	297.	20214.	120.	120.				2648.
	9	519.	37125.	195.	195.				4805.
	10	1938.	148699.	655.	655.				18909.
	11	553.	56988.	120.	120.				6736.
	12	544.	47326.	150.	152.				5871.
1886.00		6122.	446650.	2880.	2882.	1.16	90.	3170.	46979.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 16; SECID = S1888; SRD = 9200.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	113.	3444.	152.	152.				552.
	2	119.	2919.	225.	225.				494.
	3	132.	3939.	185.	185.				635.
	4	80.	1980.	150.	150.				335.
	5	421.	23480.	230.	230.				3235.
	6	1147.	65064.	610.	610.				8922.
	7	1143.	101642.	310.	310.				12458.
	8	357.	27475.	120.	120.				3490.
	9	617.	49463.	195.	195.				6220.
	10	2265.	192909.	655.	655.				23901.
	11	613.	67662.	120.	120.				7862.
	12	619.	58576.	150.	153.				7127.
1886.50		7626.	598553.	3102.	3105.	1.17	68.	3170.	62642.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	195.	7784.	175.	175.				1165.
	2	232.	8820.	225.	225.				1337.
	3	225.	9532.	185.	185.				1406.
	4	155.	5933.	150.	150.				898.
	5	536.	35108.	230.	230.				4646.
	6	1452.	96394.	610.	610.				12709.
	7	1298.	125632.	310.	310.				15076.
	8	417.	35601.	120.	120.				4407.
	9	714.	63176.	195.	195.				7753.
	10	2593.	241603.	655.	655.				29268.
	11	673.	79056.	120.	120.				9044.
	12	694.	70732.	150.	153.				8462.
1887.00		9183.	779371.	3125.	3129.	1.15	45.	3170.	83130.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

*** START PROCESSING CROSS SECTION - " 1900"

```
XT    1900 10000,0.0177
GR        0,1900    20,1899    80,1898   160,1898   170,1899
GR        400,1900   580,1898   720,1899   900,1900   940,1898
GR        950,1897   980,1898  1000,1899  1300,1900  1530,1898
GR        1670,1900  1700,1899  1770,1900  1900,1898  1950,1896
GR        1990,1898  2070,1898.5 2130,1897.5 2170,1898  2300,1899
GR        2370,1897  2380,1898  2400,1900
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*** FINISH PROCESSING CROSS SECTION - " 1900"
*** TEMPLATE CROSS SECTION " 1900" SAVED INTERNALLY.
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1900"
  XS   S1900 10000
  GT
  N          .040  .040    .040    .040    .040    .040 .040     .040
  SA             400    900    1300   1670   1770   1990  2200
  *
  HP 1 S1900 1898,.5,1900

*** FINISH PROCESSING CROSS SECTION - "S1900"
*** CROSS SECTION "S1900" WRITTEN TO DISK, RECORD NO. = 17

--- DATA SUMMARY FOR SECID "S1900" AT SRD =  10000.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0177       .50       .00

X-Y COORDINATE PAIRS  (NGP =  28):
      X      Y          X      Y          X      Y          X      Y
      .0 1900.00      20.0 1899.00      80.0 1898.00     160.0 1898.00
    170.0 1899.00     400.0 1900.00     580.0 1898.00     720.0 1899.00
    900.0 1900.00     940.0 1898.00     950.0 1897.00     980.0 1898.00
   1000.0 1899.00    1300.0 1900.00    1530.0 1898.00    1670.0 1900.00
   1700.0 1899.00    1770.0 1900.00    1900.0 1898.00    1950.0 1896.00
   1990.0 1898.00    2070.0 1898.50    2130.0 1897.50    2170.0 1898.00
   2300.0 1899.00    2370.0 1897.00    2380.0 1898.00    2400.0 1900.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
       .0 1900.00    1950.0 1896.00    2400.0 1900.00         .0 1900.00

SUBAREA BREAKPOINTS (NSA =  8):
        400.    900.   1300.   1670.   1770.   1990.   2200.

ROUGHNESS COEFFICIENTS (NSA =  8):
         .040    .040    .040    .040    .040    .040    .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 17;  SECID = S1900;  SRD =   10000.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            3      20.      469.   40.    40.                          80.
            6      90.     3350.   90.    90.                         511.
            7      18.      259.   70.    70.                          50.
            8      23.      527.   45.    45.                          90.
  1898.00         150.     4605.  245.   245.  1.21   940.  2380.    606.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      49.     1025.  115.   115.                         180.
            2      29.      425.  115.   115.                          82.
            3      45.     1382.   60.    60.                         221.
```

$Q_{2.30} = 133 = Q_2$

$Q_{2.00} = 399 = Q_3$

$WSEL_2 \approx 98.6$

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            4      23.     342.    93.    93.                          66.
            6     143.    5911.   123.   123.                         878.
            7      92.    1960.   210.   210.                         343.
            8      55.    1366.   103.   103.                         231.
  1898.50         436.   12411.   818.   818.  1.36    50.  2385.   1545.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     115.    3587.   150.   150.                         571.
            2     115.    2699.   230.   230.                         461.
            3      80.    2977.    80.    80.                         454.
            4      93.    2171.   185.   185.                         371.
            6     213.    9765.   155.   155.                        1412.
            7     197.    7004.   210.   210.                        1079.
            8     128.    3685.   190.   190.                         599.
  1899.00         940.   31887.  1200.  1200.  1.17    20.  2390.   4369.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     221.    7128.   275.   275.                        1126.
            2     264.    7911.   365.   365.                        1272.
            3     160.    4547.   240.   240.                         741.
            4     208.    6399.   278.   278.                        1023.
            5      13.     185.    50.    50.                          35.
            6     298.   15123.   188.   188.                        2133.
            7     302.   14296.   210.   210.                        2050.
            8     225.    9196.   195.   195.                        1369.
  1899.50        1690.   64784.  1800.  1801.  1.16    10.  2395.   8616.

     WSEL  SA#     AREA       K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     390.   14282.   400.   400.                        2185.
            2     480.   17400.   500.   500.                        2669.
            3     320.   10270.   400.   400.                        1624.
            4     370.   13782.   370.   370.                        2100.
            5      50.    1173.   100.   100.                         201.
            6     400.   22189.   220.   220.                        3061.
            7     407.   23522.   210.   210.                        3210.
            8     323.   16592.   200.   200.                        2334.
  1900.00        2740.  119209.  2400.  2401.  1.17     0.  2400.  15387.
1
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1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1914"
   XT    1914 10770,0.018
   GR        0,1914  50,1912  100,1911  110,1912  220,1914  385,1912
   GR        410,1912  485,1913  570,1912.2  720,1914  825,1912  900,1914
   GR        1065,1914  1090,1912  1100,1912  1180,1913  1230,1912  1265,1910.5
   GR        1285,1912  1430,1914  1535,1912  1800,1914  1840,1913.5  1910,1914
   GR        1975,1912  1995,1911.5  2005,1912  2050,1913  2090,1912  2165,1913
   GR        2245,1912  2250,1912  2290,1914
   *

 *** FINISH PROCESSING CROSS SECTION - " 1914"
 *** TEMPLATE CROSS SECTION " 1914" SAVED INTERNALLY.
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
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$WSEL_3 = 1899$

```
*** START PROCESSING CROSS SECTION - "S1914"
  XS   S1914 10770
  GT
  N          .04   .04   .04   .04   .04   .04   .04   .04   .04  .04
  SA           230   485   725   940   1175  1450  1800  2050  2160
  *
  HP 1 S1914 1911.5,.5,1915.5

*** FINISH PROCESSING CROSS SECTION - "S1914"
*** CROSS SECTION "S1914" WRITTEN TO DISK, RECORD NO. = 18

--- DATA SUMMARY FOR SECID "S1914" AT SRD =  10770.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0180       .50       .00

X-Y COORDINATE PAIRS  (NGP =  33):
       X      Y          X      Y          X      Y          X      Y
      .0 1914.00      50.0 1912.00     100.0 1911.00     110.0 1912.00
    220.0 1914.00     385.0 1912.00     410.0 1912.00     485.0 1913.00
    570.0 1912.20     720.0 1914.00     825.0 1912.00     900.0 1914.00
   1065.0 1914.00    1090.0 1912.00    1100.0 1912.00    1180.0 1913.00
   1230.0 1912.00    1265.0 1910.50    1285.0 1912.00    1430.0 1914.00
   1535.0 1912.00    1800.0 1914.00    1840.0 1913.50    1910.0 1914.00
   1975.0 1912.00    1995.0 1911.50    2005.0 1912.00    2050.0 1913.00
   2090.0 1912.00    2165.0 1913.00    2245.0 1912.00    2250.0 1912.00
   2290.0 1914.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
       .0 1914.00    1265.0 1910.50    2290.0 1914.00         .0 1914.00

SUBAREA BREAKPOINTS (NSA = 10):
        230.    485.    725.    940.   1175.   1450.   1800.   2050.
       2160.

ROUGHNESS COEFFICIENTS (NSA = 10):
         .040    .040    .040    .040    .040    .040    .040    .040
         .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 18;  SECID = S1914;  SRD =   10770.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1       8.     111.    30.    30.                          21.
            6      18.     430.    37.    37.                          74.
  1911.50          26.     541.    67.    67.  1.10    75.  1278.     87.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      30.     704.    60.    60.                         120.
            6      41.    1267.    55.    55.                         203.
            8       8.     111.    30.    30.                          21.
  1912.00          79.    2081.   145.   145.  1.10    50.  2005.    313.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      70.    2055.   100.   100.                         332.
            2      32.     549.   104.   104.                         102.
            3       9.      90.    57.    57.                          19.
            4      11.     166.    45.    45.                          32.
            5      17.     273.    56.    56.                          51.
            6      84.    2521.   116.   116.                         406.
            7      23.     342.    93.    93.                          66.
            8      32.     723.    69.    69.                         125.
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          9     14.    212.   57.   58.                          41.
         10     15.    235.   55.   55.                          44.
  1912.50       307.   7166.  752.  752.  1.25    38.  2260.    998.

    WSEL  SA#    AREA       K  TOPW  WETP  ALPH    LEW    REW     QCR
          1     130.   4607.  140.  140.                        711.
          2     104.   2652.  183.  183.                        444.
          3      61.   1227.  152.  152.                        218.
          4      45.   1056.   90.   90.                        181.
          5      56.   1445.   98.   98.                        241.
          6     158.   5325.  183.  183.                        832.
          7      93.   2171.  185.  185.                        371.
          8      76.   2258.  108.  108.                        364.
          9      57.   1383.  110.  110.                        235.
         10      55.   1297.  110.  110.                        222.
  1913.00       834.  23420. 1357. 1357.  1.10    25.  2270.   3537.

    WSEL  SA#    AREA       K  TOPW  WETP  ALPH    LEW    REW     QCR
          1     210.   8666.  180.  180.                       1287.
          2     205.   7221.  224.  224.                       1116.
          3     147.   4557.  193.  193.                        727.
          4     101.   3113.  135.  135.                        498.
          5     106.   4029.  104.  104.                        611.
          6     258.  10722.  219.  219.                       1590.
          7     208.   6399.  278.  278.                       1023.
          8     134.   5266.  124.  124.                        792.
          9     112.   4243.  110.  110.                        644.
         10     113.   4023.  120.  120.                        619.
  1913.50      1595.  58241. 1686. 1686.  1.04    13.  2280.   8637.
1
 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
   CROSS-SECTION PROPERTIES:  ISEQ = 18;  SECID = S1914;  SRD =   10770.

    WSEL  SA#    AREA       K  TOPW  WETP  ALPH    LEW    REW     QCR
          1     311.  14131.  230.  230.                       2048.
          2     327.  14369.  255.  255.                       2100.
          3     254.   9841.  240.  240.                       1485.
          4     180.   6816.  175.  175.                       1034.
          5     160.   7635.  110.  110.                       1093.
          6     380.  17572.  275.  275.                       2537.
          7     366.  14058.  350.  350.                       2125.
          8     228.   7957.  250.  250.                       1231.
          9     167.   8244.  110.  110.                       1171.
         10     175.   7958.  130.  130.                       1154.
  1914.00      2548. 108580. 2125. 2126.  1.03     0.  2290.  15588.
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 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1924"
  XT    1924 11210,0.018
  GR        0,1924 40,1922 50,1921 60,1922 100,1923 115,1921 150,1923
  GR        250,1924 300,1924 340,1923 360,1924 450,1922 470,1924 770,1924
  GR        830,1922.5 890,1922 950,1922.5 1400,1922 1430,1920.5 1470,1922
  GR        1550,1924 1610,1923 1700,1924 1750,1924 1900,1922 1910,1921.5
  GR        1950,1922 2000,1923 2070,1922 2170,1924 2230,1924.5
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*** FINISH PROCESSING CROSS SECTION - " 1924"
*** TEMPLATE CROSS SECTION " 1924" SAVED INTERNALLY.
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1924"
  XS   S1924 11210
  GT
  N            .04   .04   .04   .04   .04   .04   .04   .04   .04   .04  .04
  SA             100   115   300   360   780   950   1400  1550  1750  2000
  *
  HP 1 S1924 1921.5,.5,1924

*** FINISH PROCESSING CROSS SECTION - "S1924"
*** CROSS SECTION "S1924" WRITTEN TO DISK, RECORD NO. = 19

--- DATA SUMMARY FOR SECID "S1924" AT SRD =  11210.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0180       .50       .00

X-Y COORDINATE PAIRS  (NGP =  31):
       X      Y          X      Y          X      Y          X      Y
       .0 1924.00      40.0 1922.00      50.0 1921.00      60.0 1922.00
    100.0 1923.00     115.0 1921.00     150.0 1923.00     250.0 1924.00
    300.0 1924.00     340.0 1923.00     360.0 1924.00     450.0 1922.00
    470.0 1924.00     770.0 1924.00     830.0 1922.50     890.0 1922.00
    950.0 1922.50    1400.0 1922.00    1430.0 1920.50    1470.0 1922.00
   1550.0 1924.00    1610.0 1923.00    1700.0 1924.00    1750.0 1924.00
   1900.0 1922.00    1910.0 1921.50    1950.0 1922.00    2000.0 1923.00
   2070.0 1922.00    2170.0 1924.00    2230.0 1924.50

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
       .0 1924.00    1430.0 1920.50    2230.0 1924.50    2230.0 1924.50

SUBAREA BREAKPOINTS (NSA = 11):
        100.    115.    300.    360.    780.    950.   1400.   1550.
       1750.   2000.

ROUGHNESS COEFFICIENTS (NSA = 11):
         .040    .040    .040    .040    .040    .040    .040    .040
         .040    .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 19;  SECID = S1924;  SRD =   11210.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1       3.       37.    10.    10.                          7.
            2       1.       14.     4.     4.                          3.
            3       2.       32.     9.     9.                          6.
            8      23.      547.    47.    47.                         94.
  1921.50          29.      630.    69.    69.  1.07    45.  1457.    103.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
```

	1	10.	234.	20.	20.				40.
	2	4.	87.	8.	8.				15.
	3	9.	205.	18.	18.				35.
	8	53.	1613.	70.	70.				258.
	10	13.	185.	50.	50.				35.
1922.00		88.	2325.	165.	165.	1.13	40.	1950.	340.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	28.	687.	50.	50.				116.
	2	8.	258.	11.	11.				41.
	3	20.	605.	26.	26.				97.
	5	7.	102.	28.	28.				20.
	6	30.	443.	120.	120.				85.
	7	113.	1663.	450.	450.				319.
	8	93.	3507.	90.	90.				532.
	10	53.	1200.	113.	113.				207.
	11	15.	222.	60.	60.				43.
1922.50		366.	8686.	948.	948.	1.51	30.	2095.	1047.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	60.	1843.	80.	80.				295.
	2	15.	555.	15.	15.				85.
	3	35.	1302.	35.	35.				199.
	5	28.	645.	55.	55.				110.
	6	95.	2732.	140.	140.				444.
	7	338.	10378.	450.	450.				1659.
	8	143.	6305.	110.	110.				920.
	10	125.	3720.	175.	175.				599.
	11	60.	1408.	120.	120.				241.
1923.00		898.	28889.	1180.	1181.	1.11	20.	2120.	4221.

$Q_{1.00} = Q_{9,10} = 1413$

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 19; SECID = S1924; SRD = 11210.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	103.	4159.	90.	90.				621.
	2	23.	1092.	15.	15.				156.
	3	65.	2024.	85.	85.				323.
	4	8.	111.	30.	30.				21.
	5	62.	1901.	83.	83.				304.
	6	170.	6593.	160.	160.				994.
	7	563.	24314.	450.	450.				3569.
	8	203.	10132.	130.	130.				1434.
	9	19.	277.	75.	75.				53.
	10	222.	8505.	213.	213.				1287.
	11	126.	4288.	145.	145.				668.
1923.50		1561.	63396.	1475.	1476.	1.07	10.	2145.	8829.

$\% K = .139$
$Q_{9,10} \approx 1223$ cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	150.	7314.	100.	100.				1042.
	2	30.	1764.	15.	15.				241.
	3	120.	4131.	135.	135.				642.
	4	30.	704.	60.	60.				120.
	5	111.	3937.	120.	120.				608.
	6	254.	12344.	170.	170.				1759.
	7	788.	42599.	450.	450.				5911.
	8	273.	15107.	150.	150.				2084.
	9	75.	1760.	150.	150.				301.
	10	338.	15355.	250.	250.				2225.
	11	205.	8650.	170.	170.				1277.
1924.00		2373.	113665.	1770.	1771.	1.08	0.	2170.	14988.

$\% K = .15$
$Q_{9,10} \approx 2257$ cfs

$\therefore WSEL_{9,10} = 23.7$ ft

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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1938"
  XT    1938 12130,0.018
  GR        0,1938 160,1936 320,1938 470,1938 480,1936 540,1938 570,1938
  GR        580,1935.5 600,1936 660,1935 680,1936 725,1937 790,1934
  GR        820,1936 860,1938 900,1936 920,1935 960,1936 1000,1937 1100,1938
  GR        1350,1936 1390,1935 1400,1936 1480,1936 1700,1938 1800,1936
  GR        1810,1936 1880,1938 2000,1936 2100,1937 2120,1934 2140,1936
  GR        2200,1936 2220,1935 2250,1936 2400,1938
  *

*** FINISH PROCESSING CROSS SECTION - " 1938"
*** TEMPLATE CROSS SECTION " 1938" SAVED INTERNALLY.
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1938"
  XS   S1938 12130
  GT
  N          .040 .040 .040 .040 .040 .040  .040 .040   .040   .040      .040
  SA            470  570 725   860  1000 1100  1480  1700   1880    2250
  *
  HP 1 S1938 1935,.5,1937.5

*** FINISH PROCESSING CROSS SECTION - "S1938"
*** CROSS SECTION "S1938" WRITTEN TO DISK, RECORD NO. = 20

--- DATA SUMMARY FOR SECID "S1938" AT SRD =  12130.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0180       .50       .00

X-Y COORDINATE PAIRS  (NGP =  36):
       X      Y          X      Y          X      Y          X      Y
      .0 1938.00     160.0 1936.00     320.0 1938.00     470.0 1938.00
    480.0 1936.00     540.0 1938.00     570.0 1938.00     580.0 1935.50
    600.0 1936.00     660.0 1935.00     680.0 1936.00     725.0 1937.00
    790.0 1934.00     820.0 1936.00     860.0 1938.00     900.0 1936.00
    920.0 1935.00     960.0 1936.00    1000.0 1937.00    1100.0 1938.00
   1350.0 1936.00    1390.0 1935.00    1400.0 1936.00    1480.0 1936.00
   1700.0 1938.00    1800.0 1936.00    1810.0 1936.00    1880.0 1938.00
   2000.0 1936.00    2100.0 1937.00    2120.0 1934.00    2140.0 1936.00
   2200.0 1936.00    2220.0 1935.00    2250.0 1936.00    2400.0 1938.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      .0 1938.00     790.0 1934.00    2400.0 1938.00        .0 1938.00

SUBAREA BREAKPOINTS (NSA = 11):
       470.    570.    725.    860.   1000.   1100.   1480.   1700.
      1880.   2250.

ROUGHNESS COEFFICIENTS (NSA = 11):
        .040    .040    .040    .040    .040    .040    .040    .040
        .040    .040    .040
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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 20; SECID = S1938; SRD = 12130.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	4	18.	430.	37.	37.				74.
	10	8.	195.	17.	17.				33.
1935.00		27.	624.	53.	54.	1.00	768.	2130.	107.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	3	10.	148.	40.	40.				28.
	4	41.	1267.	55.	55.				203.
	5	8.	111.	30.	30.				21.
	7	6.	92.	25.	25.				18.
	10	25.	585.	50.	50.				100.
1935.50		90.	2203.	200.	200.	1.21	630.	2235.	312.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	3	46.	989.	102.	102.				172.
	4	73.	2729.	73.	73.				416.
	5	30.	704.	60.	60.				120.
	7	25.	586.	50.	50.				100.
	10	58.	1709.	83.	84.				277.
1936.00		232.	6717.	369.	369.	1.14	578.	2250.	978.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	20.	296.	80.	80.				57.
	2	4.	65.	18.	18.				12.
	3	103.	3322.	127.	127.				525.
	4	115.	4904.	94.	94.				723.
	5	68.	2075.	90.	90.				332.
	7	106.	2636.	193.	193.				444.
	8	14.	203.	55.	55.				39.
	9	16.	259.	53.	53.				48.
	10	151.	4278.	227.	227.				698.
	11	9.	139.	38.	38.				27.
1936.50		605.	18177.	972.	973.	1.20	120.	2288.	2475.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	80.	1877.	160.	160.				321.
	2	18.	410.	35.	35.				70.
	3	172.	6981.	151.	151.				1042.
	4	168.	8010.	115.	115.				1147.
	5	120.	4468.	120.	120.				681.
	7	218.	7285.	255.	255.				1140.
	8	55.	1291.	110.	110.				221.
	9	53.	1317.	95.	95.				221.
	10	285.	10029.	310.	310.				1551.
	11	38.	880.	75.	75.				150.
1937.00		1205.	42548.	1426.	1427.	1.13	80.	2325.	5915.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 20; SECID = S1938; SRD = 12130.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	180.	5535.	240.	240.				885.
	2	39.	1208.	53.	53.				193.

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            3     248.   12731.   153.   153.                          1792.
            4     228.   12621.   125.   125.                          1742.
            5     183.    8519.   130.   130.                          1227.
            6      13.     185.    50.    50.                            35.
            7     361.   14622.   318.   318.                          2181.
            8     124.    3805.   165.   165.                           608.
            9     111.    3564.   138.   138.                           563.
           10     448.   20005.   340.   340.                          2913.
           11      84.    2594.   113.   113.                           415.
  1937.50         2017.   85388.  1823.  1824.  1.12    40.  2363.  11384.
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 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1946"
   XT    1946 12600,.018
   GR        0,1946    20,1945   290,1945   305,1944   330,1944
   GR        340,1946   370,1946   400,1944   520,1944   700,1945
   GR        770,1944   800,1944   900,1946  1030,1946  1100,1944
   GR        1200,1946  1330,1944  1360,1944  1400,1946  1450,1944
   GR        1500,1944  1540,1946  1670,1945  1800,1946  1850,1943
   GR        1870,1944  2050,1946  2120,1944  2160,1943  2200,1942
   GR        2250,1942  2260,1943  2330,1944  2420,1943  2450,1944
   GR        2510,1946
   *

 *** FINISH PROCESSING CROSS SECTION - " 1946"
 *** TEMPLATE CROSS SECTION " 1946" SAVED INTERNALLY.
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - "S1946"
   XS   S1946 12600
   GT
   N         .04   .04   .04   .04   .04   .04   .04   .04   .04   .04
   SA          370   700   1030  1200  1400  1540  1800  2050  2330
   *
   HP 1 S1946 1942.5,.5,1946

 *** FINISH PROCESSING CROSS SECTION - "S1946"
 *** CROSS SECTION "S1946" WRITTEN TO DISK, RECORD NO. = 21

 --- DATA SUMMARY FOR SECID "S1946" AT SRD =  12600.  ERR-CODE =      0

      SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0180       .50       .00

 X-Y COORDINATE PAIRS  (NGP =  36):
       X      Y          X      Y          X      Y          X      Y
       .0 1946.00      20.0 1945.00     290.0 1945.00     305.0 1944.00
    330.0 1944.00     340.0 1946.00     370.0 1946.00     400.0 1944.00
    520.0 1944.00     700.0 1945.00     770.0 1944.00     800.0 1944.00
    900.0 1946.00    1030.0 1946.00    1100.0 1944.00    1200.0 1946.00
   1330.0 1944.00    1360.0 1944.00    1400.0 1946.00    1450.0 1944.00
   1500.0 1944.00    1540.0 1946.00    1670.0 1945.00    1800.0 1946.00
   1850.0 1943.00    1870.0 1944.00    2050.0 1946.00    2120.0 1944.00
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  2160.0 1943.00    2200.0 1942.00    2250.0 1942.00    2260.0 1943.00
  2330.0 1944.00    2420.0 1943.00    2450.0 1944.00    2510.0 1946.00

 X-Y MAX-MIN POINTS:
    XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
      .0 1946.00    2200.0 1942.00    2510.0 1946.00          .0 1946.00

SUBAREA BREAKPOINTS (NSA = 10):
       370.    700.   1030.   1200.   1400.   1540.   1800.   2050.
      2330.

ROUGHNESS COEFFICIENTS (NSA = 10):
        .040    .040    .040    .040    .040    .040    .040    .040
        .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 21;  SECID = S1946;  SRD =   12600.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            9      31.      649.    75.    75.                          114.
  1942.50          31.      649.    75.    75.  1.00  2180.  2255.    114.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            9      75.     2305.   100.   100.                          369.
  1943.00          75.     2305.   100.   100.  1.00  2160.  2260.    369.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            8       5.       68.    18.    18.                           13.
            9     139.     4799.   155.   155.                          745.
           10      15.      222.    60.    60.                           43.
  1943.50         158.     5088.   233.   233.  1.10  1842.  2435.    704.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            8      18.      430.    37.    37.                           74.
            9     230.     9101.   210.   210.                         1366.
           10      60.     1408.   120.   120.                          241.
  1944.00         308.    10938.   367.   367.  1.11  1833.  2450.   1524.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      15.      317.    35.    35.                           56.
            2      84.     1672.   218.   218.                          298.
            3      30.      537.    90.    90.                           98.
            4      11.      157.    43.    43.                           30.
            5      26.      477.    73.    73.                           86.
            6      31.      642.    73.    73.                          113.
            8      50.     1258.    90.    90.                          211.
            9     339.    16500.   228.   228.                         2352.
           10     124.     4349.   135.   135.                          672.
  1944.50         709.    25910.   983.   983.  1.35   298.  2465.   2945.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      35.     1100.    45.    45.                          175.
            2     218.     6329.   315.   315.                         1026.
            3      90.     2385.   150.   150.                          396.
            4      43.      997.    85.    85.                          171.
            5      73.     1985.   115.   115.                          327.
            6      73.     2255.    95.    95.                          359.
            8     108.     3347.   143.   143.                          534.
            9     458.    25836.   245.   245.                         3548.
           10     195.     8651.   150.   150.                         1262.
  1945.00        1291.    52884.  1343.  1344.  1.29   290.  2480.   6310.
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
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P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 21; SECID = S1946; SRD = 12600.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	196.	5166.	328.	328.				858.
	2	377.	15574.	323.	323.				2312.
	3	171.	6287.	175.	175.				961.
	4	96.	2940.	128.	128.				470.
	5	141.	4856.	158.	158.				754.
	6	126.	4891.	118.	118.				737.
	7	33.	480.	130.	130.				92.
	8	193.	7117.	197.	197.				1088.
	9	584.	37103.	263.	263.				4948.
	10	274.	14288.	165.	165.				2001.
1945.50		2190.	98703.	1982.	1982.	1.26	10.	2495.	11631.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	363.	14085.	340.	340.				2124.
	2	540.	27928.	330.	330.				3920.
	3	265.	11907.	200.	200.				1731.
	4	170.	6331.	170.	170.				965.
	5	230.	9402.	200.	200.				1400.
	6	190.	8672.	140.	140.				1256.
	7	130.	3051.	260.	260.				522.
	8	305.	12967.	250.	250.				1912.
	9	720.	50326.	280.	280.				6552.
	10	360.	21283.	180.	180.				2889.
1946.00		3273.	165953.	2350.	2351.	1.19	0.	2510.	20086.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

```
*** START PROCESSING CROSS SECTION - " 1954"
  XS    1954 13000
  GR        0,1954 80,1952 100,1950.5 130,1951 160,1952 170,1953 310,1953
  GR        320,1954 340,1954 360,1952 380,1952 460,1953 540,1954 700,1952
  GR        770,1953 775,1952 780,1953 870,1953 880,1952 895,1952 930,1954
  GR        1080,1954 1200,1953 1230,1953.5 1400,1953 1550,1953 1580,1952
  GR        1620,1952 1660,1954 1740,1952 1770,1950 1800,1952 1950,1953
  GR        2100,1954 2160,1950 2200,1952 2220,1950 2250,1952 2320,1954
  *
  N          .040  .040  .040  .040  .040  .040  .040  .040  .040
  SA             160  340   540   870   1370   1660  1800  2100
  *
  HP 1 S1954 1951.0,.5,1953.5

*** FINISH PROCESSING CROSS SECTION - " 1954"
*** CROSS SECTION " 1954" WRITTEN TO DISK, RECORD NO. = 22

--- DATA SUMMARY FOR SECID " 1954" AT SRD =  13000.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0180       .50       .00

X-Y COORDINATE PAIRS  (NGP =  39):
      X      Y          X      Y          X      Y          X      Y
      .0 1954.00      80.0 1952.00     100.0 1950.50     130.0 1951.00
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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-05-94  08:28

*** START PROCESSING CROSS SECTION - " 1954"
  XS     1954 13000
  GR        0,1954 80,1952 100,1950.5 130,1951 160,1952 170,1953 310,1953
  GR        320,1954 340,1954 360,1952 380,1952 460,1953 540,1954 700,1952
  GR        770,1953 775,1952 780,1953 870,1953 880,1952 895,1952 930,1954
  GR        1080,1954 1200,1953 1230,1953.5 1400,1953 1550,1953 1580,1952
  GR        1620,1952 1660,1954 1740,1952 1770,1950 1800,1952 1950,1953
  GR        2100,1954 2160,1950 2200,1952 2220,1950 2250,1952 2320,1954
  *
  N          .040  .040  .040  .040  .040  .040  .040  .040  .040
  SA             160  340   540   870   1370   1660  1800  2100
  *
  HP 1  1954 1951.0,.5,1953.5

*** FINISH PROCESSING CROSS SECTION - " 1954"
*** CROSS SECTION " 1954" WRITTEN TO DISK, RECORD NO. = 22

--- DATA SUMMARY FOR SECID " 1954" AT SRD =  13000.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0180       .50       .00

X-Y COORDINATE PAIRS  (NGP =  39):
       X      Y          X      Y          X      Y          X      Y
       .0 1954.00      80.0 1952.00     100.0 1950.50     130.0 1951.00
    160.0 1952.00     170.0 1953.00     310.0 1953.00     320.0 1954.00
    340.0 1954.00     360.0 1952.00     380.0 1952.00     460.0 1953.00
    540.0 1954.00     700.0 1952.00     770.0 1953.00     775.0 1952.00
    780.0 1953.00     870.0 1953.00     880.0 1952.00     895.0 1952.00
    930.0 1954.00    1080.0 1954.00    1200.0 1953.00    1230.0 1953.50
   1400.0 1953.00    1550.0 1953.00    1580.0 1952.00    1620.0 1952.00
   1660.0 1954.00    1740.0 1952.00    1770.0 1950.00    1800.0 1952.00
   1950.0 1953.00    2100.0 1954.00    2160.0 1950.00    2200.0 1952.00
   2220.0 1950.00    2250.0 1952.00    2320.0 1954.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
       .0 1954.00    1770.0 1950.00    2320.0 1954.00         .0 1954.00

SUBAREA BREAKPOINTS (NSA =  9):
        160.    340.    540.    870.   1370.   1660.   1800.   2100.

ROUGHNESS COEFFICIENTS (NSA =  9):
         .040    .040    .040    .040    .040    .040    .040    .040
         .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-05-94  08:28
    CROSS-SECTION PROPERTIES:  ISEQ = 22;  SECID =  1954;  SRD =   13000.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1       9.     135.    37.    37.                          26.
             7      15.     351.    30.    30.                          60.
             9      30.     703.    60.    60.                         120.
```

1951.00		54.	1190.	127.	127.	1.06	93.	2235.	195.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	33.	837.	58.	58.				140.
	7	34.	1036.	45.	45.				166.
	9	68.	2072.	90.	90.				332.
1951.50		134.	3945.	193.	194.	1.02	87.	2243.	629.

Q 2.00 = Q = 1146 cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	68.	2244.	80.	80.				352.
	7	60.	2232.	60.	60.				340.
	9	120.	4463.	120.	120.				681.
1952.00		248.	8938.	260.	260.	1.01	80.	2250.	1365.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	113.	4530.	100.	100.				677.
	2	1.	18.	5.	5.				4.
	3	21.	376.	65.	65.				69.
	4	20.	295.	80.	80.				57.
	5	11.	214.	29.	29.				38.
	6	26.	534.	65.	65.				95.
	7	95.	3964.	80.	80.				587.
	8	19.	277.	75.	75.				53.
	9	186.	8186.	145.	145.				1198.
1952.50		492.	18395.	644.	644.	1.19	60.	2268.	2237.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	168.	7789.	120.	120.				1123.
	2	5.	117.	10.	10.				20.
	3	65.	1704.	110.	110.				284.
	4	80.	1876.	160.	160.				321.
	5	29.	824.	43.	43.				134.
	6	65.	1948.	90.	90.				313.
	7	140.	6520.	100.	100.				940.
	8	75.	1760.	150.	150.				301.
	9	265.	13254.	170.	170.				1877.
1953.00		891.	35792.	953.	954.	1.21	40.	2285.	4449.

∴ WSEL ≈ 53.1 +/-

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-05-94 08:28
CROSS-SECTION PROPERTIES: ISEQ = 22; SECID = 1954; SRD = 13000.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	233.	12140.	140.	140.				1700.
	2	81.	1967.	155.	155.				334.
	3	131.	4374.	155.	155.				685.
	4	215.	6557.	290.	290.				1050.
	5	104.	1980.	281.	281.				356.
	6	201.	6011.	280.	280.				968.
	7	195.	10031.	120.	120.				1411.
	8	169.	5189.	225.	225.				829.
	9	356.	19808.	195.	195.				2732.
1953.50		1685.	68057.	1841.	1842.	1.30	20.	2303.	8031.

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    160.0 1952.00     170.0 1953.00     310.0 1953.00     320.0 1954.00
    340.0 1954.00     360.0 1952.00     380.0 1952.00     460.0 1953.00
    540.0 1954.00     700.0 1952.00     770.0 1953.00     775.0 1952.00
    780.0 1953.00     870.0 1953.00     880.0 1952.00     895.0 1952.00
    930.0 1954.00    1080.0 1954.00    1200.0 1953.00    1230.0 1953.50
   1400.0 1953.00    1550.0 1953.00    1580.0 1952.00    1620.0 1952.00
   1660.0 1954.00    1740.0 1952.00    1770.0 1950.00    1800.0 1952.00
   1950.0 1953.00    2100.0 1954.00    2160.0 1950.00    2200.0 1952.00
   2220.0 1950.00    2250.0 1952.00    2320.0 1954.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
       .0 1954.00    1770.0 1950.00    2320.0 1954.00         .0 1954.00

SUBAREA BREAKPOINTS (NSA =  9):
        160.    340.    540.    870.   1370.   1660.   1800.   2100.

ROUGHNESS COEFFICIENTS (NSA =  9):
         .040    .040    .040    .040    .040    .040    .040    .040
         .040
+++018 UNKNOWN SECID; DATA IGNORED -    S1954
  *
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1956"
  XS    1956 13170
  GR        0,1956 75,1954 90,1953 95,1954 110,1956
  GR        170,1957 250,1956 290,1956 320,1957 380,1956
  GR        410,1956 545,1957 610,1956 620,1955.8 625,1956
  GR        650,1957 750,1957.3 820,1956 860,1957.3 880,1956
  GR        900,1955.5 910,1956 920,1956.7 950,1956.5 990,1957.5
  GR        1020,1956 1040,1956 1110,1957.5 1130,1957 1195,1956
  GR        1210,1956 1230,1958 1300,1957 1335,1957 1370,1957.3
  GR        1470,1956 1510,1957 1560,1956 1570,1954.5 1585,1956
  GR        1600,1956.1 1610,1956 1770,1954 1800,1956 1870,1956.6
  GR        2010,1957.3 2095,1956 2120 1954.5 2150 1956
  *
  N            0.04    0.04    0.04    0.04    0.04    0.04
  SA               350     1100    1370    1600    1870
  *
  HP 1  1956 1955,0.5,1957

*** FINISH PROCESSING CROSS SECTION - " 1956"
*** CROSS SECTION " 1956" WRITTEN TO DISK, RECORD NO. = 23

--- DATA SUMMARY FOR SECID " 1956" AT SRD =  13170.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0180       .50       .00

X-Y COORDINATE PAIRS  (NGP =  49):
       X       Y          X       Y          X       Y          X       Y
       .0 1956.00      75.0 1954.00      90.0 1953.00      95.0 1954.00
    110.0 1956.00     170.0 1957.00     250.0 1956.00     290.0 1956.00
    320.0 1957.00     380.0 1956.00     410.0 1956.00     545.0 1957.00
    610.0 1956.00     620.0 1955.80     625.0 1956.00     650.0 1957.00
    750.0 1957.30     820.0 1956.00     860.0 1957.30     880.0 1956.00
    900.0 1955.50     910.0 1956.00     920.0 1956.70     950.0 1956.50
    990.0 1957.50    1020.0 1956.00    1040.0 1956.00    1110.0 1957.50
   1130.0 1957.00    1195.0 1956.00    1210.0 1956.00    1230.0 1958.00
   1300.0 1957.00    1335.0 1957.00    1370.0 1957.30    1470.0 1956.00
   1510.0 1957.00    1560.0 1956.00    1570.0 1954.50    1585.0 1956.00
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   1600.0 1956.10    1610.0 1956.00    1770.0 1954.00    1800.0 1956.00
   1870.0 1956.60    2010.0 1957.30    2095.0 1956.00    2120.0 1954.50
   2150.0 1956.00

 X-Y MAX-MIN POINTS:
     XMIN       Y         X    YMIN      XMAX       Y         X    YMAX
       .0 1956.00      90.0 1953.00    2150.0 1956.00    1230.0 1958.00

 SUBAREA BREAKPOINTS (NSA =  6):
        350.   1100.   1370.   1600.   1870.

 ROUGHNESS COEFFICIENTS (NSA =  6):
         .040    .040    .040    .040    .040    .040
1
 WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 23;  SECID = 1956;  SRD =   13170.
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Q2.00 = 720 cfs = Q_1

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	53.	1692.	65.	65.				268.
	4	2.	31.	8.	8.				6.
	5	48.	1114.	95.	95.				191.
	6	5.	68.	18.	18.				13.
1955.00		107.	2905.	187.	187.	1.11	38.	2130.	434.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	91.	3449.	88.	88.				523.
	4	8.	195.	17.	17.				33.
	5	107.	3285.	143.	143.				525.
	6	18.	430.	37.	37.				74.
1955.50		224.	7359.	283.	284.	1.06	19.	2140.	1097.

∴ WSEL$_1$ ≅ 55.8+/-

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	140.	6114.	110.	110.				896.
	2	9.	115.	45.	45.				23.
	4	19.	574.	25.	25.				92.
	5	190.	7076.	190.	190.				1078.
	6	41.	1267.	55.	55.				203.
1956.00		399.	15145.	425.	426.	1.06	0.	2150.	2126.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	236.	8811.	235.	236.				1344.
	2	115.	2122.	328.	328.				385.
	3	17.	295.	53.	53.				54.
	4	59.	1337.	123.	124.				231.
	5	304.	12625.	258.	258.				1872.
	6	77.	2614.	88.	88.				409.
1956.50		808.	27804.	1085.	1087.	1.17	0.	2150.	3656.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	383.	15079.	350.	351.				2269.
	2	346.	9159.	577.	577.				1520.
	3	53.	1365.	90.	90.				228.
	4	141.	4086.	207.	207.				664.
	5	439.	22564.	270.	270.				3171.
	6	145.	4335.	200.	201.				700.
1957.00		1506.	56588.	1694.	1697.	1.22	0.	2150.	7282.

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 WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
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        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 1962"
  XT    1962 13440,0.020
  GR        0,1962 120,1960 140,1958.5 200,1958 230,1960 250,1959 260,1960
  GR        400,1962 500,1961.5 550,1960 600,1960 610,1961 740,1961
  GR        760,1962 860,1960 900,1962 940,1958 950,1960 970,1961 1270,1962
  GR        1280,1959.5 1285,1960 1350,1962 1560,1962 1670,1960 1680,1959.5
  GR        1690,1960 1740,1960 1800,1962 1830,1962 1860,1960 1900,1962
  GR        2100,1962 2130,1959 2140,1960 2200,1961 2250,1962 2400,1962
  GR        2450,1960 2460,1959.5 2490,1960 2600,1961 2680,1962
  *

*** FINISH PROCESSING CROSS SECTION - " 1962"
*** TEMPLATE CROSS SECTION " 1962" SAVED INTERNALLY.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S1962"
  XS   S1962 13440
  GT
  N          .040 .040 .040 .040 .040 .040 .040 .040 .040 .040 .040 .040
  SA            230  400  760  900  970 1270  1560 1830 2100 2250 2490
  *
  HP 1 S1962 1959.5,.5,1962

*** FINISH PROCESSING CROSS SECTION - "S1962"
*** CROSS SECTION "S1962" WRITTEN TO DISK, RECORD NO. = 24

--- DATA SUMMARY FOR SECID "S1962" AT SRD =  13440.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0200       .50       .00

X-Y COORDINATE PAIRS  (NGP =  43):
       X      Y          X      Y          X      Y          X      Y
      .0 1962.00     120.0 1960.00     140.0 1958.50     200.0 1958.00
    230.0 1960.00     250.0 1959.00     260.0 1960.00     400.0 1962.00
    500.0 1961.50     550.0 1960.00     600.0 1960.00     610.0 1961.00
    740.0 1961.00     760.0 1962.00     860.0 1960.00     900.0 1962.00
    940.0 1958.00     950.0 1960.00     970.0 1961.00    1270.0 1962.00
   1280.0 1959.50    1285.0 1960.00    1350.0 1962.00    1560.0 1962.00
   1670.0 1960.00    1680.0 1959.50    1690.0 1960.00    1740.0 1960.00
   1800.0 1962.00    1830.0 1962.00    1860.0 1960.00    1900.0 1962.00
   2100.0 1962.00    2130.0 1959.00    2140.0 1960.00    2200.0 1961.00
   2250.0 1962.00    2400.0 1962.00    2450.0 1960.00    2460.0 1959.50
   2490.0 1960.00    2600.0 1961.00    2680.0 1962.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
       .0 1962.00     200.0 1958.00    2680.0 1962.00         .0 1962.00

SUBAREA BREAKPOINTS (NSA = 12):
        230.    400.    760.    900.    970.   1270.   1560.   1830.
       2100.   2250.   2490.

ROUGHNESS COEFFICIENTS (NSA = 12):
         .040    .040    .040    .040    .040    .040    .040    .040
         .040    .040    .040    .040
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
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P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 24; SECID = S1962; SRD = 13440.

$Q_{1.10} = Q_8 = 993$
$Q_{1.11} = Q_7 = 111$ cfs
$Q_{2.00} = 720 = Q_1$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	99.	3737.	96.	96.				567.
	2	4.	55.	15.	15.				11.
	5	17.	515.	23.	23.				83.
	10	3.	37.	10.	10.				7.
1959.50		122.	4345.	143.	144.	1.06	127.	2135.	618.

$WSEL_1 \cong 59.8 +/-$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	150.	6866.	110.	110.				994.
	2	15.	351.	30.	30.				60.
	5	30.	1110.	30.	30.				170.
	7	2.	26.	7.	7.				5.
	8	5.	74.	20.	20.				14.
	10	10.	234.	20.	20.				40.
	11	10.	148.	40.	40.				28.
1960.00		222.	8809.	257.	258.	1.17	120.	2490.	1080.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	213.	10448.	140.	140.				1486.
	2	39.	1022.	65.	65.				170.
	3	30.	640.	72.	72.				112.
	4	9.	129.	35.	35.				25.
	5	49.	1906.	45.	45.				288.
	7	10.	194.	25.	25.				35.
	8	51.	1107.	113.	113.				193.
	9	4.	65.	18.	18.				12.
	10	29.	694.	55.	55.				118.
	11	33.	907.	53.	53.				149.
	12	14.	203.	55.	55.				39.
1960.50		480.	17315.	674.	675.	1.37	90.	2545.	1960.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	290.	15415.	170.	170.				2149.
	2	80.	2567.	100.	100.				406.
	3	72.	2237.	93.	93.				356.
	4	35.	821.	70.	70.				140.
	5	75.	3229.	60.	60.				476.
	7	27.	729.	44.	44.				121.
	8	118.	3638.	155.	155.				581.
	9	18.	410.	35.	35.				70.
	10	65.	1947.	90.	90.				313.
	11	63.	2267.	65.	65.				348.
	12	55.	1291.	110.	110.				221.
1961.00		896.	34550.	992.	993.	1.26	60.	2600.	4313.

$\therefore WSEL_7 \cong 61.0 +/-$

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 24; SECID = S1962; SRD = 13440.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	383.	21943.	200.	200.				3002.
	2	139.	5261.	135.	135.				798.
	3	190.	5893.	250.	250.				940.
	4	79.	2421.	105.	105.				387.
	5	106.	5470.	65.	65.				771.
	6	38.	554.	150.	150.				106.

```
            7     53.    1795.    62.    62.                          281.
            8    206.    7866.   198.   198.                         1191.
            9     39.    1209.    53.    53.                          193.
           10    118.    4311.   120.   120.                          660.
           11     98.    4276.    78.    78.                          627.
           12    120.    3852.   150.   150.                          609.
  1961.50        1568.   64852.  1564.  1566.  1.22    30.  2640.    8077.
```

: $WSEL_8 \simeq 61.4 +/-$

: $WSEL_{10} = 61.5$

$Q_{100} = Q_{10} = 656$

```
     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     490.    30208.   230.   230.                        4058.
            2     215.     9363.   170.   170.                        1372.
            3     343.    12339.   360.   360.                        1896.
            4     140.     5213.   140.   140.                         794.
            5     140.     8245.    70.    70.                        1123.
            6     150.     3520.   300.   300.                         602.
            7      89.     3532.    80.    80.                         530.
            8     315.    14063.   240.   240.                        2048.
            9      70.     2605.    70.    70.                         397.
           10     185.     7918.   150.   150.                        1166.
           11     140.     6998.    90.    90.                         991.
           12     205.     8033.   190.   190.                        1208.
  1962.00        2481.   112037.  2090.  2092.  1.17     0.  2680.   14166.
1
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1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1970"
   XT    1970 13800,0.020
   GR        0,1970 0,1968 40,1966 50,1965 80,1966 100,1968 140,1970
   GR        160,1970 190,1967 200,1968 240,1968 400,1969 425,1968 430,1967.5
   GR        440,1968 490,1968 520,1969 600,1970 720,1968 760,1968
   GR        780,1966.5 820,1968 880,1968 900,1969 1100,1969 1120,1968
   GR        1150,1970 1200,1970 1240,1968 1330,1968 1350,1967 1420,1967
   GR        1430,1968 1450,1970 1500,1970 1520,1966 1570,1966 1660,1968
   GR        1690,1968 1750,1968 1800,1969 1850,1969
   GR        1860,1965 1870,1965 1880,1969 1930,1967 2000,1970 2210,1969.5
   GR        2255,1968 2280,1967 2305,1970
   *

 *** FINISH PROCESSING CROSS SECTION - " 1970"
 *** TEMPLATE CROSS SECTION " 1970" SAVED INTERNALLY.
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - "S1970"
   XS   S1970 13800
   GT
   N         .040 .040 .040 .040 .040 .040 .040 .040 .040 .040 .040 .040 .040
   SA           160 400 520 600 820 1100 1200 1500   1690   1850  1880 2210
   *
   HP 1 S1970 1965.5,.5,1970

 *** FINISH PROCESSING CROSS SECTION - "S1970"
 *** CROSS SECTION "S1970" WRITTEN TO DISK, RECORD NO. = 25

 --- DATA SUMMARY FOR SECID "S1970" AT SRD =  13800.  ERR-CODE =      0
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SKEW	IHFNO	VSLOPE	EK	CK
.0	0.	.0200	.50	.00

X-Y COORDINATE PAIRS (NGP = 51):

X	Y	X	Y	X	Y	X	Y
.0	1970.00	.0	1968.00	40.0	1966.00	50.0	1965.00
80.0	1966.00	100.0	1968.00	140.0	1970.00	160.0	1970.00
190.0	1967.00	200.0	1968.00	240.0	1968.00	400.0	1969.00
425.0	1968.00	430.0	1967.50	440.0	1968.00	490.0	1968.00
520.0	1969.00	600.0	1970.00	720.0	1968.00	760.0	1968.00
780.0	1966.50	820.0	1968.00	880.0	1968.00	900.0	1969.00
1100.0	1969.00	1120.0	1968.00	1150.0	1970.00	1200.0	1970.00
1240.0	1968.00	1330.0	1968.00	1350.0	1967.00	1420.0	1967.00
1430.0	1968.00	1450.0	1970.00	1500.0	1970.00	1520.0	1966.00
1570.0	1966.00	1660.0	1968.00	1690.0	1968.00	1750.0	1968.00
1800.0	1969.00	1850.0	1969.00	1860.0	1965.00	1870.0	1965.00
1880.0	1969.00	1930.0	1967.00	2000.0	1970.00	2210.0	1969.50
2255.0	1968.00	2280.0	1967.00	2305.0	1970.00		

X-Y MAX-MIN POINTS:

XMIN	Y	X	YMIN	XMAX	Y	X	YMAX
.0	1970.00	50.0	1965.00	2305.0	1970.00	.0	1970.00

SUBAREA BREAKPOINTS (NSA = 13):

160. 400. 520. 600. 820. 1100. 1200. 1500.
1690. 1850. 1880. 2210.

ROUGHNESS COEFFICIENTS (NSA = 13):

.040 .040 .040 .040 .040 .040 .040 .040
.040 .040 .040 .040 .040

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 25; SECID = S1970; SRD = 13800.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	5.	74.	20.	20.				14.
	11	6.	122.	13.	13.				21.
1965.50		11.	196.	33.	33.	1.10	45.	1871.	33.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	20.	469.	40.	40.				80.
	11	13.	405.	15.	15.				65.
1966.00		33.	874.	55.	55.	1.08	40.	1873.	136.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	44.	1397.	55.	55.				221.
	9	31.	649.	75.	75.				114.
	11	21.	839.	18.	18.				127.
1966.50		96.	2885.	148.	148.	1.18	30.	1874.	403.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	75.	2921.	70.	70.				441.
	5	5.	74.	20.	20.				14.
	9	75.	2304.	100.	100.				369.
	11	30.	1428.	20.	21.				208.
1967.00		185.	6728.	210.	211.	1.11	20.	1875.	936.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	114.	5138.	85.	85.				747.
	2	3.	37.	10.	10.				7.
	5	20.	469.	40.	40.				80.
	8	39.	855.	85.	85.				148.

$\therefore WSEL_1 = 67.5$

	9	131.	5046.	125.	125.				763.
	11	41.	2182.	23.	23.				310.
	12	6.	89.	24.	24.				17.
	13	4.	61.	17.	17.				12.
1967.50		357.	13878.	408.	410.	1.19	10.	2284.	1737.

$\therefore WSEL_{8-10} \approx 67.7'$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	160.	8141.	100.	100.				1148.
	2	10.	234.	20.	20.				40.
	3	4.	55.	15.	15.				11.
	5	45.	1382.	60.	60.				221.
	8	85.	2840.	100.	100.				445.
	9	200.	9016.	150.	150.				1310.
	11	53.	3112.	25.	26.				432.
	12	24.	567.	48.	48.				97.
	13	17.	390.	33.	33.				67.
1968.00		597.	25738.	552.	554.	1.16	0.	2288.	3273.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 25; SECID = S1970; SRD = 13800.

$Q_{1.11} = 111 = Q_7$

$Q_{1.10} = 993 = Q_{8-10}$

$Q_{1.00} = 656 = Q_{13}$

$Q_{2.00} = 720 = Q_1$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	213.	12224.	110.	111.				1676.
	2	61.	1284.	145.	145.				226.
	3	43.	965.	93.	93.				167.
	5	103.	3257.	130.	130.				516.
	6	33.	726.	70.	70.				126.
	7	4.	65.	18.	18.				12.
	8	184.	6361.	205.	205.				987.
	9	291.	14748.	183.	183.				2081.
	10	36.	765.	85.	85.				134.
	11	66.	4228.	28.	29.				575.
	12	54.	1671.	73.	73.				267.
	13	38.	1146.	53.	53.				184.
1968.50		1125.	47440.	1190.	1193.	1.32	0.	2293.	5404.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	270.	17151.	120.	121.				2298.
	2	155.	4436.	230.	230.				722.
	3	96.	3094.	120.	120.				489.
	5	175.	6917.	160.	160.				1039.
	6	70.	2385.	80.	80.				372.
	7	18.	410.	35.	35.				70.
	8	290.	12981.	220.	220.				1889.
	9	383.	23098.	185.	185.				3121.
	10	85.	2666.	110.	110.				424.
	11	80.	5542.	30.	32.				741.
	12	97.	3599.	97.	97.				549.
	13	69.	2513.	72.	72.				386.
1969.00		1787.	84792.	1458.	1462.	1.24	0.	2297.	10062.

$\therefore WSEL_7 \approx 69.2'$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	333.	22958.	130.	132.				3017.
	2	271.	11113.	235.	235.				1654.
	3	156.	6937.	120.	120.				1012.
	4	10.	148.	40.	40.				28.
	5	263.	12125.	190.	190.				1751.
	6	210.	6457.	280.	280.				1032.
	7	37.	1248.	43.	43.				195.
	8	404.	21563.	235.	235.				3003.
	9	476.	32910.	188.	188.				4299.
	10	165.	6273.	160.	160.				951.
	11	95.	7380.	30.	32.				959.

```
          12     148.    6777.   108.   108.                          981.
          13     110.    4634.    91.    91.                          685.
  1969.50        2676.  140524.  1849.  1854.  1.21     0.  2301.  16581.
1
 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 25;  SECID = S1970;  SRD =   13800.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     400.   29682.   140.   142.                        3837.
            2     390.   20069.   240.   240.                        2821.
            3     216.   11924.   120.   120.                        1647.
            4      40.     939.    80.    80.                         160.
            5     365.   19049.   220.   220.                        2668.
            6     350.   15128.   280.   280.                        2221.
            7      60.    2521.    50.    50.                         373.
            8     525.   32051.   250.   250.                        4317.
            9     570.   44101.   190.   190.                        5602.
           10     245.   12124.   160.   160.                        1720.
           11     110.    9423.    30.    32.                        1195.
           12     258.    8128.   330.   330.                        1291.
           13     156.    8097.    95.    95.                        1137.
  1970.00         3685.  213234.  2185.  2190.  1.19     0.  2305.  24887.
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 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 1980"
   XS    1980 14300
   GR        0,1980 25,1980 70,1979.5 110,1980 130,1978
   GR        145,1980 195,1979.5 220,1980 335,1981.8 390,1979.9
   GR        410,1980 555,1982 605,1982 650.5,1982 720.5,1980
   GR        740,1978 760,1977.8 775,1978 825,1979.5 860,1979.2
   GR        880,1980 910,1980.7 955,1980 995,1979.5 1055,1979.4
   GR        1085,1979 1115,1978.9 1141,1979 1156,1979 1176,1979.5
   GR        1196,1979.5 1256,1979.5 1316,1979.4 1356,1978 1386,1976
   GR        1416,1980 1481,1982 1521,1981.5 1546,1982 1596,1981.4
   GR        1626,1982 1666,1982.8 1701,1982 1711,1981.5 1721,1982
   GR        1741,1982.9 1766,1982 1785,1982 1825,1982.6 1860,1982
   GR        1870,1980 1880,1978 1890,1978 1900,1980 1915,1980.3
   GR        1940,1980 1955,1980 2005,1982 2006,1982 2040,1980
   GR        2190,1980 2210,1980.5 2225,1980 2253,1980.5 2273,1980
   GR        2283,1979.3 2328,1981 2353,1980 2373,1978.5 2390,1980
   GR        2435,1980 2520,1978 2550,1980 2595,1980.4
   N         .040  .040 .040  .040  .040  .040  .040  .040  .040  .040 .040
   SA          330 650 920 1205 1495 1590 1740 1970 2065 2265
   *
   HP 1  1980 1977.0,.5,1982.0

 *** FINISH PROCESSING CROSS SECTION - " 1980"
 *** CROSS SECTION " 1980" WRITTEN TO DISK, RECORD NO. = 26

 --- DATA SUMMARY FOR SECID " 1980" AT SRD =  14300.  ERR-CODE =      0

      SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0200       .50       .00
```

$\therefore WSEL_{13} = 69.5$

X-Y COORDINATE PAIRS (NGP = 74):

X	Y	X	Y	X	Y	X	Y
.0	1980.00	25.0	1980.00	70.0	1979.50	110.0	1980.00
130.0	1978.00	145.0	1980.00	195.0	1979.50	220.0	1980.00
335.0	1981.80	390.0	1979.90	410.0	1980.00	555.0	1982.00
605.0	1982.00	650.5	1982.00	720.5	1980.00	740.0	1978.00
760.0	1977.80	775.0	1978.00	825.0	1979.50	860.0	1979.20
880.0	1980.00	910.0	1980.70	955.0	1980.00	995.0	1979.50
1055.0	1979.40	1085.0	1979.00	1115.0	1978.90	1141.0	1979.00
1156.0	1979.00	1176.0	1979.50	1196.0	1979.50	1256.0	1979.50
1316.0	1979.40	1356.0	1978.00	1386.0	1976.00	1416.0	1980.00
1481.0	1982.00	1521.0	1981.50	1546.0	1982.00	1596.0	1981.40
1626.0	1982.00	1666.0	1982.80	1701.0	1982.00	1711.0	1981.50
1721.0	1982.00	1741.0	1982.90	1766.0	1982.00	1785.0	1982.00
1825.0	1982.60	1860.0	1982.00	1870.0	1980.00	1880.0	1978.00
1890.0	1978.00	1900.0	1980.00	1915.0	1980.30	1940.0	1980.00
1955.0	1980.00	2005.0	1982.00	2006.0	1982.00	2040.0	1980.00
2190.0	1980.00	2210.0	1980.50	2225.0	1980.00	2253.0	1980.50
2273.0	1980.00	2283.0	1979.30	2328.0	1981.00	2353.0	1980.00
2373.0	1978.50	2390.0	1980.00	2435.0	1980.00	2520.0	1978.00
2550.0	1980.00	2595.0	1980.40				

X-Y MAX-MIN POINTS:

XMIN	Y	X	YMIN	XMAX	Y	X	YMAX
.0	1980.00	1386.0	1976.00	2595.0	1980.40	1741.0	1982.90

SUBAREA BREAKPOINTS (NSA = 11):

330. 650. 920. 1205. 1495. 1590. 1740. 1970.
2065. 2265.

ROUGHNESS COEFFICIENTS (NSA = 11):

.040 .040 .040 .040 .040 .040 .040 .040
.040 .040 .040

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

CROSS-SECTION PROPERTIES: ISEQ = 26; SECID = 1980; SRD = 14300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	5	11.	263.	23.	23.				45.
1977.00		11.	263.	23.	23.	1.00	1371.	1394.	45.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	5	25.	776.	34.	34.				124.
1977.50		25.	776.	34.	34.	1.00	1364.	1397.	124.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	3	3.	28.	35.	35.				6.
	5	45.	1671.	45.	45.				255.
1978.00		48.	1699.	80.	80.	1.11	740.	1401.	204.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	2.	32.	9.	9.				6.
	3	26.	591.	57.	57.				102.
	5	72.	2924.	63.	63.				437.
	8	6.	129.	15.	15.				23.
	11	7.	106.	29.	29.				20.
1978.50		114.	3782.	172.	173.	1.25	125.	2528.	471.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	9.	204.	18.	18.				35.
	3	60.	1876.	78.	78.				299.
	4	3.	14.	56.	56.				4.
	5	108.	4862.	81.	81.				708.

	8	15.	458.	20.	20.				74.
	11	32.	702.	70.	70.				122.
1979.00		226.	8117.	322.	323.	1.20	120.	2535.	981.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	20.	603.	26.	26.				97.
	3	111.	3497.	142.	142.				555.
	4	55.	934.	181.	181.				173.
	5	156.	5793.	156.	157.				884.
	8	26.	1002.	25.	25.				153.
	11	78.	2182.	119.	119.				357.
1979.50		446.	14011.	650.	651.	1.12	115.	2543.	1981.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 26; SECID = 1980; SRD = 14300.

$Q_{2.00} = Q_1 = 720$ cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	75.	1476.	195.	195.				264.
	2	1.	6.	23.	23.				1.
	3	186.	7689.	160.	160.				1142.
	4	170.	4911.	250.	250.				798.
	5	260.	11155.	211.	211.				1642.
	8	40.	1789.	30.	30.				262.
	11	153.	5085.	181.	181.				797
1980.00		886.	32110.	1049.	1050.	1.12	25.	2550.	4357.

$WSEL_1 \cong 80.3$ +/-

$Q_{1.10} = 1104$
From Flow Diversion Analysis
$WSEL_{1.10} = 79.6$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	193.	6006.	252.	253.				958.
	2	25.	461.	74.	74.				84.
	3	276.	12783.	198.	199.				1844.
	4	303.	11858.	282.	282.				1785.
	5	370.	19060.	227.	228.				2680.
	8	80.	2574.	100.	100.				408.
	9	15.	313.	34.	34.				55.
	10	80.	1619.	200.	200.				287.
	11	289.	10372.	304.	305.				1595.
1980.50		1631.	65046.	1671.	1673.	1.15	0.	2595.	8526.

$Q_{1.00} = Q_{10,11} = 656$

$WSEL_{11} \approx 80.0$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	327.	13342.	284.	285.				1991.
	2	75.	1984.	124.	124.				329.
	3	387.	20081.	235.	235.				2816.
	4	446.	22373.	285.	285.				3164.
	5	488.	28841.	244.	244.				3917.
	8	132.	5709.	105.	106.				840.
	9	36.	1025.	52.	52.				166.
	10	180.	6253.	200.	200.				969.
	11	447.	20363.	330.	331.				2954.
1981.00		2517.	119970.	1858.	1862.	1.09	0.	2595.	15941.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	477.	23293.	316.	318.				3325.
	2	150.	5018.	175.	175.				785.
	3	508.	30198.	252.	252.				4095.
	4	588.	35523.	285.	285.				4796.
	5	614.	40498.	260.	260.				5351.
	6	0.	0.	2.	2.				0.
	7	1.	4.	11.	11.				1.
	8	185.	9873.	108.	108.				1379.
	9	67.	2341.	73.	73.				362.
	10	280.	13056.	200.	200.				1880.
	11	612.	34333.	330.	331.				4732.
1981.50		3481.	194137.	2011.	2016.	1.06	0.	2595.	25219.

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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 26;  SECID =  1980;  SRD =   14300.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     640.   36936.   330.   332.                       5061.
            2     250.   10018.   225.   225.                       1499.
            3     639.   42253.   270.   270.                       5577.
            4     731.   50993.   285.   285.                       6640.
            5     749.   52442.   290.   290.                       6827.
            6      27.     425.    95.    95.                         80.
            7      17.     297.    56.    56.                         55.
            8     239.   14931.   110.   111.                       2005.
            9     109.    4445.    94.    94.                        661.
           10     380.   21717.   200.   200.                       2973.
           11     777.   51052.   330.   332.                       6768.
   1982.00         4558.  285510.  2285.  2290.  1.06     0.  2595.  35501.
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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 2000"
   XT    2000 15300,0.021
   GR         0,2000 60,1998 70,1997 85,1998 130,1999 220,1998 320,1999
   GR         400,2000 430,2000 490,1998 530,1998 600,2000 770,1998.5
   GR         830,1998.5 900,2000
   GR         1080,1998.5 1100,1996.0 1110,1996.0 1120,1998 1150,2000
   GR         1200,1999.5 1260,1999.5 1300,2000 1400,1999 1420,1998
   GR         1460,1999.5 1550,1999.5 1560,1998 1570,1998 1580,1999.5
   GR         1730,1999.5 1760,1999 1850,2000 1960,2000 2000,1999
   GR         2010,1998 2030,1998 2100,1999 2150,2000
   *

 *** FINISH PROCESSING CROSS SECTION - " 2000"
 *** TEMPLATE CROSS SECTION " 2000" SAVED INTERNALLY.
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - "S2000"
   XS   S2000 15300
   GT
   N          .040 .040 .040 .040  .040 .040 .040  .040 .040  .040 .040 .040
   SA            130   430 830   900   1080   1120   1150 1300 1460 1580 1850
   *
   HP 1 S2000 1998.5,.5,2000

 *** FINISH PROCESSING CROSS SECTION - "S2000"
 *** CROSS SECTION "S2000" WRITTEN TO DISK, RECORD NO. = 27

 --- DATA SUMMARY FOR SECID "S2000" AT SRD =  15300.  ERR-CODE =      0
```

SKEW	IHFNO	VSLOPE	EK	CK
.0	0.	.0210	.50	.00

X-Y COORDINATE PAIRS (NGP = 39):

X	Y	X	Y	X	Y	X	Y
.0	2000.00	60.0	1998.00	70.0	1997.00	85.0	1998.00
130.0	1999.00	220.0	1998.00	320.0	1999.00	400.0	2000.00
430.0	2000.00	490.0	1998.00	530.0	1998.00	600.0	2000.00
770.0	1998.50	830.0	1998.50	900.0	2000.00	1080.0	1998.50
1100.0	1996.00	1110.0	1996.00	1120.0	1998.00	1150.0	2000.00
1200.0	1999.50	1260.0	1999.50	1300.0	2000.00	1400.0	1999.00
1420.0	1998.00	1460.0	1999.50	1550.0	1999.50	1560.0	1998.00
1570.0	1998.00	1580.0	1999.50	1730.0	1999.50	1760.0	1999.00
1850.0	2000.00	1960.0	2000.00	2000.0	1999.00	2010.0	1998.00
2030.0	1998.00	2100.0	1999.00	2150.0	2000.00		

X-Y MAX-MIN POINTS:

XMIN	Y	X	YMIN	XMAX	Y	X	YMAX
.0	2000.00	1100.0	1996.00	2150.0	2000.00	.0	2000.00

SUBAREA BREAKPOINTS (NSA = 12):

130. 430. 830. 900. 1080. 1120. 1150. 1300.
1460. 1580. 1850.

ROUGHNESS COEFFICIENTS (NSA = 12):

.040 .040 .040 .040 .040 .040 .040 .040
.040 .040 .040 .040

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 27; SECID = S2000; SRD = 15300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	34.	859.	63.	63.				145.
	2	24.	351.	95.	95.				67.
	3	28.	557.	73.	73.				99.
	6	65.	3327.	40.	40.				470.
	7	2.	28.	8.	8.				5.
	9	6.	86.	23.	23.				17.
	10	7.	134.	17.	17.				24.
	12	20.	358.	60.	60.				66.
1998.50		186.	5700.	378.	378.	1.81	45.	2065.	549.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	75.	2304.	100.	100.				369.
	2	95.	2229.	190.	190.				381.
	3	117.	2833.	222.	222.				480.
	4	6.	86.	23.	23.				17.
	5	15.	222.	60.	60.				43
	6	85.	5203.	40.	40.				703
	7	8.	176.	15.	15.				30
	9	23.	547.	47.	47.				94
	10	17.	494.	23.	23.				80.
	12	60.	1589.	100.	100.				264.
1999.00		500.	15683.	820.	821.	1.72	30.	2100.	1688.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	129.	5167.	115.	115.				773.
	2	200.	6787.	230.	230.				1058.
	3	250.	8042.	311.	311.				1271.
	4	23.	547.	47.	47.				94.
	5	60.	1408.	120.	120.				241.
	6	105.	7399.	40.	40.				965.

$Q_{2.00} = Q_{1,2} = \cancel{838}$ 720 cfs

$Q_{1.11} = Q_{5-9} = 1104$ cfs

$Q_{1.00} = Q_{12} = 656$

%K = .39
$\therefore Q_{5-9} \approx 661$ cfs

$WSEL_{1,2} \cong 99.0 \pm$

```
          7     17.     518.    23.    23.                          83.
          9     63.    1597.   110.   110.                         267.
         10     30.    1112.    30.    30.                         170.
         11     19.     277.    75.    75.                          53.
         12    121.    4008.   145.   145.                         629.
  1999.50     1016.   36862.  1245.  1246.  1.44    15.  2125.   4343.
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WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 27;  SECID = S2000;  SRD =   15300.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     190.     9109.   130.   130.                      1303.
            2     325.    13698.   270.   270.                      2023.
            3     428.    16644.   400.   400.                      2508.
            4      53.     1614.    70.    70.                       258.
            5     135.     4151.   180.   180.                       663.
            6     125.     9894.    40.    40.                      1254.
            7      30.     1116.    30.    30.                       170.
            8      53.      971.   150.   150.                       176.
            9     130.     4215.   160.   160.                       665.
           10      90.     2764.   120.   120.                       442.
           11     143.     3467.   270.   270.                       587.
           12     205.     8031.   190.   190.                      1208.
  2000.00         1905.    75675.  2010.  2011.  1.35     0.  2150.   9057.
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WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 2020"
  XT    2020 16300,0.020
  GR        0,2020    70,2019.5   90,2018   110,2018   130,2020
  GR        200,2020   250,2017   270,2019.5  320,2018   400,2020
  GR        420,2020   500,2018.5  530,2017.5  540,2018   570,2019
  GR       600,2019 650,2019 680,2018 690,2016 710,2016 730,2018 830,2018
  GR       1000,2020
  GR       1050,2020  1120,2019.5  1130,2018.5 1140,2018  1170,2019
  GR       1250,2019.5 1260,2018 1280,2017.5 1300,2018  1450,2020
  GR       1630,2019  1670,2018 1730,2017  1840,2017  1900,2019  2000,2020
  *

*** FINISH PROCESSING CROSS SECTION - " 2020"
*** TEMPLATE CROSS SECTION " 2020" SAVED INTERNALLY.
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S2020"
  XS   S2020 16300
  GT
  N         .040    .040    .040  .040  .040  .040  .040
  SA            200    420    600    1050   1250   1630
```

%K = .60
.65 ≈ 1286
∴ WSEL ≈ 59 = 99.4+/-

∴ WSEL ≈ 99.6+/-

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*
HP 1 S2020 2017.0,.5,2020

*** FINISH PROCESSING CROSS SECTION - "S2020"
*** CROSS SECTION "S2020" WRITTEN TO DISK, RECORD NO. = 28

--- DATA SUMMARY FOR SECID "S2020" AT SRD =  16300.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0200       .50       .00

X-Y COORDINATE PAIRS  (NGP =  39):
       X      Y          X      Y          X      Y          X      Y
      .0 2020.00      70.0 2019.50      90.0 2018.00     110.0 2018.00
    130.0 2020.00     200.0 2020.00     250.0 2017.00     270.0 2019.50
    320.0 2018.00     400.0 2020.00     420.0 2020.00     500.0 2018.50
    530.0 2017.50     540.0 2018.00     570.0 2019.00     600.0 2019.00
    650.0 2019.00     680.0 2018.00     690.0 2016.00     710.0 2016.00
    730.0 2018.00     830.0 2018.00    1000.0 2020.00    1050.0 2020.00
   1120.0 2019.50    1130.0 2018.50    1140.0 2018.00    1170.0 2019.00
   1250.0 2019.50    1260.0 2018.00    1280.0 2017.50    1300.0 2018.00
   1450.0 2020.00    1630.0 2019.00    1670.0 2018.00    1730.0 2017.00
   1840.0 2017.00    1900.0 2019.00    2000.0 2020.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      .0 2020.00     690.0 2016.00    2000.0 2020.00        .0 2020.00

SUBAREA BREAKPOINTS (NSA =  7):
        200.    420.    600.   1050.   1250.   1630.

ROUGHNESS COEFFICIENTS (NSA =  7):
        .040    .040    .040    .040    .040    .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 28;  SECID = S2020;  SRD =   16300.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            4      28.      870.    35.    35.                          138.
  2017.00          28.      870.    35.    35.  1.00   685.   720.    138.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            2       3.       45.    12.    12.                            9.
            4      47.     1857.    43.    43.                          279.
            7      66.     1400.   155.   155.                          246.
  2017.50         116.     3303.   210.   210.  1.33   242.  1855.    425.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            2      12.      289.    25.    25.                           49.
            3       6.       92.    25.    25.                           18.
            4      70.     3250.    50.    50.                          470.
            6      10.      148.    40.    40.                           28.
            7     155.     4871.   200.   200.                          774.
  2018.00         254.     8650.   340.   340.  1.20   233.  1870.   1137.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      13.      264.    32.    32.                           47.
            2      37.      866.    74.    74.                          148.
            3      26.      597.    55.    55.                          103.
            4     159.     4974.   208.   208.                          793.
            5       6.       92.    25.    25.                           18.
            6      40.      940.    81.    81.                          161.
            7     264.    10609.   235.   235.                         1586.
```

$Q_{2.00} \approx Q_1 = 824$ cfs

$Q_{1.10} \approx Q_4 = 1285$ cfs

$Q_{1.00} \approx Q_6 = 763$

```
 2018.50          546.   18343.   709.   709.  1.13    83.  1885.   2555.

    WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW    QCR
            1      32.     956.    43.    43.                        154.
            2      86.    2525.   123.   123.                        409.
            3      64.    1818.    97.    97.                        297.
            4     278.   10651.   265.   265.                       1611.
            5      24.     577.    45.    45.                         98.
            6      91.    2783.   122.   122.                        445.
            7     390.   18561.   270.   270.                       2660.
 2019.00          964.   37871.   964.   965.  1.12    77.  1900.   5178.

    WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW    QCR
            1      56.    2124.    55.    55.                        323.
            2     160.    5656.   172.   172.                        873.
            3     134.    4571.   153.   153.                        712.
            4     446.   19215.   358.   358.                       2823.
            5      68.    1624.   130.   130.                        276.
            6     184.    5567.   253.   253.                        894.
            7     538.   28288.   320.   320.                       3953.
 2019.50         1585.   67044.  1440.  1441.  1.13    70.  1950.   8877.
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
   CROSS-SECTION PROPERTIES:  ISEQ = 28;  SECID = S2020;  SRD =   16300.

    WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW    QCR
            1     103.    3256.   130.   130.                        516.
            2     253.   10976.   200.   200.                       1610.
            3     218.    9189.   180.   180.                       1357.
            4     635.   32172.   400.   400.                       4540.
            5     150.    4611.   200.   200.                        737.
            6     343.   11901.   380.   380.                       1845.
            7     710.   40836.   370.   370.                       5581.
 2020.00         2410.  112942.  1860.  1861.  1.12     0.  2000.  14735.
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 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 2030"
   XT    2030 16780,0.020
   GR        0,2030 30,2028 80,2028 100,2026 115,2028 185,2028 195,2026
   GR        205,2028 220,2030 400,2030 460,2028 500,2028 505,2026
   GR        520,2026 530,2028 600,2030 660,2027 670,2028 700,2030
   GR        1050,2030 1130,2028 1140,2027.5 1200,2030
   *

 *** FINISH PROCESSING CROSS SECTION - " 2030"
 *** TEMPLATE CROSS SECTION " 2030" SAVED INTERNALLY.
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
```

$\therefore WSEL_4 \cong 18.8 \pm$

$WSEL_6 \cong 19.4 \pm$

$\therefore WSEL_1 = 20.2 \pm$

separate calcs

```
*** START PROCESSING CROSS SECTION - "S2030"
  XS   S2030 16780
  GT
  N          .040    .040     .040      .040     .040     .040
  SA              205     530      600       800      1050
  *
  HP 1 S2030 2027.5,.5,2030

*** FINISH PROCESSING CROSS SECTION - "S2030"
*** CROSS SECTION "S2030" WRITTEN TO DISK, RECORD NO. = 29

--- DATA SUMMARY FOR SECID "S2030" AT SRD =  16780.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0200       .50       .00

X-Y COORDINATE PAIRS  (NGP =  23):
       X      Y          X      Y          X      Y          X      Y
      .0 2030.00      30.0 2028.00      80.0 2028.00     100.0 2026.00
    115.0 2028.00     185.0 2028.00     195.0 2026.00     205.0 2028.00
    220.0 2030.00     400.0 2030.00     460.0 2028.00     500.0 2028.00
    505.0 2026.00     520.0 2026.00     530.0 2028.00     600.0 2030.00
    660.0 2027.00     670.0 2028.00     700.0 2030.00    1050.0 2030.00
   1130.0 2028.00    1140.0 2027.50    1200.0 2030.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      .0 2030.00     100.0 2026.00    1200.0 2030.00        .0 2030.00

SUBAREA BREAKPOINTS (NSA =  6):
        205.    530.    600.    800.   1050.

ROUGHNESS COEFFICIENTS (NSA =  6):
        .040    .040    .040    .040    .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 29;  SECID = S2030  SRD =   16780.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      31.      944.   41.    42.                          152.
            2      31.     1272.   26.    27.                          191.
            4       4.       55.   15.    15.                           11.
  2027.50          66.     2271.   83.    83.  1.12    85.   665.    314.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      55.     2033.   55.    56.                          312.
            2      45.     2168.   30.    31.                          313.
            4      15.      351.   30.    30.                           60.
            6       6.       81.   22.    22.                           16.
  2028.00         121.     4634.  137.   138.  1.17    80.  1152.    593.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     144.     4589.  183.   183.                          729.
            2      85.     3043.   89.    89.                          469.
            3       4.       65.   18.    18.                           12.
            4      34.     1031.   48.    48.                          166.
            6      25.      539.   54.    54.                           94.
  2028.50         292.     9267.  390.   392.  1.05    23.  1164.   1402.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     238.    10242.  190.   191.                         1507.
            2     134.     5740.  108.   108.                          847.
```

$Q_{2.00} = 824\,cfs = Q_1$

$Q_{1.10} = Q_{24} = 1285$

$Q_{1.00} = 763 = Q_6$

$\therefore WSEL_1 = 28.6 \pm$

```
          3      18.     411.    35.    35.                          70.
          4      63.    2265.    65.    65.                         348.
          6      60.    1733.    86.    86.                         281.
  2029.00       511.   20390.   484.   485.  1.06    15.  1176.   2900.

    WSEL  SA#    AREA       K   TOPW   WETP  ALPH    LEW    REW    QCR
          1     334.   17653.   198.   198.                       2469.
          2     192.    9438.   126.   127.                       1346.
          3      39.    1210.    53.    53.                        193.
          4      99.    4185.    83.    83.                        619.
          6     111.    3938.   118.   118.                        607.
  2029.50       776.   36425.   577.   578.  1.07     8.  1188.   4947.

    WSEL  SA#    AREA       K   TOPW   WETP  ALPH    LEW    REW    QCR
          1     435.   26697.   205.   206.                       3596.
          2     260.   14245.   145.   146.                       1976.
          3      70.    2607.    70.    70.                        397.
          4     145.    6911.   100.   100.                        991.
          6     178.    7394.   150.   150.                       1096.
  2030.00      1088.   57854.   670.   672.  1.07     0.  1200.   7595.
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WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 2040"
  XT    2040 17300,0.022
  GR        0,2040    30,2036.5   40,2036.5   50,2038 80,2039  140,2039.5
  GR        170,2040   250,2038   270,2038   280,2039
  GR        320,2039   380,2038   420,2036.5  440,2037   450,2040
  GR        680,2040   750,2037.5  760,2037.5  770,2038.5  800,2038.5
  GR        920,2038   940,2037   970,2037  1000,2038  1070,2038.5
  GR        1080,2040  1100,2040  1140,2038  1150,2040  1250,2040
  GR        1290,2038  1370,2040
  *

*** FINISH PROCESSING CROSS SECTION - " 2040"
*** TEMPLATE CROSS SECTION " 2040" SAVED INTERNALLY.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S2040"
  XS   S2040 17300
  GT
  N             .040    .040    .040  .040  .040     .040
  SA               170     680    770    1100   1250
  *
  HP 1 S2040 2038.5,.5,2040

*** FINISH PROCESSING CROSS SECTION - "S2040"
*** CROSS SECTION "S2040" WRITTEN TO DISK, RECORD NO. = 30

--- DATA SUMMARY FOR SECID "S2040" AT SRD =  17300.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0220       .50       .00
```

ZK=.41

Q_{24} = 1197

∴ WSEL$_{24}$ ≅ 29.1 +/-

∴ WSEL$_{6}$ ≅ 29.7 +/-

X-Y COORDINATE PAIRS (NGP = 32):

X	Y	X	Y	X	Y	X	Y
.0	2040.00	30.0	2036.50	40.0	2036.50	50.0	2038.00
80.0	2039.00	140.0	2039.50	170.0	2040.00	250.0	2038.00
270.0	2038.00	280.0	2039.00	320.0	2039.00	380.0	2038.00
420.0	2036.50	440.0	2037.00	450.0	2040.00	680.0	2040.00
750.0	2037.50	760.0	2037.50	770.0	2038.50	800.0	2038.50
920.0	2038.00	940.0	2037.00	970.0	2037.00	1000.0	2038.00
1070.0	2038.50	1080.0	2040.00	1100.0	2040.00	1140.0	2038.00
1150.0	2040.00	1250.0	2040.00	1290.0	2038.00	1370.0	2040.00

X-Y MAX-MIN POINTS:

XMIN	Y	X	YMIN	XMAX	Y	X	YMAX
.0	2040.00	30.0	2036.50	1370.0	2040.00	.0	2040.00

SUBAREA BREAKPOINTS (NSA = 6):

170. 680. 770. 1100. 1250.

ROUGHNESS COEFFICIENTS (NSA = 6):

.040 .040 .040 .040 .040 .040

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 30; SECID = S2040; SRD = 17300.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	53.	2014.	52.	52.				307.
	2	113.	3617.	140.	140.				572.
	3	29.	771.	48.	48.				128.
	4	143.	3466.	270.	270.				587.
	5	3.	46.	13.	13.				9.
	6	8.	111.	30.	30.				21.
2038.50		348.	10026.	553.	553.	1.11	13.	1310.	1487.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	84.	3497.	71.	72.				520.
	2	197.	7316.	197.	197.				1116.
	3	57.	1977.	62.	62.				306.
	4	293.	10683.	303.	303.				1637.
	5	13.	292.	25.	25.				50.
	6	30.	704.	60.	60.				120.
2039.00		673.	24469.	718.	719.	1.03	9.	1330.	3645.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	136.	5070.	136.	136.				773.
	2	320.	13761.	258.	259.				2025.
	3	91.	3819.	76.	76.				565.
	4	446.	21307.	307.	307.				3050.
	5	28.	862.	38.	38.				138.
	6	68.	2075.	90.	90.				332.
2039.50		1089.	46894.	904.	905.	1.04	4.	1350.	6644.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	213.	9173.	170.	170.				1348.
	2	455.	23395.	280.	281.				3291.
	3	133.	6383.	90.	90.				912.
	4	600.	34700.	310.	310.				4737.
	5	50.	1856.	50.	50.				284.
	6	120.	4468.	120.	120.				681.
2040.00		1570.	79976.	1020.	1021.	1.05	0.	1370.	10770.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY

$Q_{2.00} = 824$ cfs $= Q_1$

$Q_{1.10} = 1285 = Q_2$

$Q_{1.00} = 763 = Q_{34}$

$WSEL_{3A} = 38.6 +/-$

$WSEL_2 \cong 39.1 +/-$

$WSEL_1 \cong 39.6 +/-$

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P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 2046"
  XT    2046 17460
  GR        0,2046 110,2044 125,2043.6 135,2044 142,2046
  GR        165,2046.9 180,2046 195,2045.9 203,2046 225,2046.2
  GR        249,2046 265,2045.8 290,2046 310,2046.5 338,2046
  GR        410,2046 470,2046.2 490,2046 512,2045.8 520,2046 545,2046.5
  GR        548,2046.2 608,2046.8 620,2046 635,2044.8 672,2045
  GR        690,2046 750,2048 792,2048 875,2048.2 958,2048
  GR        985,2047.8 1005,2048 1055,2047.5 1080,2048 1110,2048.2
  GR        1140,2048 1160,2046 1190,2048 1230,2048
  *

*** FINISH PROCESSING CROSS SECTION - " 2046"
*** TEMPLATE CROSS SECTION " 2046" SAVED INTERNALLY.
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S2046"
  XS   S2046 17460
  GT
  N            .040    .040    .040   .040  .040  .040
  SA                 165  200    545    810  1230
  *
  HP 1 S2046 2044.5,.5,2048.0

*** FINISH PROCESSING CROSS SECTION - "S2046"
*** CROSS SECTION "S2046" WRITTEN TO DISK, RECORD NO. = 31

--- DATA SUMMARY FOR SECID "S2046" AT SRD =  17460.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0220       .50       .00

X-Y COORDINATE PAIRS  (NGP =  40):
       X      Y          X      Y          X      Y          X      Y
       .0 2046.00      110.0 2044.00     125.0 2043.60     135.0 2044.00
    142.0 2046.00      165.0 2046.90     180.0 2046.00     195.0 2045.90
    203.0 2046.00      225.0 2046.20     249.0 2046.00     265.0 2045.80
    290.0 2046.00      310.0 2046.50     338.0 2046.00     410.0 2046.00
    470.0 2046.20      490.0 2046.00     512.0 2045.80     520.0 2046.00
    545.0 2046.50      548.0 2046.20     608.0 2046.80     620.0 2046.00
    635.0 2044.80      672.0 2045.00     690.0 2046.00     750.0 2048.00
    792.0 2048.00      875.0 2048.20     958.0 2048.00     985.0 2047.80
   1005.0 2048.00     1055.0 2047.50    1080.0 2048.00    1110.0 2048.20
   1140.0 2048.00     1160.0 2046.00    1190.0 2048.00    1230.0 2048.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
       .0 2046.00      125.0 2043.60    1230.0 2048.00     875.0 2048.20

 SUBAREA BREAKPOINTS (NSA =  6):
         165.    200.    545.    810.   1230.

 ROUGHNESS COEFFICIENTS (NSA =  6):
          .040    .040    .040    .040    .040    .040
1
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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 31; SECID = S2046; SRD = 17460.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	25.	548.	54.	54.				95.
2044.50		25.	548.	54.	54.	1.00	83.	137.	95.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	59.	1754.	84.	84.				283.
	4	4.	32.	39.	40.				7.
2045.00		63.	1785.	123.	123.	1.08	55.	672.	247.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	108.	3923.	113.	113.				602.
	4	28.	647.	55.	55.				111.
2045.50		136.	4570.	167.	168.	1.06	28.	681.	673.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	172.	7270.	142.	142.				1074.
	2	1.	6.	20.	20.				1.
	3	7.	56.	74.	74.				13.
	4	59.	1943.	70.	70.				305.
2046.00		239.	9275.	306.	306.	1.08	0.	690.	1152.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	246.	12452.	155.	156.				1762.
	2	13.	295.	28.	28.				51.
	3	149.	3164.	345.	345.				555.
	4	104.	3431.	125.	126.				539.
	5	3.	46.	13.	13.				9.
2046.50		516.	19388.	666.	667.	1.36	0.	1168.	2211.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	327.	19082.	165.	166.				2608.
	2	29.	971.	35.	35.				152.
	3	321.	11414.	345.	345.				1760.
	4	183.	7010.	175.	175.				1061.
	5	13.	293.	25.	25.				50.
2047.00		873.	38769.	745.	747.	1.19	0.	1175.	4913.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	409.	27717.	165.	167.				3656.
	2	47.	2118.	35.	35.				308.
	3	494.	23361.	345.	345.				3352.
	4	274.	13029.	190.	190.				1868.
	5	28.	863.	38.	38.				138.
2047.50		1252.	67088.	773.	775.	1.41	0.	1183.	8580.

Per Flow Diversion
Q100 = 2048 cfs
WSEL 1.00 = 46.87

Q2.0 = Q1 = 824
∴ WSEL1 ≅ 45.7 +/-

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 31; SECID = S2046; SRD = 17460.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	492.	37570.	165.	167.				4816.
	2	64.	3595.	35.	35.				495.
	3	666.	38490.	345.	345.				5254.
	4	373.	20684.	205.	205.				2853.
	5	73.	1550.	172.	172.				272.

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  2048.00        1669.  101889.   922.   925.  1.11     0.  1190.  12066.
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WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 2054"
  XT    2054 17970
  GR        0,2054  10,2052  15,2051.5 50,2052 100,2052
  GR        150,2053   160,2052   250,2054   310,2054   400,2052.5
  GR        430,2051   440,2052   450,2050   500,2051   510,2052.5
  GR        570,2051.5  630,2052.5  650,2052   670,2050   680,2052
  GR        720,2053   800,2052   900,2054   910,2054   980,2053
  GR        1000,2051  1025,2052  1100,2052  1200,2054  1260,2054
  GR        1330,2052  1370,2054

*** FINISH PROCESSING CROSS SECTION - " 2054"
*** TEMPLATE CROSS SECTION " 2054" SAVED INTERNALLY.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S2054"
  XS   S2054 17970
  GT
  N            .040    .040    .040    .040     .040      .040
  SA                  310     510    720    910      1260
  *
  HP 1 S2054 2051.5,.5,2054

*** FINISH PROCESSING CROSS SECTION - "S2054"
*** CROSS SECTION "S2054" WRITTEN TO DISK, RECORD NO. = 32

--- DATA SUMMARY FOR SECID "S2054" AT SRD =  17970.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0220       .50       .00

X-Y COORDINATE PAIRS  (NGP =  32):
       X      Y          X      Y          X      Y          X      Y
      .0 2054.00      10.0 2052.00      15.0 2051.50      50.0 2052.00
    100.0 2052.00     150.0 2053.00     160.0 2052.00     250.0 2054.00
    310.0 2054.00     400.0 2052.50     430.0 2051.00     440.0 2052.00
    450.0 2050.00     500.0 2051.00     510.0 2052.50     570.0 2051.50
    630.0 2052.50     650.0 2052.00     670.0 2050.00     680.0 2052.00
    720.0 2053.00     800.0 2052.00     900.0 2054.00     910.0 2054.00
    980.0 2053.00    1000.0 2051.00    1025.0 2052.00    1100.0 2052.00
   1200.0 2054.00    1260.0 2054.00    1330.0 2052.00    1370.0 2054.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      .0 2054.00     450.0 2050.00    1370.0 2054.00        .0 2054.00

SUBAREA BREAKPOINTS (NSA =  6):
       310.    510.    720.    910.   1260.

ROUGHNESS COEFFICIENTS (NSA =  6):
        .040    .040    .040    .040    .040    .040
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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 32; SECID = S2054; SRD = 17970.

Chan 2.0
$Q_{2.0} = Q_1 = 824$ cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	2	60.	1919.	76.	76.				304.
	3	17.	515.	23.	23.				83.
	5	4.	65.	18.	18.				12.
2051.50		81.	2499.	116.	116.	1.04	420.	1013.	380.

Chan 1.0
$Q_{1.0} = Q_{2.4} = 2048$ cfs

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	10.	148.	40.	40.				28.
	2	103.	4014.	97.	97.				606.
	3	45.	1054.	90.	90.				181.
	5	18.	410.	35.	35.				70.
2052.00		176.	5626.	262.	262.	1.20	10.	1025.	748.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	69.	1556.	145.	145.				269.
	2	155.	7239.	110.	110.				1044.
	3	115.	3062.	190.	190.				508.
	4	16.	240.	65.	65.				46.
	5	80.	2051.	140.	140.				343.
	6	7.	102.	28.	28.				20.
2052.50		442.	14250.	678.	678.	1.36	8.	1340.	1735.

%K = .74
$Q_{2.4} \approx 1283$

→ $WSEL_{2.4} = 52.7$ ±

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	155.	4868.	200.	200.				774.
	2	218.	10847.	140.	140.				1538.
	3	215.	8127.	210.	210.				1234.
	4	65.	1525.	130.	130.				261.
	5	158.	5573.	170.	170.				860.
	6	28.	645.	55.	55.				110.
2053.00		838.	31585.	905.	906.	1.15	5.	1350.	4267.

%K = .65
$Q_{2.4} \approx 2769$

∴ $WSEL_1 = 53.1$ ±

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	261.	10743.	225.	225.				1597.
	2	295.	15842.	170.	170.				2205.
	3	320.	15768.	210.	210.				2242.
	4	136.	4657.	155.	155.				725.
	5	258.	10338.	230.	230.				1546.
	6	62.	1902.	83.	83.				304.
2053.50		1332.	59249.	1073.	1074.	1.07	3.	1360.	8123.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	380.	18697.	250.	250.				2658.
	2	388.	22402.	200.	200.				3061.
	3	425.	25303.	210.	210.				3431.
	4	220.	9367.	180.	180.				1380.
	5	388.	17505.	290.	290.				2542.
	6	110.	4096.	110.	110.				624.
2054.00		1910.	97370.	1240.	1241.	1.06	0.	1370.	13066.

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

```
*** START PROCESSING CROSS SECTION - " 2064"
  XT    2064 18460
  GR        0,2064 30,2062 110,2062 140,2061 160,2062 250,2063 300,2064
  GR        330,2062 350,2063.5 390,2062 460,2064 500,2064 670,2062
  GR        680,2060 715,2062 740,2063 800,2064
  *

*** FINISH PROCESSING CROSS SECTION - " 2064"
*** TEMPLATE CROSS SECTION " 2064" SAVED INTERNALLY.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S2064"
  XS   S2064 18460
  GT
  N           .040   .040    .040    .040     .040
  SA              300    460      500     740
  *
  HP 1 S2064 2062.0,.5,2064

*** FINISH PROCESSING CROSS SECTION - "S2064"
*** CROSS SECTION "S2064" WRITTEN TO DISK, RECORD NO. = 33

--- DATA SUMMARY FOR SECID "S2064" AT SRD =  18460.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0220       .50       .00

X-Y COORDINATE PAIRS  (NGP =  17):
       X      Y          X      Y          X      Y          X      Y
       .0 2064.00      30.0 2062.00     110.0 2062.00     140.0 2061.00
    160.0 2062.00     250.0 2063.00     300.0 2064.00     330.0 2062.00
    350.0 2063.50     390.0 2062.00     460.0 2064.00     500.0 2064.00
    670.0 2062.00     680.0 2060.00     715.0 2062.00     740.0 2063.00
    800.0 2064.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
       .0 2064.00     680.0 2060.00     800.0 2064.00        .0 2064.00

SUBAREA BREAKPOINTS (NSA =  5):
        300.    460.    500.    740.

ROUGHNESS COEFFICIENTS (NSA =  5):
         .040    .040    .040    .040    .040
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 33;  SECID = S2064;  SRD =   18460.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1      25.     586.    50.    50.                       100.
             4      45.    1670.    45.    45.                       255.
  2062.00           70.    2256.    95.    95.  1.12   110.   715.    322.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     103.    2625.   183.   183.                       440.
             2      11.     166.    45.    45.                        32.
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            4      81.    2631.   100.   100.                          416.
  2062.50          196.    5422.   328.   328.  1.08    23.   728.    826.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     208.    7112.   235.   235.                        1106.
            2      45.    1055.    90.    90.                         181.
            4     145.    5160.   155.   155.                         796.
  2063.00          398.   13328.   480.   480.  1.03    15.   740.   2020.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     333.   14360.   268.   268.                        2109.
            2     101.    3111.   135.   135.                         498.
            4     233.    9690.   198.   198.                        1437.
            5       8.     111.    30.    30.                          21.
  2063.50          675.   27271.   630.   631.  1.04     8.   770.   3884.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     475.   24030.   300.   300.                        3392.
            2     175.    6915.   160.   160.                        1039.
            4     343.   16159.   240.   240.                        2322.
            5      30.     704.    60.    60.                         120.
  2064.00         1023.   47807.   760.   761.  1.04     0.   800.   6601.
1
  *
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WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 2074"
  XT    2074 18920
  GR        0,2074   5,2073 20,2072  30,2072    40,2073
  GR        50,2072.5   70,2072.5   75,2074    90,2074   100,2073
  GR        150,2073   175,2074   260,2074   280,2072.5  300,2074
  GR        350,2074   400,2072   415,2070   440,2072   450,2071.5
  GR        500,2072   550,2071   700,2071   800,2074   830,2074
  GR        870,2072.5  940,2074   970,2074  1000,2072.5 1030,2074
  *

*** FINISH PROCESSING CROSS SECTION - " 2074"
*** TEMPLATE CROSS SECTION " 2074" SAVED INTERNALLY.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S2074"
  XS   S2074 18920
  GT
  N          .040  .040    .040    .040  .040     .040     .040
  SA             90      260    350    450    830    970
  *
  HP 1 S2074 2071.0,.5,2074

*** FINISH PROCESSING CROSS SECTION - "S2074"
*** CROSS SECTION "S2074" WRITTEN TO DISK, RECORD NO. = 34

--- DATA SUMMARY FOR SECID "S2074" AT SRD =  18920.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0220       .50       .00
```

X-Y COORDINATE PAIRS (NGP = 30):

X	Y	X	Y	X	Y	X	Y
.0	2074.00	5.0	2073.00	20.0	2072.00	30.0	2072.00
40.0	2073.00	50.0	2072.50	70.0	2072.50	75.0	2074.00
90.0	2074.00	100.0	2073.00	150.0	2073.00	175.0	2074.00
260.0	2074.00	280.0	2072.50	300.0	2074.00	350.0	2074.00
400.0	2072.00	415.0	2070.00	440.0	2072.00	450.0	2071.50
500.0	2072.00	550.0	2071.00	700.0	2071.00	800.0	2074.00
830.0	2074.00	870.0	2072.50	940.0	2074.00	970.0	2074.00
1000.0	2072.50	1030.0	2074.00				

X-Y MAX-MIN POINTS:

XMIN	Y	X	YMIN	XMAX	Y	X	YMAX
.0	2074.00	415.0	2070.00	1030.0	2074.00	.0	2074.00

SUBAREA BREAKPOINTS (NSA = 7):
90. 260. 350. 450. 830. 970.

ROUGHNESS COEFFICIENTS (NSA = 7):
.040 .040 .040 .040 .040 .040 .040

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00
CROSS-SECTION PROPERTIES: ISEQ = 34; SECID = S2074; SRD = 18920.

$Q_{1.00} = 2048$ cfs $= Q_{3-5}$

$Q_{2.00} = 824$ cfs $= Q_{1,2}$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	4	10.	234.	20.	20.				40.
2071.00		10.	234.	20.	20.	1.00	408.	428.	40.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	4	23.	689.	30.	30.				111.
	5	85.	1856.	192.	192.				324.
2071.50		108.	2546.	222.	222.	1.08	404.	717.	412.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	4	43.	1416.	50.	50.				222.
	5	204.	6112.	283.	283.				983.
2072.00		247.	7529.	333.	334.	1.01	400.	733.	1201.

% K = 1.0

$\therefore WSEL_{3-5} \cong 72.3$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	8.	153.	23.	23.				28.
	4	71.	2847.	63.	63.				426.
	5	350.	14447.	300.	300.				2145.
2072.50		429.	17448.	385.	385.	1.01	13.	750.	2550.

% K = .99
$Q_{3-5} = 2527$

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	35.	864.	67.	67.				146.
	3	3.	49.	13.	13.				9.
	4	105.	4884.	75.	75.				705.
	5	504.	25604.	317.	317.				3610.
	6	9.	135.	37.	37.				26.
	7	5.	74.	20.	20.				14.
2073.00		662.	31611.	528.	529.	1.07	5.	1010.	4064.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	70.	2567.	71.	71.				393.
	2	29.	628.	68.	68.				110.
	3	13.	312.	27.	27.				53.
	4	146.	7603.	88.	88.				1066.
	5	667.	39417.	333.	333.				5350.
	6	37.	860.	73.	73.				147.
	7	20.	469.	40.	40.				80.
2073.50		981.	51857.	699.	700.	1.13	3.	1020.	6215.

WSEL	SA#	AREA	K	TOPW	WETP	ALPH	LEW	REW	QCR
	1	106.	4974.	75.	75.				718.
	2	68.	2155.	85.	85.				341.
	3	30.	921.	40.	40.				147.
	4	193.	11077.	100.	100.				1516.
	5	838.	55805.	350.	350.				7351.
	6	83.	2536.	110.	110.				405.
	7	45.	1383.	60.	60.				221.
2074.00		1361.	78850.	820.	821.	1.14	0.	1030.	9313.

%K = .09 Q ≈ 842

WSEL ≈ 74.0
1/2

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HP 2 S2074 2071.0,.5,2074,3050

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

VELOCITY DISTRIBUTION: ISEQ = 34; SECID = S2074; SRD = 18920.

WSEL	LEW	REW	AREA	K	Q	VEL
2071.00	407.5	427.5	10.0	234.	3050.	305.00

X STA.	407.5	411.7	412.4	413.0	413.5	414.0
A(I)	1.2	.4	.4	.4	.4	
V(I)	128.98	348.30	375.17	378.67	396.98	
X STA.	414.0	414.4	414.8	415.2	415.6	416.0
A(I)	.4	.4	.4	.4	.4	
V(I)	405.79	402.72	409.99	394.96	408.34	
X STA.	416.0	416.4	416.8	417.3	417.7	418.2
A(I)	.4	.4	.4	.4	.4	
V(I)	431.25	407.38	409.74	400.28	392.98	
X STA.	418.2	418.8	419.4	420.1	420.9	427.5
A(I)	.4	.4	.4	.5	1.7	
V(I)	388.38	370.15	357.10	320.77	88.47	

VELOCITY DISTRIBUTION: ISEQ = 34; SECID = S2074; SRD = 18920.

WSEL	LEW	REW	AREA	K	Q	VEL
2071.50	403.8	716.7	107.9	2546.	3050.	28.26

X STA.	403.8	412.6	414.9	417.2	420.3	425.2
A(I)	5.2	3.1	3.2	3.6	4.4	
V(I)	29.24	48.50	47.37	41.94	35.04	
X STA.	425.2	551.1	562.0	572.9	583.7	594.4
A(I)	9.7	5.4	5.5	5.4	5.4	
V(I)	15.64	28.17	27.96	28.28	28.28	
X STA.	594.4	605.3	616.2	627.2	638.1	649.3
A(I)	5.4	5.4	5.5	5.5	5.6	
V(I)	28.04	28.04	27.71	27.93	27.39	
X STA.	649.3	660.0	670.7	681.7	692.8	716.7
A(I)	5.4	5.4	5.5	5.6	7.8	
V(I)	28.35	28.42	27.98	27.37	19.63	

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WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

VELOCITY DISTRIBUTION: ISEQ = 34; SECID = S2074; SRD = 18920.

WSEL	LEW	REW	AREA	K	Q	VEL
2072.00	400.0	733.3	246.7	7529.	3050.	12.36

X STA.	400.0	412.9	417.6	510.8	544.3	555.0
A(I)	11.2	8.8	36.2	18.4	10.4	
V(I)	13.65	17.38	4.21	8.28	14.67	
X STA.	555.0	564.9	575.3	585.4	595.5	603.9
A(I)	9.9	10.4	10.1	10.2	8.4	
V(I)	15.33	14.72	15.14	15.01	18.12	
X STA.	603.9	613.4	624.5	635.2	646.1	656.8
A(I)	9.5	11.1	10.7	10.9	10.7	
V(I)	16.13	13.79	14.19	14.05	14.21	
X STA.	656.8	667.5	678.2	688.8	699.2	733.3
A(I)	10.7	10.7	10.6	10.4	17.5	
V(I)	14.29	14.21	14.38	14.63	8.74	

VELOCITY DISTRIBUTION: ISEQ = 34; SECID = S2074; SRD = 18920.

WSEL	LEW	REW	AREA	K	Q	VEL
2072.50	12.5	750.0	428.8	17448.	3050.	7.11

X STA.	12.5	413.8	420.8	433.4	465.4	524.2
A(I)	30.9	15.9	19.4	26.8	41.3	
V(I)	4.93	9.60	7.87	5.70	3.69	
X STA.	524.2	542.5	555.3	567.3	579.3	590.9
A(I)	21.3	18.7	17.9	18.0	17.4	
V(I)	7.17	8.14	8.50	8.47	8.74	
X STA.	590.9	603.1	615.4	627.7	640.0	652.5
A(I)	18.3	18.3	18.5	18.4	18.8	
V(I)	8.32	8.32	8.22	8.29	8.13	
X STA.	652.5	664.6	676.6	688.9	700.9	750.0
A(I)	18.1	18.1	18.4	18.0	36.1	
V(I)	8.41	8.43	8.30	8.46	4.22	

1
WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
COE & VAN LOO CONSULTANTS
SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
*** RUN DATE & TIME: 08-04-94 14:00

VELOCITY DISTRIBUTION: ISEQ = 34; SECID = S2074; SRD = 18920.

WSEL	LEW	REW	AREA	K	Q	VEL
2073.00	5.0	1010.0	662.1	31611.	3050.	4.61

X STA.	5.0	410.5	418.9	431.7	457.7	486.9
A(I)	69.2	23.3	27.8	34.7	37.4	

```
  V(I)            2.20       6.56       5.49       4.40       4.08

X STA.       486.9      522.8      541.5      555.6      569.1      582.6
  A(I)            41.9       30.7       27.5       27.0       27.0
  V(I)            3.64       4.97       5.54       5.65       5.65

X STA.       582.6      596.3      610.0      623.5      637.1      651.0
  A(I)            27.5       27.5       26.8       27.3       27.8
  V(I)            5.55       5.55       5.68       5.60       5.49

X STA.       651.0      664.4      677.8      691.4      705.3     1010.0
  A(I)            26.8       26.8       27.2       27.4       70.7
  V(I)            5.68       5.69       5.61       5.57       2.16


   VELOCITY DISTRIBUTION:  ISEQ = 34;  SECID = S2074;  SRD =   18920.

       WSEL     LEW     REW    AREA        K        Q    VEL
    2073.50     2.5  1020.0   981.5   51857.    3050.   3.11

X STA.          2.5       74.1      411.9      422.7      443.0      466.8
  A(I)            69.8       98.0       35.0       42.6       44.9
  V(I)            2.19       1.56       4.36       3.58       3.39

X STA.       466.8      496.5      525.4      544.1      559.7      575.3
  A(I)            50.0       50.0       41.1       38.7       39.0
  V(I)            3.05       3.05       3.71       3.94       3.91

X STA.       575.3      590.6      605.9      621.3      636.6      651.9
  A(I)            38.2       38.2       38.6       38.3       38.1
  V(I)            4.00       4.00       3.95       3.98       4.00

X STA.       651.9      667.3      682.4      697.7      715.2     1020.0
  A(I)            38.6       37.6       38.2       40.2      126.4
  V(I)            3.95       4.05       3.99       3.79       1.21
1
WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00


   VELOCITY DISTRIBUTION:  ISEQ = 34;  SECID = S2074;  SRD =   18920.

       WSEL     LEW     REW    AREA        K        Q    VEL
    2074.00      .0  1030.0  1361.3   78850.    3050.   2.24

X STA.           .0       56.8      285.4      414.6      428.6      453.5
  A(I)            82.7      113.0      101.6       48.4       59.1
  V(I)            1.84       1.35       1.50       3.15       2.58

X STA.       453.5      479.0      510.3      534.1      552.7      570.1
  A(I)            59.6       65.9       58.2       53.1       52.3
  V(I)            2.56       2.31       2.62       2.87       2.92

X STA.       570.1      587.1      604.2      621.5      638.6      655.7
  A(I)            51.2       51.2       51.8       51.4       51.2
  V(I)            2.98       2.98       2.94       2.97       2.98

X STA.       655.7      673.0      689.8      707.5      800.0     1030.0
  A(I)            51.8       50.5       52.3      128.3      127.5
  V(I)            2.94       3.02       2.92       1.19       1.20
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WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 2079"
  XT    2079 19200
  GR         0,2079 20,2078 30,2077.2 92,2078 121,2076.2
  GR         134,2078 144,2078.5 155,2078 182,2077.2 210,2078
  GR         265,2079 330,2078 345,2076.8 362,2076.8 380,2076.6
  GR         391,2078 410,2078.5 422,2078 441,2077.9 460,2078
  GR         475,2078.3 505,2078 540,2078 575,2078.5 605,2078
  GR         620,2077.6 645,2078 690,2078.8 738,2078 760,2077
  GR         790,2077.2 808,2076.8 838,2077.5 860,2078 900,2079
  GR         940,2079.8
  *

*** FINISH PROCESSING CROSS SECTION - " 2079"
*** TEMPLATE CROSS SECTION " 2079" SAVED INTERNALLY.
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S2079"
  XS   S2079 19200
  GT
  N            0.04    0.04    0.04    0.04    0.04    0.04
  SA               270     410     580     695     940
  *
  HP 1 S2079 2077,0.5,2079

*** FINISH PROCESSING CROSS SECTION - "S2079"
*** CROSS SECTION "S2079" WRITTEN TO DISK, RECORD NO. = 35

--- DATA SUMMARY FOR SECID "S2079" AT SRD =  19200.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0220       .50       .00

X-Y COORDINATE PAIRS  (NGP =  36):
       X      Y          X      Y          X      Y          X      Y
       .0 2079.00      20.0 2078.00      30.0 2077.20      92.0 2078.00
    121.0 2076.20     134.0 2078.00     144.0 2078.50     155.0 2078.00
    182.0 2077.20     210.0 2078.00     265.0 2079.00     330.0 2078.00
    345.0 2076.80     362.0 2076.80     380.0 2076.60     391.0 2078.00
    410.0 2078.50     422.0 2078.00     441.0 2077.90     460.0 2078.00
    475.0 2078.30     505.0 2078.00     540.0 2078.00     575.0 2078.50
    605.0 2078.00     620.0 2077.60     645.0 2078.00     690.0 2078.80
    738.0 2078.00     760.0 2077.00     790.0 2077.20     808.0 2076.80
    838.0 2077.50     860.0 2078.00     900.0 2079.00     940.0 2079.80

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
       .0 2079.00     121.0 2076.20     940.0 2079.80     940.0 2079.80

SUBAREA BREAKPOINTS (NSA =  6):
       270.    410.    580.    695.    940.

ROUGHNESS COEFFICIENTS (NSA =  6):
        .040    .040    .040    .040    .040    .040
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1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 35;  SECID = S2079;  SRD =   19200.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1       7.      151.    19.    19.                          27.
            2      10.      138.    41.    41.                          27.
            5       2.       14.    18.    18.                           3.
  2077.00          19.      303.    77.    77.  1.16   108.   817.     49.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      27.      491.    78.    78.                          89.
            2      33.      900.    51.    51.                         148.
            5      34.      675.    89.    89.                         121.
  2077.50          94.     2066.   218.   218.  1.11    26.   838.    331.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      89.     2144.   169.   169.                         364.
            2      60.     2238.    61.    61.                         342.
            3       2.       10.    38.    38.                           2.
            4       8.      102.    40.    40.                          20.
            5      87.     2586.   122.   122.                         417.
  2078.00         246.     7079.   430.   430.  1.13    20.   860.    994.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     188.     6147.   228.   228.                         968.
            2     104.     3666.   112.   113.                         566.
            3      66.     1312.   170.   170.                         234.
            4      42.      932.    93.    93.                         162.
            5     160.     5708.   172.   172.                         880.
  2078.50         561.    17764.   775.   776.  1.08    10.   880.   2598.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     311.    12723.   270.   270.                        1894.
            2     168.     7066.   140.   140.                        1045.
            3     151.     5203.   170.   170.                         808.
            4      96.     3170.   115.   115.                         498.
            5     257.    11099.   205.   205.                        1629.
  2079.00         983.    39261.   900.   901.  1.02     0.   900.   5759.
1
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1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 2084"
  XT    2084 19420
  GR         605,2083.3  660,2082    715,2082.3  735,2083.5  805,2083.5
  GR         835,2082.8  870,2083.7  895,2083.6  920,2083.8  945,2083.1
  GR         955,2082.9  960,2083.3  970,2083    985,2082.7 1000,2082.9
  GR        1025,2082.4 1035,2082.3 1045,2083.6 1060,2082   1065,2081.7
  GR        1070,2082   1090,2084.4 1110,2084.5 1120,2084.5 1135,2084
  GR        1145,2083   1150,2084   1160,2084   1175,2084   1235,2084.2
  GR        1250,2084.6 1275,2084.5 1285,2084.9 1300,2084   1315,2083.1
  GR        1335,2083.2 1340,2083.5 1355,2084   1370,2084.8 1385,2084.7
  GR        1410,2084   1450,2083.6 1460,2083.3 1475,2083.9 1500,2084
  GR        1510,2083.3 1520,2083.3 1530,2084   1545,2084   1605,2086
  *
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Chan 2.00

$Q_1 = 824$ cfs

$WSEL_1 \cong 78.5$ +/-

Chan 1.00

$Q_{2-5} = 2048$ cfs

%K = .65

$\therefore Q_{2-5} = 1700$ cfs

$\therefore WSEL_{2-5} \approx 78.6$ +/-

%K = .68

$Q_{2-5} = 3892$

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*** FINISH PROCESSING CROSS SECTION - " 2084"
*** TEMPLATE CROSS SECTION " 2084" SAVED INTERNALLY.
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S2084"
  XS   S2084 19420
  GT
  N          .04   .04   .04   .04   .04   .04   .04   .04
  SA            870   960   1000  1120  1285  1370  1605
  *
  HP 1 S2084 2082.5,.5,2085

*** FINISH PROCESSING CROSS SECTION - "S2084"
*** CROSS SECTION "S2084" WRITTEN TO DISK, RECORD NO. = 36

--- DATA SUMMARY FOR SECID "S2084" AT SRD =  19420.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0220       .50       .00

X-Y COORDINATE PAIRS  (NGP =  50):
       X      Y          X      Y          X      Y          X      Y
    605.0 2083.30     660.0 2082.00     715.0 2082.30     735.0 2083.50
    805.0 2083.50     835.0 2082.80     870.0 2083.70     895.0 2083.60
    920.0 2083.80     945.0 2083.10     955.0 2082.90     960.0 2083.30
    970.0 2083.00     985.0 2082.70    1000.0 2082.90    1025.0 2082.40
   1035.0 2082.30    1045.0 2083.60    1060.0 2082.00    1065.0 2081.70
   1070.0 2082.00    1090.0 2084.40    1110.0 2084.50    1120.0 2084.50
   1135.0 2084.00    1145.0 2083.00    1150.0 2084.00    1160.0 2084.00
   1175.0 2084.00    1235.0 2084.20    1250.0 2084.60    1275.0 2084.50
   1285.0 2084.90    1300.0 2084.00    1315.0 2083.10    1335.0 2083.20
   1340.0 2083.50    1355.0 2084.00    1370.0 2084.80    1385.0 2084.70
   1410.0 2084.00    1450.0 2083.60    1460.0 2083.30    1475.0 2083.90
   1500.0 2084.00    1510.0 2083.30    1520.0 2083.30    1530.0 2084.00
   1545.0 2084.00    1605.0 2086.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    605.0 2083.30    1065.0 2081.70    1605.0 2086.00    1605.0 2086.00

SUBAREA BREAKPOINTS (NSA =  8):
        870.    960.   1000.   1120.   1285.   1370.   1605.

ROUGHNESS COEFFICIENTS (NSA =  8):
         .040    .040    .040    .040    .040    .040    .040    .040
1
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
   CROSS-SECTION PROPERTIES:  ISEQ = 36;  SECID = S2084;  SRD =   19420.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      25.     427.    79.    79.                          79.
            4      11.     177.    35.    35.                          33.
  2082.50          35.     604.   115.   115.  1.00   639.  1074.    112.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
```

Chan 1.00:
2084 $Q_T = 2843$
From Flowsplit analysis
$WSEL_{2,3,4} \cong 84.6$
$Q_{2,3,4} \cong 2048$
$\therefore Q_{5,6,7} \cong 800$ cfs
$\bar{Q} = 267$ cfs

```
            1      74.    1923.   125.   125.                          320.
            2       0.       2.     6.     6.                            0.
            3       5.      61.    30.    30.                           12.
            4      37.     936.    68.    68.                          158.
  2083.00          117.    2922.   230.   230.  1.04   618.  1078.    463.

    WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     153.    4978.   187.   187.                          785.
            2      10.     178.    29.    29.                           32.
            3      24.     625.    40.    40.                          104.
            4      75.    2636.    81.    81.                          408.
            5       2.      28.     8.     8.                            5.
            6       9.     147.    32.    32.                           28.
            7       4.      37.    27.    27.                            8.
  2083.50          276.    8628.   404.   405.  1.08   605.  1523.   1247.

    WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     285.   11106.   265.   266.                         1675.
            2      44.    1036.    90.    90.                          178.
            3      44.    1730.    40.    40.                          260.
            4     117.    5305.    87.    87.                          771.
            5       8.     175.    15.    15.                           30.
            6      31.     777.    55.    55.                          130.
            7      35.     566.   120.   120.                          106.
  2084.00          563.   20694.   672.   673.  1.14   605.  1530.   2742.

    WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     417.   20968.   265.   266.                         2971.
            2      89.    3321.    90.    90.                          506.
            3      64.    3240.    40.    40.                          457.
            4     162.    7816.   110.   110.                         1118.
            5      57.    1246.   126.   126.                          217.
            6      63.    2113.    73.    73.                          330.
            7     110.    3112.   168.   168.                          508.
  2084.50          963.   41816.   872.   874.  1.13   605.  1560.   5390.
1
 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 36;  SECID = S2084;  SRD =   19420.

    WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     550.   33162.   265.   267.                         4493.
            2     134.    6547.    90.    90.                          933.
            3      84.    5105.    40.    40.                          688.
            4     222.   12463.   120.   120.                         1716.
            5     136.    4450.   165.   165.                          701.
            6     103.    4358.    85.    85.                          643.
            7     205.    7618.   205.   205.                         1161.
  2085.00         1434.   73703.   970.   973.  1.12   605.  1575.   9362.
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 WSPRO        FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188          MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 2090"
  XS    2090 19690
  GR        0,2091    20,2090.2  25,2090    45,2088     55,2087.6
  GR        75,2087.1 105,2087.6  110,2088    120,2089.4   150,2088.9
```

$\therefore$ $WSEL_7 \cong 84.3$

$WSEL_6 \cong 84.4$

$WSEL_5 \cong 84.6$ +/-

```
GR        175,2089.2  190,2088
GR        205,2087.7  217,2088   230,2089.4   245,2088.8  285,2089.1
GR        315,2089.9  355,2089.5  370,2088.1  390,2088.3  410,2088.7
GR        430,2088.7  450,2089.6  515,2088.7  540,2089.1  585,2089.3
GR        596,2089.1  620,2089.5  640,2089.3  660,2089.6  685,2088.9
GR        700,2090    735,2092    760,2092.6
N            .04   .04    .04
SA              120   315
*
HP 1  2090 2088.5,.5,2090

*** FINISH PROCESSING CROSS SECTION - " 2090"
*** CROSS SECTION " 2090" WRITTEN TO DISK, RECORD NO. = 37

--- DATA SUMMARY FOR SECID " 2090" AT SRD =  19690.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0220       .50       .00

X-Y COORDINATE PAIRS  (NGP =  35):
       X      Y          X      Y          X      Y          X      Y
      .0 2091.00      20.0 2090.20      25.0 2090.00      45.0 2088.00
    55.0 2087.60      75.0 2087.10     105.0 2087.60     110.0 2088.00
   120.0 2089.40     150.0 2088.90     175.0 2089.20     190.0 2088.00
   205.0 2087.70     217.0 2088.00     230.0 2089.40     245.0 2088.80
   285.0 2089.10     315.0 2089.90     355.0 2089.50     370.0 2088.10
   390.0 2088.30     410.0 2088.70     430.0 2088.70     450.0 2089.60
   515.0 2088.70     540.0 2089.10     585.0 2089.30     596.0 2089.10
   620.0 2089.50     640.0 2089.30     660.0 2089.60     685.0 2088.90
   700.0 2090.00     735.0 2092.00     760.0 2092.60

 X-Y MAX-MIN POINTS:
    XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      .0 2091.00      75.0 2087.10     760.0 2092.60     760.0 2092.60

SUBAREA BREAKPOINTS (NSA =  3):
       120.    315.

ROUGHNESS COEFFICIENTS (NSA =  3):
        .040    .040    .040
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

         Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
         COE & VAN LOO CONSULTANTS
         SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
           *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 37;  SECID =  2090;  SRD =   19690.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      70.     2529.   74.    74.                          389.
            2      20.      497.   38.    38.                           84.
            3       8.      110.   34.    34.                           21.
  2088.50          98.     3135.  146.   146.  1.13    40.   400.    431.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     109.     4902.   82.    82.                          713.
            2      46.     1051.   95.    95.                          181.
            3      44.      821.  122.   122.                          148.
  2089.00         199.     6773.  299.   299.  1.36    35.   686.    787.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     152.     8039.   90.    90.                         1124.
            2     121.     3466.  180.   180.                          564.
            3     152.     3439.  318.   319.                          593.
  2089.50         425.    14945.  588.   589.  1.46    30.   693.   1695.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
```

Chan 1.00
2090 : Q = 2843
From Flow split
Analyse WSEL ≅ 89.82+/-

```
            1     198.   12065.    95.    95.                        1628.
            2     216.    8589.   195.   195.                        1287.
            3     333.   11277.   385.   385.                        1760.
  2090.00         748.   31931.   675.   676.  1.22    25.   700.   4041.
1
  *
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - " 2108"
  XT    2108 20590
  GR         0,2108    30,2106    32,2105.5   70,2105.5   80,2107
  GR         100,2105.5  110,2106   130,2106.5  275,2106.5  280,2107
  GR         350,2106   380,2105   410,2105   440,2106   460,2108
  *

*** FINISH PROCESSING CROSS SECTION - " 2108"
*** TEMPLATE CROSS SECTION " 2108" SAVED INTERNALLY.
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

*** START PROCESSING CROSS SECTION - "S2108"
  XS   S2108 20590
  GT
  N             .040   .045    .040
  SA                80     280
  *
  HP 1 S2108 2106.5,.5,2108

*** FINISH PROCESSING CROSS SECTION - "S2108"
*** CROSS SECTION "S2108" WRITTEN TO DISK, RECORD NO. = 38

--- DATA SUMMARY FOR SECID "S2108" AT SRD =  20590.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0220       .50       .00

X-Y COORDINATE PAIRS  (NGP =  15):
       X      Y          X      Y          X      Y          X      Y
      .0 2108.00      30.0 2106.00      32.0 2105.50      70.0 2105.50
    80.0 2107.00     100.0 2105.50     110.0 2106.00     130.0 2106.50
   275.0 2106.50     280.0 2107.00     350.0 2106.00     380.0 2105.00
   410.0 2105.00     440.0 2106.00     460.0 2108.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      .0 2108.00     380.0 2105.00     460.0 2108.00        .0 2108.00

SUBAREA BREAKPOINTS (NSA =  3):
        80.    280.

ROUGHNESS COEFFICIENTS (NSA =  3):
        .040    .045    .040
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS
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        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 38;  SECID = S2108;  SRD =   20590.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1      45.     1463.   54.    54.                        230.
             2      19.      368.   43.    43.                         72.
             3     115.     3946.  130.   130.                        614.
  2106.50          179.     5777.  228.   228.  1.05    23.   445.    877.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1      75.     3033.   65.    65.                        453.
             2     116.     2680.  200.   200.                        503.
             3     190.     7620.  170.   170.                       1140.
  2107.00          381.    13332.  435.   435.  1.14    15.   450.   1890.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     109.     5308.   73.    73.                        757.
             2     216.     7541.  200.   200.                       1276.
             3     276.    13945.  175.   175.                       1970.
  2107.50          601.    26793.  448.   448.  1.08     8.   455.   3811.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
             1     147.     8198.   80.    80.                       1131.
             2     316.    14208.  200.   200.                       2257.
             3     365.    21771.  180.   180.                       2949.
  2108.00          828.    44177.  460.   460.  1.05     0.   460.   6162.
1
  *
1
 WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
 P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00

 *** START PROCESSING CROSS SECTION - " 2122"
  XS    2122 21290
  GR        0,2122  25,2120 70,2120  80,2119 90,2117
  GR        140,2117   150,2120   180,2122
  N            .045  .040   .045
  SA             80       150
  *
  HP 1  2122 2120.5,.5,2122

 *** FINISH PROCESSING CROSS SECTION - " 2122"
 *** CROSS SECTION " 2122" WRITTEN TO DISK, RECORD NO. = 39

 --- DATA SUMMARY FOR SECID " 2122" AT SRD =  21290.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
       .0        0.     .0220       .50       .00

 X-Y COORDINATE PAIRS  (NGP =   8):
       X      Y          X      Y          X      Y          X      Y
      .0 2122.00      25.0 2120.00      70.0 2120.00      80.0 2119.00
    90.0 2117.00     140.0 2117.00     150.0 2120.00     180.0 2122.00

  X-Y MAX-MIN POINTS:
     XMIN      Y          X    YMIN      XMAX       Y          X    YMAX
      .0 2122.00      90.0 2117.00     180.0 2122.00        .0 2122.00

 SUBAREA BREAKPOINTS (NSA =  3):
         80.    150.
```
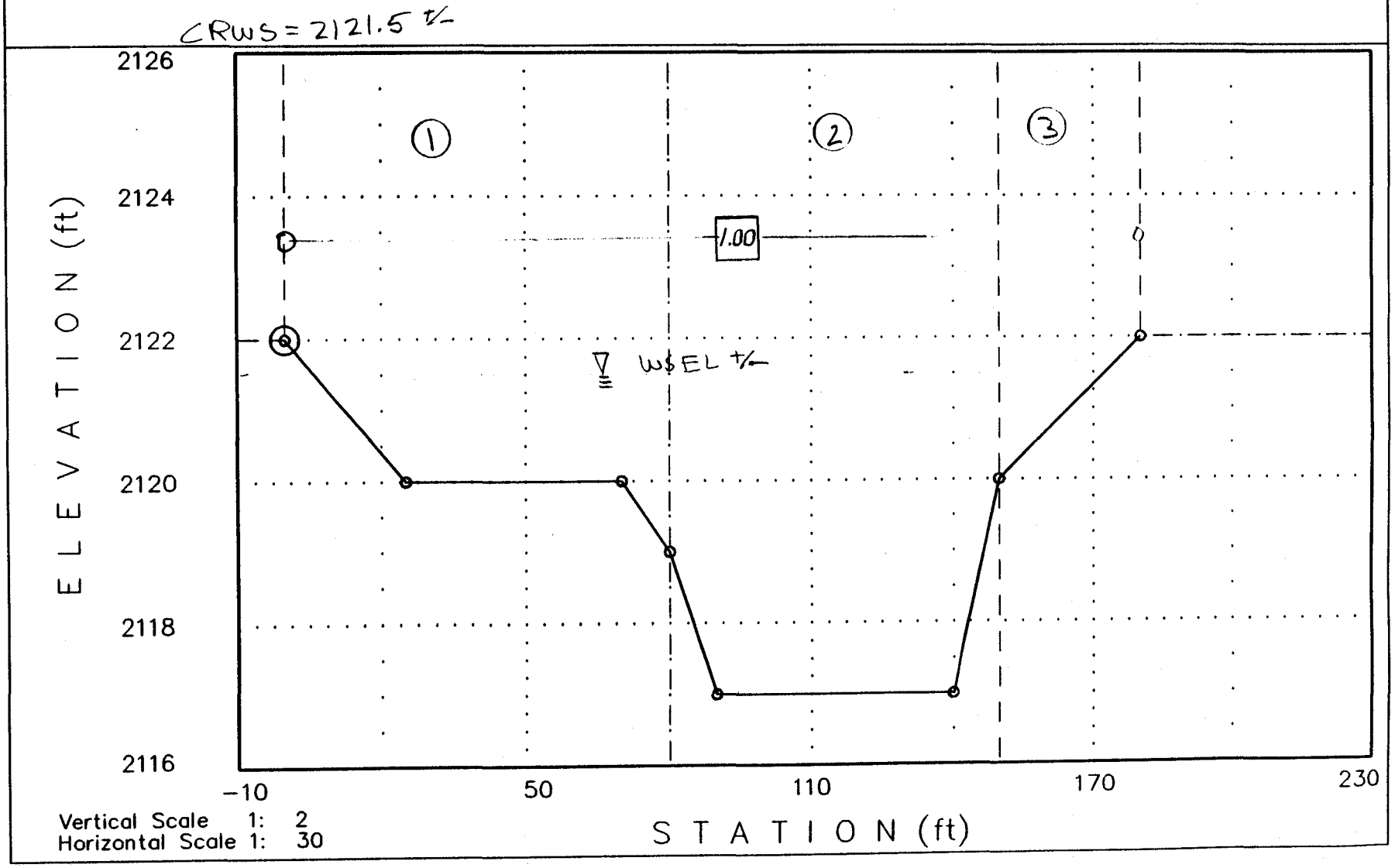
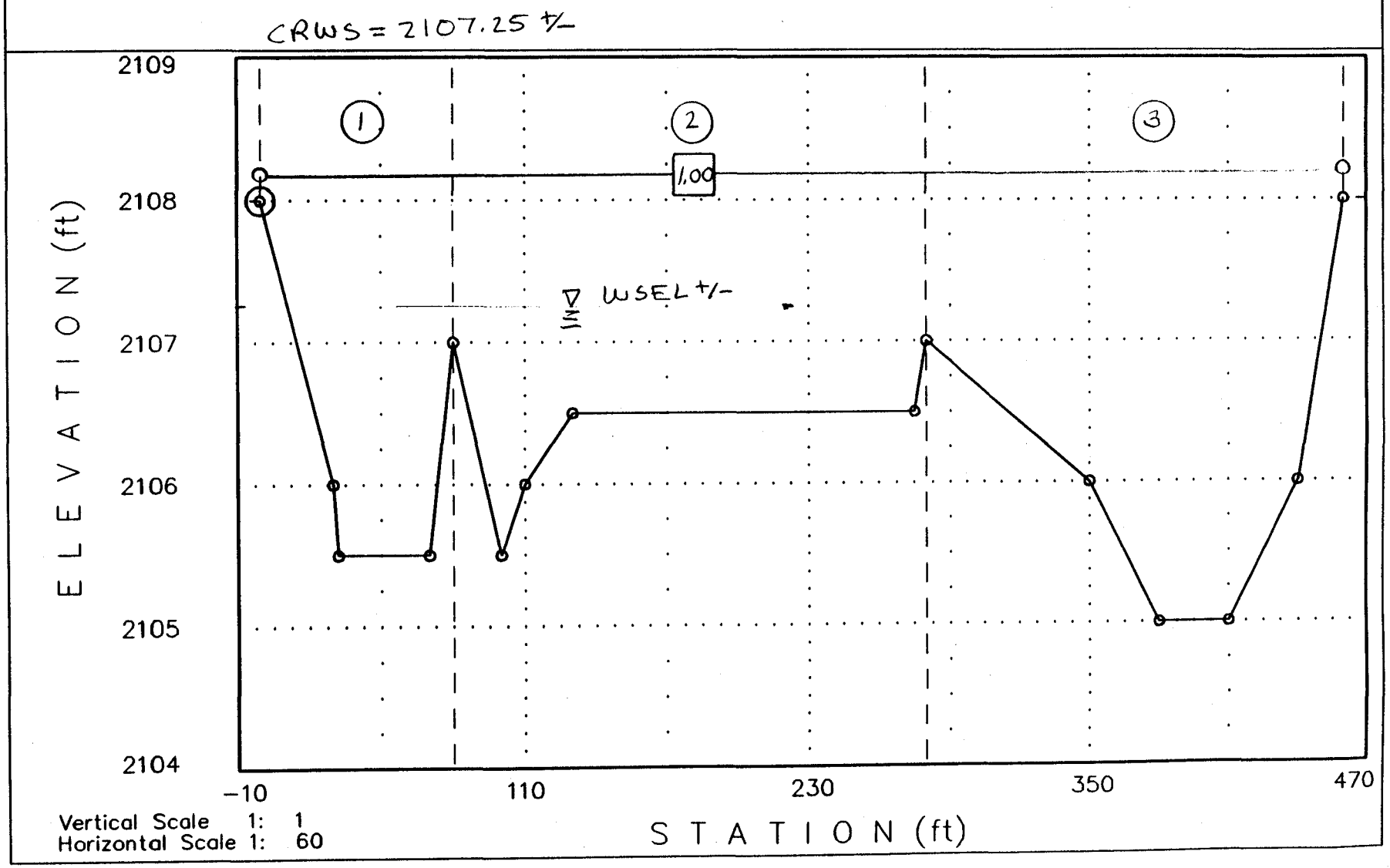

```
ROUGHNESS COEFFICIENTS (NSA =  3):
        .045    .040    .045
1
WSPRO         FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
P060188           MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        Wash 6a: FLOODPLAIN DELINEATION STUDY : Critical Depth Calc's
        COE & VAN LOO CONSULTANTS
        SECTIONS BASED ON TOPO MAPS @ 1 IN.=200 FT., 2 FT. CONTOURS
          *** RUN DATE & TIME: 08-04-94  14:00
    CROSS-SECTION PROPERTIES:  ISEQ = 39;  SECID =  2122;  SRD =   21290.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      34.      762.    61.    61.                        144.
            2     220.    17477.    70.    71.                       2213.
            3       2.       25.     8.     8.                          5.
  2120.50          256.    18264.   139.   139.  1.19    19.   158.   1808.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1      66.     2165.    68.    68.                        372.
            2     255.    22353.    70.    71.                       2762.
            3       8.      156.    15.    15.                         30.
  2121.00          329.    24674.   153.   153.  1.25    13.   165.   2447.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     102.     4158.    74.    74.                        676.
            2     290.    27697.    70.    71.                       3349.
            3      17.      461.    23.    23.                         83.
  2121.50          408.    32316.   166.   167.  1.28     6.   173.   3205.

     WSEL  SA#     AREA        K   TOPW   WETP  ALPH    LEW    REW     QCR
            1     140.     6724.    80.    80.                       1051.
            2     325.    33489.    70.    71.                       3974.
            3      30.      992.    30.    30.                        170.
  2122.00          495.    41206.   180.   181.  1.30     0.   180.   4080.
1
  *
  EX         0  1
+++021 DATA COUNT INCONSISTENT WITH PROFILE COUNT -     2     0
+++014 WARNING:  EXCESS DATA ITEMS IGNORED.
+++023 DISCHARGE DATA INVALID OR MISSING -     0


+++024 PROFILE COMPUTATIONS BYPASSED DUE TO INCONSISTENT CONTROL DATA.

  ER

1  NORMAL  END  OF  WSPRO  EXECUTION.
```

<<<<<< Cross Section: 2122: (FN = WLOMR) >>>>>>



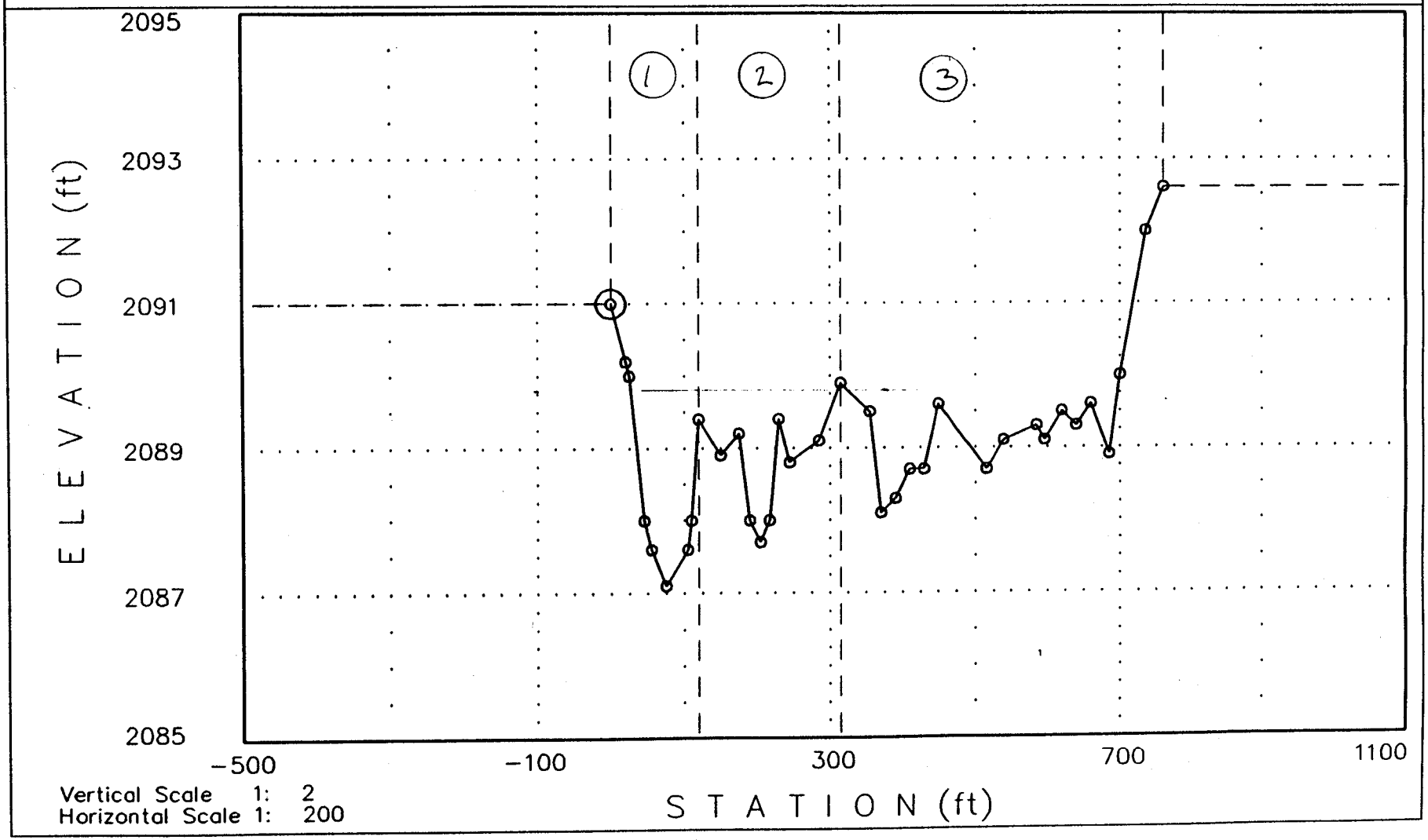
07-20-1994

<<<<<< Cross Section: 2108: (FN = WLOMR) >>>>>>



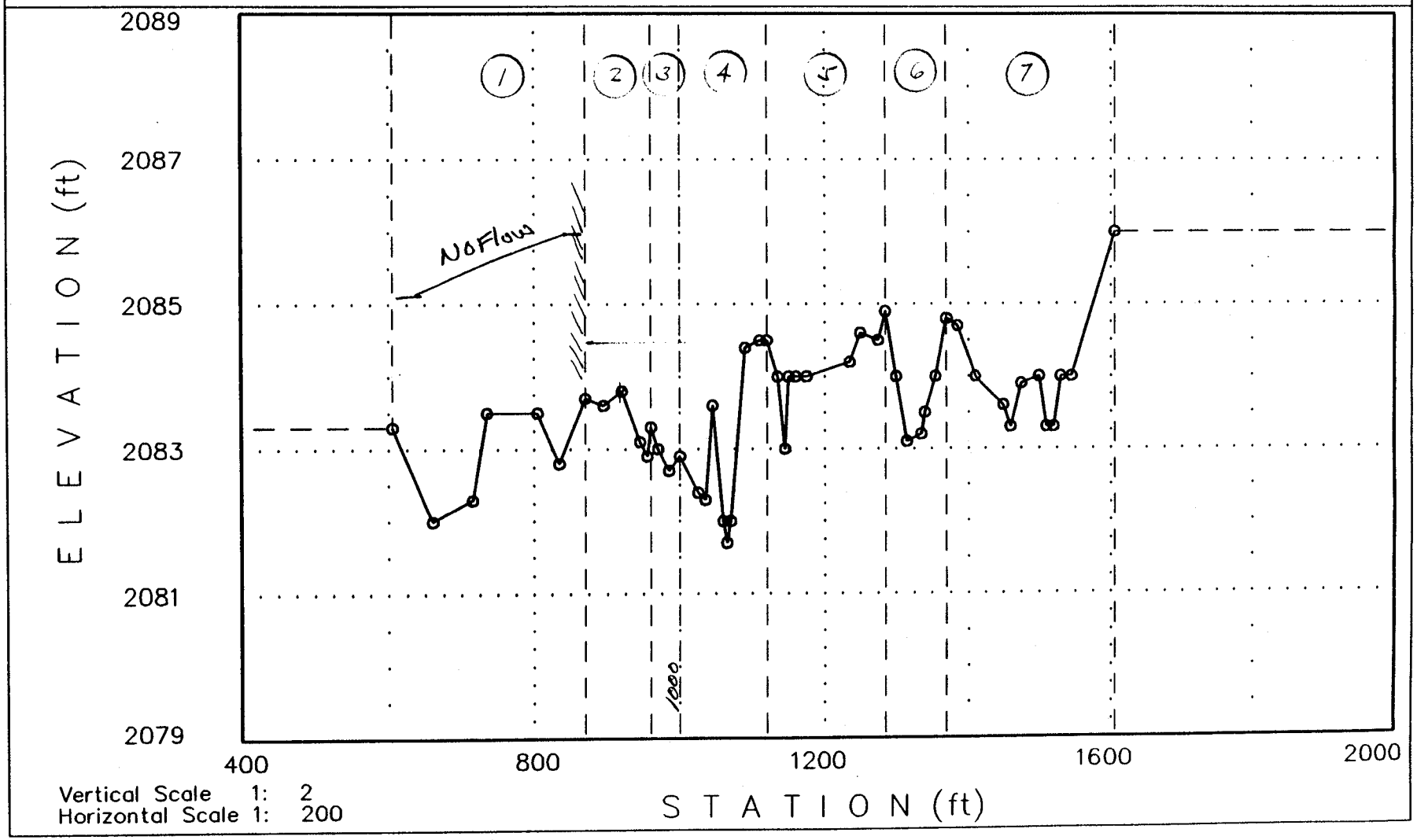
07-20-1994

<<<<<< Cross Section: 2090: (FN = WLOMR) >>>>>>



08-02-1994

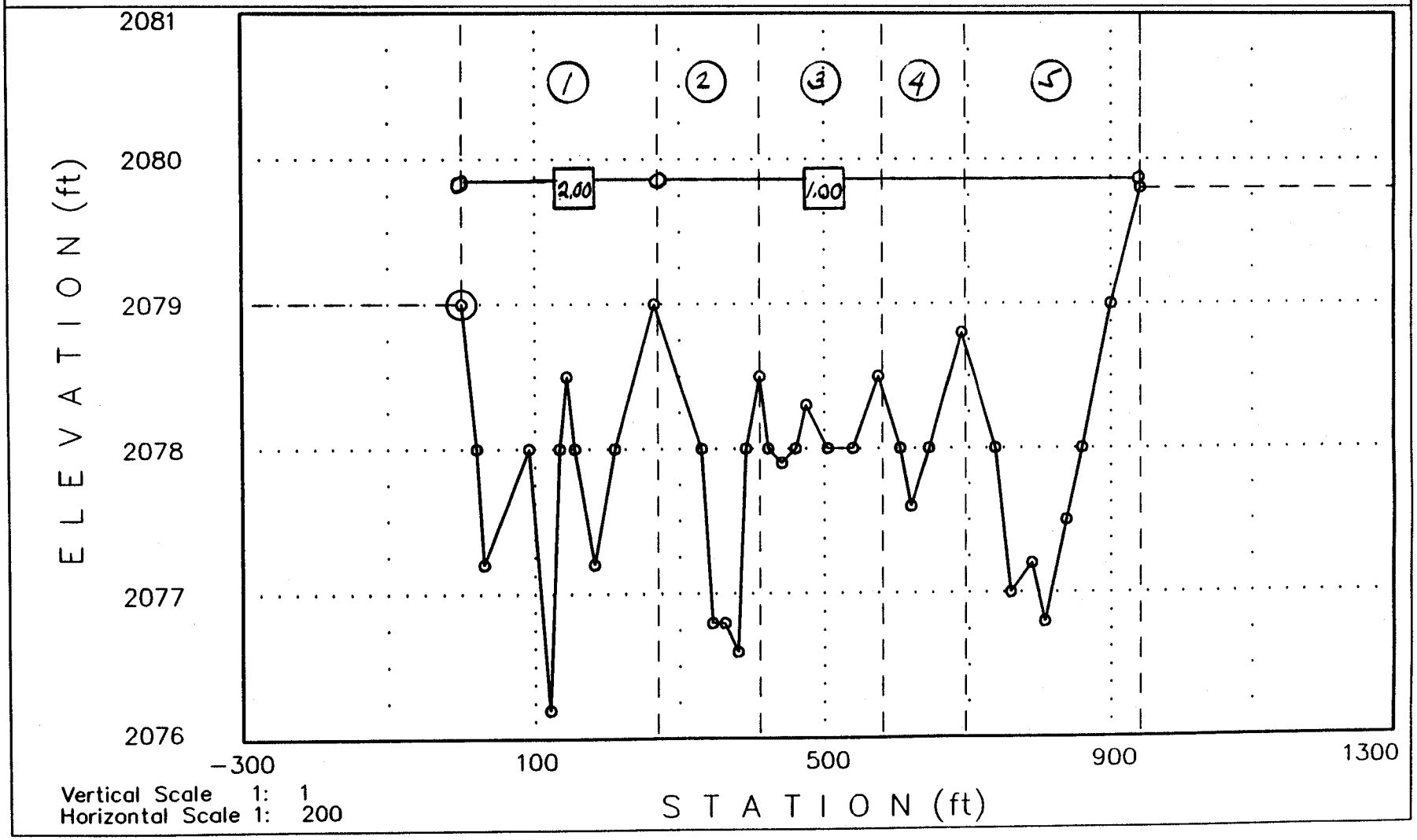
<<<<<< Cross Section: 2084: (FN = WLOMR) >>>>>>



07-25-1994

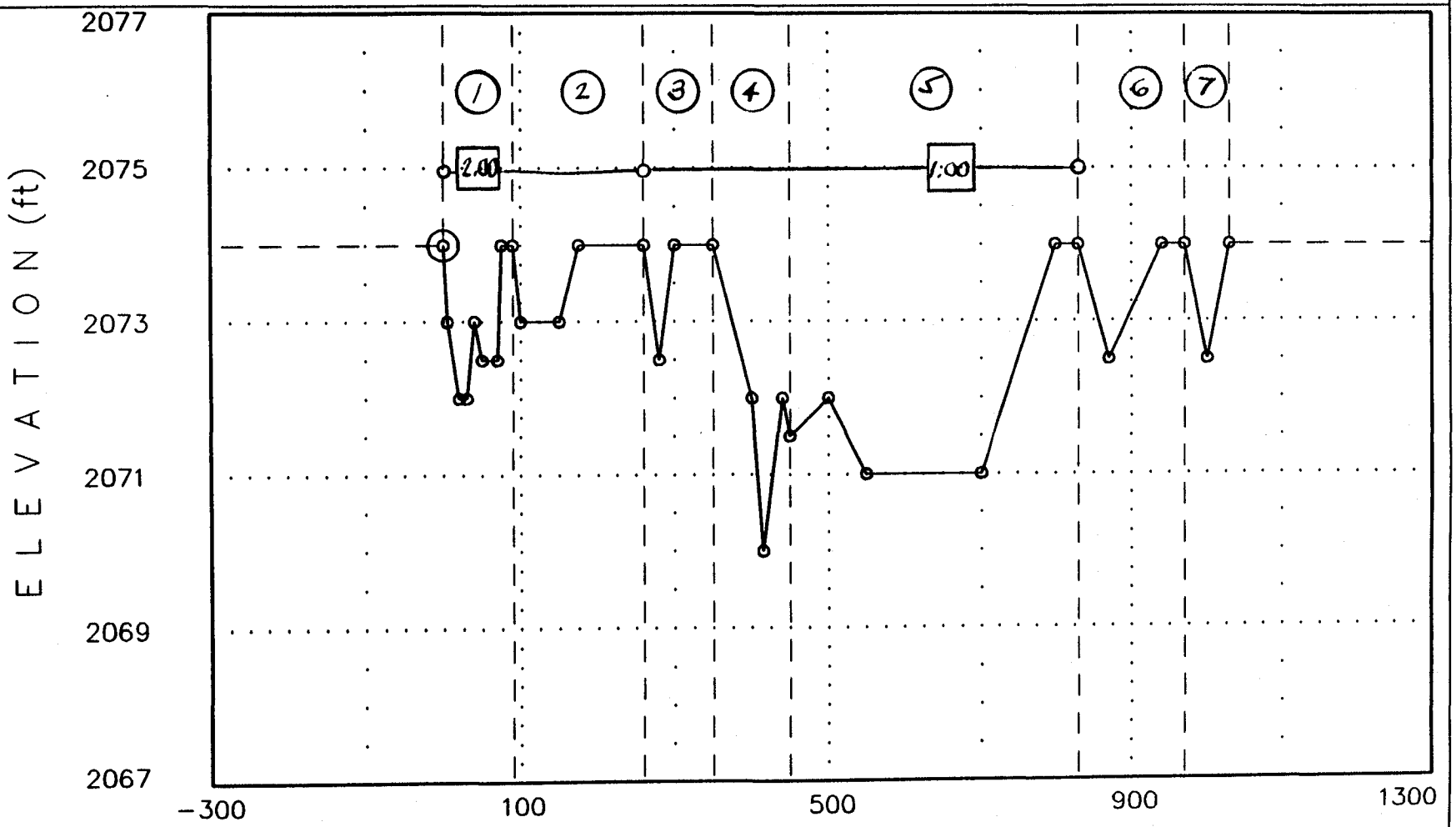
1110

<<<<<< Cross Section: 2079: (FN = WLOMR) >>>>>>



07-20-1994

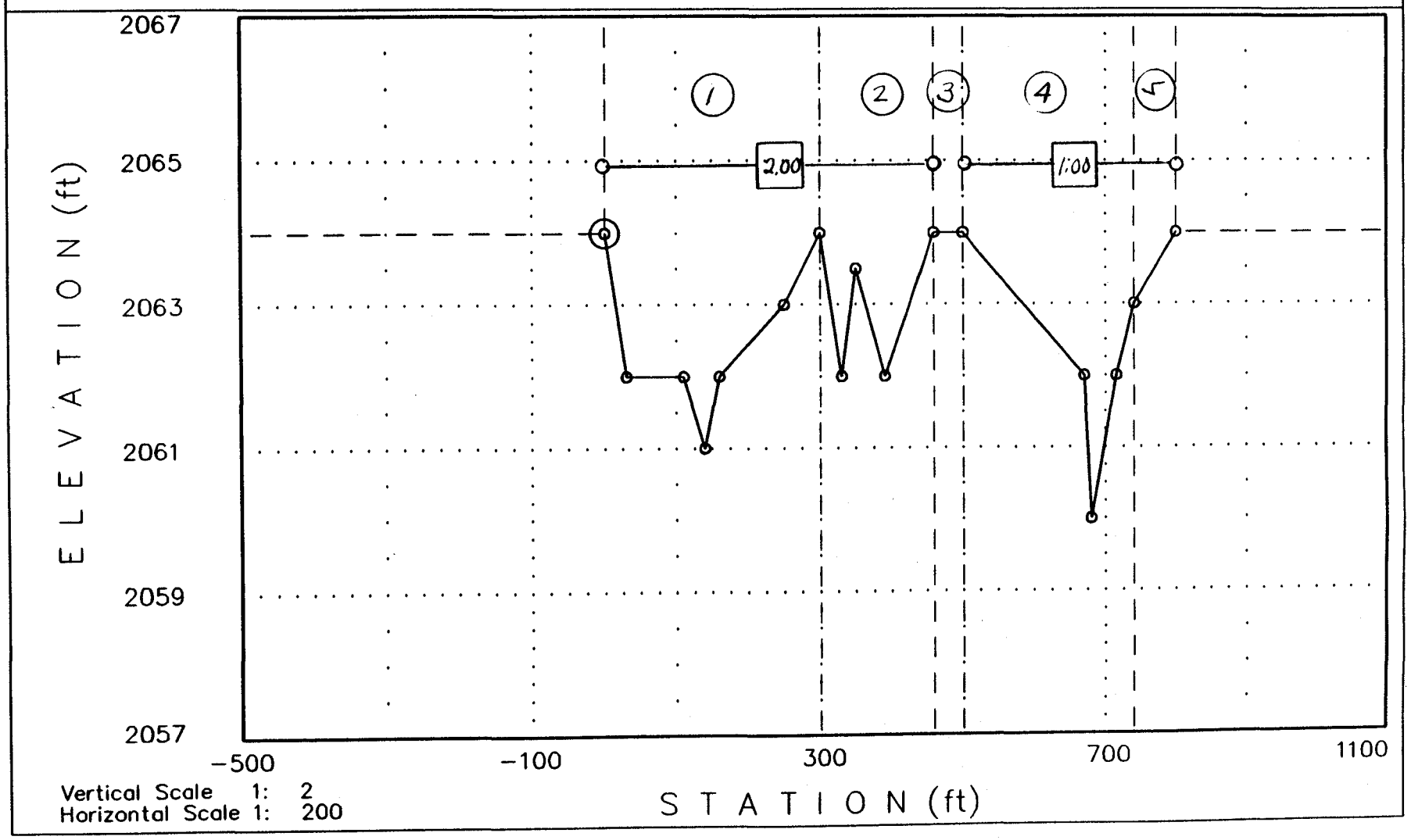
<<<<<< Cross Section: 2074: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 200

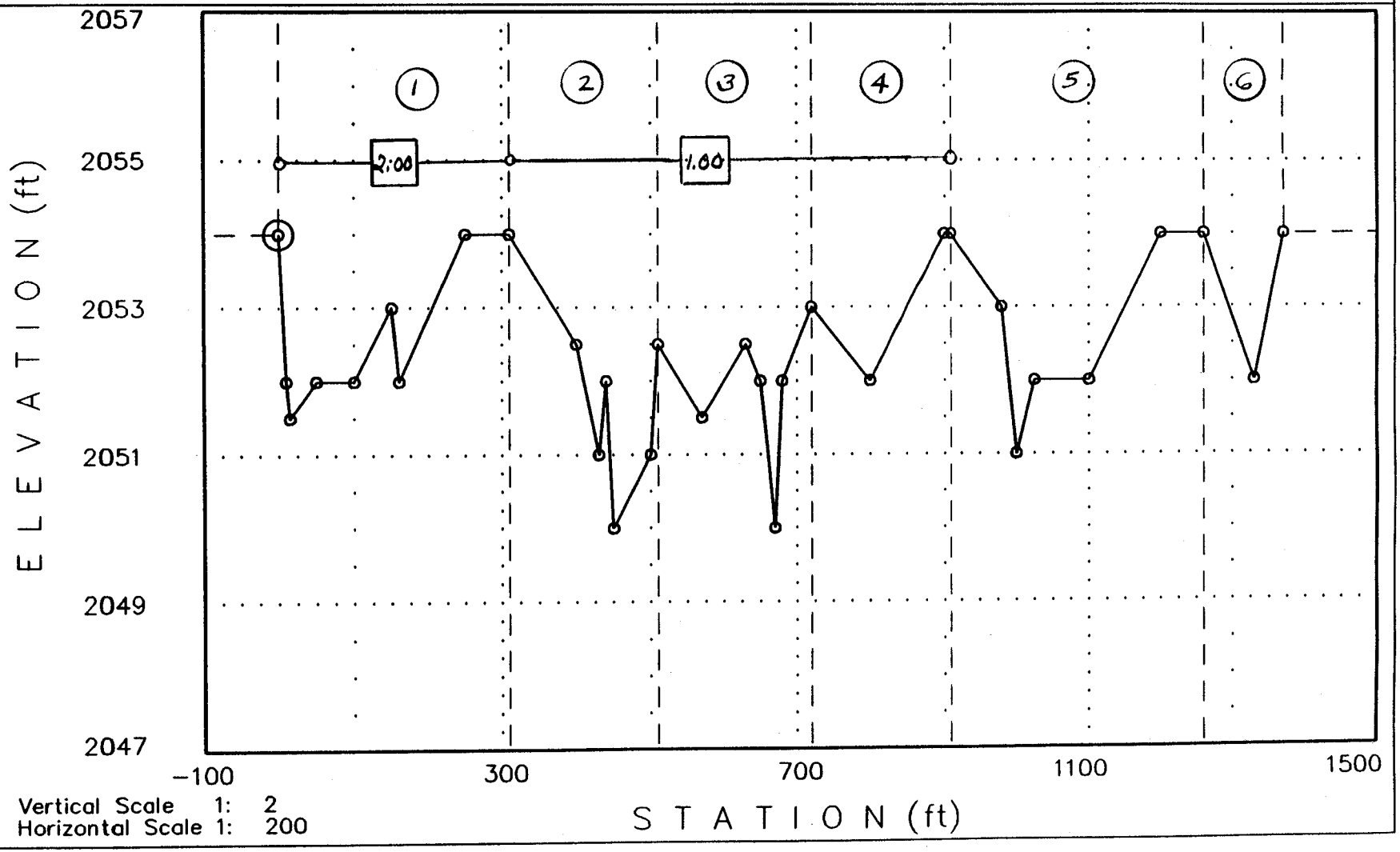
07-20-1994

<<<<<< Cross Section: 2064: (FN = WLOMR) >>>>>>



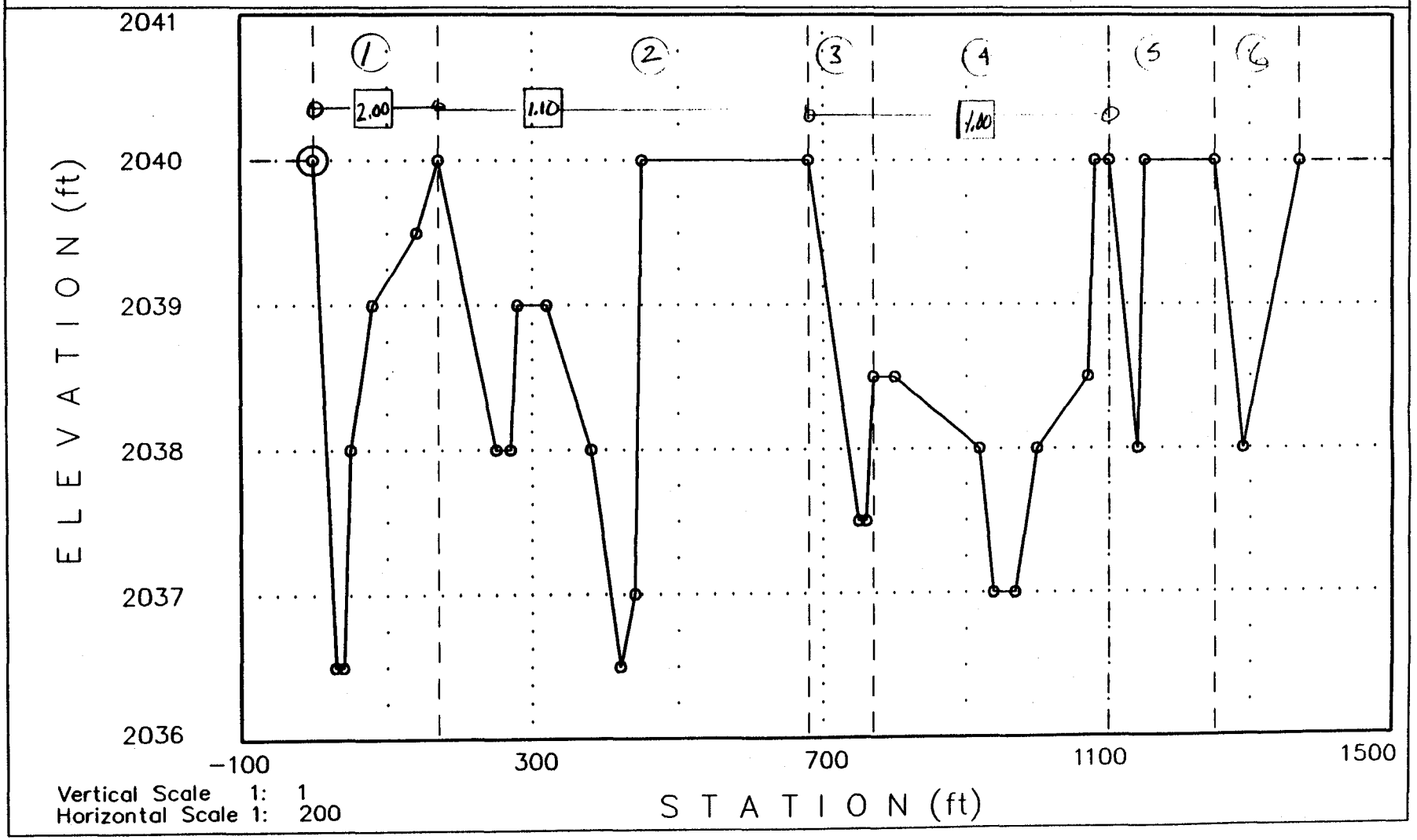
07-20-1994

<<<<<< Cross Section: 2054: (FN = WLOMR) >>>>>>



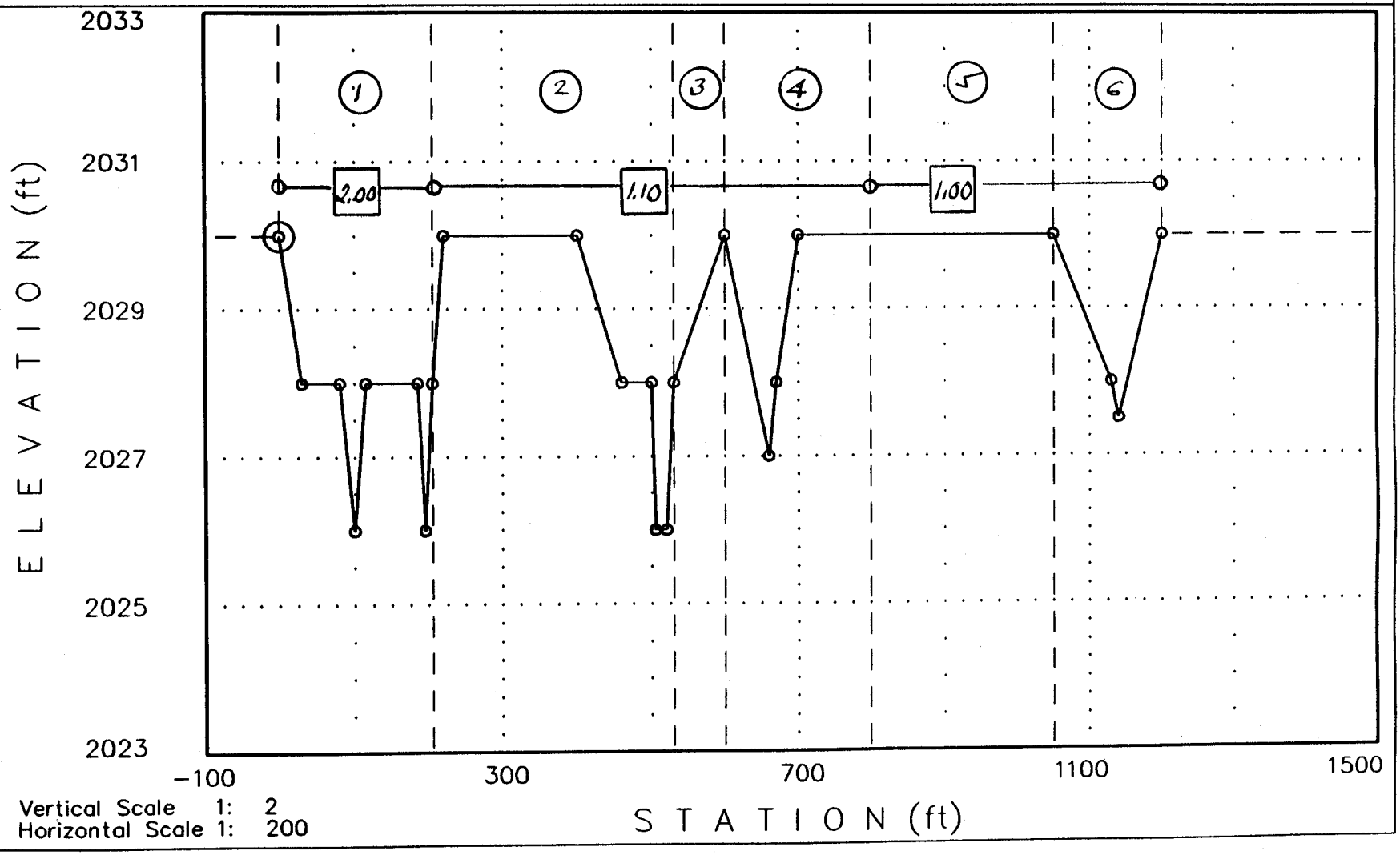
07-20-1994

<<<<<< Cross Section: 2040: (FN = WLOMR) >>>>>>



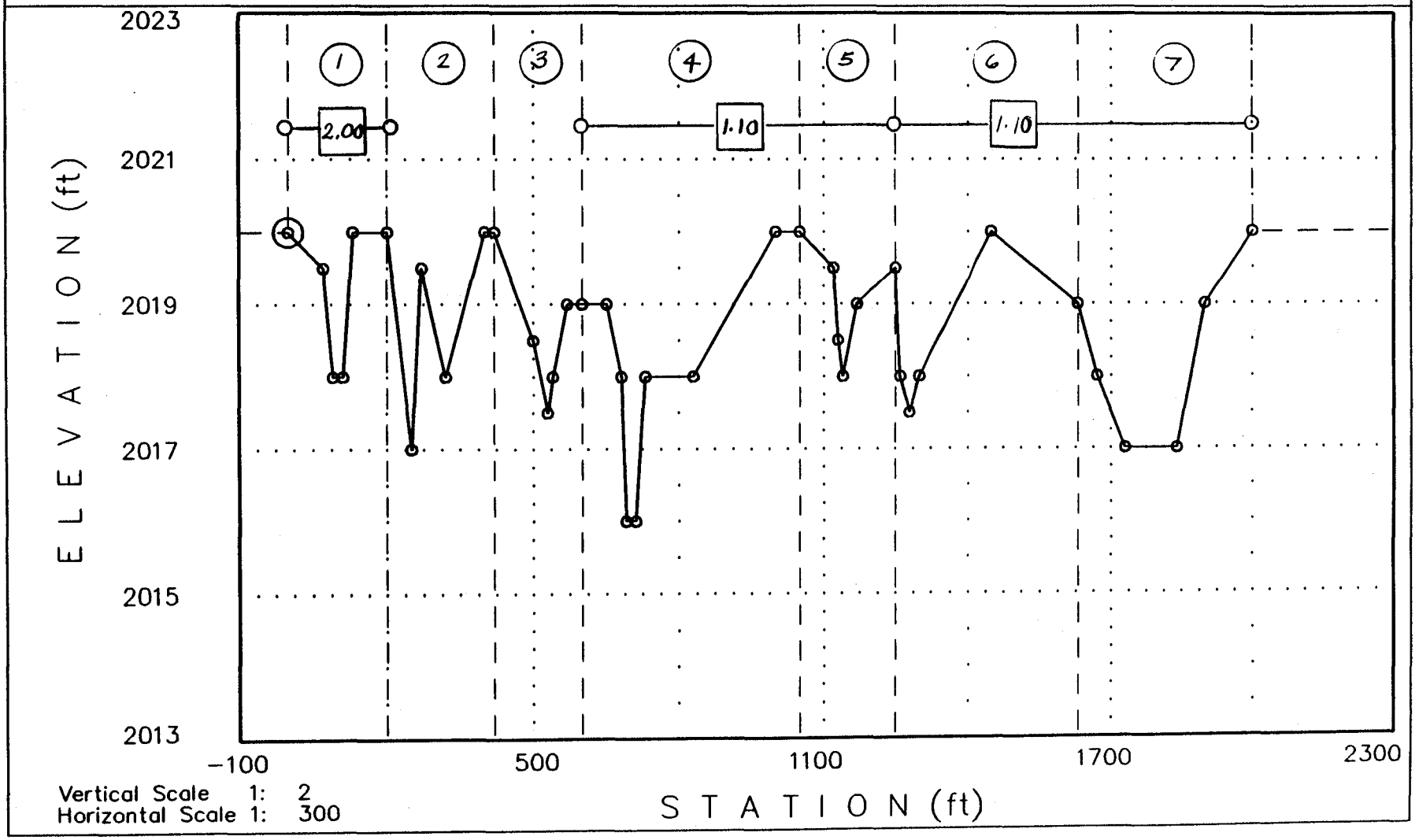
07-20-1994

<<<<<< Cross Section: 2030: (FN = WLOMR) >>>>>>



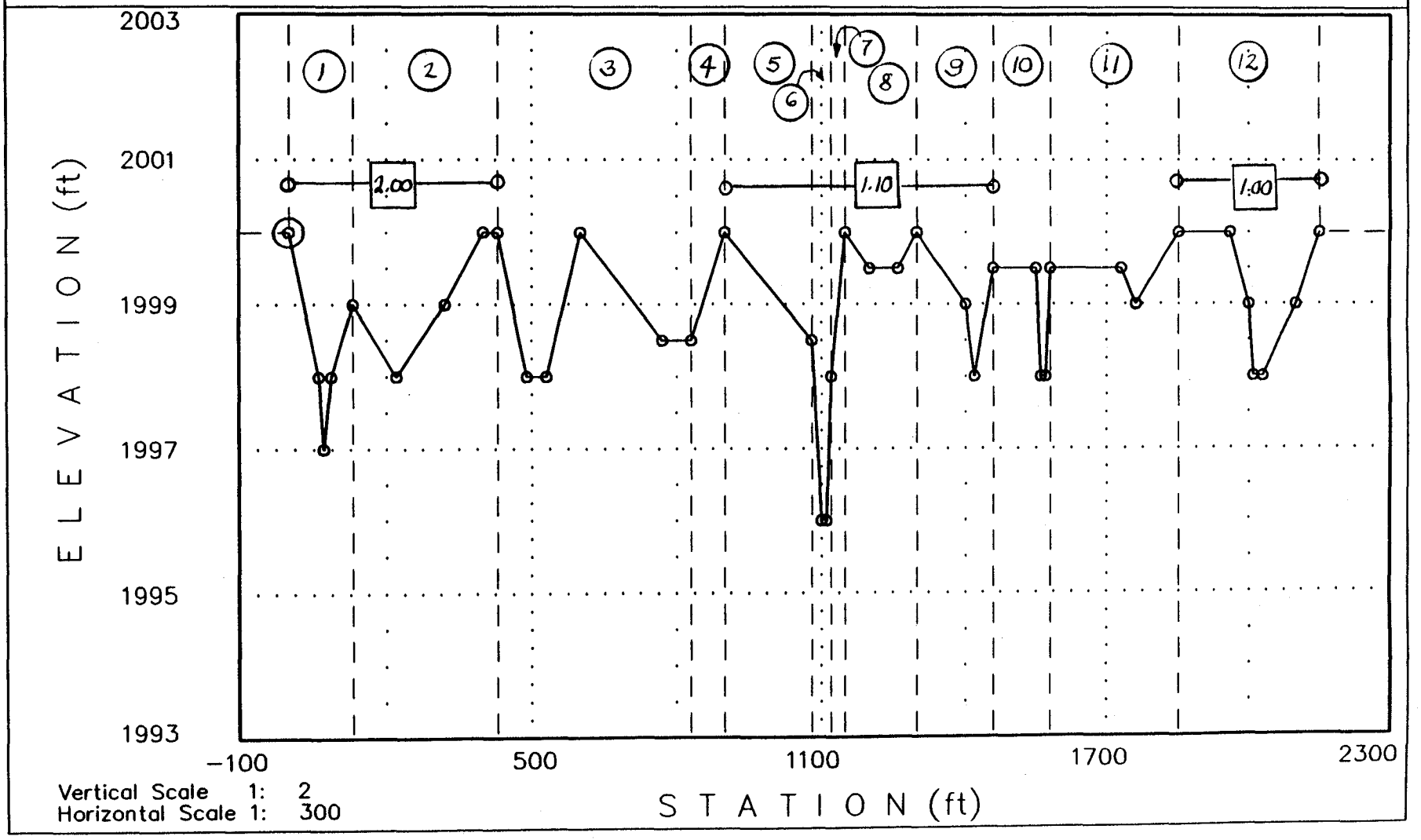
07-20-1994

<<<<<< Cross Section: 2020: (FN = WLOMR) >>>>>>



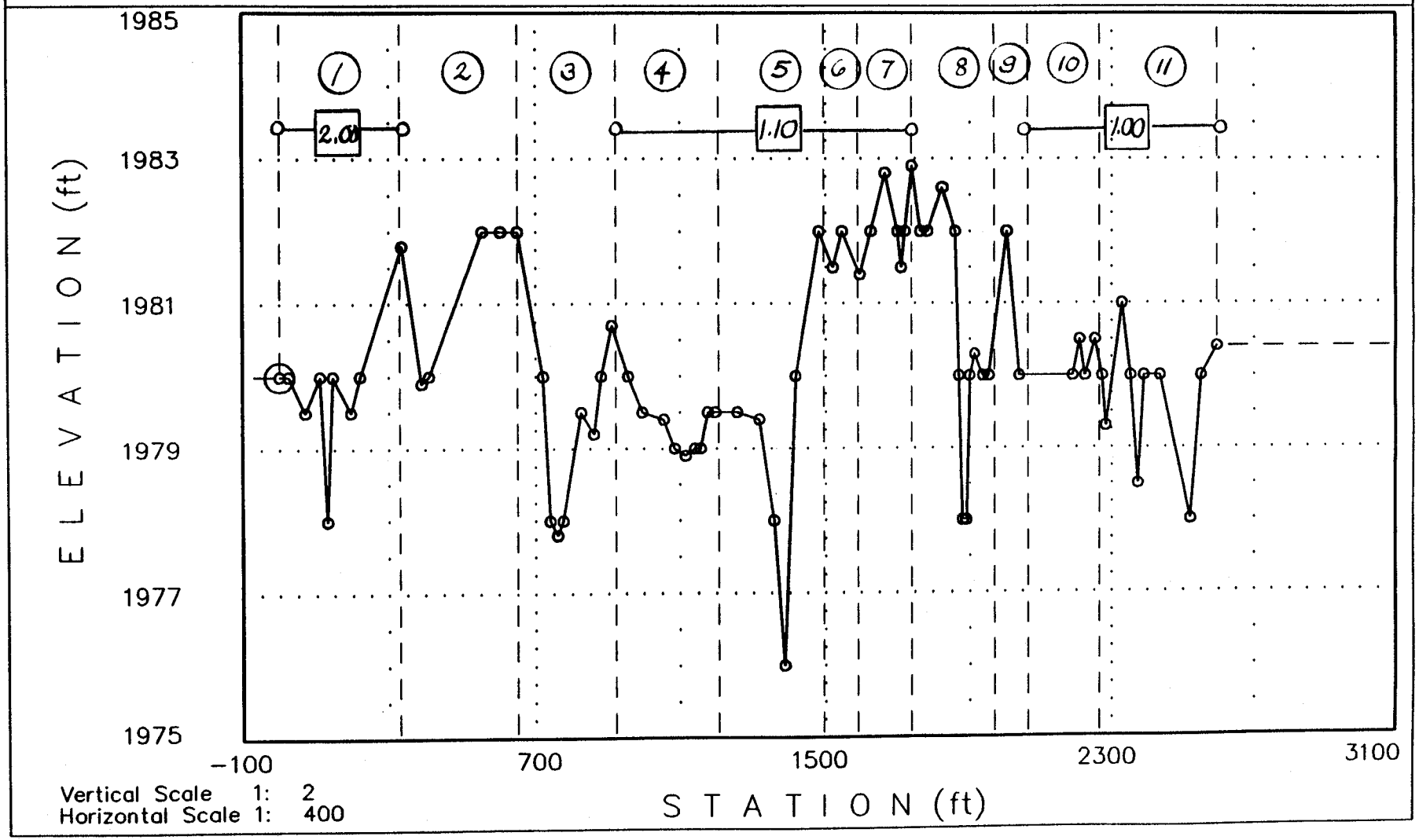
07-20-1994

<<<<<< Cross Section: 2000: (FN = WLOMR) >>>>>>



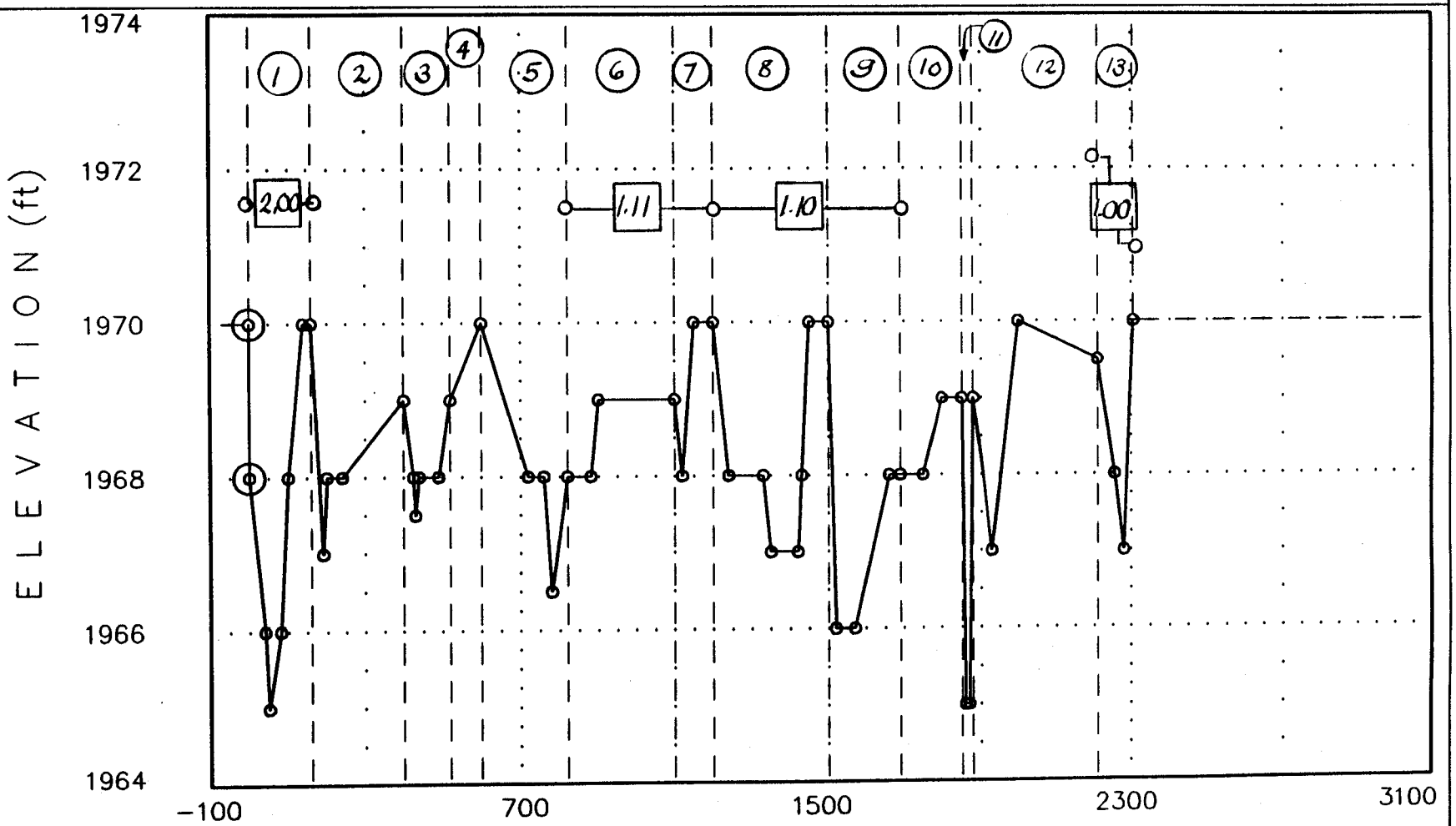
07-20-1994

<<<<<< Cross Section: 1980: (FN = WLOMR) >>>>>>



07-20-1994

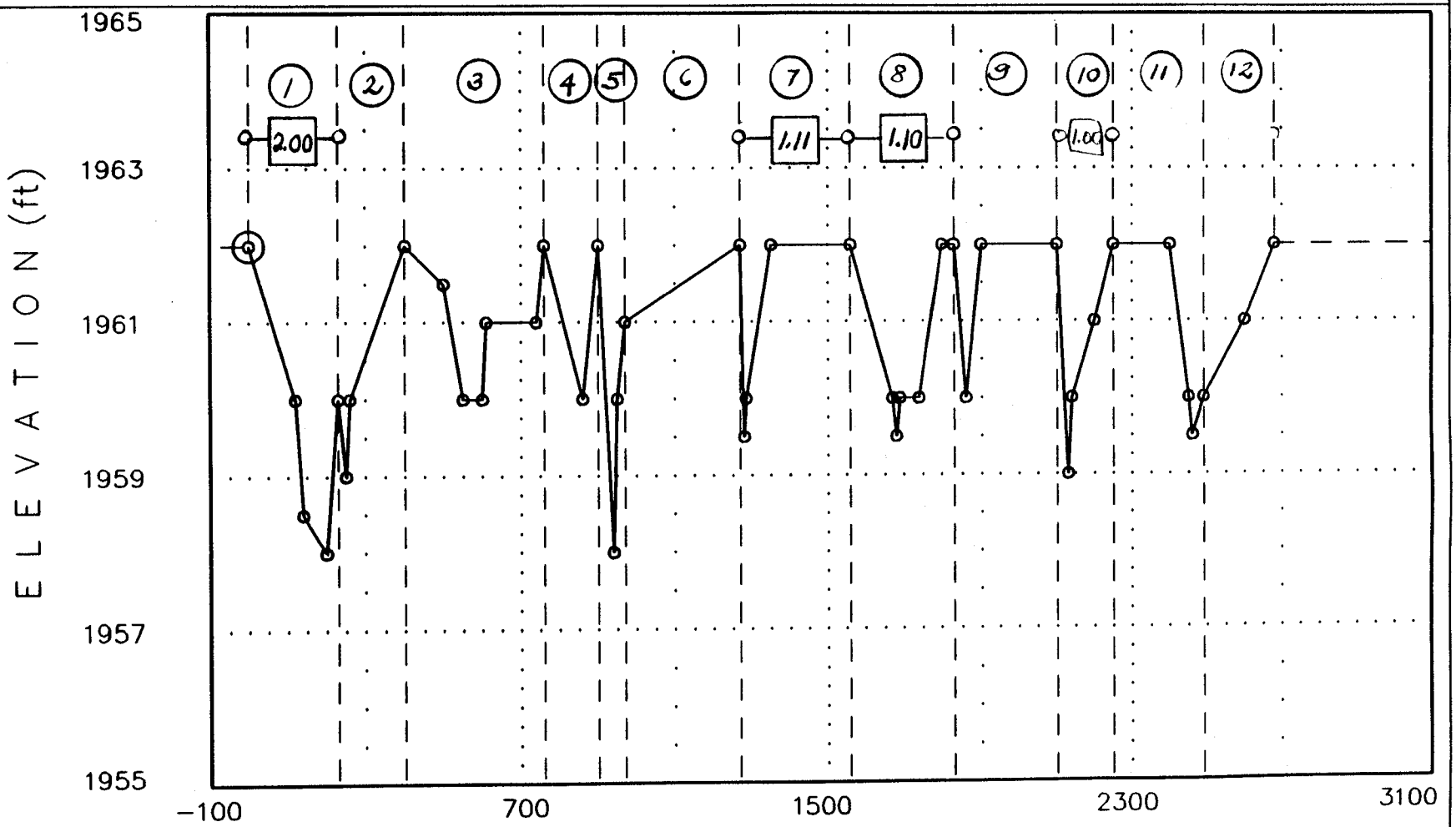
<<<<<< Cross Section: 1970: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 400

07-20-1994

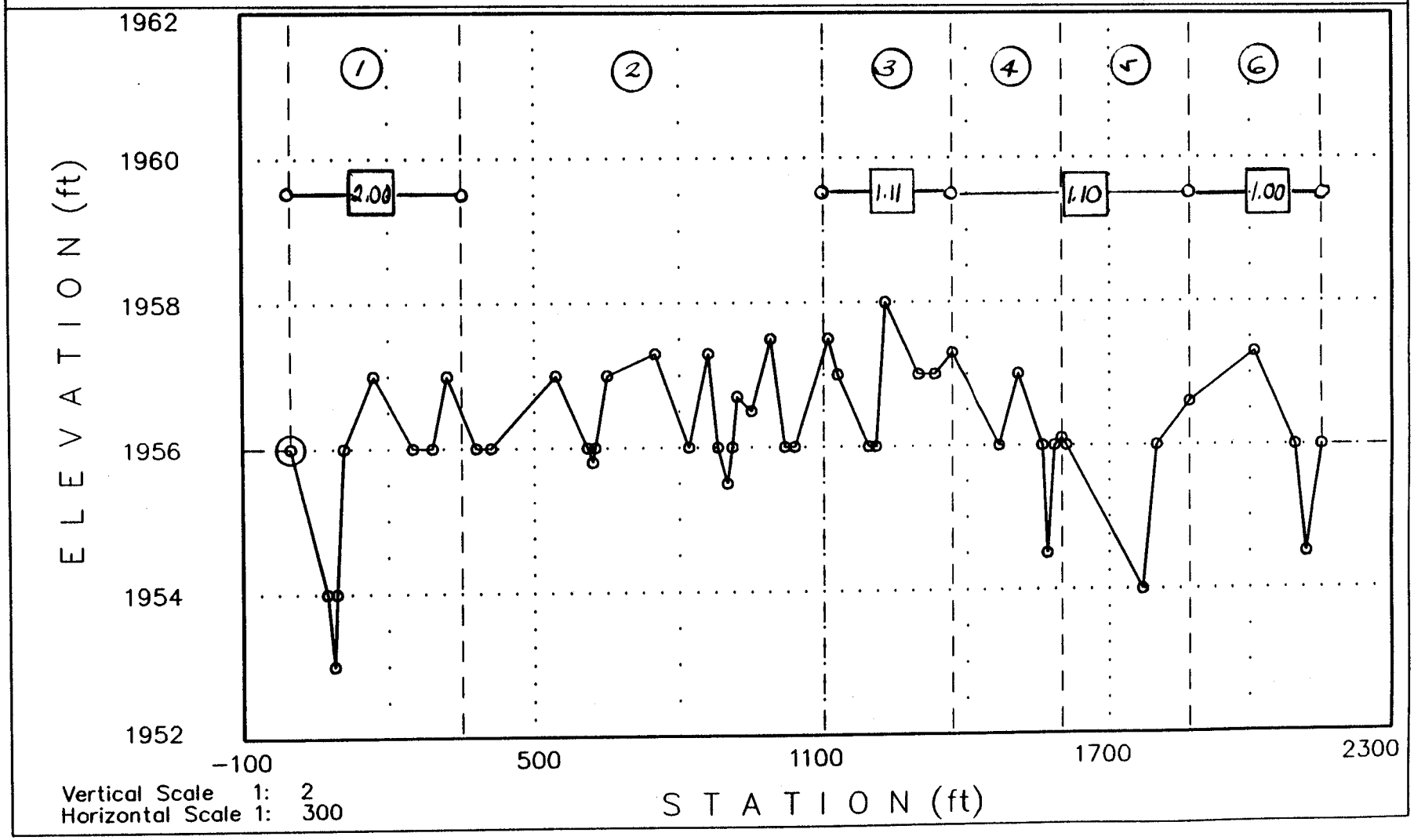
<<<<<< Cross Section: 1962: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 400

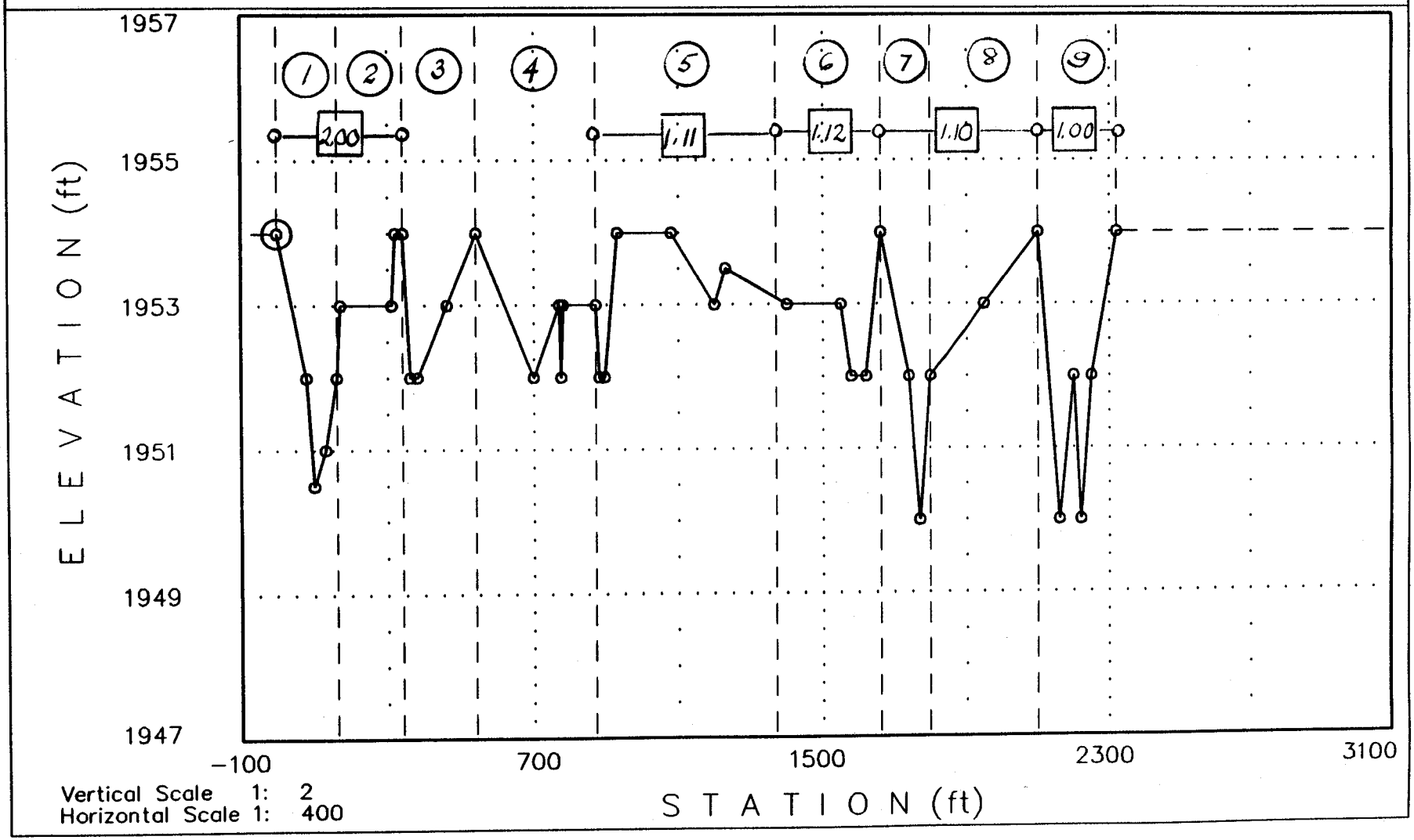
07-20-1994

<<<<<< Cross Section: 1956: (FN = WLOMR) >>>>>>



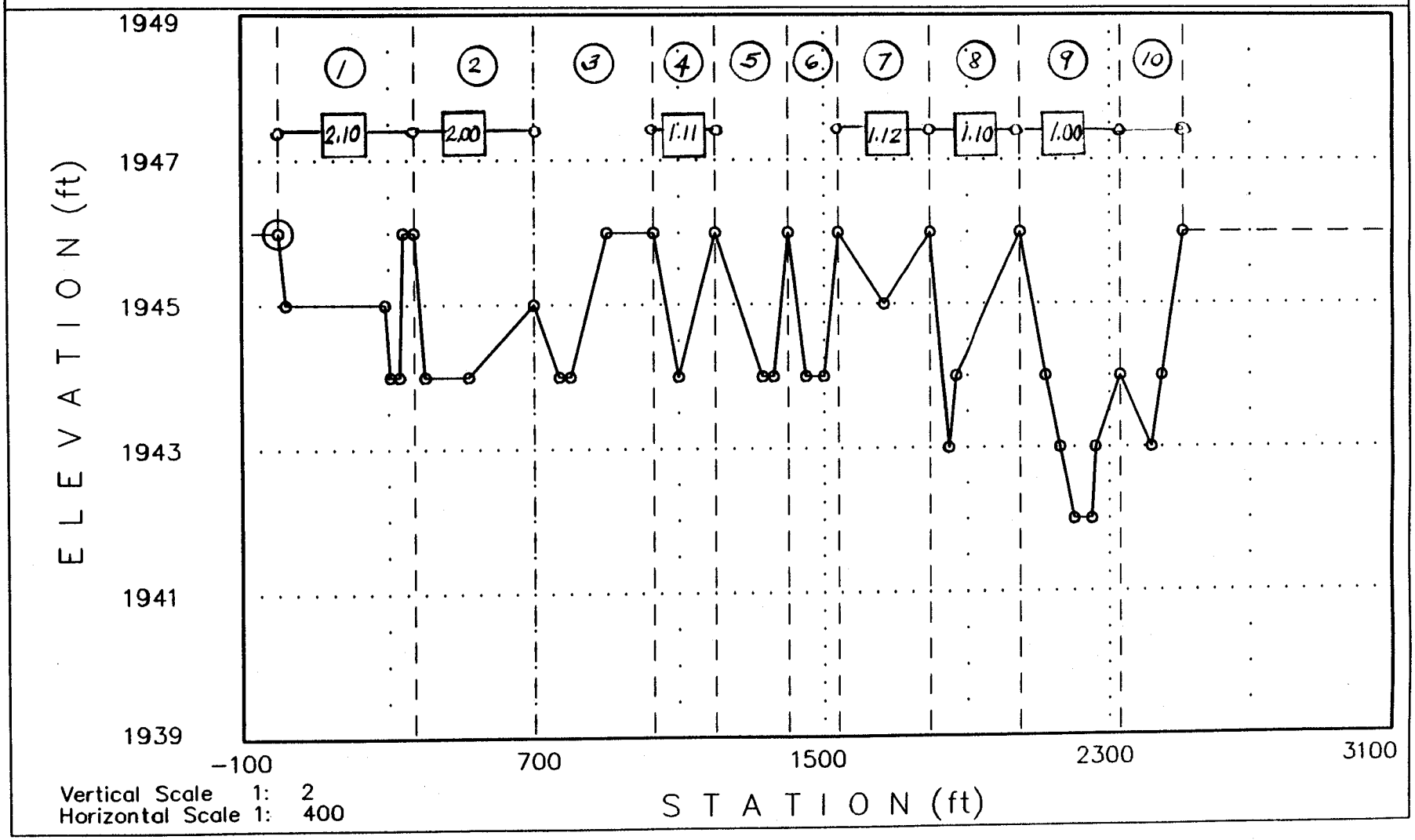
07-20-1994

<<<<<< Cross Section: 1954: (FN = WLOMR) >>>>>>



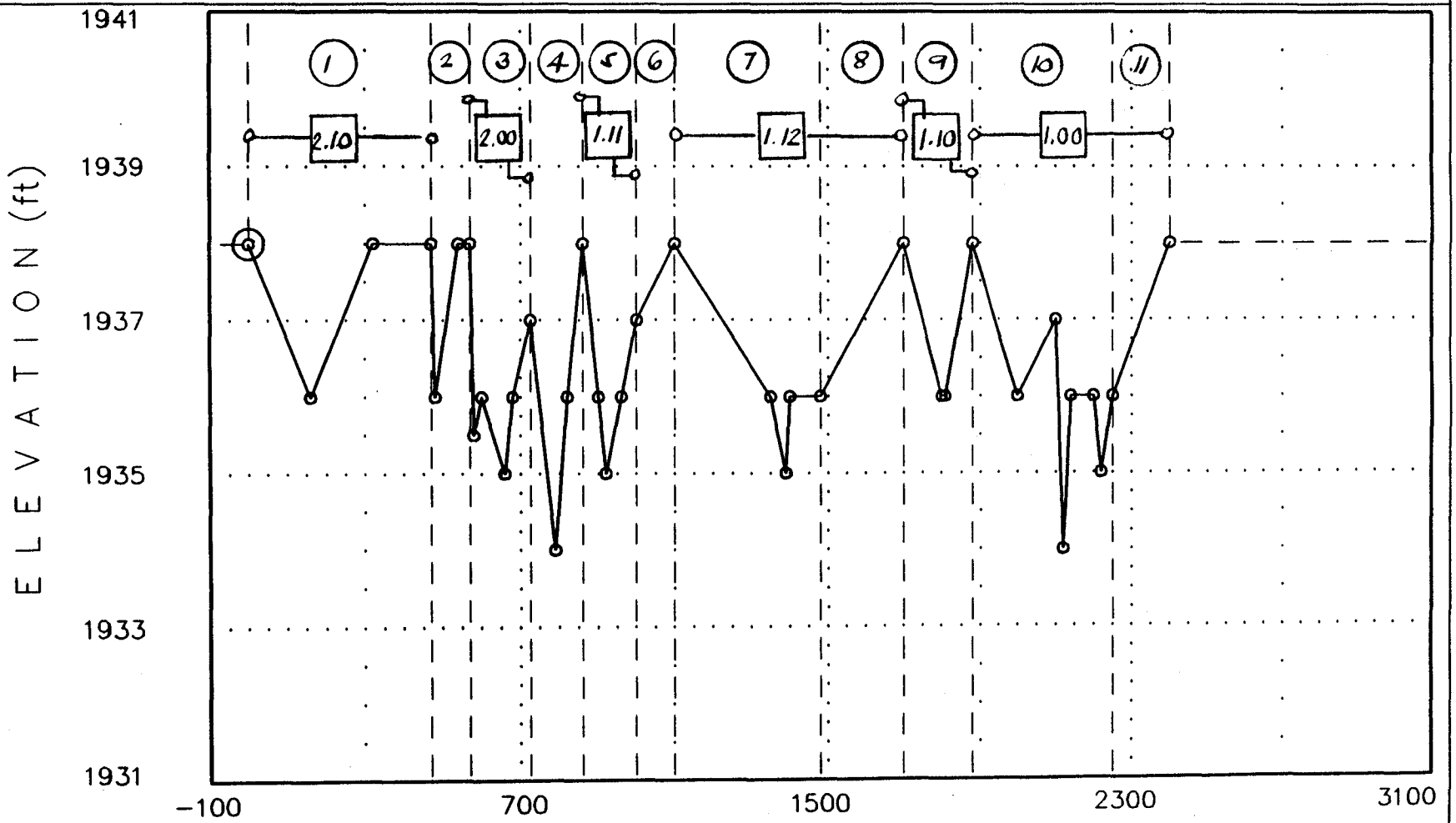
07-20-1994

<<<<<< Cross Section: 1946: (FN = WLOMR) >>>>>>



07-20-1994

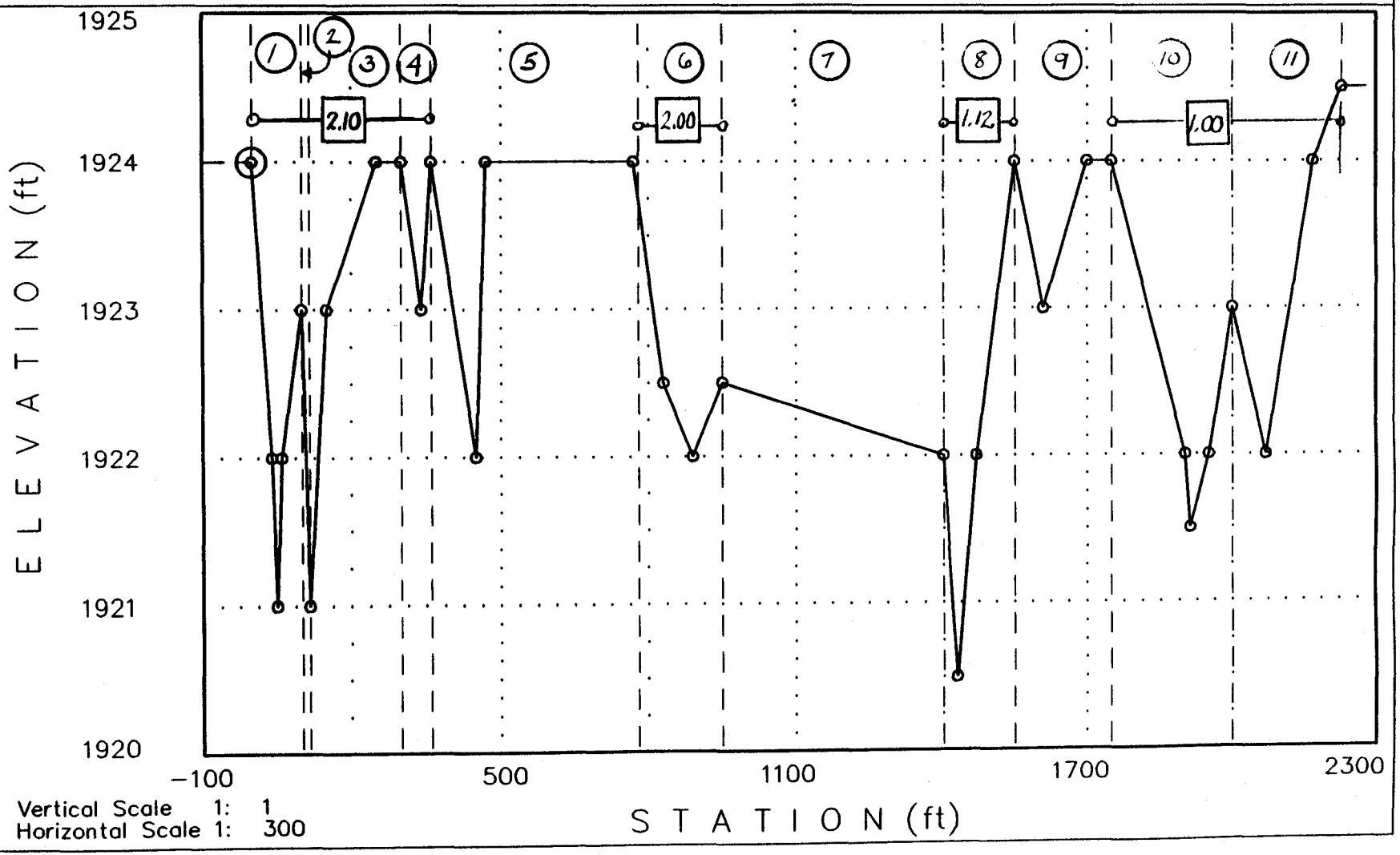
<<<<<< Cross Section: 1938: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 400

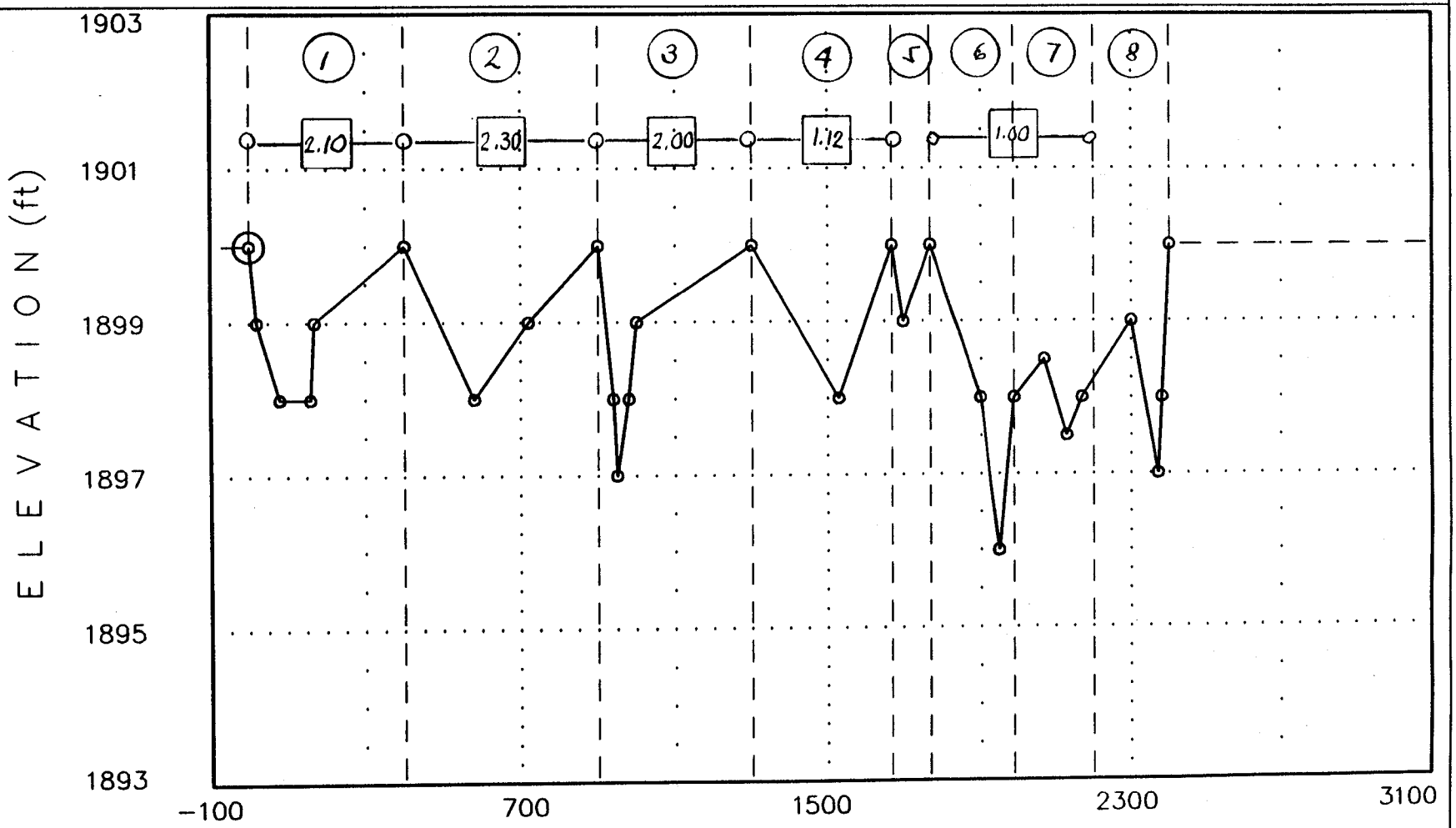
07-20-1994

<<<<<< Cross Section: 1924: (FN = WLOMR) >>>>>>



07-20-1994

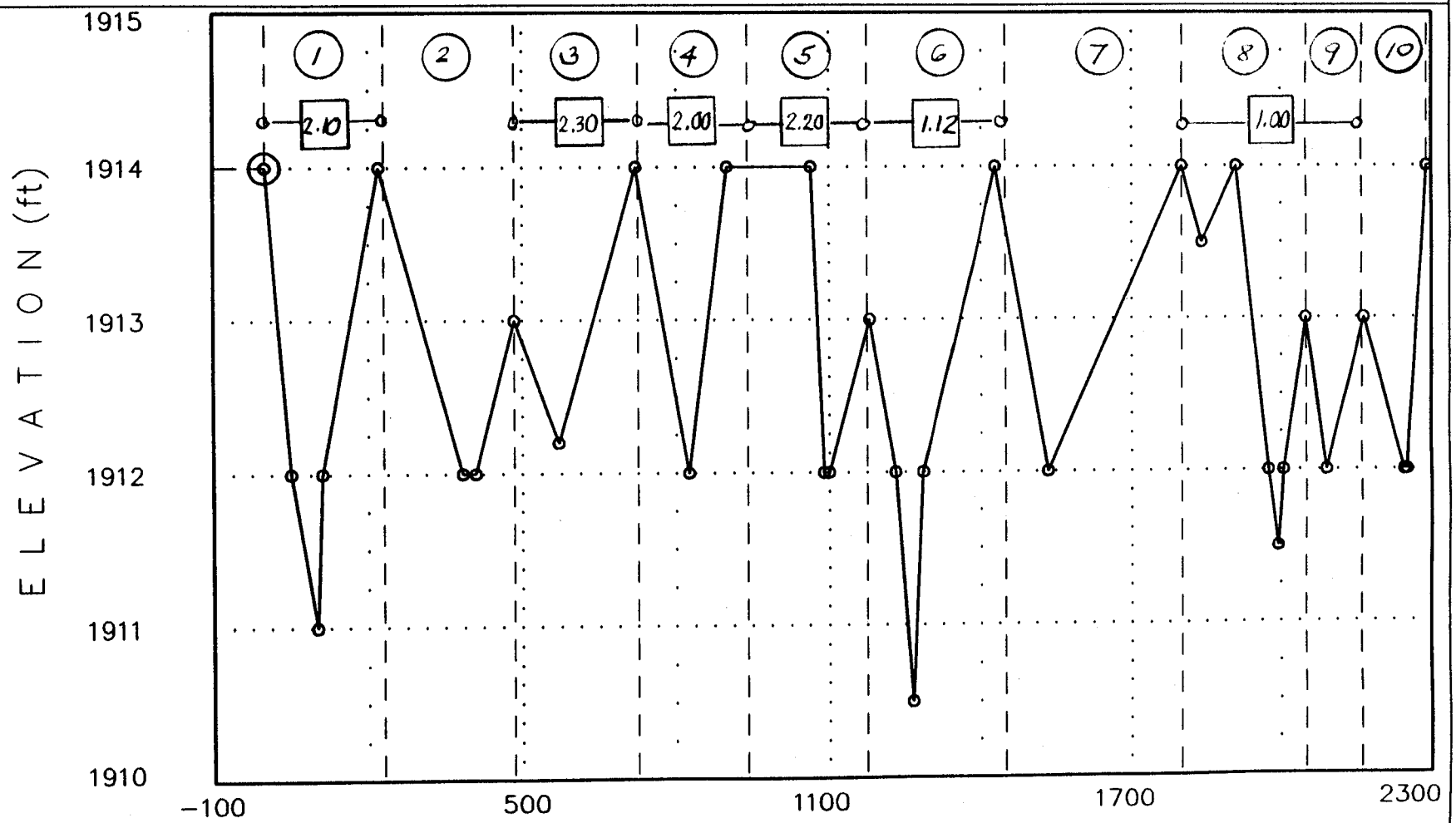
<<<<<< Cross Section: 1900: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 400

07-20-1994

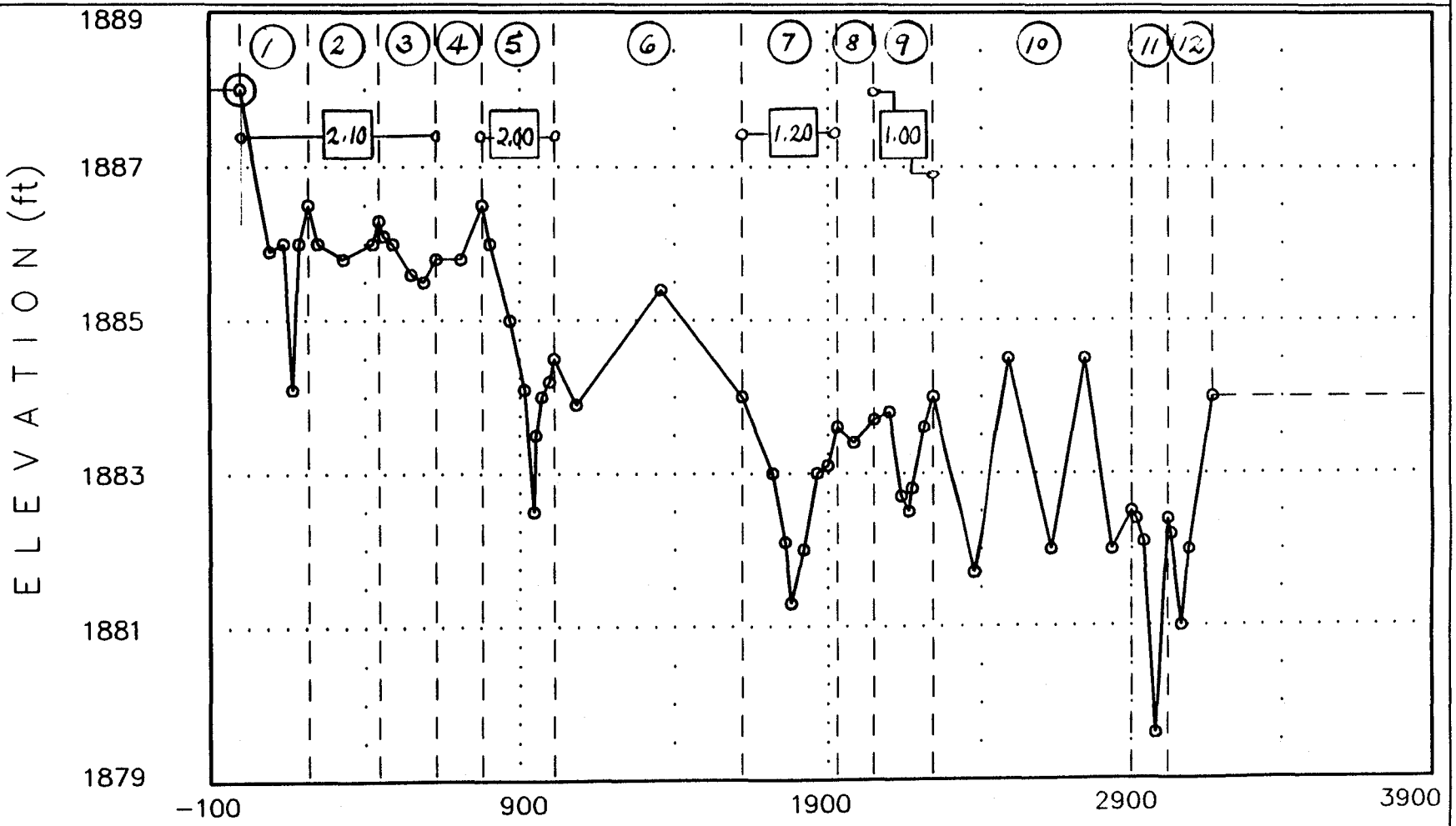
<<<<<< Cross Section: 1914: (FN = WLOMR) >>>>>>



Vertical Scale 1: 1
Horizontal Scale 1: 300

07-20-1994

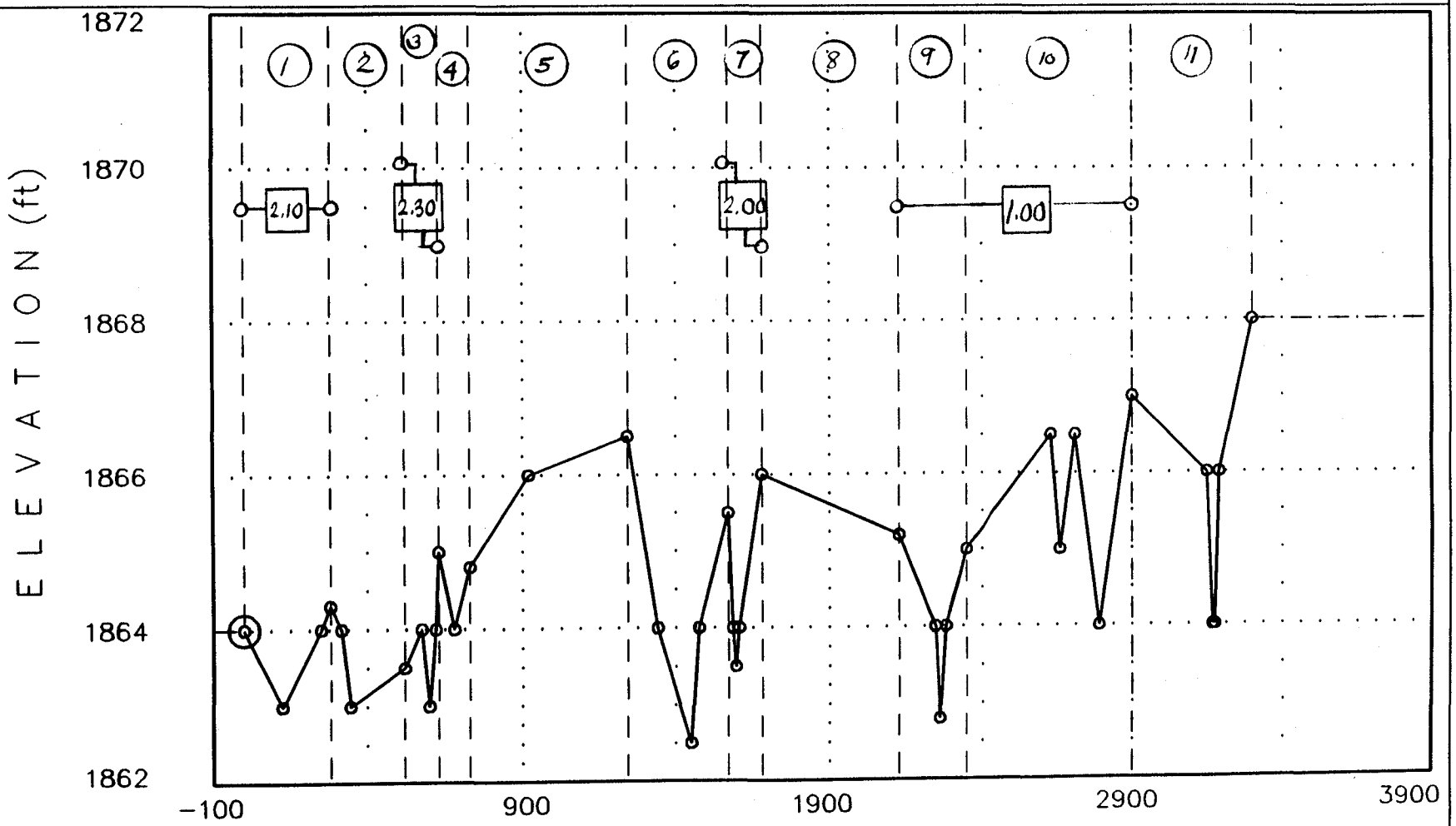
<<<<<< Cross Section: 1888: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 500

07-20-1994

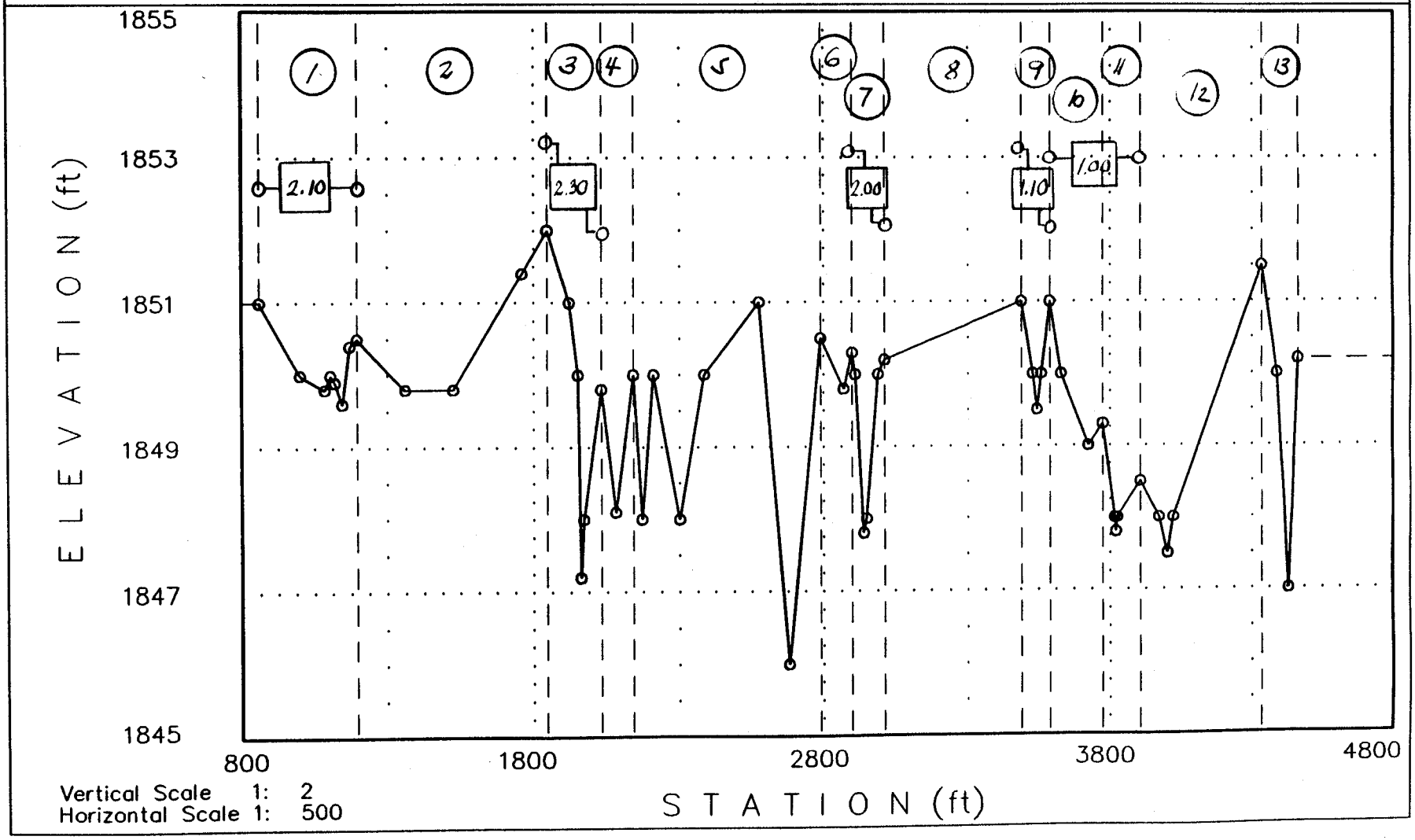
<<<<<< Cross Section: 1864: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 500

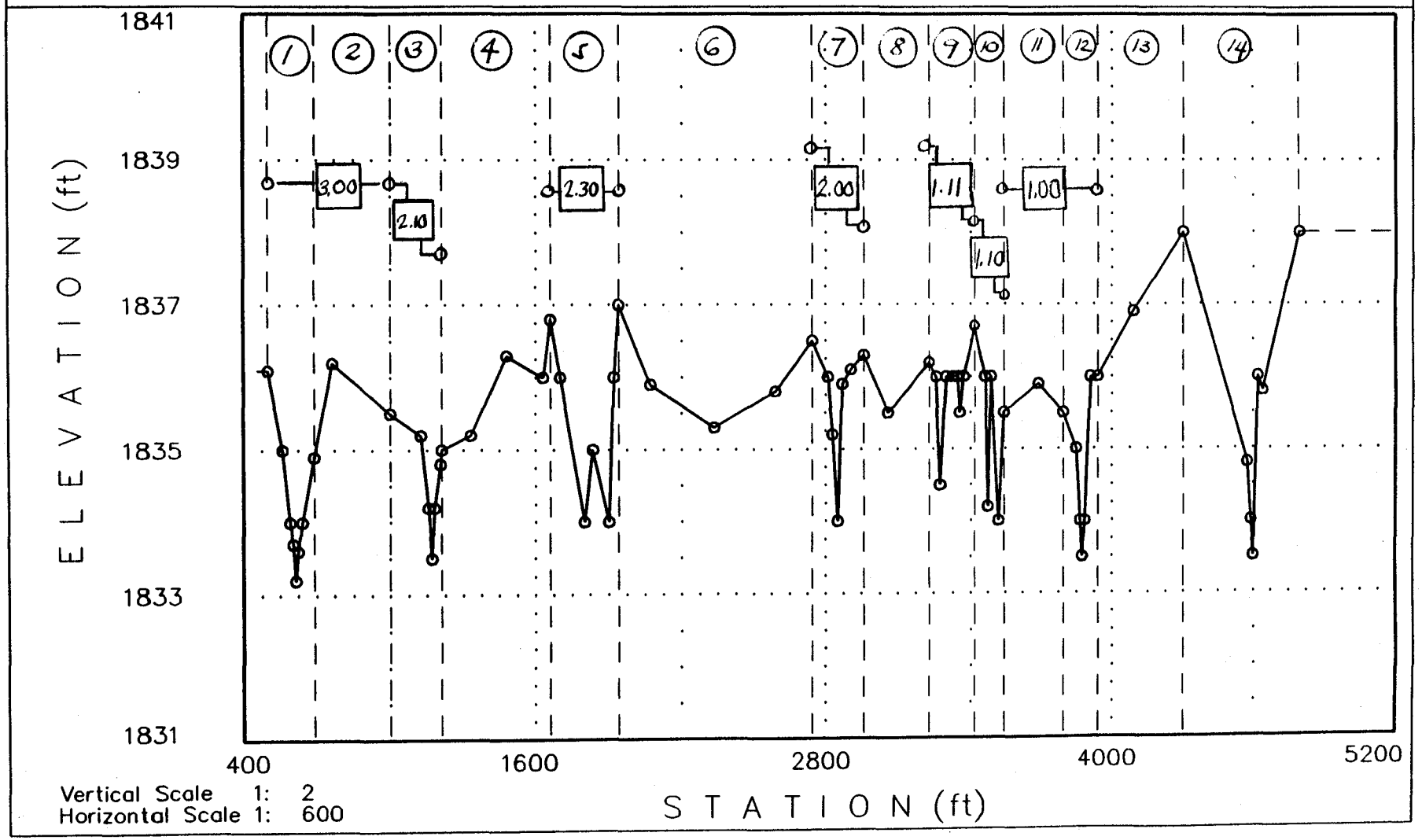
07-20-1994

<<<<<< Cross Section: 1850: (FN = WLOMR) >>>>>>



07-21-1994

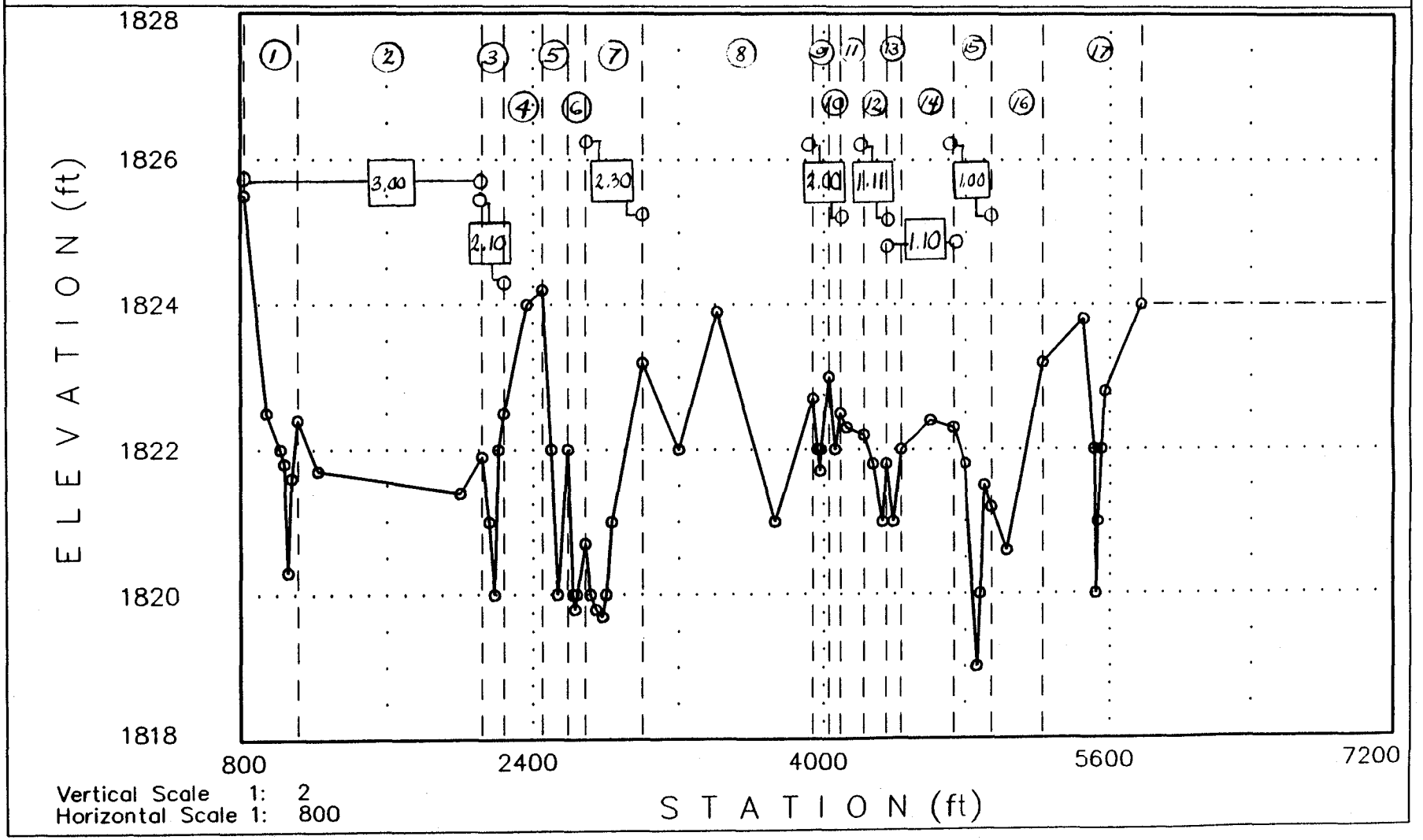
<<<<<< Cross Section: 1836: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 600

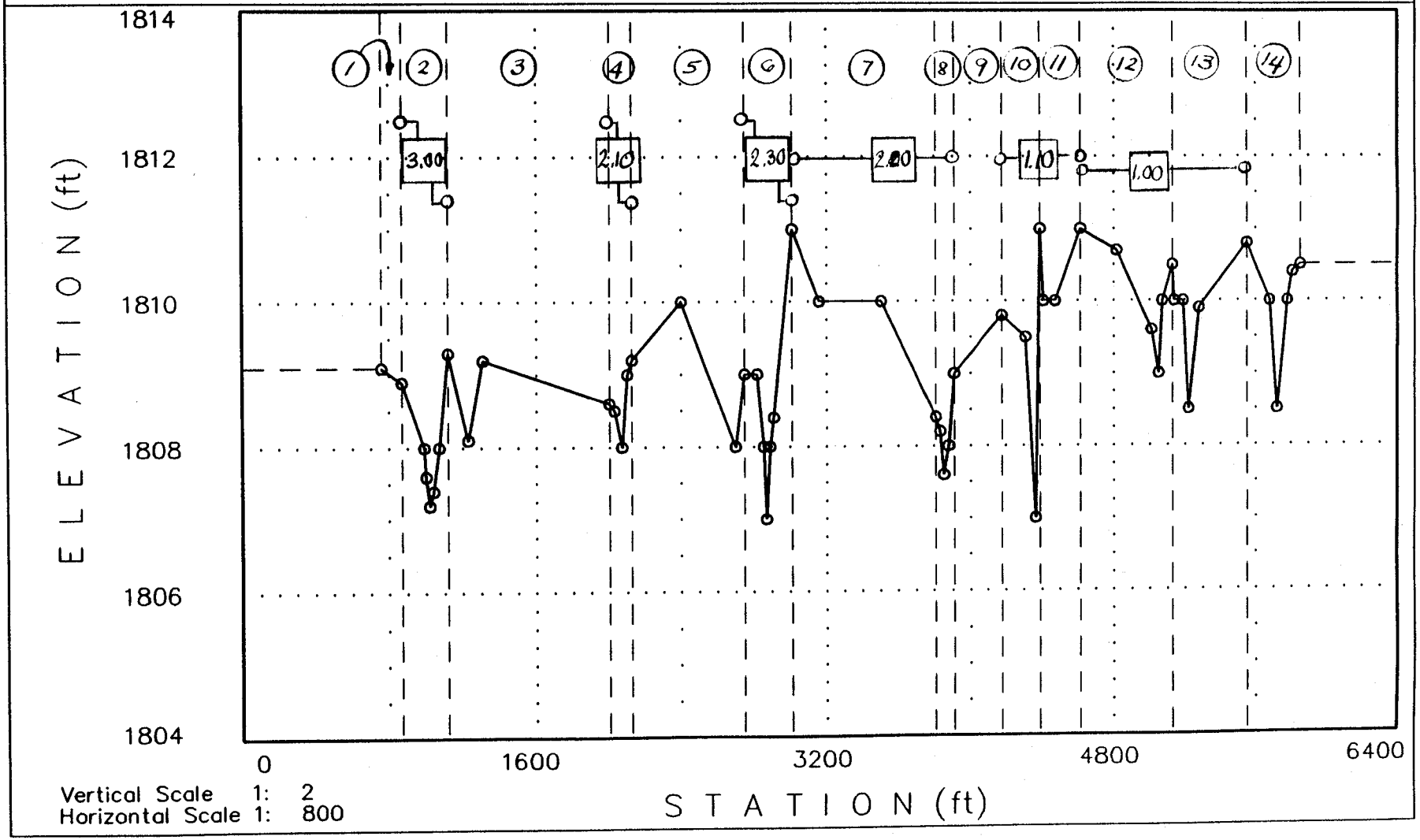
07-20-1994

<<<<<< Cross Section: 1821: (FN = WLOMR) >>>>>>



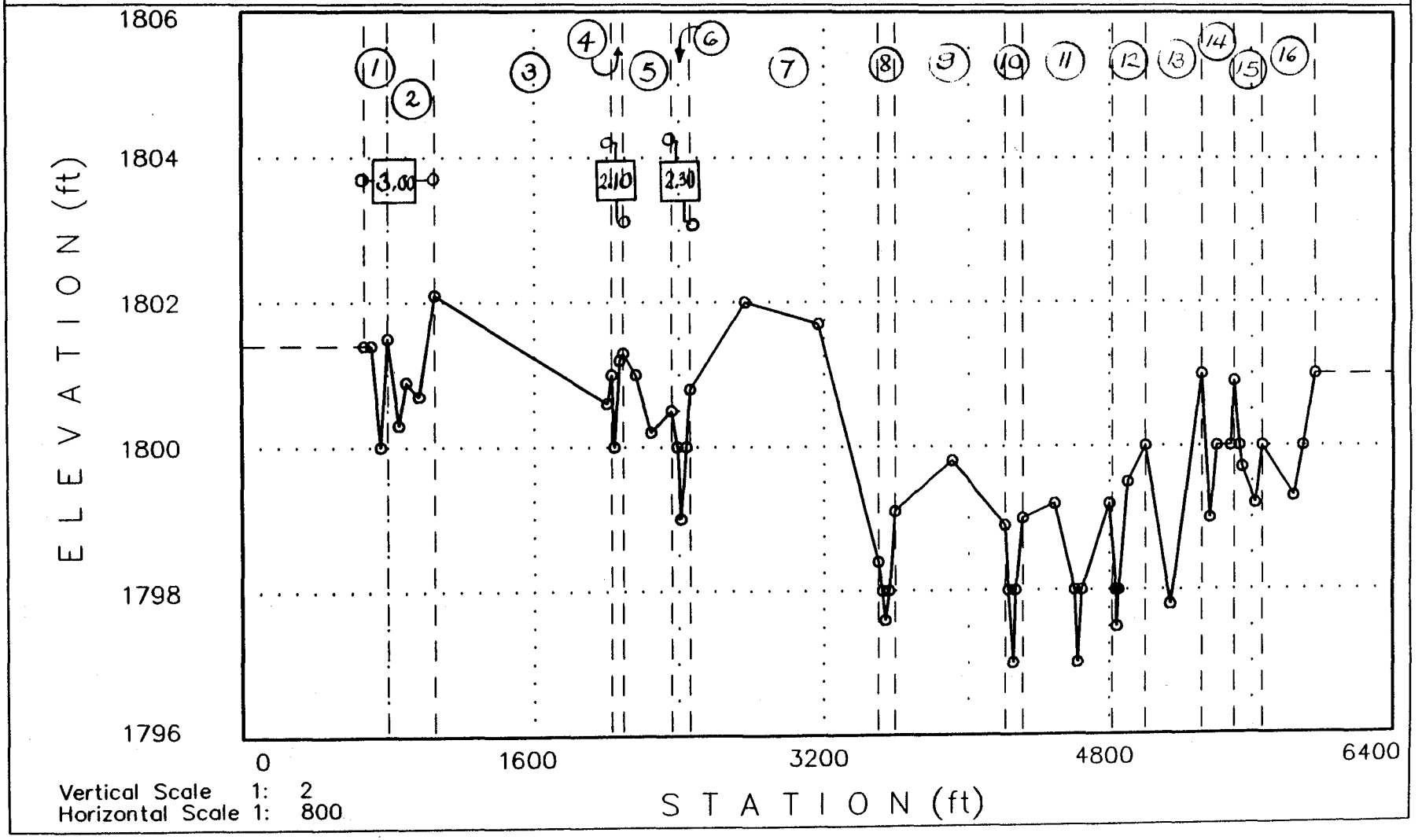
07-20-1994

<<<<<< Cross Section: 1809: (FN = WLOMR) >>>>>>



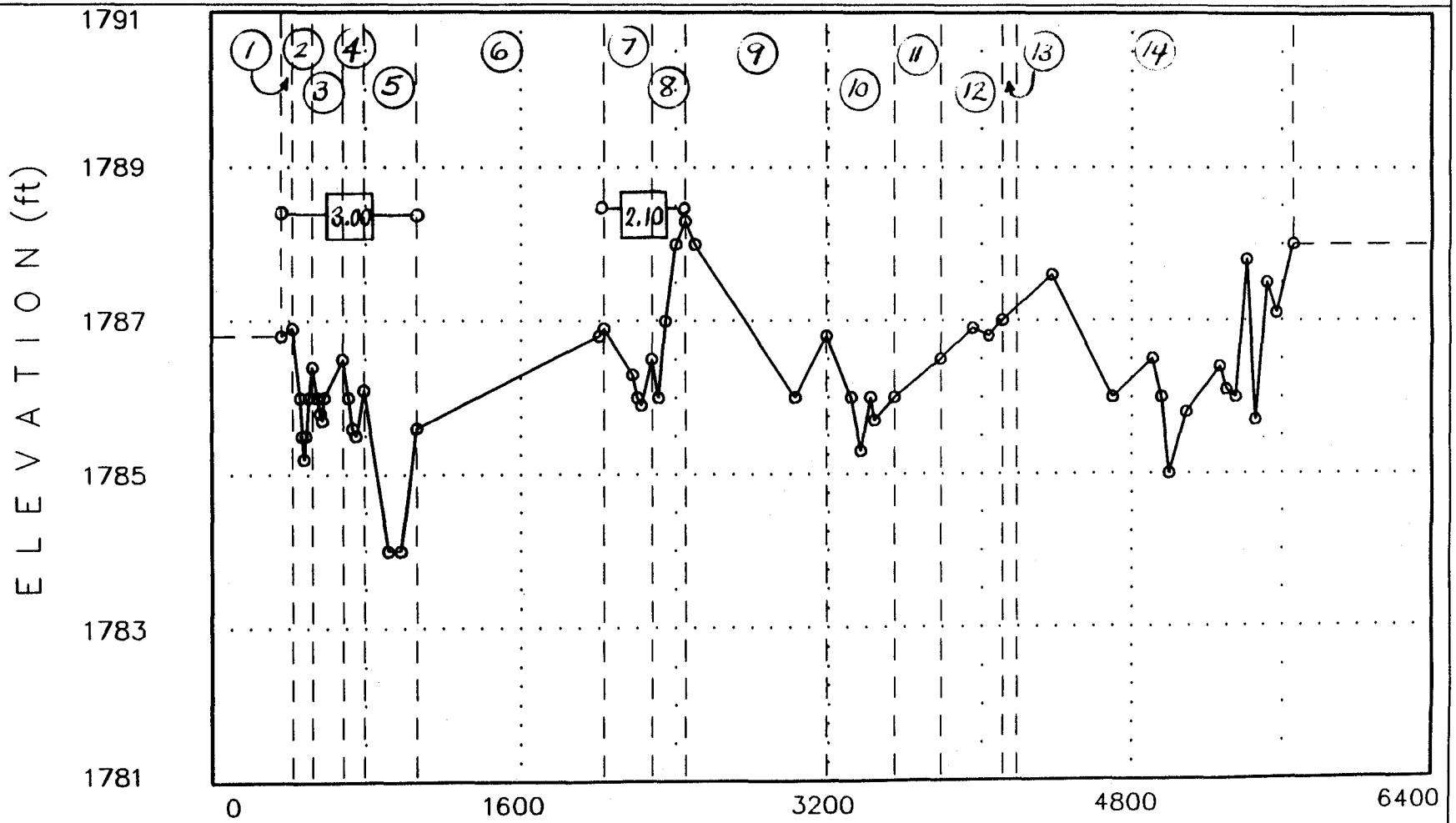
07-20-1994

<<<<<< Cross Section: 1801: (FN = WLOMR) >>>>>>



07-20-1994

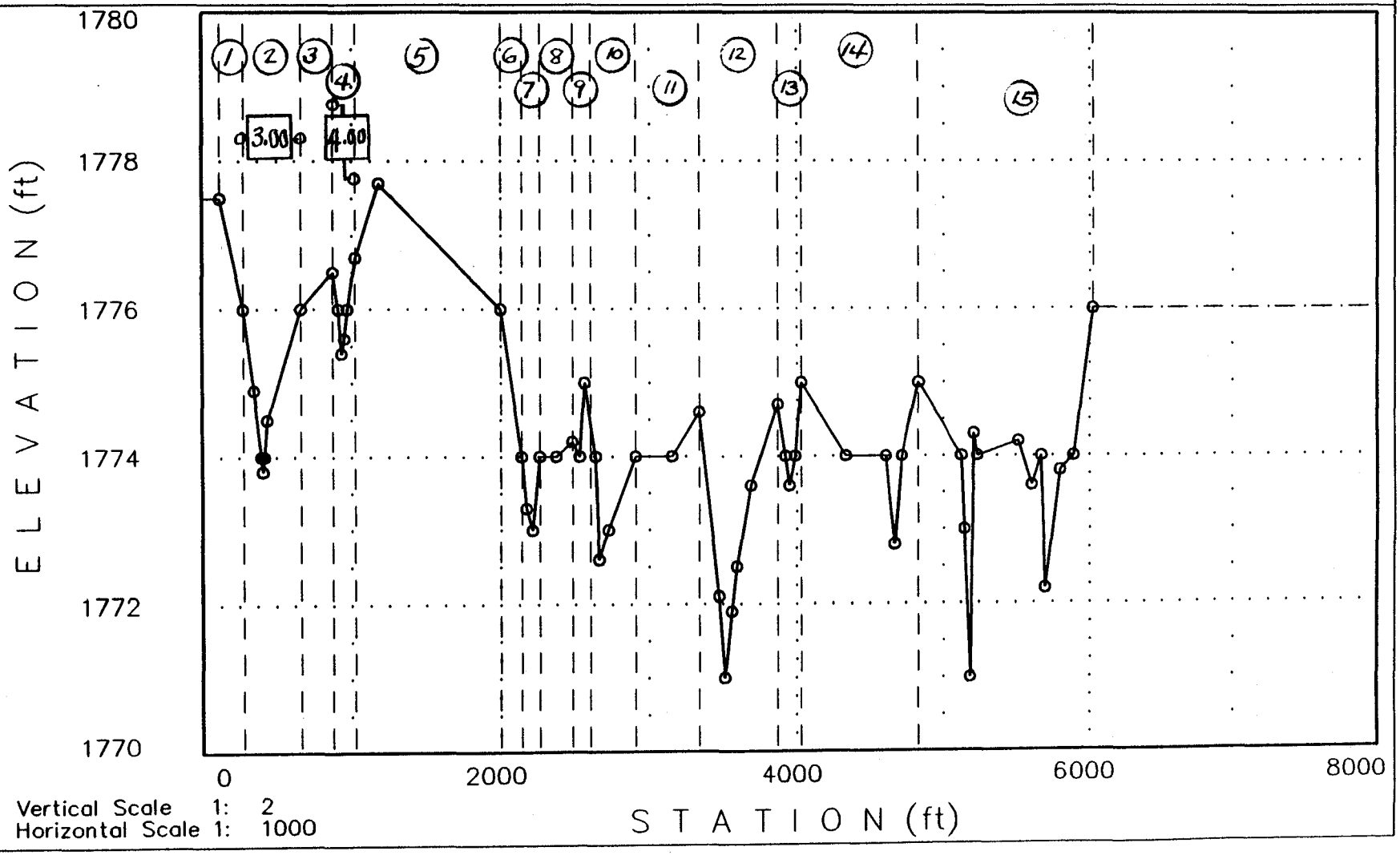
<<<<<< Cross Section: 1787: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 800

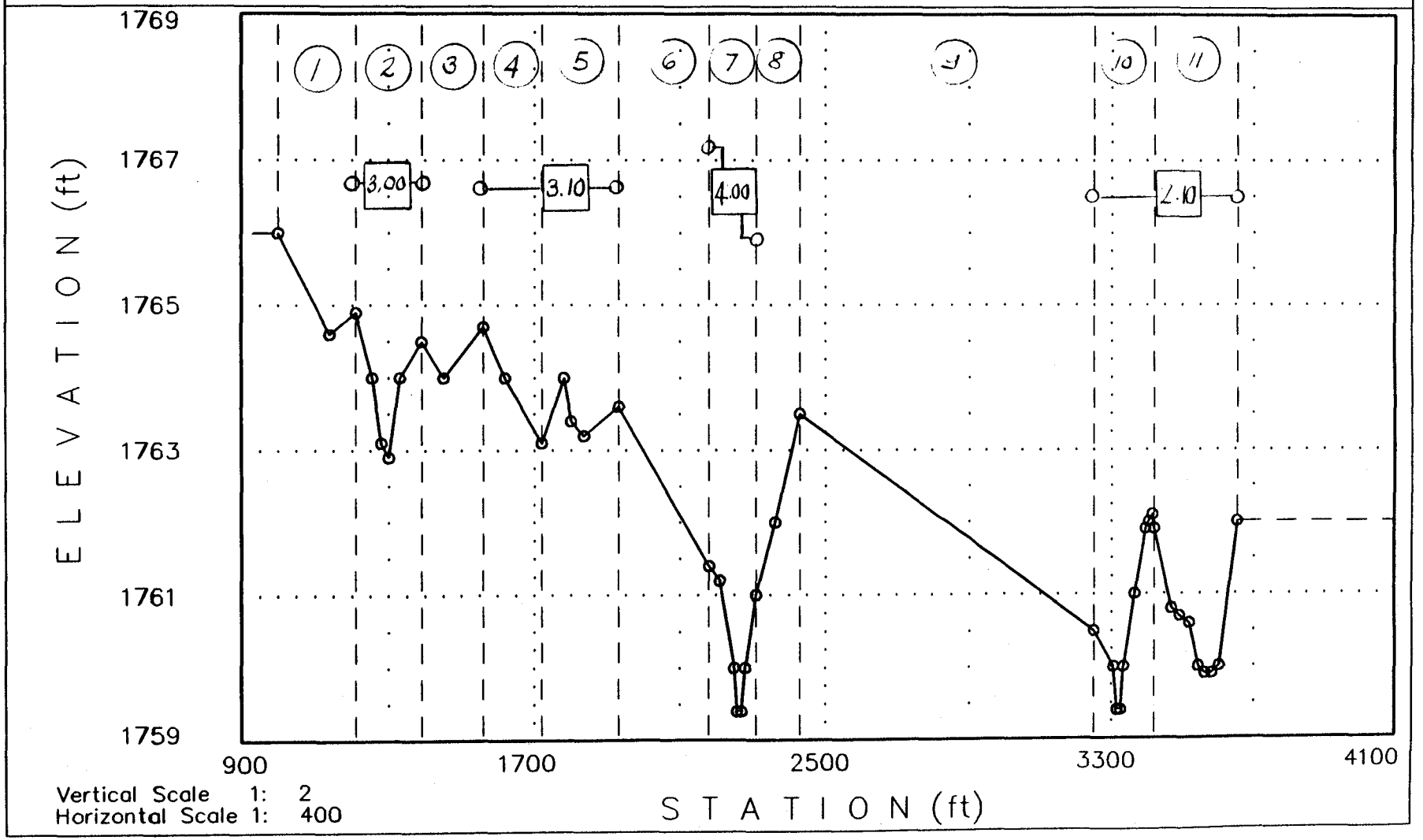
07-20-1994

<<<<<< Cross Section: 1776: (FN = WLOMR) >>>>>>



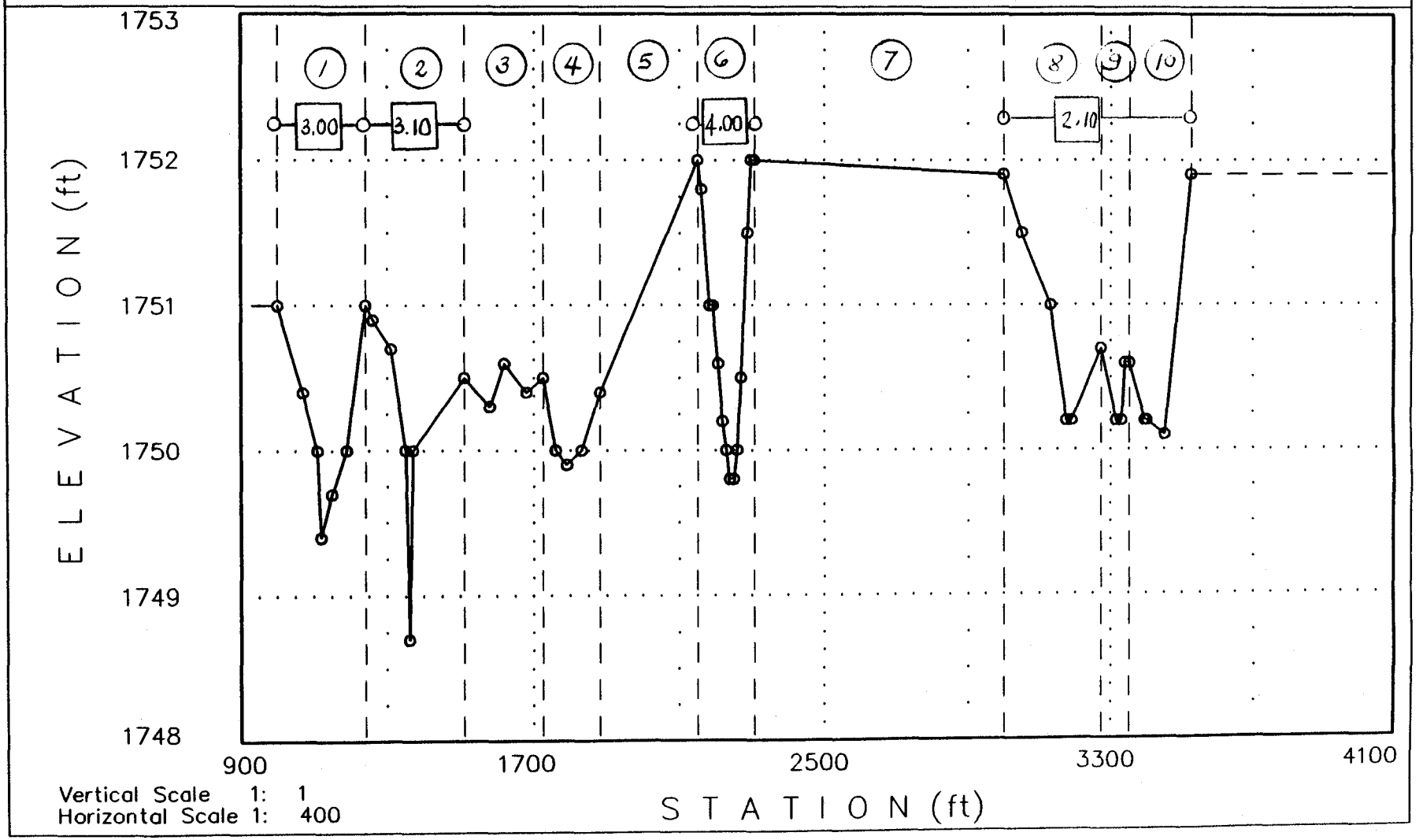
07-21-1994

<<<<<< Cross Section: 1766: (FN = WLOMR) >>>>>>



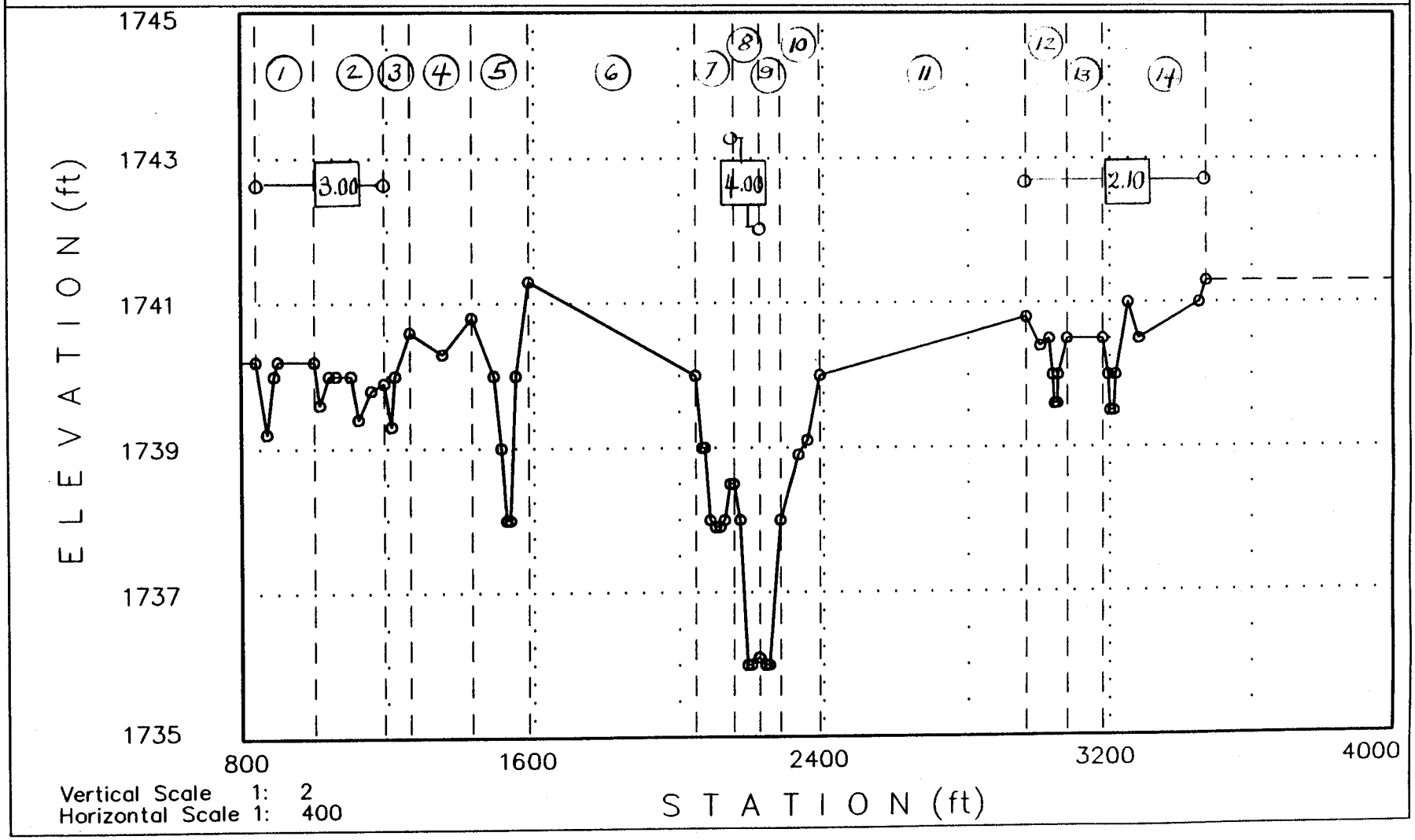
07-20-1994

<<<<<< Cross Section: 1751: (FN = WLOMR) >>>>>>



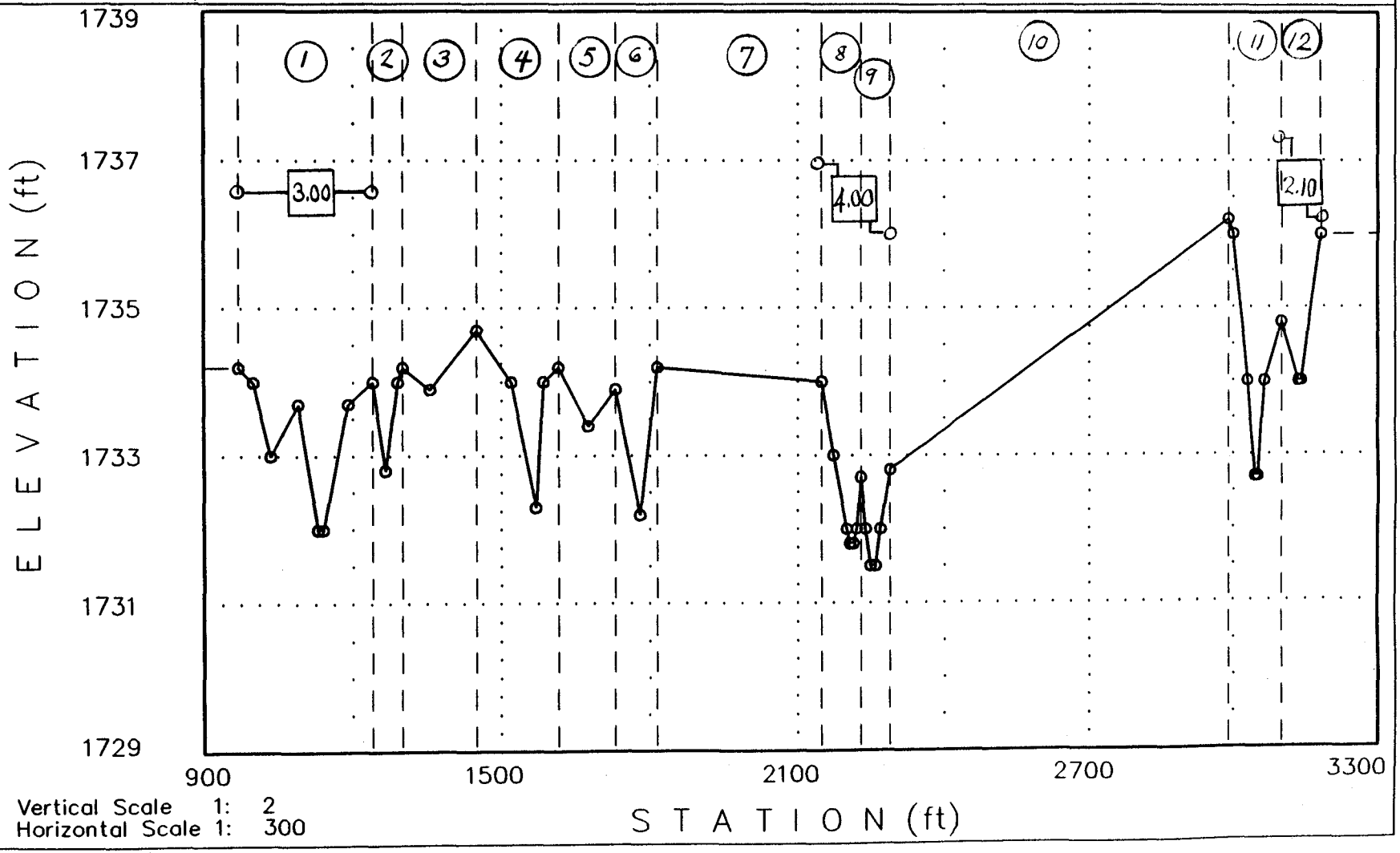
07-20-1994

<<<<<< Cross Section: 1740: (FN = WLOMR) >>>>>>



07-20-1994

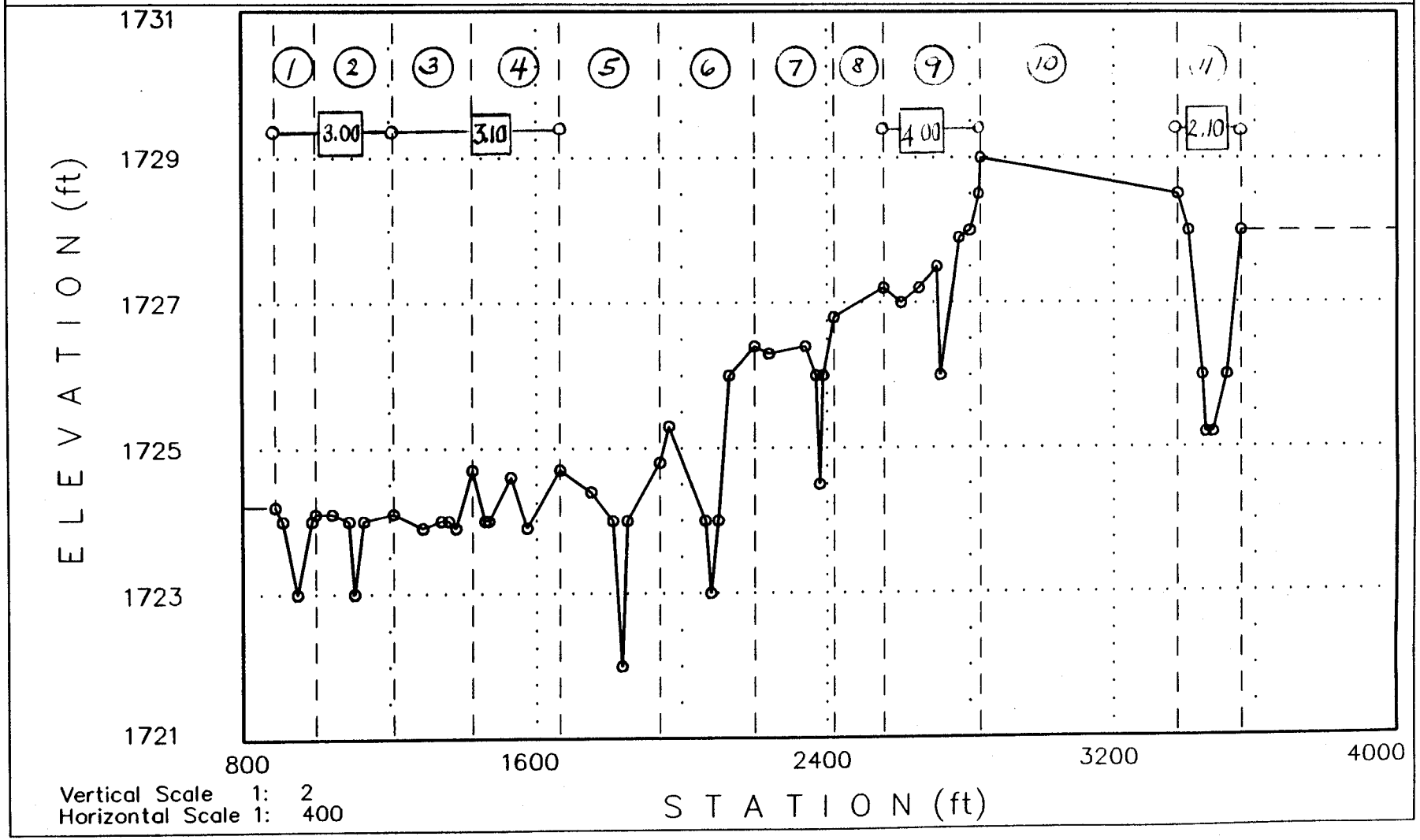
<<<<<< Cross Section: 1734: (FN = WLOMR) >>>>>>



Vertical Scale 1: 2
Horizontal Scale 1: 300

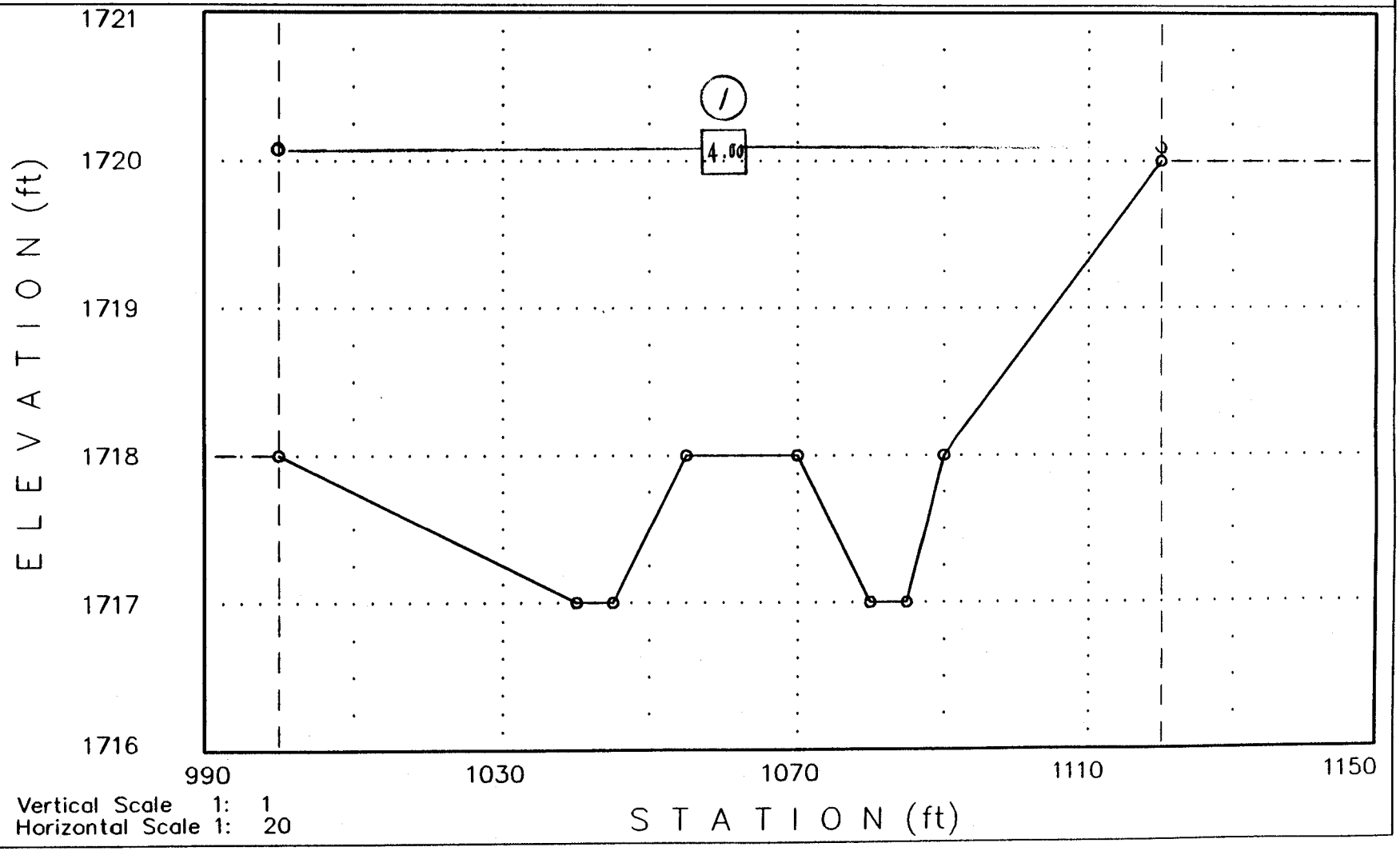
07-20-1994

<<<<<< Cross Section: 1724: (FN = WLOMR) >>>>>>



07-20-1994

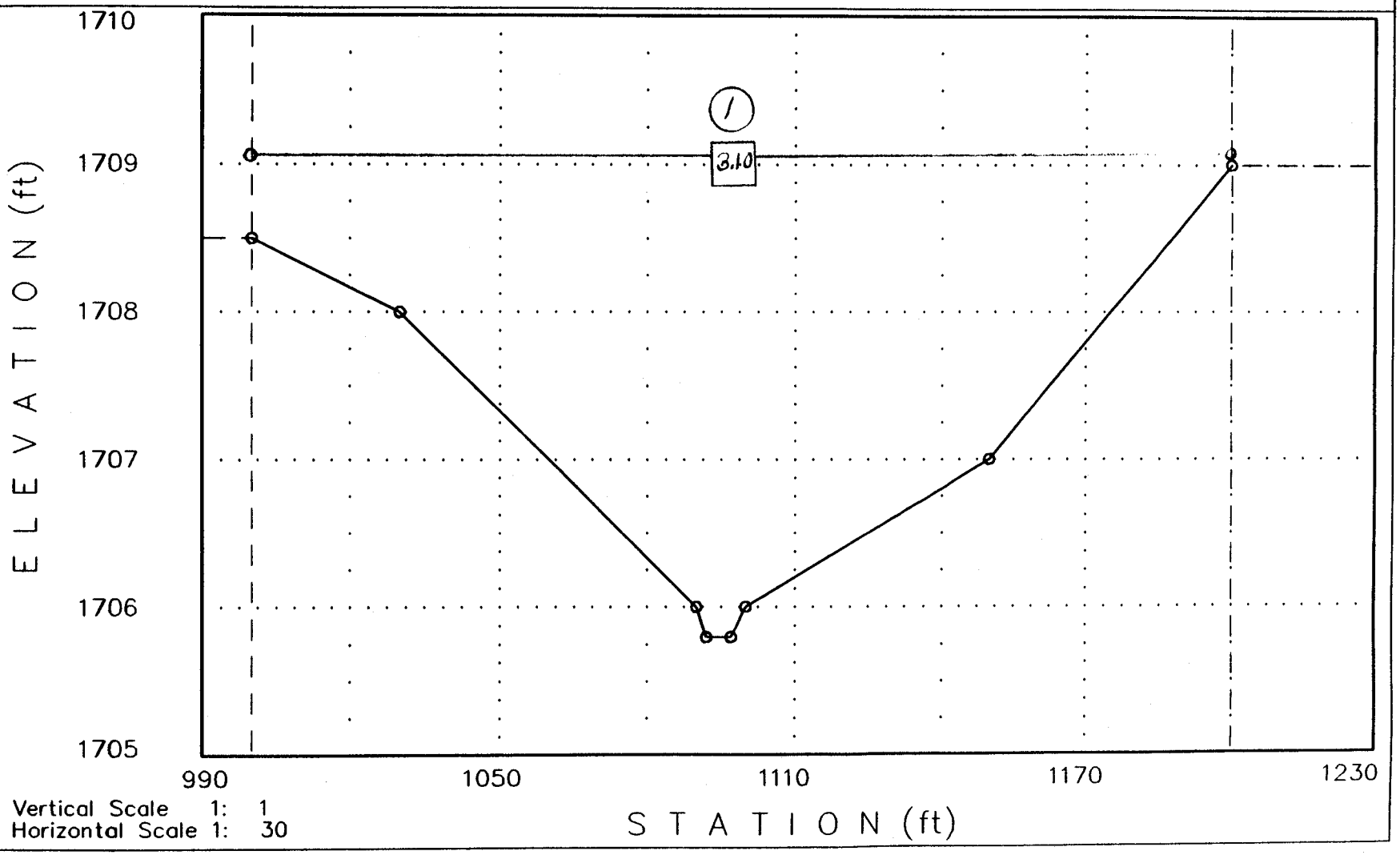
<<<<<< Cross Section: 1719: (FN = WLOMR) >>>>>>



Vertical Scale 1: 1
Horizontal Scale 1: 20

07-20-1994

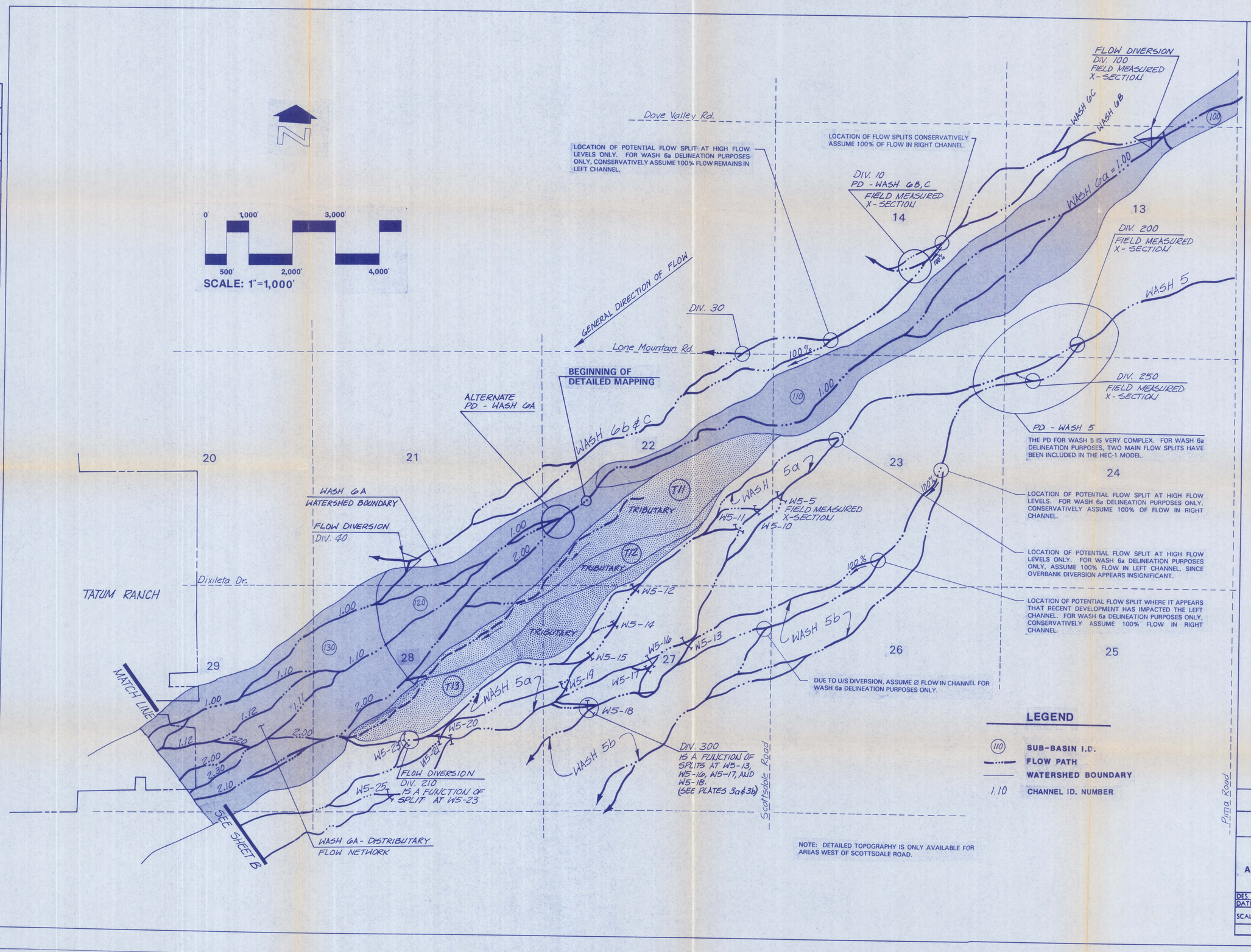
<<<<<< Cross Section: 1708: (FN = WLOMR) >>>>>>



Vertical Scale 1: 1
Horizontal Scale 1: 30

07-20-1994

Appendix E
Plates 1, 2, and 3



REVISION BY				
NO.	DESCRIPTION	REV. BY	CKD BY	DATE

REVISION BY				
NO.	DESCRIPTION	REV. BY	CKD BY	DATE

REVISION BY				
NO.	DESCRIPTION	REV. BY	CKD BY	DATE

AUG 05 1994

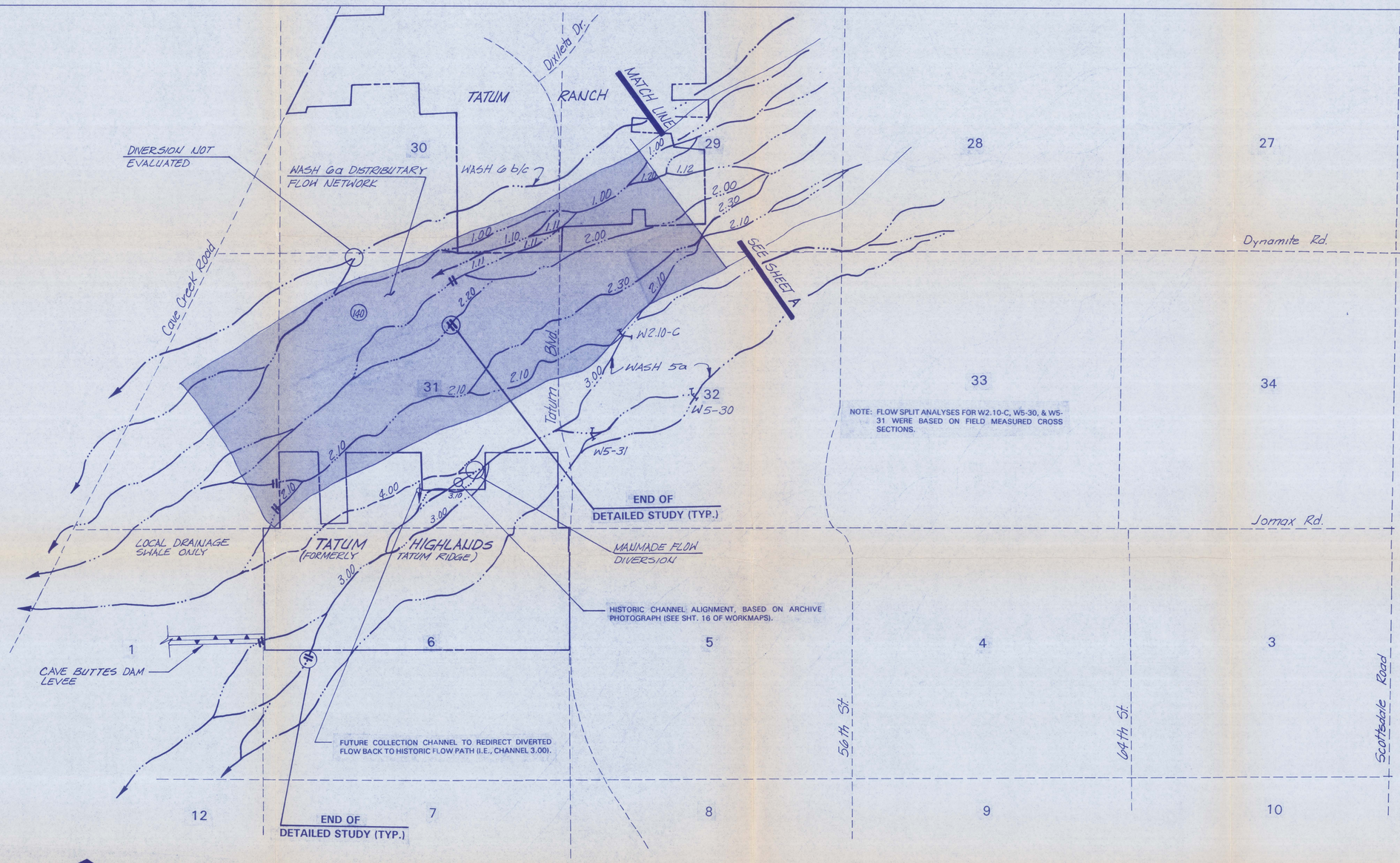
COE & VAN LOO CONSULTING ENGINEERS INC. PHOENIX ARIZONA

PLATE 2A

APPLICATION OF HEC-1 TO WATERSHEDS WITH DISTRIBUTARY - FLOW AREAS

DES. DD	DR MAP	CK	SHEET NO.	TOTAL SHEETS	AS BUILT
DATE	DATE	DATE			
SCALE 1" = 20 HORIZONTAL, 2 VERTICAL					

JOB # 94-0045-01



NOTE: FLOW SPLIT ANALYSES FOR W2.10-C, W5-30, & W5-31 WERE BASED ON FIELD MEASURED CROSS SECTIONS.

0' 1,000' 3,000'
500' 2,000' 4,000'
SCALE: 1"=1,000'

LEGEND

- (110) SUB-BASIN I.D.
- FLOW PATH
- WATERSHED BOUNDARY
- 1.10 CHANNEL ID. NUMBER

REVISION BY				
NO.	DESCRIPTION	REV. BY	CKD BY	DATE

REVISION BY				
NO.	DESCRIPTION	REV. BY	CKD BY	DATE

REVISION BY				
NO.	DESCRIPTION	REV. BY	CKD BY	DATE

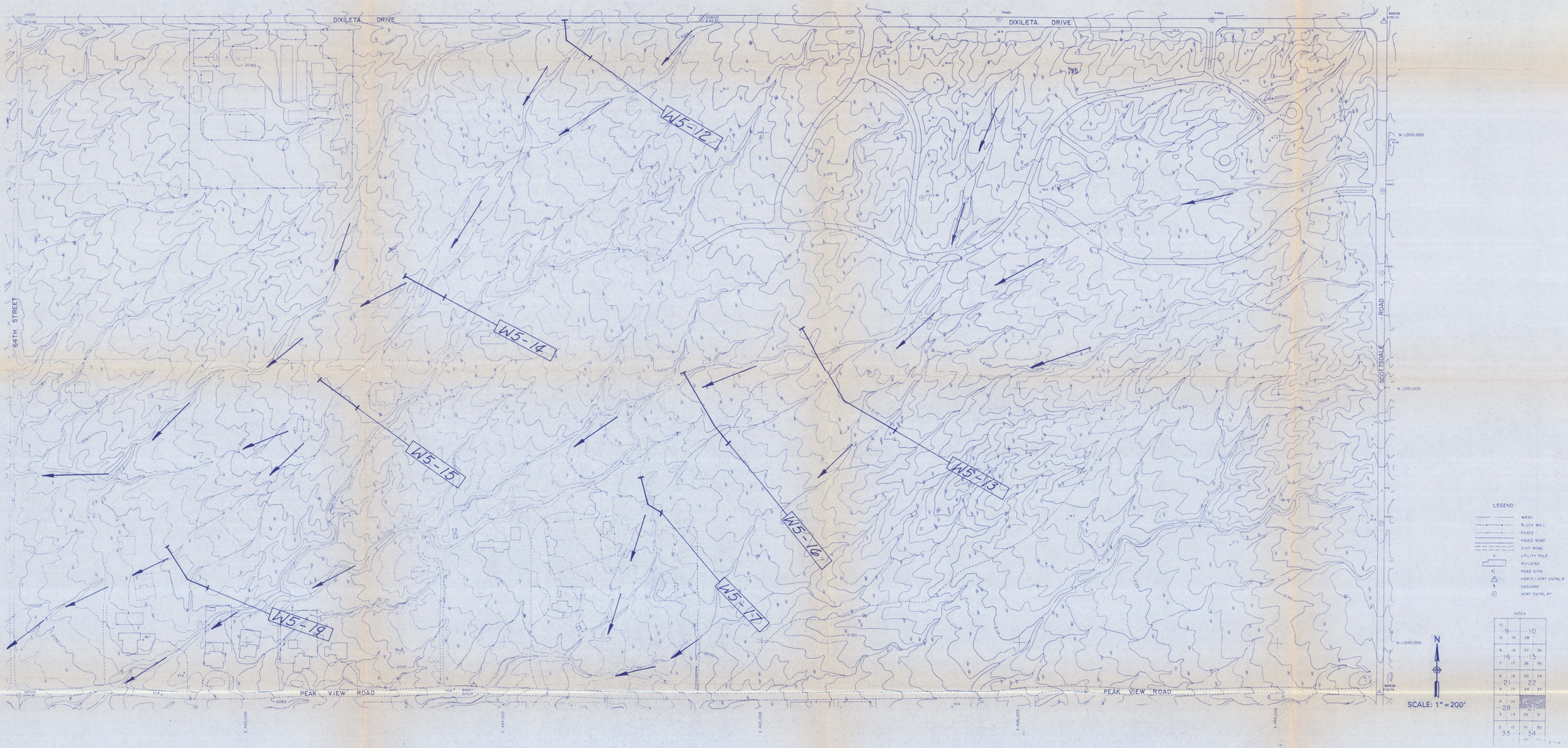
COE & VAN LOO CONSULTING ENGINEERS INC. PHOENIX ARIZONA

PLATE 2B

APPLICATION OF HEC-1 TO WATERSHEDS WITH DISTRIBUTARY - FLOW AREAS

DES. DWD	DR MGP	CK	SHEET NO.	TOTAL SHEETS	AS BUILT
DATE	DATE	DATE			
SCALE 1" = 20 HORIZONTAL, 2 VERTICAL					

JOB # 97-0045-01



LEGEND

CHANNEL ID. NUMBER

W5-18 SPLIT SECTION

CYL
COE & VAN LOO
PLANNING · ENGINEERING
LANDSCAPE ARCHITECTURE

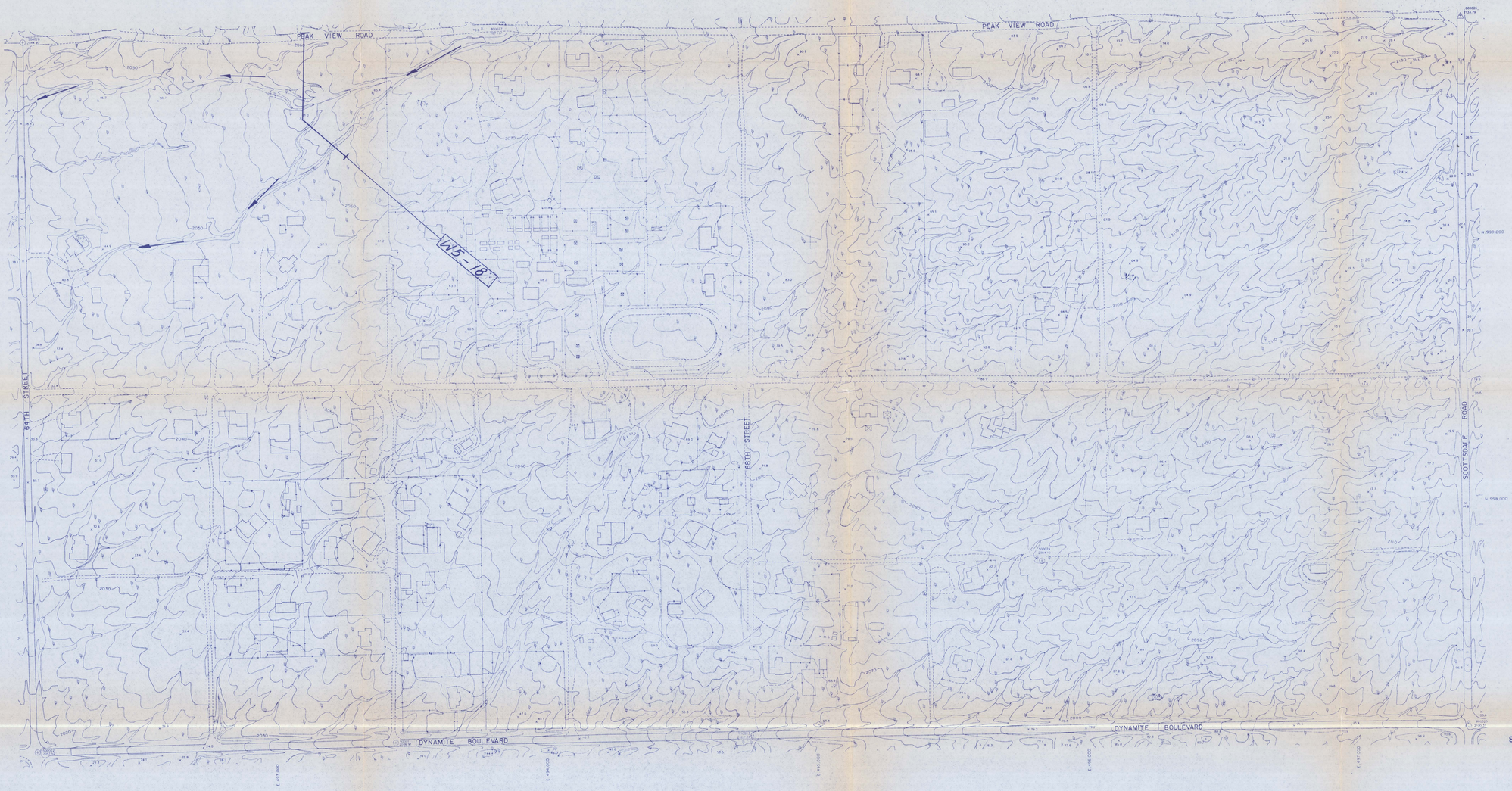
WASH 6A FLOODPLAIN DELINEATION STUDY

PLATE 3

DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
DATE:	

REVISIONS	DATE	BY

SHEET A OF



LEGEND

CHANNEL ID. NUMBER

W5-18 SPLIT SECTION

CVL
COE & VAN LOO
PLANNING · ENGINEERING
LANDSCAPE ARCHITECTURE

WASH 6A FLOODPLAIN DELINEATION STUDY

PLATE 3

DESIGNED BY:	REVISIONS	DATE	BY
DRAWN BY:			
CHECKED BY:			
DATE:	SHEET B OF		