LETTER OF MAP REVISION REQUEST FOR SKUNK CREEK

City of Phoenix Contract No. SA-930222

TECHNICAL DATA NOTEBOOK

November 2002

Prepared for:

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Submitted to:

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LETTER OF MAP REVISION REQUEST

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SKUNK CREEK FROM ADOBE DAM TO INTERSTATE 17

PHOENIX, ARIZONA

TECHNICAL DATA NOTEBOOK

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NOVEMBER 2002

REGISTERED PROFESSIONAL ENGINEER
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Date Signed 11-7-02
ARIZONA, U.S.A.

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SECTION 1: INTRODUCTION

1.1 PURPOSE OF STUDY

This Technical Data Notebook (TDN) documents the hydraulic analysis conducted to define the revised floodplain/floodway limits proposed for Skunk Creek, from Adobe Dam to Interstate 17. The study reach is located within the City of Phoenix, in Section 35 of Township 5 North, Range 2 East, and Sections 2, 10, 11, and 15 of Township 4 North, Range 2 East, G&SRB&M, Maricopa County, Arizona. See Figure 1-1 for a location map.

1.2 AUTHORITY FOR STUDY

This study was completed by Tetra Tech, Inc. for the City of Phoenix under subcontract to EMCON/OWT Solid Waste Services, a member of the IT Group (EMCON). The City of Phoenix project number is SA-930222. Mr. Marty Arambel is the Project Manager for the City of Phoenix, Mr. Garth Bowers is the Project Manager for EMCON, and Mr. Pedro Calza is the Project Manager for Tetra Tech.

1.3 DESCRIPTION OF STUDY AREA

Skunk Creek is a typical alluvial desert wash which originates in the northern mountains of Maricopa County. It is a tributary of the New River and courses through unincorporated portions of Maricopa County and the cities of Phoenix, Glendale, and Peoria. The Skunk Creek watershed above Adobe Dam is approximately 90 square miles in area and drains generally from north to south. The Central Arizona Project (CAP) Canal transects the lower portion of the watershed. Skunk Creek is conveyed across the Canal in a concrete overchute. Immediately downstream of the Canal is its confluence with Sonoran Wash. Downstream of the confluence, Skunk Creek has been almost completely channelized by various City of Phoenix (the City) and U.S. Army Corps of Engineers (the Corps) projects until it reaches Adobe Dam. The study limits are from Adobe Dam to Interstate 17.

1.4 BACKGROUND

A map revision is necessary to reflect changes in water surface elevation and floodplain/floodway boundary adjustments that are a result of multiple construction projects in and adjacent to the Skunk Creek channel. These projects include: the Skunk Creek Landfill and

associated levees; the Pinnacle Peak Road bridge, drop structure, and associated channelization; the Adobe Highlands residential development; and Paseo Highlands Park, located on the southeast corner of Pinnacle Peak Road and 35th Avenue.

In 1992, the Skunk Creek Channel Improvements project channelized Skunk Creek through the Skunk Creek Landfill area using levees with soil-cement bank protection. The project was designed to protect the Skunk Creek Landfill from the Federal Emergency Management Agency (FEMA) 100-year flood event. Hydraulic design for the project was completed by Harza Engineering Company; construction plans were developed by Morea-Hall Engineering, Inc. There are active, inactive (closed), and planned landfill cells along the entire length of the channelization project. The elevation of the closed landfill cells behind the bank protection is typically higher than the 100-year water surface. However, the elevation of the undeveloped landfill area, which includes the proposed cells, is generally lower than the 100-year water surface. These areas are protected by levees with soil cement bank protection. The undeveloped cells will eventually be built up to height significantly higher than the existing levees.

During construction of the Channel Improvements project, the channel invert was re-graded and cleared of vegetation from the downstream limits of the landfill to Happy Valley Road. Typical desert brush has since re-vegetated the channel. Happy Valley Road is an arterial street which splits the landfill roughly in half, north and south, and crosses Skunk Creek via an at-grade crossing. Upstream of Happy Valley Road to the existing Corps of Engineers levee system, the channel invert was left in a more natural state, except for the area excavated to construct the soil cement bank. The Skunk Creek levee system wraps into high ground on both sides of the channel at the Happy Valley Road crossing. Penetrations were provided through the levees for interior drainage at all four corners of the crossing. The culverts which penetrate the levees are equipped with flap gates to prevent flood waters from entering the detention basins on the back side of the levees.

In 1994, a hydraulic analysis performed by Simons, Li & Associates, Inc. (SLA) indicated that the as-built levees did not meet the FEMA freeboard requirement at some locations upstream of Happy Valley Road. Consequently, a project was developed in 1998 to construct concrete freeboard walls on top of the levees which did not meet the three foot FEMA freeboard requirement. The construction plans were prepared by EMCON.

In 1995, the City of Phoenix constructed an all-weather crossing of Skunk Creek at Pinnacle Peak Road. This project included a four-span concrete box-girder bridge, a roller-compacted concrete drop structure located approximately 350 feet upstream of the bridge, and an excavated channel with soil-cement bank protection between the drop structure and the bridge. The excavated channel has a bottom width of 250 feet and continues, unlined, downstream of the bridge to the Adobe Dam reservoir area. The construction plans for the Pinnacle Peak Road Bridge, drop structure, and associated channelization were prepared by Wood Patel and Associates, Inc.

The Adobe Highlands residential development is located east of 35th Avenue and south of Pinnacle Peak Road, next to the upstream side of Adobe Dam. Grading for the project was completed in 2000. Coe & Van Loo Consultants, Inc. prepared the civil engineering plans for the development. They also prepared and submitted a Letter of Map Revision (LOMR) request to FEMA for revision of the 100-year floodplain and floodway boundaries in the area of the development, based upon updated topographic information along 35th Avenue from Pinnacle Peak Road to Adobe Dam. The LOMR, Case No. 98-09-1096P, was approved by FEMA, effective November 19, 1998. The HEC-2 model prepared for the LOMR is now the effective Flood Insurance Study (FIS) model from Adobe Dam to Pinnacle Peak Road. No new hydrology was prepared for the study.

In 2001, construction began on Paseo Highlands Park, a City of Phoenix park located on the southeast corner of Pinnacle Peak Road and 35th Avenue. Grading plans for the park were used by Coe & Van Loo Consultants, Inc., in preparation of a HEC-2 model of flow breakout from Skunk Creek that occurs on the east bank, just north of Pinnacle Peak Road. That model and its supporting documentation have been submitted under separate cover.

1.5 METHODOLOGY

No new hydrology was completed for this study. The effective FIS 100-year peak discharge of 39,000 cfs was used for the analysis. The hydraulic analysis was completed using the U.S. Army Corps of Engineers HEC-2 program, version 4.6.2, as implemented by Dodson & Associates, July 1995. There are two effective FIS HEC-2 models within the study reach. The effective

model from the 1998 Adobe Highlands LOMR begins in the Adobe Dam reservoir area and goes to Pinnacle Peak Road. The second effective model begins at Pinnacle Peak Road and ends above the confluence with Buchanan Wash, at the downstream end of the Corps' levees. The City of Phoenix provided the documentation for both models, but the available documentation was incomplete.

Problems with effective FIS model documentation are discussed in Section 5.7.

1.6 SUMMARY OF RESULTS

The effective FIS floodway surcharges range from –0.3 to 0.5 feet. In the revised model, the floodway is equal to the floodplain at all locations. No floodway profile was run in the revised model, because the study reach is almost completely channelized and new development will not be encroaching into the floodplain.

The differences in water surface elevations between the effective model and the revised model. range from –8.0 feet just upstream of the Pinnacle Peak Road bridge to 2.7 feet at FIS cross-section AI. The large changes in water surface elevations are due to the extensive channel modifications that have taken place since the FIS study was completed.

There has been extensive grading and channelization of the reach from the Corps' levees downstream to Happy Valley Road (FIS cross-sections AO – AR), resulting in water surface elevation increases up to 2.5 feet. The width of the revised 100-year floodplain is approximately one-third of its previous width. Also, a new levee around the Skunk Creek Landfill on the west bank has pushed the confluence with Buchanan Wash approximately 1400 feet upstream of its historical location.

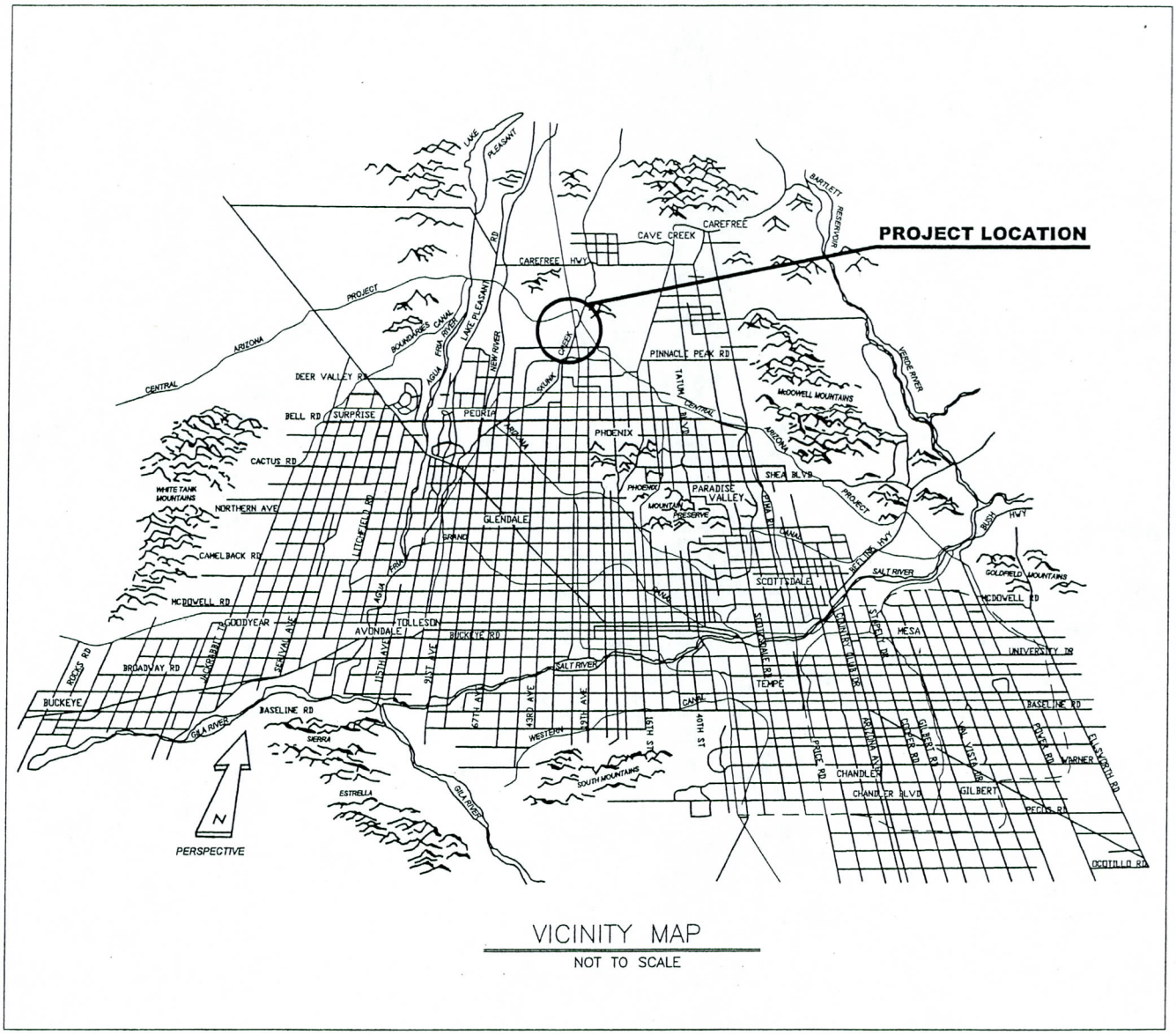
At the time that the effective FIS study was completed, there were already levees containing the flow through the Skunk Creek Landfill reach downstream of Happy Valley Road (FIS cross-sections AJ - AN). However, the channel bottom was left in a more natural state and was not completely graded as it is at present. The grading project evened out the channel bottom, altering the cross-section geometry, which in turn causes changes, both positive and negative, in

water surface elevations. However, the elevation changes alter the floodplain boundary very little, because the flow is still contained between the levees.

The largest difference in water surface elevation is -8.0 feet, which occurs at effective FIS cross-section 9.115. This cross-section is immediately downstream of the drop structure north of Pinnacle Peak Road. Skunk Creek has been channelized, and the channel bed lowered, from this point to the downstream end of the study reach. However, the elevation changes alter the width of the floodplain very little, because the flow is contained within the channel. Revisions to the floodplain boundary south of Pinnacle Peak Road are due to breakout flooding on the left overbank, which is analyzed in a separate report prepared by Coe & Van Loo Consultants, Inc.

There is also a flow breakout of about 1,000 cfs on the right overbank at RM 9.35, which is upstream of the drop structure. No mapping of the overbank area was available, so it was not possible to delineate the extents of flooding due to the breakout. The amount of breakout flow is noted on the workmaps and the overtopped area is labeled "Limit of Detailed Study".

FIGURE 1-1: Location Map



SECTION 2: ADWR AND FEMA FORMS

2.1 STUDY DOCUMENTATION ABSTRACT

STUDY DOCUMENTATION ABSTRACT		INITIAL STUDY	RESTUDY	CLOMR	LOMR	OTHER
Skunk Creek – Adobe Dam to I-17					X	
SECTION 1: GENERAL INFORMATION						
1A	COMMUNITY	Phoenix, Arizona				
1B	COMMUNITY NUMBER	040051				
1C	COUNTY	Maricopa				
1D	STATE	Arizona				
1E	DATE STUDY ACCEPTED					
1F	STUDY CONTRACTOR CONTACT(S) ADDRESS PHONE	Tetra Tech Infrastructure Southwest Group Pedro Calza, P.E. 4801 E. Washington Street, Ste. 260 Phoenix, AZ 85034 (602) 682-3300				
1G	TECH REVIEWER (FEMA) PHONE					
1H	FEMA REGIONAL REVIEWER PHONE					
1I	STATE REVIEWER PHONE					
1J	LOCAL REVIEWER PHONE	Flood Control District of Maricopa County				
1K	RIVER OR STREAM NAME	Skunk Creek				
1L	REACH DESCRIPTION	Adobe Dam to Interstate 17 River Mile 8.69 – 11.57				
1K	STUDY TYPE	Riverine				

SECTION 2: MAPPING INFORMATION		
2A	USGS QUAD SHEET(S)	Hedgpeth Hills, Arizona, 7.5 Minute USGS QUAD Map Union Hills, Arizona, 7.5 Minute USGS QUAD Map
2B	MAPPING FOR HYDROLOGIC STUDY: TYPE/SOURCE SCALE DATE	N/A
2C	MAPPING FOR HYDRAULIC STUDY: TYPE/SOURCE SCALE DATE	Mapping provided in digital format Prepared by M&B Aerial Mapping, Inc. Flight Dates: 1/7/98 and 2/11/00 Two-foot contour interval, generally One-foot contour interval from RM 9.16 – 9.42

SECTION 3: HYDROLOGY		
3A	MODEL OR METHOD USED (including vendor and version description)	Used Existing FIS Hydrologic Information
3B	STORM DURATION	
3C	HYETOGRAPH	
3D	FREQUENCIES DETERMINED	
3E	LIST OF GAGES USED IN FREQUENCY ANALYSIS OR CALIBRATION (Location, Years of Record, Gage Ownership)	
3F	RAINFALL AND REFERENCE	
3G	UNIQUE CONDITIONS AND PROBLEMS	
3H	COORDINATION OF Q'S (Agency, Date, Comments)	

SECTION 4: HYDRAULICS		
4A	MODEL OR METHOD USED (Including Vendor and Version Description)	ProHEC-2, Version 4.6.2PD Dodson & Associates, Houston, TX July 1995
4B	REGIME	Subcritical
4C	FREQUENCIES FOR WHICH PROFILES WERE COMPUTED	100-Year
4D	METHOD OF FLOODWAY CALCULATION	N/A, Floodway = Floodplain
4E	UNIQUE CONDITIONS AND PROBLEMS	Flow Split, Bridge Piers, Drop Structure - See Attached Report

ADDITIONAL STUDY INFORMATION	
ITEM	DESCRIPTION/DISCUSSION
Backup Report	Report provides technical appendices including HEC-2 input and output and floodplain/floodway maps

2.2 APPLICATION/CERTIFICATION FORMS

The required FEMA application and certification forms (MT-2 Forms 1,4,5,6,7) are included in Appendix ~~G~~. 8

SECTION 3: SURVEY AND MAPPING INFORMATION

3.1 FIELD SURVEY INFORMATION

Control surveys of the project area were completed for topographic mapping purposes in February 2000 and January 2001 by Morrison-Maierle, Inc., an Arizona Corporation. Additional survey for culvert and cross-section data was conducted in June 2001. A copy of the field notes, control point summary, and list of Elevation Reference Marks (ERM) is included in Appendix C.

The vertical datum used for the effective topographic mapping (September 1986) was NGVD29, while the datum used for the new mapping was not clearly defined. Consequently, four control points common to both surveys (ERMs 517, 519, 525, 526) were compared to check the vertical datum. The elevations at all four points agree within 0.30 feet. ERM 525, located near the CAP Canal at the upper study limit, and ERM 519, located near the confluence with Skunk Creek, agree within 0.05 feet. Therefore, the water surface elevations of this study are compared directly with the effective study without adjustment.

Morrison-Maierle also surveyed the parapet walls that were erected on top of levees upstream of Happy Valley Road that had inadequate freeboard. The top of wall elevations are shown on as-built drawings prepared by EMCON. The wall elevations were added to the cross-section ground profiles in the hydraulic model.

3.2 MAPPING DESCRIPTION

New two-foot contour mapping, provided in digital format, was used to prepare the Skunk Creek hydraulic model. The mapping is based on aerial photography taken by M & B Aerial Mapping, Inc. The area was covered on two separate flights, as follows:

January 7, 1998:	Main site map (the Skunk Creek Landfill).
February 11, 2000:	Coverage upstream and downstream of the landfill.

Control survey work for the mapping was done by Morrison-Maierle, Inc., as described in Section 3.1.

SECTION 4: HYDROLOGIC ANALYSIS

The effective FIS hydrologic data was used for this study. The effective FIS peak 100-year discharge in the study reach is 39,000 cfs.

SECTION 5: HYDRAULIC ANALYSIS

5.1 METHOD DESCRIPTION

Standard hydraulic methods were used to determine the 100-year event floodplain boundaries. Water surface profile modeling was done using the U.S. Army Corps of Engineers HEC-2 computer program, as implemented by Dodson & Associates, Inc. in their ProHEC2 Plus software, version 4.6.2PD, July 1995.

The study reach begins at River Mile 8.69, which is located in the ponding area upstream of Adobe Dam, south of Pinnacle Peak Road and west of 35th Avenue. The natural channel only extends about 1,400 feet north (upstream) of the ponding area. From that point to the upstream study limit at River Mile 11.57, Skunk Creek has been almost completely channelized by various City of Phoenix (the City) and U.S. Army Corps of Engineers (the Corps) projects. A 100-year bridge crossing at Pinnacle Peak Road was constructed by the City in 1995. The project included a stepped concrete drop structure, located approximately 350 feet upstream of the bridge, and an incised channel with soil cement bank protection that begins at the drop structure and goes downstream, under the bridge. The channel continues, unlined, for approximately 800 feet south of Pinnacle Peak Road to the Adobe Dam reservoir area.

Upstream of the drop structure, the Skunk Creek landfill borders both sides of the channel for 1.5 miles to the confluence with Buchanan Wash at River Mile 11.03. Continuing upstream from the Buchanan Wash confluence, the Corps constructed levees that channelize Skunk Creek as it passes under Interstate 17. There are three breaks in the channelization within the study reach. These are at the Buchanan Wash confluence, at Happy Valley Road (an at-grade crossing), and on the east overbank between the southern end of the Skunk Creek landfill and the drop structure north of Pinnacle Peak Road. The ultimate design of the Pinnacle Peak Road bridge crossing includes complete channelization between the bridge and the landfill, but there was insufficient funding to complete the entire project at the time the bridge was constructed. During the 100-year event, flow breaks out of the channel at this location, covers the east overbank, and flows across Pinnacle Peak Road and 35th Avenue. The flow split analysis is discussed in Section 5.5.4.

The HEC-2 model developed for this study replaces two currently effective FIS models. The first effective model begins at River Mile 8.69, the downstream limit of the study area. This model is effective to River Mile 9.05, which is approximately 300 feet south of Pinnacle Peak Road. The second model is effective from River Mile 9.05 to the upstream limit of the study reach. The models overlap because they both contain cross-sections from River Mile 8.69 to 10.04, but each one is effective for only the River Miles listed in Table 5-1. Problems were encountered in obtaining sufficient documentation for the effective FIS models. These problems are discussed in Section 5.7.

TABLE 5-1: Summary of Effective Models

MODEL	RUN DATE	TOTAL RIVER MILES IN MODEL	EFFECTIVE FIS RIVER MILES	FIS CROSS SECTIONS
#1	10/12/98	8.69 – 10.04	8.69 – 9.05	AG – AH
#2	2/20/90	8.69 – 11.40	9.05 – 11.40	AI – AR

Duplicate effective models were produced for both effective models to assure that the ProHEC-2 software used to develop the new model is compatible with previous models.

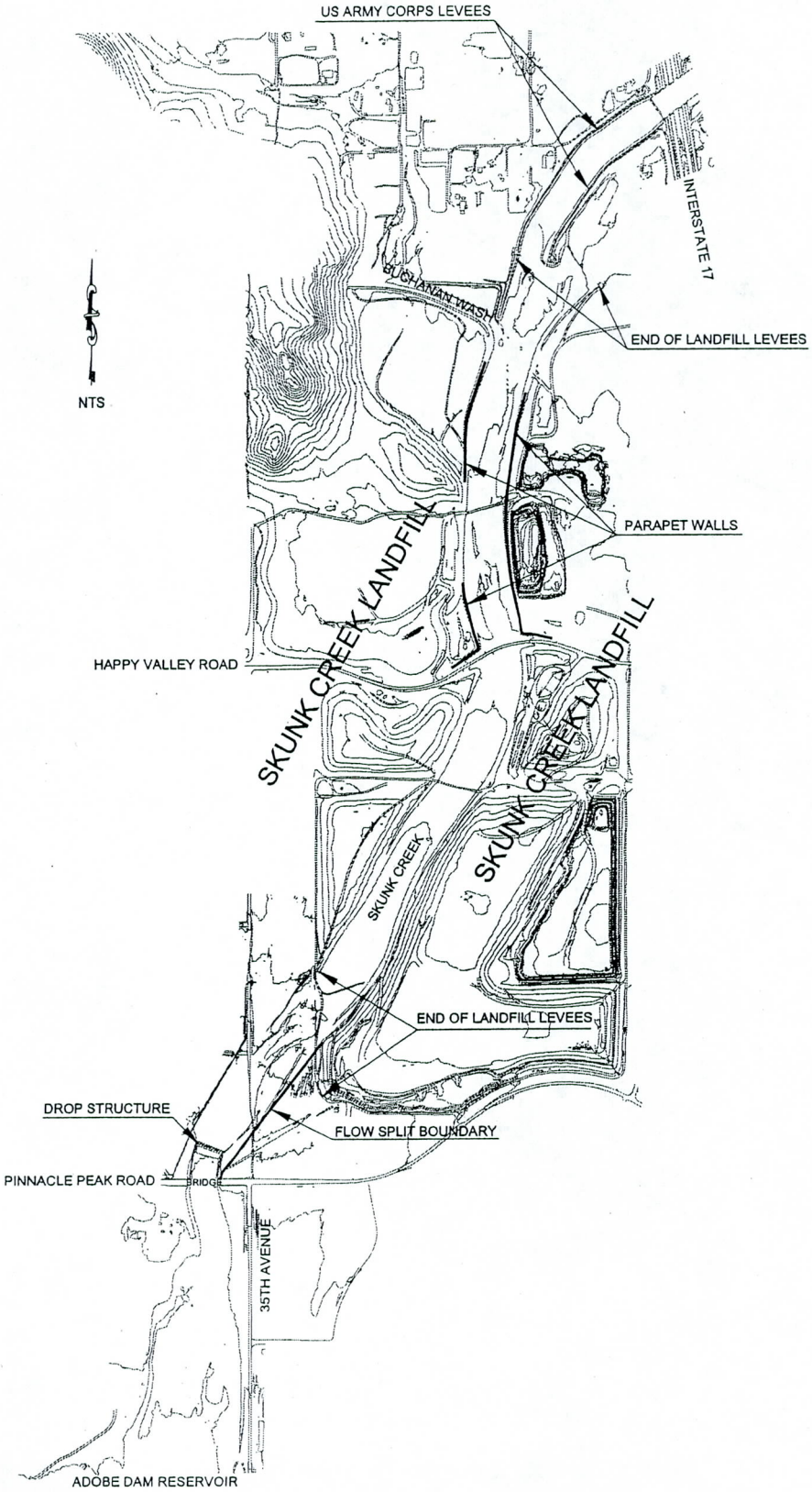
The proposed model incorporates revised river stationing because extensive channelization of Skunk Creek has straightened the reach. The proposed model begins at River Mile 8.69, as the effective models do, but all upstream cross-sections have been re-stationed. An attempt was made to duplicate the placement of cross-sections from the current effective models so that a comparison of water surface elevations could be made. Due to changes in topography and channel alignment, this was not always possible. The river miles shown in Table 5-1 are not revised; they are the original cross-section stations from the current effective models.

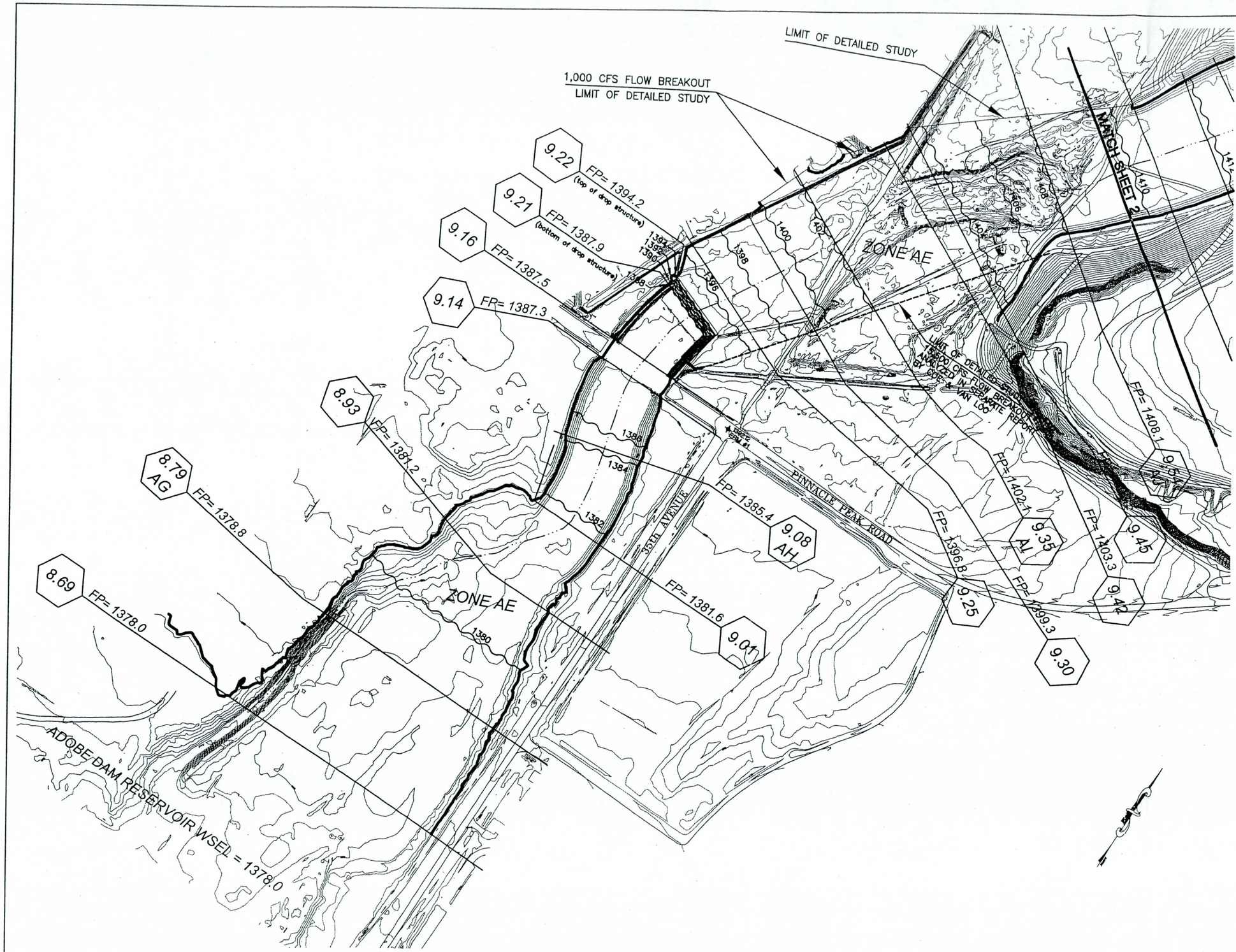
The proposed HEC-2 model begins in the pooling area behind Adobe Dam. The 100-year pooled water surface elevation (WSEL) of 1378.0 feet was used to begin the model. The current effective model uses this procedure and was the source of the starting WSEL data.

5.2 WORK STUDY MAPS

Work study maps were prepared at a scale of 1" = 200'. Figure 5-1 shows a general overview of the study area and key features. Figure 5-2 shows a set of reduced scale work study maps. The baseline generally follows the channel thalweg. The basis for river mile stationing on Skunk Creek is at River Mile 0.00, which is the confluence of Skunk Creek and New River. For this study, the revised baseline stationing begins at River Mile 8.69 and continues upstream to River Mile 11.57, which is immediately downstream of Interstate 17. Cross-sections are labeled by River Mile station, rounded to the nearest 1/100th of a mile.

FIGURE 5-1: Study Area Overview





THE BASE TOPOGRAPHIC MAPPING USED TO CONDUCT THIS FLOODPLAIN DELINEATION STUDY WAS PREPARED BY M & B AERIAL MAPPING COMPANY, INC. THIS MAPPING IS BASED ON AERIAL PHOTOGRAPHY TAKEN FEB 11, 2000 AND JAN 24, 2001. PROJECT CONTROL WAS PROVIDED BY MORRISON-MAIERLE, INC. TETRA TECH, INC. ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE CONTROL SURVEY OR THE BASE TOPOGRAPHIC MAPPING.

200 0 200 400
SCALE: 1"= 200 FEET
CONTOUR INTERVAL = 2 FEET

LEGEND

100-YR FLOODPLAIN BOUNDARY	
HYDRAULIC BASE LINE	
CROSS SECTION	0.10 A — FP= 1483.6 (FLOODPLAIN WATER SURFACE ELEVATION) — CROSS SECTION RIVER MILE — FIS INDEX CROSS SECTION
ELEVATION REFERENCE MARK	ERM XXX
BASE FLOOD ELEVATION	1462
SFH ZONE DESIGNATION	ZONE AE
FLOW SPLIT BOUNDARY	

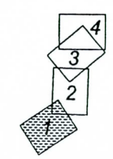
NOTE: FLOODWAY = FLOODPLAIN AT ALL LOCATIONS

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929.

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM #1	1392.12	FOUND BRASS CAP IN HANDHOLE IN INTERSECTION OF 35TH AVENUE AND PINNACLE PEAK ROAD. N: 981,636.31 E: 433,844.66

KEY MAP



NO.	REVISION	BY	DATE
2			
1			

CITY OF PHOENIX
MARICOPA COUNTY, ARIZONA

SKUNK CREEK
WORK STUDY MAP
LETTER OF MAP REVISION

Registered Professional Engineer (Civil) CERTIFICATE NO. 30493 PEDRO A. CALZA Date Signed ARIZONA, U.S.A.

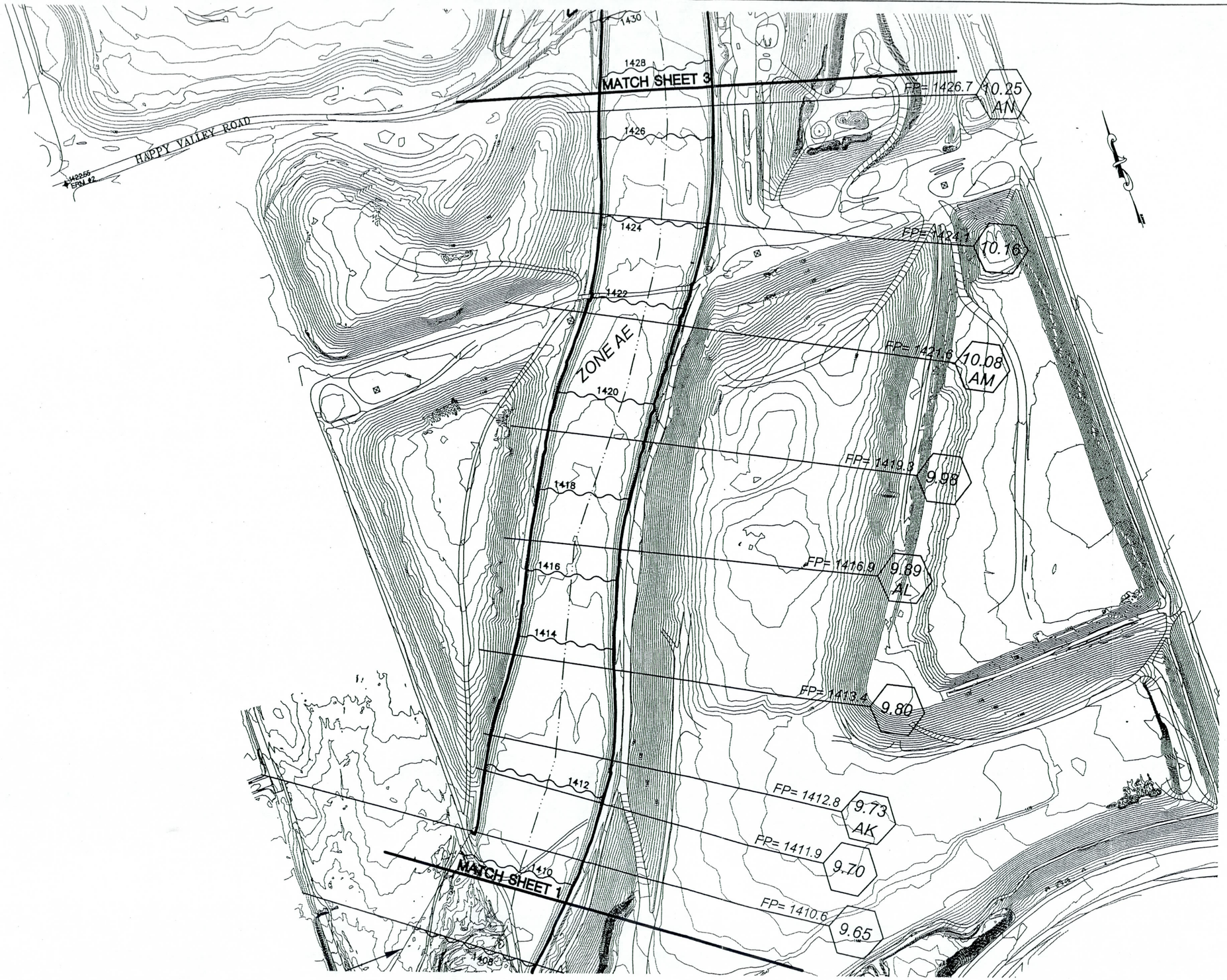
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
1801 East Washington Street, Suite 100, Phoenix, AZ 85034
(602) 682-3300 FAX (602) 244-1164

	BY	DATE
DESIGN	LML	09/2002
DESIGN CHK.	PAC	09/2002
PLANS	LML	09/2002
PLANS CHK.	PAC	09/2002

FIGURE 5-2

SHEET 1 OF 4

P:\Emcn-002\Buchanan-Skunk\Workmaps.dwg, 09/17/2002 02:13:58 PM, LML



THE BASE TOPOGRAPHIC MAPPING USED TO CONDUCT THIS FLOODPLAIN DELINEATION STUDY WAS PREPARED BY M & B AERIAL MAPPING COMPANY, INC. THIS MAPPING IS BASED ON AERIAL PHOTOGRAPHY TAKEN FEB 11, 2000 AND JAN 24, 2001. PROJECT CONTROL WAS PROVIDED BY MORRISON-MAIERLE, INC. TETRA TECH, INC. ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE CONTROL SURVEY OR THE BASE TOPOGRAPHIC MAPPING.

200 0 200 400
SCALE: 1"= 200 FEET
CONTOUR INTERVAL = 2 FEET

LEGEND

100-YR FLOODPLAIN BOUNDARY

HYDRAULIC BASE LINE

CROSS SECTION — 0.10 A — CROSS SECTION RACE MILE — FP= 1483.6 — FLOODWAY WATER SURFACE ELEVATION — FB MARK CROSS SECTION

ELEVATION REFERENCE MARK — ERM XXX

BASE FLOOD ELEVATION — 1462

SFH ZONE DESIGNATION — ZONE AE

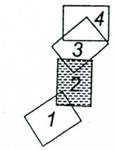
NOTE: FLOODWAY = FLOODPLAIN AT ALL LOCATIONS

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929.

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM #2	1422.55	FOUND BRASS CAP IN HANDHOLE IN INTERSECTION OF 35TH AVENUE AND HAPPY VALLEY ROAD. N: 986,915.82 E: 433,818.21

KEY MAP



NO.	REVISION	BY	DATE
2			
1			

CITY OF PHOENIX
MARICOPA COUNTY, ARIZONA

SKUNK CREEK
WORK STUDY MAP
LETTER OF MAP REVISION

Registered Professional Engineer (Civil) CERTIFICATE NO. 30493 PEDRO A. CALZA Date Signed ARIZONA, U.S.A.

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
4801 East Washington Street, Suite 160, Phoenix, AZ 85034
(602) 682-2000 FAX (602) 244-1164

	BY	DATE
DESIGN	LML	09/2002
DESIGN CHK.	PAC	09/2002
PLANS	LML	09/2002
PLANS CHK.	PAC	09/2002

FIGURE 5-2

SHEET 2 OF 4

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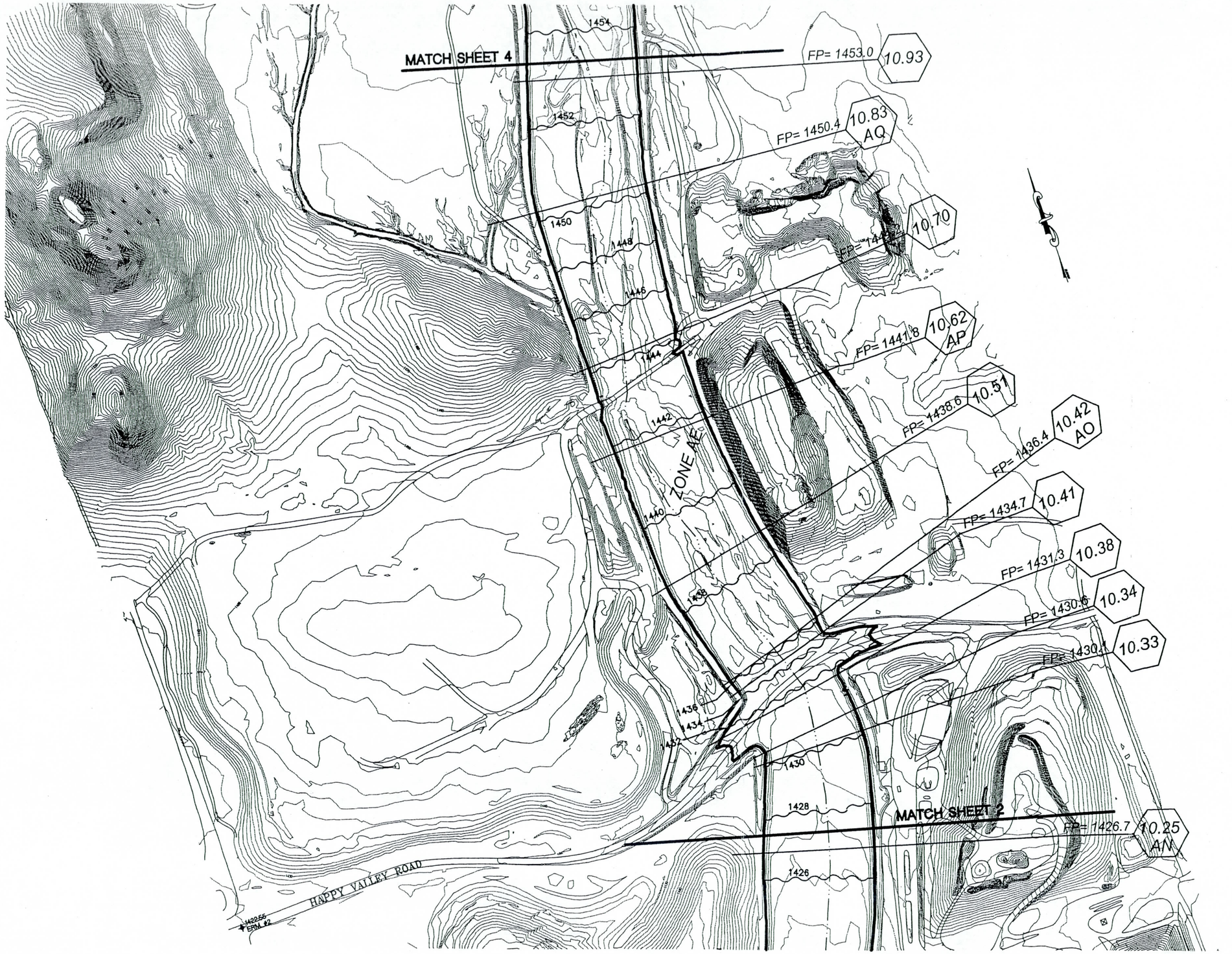

THE BASE TOPOGRAPHIC MAPPING USED TO CONDUCT THIS FLOODPLAIN DELINEATION STUDY WAS PREPARED BY M & B AERIAL MAPPING COMPANY, INC. THIS MAPPING IS BASED ON AERIAL PHOTOGRAPHY TAKEN FEB 11, 2000 AND JAN 24, 2001. PROJECT CONTROL WAS PROVIDED BY MORRISON-MAIERLE, INC. TETRA TECH, INC. ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE CONTROL SURVEY OR THE BASE TOPOGRAPHIC MAPPING.

200 0 200 400
SCALE: 1"= 200 FEET
CONTOUR INTERVAL = 2 FEET

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LEGEND

100-YR FLOODPLAIN BOUNDARY

HYDRAULIC BASE LINE

CROSS SECTION — 0.10 A — FP= 1483.6 (FLOODPLAIN WATER SURFACE ELEVATION) — CROSS SECTION BACK MILE — FB BUCKY CROSS SECTION

ELEVATION REFERENCE MARK — ERM XXX

BASE FLOOD ELEVATION — 1462

SFH ZONE DESIGNATION — ZONE AE

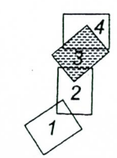
NOTE: FLOODWAY = FLOODPLAIN AT ALL LOCATIONS

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929.

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM #2	1422.55	FOUND BRASS CAP IN HANDHOLE IN INTERSECTION OF 35TH AVENUE AND HAPPY VALLEY ROAD. N: 986,915.82 E: 433,818.21

KEY MAP



NO.	REVISION	BY	DATE
1			
2			

CITY OF PHOENIX
MARICOPA COUNTY, ARIZONA

SKUNK CREEK
WORK STUDY MAP
LETTER OF MAP REVISION

Registered Professional Engineer (Civil) CERTIFICATE NO. 30493 PEDRO A. CALZA Date Signed ARIZONA, U.S.A.

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	BY	DATE
DESIGN	LML	09/2002
DESIGN CHK.	PAC	09/2002
PLANS	LML	09/2002
PLANS CHK.	PAC	09/2002

FIGURE 5-2

SHEET 3 OF 4

THE BASE TOPOGRAPHIC MAPPING USED TO CONDUCT THIS FLOODPLAIN DELINEATION STUDY WAS PREPARED BY M & B AERIAL MAPPING COMPANY, INC. THIS MAPPING IS BASED ON AERIAL PHOTOGRAPHY TAKEN FEB 11, 2000 AND JAN 24, 2001. PROJECT CONTROL WAS PROVIDED BY MORRISON-MAIERLE, INC. TETRA TECH, INC. ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE CONTROL SURVEY OR THE BASE TOPOGRAPHIC MAPPING.

200 0 200 400

SCALE: 1"= 200 FEET

CONTOUR INTERVAL = 2 FEET

LEGEND

100-YR FLOODPLAIN BOUNDARY

HYDRAULIC BASE LINE

CROSS SECTION — 0.10 A — FP= 1483.6 — FLOODPLAIN WATER SURFACE ELEVATION — CROSS SECTION BASE MILE — TO MATCH CROSS SECTION

ELEVATION REFERENCE MARK — ERM XXX

BASE FLOOD ELEVATION — 1462

SFH ZONE DESIGNATION — ZONE AE

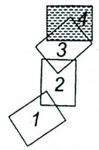
NOTE: FLOODWAY = FLOODPLAIN AT ALL LOCATIONS

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929.

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
RM519	1555.08	FOUND STONE AT THE SE CORNER OF SEC. 34, T5N R2E. N: 991,520.42 E: 434,056.21
ERM #3	1460.07	BC NORTH END OF LEVEE N: 990,864.33 E: 437,624.80

KEY MAP



NO.	REVISION	BY	DATE
2			
1			

CITY OF PHOENIX
MARICOPA COUNTY, ARIZONA

SKUNK CREEK
WORK STUDY MAP
LETTER OF MAP REVISION

Registered Professional Engineer (Civil) CERTIFICATE NO. 30493 PEDRO A. CALZA Date Signed ARIZONA, U.S.A.

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
4801 East Washington Street, Suite 260, Phoenix, AZ 85034
(602) 685-3300 FAX (602) 244-1154

	BY	DATE
DESIGN	LML	09/2002
DESIGN CHK.	PAC	09/2002
PLANS	LML	09/2002
PLANS CHK.	PAC	09/2002

FIGURE 5-2 SHEET 4 OF 4

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5.3 PARAMETER ESTIMATION

5.3.1 Roughness coefficients

Roughness coefficients were based on field observations and engineering judgement. The grading and channelization projects have left the study reach fairly uniform in regards to roughness and flow obstructions. Overbank N values range from 0.030 to 0.050. Channel N values range from 0.020 to 0.040. A Manning's N value of 0.035 was used for the channel and overbanks within channelized sections of the reach. It should be noted that the channel roughness may vary, depending upon the amount of vegetation present. Following levee construction, the channel was virtually cleared of vegetation, but over time it has regrown. It is probable that future maintenance projects will again remove vegetation in the channel, although this is not a scheduled activity.

5.3.2 Expansion and contraction coefficients

The standard expansion and contraction coefficients of 0.3 and 0.1, respectively, were used. The bridge at Pinnacle Peak Road does not have abutments that encroach into the channel. Instead, the incised channel continues uninterrupted underneath the bridge, with only bridge piers causing added obstructions. Downstream of the Skunk Creek landfill, flow expands onto the east overbank at approximately a 4:1 ratio, so no adjustment of the expansion coefficient was necessary.

5.4 CROSS SECTION DESCRIPTION

Cross-sections were placed approximately every four to five hundred feet. At roads, breaks in the levees, the bridge, and the drop structure, they are spaced as needed to model the flow appropriately. Cross-sections are labeled by river mile station, rounded to the nearest $1/100^{th}$ of a mile. All cross-sections are stationed from left to right, looking downstream. The baseline station for all cross-sections is 5,000.

The ground profiles for cross-sections 9.25 through 11.03 were obtained using BOSS-RMS computer software, which runs within AutoCAD and cuts cross-sections using a digital terrain map (DTM). The cross-sections at the top and bottom of the drop structure were taken from topographic mapping. All other cross-sections were cut from the DTM using Softdesk Civil Site software.

In 1994, a hydraulic analysis performed by Simons, Li & Associates, Inc. (SLA) indicated that the as-built levees did not meet the FEMA freeboard requirement at some locations upstream of Happy Valley Road. Consequently, a project was developed in 1998 to construct concrete freeboard walls on top of levees which did not meet the three foot FEMA freeboard requirement. The walls are in place from cross-section 10.38 through 10.93. These cross-sections were edited to include the surveyed top-of-wall elevations from the as-built construction plans.

5.5 MODELING CONSIDERATIONS

5.5.1 Hydraulic Jump and Drop Analysis

There is one drop structure within the study reach, located approximately 350 feet upstream of Pinnacle Peak Road. It is a stepped roller compacted concrete (RCC) structure consisting of seven steps (approximately 6.42 feet horizontal to 2.14 feet vertical) that extend across the incised channel. The structure includes a concrete stilling basin to induce a controlled hydraulic jump, upstream and downstream concrete cutoff walls to mitigate undermining of the structure, a network of perforated pipe weep holes to relieve uplift forces, and riprap channel protection upstream and downstream of the structure. The design capacity of the structure is 22,000 cfs, which is approximately the portion of the 100-year event that would pass over it. The remainder of the 100-year flow breaks out of the channel over the east bank between cross-sections 9.25 and 9.42 and flows southward over Pinnacle Peak Road. For details of the drop structure design, refer to *Final Drainage Report – Pinnacle Peak Road Bridge over Skunk Creek*, by Wood, Patel & Associates, July 1994. The report includes spillway drop structure and uplift calculations.

For this study, the drop structure was modeled using two cross-sections, one at the top lip of the structure and another at the bottom. The hydraulic jump is contained within the incised channel, so no special adjustments of the floodplain/floodway boundaries were necessary.

5.5.2 Bridges and Culverts

The only bridge in the study reach is at the Pinnacle Peak Road crossing. There are no culverts. The bridge is a four span, concrete girder structure with three sets of 4-foot diameter piers. The abutments are spaced approximately 314 feet apart. It is designed to pass the 100-year event without overtopping and to survive the forces generated by the 500-year event. For details of the bridge design, refer to *Phase 1, Design Option Report – Pinnacle Peak Road Bridge over Skunk Creek, Addendum*, by Wood, Patel & Associates and Alpha Engineering Group, Inc., November 1993. Official record drawings were obtained from the City of Phoenix (*Pinnacle Peak Road Bridge over Skunk Creek*, Project No. BR-922765, 1994). No as-built drawings were available.

The bridge was modeled using the Normal Bridge Method. Cross-sections 9.145 and 9.155 model the downstream and upstream bridge faces, respectively. The piers are modeled by adjusting the ground profile using the GR cards.

5.5.3 Levees and Dikes

The first channelization project in the study reach was completed by the Corps at an unknown date. This project included levees upstream and downstream of the I-17 crossing. Contract drawings dated 1981 were obtained (refer to *Gila River Basin, New River and Phoenix City Streams, Arizona – Skunk Creek Channel and Levees*, Spec. No. DACW09-82-B0004). The Corps levees end just upstream of the confluence with Buchanan Wash, at Cross-section 11.19.

In 1992, the Skunk Creek Channel Improvements project channelized Skunk Creek through the Skunk Creek Landfill area and provided soil-cement bank protection. The project was designed to protect the landfill from the FEMA 100-year flood event. There are active, inactive (closed), and planned landfill cells along the entire length of the channelization project. The elevation of the closed landfill cells behind the bank protection is typically higher than the 100-year water surface. As a result, the soil cement levees have effectively become soil cement bank protection. The elevation of the undeveloped landfill area, which includes the proposed cells, is generally lower than the 100-year water surface. These areas are protected by levees with soil cement bank protection. The undeveloped cells will eventually be built up to a height significantly

higher than the existing soil-cement levees. As a result, the soil cement levees will effectively become soil cement bank protection. For construction drawings of the project, refer to *City of Phoenix, Engineering and Architectural Services, Project Management, Skunk Creek Channel Improvements*, Index Number SA-884080, Morea-Hall Engineering, Inc., April 22, 1992. The hydraulic analysis for the project is detailed in *Skunk Creek Channel – Hydraulic Analysis of Proposed Channel Improvement, Phoenix, Arizona*, by Harza Engineering Company, July 1986.

A 1998 study by Simons, Li & Associates showed that there was insufficient freeboard (less than 3 feet) at some locations on the landfill levees upstream of Happy Valley Road. As a result, concrete parapet walls were constructed on top of the levees from Cross-section 10.41 to 10.93. For design details, refer to *Design Concept Report, Skunk Creek Channel Improvements – Alternatives Analysis for Freeboard, Skunk Creek Landfill, Phoenix, Arizona*, by Simons, Li & Associates, Inc., September 1998. Construction plans were prepared by EMCON.

No special modeling techniques were used for the levees. They are not overtopped by the 100-year event, so no split flow routines were necessary. Cross-section geometry was taken from the topographic mapping and as-built construction plans for the parapet walls. Additional design documents concerning the levees are included in Appendix F.

When the bridge and drop structure were constructed in 1995, two different guide banks were built on the east overbank to direct high frequency flows over the drop structure. The innermost guide bank is a temporary "sugar" dike intended to redirect flows up to the 10-year event. The outermost guide bank is described in *Final Drainage Report – Pinnacle Peak Road Bridge over Skunk Creek*, by Wood, Patel & Associates, as an earthen levee, approximately 3 to 4 feet high, with a concrete cutoff wall core, protected by riprap. A similar guide bank was constructed at the western side of the drop structure. However, since as-builts are not available, there is no evidence that the concrete wall cores were ever constructed. Also, there are no design calculations showing that the guide banks would withstand the forces generated during a 100-year flood event. Therefore, these structures were assumed to fail and were not treated as permanent structures in the model.

5.5.4 Islands and Flow Splits

There are no hydraulically significant islands within the study reach. A flow split does occur upstream of the drop structure, north of Pinnacle Peak Road. South of the landfill, flow breaks out on the east overbank and moves southward, flowing over Pinnacle Peak Road. The tendency for the flow to break out in this direction was increased by the construction of the Adobe Mountain subdivision on the west bank in 1986. This project included fill and bank protection that removed a portion of the west overbank north of Pinnacle Peak Road from the floodplain (LOMR first issued June 15, 1987; re-issued March 9, 1990).

The flow split was modeled by drawing a flow "boundary line" from the eastern abutment of the Pinnacle Peak Road bridge upstream to the point where flow begins expanding over the east overbank, at the southern end of the Skunk Creek Landfill (see Figure 5-1). Flow that crossed this boundary line was assumed to continue southward, over Pinnacle Peak Road, instead of going over the drop structure and into the channel under the bridge. The exact amount of discharge in the flow split model was determined by matching water surface elevations at Cross-section 9.25. The station where the flow boundary line divides Cross-section 9.25 is coded as the east bank ineffective flow station in the main channel model, and as the west bank ineffective flow station in the split flow model. The result of this method was a split flow discharge of 15,500 cfs, leaving 23,500 cfs in the main channel. Downstream of the bridge, breakout flow on the overbank re-enters the main channel gradually, beginning immediately south of Pinnacle Peak Road and continuing to weir into the channel as it moves southward. The City of Phoenix Paseo Highlands Park, on the southeast corner of Pinnacle Peak Road and 35th Avenue, is inundated by the breakout flow. The park extends approximately 1,600 feet south of Pinnacle Peak Road. South of the park is the Adobe Highlands residential subdivision, located immediately upstream of Adobe Dam.

An analysis of the 100-year floodplain resulting from the flow breakout, *Split Flow Analysis over Pinnacle Peak Road*, dated October 7, 2002 was prepared by Coe & Van Loo Consultants, Inc. (CVL) and is submitted under separate cover. The CVL analysis is based upon a split flow peak discharge of 15,500 cfs on the east bank at Pinnacle Peak Road. The results of the CVL analysis were not available at the time this report was prepared, so the hydraulic model for this study was

for this study was coded to return all breakout flow to the main channel at the first cross-section downstream of Pinnacle Peak Road.

5.5.5 Ineffective Flow Areas

Ineffective flow areas are designated to remove swales, small side channels, local depressions, or floodplain fringe areas from the hydraulic capacity of a cross-section because these areas do not contribute to the downstream conveyance of the flow. Such areas have been identified at the Happy Valley Road crossing and between the drop structure and the downstream boundary of the landfill. Encroachment Method 1 was used to define the ineffective flow boundary in these areas.

5.5.6 Supercritical Flow

The revised HEC-2 model was coded for subcritical flow profile computations. The modeling results confirm the wash functions in this flow regime. The model results indicate that sustained supercritical flow does not occur within the study reach, with the exception of flow that passes over the drop structure north of Pinnacle Peak Road. A concrete stilling basin at the base of the drop structure contains the resulting hydraulic jump, where flow returns to a subcritical regime.

5.6 FLOODWAY MODELING

The floodway concept is used to define the amount of floodplain encroachment that is considered acceptable for development. A floodway consists of the main channel of a stream plus sufficient overbank area to convey the 100-year flood without increasing flood heights by more than a specified amount. FEMA standards limit the maximum increase in floodway elevation to one foot (1') above the base flood elevation.

The study reach is almost completely channelized within levees that contain the 100-year flood event. Further encroachment into the channel is unlikely to occur. For this reason, the floodway is defined as being equal to the delineated floodplain.

5.7 PROBLEMS ENCOUNTERED

5.7.1 Incomplete Documentation

Sufficient documentation of the effective FIS models was not available from any source. Two versions of the HEC-2 model from the 1998 LOMR were received, in which FIS cross-sections AG and AH were revised. Neither version exactly matches the revised Base Flood Water Surface Elevations published in the Floodway Data table (see Columns 9-12 in Table 5-2). Also, the effective FIS model cited in the 1998 LOMR submission was actually an older version that did not incorporate revisions made in 1987, as documented in the *Flood Insurance Study for Maricopa County, Arizona, and Incorporated Areas, Volume 3 of 12*, revised September 30, 1995.

The documentation that was available for the effective FIS HEC-2 model for the balance of the study reach included the following:

- A hardcopy printout of a HEC-2 run executed on 02-02-90, which was labeled "Skunk Creek, Adobe Subdivision; 100-Year Natural with Proposed Conditions; Baker Engineers", using the HEC-2 release dated November 1976, updated May 1984. The results of this model do not exactly match the Base Flood Water Surface Elevations published in the Floodway Data table (see Columns 5 and 6 in Table 5-2).

- An undated, unsealed set of 200 scale workmaps that cover the entire study area, prepared by Dibble & Associates, Consulting Engineers, for the Flood Control District of Maricopa County. Photogrammetry by Kenney Aerial Mapping, flown on August 8, 1974. These workmaps show the 100-year floodplain, floodway, base flood elevations, and cross-section locations. However, HEC-2 model cross-sections 9.09, 9.10, 9.19, and 9.20 are not shown on the workmaps.

The duplicate effective model was created by retyping the hardcopy data into a HEC-2 input file. The results of the duplicate effective model, run on an updated version of HEC-2 (May 1984) still do not exactly match the Base Flood Water Surface Elevations published in the Floodway Data table (see Columns 7 and 8 in Table 5-2).

5.7.2 Flow Breakout at RM 9.30

There is a flow breakout of about 1,000 cfs on the right overbank upstream of the drop structure at revised cross-section 9.35. No mapping of the overbank area was available, so it was not possible to delineate the extents of flooding due to the breakout. The amount of breakout flow was determined by modifying the revised FIS model. The split flow option was used to define a weir along the top of the right overbank from cross-sections 9.25 to 9.42.

TABLE 5-2: Comparison of Available Effective FIS Model Documentation

FIRM Cross Section Label	Effective FIS Floodway WSEL	Effective FIS Floodplain WSEL	HEC-2 Model Cross Section Identifiers	Effective HEC-2 Model Floodway WSEL (hardcopy only)	Effective HEC-2 Model Floodplain WSEL (hardcopy only)	Duplicate Effective Floodway WSEL	Duplicate Effective Floodplain WSEL	Effective Model #1 from 1998 LOMR Floodway WSEL	Effective Model #1 from 1998 LOMR Floodplain WSEL	Effective Model #2 from 1998 LOMR Floodway WSEL	Effective Model #2 from 1998 LOMR Floodplain WSEL
	Revised 11/19/98	Revised 11/19/98		Run Date: 02/20/90	Run Date: 02/20/90	Run Date: 07/28/97	Run Date: 07/28/97	Run Date: 08/28/98	Run Date: 08/28/98	Run Date: 10/12/98	Run Date: 10/12/98
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			8.69	1379.1	1378.2	1379.1	1378.2	1378.1	1378.0	1378.0	1378.0
AG	1378.2	1378.2	8.75 (AG)	1383.5	1383.3	1383.5	1383.3	1383.0	1382.1	1378.1	1378.1
			8.89	1388.5	1388.1	1388.5	1388.1	1386.6	1387.1	1382.9	1382.9
			8.965	1391.1	1390.8	1391.1	1390.8	1390.5	1390.3	1383.1	1383.1
AH	1385.4	1385.4	9.05 (AH)	1394.0	1393.1	1394.0	1393.1	1393.6	1393.0	1385.6	1385.6
			9.09	1395.2	1395.2	1395.2	1395.2				
			9.10	1395.2	1395.2	1395.1	1395.2				
			9.115	1395.5	1395.5	1395.5	1395.5	1394.8	1394.1	1394.9	1394.1
			9.19	1396.3	1396.3	1396.2	1396.3				
			9.20	1396.7	1396.8	1396.6	1396.8				
			9.21	1398.1	1398.0	1398.1	1398.0	1398.4	1397.6	1398.4	1397.6

AI	1399.4	1399.4	9.31 (AI)	1399.2	1399.4	1399.1	1399.4	1401.8	1401.3	1401.8	1401.3

			9.40	1402.8	1402.6	1402.9	1402.6	1404.5	1403.7	1404.5	1403.7
AJ	1405.8	1405.8	9.48 (AJ)	1405.8	1405.8	1405.8	1405.8	1407.0	1406.5	1407.0	1406.5
			9.58	1409.4	1408.9	1409.4	1408.9	1409.0	1408.6	1409.0	1408.6

FIRM Cross Section Label	Effective FIS Floodway WSEL	Effective FIS Floodplain WSEL	HEC-2 Model Cross Section Identifiers	Effective HEC-2 Model Floodway WSEL (hardcopy only)	Effective HEC-2 Model Floodplain WSEL (hardcopy only)	Duplicate Effective Floodway WSEL	Duplicate Effective Floodplain WSEL	Effective Model #1 from 1998 LOMR Floodway WSEL	Effective Model #1 from 1998 LOMR Floodplain WSEL	Effective Model #2 from 1998 LOMR Floodway WSEL	Effective Model #2 from 1998 LOMR Floodplain WSEL
	Revised 11/19/98	Revised 11/19/98		Run Date: 02/20/90	Run Date: 02/20/90	Run Date: 07/28/97	Run Date: 07/28/97	Run Date: 08/28/98	Run Date: 08/28/98	Run Date: 10/12/98	Run Date: 10/12/98

AK	1411.7	1411.7	9.67 (AK)	1411.7	1411.7	1411.6	1411.7	1411.6	1411.7	1411.7	1411.7
			9.75	1415.4	1415.4	1415.4	1415.4	1415.4	1415.4	1415.4	1415.4
AL	1418.7	1418.7	9.84 (AL)	1418.7	1418.7	1418.7	1418.7	1418.7	1418.7	1418.7	1418.7
			9.94	1420.5	1420.5	1420.5	1420.5	1420.5	1420.5	1420.5	1420.5
AM	1422.2	1422.2	10.04 (AM)	1422.2	1422.2	1422.2	1422.2	1422.2	1422.2	1422.2	1422.2
			10.12	1423.2	1423.2	1423.2	1423.2				
AN	1426.6	1426.6	10.21 (AN)	1426.7	1426.7	1426.7	1426.7				

			10.30	1430.6	1430.6	1430.6	1430.6				

AO	1434	1434	10.40 (AO)	1434.0	1434.0	1434.0	1434.0				
			10.49	1437.1	1437.1	1437.1	1437.1				
AP	1440.4	1440.4	10.62 (AP)	1440.4	1440.4	1440.4	1440.4				
			10.70	1443.6	1443.6	1443.6	1443.6				
AQ	1447.9	1447.9	10.83 (AQ)	1447.9	1447.9	1447.9	1447.9				
			10.93	1451.0	1451.0	1451.0	1451.0				
AR	1454.7	1454.7	11.04 (AR)	1454.7	1454.7	1454.7	1454.7				

			11.20	1460.4	1460.4	1460.4	1460.4				
			11.30	1463.2	1463.2	1463.2	1463.2				
			11.40	1463.6	1463.6	1463.6	1463.6				

5.8 CALIBRATION

No independent calibration studies were conducted for the proposed HEC-2 model.

5.9 FINAL RESULTS

5.9.1 Hydraulic Analysis Results

The results of the HEC-2 hydraulic analysis conducted for the proposed revisions to the Skunk Creek Flood Insurance Study are summarized in Table 5-3.

TABLE 5-3: Hydraulic Analysis Results

Cross Section Identifier	Peak Discharge (cfs)	WSEL (ft)	Critical WSEL (ft)	Average Velocity (ft/s)	Top Width of Flow (ft)	Maximum Channel Depth (ft)	Hydraulic Depth of Flow (ft)	Froude Number	Left Station where WSEL Meets Ground	Right Station where WSEL Meets Ground
8.69	39000	1378.00	1374.50	5.55	1014.10	14.00	6.93	0.37	4045.04	5059.14
8.79	39000	1378.75	1377.37	8.33	896.38	12.75	5.22	0.64	4134.82	5031.20
8.93	39000	1381.24	1378.60	8.67	616.60	11.24	7.29	0.57	4600.57	5217.16
9.01	39000	1381.58	1381.58	15.43	346.63	9.39	7.29	1.01	4835.91	5182.54
9.08	39000	1385.41	1382.13	10.93	350.18	11.94	10.19	0.60	4830.35	5180.53
9.14	23500	1387.32	1380.44	6.31	309.42	13.32	12.03	0.32	4844.65	5154.07
9.145	23500	1387.17	1381.55	7.41	283.37	12.27	11.20	0.40	5020.65	5319.03
Bridge										
9.155	23500	1387.30	1381.75	7.44	283.74	12.20	11.13	0.40	5020.46	5319.22
9.16	23500	1387.54	1380.83	6.47	302.78	13.54	11.99	0.33	4857.05	5159.82
9.21	23500	1387.94	1380.89	4.87	433.00	11.94	11.15	0.26	4734.68	5167.68
Drop Str.										
9.22	23500	1394.23	1394.23	11.39	511.50	4.23	4.03	1.00	4670.75	5182.25
9.25	23500	1396.82	1396.82	11.47	542.45	4.82	3.93	0.99	4738.18	5280.63
9.30	39000	1399.25	1399.25	13.25	576.97	6.25	5.27	0.98	4703.41	5280.38
9.35	39000	1402.10	1399.99	9.37	629.82	10.10	6.94	0.58	4657.95	5287.77
9.42	39000	1403.33	1401.68	9.88	681.37	10.33	6.15	0.63	4549.48	5230.85
9.45	39000	1403.53	1403.53	12.98	648.26	10.53	4.84	0.95	4560.74	5209.00
9.54	39000	1408.08	1405.70	9.82	491.43	11.08	8.08	0.61	4685.57	5177.00
9.65	39000	1410.57	1408.58	10.61	466.90	8.57	7.87	0.67	4759.95	5226.85
9.70	39000	1411.86	1410.07	10.37	514.76	7.86	7.31	0.68	4757.74	5272.50
9.73	39000	1412.83	1410.11	9.20	522.66	8.83	8.11	0.57	4767.98	5290.64
9.80	39000	1413.42	1412.91	13.34	428.32	7.42	6.83	0.90	4775.47	5203.79
9.89	39000	1416.91	1415.10	11.98	383.13	10.91	8.50	0.72	4775.54	5158.67
9.98	39000	1419.25	1417.47	11.55	413.94	9.25	8.16	0.71	4856.10	5270.04
10.08	39000	1421.59	1420.21	12.20	406.99	9.59	7.85	0.77	4855.91	5262.90

Cross Section Identifier	Peak Discharge (cfs)	WSEL (ft)	Critical WSEL (ft)	Average Velocity (ft/s)	Top Width of Flow (ft)	Maximum Channel Depth (ft)	Hydraulic Depth of Flow (ft)	Froude Number	Left Station where WSEL Meets Ground	Right Station where WSEL Meets Ground
10.16	39000	1424.09	1422.72	11.62	454.78	8.09	7.38	0.75	4805.77	5260.56
10.25	39000	1426.71	1426.31	12.91	486.32	6.71	6.21	0.91	4791.56	5277.88
10.33	39000	1430.13	1429.33	12.56	450.34	8.13	6.89	0.84	4802.19	5252.54
10.34	39000	1430.57	1429.81	12.75	436.81	8.57	7.00	0.85	4792.27	5229.07
10.38	39000	1431.33	1431.33	14.30	430.68	7.33	6.33	1.00	4841.32	5272.00
10.41	39000	1434.66	1434.66	14.15	448.94	6.66	6.14	1.01	4797.50	5246.44
10.42	39000	1436.40	1434.71	11.07	474.69	10.40	7.43	0.71	4758.79	5233.48
10.51	39000	1438.61	1437.03	11.65	468.40	10.61	7.14	0.77	4726.81	5195.21
10.62	39000	1441.81	1440.35	12.41	422.02	11.81	7.45	0.80	4688.49	5110.51
10.70	39000	1444.16	1444.03	14.40	406.49	10.16	6.66	0.98	4766.96	5173.45
10.83	39000	1450.36	1448.93	11.22	485.67	12.36	7.16	0.74	4807.00	5292.67
10.93	39000	1452.96	1451.39	11.16	475.20	12.96	7.35	0.73	4796.08	5271.29
11.03	39000	1455.58	1453.00	9.48	505.52	13.58	8.14	0.59	4615.31	5120.83
11.14	39000	1457.62	1457.62	15.16	368.24	9.62	6.99	1.01	4762.00	5130.24
11.19	39000	1460.56	1460.56	16.02	308.90	8.56	7.88	1.01	4839.01	5147.91
11.29	39000	1462.88	1461.79	14.01	315.16	10.88	8.83	0.83	4853.13	5168.30
11.39	39000	1464.58	1462.10	12.11	320.78	11.17	10.04	0.67	4838.52	5159.30
11.48	39000	1465.32	1462.48	11.71	321.86	11.32	10.34	0.64	4842.57	5164.43
11.56	39000	1468.43	1468.43	16.52	282.25	9.29	8.37	1.01	4861.43	5143.68
11.57	39000	1470.39	1470.39	17.38	241.45	10.10	9.29	1.00	4881.57	5123.02

Table 5-4 summarizes the water surface elevations for the floodplain and floodway of the effective FIS HEC-2 models, the duplicate effective FIS model, and the revised HEC-2 model.

Table 5-5 summarizes the differences in floodplain and floodway water surface elevations between the effective FIS HEC-2 models, the duplicate effective FIS model, and the revised HEC-2 model.

TABLE 5-4: Comparison of Water Surface Elevations

FIRM Cross Section Label	Effective FIS Floodway WSEL	Effective FIS Floodplain WSEL	Effective FIS Model Cross Section Identifiers	Effective FIS Floodway WSEL (Xsecs 8.69 - 9.05)	Effective FIS Floodplain WSEL (Xsecs 8.69 - 9.05)	Effective FIS Floodway WSEL (Xsecs 9.09 - 11.57)	Effective FIS Floodplain WSEL (Xsecs 9.09 - 11.57)	Duplicate Effective Floodway WSEL	Duplicate Effective Floodplain WSEL	Revised HEC-2 Cross Section Identifier	Revised Floodway WSEL	Revised Floodplain WSEL
				HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. May 1984	HEC-2 ver. May 1984	HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. 4.6.2 May 1991		HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. 4.6.2 May 1991
	Revised 11/19/98	Revised 11/19/98		Run Date: 10/12/98	Run Date: 10/12/98	Run Date: 02/20/90	Run Date: 02/20/90					
			8.69	1378.0	1378.0			1378.0	1378.0	8.69	1378.0	1378.0
AG	1378.2	1378.2	8.75 (AG)	1378.1	1378.1			1378.1	1378.1	8.79	1378.8	1378.8
			8.89	1382.9	1382.9			1382.9	1382.9	8.93	1381.2	1381.2
			8.965	1383.1	1383.1			1383.1	1383.1	9.01	1381.6	1381.6
AH	1385.4	1385.4	9.05 (AH)	1385.6	1385.6			1385.6	1385.6	9.08	1385.4	1385.4
			9.09			1395.2	1395.2	1395.2	1395.2	9.14	1387.3	1387.3
			9.10			1395.2	1395.2	1395.1	1395.2			
										9.145	1387.2	1387.2
										Bridge		
										9.155	1387.3	1387.3
			9.115			1395.5	1395.5	1395.5	1395.5	9.16	1387.5	1387.5
										9.21	1387.9	1387.9
										Drop Str.		
			9.19			1396.3	1396.3	1396.2	1396.3	9.22	1394.2	1394.2
			9.20			1396.7	1396.8	1396.6	1396.8			
			9.21			1398.1	1398.0	1398.1	1398.0	9.25	1396.8	1396.8
			---							9.3	1399.3	1399.3
AI	1399.4	1399.4	9.31 (AI)			1399.2	1399.4	1399.1	1399.4	9.35	1402.1	1402.1
			---							9.42	1403.3	1403.3
			9.40			1402.8	1402.6	1402.9	1402.6	9.45	1403.5	1403.5

FIRM Cross Section Label	Effective FIS Floodway WSEL	Effective FIS Floodplain WSEL	Effective FIS Model Cross Section Identifiers	Effective FIS Floodway WSEL (Xsecs 8.69 - 9.05)	Effective FIS Floodplain WSEL (Xsecs 8.69 - 9.05)	Effective FIS Floodway WSEL (Xsecs 9.09 - 11.57)	Effective FIS Floodplain WSEL (Xsecs 9.09 - 11.57)	Duplicate Effective Floodway WSEL	Duplicate Effective Floodplain WSEL	Revised HEC-2 Cross Section Identifier	Revised Floodway WSEL	Revised Floodplain WSEL
				HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. May 1984	HEC-2 ver. May 1984	HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. 4.6.2 May 1991		HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. 4.6.2 May 1991
	Revised 11/19/98	Revised 11/19/98		Run Date: 10/12/98	Run Date: 10/12/98	Run Date: 02/20/90	Run Date: 02/20/90					
AJ	1405.8	1405.8	9.48 (AJ)			1405.8	1405.8	1405.8	1405.8	9.54	1408.1	1408.1
			9.58			1409.4	1408.9	1409.4	1408.9	9.65	1410.6	1410.6
			---							9.7	1411.9	1411.9
AK	1411.7	1411.7	9.67 (AK)			1411.7	1411.7	1411.6	1411.7	9.73	1412.8	1412.8
			9.75			1415.4	1415.4	1415.4	1415.4	9.8	1413.4	1413.4
AL	1418.7	1418.7	9.84 (AL)			1418.7	1418.7	1418.7	1418.7	9.89	1416.9	1416.9
			9.94			1420.5	1420.5	1420.5	1420.5	9.98	1419.3	1419.3
AM	1422.2	1422.2	10.04 (AM)			1422.2	1422.2	1422.2	1422.2	10.08	1421.6	1421.6
			10.12			1423.2	1423.2	1423.2	1423.2	10.16	1424.1	1424.1
AN	1426.6	1426.6	10.21 (AN)			1426.7	1426.7	1426.7	1426.7	10.25	1426.7	1426.7
			---							10.33	1430.1	1430.1
			---							10.34	1430.6	1430.6
			10.30			1430.6	1430.6	1430.6	1430.6	10.38	1431.3	1431.3
			---							10.41	1434.7	1434.7
AO	1434	1434	10.40 (AO)			1434.0	1434.0	1434.0	1434.0	10.42	1436.4	1436.4
			10.49			1437.1	1437.1	1437.1	1437.1	10.51	1438.6	1438.6
AP	1440.4	1440.4	10.62 (AP)			1440.4	1440.4	1440.4	1440.4	10.62	1441.8	1441.8
			10.70			1443.6	1443.6	1443.6	1443.6	10.7	1444.2	1444.2
AQ	1447.9	1447.9	10.83 (AQ)			1447.9	1447.9	1447.9	1447.9	10.83	1450.4	1450.4
			10.93			1451.0	1451.0	1451.0	1451.0	10.93	1453.0	1453.0
AR	1454.7	1454.7	11.04 (AR)			1454.7	1454.7	1454.7	1454.7	11.03	1455.6	1455.6

FIRM Cross Section Label	Effective FIS Floodway WSEL	Effective FIS Floodplain WSEL	Effective FIS Model Cross Section Identifiers	Effective FIS Floodway WSEL (Xsecs 8.69 - 9.05)	Effective FIS Floodplain WSEL (Xsecs 8.69 - 9.05)	Effective FIS Floodway WSEL (Xsecs 9.09 - 11.57)	Effective FIS Floodplain WSEL (Xsecs 9.09 - 11.57)	Duplicate Effective Floodway WSEL	Duplicate Effective Floodplain WSEL	Revised HEC-2 Cross Section Identifier	Revised Floodway WSEL	Revised Floodplain WSEL
				HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. May 1984	HEC-2 ver. May 1984	HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. 4.6.2 May 1991		HEC-2 ver. 4.6.2 May 1991	HEC-2 ver. 4.6.2 May 1991
	Revised 11/19/98	Revised 11/19/98		Run Date: 10/12/98	Run Date: 10/12/98	Run Date: 02/20/90	Run Date: 02/20/90					
			---							11.14	1457.6	1457.6
			11.20			1460.4	1460.4	1460.4	1460.4	11.19	1460.6	1460.6
			11.30			1463.2	1463.2	1463.2	1463.2	11.29	1462.9	1462.9
			11.40			1463.6	1463.6	1463.6	1463.6	11.39	1464.6	1464.6
			---							11.48	1465.3	1465.3
			---							11.56	1468.4	1468.4
			---							11.57	1470.4	1470.4

TABLE 5-5: Differences in Water Surface Elevations

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Effective FIS Model Cross Section Identifiers	Effective FIS (FW-FP) [ft]	Duplicate Effective FIS (FW-FP) [ft]	Effective FIS FW - Duplicate Effective FIS FW [ft]	Effective FIS FP - Duplicate Effective FIS FP [ft]	Revised HEC-2 Cross Section Identifier	Revised HEC-2 (FW-FP) [ft]	Revised HEC-2 FP - Effective FIS FP [ft]
8.69	0.0	0.0	0.0	0.0	8.69	0.0	0.0
8.75 (AG)	0.0	0.0	0.0	0.0	8.79	0.0	0.7
8.89	0.0	0.0	0.0	0.0	8.93	0.0	-1.7
8.965	0.0	0.0	0.0	0.0	9.01	0.0	-1.5
9.05 (AH)	0.0	0.0	0.0	0.0	9.08	0.0	-0.2
9.09	0.0	0.0	0.0	0.0	9.14	0.0	-7.9
9.10	0.0	-0.1	0.1	0.0			
					9.145	0.0	
					Bridge		
					9.155	0.0	
9.115	0.0	0.0	0.0	0.0	9.16	0.0	-8.0
					9.21	0.0	
					Drop Str.		
9.19	0.0	-0.1	0.1	0.0	9.22	0.0	-2.1
9.20	-0.1	-0.2	0.1	0.0			
9.21	0.1	0.1	0.0	0.0	9.25	0.0	-1.2
					9.3	0.0	
9.31 (AI)	-0.2	-0.3	0.1	0.0	9.35	0.0	2.7
					9.42	0.0	
9.40	0.2	0.3	-0.1	0.0	9.45	0.0	0.9
9.48 (AJ)	0.0	0.0	0.0	0.0	9.54	0.0	2.3
9.58	0.5	0.5	0.0	0.0	9.65	0.0	1.7
					9.7	0.0	
9.67 (AK)	0.0	-0.1	0.1	0.0	9.73	0.0	1.1
9.75	0.0	0.0	0.0	0.0	9.8	0.0	-2.0
9.84 (AL)	0.0	0.0	0.0	0.0	9.89	0.0	-1.8
9.94	0.0	0.0	0.0	0.0	9.98	0.0	-1.3
10.04 (AM)	0.0	0.0	0.0	0.0	10.08	0.0	-0.6
10.12	0.0	0.0	0.0	0.0	10.16	0.0	0.9
10.21 (AN)	0.0	0.0	0.0	0.0	10.25	0.0	0.0
					10.33	0.0	
					10.34	0.0	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Effective FIS Model Cross Section Identifiers	**Effective FIS (FW-FP) [ft]**	**Duplicate Effective FIS (FW-FP) [ft]**	**Effective FIS FW - Duplicate Effective FIS FW [ft]**	**Effective FIS FP - Duplicate Effective FIS FP [ft]**	**Revised HEC-2 Cross Section Identifier**	**Revised HEC-2 (FW-FP) [ft]**	**Revised HEC-2 FP - Effective FIS FP [ft]**
10.30	0.0	0.0	0.0	0.0	10.38	0.0	0.7
					10.41	0.0	
10.40 (AO)	0.0	0.0	0.0	0.0	10.42	0.0	2.4
10.49	0.0	0.0	0.0	0.0	10.51	0.0	1.5
10.62 (AP)	0.0	0.0	0.0	0.0	10.62	0.0	1.4
10.70	0.0	0.0	0.0	0.0	10.7	0.0	0.6
10.83 (AQ)	0.0	0.0	0.0	0.0	10.83	0.0	2.5
10.93	0.0	0.0	0.0	0.0	10.93	0.0	2.0
11.04 (AR)	0.0	0.0	0.0	0.0	11.03	0.0	0.9
					11.14	0.0	
11.20	0.0	0.0	0.0	0.0	11.19	0.0	0.2
11.30	0.0	0.0	0.0	0.0	11.29	0.0	-0.3
11.40	0.0	0.0	0.0	0.0	11.39	0.0	1.0
					11.48	0.0	
					11.56	0.0	
					11.57	0.0	

As shown in Columns 4 and 5 of Table 5-5, the duplicate effective FIS model accurately reflects the effective FIS model. Columns 2 and 3 demonstrate that the floodway surcharge for the effective model ranges from –0.3 to 0.5 feet, while Column 7 shows that the floodway is equal to the floodplain at all locations in the revised HEC-2 model. No floodway profile was run in the revised model, because the study reach is almost completely channelized and new development will not be encroaching into the floodplain.

Column 8 summarizes the differences in water surface elevations between the effective model and the revised model. These differences range from –8.0 feet just upstream of the Pinnacle Peak Road bridge to 2.7 feet at FIS cross-section AI. The large changes in water surface elevations are due to the extensive channel modifications that have taken place since the FIS study was completed.

Effective model cross-sections 11.20, 11.30, and 11.40 are located in the reach immediately downstream of Interstate 17 that was channelized by the U.S. Army Corps of Engineers. These levees were already in place when the effective FIS study was done. The results of the revised model at these cross-sections closely approximate the effective study results. The 1.0 foot difference at cross-section 11.40 is due to the use of updated mapping in the revised model. The average channel bottom elevation is about one foot higher in the revised model than it was in the effective model.

There has been extensive grading and channelization of the reach from the Corps' levees downstream to Happy Valley Road (FIS cross-sections AO – AR), resulting in water surface elevation increases up to 2.5 feet. The width of the revised 100-year floodplain is approximately one-third of its previous width. Also, a new levee around the Skunk Creek Landfill on the west bank has pushed the confluence with Buchanan Wash approximately 1400 feet upstream of its historical location.

Happy Valley Road crosses Skunk Creek at-grade, which requires a break in the levee system. The revised model contains four cross-sections at Happy Valley Road in order to more accurately model the channel transition. In comparison, the effective FIS model uses a single

cross-section at Happy Valley Road (cross-section 10.30), which is oriented such that it crosses over two of the revised model cross-sections (10.34 and 10.38). The water surface elevation at revised cross-section 10.34 is equal to the water surface elevation at effective FIS cross-section 10.30.

At the time that the effective FIS study was completed, there were already levees containing the flow through the Skunk Creek Landfill reach downstream of Happy Valley Road (FIS cross-sections AJ - AN). However, the channel bottom was left in a more natural state and was not completely graded as it is at present. The grading project evened out the channel bottom, altering the cross-section geometry, which in turn causes changes, both positive and negative, in water surface elevations. However, the elevation changes alter the floodplain boundary very little, because the flow is still contained between the levees.

The largest difference in water surface elevation is -8.0 feet, which occurs at effective FIS cross-section 9.115. This cross-section is immediately downstream of the drop structure north of Pinnacle Peak Road. Skunk Creek has been channelized, and the channel bed lowered, from this point to the downstream end of the study reach. The effective model for FIS cross-sections AG and AH, from the 1998 LOMR, does incorporate the new channel geometry. Differences in water surface elevation through this reach are attributed to variations in mapping, which are apparent when effective model cross-sections 8.75 through 9.05 are compared with the revised model cross-sections. The minimum channel elevation varies up to 3.2 feet. However, the elevation changes alter the width of the floodplain very little, because the flow is still contained within the channel. Revisions to the floodplain boundary south of Pinnacle Peak Road are due to breakout flooding on the left overbank, which is analyzed in a separate report prepared by Coe & Van Loo Consultants, Inc.

5.8.2 Verification of Results

It is difficult to compare the results of the revised HEC-2 model with the effective HEC-2 model due to the multiple construction projects that have altered the topography of the Skunk Creek channel corridor. There are no gaging stations within the study reach. No historical flow data were available, therefore, no attempt was made to verify the results of the hydraulic modeling.

SECTION 6: EROSION AND SEDIMENT TRANSPORT

An erosion and sediment transport analysis was not conducted for the Skunk Creek Letter of Map Revision (LOMR) request. A scour analysis was conducted for the design of the Skunk Creek levees to determine the toe-down depth used for the soil cement armor protection (10 feet). A copy of this scour analysis is provided in Appendix E. These levees were constructed to protect the Skunk Creek Landfill. The area behind the levees has been filled to an elevation above the original top-of-levee. As a result, the soil cement levees have effectively become soil cement bank protection.

SECTION 7: DRAFT FIS REPORT DATA

7.1 SUMMARY OF DISCHARGES

The effective 100-year peak discharge is 39,000 cfs through the study reach.

7.2 FLOODWAY DATA

TABLE 7-1: Floodway Data Table

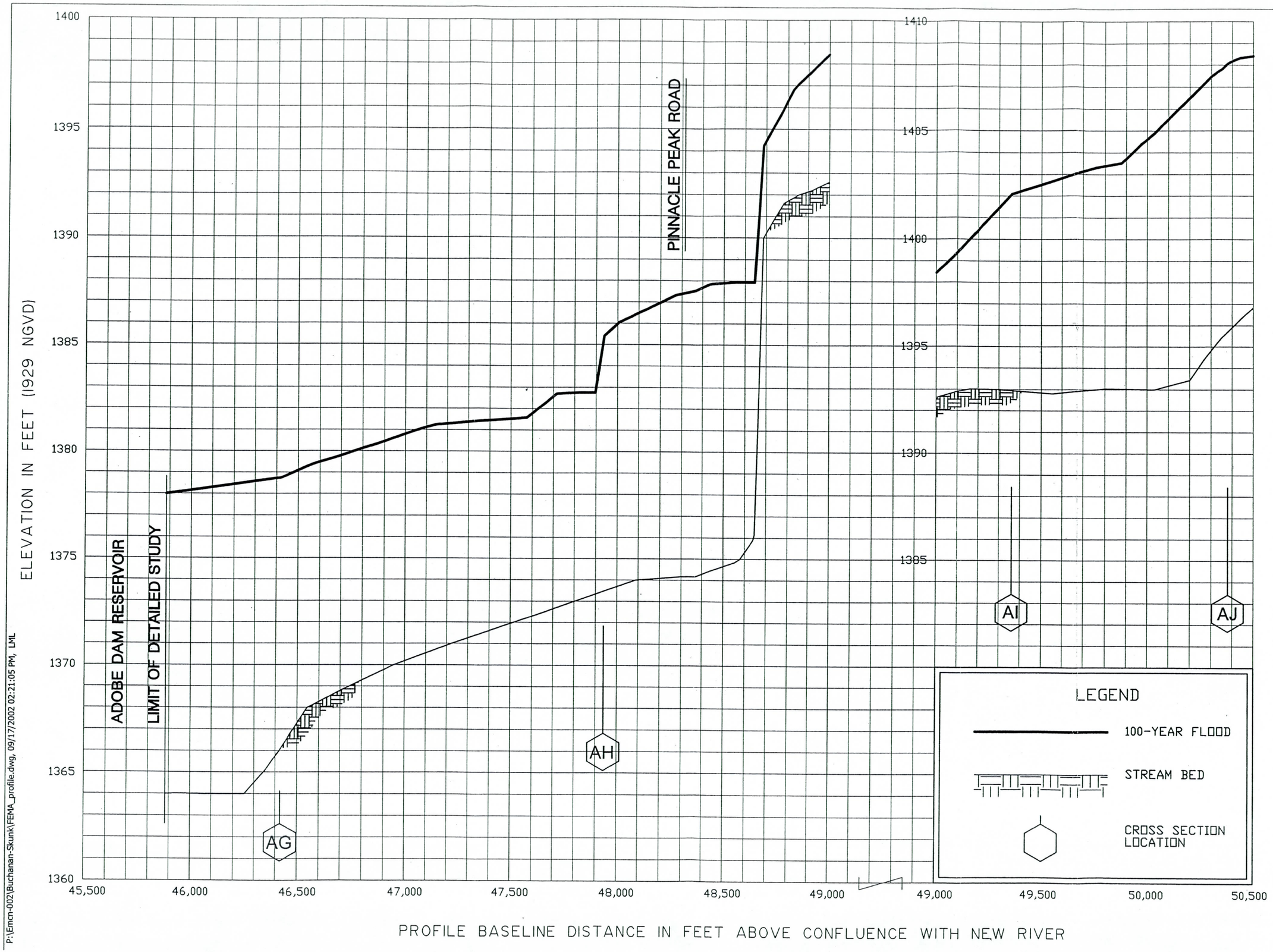
FLOODING SOURCE		FLOODWAY			WATER SURFACE ELEVATION		
Cross Section	Distance [1]	Width (ft)	Section Area (ft^2)	Velocity (ft^2/s)	With Floodway (ft)	Without Floodway (ft)	Difference (ft)
AG	8.79	896	4,679	8.3	1378.8	1378.8	0.0
AH	9.08	350	3,568	10.9	1385.4	1385.4	0.0
AI	9.35	630	4,373	9.4	1402.1	1402.1	0.0
AJ	9.54	491	3,970	9.8	1408.1	1408.1	0.0
AK	9.73	523	4,241	9.2	1412.8	1412.8	0.0
AL	9.89	383	3,255	12.0	1416.9	1416.9	0.0
AM	10.08	407	3,197	12.2	1421.6	1421.6	0.0
AN	10.25	486	3,021	12.9	1426.7	1426.7	0.0
AO	10.42	475	3,527	11.1	1436.4	1436.4	0.0
AP	10.62	422	3,143	12.4	1441.8	1441.8	0.0
AQ	10.83	486	3,476	11.2	1450.4	1450.4	0.0
AR	11.03	506	4,114	9.5	1455.6	1455.6	0.0

[1] Distance upstream of New River confluence (miles)

Table 7-1	FEDERAL EMERGENCY MANAGEMENT AGENCY CITY OF PHOENIX, ARIZONA	FLOODWAY DATA SKUNK CREEK

7.3 ANNOTATED FIRM MAP

An Annotated Firm Map in FEMA format is in Figure 7-1.



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FLOOD PROFILES

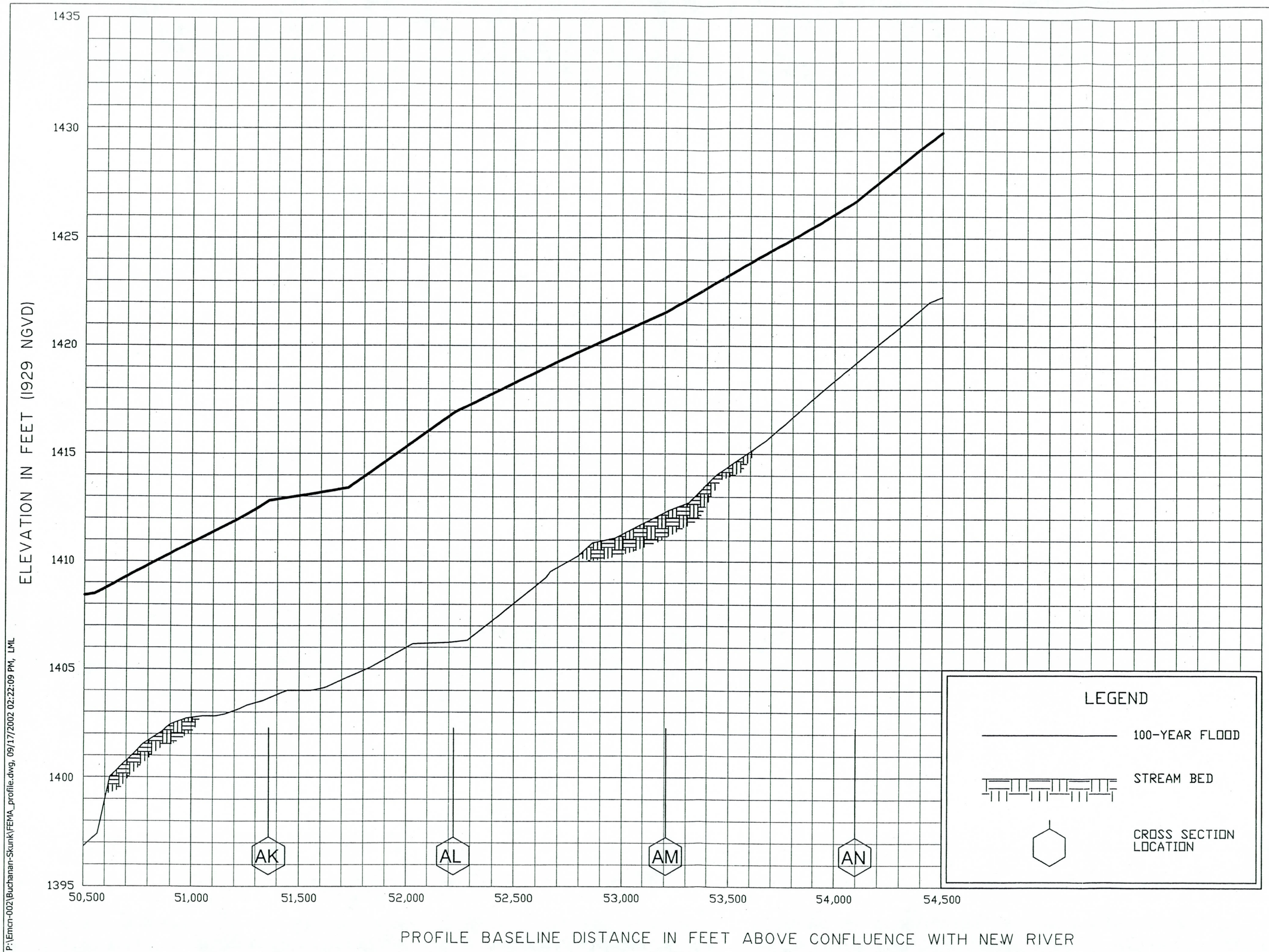
SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF PHOENIX, ARIZONA

FIGURE 7-2

SHEET 1 OF 4



FLOOD PROFILES

SKUNK CREEK

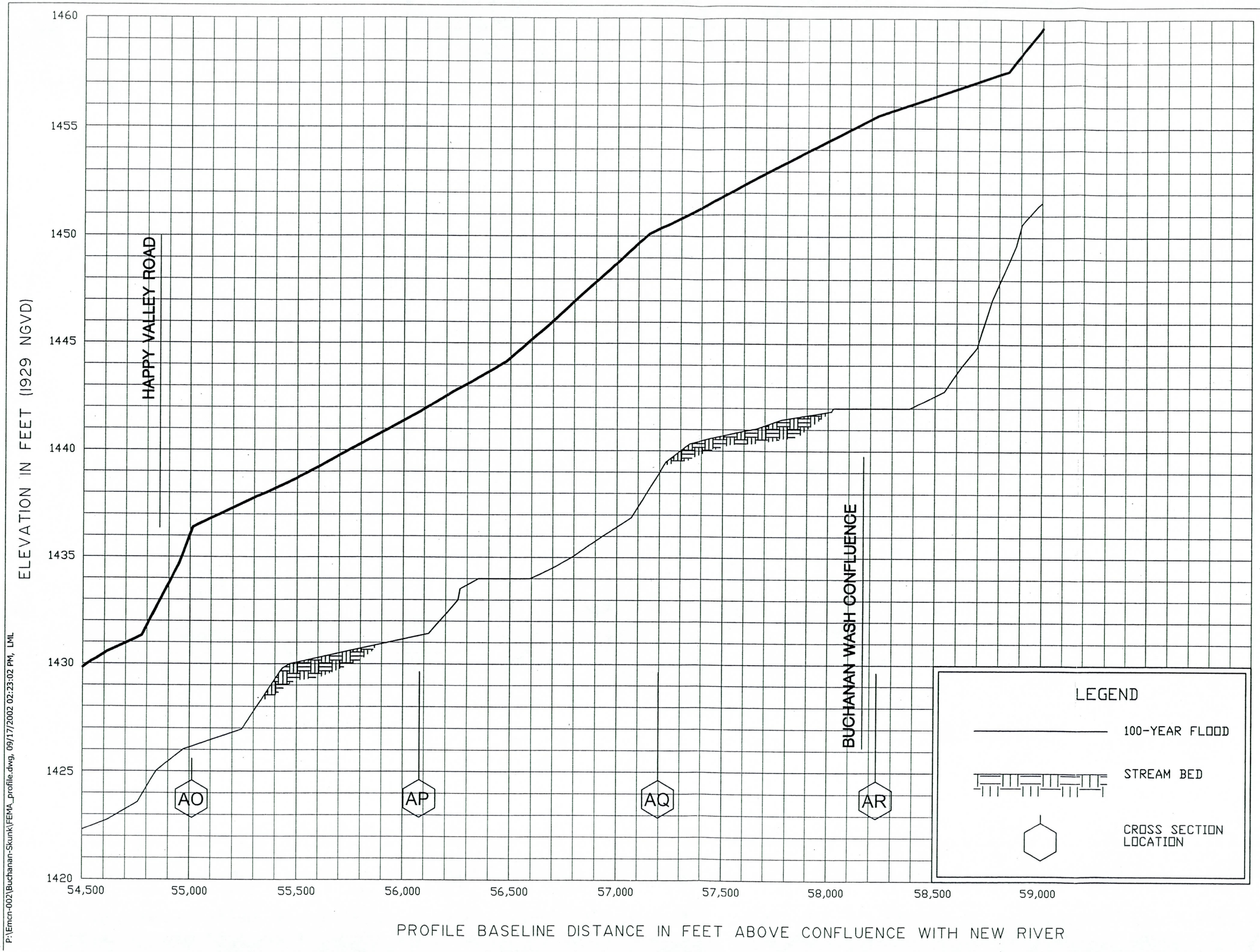
FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FIGURE 7-2

SHEET 2 OF 4

P:\Emcn-002\Buchanan-Skunk\FEMA_profile.dwg, 09/17/2002 02:22:09 PM, LML



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FLOOD PROFILES

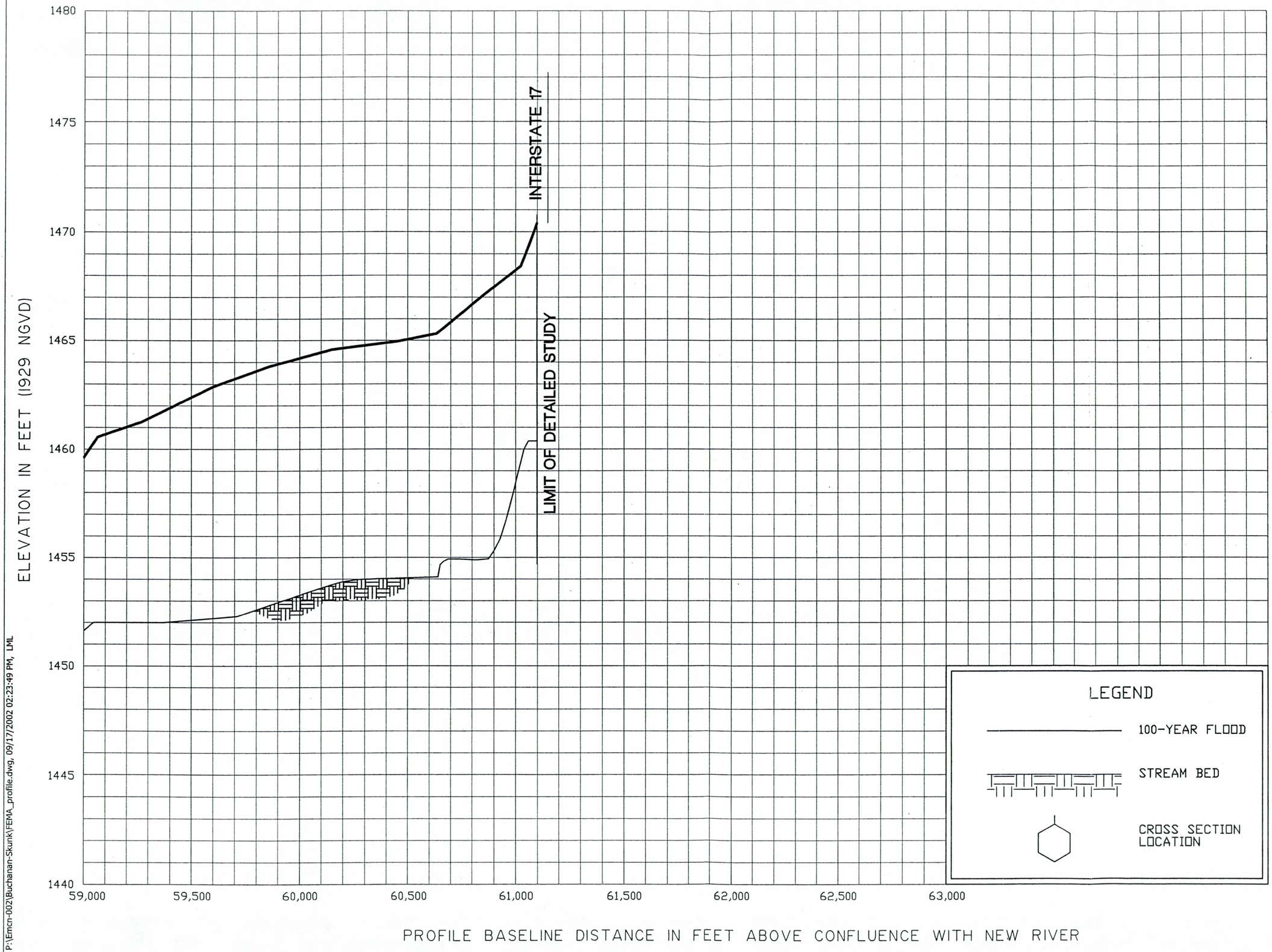
SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF PHOENIX, ARIZONA

FIGURE 7-2

SHEET 3 OF 4



FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF PHOENIX, ARIZONA

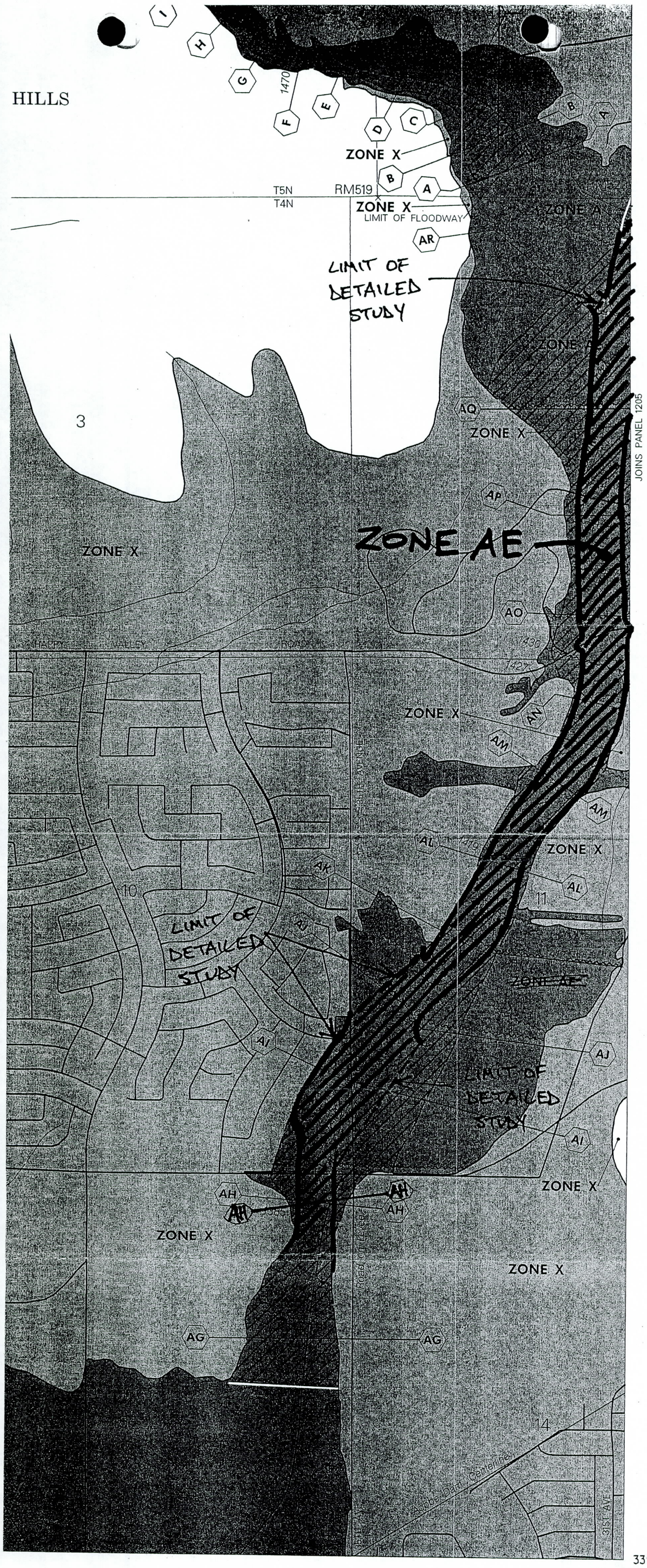
FIGURE 7-2

SHEET 4 OF 4

P:\Emcn-002\Buchanan-Skunk\FEMA_profile.dwg, 09/17/2002 02:23:49 PM, LML

7.4 FLOOD PROFILES

The proposed flood profile for Skunk Creek is provided on Figure 7-2 in FEMA format.



(EL 987)

RM7

M2

97°07'30", 32°22'30"

Base Flood Elevation in Feet Where Uniform Within Zone. See Map Index Elevation Datum.

Elevation Reference Mark

River Mile

Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for more detailed data on BFE's, and for any information on floodway delineations, prior to use of this map for property purchase or construction purposes.

Areas of Special Flood Hazard (100-year flood) include Zones A, AE, A1-A30, AH, AO, A99, V, VE and V1-V30.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown at 1/20 inch.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and /or Otherwise Protected Areas established under the Coastal Barrier Improvement Act of 1990 (PL 101-591).

For community map revision history prior to countywide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index

EFFECTIVE DATE OF
COUNTYWIDE FLOOD INSURANCE RATE MAP:
APRIL 15, 1988

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:
SEPTEMBER 29, 1989, SEPTEMBER 4, 1991

Map revised July 19, 2001 to update corporate limits, to change base flood elevations, to add base flood elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET
1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 1185 OF 4350
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GLENDALE, CITY OF	040045	1185	G
PHOENIX, CITY OF	040051	1185	G

MAP NUMBER
04013C1185 G

MAP REVISED:
JULY 19, 2001

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 1205 OF 4350

(SEE MAP INDEX FOR PANELS NOT PRINTED)

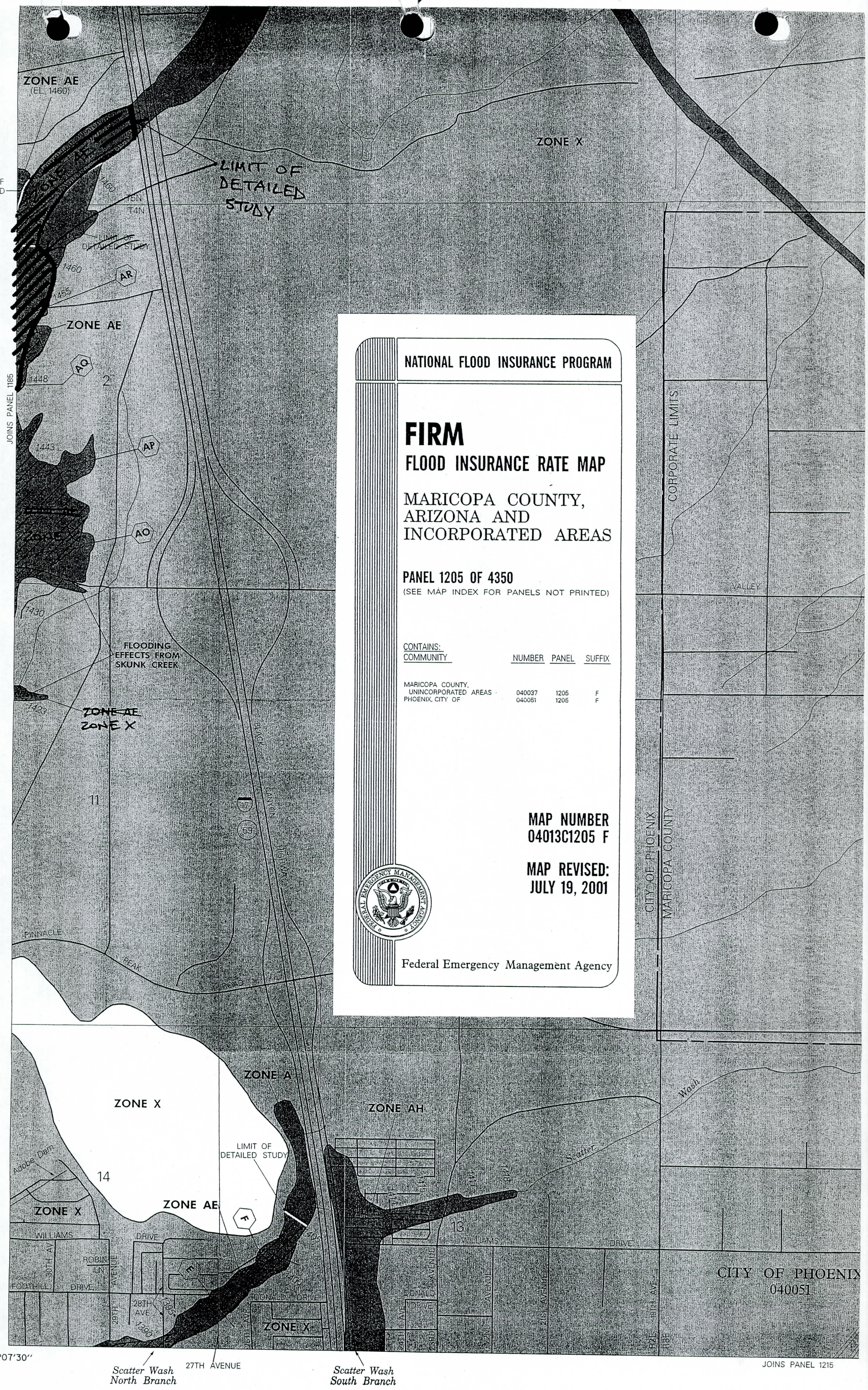
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY, UNINCORPORATED AREAS	040037	1205	F
PHOENIX, CITY OF	040051	1205	F

MAP NUMBER 04013C1205 F

MAP REVISED: JULY 19, 2001

Federal Emergency Management Agency



SKUNK CREEK LANDFILL PLAN MODIFICATION AND UPDATE
CONTRACT NO. SA-930222

CHANGE ORDER REQUEST

I. INTRODUCTION

The City of Phoenix has requested that Tetra Tech/Simons, Li & Associates, Inc. (TT/SLA) prepare the following scopes of work and cost proposals for additional work under the above contract. The additional work includes: 1) adding two reaches of the Skunk Creek channel to the Letter of Map Revision (LOMR) request being prepared under the current scope; and 2) preparing a separate LOMR request for Buchanan Wash.

The additional reaches of Skunk Creek include approximately 2700 feet of channel from the confluence with Buchanan Wash, upstream to Interstate Highway 17, and approximately 2700 feet channel from Pinnacle Peak Road, downstream to the Adobe Dam reservoir. These reaches include the existing Corps of Engineers' levee system and additional channelization of Skunk Creek, respectively.

The separate LOMR for Buchanan Wash extends from its confluence with Skunk Creek, approximately 9800 feet (1.85 mi.) upstream to the Central Arizona Project (CAP) Canal, and includes the existing Skunk Creek Landfill levee and the Kaufman & Broad, Hillcrest Subdivision, which is about to be constructed.

It is understood that the existing FIS hydrology for Skunk Creek and Buchanan Wash will be used to prepare the LOMR requests. It is also understood that the topographic mapping, survey control, field survey information, and the levee stability analyses, required to prepare the floodplain/floodway delineations and the LOMR requests, will be provided to TT/SLA. As a minimum, the topographic mapping prepared for this additional work should extend 200 feet beyond the lateral limits of FEMA's currently effective floodplain boundaries.

Since the LOMR requests will be prepared as two independent documents, the tasks required to accomplish the work and the fee proposals are presented separately below.

II. SKUNK CREEK LOMR EXTENSION

Operation & Maintenance Plan. (Pedro).

Description of Services

Task 1: Coordination

This task includes attending meetings, conducting telephone conferences, and preparing correspondence on behalf of the City to the Flood Control District of Maricopa County, the Federal Emergency Management Agency (FEMA), and their Technical Evaluation Consultant (Michael Baker, Jr., Inc.), as required, to gain approval of the Letter of Map Revision (LOMR) request. This task also includes responding to general review comments from the City and FEMA, or their consultant, regarding the LOMR analyses, mapping, and documentation.

Task 2: Data Collection and Review

This task includes the collection and detailed review of data required to prepare the LOMR request. This data will include the as-built plans for the levee designed and constructed by the US Army

Corps of Engineers, upstream of the landfill levees; the Corps levee design report, the sediment transport/scour analyses, and any interior drainage analysis; and the Corps levee stability analyses or certification of stability. Available compaction certificates from the Corps levee construction will also be sought. As-built plans will also be collected, along with the design report information, for the existing channelization downstream of Pinnacle Peak Road. This task also includes a site visit to verify existing conditions and document field conditions with photographs for model development and LOMR support.

Task 3: Extend Existing Conditions Model

Using the topographic mapping provided, the existing conditions HEC-2 model for the landfill reach will be extended, upstream of the Buchanan Wash confluence to Interstate Highway 17, and downstream of the Pinnacle Peak Road to the Adobe Dam reservoir. This model will define the hydraulic impacts of the Corps' levee system and the channelization downstream of Pinnacle Peak Road. The water-surface elevations resulting from this model will be compared to the effective 100-year flood profile to quantify the impact of the Corps' levee system and the channelization downstream of Pinnacle Peak Road on the effective floodplain/floodway upstream, downstream, and within the extension limits. This model will also be used to demonstrate to FEMA that the required amount of freeboard is provided by the existing Corps levee system.

Task 4: Prepare Split-flow Model

Due to the channelization and construction of the Pinnacle Peak Road Bridge over Skunk Creek, a split-flow condition occurs east of the bridge during the 100-year event. The split-flow overtops Pinnacle Peak Road and re-enters the channel at some point downstream. A separate HEC-2 model will be developed, using both available mapping and the new mapping provided, to define the path, water-surface profile, floodplain limit of the split flow.

Task 5: Extend Revised Floodplain/Floodway Mapping

Using the topographic mapping provided, the revised floodplain/floodway mapping and 100-year flood profile will be extended to include the existing Corps levee system and the channelization downstream of Pinnacle Peak Road. The mapping and profile will identify the resulting 100-year water-surface elevations upstream, downstream, and within the extended project areas, as required by FEMA.

Task 6: Revise LOMR Request Documentation

The LOMR request document being prepared for Skunk Creek, in accordance with Arizona Department of Water Resources State Standards Attachment 1-97, will be revised to include the Corps levee system upstream and the channelization downstream of the current project limits. The text, drawings, exhibits, tables, and documentation in the Technical Data Notebook (TDN) will be modified to summarize the hydraulic impacts of the existing levee system and channelization. The FEMA forms will be modified accordingly. One (1) draft copy of the TDN, including modifications, the appropriate input/output computer files, and the revised floodplain/floodway mapping, will be submitted to the City of Phoenix for review and approval. Three (3) copies of the final TDN will be submitted to the City. The City of Phoenix will submit the final TDN to FEMA, as required, and be responsible for all fees required by the reviewing agencies.

Fee Proposal

SKUNK CREEK LANDFILL MODIFICATIONS & UPDATE

CHANGE ORDER REQUEST - SKUNK CREEK LOMR EXTENSION

STAFF HOUR ESTIMATE BY TASK

Task	Project Manager	Project Engineer	Engineer Designer	Drafter	Clerical	TOTAL
1. Coordination	4				2	6
2. Data Collection & Review	2	8	8	2		20
3. Extend Existing Model	4	12	20			36
4. Prepare Split-Flow Model	4	24	16	4		48
5. Extend Floodplain Mapping	2	8	24	24		58
6. Expand LOMR Document	4	24	12	8	8	56
Total Hours	**20**	**76**	**80**	**38**	**10**	**224**

COST ESTIMATE

20	Project Manager Hours @ $40.00/hour	:	$800.00
76	Engineer Hours @ $32.50/hour	:	$2,470.00
80	Designer Hours @ $27.00/hour	:	$2,160.00
38	Drafter Hours @ $23.00/hour	:	$874.00
10	Clerical Hours @ $13.50/hour	:	$135.00

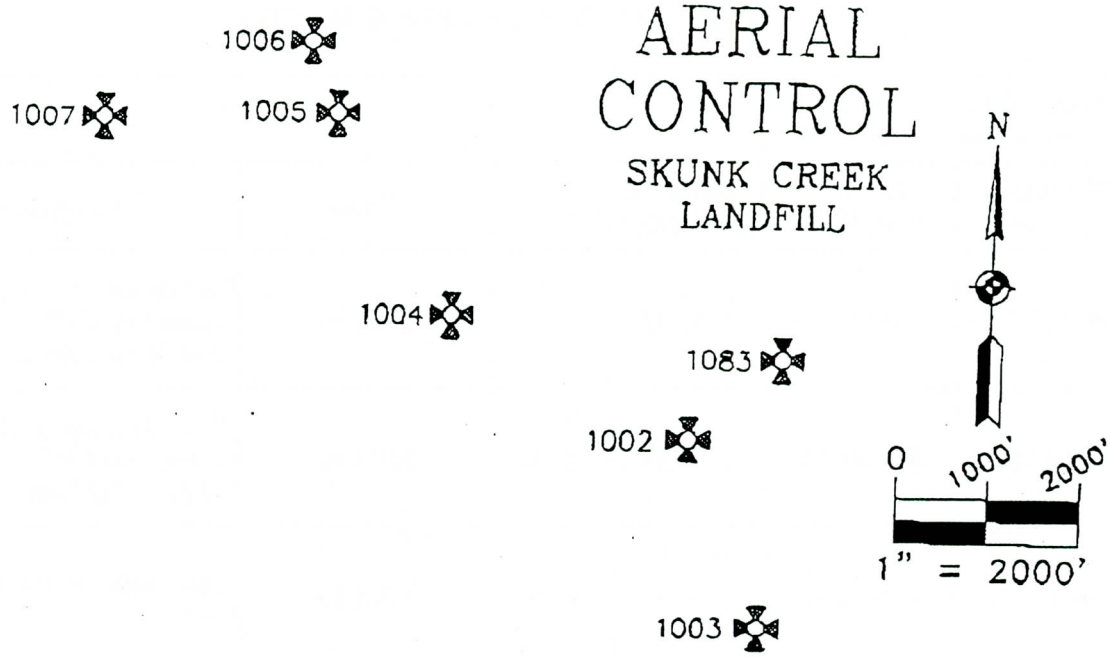
Total Direct Labor:	$ 6,439.00
Overhead @160%:	$10,302.40
Subtotal:	$16,741.40
Profit @10%	$ 1,674.14
Total:	**$18,415.54**

ELEVATION REFERENCE MARKS

State Plane Coordinates Arizona Central - NAD83					
Northing [Int. Feet]	**Easting [Int. Feet]**	**Elevation [NGVD29]**	**Type**	**Name**	**Description**
981636.31	433844.66	1392.12	City	ERM #1	Found brass cap in handhole at intersection of 35th Avenue and Pinnacle Peak Road.
986915.82	433818.21	1422.55	City	ERM #2	Found brass cap in handhole at intersection of 35th Avenue and Happy Valley Road.
990864.33	437624.80	1460.07	City	ERM #3	Found brass cap, north end of levee.
996816.7	631562.7	1500.60	FEMA	RM517	Found US Dept of the Interior BC along CAP Canal stamped Point #45, Station 402+67.37 125' Right.
991515.6	633855.0	1555.08	FEMA	RM519	Found stone at the SE corner of Sec 34 T5N R2E.
996480.99	430163.65	1502.21	FEMA	RM525	Found US Dept of the Interior BC along CAP Canal stamped Point #43, Station 386+00, 125' Right.
996877.09	431783.43	1500.11	FEMA	RM526	Found US Dept of the Interior BC along CAP Canal stamped Point #44, Station 402+67.37, 125' Right

AERIAL CONTROL

SKUNK CREEK LANDFILL



PNT#	NORTHING	EASTING	ELEV.
1000	981739.6345	435133.5306	1396.48
1001	980179.0882	434588.1925	1385.18
1002	992865.4662	434055.9820	1465.10
1003	990848.5704	434866.5745	1454.12
1004	994138.9058	431424.3238	1491.82
1005	996233.7449	430089.4840	1497.90
1006	996984.4573	429795.3904	1503.81
1007	996153.5265	427562.2756	1518.22
1083	993734.6941	435052.9030	1467.71

REGISTERED LAND SURVEYOR
CERTIFICATE NO
22282
JAMES G.
SPRING
Date Signed 3/30/2001
ARIZONA, U.S.A.

PNT#1000
GROUND SHOT
EL=1396.48

PNT#1001
GROUND SHOT
EL=1385.18

MORRISON MAIERLE, INC.
an Arizona Corporation
SURVEYORS
ENGINEERS
SCIENTISTS
PLANNERS

120 N 44th Street, Suite 410
Phoenix, AZ 85034-1822
Phone: (602) 244-9662
Fax: (602) 244-9472

8001.165.01

1/24/2001

MORRISON MAIERLE, INC.
an Arizona Corporation

Phone - 602-244-9662 Fax - 602-244-9472 E-Mail - jspring@m-m.net

MEMO

DATE: 10/16/01 Fax # --

TO: Bart B.

FROM: Jim Spring

SUBJECT: Survey Records

Bart:
Please find attached the survey notes for the work preformed on the Buchanan Wash Survey. All work was preformed by gps/rtk, control was tied to work that we have done on the Skunk Creek landfill project. Ties were made to monuments that you had requested put the data is related to Skunk Creek and not to any control established by the flood control.
If we can be of any more assistance or if you need further data please let me know.

Jim Spring, PLS
Vice President Survey Operations

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REGISTERED LAND SURVEYOR
CERTIFICATE NO.
22282
JAMES G.
SPRING
Date Signed 12/15/2021
ARIZONA U.S.A.

Text 1 of 2

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118,992031.0095865517,437545.8404405314,1462.3182705697,TOE3
119,992008.7845942036,437561.5453143998,1461.4580126202,EG

112.071666467,HT1325.6460
--20:45:31.84,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--20:45:38.87,Solve for local Horizontal transformation, RMS N: 0.1779,
RMS E: 0.0518
HC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
HC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
HC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
HC,PN13,LA33.425257416,LN-112.073352500,HT1335.2570,--H
HC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
HC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
HC,PN4,LA33.432608488,LN-112.072127492,HT1357.0590,--H
HC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
--20:45:42.06,Solve for local Vertical transformation, RMS ELV: 0.0006
VC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
VC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
VC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
VC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
VC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
VC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
LH,PN15,Ha3.280830488,Hb0.006818573,Hc109238.064721569,Hd658055.97919059
4,SC1.000001293,RT0.070868
LV,PN15,Va0.000303868,Vb0.000150464,Vc57.370267624,Ba33.423260101,Bo-
112.071666467,Bh1325.6460
--Set BASE : record intrvl: OFF, elev cutoff: 8 deg, antenna ht: 6.680
--00:50:57.26,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--Set BASE : record intrvl: OFF, elev cutoff: 8 deg, antenna ht: 6.680
--00:55:00.36,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--Set ROVER: record intrvl: OFF, elev cutoff: 8 deg, antenna ht: 6.980
--Send Base position to Rover:LA33.423260101,LN-
112.071666467,HT1325.6460
--00:55:29.25,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--00:55:36.17,Solve for local Horizontal transformation, RMS N: 0.1779,
RMS E: 0.0518
HC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
HC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
HC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
HC,PN13,LA33.425257416,LN-112.073352500,HT1335.2570,--H
HC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
HC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
HC,PN4,LA33.432608488,LN-112.072127492,HT1357.0590,--H
HC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
--00:55:39.36,Solve for local Vertical transformation, RMS ELV: 0.0006
VC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
VC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
VC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
VC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
VC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
VC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
LH,PN15,Ha3.280830488,Hb0.006818573,Hc109238.064721569,Hd658055.97919059
4,SC1.000001293,RT0.070868
LV,PN15,Va0.000303868,Vb0.000150464,Vc57.370267624,Ba33.423260101,Bo-
112.071666467,Bh1325.6460
--Set ROVER: record intrvl: OFF, elev cutoff: 8 deg, antenna ht: 5.210

2/01

This project
B170.002.03

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
22282
JAMES G.
SPRING
Date Signed 12/14/2007
ARIZONA U.S.A.

1 of 9

Prod Data File.

--Send Base position to Rover:LA33.423260101,LN-
112.071666467,HT1325.6460
--01:44:41.49,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--01:44:49.18,Solve for local Horizontal transformation, RMS N: 0.1779,
RMS E: 0.0518
HC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
HC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
HC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
HC,PN13,LA33.425257416,LN-112.073352500,HT1335.2570,--H
HC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
HC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
HC,PN4,LA33.432608488,LN-112.072127492,HT1357.0590,--H
HC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
--01:44:52.37,Solve for local Vertical transformation, RMS ELV: 0.0006
VC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
VC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
VC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
VC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
VC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
VC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
LH,PN15,Ha3.280830488,Hb0.006818573,Hc109238.064721569,Hd658055.97919059
4,SC0.999999292,RT0.070868
LV,PN15,Va0.000303868,Vb0.000150464,Vc57.370267624,Ba33.423260101,Bo-
112.071666467,Bh1325.6460
--Check control point: 18, N err: -0.338, E err: -1.037, Elv err: -0.185
EP,TM19: 1:13.00,LA33.431912681,LN-
112.073150393,HT1349.1775,RH0.0087,RV0.0139,DH1.10,DV1.59
--Check control point: 18, N err: -0.362, E err: -1.041, Elv err: -0.148
EP,TM19: 1:30.00,LA33.431912657,LN-
112.073150399,HT1349.2148,RH0.0211,RV0.0305,DH1.10,DV1.59
--19:54:09.26,Solve for local Horizontal transformation, RMS N: 0.1779,
RMS E: 0.0518
HC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
HC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
HC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
HC,PN13,LA33.425257416,LN-112.073352500,HT1335.2570,--H
HC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
HC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
HC,PN4,LA33.432608488,LN-112.072127492,HT1357.0590,--H
HC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
--19:54:12.39,Solve for local Vertical transformation, RMS ELV: 0.0006
VC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
VC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
VC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
VC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
VC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
VC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
LH,PN15,Ha3.280830488,Hb0.006818573,Hc109238.064721569,Hd658055.97919059
4,SC0.999999292,RT0.070868
LV,PN15,Va0.000303868,Vb0.000150464,Vc57.370267624,Ba33.423260101,Bo-
112.071666467,Bh1325.6460
--Set BASE : record intrvl: OFF, elev cutoff: 8 deg, antenna ht: 6.680
--23:35:03.16,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--Set ROVER: record intrvl: OFF, elev cutoff: 8 deg, antenna ht: 6.980
--Send Base position to Rover:LA33.423260101,LN-

112.071666467,HT1325.6460
--23:35:23.65,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--23:35:34.86,Solve for local Horizontal transformation, RMS N: 0.1779,
RMS E: 0.0518
HC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
HC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
HC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
HC,PN13,LA33.425257416,LN-112.073352500,HT1335.2570,--H
HC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
HC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
HC,PN4,LA33.432608488,LN-112.072127492,HT1357.0590,--H
HC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
--23:35:38.04,Solve for local Vertical transformation, RMS ELV: 0.0006
VC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
VC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
VC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
VC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
VC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
VC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
LH,PN15,Ha3.280830488,Hb0.006818573,Hc109238.064721569,Hd658055.97919059
4,SC1.000001293,RT0.070868
LV,PN15,Va0.000303868,Vb0.000150464,Vc57.370267624,Ba33.423260101,Bo-
112.071666467,Bh1325.6460
EP,TM16:57:30.00,LA33.410244717,LN-
112.073395442,HT1274.0223,RH0.0198,RV0.0280,DH1.04,DV1.47
GS,PN30,N 976347.20641,E 436522.97003,EL1376.273,--BCHH 31&DV
EP,TM17:16:20.00,LA33.415471387,LN-
112.080578691,HT1289.8735,RH0.0201,RV0.0237,DH1.00,DV1.17
GS,PN31,N 981636.31153,E 433844.65795,EL1392.117,--BCHH 35&PINPEAK
EP,TM17:19:2.00,LA33.415444179,LN-
112.083715816,HT1286.7052,RH0.0144,RV0.0172,DH1.14,DV1.31
GS,PN32,N 981614.77784,E 431194.02848,EL1388.702,--BC 36&PINPEAK
EP,TM18: 5:18.00,LA33.435818826,LN-
112.083118123,HT1374.3198,RH0.0287,RV0.0494,DH1.44,DV2.48
GS,PN50,N 994122.35316,E 431727.51496,EL1476.937,--HDWL
EP,TM18: 5:51.00,LA33.435827132,LN-
112.083126500,HT1376.2583,RH0.0220,RV0.0391,DH1.44,DV2.48
GS,PN51,N 994130.76566,E 431720.45880,EL1478.875,--HDWL
EP,TM18: 6:8.00,LA33.435827690,LN-
112.083126886,HT1376.7662,RH0.0252,RV0.0436,DH1.43,DV2.48
GS,PN52,N 994131.33027,E 431720.13439,EL1479.383,--HDWL
EP,TM18: 6:37.00,LA33.435827354,LN-
112.083172326,HT1376.9541,RH0.0239,RV0.0414,DH1.43,DV2.48
GS,PN53,N 994131.07826,E 431681.75614,EL1479.568,--HDWL
EP,TM18: 6:56.00,LA33.435826546,LN-
112.083172172,HT1376.4376,RH0.0267,RV0.0463,DH1.43,DV2.48
GS,PN54,N 994130.26092,E 431681.88425,EL1479.051,--HDWL
EP,TM18: 7:16.00,LA33.435817207,LN-
112.083172215,HT1374.2884,RH0.0267,RV0.0463,DH1.43,DV2.48
GS,PN55,N 994120.82062,E 431681.82634,EL1476.901,--HDWL
EP,TM18: 8:3.00,LA33.435826533,LN-
112.083161693,HT1372.6218,RH0.0285,RV0.0495,DH1.43,DV2.48
GS,PN56,N 994130.22776,E 431690.73510,EL1475.236,--INV
EP,TM18: 8:24.00,LA33.435826849,LN-
112.083137323,HT1372.6627,RH0.0307,RV0.0535,DH1.42,DV2.48
GS,PN57,N 994130.50020,E 431711.31759,EL1475.279,--INV

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EP,TM18:20:35.00,LA33.435862435,LN-
112.083138497,HT1374.2722,RH0.0262,RV0.0427,DH1.13,DV1.79
GS,PN58,N 994166.47446,E 431710.40837,EL1476.890,--HDWL
EP,TM18:21:59.00,LA33.435853860,LN-
112.083138780,HT1376.4576,RH0.0243,RV0.0391,DH1.13,DV1.81
GS,PN59,N 994157.80748,E 431710.14892,EL1479.075,--HDWL
EP,TM18:22:17.00,LA33.435853247,LN-
112.083138567,HT1376.8467,RH0.0243,RV0.0392,DH1.13,DV1.82
GS,PN60,N 994157.18700,E 431710.32763,EL1479.464,--HDWL
EP,TM18:22:51.00,LA33.435852598,LN-
112.083183679,HT1377.1185,RH0.0226,RV0.0365,DH1.13,DV1.83
GS,PN61,N 994156.61749,E 431672.22592,EL1479.732,--HDWL
EP,TM18:23:6.00,LA33.435852845,LN-
112.083183944,HT1376.6178,RH0.0292,RV0.0446,DH1.10,DV1.62
GS,PN62,N 994156.86750,E 431672.00291,EL1479.232,--HDWL
EP,TM18:23:51.00,LA33.435860288,LN-
112.083191795,HT1374.9183,RH0.0219,RV0.0327,DH1.10,DV1.64
GS,PN63,N 994164.40672,E 431665.38933,EL1477.532,--HDWL
EP,TM18:27:17.00,LA33.435853586,LN-
112.083172624,HT1372.8630,RH0.0176,RV0.0271,DH1.10,DV1.70
GS,PN64,N 994157.59471,E 431681.56478,EL1475.478,--INV
EP,TM18:27:48.00,LA33.435853990,LN-
112.083149585,HT1372.8213,RH0.0249,RV0.0357,DH1.25,DV1.79
GS,PN65,N 994157.95962,E 431701.02400,EL1475.438,--INV
EP,TM18:28:29.00,LA33.435866053,LN-
112.083175545,HT1372.8977,RH0.0157,RV0.0238,DH1.10,DV1.72
GS,PN66,N 994170.20329,E 431679.12708,EL1475.513,--FD REBAR
EP,TM19:59:26.00,LA33.415655634,LN-
112.080925401,HT1288.1588,RH0.0166,RV0.0283,DH0.92,DV1.56
GS,PN70,N 981823.20347,E 433552.13448,EL1390.384,--EG
--Set ROVER: record intrvl: OFF, elev cutoff:  8 deg, antenna ht: 6.980
--Send Base position to Rover:LA33.423260101,LN-
112.071666467,HT1325.6460
--02:47:45.09,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--02:47:52.18,Solve for local Horizontal transformation, RMS N: 0.1779,
RMS E: 0.0518
HC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
HC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
HC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
HC,PN13,LA33.425257416,LN-112.073352500,HT1335.2570,--H
HC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
HC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
HC,PN4,LA33.432608488,LN-112.072127492,HT1357.0590,--H
HC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
--02:47:55.36,Solve for local Vertical transformation, RMS ELV: 0.0006
VC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
VC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
VC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
VC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
VC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
VC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
LH,PN15,Ha3.280830488,Hb0.006818573,Hc109238.064721569,Hd658055.97919059
4,SC1.000001293,RT0.070868
LV,PN15,Va0.000303868,Vb0.000150464,Vc57.370267624,Ba33.423260101,Bo-
112.071666467,Bh1325.6460
EP,TM20: 1:20.00,LA33.415614285,LN-
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112.080935612,HT1287.5726,RH0.0167,RV0.0279,DH0.92,DV1.54
GS,PN70,N 981781.42512,E 433543.41463,EL1389.795,--EG
EP,TM20: 2:6.00,LA33.415615773,LN-
112.080947599,HT1287.2532,RH0.0157,RV0.0258,DH0.92,DV1.53
GS,PN71,N 981782.95242,E 433533.28988,EL1389.474,--TOP
EP,TM20: 4:28.00,LA33.415619561,LN-
112.080985197,HT1271.4169,RH0.0183,RV0.0299,DH0.92,DV1.50
GS,PN72,N 981786.85183,E 433501.53174,EL1373.635,--TOE
EP,TM20: 4:52.00,LA33.415620694,LN-
112.080992064,HT1270.9420,RH0.0167,RV0.0272,DH0.92,DV1.49
GS,PN73,N 981788.00975,E 433495.73248,EL1373.160,--EG
EP,TM20: 5:7.00,LA33.415621811,LN-
112.080997996,HT1272.7074,RH0.0204,RV0.0333,DH0.92,DV1.49
GS,PN74,N 981789.14992,E 433490.72370,EL1374.925,--EG
EP,TM20: 5:29.00,LA33.415624752,LN-
112.081040792,HT1271.4659,RH0.0205,RV0.0332,DH0.92,DV1.49
GS,PN75,N 981792.20332,E 433454.57158,EL1373.680,--EG
EP,TM20: 5:57.00,LA33.415647441,LN-
112.081120496,HT1272.0275,RH0.0183,RV0.0296,DH0.92,DV1.48
GS,PN76,N 981815.28721,E 433387.28105,EL1374.237,--EG
EP,TM20: 6:22.00,LA33.415662004,LN-
112.081188971,HT1271.8621,RH0.0184,RV0.0296,DH0.92,DV1.48
GS,PN77,N 981830.13735,E 433329.45889,EL1374.067,--EG
EP,TM20: 6:41.00,LA33.415670527,LN-
112.081242400,HT1272.4561,RH0.0205,RV0.0330,DH0.92,DV1.47
GS,PN78,N 981838.85258,E 433284.33620,EL1374.657,--EG
EP,TM20: 7:2.00,LA33.415674202,LN-
112.081274466,HT1272.3543,RH0.0168,RV0.0269,DH0.92,DV1.47
GS,PN79,N 981842.62850,E 433257.25178,EL1374.553,--TOE1
EP,TM20: 7:33.00,LA33.415679272,LN-
112.081309466,HT1287.1856,RH0.0156,RV0.0248,DH0.92,DV1.46
GS,PN80,N 981847.81864,E 433227.69243,EL1389.381,--TOP1
EP,TM20: 8:12.00,LA33.415680760,LN-
112.081323005,HT1287.3734,RH0.0124,RV0.0197,DH0.92,DV1.45
GS,PN81,N 981849.34813,E 433216.25625,EL1389.568,--EG
EP,TM20: 8:26.00,LA33.415683939,LN-
112.081342249,HT1289.6819,RH0.0184,RV0.0291,DH0.92,DV1.45
GS,PN82,N 981852.59813,E 433200.00445,EL1391.875,--EG
--Set BASE : record intrvl: OFF, elev cutoff:  8 deg, antenna ht: 6.680
--Set BASE : record intrvl: OFF, elev cutoff:  8 deg, antenna ht: 6.680
--Set BASE : record intrvl: OFF, elev cutoff:  8 deg, antenna ht: 6.680
--21:04:25.67,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--Set ROVER: record intrvl: OFF, elev cutoff:  8 deg, antenna ht: 6.980
--Set ROVER: record intrvl: OFF, elev cutoff:  8 deg, antenna ht: 6.980
--Set ROVER: record intrvl: OFF, elev cutoff:  8 deg, antenna ht: 6.980
--Send Base position to Rover:LA33.423260101,LN-
112.071666467,HT1325.6460
--21:05:55.14,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--21:06:02.17,Solve for local Horizontal transformation, RMS N: 0.1779,
RMS E: 0.0518
HC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
HC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
HC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
HC,PN13,LA33.425257416,LN-112.073352500,HT1335.2570,--H
HC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
```

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Thomsen, B.W. and H.W. Hjalmarson, April 1991, *Estimated Manning's Roughness Coefficients for Stream Channels and Floodplains in Maricopa County, Arizona*, U.S. Geological Survey, Water Resources Division, Tucson, AZ.

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A.1 Data Collection Summary

Previous and applicable studies include:

- An effective FIS study prepared at an unknown date by an unknown contractor. Problems obtaining documentation of the effective FIS study are documented in Section 5.7.1.

- Partial documentation of a LOMR prepared by Coe & Van Loo Consultants in 1998. Problems with documentation of the LOMR study are documented in Section 5.7.1.

A.2 Referenced Documents

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City of Phoenix, 1994, *Pinnacle Peak Road Bridge over Skunk Creek*, Project No. BR-922765, (construction plans).

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Federal Emergency and Management Agency, December 1993, *Appeals, Revisions, and Amendments to National Flood Insurance Program Maps, A Guide for Community Officials*, FIA-12.

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Federal Emergency Management Agency (FEMA), *Flood Insurance Study for Maricopa County, Arizona and Incorporated Areas*, revised July 19, 2001.

Flood Control District of Maricopa County, January 1996, *Drainage Design Manual for Maricopa County, Volume II: Hydraulics*.

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HC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
HC,PN4,LA33.432608488,LN-112.072127492,HT1357.0590,--H
HC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
--21:06:05.47,Solve for local Vertical transformation, RMS ELV: 0.0006
VC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
VC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
VC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
VC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
VC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
VC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
LH,PN15,Ha3.280830488,Hb0.006818573,Hc109238.064721569,Hd658055.97919059
4,SC1.000001293,RT0.070868
LV,PN15,Va0.000303868,Vb0.000150464,Vc57.370267624,Ba33.423260101,Bo-
112.071666467,Bh1325.6460
EP,TM14:26:17.00,LA33.424654831,LN-
112.071881275,HT1332.3620,RH0.0116,RV0.0223,DH1.28,DV2.47
GS,PN33,N 986867.39033,E 437824.43914,EL1435.213,--BC ROW 29&HV
EP,TM14:48:40.00,LA33.425177691,LN-
112.073957185,HT1336.1973,RH0.0131,RV0.0236,DH1.28,DV2.31
GS,PN34,N 987399.61887,E 436071.91778,EL1438.910,--PK W.LEVY/800'N.
EP,TM15:21:44.00,LA33.433249969,LN-
112.080354093,HT1452.3675,RH0.0113,RV0.0145,DH0.99,DV1.27
GS,PN35,N 991520.42260,E 434056.20510,EL1555.082,--PT#712
EP,TM15:33:34.00,LA33.434580607,LN-
112.080357897,HT1362.3053,RH0.0125,RV0.0174,DH0.94,DV1.31
GS,PN36,N 992865.48962,E 434055.95653,EL1465.081,--MMI FP#1002
EP,TM15:54:44.00,LA33.442544131,LN-
112.083059339,HT1397.3568,RH0.0165,RV0.0261,DH1.01,DV1.60
GS,PN37,N 996877.08745,E 431783.43335,EL1500.105,--BM#526
EP,TM16: 0:54.00,LA33.442351744,LN-
112.083991770,HT1397.9353,RH0.0220,RV0.0354,DH1.02,DV1.64
GS,PN38,N 996684.41765,E 430995.55187,EL1500.602,--BM#517
EP,TM16: 8:17.00,LA33.442148594,LN-
112.084976284,HT1399.6336,RH0.0152,RV0.0225,DH0.92,DV1.32
GS,PN39,N 996480.98979,E 430163.65181,EL1502.214,--BM#525
--Set ROVER: record intrvl: OFF, elev cutoff:  8 deg, antenna ht: 6.980
--Send Base position to Rover:LA33.423260101,LN-
112.071666467,HT1325.6460
--01:40:06.15,Set Base receiver position, Base Pt: 15
BP,PN15,LA33.423260101,LN-112.071666467,HT1325.6460
--01:40:16.86,Solve for local Horizontal transformation, RMS N: 0.1779,
RMS E: 0.0518
HC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
HC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
HC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
HC,PN13,LA33.425257416,LN-112.073352500,HT1335.2570,--H
HC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
HC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
HC,PN4,LA33.432608488,LN-112.072127492,HT1357.0590,--H
HC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
--01:40:20.05,Solve for local Vertical transformation, RMS ELV: 0.0006
VC,PN5,LA33.432007288,LN-112.075340762,HT1354.4350,--H,V
VC,PN7,LA33.423402660,LN-112.072301546,HT1328.3190,--H,V
VC,PN12,LA33.424918164,LN-112.072196390,HT1331.9610,--H,V
VC,PN16,LA33.424694226,LN-112.080623806,HT1320.0675,--H,V
VC,PN17,LA33.424638482,LN-112.075816517,HT1324.2983,--H,V
VC,PN24,LA33.442077146,LN-112.085199078,HT1397.2019,--H,V
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LH,PN15,Ha3.280830488,Hb0.006818573,Hc109238.064721569,Hd658055.97919059
4,SC1.000001293,RT0.070868
LV,PN15,Va0.000303868,Vb0.000150464,Vc57.370267624,Ba33.423260101,Bo-
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EP,TM18:54:53.00,LA33.432442496,LN-
112.074698839,HT1359.9382,RH0.0129,RV0.0229,DH0.91,DV1.62
GS,PN83,N 990701.14875,E 435452.53336,EL1462.745,--TOP
EP,TM18:55:33.00,LA33.432448911,LN-
112.074695046,HT1357.8952,RH0.0144,RV0.0257,DH0.91,DV1.63
GS,PN84,N 990707.62673,E 435455.75106,EL1460.702,--GB
EP,TM18:55:56.00,LA33.432483018,LN-
112.074670152,HT1357.7453,RH0.0182,RV0.0325,DH0.91,DV1.63
GS,PN85,N 990742.05773,E 435476.85306,EL1460.556,--TOP1
EP,TM18:57:5.00,LA33.432549931,LN-
112.074612069,HT1339.4357,RH0.0166,RV0.0299,DH0.91,DV1.64
GS,PN86,N 990809.58988,E 435526.05882,EL1442.254,--TOE
EP,TM18:57:26.00,LA33.432563631,LN-
112.074603307,HT1340.6389,RH0.0154,RV0.0277,DH0.91,DV1.64
GS,PN87,N 990823.42273,E 435533.48949,EL1443.458,--GB1
EP,TM18:57:56.00,LA33.432580377,LN-
112.074592562,HT1341.4425,RH0.0154,RV0.0278,DH0.91,DV1.64
GS,PN88,N 990840.33015,E 435542.60252,EL1444.264,--GB2
EP,TM18:58:23.00,LA33.432600702,LN-
112.074570067,HT1346.4919,RH0.0154,RV0.0279,DH0.91,DV1.65
GS,PN89,N 990860.83494,E 435561.64663,EL1449.316,--GB3
EP,TM18:58:45.00,LA33.432617750,LN-
112.074563837,HT1347.2824,RH0.0166,RV0.0302,DH0.91,DV1.65
GS,PN90,N 990878.05598,E 435566.94677,EL1450.108,--FN
EP,TM18:59:1.00,LA33.432615546,LN-
112.074564424,HT1346.8022,RH0.0166,RV0.0302,DH0.91,DV1.65
GS,PN91,N 990875.82934,E 435566.44571,EL1449.627,--GB4
EP,TM19: 1:31.00,LA33.432624713,LN-
112.074557104,HT1347.4189,RH0.0154,RV0.0282,DH0.91,DV1.66
GS,PN92,N 990885.08231,E 435572.64880,EL1450.245,--EG
EP,TM19: 1:59.00,LA33.432642179,LN-
112.074543660,HT1347.6437,RH0.0154,RV0.0282,DH0.91,DV1.67
GS,PN93,N 990902.71320,E 435584.04264,EL1450.472,--EG
EP,TM19: 2:32.00,LA33.432662379,LN-
112.074527075,HT1348.4397,RH0.0167,RV0.0309,DH0.90,DV1.67
GS,PN94,N 990923.10131,E 435598.09469,EL1451.270,--EG
EP,TM19: 2:56.00,LA33.432705977,LN-
112.074501718,HT1349.8371,RH0.0166,RV0.0306,DH0.90,DV1.67
GS,PN95,N 990967.12592,E 435619.60787,EL1452.671,--EG
EP,TM19: 3:19.00,LA33.432741969,LN-
112.074475347,HT1351.0959,RH0.0182,RV0.0336,DH0.90,DV1.67
GS,PN96,N 991003.45964,E 435641.96043,EL1453.934,--EG
EP,TM19: 3:49.00,LA33.432788273,LN-
112.074435846,HT1352.2515,RH0.0166,RV0.0307,DH0.90,DV1.67
GS,PN97,N 991050.19380,E 435675.42539,EL1455.095,--EG
EP,TM19: 4:18.00,LA33.432832121,LN-
112.074411870,HT1353.6268,RH0.0154,RV0.0285,DH0.90,DV1.67
GS,PN98,N 991094.47379,E 435695.77264,EL1456.474,--EG
EP,TM19:23:6.00,LA33.434076501,LN-
112.072528729,HT1369.8359,RH0.0143,RV0.0254,DH0.90,DV1.61
GS,PN99,N 992348.95796,E 437289.01050,EL1472.888,--TOP
EP,TM19:23:39.00,LA33.434073627,LN-
112.072527789,HT1369.7125,RH0.0170,RV0.0304,DH0.90,DV1.60

GS,PN100,N 992346.05044,E 437289.79828,EL1472.764,--ER
EP,TM19:24:18.00,LA33.434064956,LN-
112.072520871,HT1369.4725,RH0.0170,RV0.0303,DH0.90,DV1.60
GS,PN101,N 992337.27342,E 437295.62257,EL1472.525,--ER1
EP,TM19:25:2.00,LA33.434062126,LN-
112.072518682,HT1369.5358,RH0.0170,RV0.0301,DH0.90,DV1.59
GS,PN102,N 992334.40943,E 437297.46541,EL1472.588,--TOP1
--New Rover antenna height: 5.21
EP,TM19:26:33.00,LA33.434035599,LN-
112.072490841,HT1351.3601,RH0.0157,RV0.0276,DH0.90,DV1.58
GS,PN103,N 992307.54483,E 437320.92477,EL1454.413,--TOE
EP,TM19:27:50.00,LA33.434001808,LN-
112.072458426,HT1351.3281,RH0.0416,RV0.0723,DH0.90,DV1.56
GS,PN104,N 992273.33027,E 437348.23077,EL1454.382,--EG
EP,TM19:28:7.00,LA33.433980497,LN-
112.072438762,HT1351.4905,RH0.0465,RV0.0930,DH1.00,DV2.01
GS,PN105,N 992251.75370,E 437364.79397,EL1454.545,--EG
EP,TM19:28:19.00,LA33.433960409,LN-
112.072418089,HT1351.1879,RH0.0464,RV0.0928,DH1.00,DV2.01
GS,PN106,N 992231.41072,E 437382.21226,EL1454.243,--EG
EP,TM19:28:30.00,LA33.433941403,LN-
112.072398441,HT1351.6218,RH0.0464,RV0.0924,DH1.00,DV2.00
GS,PN107,N 992212.16456,E 437398.76705,EL1454.678,--EG
EP,TM19:28:40.00,LA33.433920654,LN-
112.072377209,HT1351.6936,RH0.0463,RV0.0922,DH1.00,DV2.00
GS,PN108,N 992191.15307,E 437416.65636,EL1454.750,--EG
EP,TM19:28:49.00,LA33.433900372,LN-
112.072357015,HT1350.8802,RH0.0463,RV0.0920,DH1.00,DV1.99
GS,PN109,N 992170.61507,E 437433.66950,EL1453.937,--EG
EP,TM19:28:59.00,LA33.433880133,LN-
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EP,TM19:29:10.00,LA33.433858831,LN-
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GS,PN111,N 992128.55362,E 437467.41779,EL1453.874,--EG
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112.072296320,HT1351.1341,RH0.0460,RV0.0912,DH1.00,DV1.98
GS,PN112,N 992107.67023,E 437484.80227,EL1454.193,--EG
EP,TM19:29:56.00,LA33.433826600,LN-
112.072284582,HT1351.0942,RH0.0157,RV0.0285,DH0.91,DV1.64
GS,PN113,N 992095.91527,E 437494.69153,EL1454.154,--TOE1
EP,TM19:31:20.00,LA33.433800788,LN-
112.072259124,HT1368.5415,RH0.0161,RV0.0277,DH0.84,DV1.40
GS,PN114,N 992069.77891,E 437516.13915,EL1471.602,--TOP2
EP,TM19:31:40.00,LA33.433797371,LN-
112.072255938,HT1368.6314,RH0.0172,RV0.0288,DH0.84,DV1.40
GS,PN115,N 992066.31892,E 437518.82323,EL1471.692,--ER2
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GS,PN116,N 992058.16033,E 437525.53245,EL1472.166,--ER3
EP,TM19:32:35.00,LA33.433784713,LN-
112.072244143,HT1369.0924,RH0.0157,RV0.0262,DH0.84,DV1.40
GS,PN117,N 992053.50298,E 437528.75841,EL1472.153,--TOP4
EP,TM19:33:8.00,LA33.433762496,LN-
112.072223863,HT1359.2570,RH0.0157,RV0.0295,DH0.99,DV1.90
GS,PN118,N 992031.00959,E 437545.84044,EL1462.318,--TOE3
EP,TM19:33:24.00,LA33.433740542,LN-

112.072205214,HT1358.3963,RH0.0173,RV0.0286,DH0.84,DV1.39
·GS,PN119,N 992008.78459,E 437561.54531,EL1461.458,--EG

CHECK-2 Program: NT Module
Manning's n Value and Transition Loss Coefficient Review

Report File = P:\EMCN-002\LISA\SSPLTREV.NT2
Date: 9/5/2002
Time: 11:09:52 AM

SECNO	XNL	XNR	XNCH	CCHV	CEHV	Structure
8.69	0.045	0.045	0.035	0.1	0.3	
8.79	0.045	0.045	0.035	0.1	0.3	
8.93	0.045	0.045	0.035	0.1	0.3	
9.01	0.045	0.045	0.035	0.1	0.3	
9.08	0.045	0.045	0.035	0.1	0.3	
9.14	0.035	0.035	0.035	0.1	0.3	
9.145	0.035	0.035	0.035	0.1	0.3	BT
9.155	0.035	0.035	0.035	0.1	0.3	BT
9.16	0.035	0.035	0.035	0.1	0.3	
9.21	0.035	0.035	0.02	0.1	0.3	
9.22	0.04	0.035	0.035	0.1	0.3	
9.25	0.04	0.035	0.035	0.1	0.3	
9.3	0.04	0.035	0.035	0.1	0.3	
9.35	0.04	0.035	0.035	0.1	0.3	
9.42	0.04	0.035	0.035	0.1	0.3	
9.45	0.04	0.04	0.04	0.1	0.3	
9.54	0.035	0.04	0.04	0.1	0.3	
9.65	0.035	0.04	0.04	0.1	0.3	
9.7	0.035	0.035	0.035	0.1	0.3	
9.73	0.035	0.035	0.035	0.1	0.3	
9.8	0.035	0.035	0.035	0.1	0.3	
9.89	0.035	0.035	0.035	0.1	0.3	
9.98	0.035	0.035	0.035	0.1	0.3	
10.08	0.035	0.035	0.035	0.1	0.3	
10.16	0.035	0.035	0.035	0.1	0.3	
10.25	0.035	0.035	0.035	0.1	0.3	
10.33	0.035	0.035	0.035	0.1	0.3	
10.34	0.035	0.035	0.035	0.1	0.3	
10.38	0.03	0.03	0.03	0.1	0.3	
10.41	0.035	0.035	0.035	0.1	0.3	
10.42	0.035	0.035	0.035	0.1	0.3	
10.51	0.035	0.035	0.035	0.1	0.3	
10.62	0.035	0.05	0.035	0.1	0.3	
10.7	0.035	0.035	0.035	0.1	0.3	
10.83	0.035	0.035	0.035	0.1	0.3	
10.93	0.035	0.035	0.035	0.1	0.3	
11.03	0.035	0.035	0.035	0.1	0.3	
11.14	0.05	0.035	0.035	0.1	0.3	
11.19	0.035	0.035	0.02	0.1	0.3	
11.29	0.035	0.035	0.02	0.1	0.3	
11.39	0.035	0.035	0.02	0.1	0.3	
11.48	0.035	0.035	0.02	0.1	0.3	
11.56	0.035	0.035	0.02	0.1	0.3	
11.57	0.035	0.035	0.02	0.1	0.3	

------Summary of Statistics------

	Minimum	Maximum
Left Overbank N Value:	0.03	0.05
Right Overbank N Value:	0.03	0.05
Channel N Value:	0.02	0.04
Contraction Coefficient:	0.1	0.1
Expansion Coefficient:	0.3	0.3

Effective Model #1

(RM 8.69 – 9.05)

SKUNK CREEK UPSTREM OF ADOBE DAM FLOODPLAIN REVISION CVL # 98001301

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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    12OCT98    TIME   13:38:05 *
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*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
*************************************
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Kofi's Revised model for Oct. 2000 submittal (from City of Phx)

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X     X  XXXXXXX   XXXXX            XXXXX
X     X  X       X     X          X     X
X     X  X       X                      X
XXXXXXX  XXXX    X         XXXXX   XXXXX
X     X  X       X                X
X     X  X       X     X          X
X     X  XXXXXXX   XXXXX           XXXXXXX
```

GR	1375.7	2350	1375.5	2510	1374.8	2720	1374.0	2960	1373.4	3150
GR	1371.3	3420	1373.3	3425	1375.6	3465	1378.0	3565		

THE ENTIRE X-SECTION 8.75 WAS REVISED BASED ON TOPOGRAPHICAL SURVEY
DATA FOR THE AREA (OCTOBER 1998, CVL)

ET			9.1							
X1	8.75	28	1065	2040	980	1030	1000		1130	2029
X2										15
GR	1385	500	1384.9	505	1383.7	610	1383.5	710	1383.9	1000
GR	1383.1	1025	1386.4	1065	1385.2	1085	1374.4	1160	1373.2	1270
GR	1374.2	1630	1375.9	1820	1377.4	1880	1373.8	1900	1373.9	1940
GR	1380	1950	1380.7	1965	1366.4	1985	1366.8	2000	1382.3	2040
GR	1382.4	2200	1382.0	2390	1382.1	2580	1381.9	2760	1381.6	2980
GR	1381.6	3230	1381.0	3630	1382.3	3800				

THE ENTIRE X-SECTION 8.89 WAS REVISED BASED ON TOPOGRAPHICAL SURVEY
DATA FOR THE AREA (OCTOBER 1998, CVL)

ET			9.1							
X1	8.89	23	1550	2300	700	850	810		1624	2276
X2										15
GR	1392.3	750	1387.3	830	1386.7	1070	1386.6	1330	1386.9	1430
GR	1385.8	1450	1387.1	1500	1388.1	1510	1390.1	1550	1375.6	1700
GR	1372.1	2020	1373.9	2050	1375.9	2190	1384.9	2300	1384.5	2360
GR	1388	2460	1388.2	2800	1387.2	3120	1386.1	3510	1387.5	3835
GR	1387.2	4080	1386.4	4250	1389.7	4300				

THE ENTIRE X-SECTION 8.965 WAS REVISED BASED ON TOPOGRAPHICAL SURVEY
DATA FOR THE AREA (OCTOBER 1998, CVL)

ET			9.1							
X1	8.965	28	1710	2110	400	410	400		1730	2093
X2										15
GR	1392	760	1387.7	910	1388	1060	1388	1360	1389.1	1510
GR	1389.1	1610	1388.4	1630	1386.9	1650	1388.1	1670	1388.4	1710
GR	1373.6	1790	1373.3	2050	1386.9	2110	1388	2150	1387.1	2210
GR	1387.2	2260	1392.3	2330	1393.3	2440	1392.2	2600	1393.0	2780
GR	1390.2	2970	1389.7	3010	1389.4	3380	1389	3760	1389.9	3950
GR	1389	4000	1390.3	4125	1389.3	4250				

THE ENTIRE X-SECTION 9.05 WAS REVISED BASED ON TOPOGRAPHICAL SURVEY
DATA FOR THE AREA (OCTOBER 1998, CVL)

ET			9.1							
X1	9.050	25	1905	2320	520	350	390		1920	2290
X2										15
GR	1398.5	700	1393.4	810	1390.8	920	1390.5	1200	1391.3	1450
GR	1391.8	1650	1391.5	1680	1391	1700	1391.6	1730	1387.3	1740
GR	1387.3	1750	1389.9	1800	1389.1	1830	1388.7	1905	1374.7	1975
GR	1375	2240	1392.3	2320	1391.7	2370	1392.1	2400	1391.5	2420

```
NH      4     .045   1945   .035   2040   .050   2600   .040   4130
ET            4.1    6.1    1170   2470   1540   2470

X1    9.48    41     1945   2300   370    420    490
GR    1412    330    1410   350    1410   440    1411.7 500    1410   560
GR    1410    640    1408   665    1406   690    1404   720    1402   770
GR    1402    800    1402   830    1402   860    1402   970    1404   1200
GR    1404    1400   1404   1640   1406   1715   1406   1725   1406   1750
GR    1404    1890   1404   1930   1404   1945   1398   1970   1396.5 2000
GR    1398    2040   1398   2150   1396   2255   1398   2280   1402   2300
GR    1404    2370   1404   2600   1403   2750   1404   2850   1406   2870
GR    1408    2920   1409   3020   1408   3100   1406   3290   1408   3450
GR    1410    4130

NC    .045    .045   .035
ET            4.1    6.1    1600   2535   1815   2535

X1    9.580   29     1910   2340   390    460    450
GR    1412    625    1410   645    1408   675    1406   870    1404   1000
GR    1406    1040   1406   1080   1404   1110   1404   1280   1406   1520
GR    1407.5  1910   1406   1965   1402   1990   1398.5 2000   1400   2060
GR    1402    2160   1400   2240   1404   2290   1406   2340   1406   2410
GR    1404    2430   1404   2500   1406   2550   1406   2720   1407   2880
GR    1406    3025   1406   3095   1408   3255   1410   3400
      ET CARD CHANGED FROM THE ORIGINAL STENCR = 0.0 TO STENCR = 2480 TO
      REMOVE ERROR MESSAGE. THIS WAS ACCEPTABLE IN THE 1982 HEC-2 VERSION

ET            4.1    6.1    1770   2480   1780   2480

X1    9.670   24     1970   2060   470    420    410
GR    1414    530    1412   540    1410   810    1408   945    1406   970
GR    1408    1010   1407   1055   1408   1130   1408   1480   1410   1840
GR    1410    1910   1408   1970   1400   2000   1402   2050   1408   2060
GR    1408    2085   1404   2110   1404   2250   1406   2270   1406   2350
GR    1405    2370   1406   2385   1420   2450   1426   2480

X1    9.75    21     1910   2035   390    410    370
GR    1424    1710   1416   1740   1414   1750   1412   1760   1410   1790
GR    1410    1800   1412   1815   1412   1890   1410   1910   1404   1935
GR    1402    1990   1401.7 2000   1402   2005   1410   2035   1408   2040
GR    1407    2070   1408   2090   1410   2175   1412   2200   1412   2270
GR    1424    2340
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= .100 CEHV= .300

*SECNO 8.690

8.690	13.90	1378.00	.00	1378.00	1378.10	.10	.00	.00	1379.20
39000.0	.0	32930.6	6069.4	.0	11846.8	5227.5	.0	.0	1377.10
.00	.00	2.78	1.16	.000	.035	.045	.000	1364.10	920.00
.000198	0.	0.	0.	0	0	0	.00	2645.00	3565.00

FLOW DISTRIBUTION FOR SECNO= 8.69 CWSEL= 1378.00

STA=	920.	2100.	2720.	3150.	3420.	3565.
PER Q=	84.4	4.1	5.0	5.8	.7	
AREA=	11846.8	1730.5	1681.0	1525.5	290.5	
VEL=	2.8	.9	1.2	1.5	.9	
DEPTH=	10.0	2.8	3.9	5.6	2.0	

*SECNO 8.750

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

8.750	11.73	1378.13	1378.13	.00	1380.10	1.97	.62	.56	1386.40
39000.0	.0	39000.0	.0	.0	3464.9	.0	237.6	40.9	1382.30
.02	.00	11.26	.00	.000	.035	.000	.000	1366.40	1134.10
.011323	980.	1000.	1030.	20	10	0	.00	873.48	2029.24

FLOW DISTRIBUTION FOR SECNO= 8.75 CWSEL= 1378.13

STA=	1134.	2040.
PER Q=	100.0	
AREA=	3464.9	
VEL=	11.3	
DEPTH=	4.0	

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.050

3301 HV CHANGED MORE THAN HVINS

9.050	10.90	1385.60	.00	.00	1387.64	2.04	1.78	.06	1388.70
39000.0	.0	39000.0	.0	.0	3404.9	.0	379.7	62.9	1392.30
.07	.00	11.45	.00	.000	.035	.000	.000	1374.70	1920.51
.003783	520.	390.	350.	3	0	0	.00	368.50	2289.01

FLOW DISTRIBUTION FOR SECNO= 9.05 CWSEL= 1385.60

STA= 1921. 2320.
PER Q= 100.0
AREA= 3404.9
VEL= 11.5
DEPTH= 9.2

*SECNO 9.115

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 110.0 3465.0 TYPE= 1 TARGET= 3355.000

9.115	8.05	1394.05	1394.05	.00	1395.45	1.39	1.93	.06	1392.00
39000.0	619.8	26821.2	11559.1	200.4	2446.3	2390.2	413.5	71.5	1392.00
.08	3.09	10.96	4.84	.045	.035	.045	.000	1386.00	1575.73
.008246	350.	370.	300.	20	13	0	.00	1889.27	3465.00

*SECNO 9.210

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.43

3470 ENCROACHMENT STATIONS= 1385.0 2950.0 TYPE= 1 TARGET= 1565.000

9.210	9.12	1397.62	.00	.00	1398.62	.99	3.13	.04	1394.00
39000.0	5362.7	21995.3	11642.0	1275.3	2246.2	2318.7	480.7	92.0	1394.00
.10	4.21	9.79	5.02	.045	.035	.040	.000	1388.50	1385.00
.004046	460.	600.	500.	2	0	0	.00	1565.00	2950.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.670

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1770.0 2480.0 TYPE= 1 TARGET= 710.000

9.670	11.69	1411.69	1411.69	.00	1414.27	2.58	3.10	.20	1408.00
39000.0	2041.0	13893.5	23065.5	412.3	832.4	2193.0	729.8	153.0	1408.00
.17	4.95	16.69	10.52	.045	.035	.045	.000	1400.00	1770.00
.008285	470.	410.	420.	2	8	0	.00	641.43	2411.43

*SECNO 9.750
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

9.750	13.72	1415.42	1415.42	.00	1418.41	2.99	2.83	.13	1410.00
39000.0	4148.7	23067.7	11783.6	626.7	1379.4	1357.0	760.5	158.4	1410.00
.18	6.62	16.72	8.68	.045	.035	.045	.000	1401.70	1742.92
.006436	390.	370.	410.	20	11	0	.00	547.02	2289.93

*SECNO 9.840

3301 HV CHANGED MORE THAN HVINS

9.840	15.70	1418.70	.00	.00	1420.76	2.05	2.25	.09	1414.00
39000.0	4666.8	29924.9	4408.3	865.0	2352.2	700.4	801.2	164.4	1410.00
.19	5.40	12.72	6.29	.045	.035	.045	.000	1403.00	1762.35
.003513	500.	480.	490.	2	0	0	.00	529.24	2291.60

*SECNO 9.940

9.940	14.54	1420.54	.00	.00	1422.43	1.89	1.65	.02	1410.00
39000.0	10190.9	25413.9	3395.1	1454.2	1992.2	599.4	845.6	170.0	1412.00
.20	7.01	12.76	5.66	.045	.035	.045	.000	1406.00	1752.14
.003138	430.	520.	470.	2	0	0	.00	505.85	2258.00

*SECNO 10.040

10.040	13.23	1422.23	.00	.00	1424.11	1.88	1.69	.00	1414.00
39000.0	3275.1	32028.2	3696.7	538.7	2695.3	749.0	895.4	176.6	1414.00
.22	6.08	11.88	4.94	.045	.035	.045	.000	1409.00	1820.96
.003119	540.	540.	540.	2	0	0	.00	553.65	2374.61

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

CCHV= .100 CEHV= .300
*SECNO 8.690

3470 ENCROACHMENT STATIONS= 920.0 2290.0 TYPE= 1 TARGET= 1370.000

8.690	13.90	1378.00	.00	1378.00	1378.16	.16	.00	.00	100000.00
39000.0	.0	38293.9	706.1	.0	11846.8	604.4	.0	.0	1377.10
.00	.00	3.23	1.17	.000	.035	.045	.000	1364.10	920.00
.000268	0.	0.	0.	0	0	0	.00	1370.00	2290.00

FLOW DISTRIBUTION FOR SECNO= 8.69 CWSEL= 1378.00

STA=	920.	2100.	2150.	2195.	2280.	2290.
PER Q=	98.2	.3	.5	.9	.1	
AREA=	11846.8	125.0	159.7	284.7	34.9	
VEL=	3.2	1.0	1.3	1.2	1.0	
DEPTH=	10.0	2.5	3.5	3.3	3.5	

*SECNO 8.750

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1130.0 2029.0 TYPE= 1 TARGET= 899.000

8.750	11.73	1378.13	1378.13	1378.13	1380.10	1.97	.81	.54	100000.00
39000.0	.0	39000.0	.0	.0	3465.3	.0	182.9	25.8	100000.00
.02	.00	11.25	.00	.000	.035	.000	.000	1366.40	1134.09
.011316	980.	1000.	1030.	20	10	0	.00	873.25	2029.00

FLOW DISTRIBUTION FOR SECNO= 8.75 CWSEL= 1378.13

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 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

FLOW DISTRIBUTION FOR SECNO=      8.97          CWSEL=   1383.12

STA=    1738.    2110.
  PER Q=    100.0
   AREA=   2974.6
    VEL=     13.1
  DEPTH=      8.4

*SECNO 9.050

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=     1920.0    2290.0  TYPE=      1  TARGET=     370.000
     9.050     10.90   1385.60      .00   1385.60   1387.64      2.04      1.78       .06 100000.00
   39000.0        .0   39000.0       .0        .0    3404.4        .0     325.0      47.8 100000.00
       .07       .00     11.46      .00      .000      .035      .000      .000   1374.70   1920.52
   .003785      520.      390.     350.         3         0         0       .00    368.49   2289.00


FLOW DISTRIBUTION FOR SECNO=      9.05          CWSEL=   1385.60

STA=    1921.    2320.
  PER Q=    100.0
   AREA=   3404.4
    VEL=     11.5
  DEPTH=      9.2

*SECNO 9.115
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1310.0    2575.0  TYPE=      1  TARGET=    1265.000
     9.115      8.81   1394.81   1394.81   1394.05   1396.64      1.83      1.90       .02   1392.00
   39000.0    1727.3  32878.6    4394.0     487.4    2831.1     771.7     356.1      54.4   1392.00
       .08      3.54     11.61      5.69      .045      .035      .045      .000   1386.00   1310.00
   .007615      350.      370.      300.        20        15         0       .00   1265.00   2575.00
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 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 9.480

3470 ENCROACHMENT STATIONS=     1540.0    2470.0  TYPE=      1  TARGET=     930.000
   9.480     10.99   1406.99       .00   1406.49   1408.32      1.33      2.20       .03   1404.00
 39000.0    3807.3   32489.7    2703.0     926.9    3259.8     578.7     576.3     101.9   1402.00
     .14      4.11      9.97      4.67      .045      .045      .050      .000   1396.00   1540.00
 .004802      370.      490.      420.         2         0         0       .00    930.00   2470.00

*SECNO 9.580

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     1815.0    2535.0  TYPE=      1  TARGET=     720.000
   9.580     10.48   1408.98       .00   1408.57   1410.82      1.84      2.35       .15   1407.50
 39000.0     549.3   33387.4    5063.3     158.0    2902.8     786.7     620.2     110.1   1406.00
     .16      3.48     11.50      6.44      .045      .035      .045      .000   1398.50   1815.00
 .005773      390.      450.      460.         2         0         0       .00    720.00   2535.00

*SECNO 9.670

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1780.0    2480.0  TYPE=      1  TARGET=     700.000
   9.670     11.65   1411.65   1411.65   1411.69   1414.29      2.64      2.89       .24   1408.00
 39000.0    1899.4   13976.7   23123.9     382.9     828.2    2176.7     655.0     116.7   1408.00
     .17      4.96     16.88     10.62      .045      .035      .045      .000   1400.00   1780.00
 .008527      470.      410.      420.         0         8         0       .00    631.22   2411.22

*SECNO 9.750
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   9.750     13.72   1415.42   1415.42   1415.42   1418.41      3.00      2.87       .11   1410.00
 39000.0    4148.5   23068.1   11783.4     626.7    1379.3    1357.0     685.5     122.1   1410.00
     .17      6.62     16.72      8.68      .045      .035      .045      .000   1401.70   1742.92
 .006437      390.      370.      410.        20        11         0       .00    547.01   2289.93
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THIS RUN EXECUTED 12OCT98 13:38:05

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SKUNK CREEK FLOODPLAIN,

SUMMARY PRINTOUT

	SECNO	CWSEL	DIFKWS	TOPWID	SSTA	VCH	ENDST	QLOB	QROB	STENCL	STCHL	STCHR	STEN
	8.690	1378.00	.00	2645.00	920.00	2.78	3565.00	.00	6069.36	.00	860.00	2100.00	.
	8.690	1378.00	.00	1370.00	920.00	3.23	2290.00	.00	706.14	920.00	860.00	2100.00	2290.
*	8.750	1378.13	.00	873.48	1134.10	11.26	2029.24	.00	.00	.00	1065.00	2040.00	.
*	8.750	1378.13	.00	873.25	1134.09	11.25	2029.00	.00	.00	1130.00	1065.00	2040.00	2029.
*	8.890	1382.88	.00	650.53	1624.73	8.00	2275.26	.00	.00	.00	1550.00	2300.00	.
*	8.890	1382.88	.00	650.52	1624.74	8.00	2275.25	.00	.00	1624.00	1550.00	2300.00	2276.
*	8.965	1383.12	.00	354.86	1738.50	13.11	2093.36	.00	.00	.00	1710.00	2110.00	.
*	8.965	1383.12	.00	354.50	1738.50	13.11	2093.00	.00	.00	1730.00	1710.00	2110.00	2093.
	9.050	1385.60	.00	368.50	1920.51	11.45	2289.01	.00	.00	.00	1905.00	2320.00	.
	9.050	1385.60	.00	368.49	1920.52	11.46	2289.00	.00	.00	1920.00	1905.00	2320.00	2290.
*	9.115	1394.05	.00	1889.27	1575.73	10.96	3465.00	619.76	11559.07	110.00	1790.00	2300.00	3465.
*	9.115	1394.81	.75	1265.00	1310.00	11.61	2575.00	1727.33	4394.04	1310.00	1790.00	2300.00	2575.
*	9.210	1397.62	.00	1565.00	1385.00	9.79	2950.00	5362.71	11642.03	1385.00	1865.00	2190.00	2950.
*	9.210	1398.42	.79	1215.00	1380.00	9.21	2595.00	7176.11	8737.38	1380.00	1865.00	2190.00	2595.
*	9.310	1401.27	.00	1450.00	1110.00	12.90	2560.00	9465.02	9027.37	1110.00	1930.00	2115.00	2560.
*	9.310	1401.77	.50	1120.00	1280.00	13.77	2400.00	9339.56	6501.69	1280.00	1930.00	2115.00	2400.
	9.400	1403.70	.00	1420.00	980.00	12.16	2400.00	12129.88	2645.89	980.00	1940.00	2200.00	2400.
	9.400	1404.46	.76	1070.00	1330.00	11.96	2400.00	9158.70	3655.93	1330.00	1940.00	2200.00	2400.
	9.480	1406.49	.00	1300.00	1170.00	9.80	2470.00	6643.32	2133.49	1170.00	1945.00	2300.00	2470.
	9.480	1406.99	.49	930.00	1540.00	9.97	2470.00	3807.32	2703.01	1540.00	1945.00	2300.00	2470.
	9.580	1408.57	.00	935.00	1600.00	11.91	2535.00	1952.02	4599.41	1600.00	1910.00	2340.00	2535.
	9.580	1408.98	.41	720.00	1815.00	11.50	2535.00	549.31	5063.30	1815.00	1910.00	2340.00	2535.

SKUNK CREEK FLOODPLAIN,

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STEN
	8.690	1378.00	.00	1378.10	2645.00	.00	32930.64	6069.36	.00	.00	860.00	2100.00	.
	8.690	1378.00	.00	1378.16	1370.00	.00	38293.86	706.14	1370.00	920.00	860.00	2100.00	2290.
*	8.750	1378.13	.00	1380.10	873.48	.00	39000.00	.00	.00	.00	1065.00	2040.00	.
*	8.750	1378.13	.00	1380.10	873.25	.00	39000.00	.00	899.00	1130.00	1065.00	2040.00	2029.
*	8.890	1382.88	.00	1383.87	650.53	.00	39000.00	.00	.00	.00	1550.00	2300.00	.
*	8.890	1382.88	.00	1383.87	650.52	.00	39000.00	.00	652.00	1624.00	1550.00	2300.00	2276.
*	8.965	1383.12	.00	1385.79	354.86	.00	39000.00	.00	.00	.00	1710.00	2110.00	.
*	8.965	1383.12	.00	1385.79	354.50	.00	39000.00	.00	363.00	1730.00	1710.00	2110.00	2093.
	9.050	1385.60	.00	1387.64	368.50	.00	39000.00	.00	.00	.00	1905.00	2320.00	.
	9.050	1385.60	.00	1387.64	368.49	.00	39000.00	.00	370.00	1920.00	1905.00	2320.00	2290.
*	9.115	1394.05	.00	1395.45	1889.27	619.76	26821.17	11559.07	3355.00	110.00	1790.00	2300.00	3465.
*	9.115	1394.81	.75	1396.64	1265.00	1727.33	32878.63	4394.04	1265.00	1310.00	1790.00	2300.00	2575.
*	9.210	1397.62	.00	1398.62	1565.00	5362.71	21995.27	11642.03	1565.00	1385.00	1865.00	2190.00	2950.
*	9.210	1398.42	.79	1399.35	1215.00	7176.11	23086.50	8737.38	1215.00	1380.00	1865.00	2190.00	2595.
*	9.310	1401.27	.00	1402.80	1450.00	9465.02	20507.60	9027.37	1450.00	1110.00	1930.00	2115.00	2560.
*	9.310	1401.77	.50	1403.69	1120.00	9339.56	23158.75	6501.69	1120.00	1280.00	1930.00	2115.00	2400.
	9.400	1403.70	.00	1405.28	1420.00	12129.88	24224.23	2645.89	1420.00	980.00	1940.00	2200.00	2400.
	9.400	1404.46	.76	1406.09	1070.00	9158.70	26185.38	3655.93	1070.00	1330.00	1940.00	2200.00	2400.
	9.480	1406.49	.00	1407.71	1300.00	6643.32	30223.19	2133.49	1300.00	1170.00	1945.00	2300.00	2470.
	9.480	1406.99	.49	1408.32	930.00	3807.32	32489.66	2703.01	930.00	1540.00	1945.00	2300.00	2470.
	9.580	1408.57	.00	1410.49	935.00	1952.02	32448.57	4599.41	935.00	1600.00	1910.00	2340.00	2535.
	9.580	1408.98	.41	1410.82	720.00	549.31	33387.38	5063.30	720.00	1815.00	1910.00	2340.00	2535.
*	9.670	1411.69	.00	1414.27	641.43	2041.00	13893.48	23065.53	710.00	1770.00	1970.00	2060.00	2480.
*	9.670	1411.65	-.05	1414.29	631.22	1899.40	13976.73	23123.88	700.00	1780.00	1970.00	2060.00	2480.
*	9.750	1415.42	.00	1418.41	547.02	4148.68	23067.74	11783.58	.00	.00	1910.00	2035.00	.
*	9.750	1415.42	.00	1418.41	547.01	4148.47	23068.13	11783.40	.00	.00	1910.00	2035.00	.
	9.840	1418.70	.00	1420.76	529.24	4666.80	29924.91	4408.30	.00	.00	1955.00	2160.00	.
	9.840	1418.71	.00	1420.76	529.25	4667.19	29924.29	4408.52	.00	.00	1955.00	2160.00	.
	9.940	1420.54	.00	1422.43	505.85	10190.94	25413.95	3395.11	.00	.00	1960.00	2120.00	.
	9.940	1420.54	.00	1422.42	505.85	10190.68	25414.45	3394.87	.00	.00	1960.00	2120.00	.
	10.040	1422.23	.00	1424.11	553.65	3275.11	32028.22	3696.66	.00	.00	1920.00	2160.00	.
	10.040	1422.23	.00	1424.11	553.66	3275.22	32027.83	3696.95	.00	.00	1920.00	2160.00	.

FLOODWAY DATA, SKUNK CREEK FLOODPLAIN,
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE	
8.690	1370.	12451.	3.1	1378.0	1378.0	.0	
8.750	895.	3465.	11.3	1378.1	1378.1	.0	AG
8.890	651.	4872.	8.0	1382.9	1382.9	.0	
8.965	355.	2975.	13.1	1383.1	1383.1	.0	
9.050	368.	3404.	11.5	1385.6	1385.6	.0	AH
9.115	1265.	4090.	9.5	1394.9	1394.1	.8	
9.210	1215.	5827.	6.7	1398.4	1397.6	.8	
9.310	1120.	4710.	8.3	1401.8	1401.3	.5	
9.400	1070.	4642.	8.4	1404.5	1403.7	.8	
9.480	930.	4765.	8.2	1407.0	1406.5	.5	
9.580	720.	3847.	10.1	1409.0	1408.6	.4	
9.670	631.	3388.	11.5	1411.7	1411.7	.0	
9.750	547.	3363.	11.6	1415.4	1415.4	.0	
9.840	529.	3918.	10.0	1418.7	1418.7	.0	
9.940	506.	4046.	9.6	1420.5	1420.5	.0	
10.040	554.	3983.	9.8	1422.2	1422.2	.0	

Effective Model #2

(RM 9.09 – 11.40)

Maricopa Co, AZ
Case 90-09-38P
Skunk Creek

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1*****************************************************
 *  WATER SURFACE PROFILES                           *
 *  VERSION OF NOVEMBER 1976                         *
 *  UPDATED MAY 1984                                 *
 *  IBM-PC-XT VERSION AUGUST 1985                    *
 *  RUN DATE  02-20-90    TIME  15:20:03              *
 *****************************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616              *
*  (916) 440-2105 (FTS) 448-2105        *
*****************************************
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D.K. STOUT

FLOODWAY RUN

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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX     XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
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02-20-90 15:20:03 PAGE 1

THIS RUN EXECUTED 02-20-90

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
*****************************************************
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T1 SKUNK CREEK,ADOBE SUBDIVISION
T2 100-YEAR NATURAL WITH PROPOSED CONDITIONS
T3 BAKER ENGINEERS

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	2.	0.	0.	.000000	.00	.0	0.	1377.800	.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1.000	.000	-1.000	.000	.000	.000	.000	.000	.000	.000

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

150.000	200.000	.000	.000	.000	.000	.000	.000	.000	.000

NC	.045	.045	.035	.100	.300	.000	.000	.000	.000	.000
QT	2.000	39000.000	39000.000	.000	.000	.000	.000	.000	.000	.000
ET	8.690	.000	6.100	.000	.000	820.000	2420.000	.000	.000	.000
X1	8.690	19.000	1979.000	2118.000	.000	.000	.000	.000	.000	.000

ET	[illegible]	4.100	6.100	110.000	2580.000	131[illegible]	2580.000	.000	.000	.000
X1	9.200	.000	1720.000	2575.000	1.000	1.000	1.000	.000	.000	.000
NH	5.000	.045	1865.000	.035	1920.000	.030	2514.000	.016	2540.000	.040
NH	4000.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
ET	9.210	4.100	6.100	1380.000	2550.000	1380.000	2550.000	.000	.000	.000
X1	9.210	32.000	1865.000	2540.000	422.000	462.000	562.000	.000	.000	.000
GR	1402.000	140.000	1402.000	300.000	1400.000	350.000	1398.000	510.000	1396.000	565.000
GR	1394.000	650.000	1394.000	670.000	1396.000	695.000	1396.000	720.000	1394.000	760.000
GR	1394.000	880.000	1396.000	1050.000	1396.000	1130.000	1394.000	1145.000	1394.000	1225.000
GR	1396.000	1290.000	1396.000	1510.000	1394.000	1720.000	1394.000	1735.000	1394.000	1765.000

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GR	1394.000	1865.000	1393.000	1920.000	1392.000	1942.000	1391.000	2040.000	1390.600	2110.000
GR	1391.000	2190.000	1392.000	2362.000	1393.000	2514.000	1398.500	2540.000	1398.000	2580.000
GR	1398.500	2950.000	1398.500	4000.000	.000	.000	.000	.000	.000	.000
NH	5.000	.045	1930.000	.035	2037.000	.030	2348.000	.016	2388.000	.045
NH	3200.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
ET	9.310	4.100	6.100	1110.000	2410.000	1280.000	2410.000	.000	.000	.000
X1	9.310	27.000	1930.000	2403.000	400.000	480.000	650.000	.000	.000	.000
GR	1406.000	20.000	1404.000	90.000	1402.000	310.000	1400.000	410.000	1398.000	425.000
GR	1398.000	820.000	1396.000	900.000	1398.000	940.000	1398.000	1130.000	1398.000	1225.000
GR	1398.000	1250.000	1399.000	1300.000	1398.000	1330.000	1399.000	1350.000	1399.000	1845.000
GR	1398.000	1930.000	1395.000	1940.000	1393.000	1950.000	1392.000	2037.000	1391.500	2080.000
GR	1392.000	2220.000	1393.000	2348.000	1398.000	2388.000	1400.000	2392.000	1401.000	2403.000
GR	1402.000	2410.000	1402.700	3200.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.035	.000	.000	.000	.000	.000	.000	.000
ET	9.400	4.100	6.100	980.000	2460.000	1330.000	2460.000	.000	.000	.000
X1	9.400	34.000	1940.000	2454.000	370.000	420.000	510.000	.000	.000	.000
GR	1410.000	110.000	1408.000	140.000	1406.000	180.000	1404.000	330.000	1402.000	510.000
GR	1400.000	635.000	1400.000	965.000	1400.000	995.000	1400.000	1030.000	1400.000	1150.000
GR	1402.000	1250.000	1402.000	1550.000	1400.000	1620.000	1400.000	1650.000	1402.000	1770.000
GR	1402.000	1940.000	1400.000	1975.000	1396.000	1990.000	1394.400	2000.000	1396.000	2040.000
GR	1396.000	2085.000	1394.000	2100.000	1394.000	2180.000	1400.000	2200.000	1402.000	2225.000
GR	1400.000	2235.000	1395.000	2260.000	1394.000	2270.000	1393.600	2310.000	1394.000	2348.000
GR	1395.000	2410.000	1402.000	2440.000	1405.000	2454.000	1405.500	2600.000	.000	.000
NH	4.000	.045	1945.000	.035	2040.000	.050	2600.000	.040	4130.000	.000
ET	9.480	4.100	6.100	1170.000	2470.000	1540.000	2470.000	.000	.000	.000
X1	9.480	41.000	1945.000	2300.000	370.000	420.000	490.000	.000	.000	.000
GR	1412.000	330.000	1410.000	350.000	1410.000	440.000	1411.700	500.000	1410.000	560.000
GR	1410.000	640.000	1408.000	665.000	1406.000	690.000	1404.000	720.000	1402.000	770.000
GR	1402.000	800.000	1402.000	830.000	1402.000	860.000	1402.000	970.000	1404.000	1200.000
GR	1404.000	1400.000	1404.000	1640.000	1406.000	1715.000	1406.000	1725.000	1406.000	1750.000
GR	1404.000	1890.000	1404.000	1930.000	1404.000	1945.000	1398.000	1970.000	1396.500	2000.000
GR	1398.000	2040.000	1398.000	2190.000	1396.000	2255.000	1398.000	2280.000	1402.000	2300.000
GR	1404.000	2370.000	1404.000	2600.000	1403.000	2750.000	1404.000	2850.000	1406.000	2870.000
GR	1408.000	2920.000	1409.000	3020.000	1408.000	3100.000	1406.500	3290.000	1408.000	3450.000
GR	1410.000	4130.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.045	.045	.035	.000	.000	.000	.000	.000	.000	.000
ET	9.580	4.100	6.100	1600.000	2535.000	1815.000	2535.000	.000	.000	.000
X1	9.580	29.000	1910.000	2340.000	390.000	460.000	450.000	.000	.000	.000
GR	1412.000	625.000	1410.000	645.000	1408.000	675.000	1406.000	870.000	1404.000	1000.000
GR	1406.000	1040.000	1406.000	1080.000	1404.000	1110.000	1404.000	1280.000	1406.000	1520.000
GR	1407.500	1910.000	1406.000	1965.000	1402.000	1990.000	1398.500	2000.000	1400.000	2060.000
GR	1402.000	2160.000	1400.000	2240.000	1404.000	2290.000	1406.000	2340.000	1406.000	2410.000
GR	1404.000	2430.000	1404.000	2500.000	1406.000	2550.000	1406.000	2720.000	1407.000	2880.000
GR	1406.000	3025.000	1406.000	3095.000	1408.000	3255.000	1410.000	3400.000	.000	.000

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X1	10.[illegible]	17.000	1885.000	2185.000	420.000	450.[illegible]0	470.000	.000	.000	.000
X3	.000	.000	.000	720.000	.000	.000	.000	.000	.000	.000
GR	1440.000	560.000	1438.000	680.000	1436.000	815.000	1434.000	1220.000	1434.000	1230.000
GR	1436.000	1805.000	1434.000	1850.000	1434.000	1885.000	1430.000	1935.000	1428.000	1970.000
GR	1426.500	2000.000	1428.000	2020.000	1430.000	2160.000	1432.000	2185.000	1434.000	2265.000
GR	1436.000	2300.000	1440.000	2310.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.035	.000	.000	.000	.000	.000	.000	.000
X1	10.620	23.000	1795.000	2020.000	605.000	600.000	590.000	.000	.000	.000
X3	.000	.000	.000	655.000	.000	.000	.000	.000	.000	.000
GR	1444.000	310.000	1442.000	340.000	1440.000	500.000	1440.000	905.000	1442.000	1010.000
GR	1442.000	1040.000	1440.000	1070.000	1438.000	1110.000	1438.000	1180.000	1438.000	1280.000
GR	1438.000	1600.000	1438.000	1635.000	1438.000	1710.000	1438.000	1735.000	1436.000	1760.000
GR	1432.000	1795.000	1430.000	1980.000	1429.200	2000.000	1430.000	2010.000	1432.000	2020.000
GR	1438.000	2090.000	1440.000	2105.000	1444.000	2125.000	.000	.000	.000	.000
X1	10.700	34.000	1915.000	2100.000	405.000	390.000	380.000	.000	.000	.000
X3	.000	.000	.000	800.000	.000	.000	.000	.000	.000	.000
GR	1450.000	295.000	1448.000	410.000	1446.000	450.000	1446.000	590.000	1447.000	645.000
GR	1446.000	680.000	1447.000	920.000	1446.000	1145.000	1444.000	1210.000	1444.000	1315.000
GR	1442.000	1340.000	1441.000	1440.000	1440.000	1615.000	1440.000	1645.000	1442.000	1690.000
GR	1442.000	1760.000	1440.000	1855.000	1438.000	1880.000	1436.000	1915.000	1434.000	1930.000
GR	1432.500	2000.000	1434.000	2090.000	1436.000	2100.000	1438.000	2115.000	1436.000	2125.000
GR	1436.000	2130.000	1438.000	2140.000	1440.000	2155.000	1442.000	2160.000	1450.000	2180.000
GR	1436.000	2180.000	1440.000	2190.000	1440.000	2230.000	1450.000	2255.000	.000	.000
X1	10.830	37.000	1830.000	2030.000	645.000	650.000	650.000	.000	.000	.000
X3	.000	.000	.000	1080.000	.000	.000	.000	.000	.000	.000
GR	1452.000	565.000	1450.000	635.000	1449.000	800.000	1450.000	970.000	1450.000	1015.000
GR	1449.000	1150.000	1448.000	1230.000	1448.000	1330.000	1449.500	1450.000	1448.000	1550.000
GR	1446.000	1630.000	1444.000	1685.000	1446.000	1730.000	1444.000	1830.000	1442.000	1840.000
GR	1442.000	1890.000	1440.000	1910.000	1438.000	1965.000	1436.000	2000.000	1438.000	2015.000
GR	1444.000	2030.000	1445.000	2160.000	1444.000	2410.000	1442.000	2420.000	1438.000	2440.000
GR	1438.000	2450.000	1442.000	2470.000	1443.000	2565.000	1442.000	2600.000	1442.000	2630.000
GR	1442.000	2730.000	1438.000	2760.000	1438.000	2770.000	1444.000	2795.000	1446.000	2820.000
GR	1448.000	2840.000	1452.000	2875.000	.000	.000	.000	.000	.000	.000
X1	10.930	38.000	1910.000	2085.000	500.000	500.000	500.000	.000	.000	.000
X3	.000	.000	.000	1360.000	.000	2965.000	.000	.000	.000	.000
GR	1456.000	570.000	1454.000	645.000	1452.500	810.000	1453.000	1040.000	1452.000	1515.000
GR	1451.000	1640.000	1450.000	1750.000	1448.000	1805.000	1448.000	1815.000	1444.000	1860.000
GR	1448.000	1910.000	1444.000	1930.000	1442.000	1970.000	1441.000	2000.000	1442.000	2015.000
GR	1444.000	2025.000	1444.000	2050.000	1448.000	2085.000	1448.000	2160.000	1446.000	2180.000
GR	1448.000	2190.000	1448.000	2220.000	1446.000	2225.000	1446.000	2360.000	1446.000	2380.000

1

GR	1447.000	2435.000	1447.000	2500.000	1448.000	2610.000	1448.500	2720.000	1449.000	3160.000
GR	1448.000	3225.000	1448.000	3270.000	1442.000	3290.000	1448.000	3305.000	1448.500	3510.000
GR	1450.000	3660.000	1452.000	3825.000	1454.000	3980.000	.000	.000	.000	.000
X1	11.040	35.000	1955.000	2065.000	500.000	500.000	500.000	.000	.000	.000
X3	.000	.000	.000	1440.000	.000	2540.000	.000	.000	.000	.000
GR	1462.000	170.000	1460.000	400.000	1458.000	710.000	1458.000	800.000	1458.000	980.000
GR	1456.000	1300.000	1456.000	1440.000	1444.000	1505.000	1444.000	1550.000	1446.000	1570.000
GR	1448.000	1610.000	1448.000	1650.000	1448.000	1680.000	1450.000	1740.000	1451.000	1850.000
GR	1450.000	1955.000	1449.000	2000.000	1450.000	2065.000	1451.000	2240.000	1451.500	2540.000
GR	1451.500	2700.000	1451.000	2880.000	1451.500	3040.000	1450.000	3120.000	1450.000	3160.000
GR	1450.500	3220.000	1450.000	3290.000	1446.000	3300.000	1452.000	3330.000	1452.000	3350.000
GR	1452.000	3480.000	1454.000	3740.000	1456.000	3800.000	1460.000	3840.000	1462.000	3850.000
NC	.000	.000	.020	.000	.000	.000	.000	.000	.000	.000
X1	11.200	4.000	1834.500	2165.500	680.000	755.000	770.000	.000	.000	.000

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*SECNO 9.050

3470 ENCROACHMENT STATIONS=     1370.0     3415.0  TYPE=      1  TARGET=     2045.000
     9.05     11.05  1393.05       .00       .00  1393.68      .63      1.72       .04  1388.00
   39000.     9703.   16281.    13016.     2202.     1867.    3720.      344.      141.   1390.00
      .09      4.41      8.72      3.50      .045      .035     .045      .000  1382.00  1370.00
  .002688      410.      550.      370.         2         0        0       .00  2045.00  3415.00
0
*SECNO 9.090
3280 CROSS SECTION       9.09 EXTENDED       1.22 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      110.0     3465.0  TYPE=      1  TARGET=     3355.000
     9.09      5.62  1395.22  1395.22       .00  1396.43     1.20      1.38       .17  1393.00
   39000.     1507.   33327.     4165.     480.     3538.    1157.      391.      157.   1392.70
      .10      3.14      9.42      3.60      .045      .035     .045      .000  1389.60  1118.41
  .007410      328.      348.      278.        20         8        0       .00  2346.59  3465.00
0
*SECNO 9.100
3280 CROSS SECTION       9.10 EXTENDED       1.21 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      110.0     3465.0  TYPE=      1  TARGET=     3355.000
     9.10      5.61  1395.21  1395.21       .00  1396.73     1.52       .00       .10  1393.00
   39000.      739.   36211.     2050.     473.     3528.    1146.      392.      157.   1392.70
      .10      1.56     10.26      1.79      .045      .016     .045      .000  1389.60  1125.41
  .001846        1.        1.        1.        20         5        0       .00  2339.59  3465.00
0
*SECNO 9.115
3280 CROSS SECTION       9.11 EXTENDED       1.53 FEET

1
  02-20-90      15:20:03                                                                          PAGE      9

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      110.0     2580.0  TYPE=      1  TARGET=     2470.000
     9.11      5.63  1395.53  1395.53       .00  1397.25     1.72       .04       .06  1394.00
   39000.      566.   38406.       27.     430.     3627.      13.      394.      158.   1393.00
      .10      1.32     10.59      2.17      .045      .016     .045      .000  1389.90   936.13
  .002164       22.       22.       22.        20         5        0       .00  1643.87  2580.00
0
*SECNO 9.190
3280 CROSS SECTION       9.19 EXTENDED       2.08 FEET
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7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1170.0     2470.0  TYPE=      1  TARGET=     1300.000
     9.48      9.82  1405.82  1405.82       .00  1407.61     1.79      2.97       .08  1404.00
   39000.     4709.   32535.    1755.     1139.    2804.     380.      626.      218.   1402.00
      .16      4.13    11.60     4.62      .045     .045     .050      .000  1396.00  1170.00
  .007937      370.     490.     420.         4        8        0       .00  1245.88  2470.00
0
1
  02-20-90      15:20:03                                                                          PAGE    11

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 9.580

3470 ENCROACHMENT STATIONS=     1600.0     2535.0  TYPE=      1  TARGET=      935.000
     9.58     10.39  1408.89      .00       .00  1410.54     1.66      2.92       .01  1407.50
   39000.     2369.   31865.    4766.      616.    2864.     769.      670.      228.   1406.00
      .18      3.85    11.13     6.20      .045     .035     .045      .000  1398.50  1600.00
  .005501      390.     450.     460.         2        0        0       .00   935.00  2535.00
0
*SECNO 9.670

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1770.0     2480.0  TYPE=      1  TARGET=    -1770.000
     9.67     11.66  1411.66  1411.66       .00  1414.27     2.61      2.80       .28  1408.00
   39000.     2009.   13925.   23066.      406.     830.    2183.      707.      236.   1408.00
      .19      4.94    16.78    10.57      .045     .035     .045      .000  1400.00  1770.00
  .008413      470.     410.     420.         3        8        0       .00   641.29  2411.29
0
*SECNO 9.750
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     9.75     13.72  1415.42  1415.42       .00  1418.41     3.00      2.85       .12  1410.00
   39000.     4148.   23068.   11783.      627.    1379.    1357.      737.      242.   1410.00
      .19      6.62    16.72     8.68      .045     .035     .045      .000  1401.70  1742.92
  .006437      390.     370.     410.        20       11        0       .00   547.01  2289.93
0
*SECNO 9.840

3301 HV CHANGED MORE THAN HVINS

     9.84     15.71  1418.71      .00       .00  1420.76     2.05      2.25       .09  1414.00
   39000.     4667.   29924.    4409.      865.    2352.     700.      778.      248.   1410.00
      .21      5.39    12.72     6.29      .045     .035     .045      .000  1403.00  1762.35
  .003512      500.     480.     490.         2        0        0       .00   529.25  2291.60
0
1
  02-20-90      15:20:03                                                                          PAGE    12

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
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3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 720.0 2310.0 TYPE= 1 TARGET= -720.000

10.49	10.55	1437.05	1437.05	.00	1438.61	1.55	1.71	.23	1434.00
39000.	9899.	26845.	2257.	2281.	2304.	398.	1095.	307.	1432.00
.29	4.34	11.65	5.68	.045	.040	.050	.000	1426.50	743.82
.006504	420.	470.	450.	20	9	0	.00	1558.81	2302.64

0
*SECNO 10.620

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 655.0 2125.0 TYPE= 1 TARGET= -655.000

10.62	11.23	1440.43	1440.43	.00	1442.40	1.97	3.21	.12	1432.00
39000.	8586.	28010.	2404.	2002.	2164.	402.	1161.	327.	1432.00
.31	4.29	12.94	5.98	.045	.035	.050	.000	1429.20	655.00
.004549	605.	590.	600.	3	8	0	.00	1316.30	2107.16

0
*SECNO 10.700

1
02-20-90 15:20:03

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 800.0 2255.0 TYPE= 1 TARGET= -800.000

10.70	11.08	1443.58	1443.58	.00	1445.90	2.32	1.88	.11	1436.00
39000.	8806.	26687.	3507.	1686.	1867.	568.	1200.	337.	1436.00
.32	5.22	14.29	6.18	.045	.035	.050	.000	1432.50	1320.26
.005209	405.	380.	390.	20	5	0	.00	902.63	2238.95

0
*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 1080.0 2875.0 TYPE= 1 TARGET= -1080.000

10.83	11.88	1447.88	.00	.00	1448.78	.90	2.74	.14	1444.00
39000.	2426.	16274.	20301.	650.	1619.	3818.	1276.	353.	1444.00
.34	3.73	10.05	5.32	.045	.035	.050	.000	1436.00	1554.28
.003489	645.	650.	650.	2	0	0	.00	1284.65	2838.93

0
*SECNO 10.930

3301 HV CHANGED MORE THAN HVINS

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
*****************************************

T1       SKUNK CREEK,ADOBE SUBDIVISION
T2       100-YEAR FLOODWAY WITH PROPOSED CONDITIONS
T3       BAKER ENGINEERS

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

       0.       3.       0.       0.  .000000      .00       .0       0.  1377.800    .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    15.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000

1
 02-20-90     15:20:03                                                                    PAGE   17

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST

*PROF 2

CCHV=    .100 CEHV=    .300
*SECNO 8.690
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     820.0     2420.0  TYPE=     1  TARGET=    1600.000
     8.69     9.38  1379.18  1379.18  1378.24  1380.64     1.46      .00       .00  1376.00
   39000.   18816.   14760.    5424.    2967.    1085.     944.       0.        0.   1376.00
      .00     6.34     13.61     5.75     .045     .035     .045     .000  1369.80   820.00
  .006725       0.        0.       0.        0        7        0      .00  1600.00  2420.00
0
*SECNO 8.750

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=     900.0     2290.0  TYPE=     1  TARGET=    1390.000
     8.75    12.56  1383.56      .00  1383.33  1385.17     1.61     4.48       .04  1376.00
   39000.   10980.   24268.    3752.    2094.    1981.     765.      89.       27.   1380.00
      .02     5.24     12.25     4.90     .045     .035     .045     .000  1371.00   900.00
  .005032     835.      739.     733.        3        0        0      .00  1360.11  2290.00
0
*SECNO 8.890
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    1280.0     2470.0  TYPE=     1  TARGET=    1190.000
     8.89    10.46  1388.46  1388.46  1388.06  1390.09     1.62     4.08       .01  1384.00
   39000.    8845.   27537.    2618.    1727.    2348.     568.     165.       46.   1384.00
      .04     5.12     11.73     4.61     .045     .035     .045     .000  1378.00  1280.00
  .005818     565.      840.     650.        2       10        0      .00  1190.00  2470.00
0
*SECNO 8.965
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3280 CROSS SECTION        9.11 EXTENDED        1.50 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1310.0     2580.0  TYPE=      1  TARGET=     1270.000
     9.11      5.60  1395.50  1395.50  1395.53  1397.26      1.76       .05       .01  1394.00
   39000.      461.   38512.      27.      300.     3592.      12.      301.      77.   1393.00
      .08      1.54    10.72     2.20      .045      .016     .045      .000  1389.90  1310.00
  .002247       22.      22.      22.       20         5       0       .00  1270.00  2580.00
0
*SECNO 9.190
3280 CROSS SECTION        9.19 EXTENDED        1.97 FEET


3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=     1310.0     2580.0  TYPE=      1  TARGET=     1270.000
     9.19      5.97  1396.17      .00  1396.28  1397.37      1.21       .06       .06  1392.80
   39000.     1999.   36965.      36.      976.     4086.      19.      305.      78.   1392.40
      .08      2.05     9.05     1.89      .045      .016     .045      .000  1390.20  1310.00
  .001178       37.      37.      37.        5         0       0       .00  1270.00  2580.00
0
*SECNO 9.200
3280 CROSS SECTION        9.20 EXTENDED        2.35 FEET


3470 ENCROACHMENT STATIONS=     1310.0     2580.0  TYPE=      1  TARGET=     1270.000
     9.20      6.35  1396.55      .00  1396.75  1397.41       .86       .00       .03  1392.80
   39000.     4558.   34369.      73.     1131.     4409.      21.      305.      78.   1392.40
      .08      4.03     7.80     3.50      .045      .035     .045      .000  1390.20  1310.00
  .003783        1.       1.       1.        3         0       0       .00  1270.00  2580.00
0
1490 NH CARD USED
*SECNO 9.210

3470 ENCROACHMENT STATIONS=     1380.0     2550.0  TYPE=      1  TARGET=     1170.000
     9.21      7.52  1398.12      .00  1398.01  1399.01       .89      1.59       .01  1394.00
   39000.     5388.   33612.       0.     1527.     4178.       0.      373.      92.   1398.50
      .11      3.53     8.05      .00      .045      .030     .045      .000  1390.60  1380.00
  .002331      422.     562.     462.        2         0       0       .00  1158.19  2538.19
0
1
  02-20-90      15:20:03                                                                PAGE    20

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

1490 NH CARD USED
*SECNO 9.310

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=     1280.0     2410.0  TYPE=      1  TARGET=     1130.000
     9.31      7.58  1399.08  1399.02  1399.38  1401.71      2.63      2.18       .52  1398.00
   39000.      158.   38842.       0.      123.     2977.       0.      434.     106.   1401.00
      .12      1.28    13.05      .00      .045      .030     .045      .000  1391.50  1280.00
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    39000.    4147.   23071.   11782.     626.    1379.    1357.     622.     146.   1410.00
       .17     6.62     16.73     8.69     .045     .035     .045     .000  1401.70   1742.92
   .006442     390.      370.     410.       4       11        0      .00   547.00   2289.92
0
 *SECNO 9.840

 3301 HV CHANGED MORE THAN HVINS

      9.84    15.71  1418.71      .00  1418.71  1420.76     2.05     2.25      .09   1414.00
    39000.    4668.   29923.     4409.     865.    2352.     701.     663.     152.   1410.00
       .19     5.39     12.72     6.29     .045     .035     .045     .000  1403.00   1762.35
   .003511     500.      480.     490.       2        0        0      .00   529.25   2291.60
0
1
  02-20-90      15:20:03                                                                  PAGE    22

    SECNO     DEPTH     CWSEL     CRIWS     WSELK      EG        HV        HL     OLOSS   BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL      TWA   LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN      ELMIN      SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR    TOPWID     ENDST

 *SECNO 9.940
      9.94    14.54  1420.54      .00  1420.54  1422.43     1.89     1.65      .02   1410.00
    39000.   10191.   25414.     3395.    1454.    1992.     599.     707.     158.   1412.00
       .20     7.01     12.76     5.66     .045     .035     .045     .000  1406.00   1752.14
   .003138     430.      520.     470.       2        0        0      .00   505.85   2258.00
0
 *SECNO 10.040
     10.04    13.23  1422.23      .00  1422.23  1424.11     1.88     1.69      .00   1414.00
    39000.    3275.   32028.     3697.     539.    2695.     749.     757.     164.   1414.00
       .21     6.08     11.88     4.94     .045     .035     .045     .000  1409.00   1820.96
   .003119     540.      540.     540.       2        0        0      .00   553.66   2374.62
0
 *SECNO 10.120

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
     10.12    11.74  1423.24  1423.24  1423.24  1426.51     3.27     1.62      .41   1414.00
    39000.    2730.   32821.     3449.     418.    2109.     553.     789.     170.   1416.00
       .22     6.53     15.56     6.24     .045     .035     .045     .000  1411.50   1753.78
   .005823     450.      380.     420.       4       11        0      .00   536.13   2289.91
0
 *SECNO 10.210
     10.21    11.15  1426.65      .00  1426.65  1429.44     2.79     2.88      .05   1420.00
    39000.    1600.   24565.    12835.     237.    1583.    1445.     823.     175.   1418.00
       .23     6.76     15.52     8.88     .045     .035     .045     .000  1415.50   1806.43
   .006835     490.      450.     475.       4        0        0      .00   523.44   2329.87
0
 *SECNO 10.300

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
     10.30     9.78  1430.58  1430.58  1430.58  1432.76     2.19     3.25      .06   1424.00
    39000.    1381.   26114.    11505.     201.    1891.    1837.     860.     183.   1424.00
       .24     6.87     13.81     6.26     .045     .040     .050     .000  1420.80   1787.12
   .007865     460.      440.     450.       3       15        0      .00   930.03   2717.16
0
1
```

```
      .3[illegible]    5.22     14.29     6.18      .045      .035      .050      [illegible]000  1432.50  1320.26
   .005209     405.      380.      390.        20         5         0       .00   902.63  2238.95
0
 *SECNO 10.830

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     1080.0     2875.0  TYPE=      1  TARGET=   -1080.000
     10.83     11.88  1447.88       .00  1447.88  1448.78      .90      2.74       .14  1444.00
    39000.     2426.   16274.    20301.     650.     1619.    3818.     1161.      258.   1444.00
       .32      3.73     10.05      5.32     .045      .035     .050      .000  1436.00  1554.28
   .003489      645.      650.      650.        2         0        0       .00  1284.65  2838.93
0
 *SECNO 10.930

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     1360.0     2965.0  TYPE=      1  TARGET=    1605.000
     10.93      9.95  1450.95  1450.95  1450.95  1452.50     1.54      2.42       .19  1448.00
    39000.     4532.   17013.   17455.     657.     1269.    2962.     1224.      273.   1448.00
       .34      6.89     13.40      5.89     .045      .035     .050      .000  1441.00  1645.16
   .007148      500.      500.      500.       20        10        0       .00  1319.84  2965.00
0
 *SECNO 11.040
1
  02-20-90      15:20:03                                                                          PAGE    25

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS     BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA     LEFT/RIGHT
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN       SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST


 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     1440.0     2540.0  TYPE=      1  TARGET=    1100.000
     11.04     10.66  1454.66       .00  1454.66  1455.61      .95      3.05       .06  1450.00
    39000.    24785.    5212.     9003.    2985.     567.    1749.     1282.      287.   1450.00
       .36      8.30     9.19      5.15     .045      .035     .050      .000  1444.00  1447.29
   .005265      500.      500.      500.        2         0        0       .00  1092.71  2540.00
0
 *SECNO 11.200

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
     11.20      8.42  1460.42  1460.42  1460.42  1464.44     4.02      2.89       .92  1467.00
    39000.        0.   39000.       0.       0.     2423.       0.     1347.      298.   1467.00
       .37       .00     16.10      .00     .045      .020     .050      .000  1452.00  1847.67
   .003008      680.      770.      755.       20        15        0       .00   304.67  2152.33
0
 *SECNO 11.300

 3301 HV CHANGED MORE THAN HVINS
```

9.[illegible]	1.00	.00	.00	1390.20	39000.00	1[illegible]6.55	.00	1397.41	37.83	7.80	5560.44	6340.60
9.210	562.00	.00	.00	1390.60	39000.00	1398.01	.00	1398.94	24.85	8.22	5580.04	7823.85
9.210	562.00	.00	.00	1390.60	39000.00	1398.12	.00	1399.01	23.31	8.05	5704.57	8078.41

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	9.310	650.00	.00	.00	1391.50	39000.00	1399.38	1399.38	1401.62	45.96	12.18	3656.17	5752.60
	9.310	650.00	.00	.00	1391.50	39000.00	1399.08	1399.02	1401.71	56.06	13.05	3099.69	5208.91
	9.400	510.00	.00	.00	1393.60	39000.00	1402.57	1402.32	1404.10	50.73	10.49	4514.26	5475.44
	9.400	510.00	.00	.00	1393.60	39000.00	1402.81	.00	1404.50	50.77	10.74	4143.54	5473.44
*	9.480	490.00	.00	.00	1396.00	39000.00	1405.82	1405.82	1407.61	79.37	11.60	4323.12	4377.59
*	9.480	490.00	.00	.00	1396.00	39000.00	1405.78	1405.78	1408.07	95.15	12.66	3610.35	3998.09
	9.580	450.00	.00	.00	1398.50	39000.00	1408.89	.00	1410.54	55.01	11.13	4248.48	5258.47
	9.580	450.00	.00	.00	1398.50	39000.00	1409.42	.00	1411.00	45.55	10.66	4165.61	5778.62
*	9.670	410.00	.00	.00	1400.00	39000.00	1411.66	1411.66	1414.27	84.13	16.78	3418.59	4252.01
*	9.670	410.00	.00	.00	1400.00	39000.00	1411.58	1411.58	1414.36	89.96	17.24	3270.82	4111.87
*	9.750	370.00	.00	.00	1401.70	39000.00	1415.42	1415.42	1418.41	64.37	16.72	3363.03	4861.02
*	9.750	370.00	.00	.00	1401.70	39000.00	1415.42	1415.42	1418.41	64.42	16.73	3362.09	4859.19
	9.840	480.00	.00	.00	1403.00	39000.00	1418.71	.00	1420.76	35.12	12.72	3917.81	6580.62
	9.840	480.00	.00	.00	1403.00	39000.00	1418.71	.00	1420.76	35.11	12.72	3918.39	6581.98
	9.940	520.00	.00	.00	1406.00	39000.00	1420.54	.00	1422.42	31.39	12.76	4045.56	6961.26
	9.940	520.00	.00	.00	1406.00	39000.00	1420.54	.00	1422.43	31.38	12.76	4045.74	6961.71
	10.040	540.00	.00	.00	1409.00	39000.00	1422.23	.00	1424.11	31.18	11.88	3983.22	6983.81
	10.040	540.00	.00	.00	1409.00	39000.00	1422.23	.00	1424.11	31.19	11.88	3983.15	6983.65
*	10.120	380.00	.00	.00	1411.50	39000.00	1423.24	1423.24	1426.51	58.23	15.56	3079.19	5110.93
*	10.120	380.00	.00	.00	1411.50	39000.00	1423.24	1423.24	1426.51	58.23	15.56	3079.19	5110.93
	10.210	450.00	.00	.00	1415.50	39000.00	1426.65	.00	1429.44	68.35	15.52	3264.75	4717.23
	10.210	450.00	.00	.00	1415.50	39000.00	1426.65	.00	1429.44	68.35	15.52	3264.75	4717.23
*	10.300	440.00	.00	.00	1420.80	39000.00	1430.58	1430.58	1432.76	78.65	13.81	3929.00	4397.61
*	10.300	440.00	.00	.00	1420.80	39000.00	1430.58	1430.58	1432.76	78.65	13.81	3929.00	4397.61
	10.400	460.00	.00	.00	1422.00	39000.00	1434.01	.00	1434.78	24.50	8.72	7024.27	7878.74
	10.400	460.00	.00	.00	1422.00	39000.00	1434.01	.00	1434.78	24.50	8.72	7024.27	7878.74
*	10.490	470.00	.00	.00	1426.50	39000.00	1437.05	1437.05	1438.61	65.04	11.65	4982.26	4835.91
*	10.490	470.00	.00	.00	1426.50	39000.00	1437.05	1437.05	1438.61	65.04	11.65	4982.26	4835.91
*	10.620	590.00	.00	.00	1429.20	39000.00	1440.43	1440.43	1442.40	45.49	12.94	4568.57	5782.30
*	10.620	590.00	.00	.00	1429.20	39000.00	1440.43	1440.43	1442.40	45.49	12.94	4568.57	5782.30
*	10.700	380.00	.00	.00	1432.50	39000.00	1443.58	1443.58	1445.90	52.09	14.29	4120.92	5403.75
*	10.700	380.00	.00	.00	1432.50	39000.00	1443.58	1443.58	1445.90	52.09	14.29	4120.92	5403.75
	10.830	650.00	.00	.00	1436.00	39000.00	1447.88	.00	1448.78	34.89	10.05	6087.34	6602.20
	10.830	650.00	.00	.00	1436.00	39000.00	1447.88	.00	1448.78	34.89	10.05	6087.34	6602.20

```
CAUTION    SECNO=     9.750   PROFILE= 2   MINIMUM SPECIFIC ENERGY

CAUTION    SECNO=    10.120   PROFILE= 1   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.120   PROFILE= 1   MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    10.120   PROFILE= 2   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.120   PROFILE= 2   MINIMUM SPECIFIC ENERGY

CAUTION    SECNO=    10.300   PROFILE= 1   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.300   PROFILE= 1   MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    10.300   PROFILE= 2   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.300   PROFILE= 2   MINIMUM SPECIFIC ENERGY

CAUTION    SECNO=    10.490   PROFILE= 1   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.490   PROFILE= 1   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    10.490   PROFILE= 1   20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION    SECNO=    10.490   PROFILE= 2   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.490   PROFILE= 2   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    10.490   PROFILE= 2   20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION    SECNO=    10.620   PROFILE= 1   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.620   PROFILE= 1   MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    10.620   PROFILE= 2   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.620   PROFILE= 2   MINIMUM SPECIFIC ENERGY

CAUTION    SECNO=    10.700   PROFILE= 1   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.700   PROFILE= 1   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    10.700   PROFILE= 1   20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION    SECNO=    10.700   PROFILE= 2   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.700   PROFILE= 2   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    10.700   PROFILE= 2   20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION    SECNO=    10.930   PROFILE= 1   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.930   PROFILE= 1   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    10.930   PROFILE= 1   20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION    SECNO=    10.930   PROFILE= 2   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    10.930   PROFILE= 2   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    10.930   PROFILE= 2   20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION    SECNO=    11.200   PROFILE= 1   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    11.200   PROFILE= 1   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    11.200   PROFILE= 1   20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION    SECNO=    11.200   PROFILE= 2   CRITICAL DEPTH ASSUMED
CAUTION    SECNO=    11.200   PROFILE= 2   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION    SECNO=    11.200   PROFILE= 2   20 TRIALS ATTEMPTED TO BALANCE WSEL

1
 02-20-90      15:20:03
```


FLOODWAY DATA, BAKER ENGINEERS
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
8.690	1600.	4995.	7.8	1379.1	1378.2	.9
8.750	1390.	4840.	8.1	1383.5	1383.3	.2
8.890	1190.	4643.	8.4	1388.5	1388.1	.4
8.965	1195.	4491.	8.7	1391.1	1390.8	.3
9.050	1150.	6278.	6.2	1394.0	1393.1	.9

Duplicate Effective Model #1

SKUNKCRK.OH2

(RM 8.69 – 9.05)

```
1*******************************************
 *  HEC-2 WATER SURFACE PROFILES            *
 *                                          *
 *  Version   4.6.2;  May 1991              *
 *                                          *
 *  RUN DATE    19MAR01    TIME   16:00:18  *
 *******************************************
```

```
****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

THIS RUN EXECUTED 19MAR01 16:00:18

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**************************************


T1       FLOODWAY STUDY  - SKUNK CREEK ABOVE ADOBE DAM
T2       SKUNK CREEK 100 YEAR
T3       SKUNK CREEK FLOODPLAIN, CORPS OF ENGINEERS MODEL OF 84 REVISED 1998
            REVISED OCTOBER 1998 BY COE & VAN LOO CONSULTANTS TO REFLECT
            NEW TOPOGRAPHIC DATA FOR PORTIONS OF THE CREEK
            GROUND SURVEY BY CVL SURVEY CREW ON OCTOBER 3, 1998
            CROSS SECTIONS 8.69, 8.75, 8.89, 8.965 AND 9.05 WERE SURVEYED

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

              2         0         0       0.000       0         0         0       1378.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1        0         -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        1         52        4         53        26        54        13        15        27
     21        22        28                  110                 200

NC   0.045     0.045     0.035     0.1       0.3
QT       2     39000     39000
ET                       9.1                                                         920       2290
      DURING MAJOR FLOODS, SKUNK CREEK IS EXPECTED TO FLOW OVER THE OVER
      SHOOT OF THE CAP AT THE UPSTREAM END OF THE COE'S LEVEES
      ALL CROSSSECTIONS WERE RECORDED BY JIM HARRIS, HYDRAULICS SECTION
      (APRIL 1983). THE PREVIOUS ONES WERE FOUND TTO BE UNSATISFACTORY.
      CHANNEL CENTERLINE CORRESPONDS TO 2000 FEET
      ALL MANNING'S "N" VALUES USED WERE OBTAINED FROM THE PREVIOUS
      MODEL AS ASSIGNED BY CASKIE AND MASHBURN BASED ON FIELD
      OBSERVATION (FEB. 1983)
      THE VALUES FOR 10, 50, 100, AND 500 YEAR FLOODS ARE 12,000, 29000,
      39,000 AND 80,000 CFS RESPECTIVELY (PER GRIGORIAN 5/27/83)

      THE ENTIRE X-SECTION 8.69 WAS REVISED BASED ON TOPOGRAPHICAL SURVEY
      DATA FOR THE AREA (OCTOBER 1998, CVL)

X1   8.690       29        860       2100      0.0       0.0       0.0
X2                                                                                         15
GR   1378.9      800       1378.2    850       1379.2    860       1380.7    870       1378.6    890
GR   1378.1      905       1377.2    1040      1374.4    1125      1367.4    1150      1366.8    1160
GR   1364.7      1775      1366.3    1840      1365.9    1900      1364.1    2000      1366.1    2050
GR   1377.1      2100      1373.9    2150      1375      2195      1374.3    2280      1376      2320
```

```
GR   1375.7      2350     1375.5      2510     1374.8      2720     1374.0      2960     1373.4      3150
GR   1371.3      3420     1373.3      3425     1375.6      3465     1378.0      3565
```

THE ENTIRE X-SECTION 8.75 WAS REVISED BASED ON TOPOGRAPHICAL SURVEY
DATA FOR THE AREA (OCTOBER 1998, CVL)

```
ET                          9.1
X1    8.75        28       1065      2040       980      1030      1000                1130      2029
X2                                                                                                 15
GR    1385       500     1384.9       505    1383.7       610    1383.5       710    1383.9      1000
GR  1383.1      1025     1386.4      1065    1385.2      1085    1374.4      1160    1373.2      1270
GR  1374.2      1630     1375.9      1820    1377.4      1880    1373.8      1900    1373.9      1940
GR    1380      1950     1380.7      1965    1366.4      1985    1366.8      2000    1382.3      2040
GR  1382.4      2200     1382.0      2390    1382.1      2580    1381.9      2760    1381.6      2980
GR  1381.6      3230     1381.0      3630    1382.3      3800
```

THE ENTIRE X-SECTION 8.89 WAS REVISED BASED ON TOPOGRAPHICAL SURVEY
DATA FOR THE AREA (OCTOBER 1998, CVL)

```
ET                          9.1
X1    8.89        23       1550      2300       700       850       810                1624      2276
X2                                                                                                 15
GR  1392.3       750     1387.3       830    1386.7      1070    1386.6      1330    1386.9      1430
GR  1385.8      1450     1387.1      1500    1388.1      1510    1390.1      1550    1375.6      1700
GR  1372.1      2020     1373.9      2050    1375.9      2190    1384.9      2300    1384.5      2360
GR    1388      2460     1388.2      2800    1387.2      3120    1386.1      3510    1387.5      3835
GR  1387.2      4080     1386.4      4250    1389.7      4300
```

THE ENTIRE X-SECTION 8.965 WAS REVISED BASED ON TOPOGRAPHICAL SURVEY
DATA FOR THE AREA (OCTOBER 1998, CVL)

```
ET                          9.1
X1   8.965        28       1710      2110       400       410       400                1730      2093
X2                                                                                                 15
GR    1392       760     1387.7       910      1388      1060      1388       1360    1389.1      1510
GR  1389.1      1610     1388.4      1630    1386.9      1650    1388.1      1670    1388.4      1710
GR  1373.6      1790     1373.3      2050    1386.9      2110      1388      2150    1387.1      2210
GR  1387.2      2260     1392.3      2330    1393.3      2440    1392.2      2600    1393.0      2780
GR  1390.2      2970     1389.7      3010    1389.4      3380      1389      3760    1389.9      3950
GR    1389      4000     1390.3      4125    1389.3      4250
```

THE ENTIRE X-SECTION 9.05 WAS REVISED BASED ON TOPOGRAPHICAL SURVEY
DATA FOR THE AREA (OCTOBER 1998, CVL)

```
ET                          9.1
X1   9.050        25       1905      2320       520       350       390                1920      2290
X2                                                                                                 15
GR  1398.5       700     1393.4       810    1390.8       920    1390.5      1200    1391.3      1450
GR  1391.8      1650     1391.5      1680      1391      1700    1391.6      1730    1387.3      1740
GR  1387.3      1750     1389.9      1800    1389.1      1830    1388.7      1905    1374.7      1975
GR    1375      2240     1392.3      2320    1391.7      2370    1392.1      2400    1391.5      2420
```

```
GR   1392.1      2530     1390.8     2710     1390.7     2940     1391.5     3320     1391.7     3430

     END OF CROSS SECTION REVISIONS

ET                4.1       6.1      110       3465      1310      2575
X1   9.115        15      1790     2300        350       300       370
GR    1400       110      1398      385       1396       660      1394      1600      1392      1790
GR    1390      1880      1388     1970       1386      2000      1388      2110      1390      2185
GR    1392      2300      1392     3650       1394      4025      1396      4480      1398      4720

NC               0.04
ET                4.1       6.1     1385       2950      1380      2595

X1   9.210        37      1865     2190        460       500       600
GR    1402       140      1402      300       1400       350      1398       510      1396       565
GR    1394       650      1394      670       1396       695      1396       720      1394       720
GR    1394       880      1396     1050       1396      1130      1394      1145      1394      1225
GR    1396      1290      1396     1510       1394      1720      1394      1735      1394      1765
GR    1394      1865      1392     1920       1392      1930      1390      1950    1388.5      2000
GR    1390      2085      1392     2180       1394      2190      1394      2200      1392      2210
GR    1392      2225      1394     2230     1394.7      2450      1395      3250      1396      4050
GR    1398      4430      1399     4600

NH       4      .045      1930     .035       2115      .050      3030      .040      3660       0.0
ET                4.1       6.1     1110       2560      1280      2400

X1   9.310        29      1930     2115        400       480       650
GR    1406        20      1404       90       1402       310      1400       410      1398       425
GR    1398       820      1396      900       1398       940      1398      1130      1398      1225
GR    1398      1250      1399     1300       1398      1330      1399      1350      1399      1845
GR    1398      1930      1394     1940       1392      1980      1392      2000      1392      2010
GR    1392      2040      1392     2090       1394      2105      1396      2115      1398      2160
GR    1398      2280      1394     3030       1400      3530      1402      3660

NH       4      .040      1940     .035       2200      .050      2300      .040      4100
ET                4.1       6.1      980       2400      1330      2400

X1   9.400        33      1940     2200        370       420       510
GR    1410       110      1408      140       1406       180      1404       330      1402       510
GR    1400       635      1400      965       1400       995      1400      1030      1400      1150
GR    1402      1250      1402     1550       1400      1620      1400      1650      1402      1770
GR    1402      1940      1400     1975       1396      1990    1394.4      2000      1396      2040
GR    1396      2085      1394     2100       1394      2180      1400      2200      1402      2300
GR    1400      2390      1400     2400       1402      2450      1404      2680      1404      2870
GR    1404      3300      1406     3790       1408      4100
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NH        4      .045      1945      .035      2040      .050      2600      .040      4130
ET               4.1       6.1      1170      2470      1540      2470

X1     9.48        41      1945      2300       370       420       490
GR     1412       330      1410       350      1410       440    1411.7       500      1410       560
GR     1410       640      1408       665      1406       690      1404       720      1402       770
GR     1402       800      1402       830      1402       860      1402       970      1404      1200
GR     1404      1400      1404      1640      1406      1715      1406      1725      1406      1750
GR     1404      1890      1404      1930      1404      1945      1398      1970    1396.5      2000
GR     1398      2040      1398      2150      1396      2255      1398      2280      1402      2300
GR     1404      2370      1404      2600      1403      2750      1404      2850      1406      2870
GR     1408      2920      1409      3020      1408      3100      1406      3290      1408      3450
GR     1410      4130

NC     .045      .045      .035
ET               4.1       6.1      1600      2535      1815      2535

X1    9.580        29      1910      2340       390       460       450
GR     1412       625      1410       645      1408       675      1406       870      1404      1000
GR     1406      1040      1406      1080      1404      1110      1404      1280      1406      1520
GR   1407.5      1910      1406      1965      1402      1990    1398.5      2000      1400      2060
GR     1402      2160      1400      2240      1404      2290      1406      2340      1406      2410
GR     1404      2430      1404      2500      1406      2550      1406      2720      1407      2880
GR     1406      3025      1406      3095      1408      3255      1410      3400
     ET CARD CHANGED FROM THE ORIGINAL STENCR = 0.0 TO STENCR = 2480 TO
     REMOVE ERROR MESSAGE. THIS WAS ACCEPTABLE IN THE 1982 HEC-2 VERSION

ET               4.1       6.1      1770      2480      1780      2480

X1    9.670        24      1970      2060       470       420       410
GR     1414       530      1412       540      1410       810      1408       945      1406       970
GR     1408      1010      1407      1055      1408      1130      1408      1480      1410      1840
GR     1410      1910      1408      1970      1400      2000      1402      2050      1408      2060
GR     1408      2085      1404      2110      1404      2250      1406      2270      1406      2350
GR     1405      2370      1406      2385      1420      2450      1426      2480

X1     9.75        21      1910      2035       390       410       370
GR     1424      1710      1416      1740      1414      1750      1412      1760      1410      1790
GR     1410      1800      1412      1815      1412      1890      1410      1910      1404      1935
GR     1402      1990    1401.7      2000      1402      2005      1410      2035      1408      2040
GR     1407      2070      1408      2090      1410      2175      1412      2200      1412      2270
GR     1424      2340
```

X1	9.840	12	1955	2160	500	490	480			
GR	1430	1720	1414	1780	1414	1955	1404	1985	1403	2000
GR	1406	2020	1408	2115	1410	2160	1412	2180	1414	2260
GR	1416	2280	1430	2340						
X1	9.940	16	1960	2120	430	470	520			
GR	1430	1715	1416	1770	1414	1800	1412	1940	1410	1960
GR	1408	1975	1406	2000	1406	2025	1408	2065	1410	2090
GR	1412	2120	1414	2155	1416	2175	1418	2225	1420	2255
GR	1430	2310								
X1	10.04	17	1920	2160	540	540	540			
GR	1428	1795	1418	1840	1416	1880	1414	1920	1412	1950
GR	1410	1970	1409	2000	1410	2070	1412	2115	1414	2160
GR	1416	2180	1418	2230	1420	2315	1422	2370	1424	2410
GR	1426	2420	1430	2445						

```
 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 1
0

CCHV=     .100 CEHV=     .300
*SECNO 8.690
     8.690     13.90   1378.00       .00   1378.00   1378.10       .10       .00       .00   1379.20
   39000.0        .0   32930.6    6069.4        .0   11846.8    5227.5        .0        .0   1377.10
       .00       .00      2.78      1.16      .000      .035      .045      .000   1364.10    920.00
   .000198        0.        0.        0.         0         0         0       .00   2645.00   3565.00

FLOW DISTRIBUTION FOR SECNO=      8.69          CWSEL=   1378.00

STA=     920.    2100.    2720.    3150.    3420.    3565.
  PER Q=     84.4      4.1      5.0      5.8       .7
   AREA=  11846.8   1730.5   1681.0   1525.5    290.5
    VEL=      2.8       .9      1.2      1.5       .9
  DEPTH=     10.0      2.8      3.9      5.6      2.0

*SECNO 8.750

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     8.750     11.73   1378.13   1378.13       .00   1380.10      1.97       .62       .56   1386.40
   39000.0        .0   39000.0        .0        .0    3464.9        .0     237.6      40.9   1382.30
       .02       .00     11.26       .00      .000      .035      .000      .000   1366.40   1134.10
   .011323      980.     1000.     1030.        20        10         0       .00    873.48   2029.24

FLOW DISTRIBUTION FOR SECNO=      8.75          CWSEL=   1378.13

STA=    1134.    2040.
  PER Q=    100.0
   AREA=   3464.9
    VEL=     11.3
  DEPTH=      4.0
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 8.890

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.16

8.890	10.78	1382.88	.00	.00	1383.87	.99	3.68	.10	1390.10
39000.0	.0	39000.0	.0	.0	4872.5	.0	315.1	55.1	1384.90
.05	.00	8.00	.00	.000	.035	.000	.000	1372.10	1624.73
.002429	700.	810.	850.	4	0	0	.00	650.53	2275.26

FLOW DISTRIBUTION FOR SECNO= 8.89 CWSEL= 1382.88

STA= 1625. 2300.
PER Q= 100.0
AREA= 4872.5
VEL= 8.0
DEPTH= 7.5

*SECNO 8.965

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .66

8.965	9.82	1383.12	.00	.00	1385.79	2.67	1.42	.50	1388.40
39000.0	.0	39000.0	.0	.0	2974.8	.0	351.1	59.7	1386.90
.06	.00	13.11	.00	.000	.035	.000	.000	1373.30	1738.50
.005640	400.	400.	410.	3	0	0	.00	354.86	2093.36

FLOW DISTRIBUTION FOR SECNO= 8.97 CWSEL= 1383.12

STA= 1738. 2110.
PER Q= 100.0
AREA= 2974.8
VEL= 13.1
DEPTH= 8.4

```
 SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
 Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
 TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
 SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 9.050

3301 HV CHANGED MORE THAN HVINS

    9.050      10.90    1385.60        .00        .00    1387.64       2.04       1.78        .06    1388.70
  39000.0         .0    39000.0         .0         .0     3404.9         .0      379.7       62.9    1392.30
      .07        .00      11.45        .00       .000       .035       .000       .000    1374.70    1920.51
  .003783       520.       390.       350.          3          0          0        .00     368.50    2289.01

FLOW DISTRIBUTION FOR SECNO=      9.05          CWSEL=   1385.60

STA=    1921.    2320.
  PER Q=    100.0
   AREA=   3404.9
    VEL=     11.5
  DEPTH=      9.2

*SECNO 9.115

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      110.0    3465.0  TYPE=      1  TARGET=     3355.000
    9.115       8.05    1394.05    1394.05        .00    1395.45       1.39       1.93        .06    1392.00
  39000.0      619.8    26821.2    11559.1      200.4     2446.3     2390.2      413.5       71.5    1392.00
      .08       3.09      10.96       4.84       .045       .035       .045       .000    1386.00    1575.73
  .008246       350.       370.       300.         20         13          0        .00    1889.27    3465.00

*SECNO 9.210

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.43

3470 ENCROACHMENT STATIONS=     1385.0    2950.0  TYPE=      1  TARGET=     1565.000
    9.210       9.12    1397.62        .00        .00    1398.62        .99       3.13        .04    1394.00
  39000.0    5362.7    21995.3    11642.0     1275.3     2246.2     2318.7      480.7       92.0    1394.00
      .10       4.21       9.79       5.02       .045       .035       .040       .000    1388.50    1385.00
  .004046       460.       600.       500.          2          0          0        .00    1565.00    2950.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

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1490 NH CARD USED
*SECNO 9.310

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1110.0    2560.0  TYPE=      1  TARGET=     1450.000
     9.310      9.27   1401.27   1401.27       .00   1402.80      1.54      2.57       .16   1398.00
   39000.0    9465.0   20507.6    9027.4    2092.2    1589.6    1708.3     547.0     108.4   1396.00
       .12      4.52     12.90      5.28      .045      .035      .050      .000   1392.00   1110.00
   .005290      400.      650.      480.        20         5         0       .00   1450.00   2560.00


1490 NH CARD USED
*SECNO 9.400

3470 ENCROACHMENT STATIONS=      980.0    2400.0  TYPE=      1  TARGET=     1420.000
     9.400      9.70   1403.70       .00       .00   1405.28      1.58      2.46       .01   1402.00
   39000.0   12129.9   24224.2    2645.9    2323.2    1992.3     550.3     597.6     121.7   1400.00
       .13      5.22     12.16      4.81      .040      .035      .044      .000   1394.00    980.00
   .005477      370.      510.      420.         2         0         0       .00   1420.00   2400.00


1490 NH CARD USED
*SECNO 9.480

3470 ENCROACHMENT STATIONS=     1170.0    2470.0  TYPE=      1  TARGET=     1300.000
     9.480     10.49   1406.49       .00       .00   1407.71      1.22      2.39       .04   1404.00
   39000.0    6643.3   30223.2    2133.5    1651.9    3082.9     494.0     648.0     134.3   1402.00
       .15      4.02      9.80      4.32      .045      .045      .050      .000   1396.00   1170.00
   .005009      370.      490.      420.         3         0         0       .00   1300.00   2470.00


*SECNO 9.580

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=     1600.0    2535.0  TYPE=      1  TARGET=      935.000
     9.580     10.07   1408.57       .00       .00   1410.49      1.92      2.57       .21   1407.50
   39000.0    1952.0   32448.6    4599.4     515.7    2725.3     706.2     694.1     145.1   1406.00
       .16      3.78     11.91      6.51      .045      .035      .045      .000   1398.50   1600.00
   .006729      390.      450.      460.         2         0         0       .00    935.00   2535.00
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 SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
 Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
 TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
 SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 9.670

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1770.0    2480.0  TYPE=      1  TARGET=      710.000
     9.670      11.69    1411.69    1411.69        .00    1414.27       2.58       3.10        .20    1408.00
   39000.0     2041.0    13893.5    23065.5      412.3      832.4     2193.0      729.8      153.0    1408.00
       .17       4.95      16.69      10.52       .045       .035       .045       .000    1400.00    1770.00
   .008285       470.       410.       420.          2          8          0        .00     641.43    2411.43

*SECNO 9.750
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     9.750      13.72    1415.42    1415.42        .00    1418.41       2.99       2.83        .13    1410.00
   39000.0     4148.7    23067.7    11783.6      626.7     1379.4     1357.0      760.5      158.4    1410.00
       .18       6.62      16.72       8.68       .045       .035       .045       .000    1401.70    1742.92
   .006436       390.       370.       410.         20         11          0        .00     547.02    2289.93

*SECNO 9.840

3301 HV CHANGED MORE THAN HVINS

     9.840      15.70    1418.70        .00        .00    1420.76       2.05       2.25        .09    1414.00
   39000.0     4666.8    29924.9     4408.3      865.0     2352.2      700.4      801.2      164.4    1410.00
       .19       5.40      12.72       6.29       .045       .035       .045       .000    1403.00    1762.35
   .003513       500.       480.       490.          2          0          0        .00     529.24    2291.60

*SECNO 9.940
     9.940      14.54    1420.54        .00        .00    1422.43       1.89       1.65        .02    1410.00
   39000.0    10190.9    25413.9     3395.1     1454.2     1992.2      599.4      845.6      170.0    1412.00
       .20       7.01      12.76       5.66       .045       .035       .045       .000    1406.00    1752.14
   .003138       430.       520.       470.          2          0          0        .00     505.85    2258.00

*SECNO 10.040
    10.040      13.23    1422.23        .00        .00    1424.11       1.88       1.69        .00    1414.00
   39000.0     3275.1    32028.2     3696.7      538.7     2695.3      749.0      895.4      176.6    1414.00
       .22       6.08      11.88       4.94       .045       .035       .045       .000    1409.00    1820.96
   .003119       540.       540.       540.          2          0          0        .00     553.65    2374.61
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T1      FLOODWAY STUDY  - SKUNK CREEK ABOVE ADOBE DAM
T2      SKUNK CREEK 100 YEAR - SECOND PROFILE
T3      SKUNK CREEK FLOODPLAIN, 39 K CFS CORPS OF ENGINEERS MODEL OF 84
T3      ** REVISED AUGUST 1998 BY COE & VAN LOO CONSULTANTS TO REFLECT
T3      ** NEW TOPOGRAPHIC DATA FOR PORTIONS OF THE CREEK
T3      ** BY AERIAL MAPPING COMPANY, PHOENIX, FLIGHT DATE 3/24/98

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

              3        0        0      0.000      0        0        0     1378.0

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    15        0        -1
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 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 2
0

CCHV=     .100 CEHV=     .300
*SECNO 8.690

3470 ENCROACHMENT STATIONS=      920.0    2290.0  TYPE=      1  TARGET=     1370.000
     8.690     13.90   1378.00       .00   1378.00   1378.16       .16       .00       .00 100000.00
   39000.0        .0   38293.9     706.1        .0   11846.8     604.4       .0        .0   1377.10
       .00       .00      3.23      1.17      .000      .035      .045      .000   1364.10    920.00
   .000268        0.        0.        0.         0         0         0       .00   1370.00   2290.00

FLOW DISTRIBUTION FOR SECNO=      8.69          CWSEL=   1378.00

STA=      920.    2100.    2150.    2195.    2280.    2290.
  PER Q=     98.2       .3       .5       .9       .1
   AREA=  11846.8    125.0    159.7    284.7     34.9
    VEL=      3.2      1.0      1.3      1.2      1.0
  DEPTH=     10.0      2.5      3.5      3.3      3.5

*SECNO 8.750

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1130.0    2029.0  TYPE=      1  TARGET=      899.000
     8.750     11.73   1378.13   1378.13   1378.13   1380.10      1.97       .81       .54 100000.00
   39000.0        .0   39000.0        .0        .0    3465.3        .0     182.9      25.8 100000.00
       .02       .00     11.25       .00      .000      .035      .000      .000   1366.40   1134.09
   .011316      980.     1000.     1030.        20        10         0       .00    873.25   2029.00

FLOW DISTRIBUTION FOR SECNO=      8.75          CWSEL=   1378.13
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

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STA=    1134.    2040.
  PER Q=    100.0
   AREA=   3465.3
    VEL=     11.3
  DEPTH=      4.0

*SECNO 8.890

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.16


3470 ENCROACHMENT STATIONS=     1624.0    2276.0  TYPE=      1  TARGET=      652.000
     8.890      10.78   1382.88       .00   1382.88   1383.87       .99      3.68       .10 100000.00
   39000.0         .0   39000.0        .0        .0    4872.1        .0     260.4      40.0 100000.00
       .05        .00      8.00       .00      .000      .035      .000      .000   1372.10   1624.74
   .002429       700.      810.      850.         4         0         0       .00    650.52   2275.25


FLOW DISTRIBUTION FOR SECNO=      8.89          CWSEL=   1382.88

STA=    1625.    2300.
  PER Q=    100.0
   AREA=   4872.1
    VEL=      8.0
  DEPTH=      7.5

*SECNO 8.965

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .66


3470 ENCROACHMENT STATIONS=     1730.0    2093.0  TYPE=      1  TARGET=      363.000
     8.965       9.82   1383.12       .00   1383.12   1385.79      2.67      1.42       .50 100000.00
   39000.0         .0   39000.0        .0        .0    2974.6        .0     296.4      44.6 100000.00
       .06        .00     13.11       .00      .000      .035      .000      .000   1373.30   1738.50
   .005635       400.      400.      410.         3         0         0       .00    354.50   2093.00
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

FLOW DISTRIBUTION FOR SECNO= 8.97 CWSEL= 1383.12

STA= 1738. 2110.
PER Q= 100.0
AREA= 2974.6
VEL= 13.1
DEPTH= 8.4

*SECNO 9.050

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 1920.0 2290.0 TYPE= 1 TARGET= 370.000

9.050	10.90	1385.60	.00	1385.60	1387.64	2.04	1.78	.06	100000.00
39000.0	.0	39000.0	.0	.0	3404.4	.0	325.0	47.8	100000.00
.07	.00	11.46	.00	.000	.035	.000	.000	1374.70	1920.52
.003785	520.	390.	350.	3	0	0	.00	368.49	2289.00

FLOW DISTRIBUTION FOR SECNO= 9.05 CWSEL= 1385.60

STA= 1921. 2320.
PER Q= 100.0
AREA= 3404.4
VEL= 11.5
DEPTH= 9.2

*SECNO 9.115
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1310.0 2575.0 TYPE= 1 TARGET= 1265.000

9.115	8.81	1394.81	1394.81	1394.05	1396.64	1.83	1.90	.02	1392.00
39000.0	1727.3	32878.6	4394.0	487.4	2831.1	771.7	356.1	54.4	1392.00
.08	3.54	11.61	5.69	.045	.035	.045	.000	1386.00	1310.00
.007615	350.	370.	300.	20	15	0	.00	1265.00	2575.00

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SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 9.210

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.57


3470 ENCROACHMENT STATIONS=     1380.0    2595.0  TYPE=      1  TARGET=     1215.000
     9.210      9.92   1398.42       .00   1397.62   1399.35       .93      2.62       .09   1394.00
   39000.0    7176.1   23086.5    8737.4    1670.7    2505.7    1650.2     418.2      69.2   1394.00
       .10      4.30      9.21      5.29      .045      .035      .040      .000   1388.50   1380.00
   .003096      460.      600.      500.         2         0         0       .00   1215.00   2595.00


1490 NH CARD USED
*SECNO 9.310

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1280.0    2400.0  TYPE=      1  TARGET=     1120.000
     9.310      9.77   1401.77   1401.77   1401.27   1403.69      1.92      2.29       .30   1398.00
   39000.0    9339.6   23158.7    6501.7    1870.8    1682.1    1157.3     481.1      82.0   1396.00
       .12      4.99     13.77      5.62      .045      .035      .050      .000   1392.00   1280.00
   .005586      400.      650.      480.        20         5         0       .00   1120.00   2400.00


1490 NH CARD USED
*SECNO 9.400

3470 ENCROACHMENT STATIONS=     1330.0    2400.0  TYPE=      1  TARGET=     1070.000
     9.400     10.46   1404.46       .00   1403.70   1406.09      1.63      2.37       .03   1402.00
   39000.0    9158.7   26185.4    3655.9    1750.4    2189.5     701.9     528.1      92.3   1400.00
       .13      5.23     11.96      5.21      .040      .035      .044      .000   1394.00   1330.00
   .004672      370.      510.      420.         3         0         0       .00   1070.00   2400.00


1490 NH CARD USED
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.480

3470 ENCROACHMENT STATIONS= 1540.0 2470.0 TYPE= 1 TARGET= 930.000

9.480	10.99	1406.99	.00	1406.49	1408.32	1.33	2.20	.03	1404.00
39000.0	3807.3	32489.7	2703.0	926.9	3259.8	578.7	576.3	101.9	1402.00
.14	4.11	9.97	4.67	.045	.045	.050	.000	1396.00	1540.00
.004802	370.	490.	420.	2	0	0	.00	930.00	2470.00

*SECNO 9.580

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 1815.0 2535.0 TYPE= 1 TARGET= 720.000

9.580	10.48	1408.98	.00	1408.57	1410.82	1.84	2.35	.15	1407.50
39000.0	549.3	33387.4	5063.3	158.0	2902.8	786.7	620.2	110.1	1406.00
.16	3.48	11.50	6.44	.045	.035	.045	.000	1398.50	1815.00
.005773	390.	450.	460.	2	0	0	.00	720.00	2535.00

*SECNO 9.670

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1780.0 2480.0 TYPE= 1 TARGET= 700.000

9.670	11.65	1411.65	1411.65	1411.69	1414.29	2.64	2.89	.24	1408.00
39000.0	1899.4	13976.7	23123.9	382.9	828.2	2176.7	655.0	116.7	1408.00
.17	4.96	16.88	10.62	.045	.035	.045	.000	1400.00	1780.00
.008527	470.	410.	420.	0	8	0	.00	631.22	2411.22

*SECNO 9.750
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

9.750	13.72	1415.42	1415.42	1415.42	1418.41	3.00	2.87	.11	1410.00
39000.0	4148.5	23068.1	11783.4	626.7	1379.3	1357.0	685.5	122.1	1410.00
.17	6.62	16.72	8.68	.045	.035	.045	.000	1401.70	1742.92
.006437	390.	370.	410.	20	11	0	.00	547.01	2289.93

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.840

3301 HV CHANGED MORE THAN HVINS

9.840	15.71	1418.71	.00	1418.70	1420.76	2.05	2.25	.09	1414.00
39000.0	4667.2	29924.3	4408.5	865.1	2352.3	700.4	726.2	128.1	1410.00
.19	5.39	12.72	6.29	.045	.035	.045	.000	1403.00	1762.35
.003512	500.	480.	490.	2	0	0	.00	529.25	2291.60

*SECNO 9.940

9.940	14.54	1420.54	.00	1420.54	1422.42	1.89	1.65	.02	1410.00
39000.0	10190.7	25414.4	3394.9	1454.1	1992.1	599.3	770.6	133.7	1412.00
.20	7.01	12.76	5.66	.045	.035	.045	.000	1406.00	1752.15
.003139	430.	520.	470.	2	0	0	.00	505.85	2258.00

*SECNO 10.040

10.040	13.23	1422.23	.00	1422.23	1424.11	1.88	1.69	.00	1414.00
39000.0	3275.2	32027.8	3697.0	538.8	2695.4	749.0	820.4	140.3	1414.00
.21	6.08	11.88	4.94	.045	.035	.045	.000	1409.00	1820.96
.003118	540.	540.	540.	2	0	0	.00	553.66	2374.62

THIS RUN EXECUTED 19MAR01 16:00:18

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SKUNK CREEK FLOODPLAIN,

SUMMARY PRINTOUT

	SECNO	CWSEL	DIFKWS	TOPWID	SSTA	VCH	ENDST	QLOB	QROB	STENCL	STCHL	STCHR	STENCR
	8.690	1378.00	.00	2645.00	920.00	2.78	3565.00	.00	6069.36	.00	860.00	2100.00	.00
	8.690	1378.00	.00	1370.00	920.00	3.23	2290.00	.00	706.14	920.00	860.00	2100.00	2290.00
*	8.750	1378.13	.00	873.48	1134.10	11.26	2029.24	.00	.00	.00	1065.00	2040.00	.00
*	8.750	1378.13	.00	873.25	1134.09	11.25	2029.00	.00	.00	1130.00	1065.00	2040.00	2029.00
*	8.890	1382.88	.00	650.53	1624.73	8.00	2275.26	.00	.00	.00	1550.00	2300.00	.00
*	8.890	1382.88	.00	650.52	1624.74	8.00	2275.25	.00	.00	1624.00	1550.00	2300.00	2276.00
*	8.965	1383.12	.00	354.86	1738.50	13.11	2093.36	.00	.00	.00	1710.00	2110.00	.00
*	8.965	1383.12	.00	354.50	1738.50	13.11	2093.00	.00	.00	1730.00	1710.00	2110.00	2093.00
	9.050	1385.60	.00	368.50	1920.51	11.45	2289.01	.00	.00	.00	1905.00	2320.00	.00
	9.050	1385.60	.00	368.49	1920.52	11.46	2289.00	.00	.00	1920.00	1905.00	2320.00	2290.00
*	9.115	1394.05	.00	1889.27	1575.73	10.96	3465.00	619.76	11559.07	110.00	1790.00	2300.00	3465.00
*	9.115	1394.81	.75	1265.00	1310.00	11.61	2575.00	1727.33	4394.04	1310.00	1790.00	2300.00	2575.00
*	9.210	1397.62	.00	1565.00	1385.00	9.79	2950.00	5362.71	11642.03	1385.00	1865.00	2190.00	2950.00
*	9.210	1398.42	.79	1215.00	1380.00	9.21	2595.00	7176.11	8737.38	1380.00	1865.00	2190.00	2595.00
*	9.310	1401.27	.00	1450.00	1110.00	12.90	2560.00	9465.02	9027.37	1110.00	1930.00	2115.00	2560.00
*	9.310	1401.77	.50	1120.00	1280.00	13.77	2400.00	9339.56	6501.69	1280.00	1930.00	2115.00	2400.00
	9.400	1403.70	.00	1420.00	980.00	12.16	2400.00	12129.88	2645.89	980.00	1940.00	2200.00	2400.00
	9.400	1404.46	.76	1070.00	1330.00	11.96	2400.00	9158.70	3655.93	1330.00	1940.00	2200.00	2400.00
	9.480	1406.49	.00	1300.00	1170.00	9.80	2470.00	6643.32	2133.49	1170.00	1945.00	2300.00	2470.00
	9.480	1406.99	.49	930.00	1540.00	9.97	2470.00	3807.32	2703.01	1540.00	1945.00	2300.00	2470.00
	9.580	1408.57	.00	935.00	1600.00	11.91	2535.00	1952.02	4599.41	1600.00	1910.00	2340.00	2535.00
	9.580	1408.98	.41	720.00	1815.00	11.50	2535.00	549.31	5063.30	1815.00	1910.00	2340.00	2535.00

	SECNO	CWSEL	DIFKWS	TOPWID	SSTA	VCH	ENDST	QLOB	QROB	STENCL	STCHL	STCHR	STENCR
*	9.670	1411.69	.00	641.43	1770.00	16.69	2411.43	2041.00	23065.53	1770.00	1970.00	2060.00	2480.00
*	9.670	1411.65	-.05	631.22	1780.00	16.88	2411.22	1899.40	23123.88	1780.00	1970.00	2060.00	2480.00
*	9.750	1415.42	.00	547.02	1742.92	16.72	2289.93	4148.68	11783.58	.00	1910.00	2035.00	.00
*	9.750	1415.42	.00	547.01	1742.92	16.72	2289.93	4148.47	11783.40	.00	1910.00	2035.00	.00
	9.840	1418.70	.00	529.24	1762.35	12.72	2291.60	4666.80	4408.30	.00	1955.00	2160.00	.00
	9.840	1418.71	.00	529.25	1762.35	12.72	2291.60	4667.19	4408.52	.00	1955.00	2160.00	.00
	9.940	1420.54	.00	505.85	1752.14	12.76	2258.00	10190.94	3395.11	.00	1960.00	2120.00	.00
	9.940	1420.54	.00	505.85	1752.15	12.76	2258.00	10190.68	3394.87	.00	1960.00	2120.00	.00
	10.040	1422.23	.00	553.65	1820.96	11.88	2374.61	3275.11	3696.66	.00	1920.00	2160.00	.00
	10.040	1422.23	.00	553.66	1820.96	11.88	2374.62	3275.22	3696.95	.00	1920.00	2160.00	.00

SKUNK CREEK FLOODPLAIN,

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	8.690	1378.00	.00	1378.10	2645.00	.00	32930.64	6069.36	.00	.00	860.00	2100.00	.00
	8.690	1378.00	.00	1378.16	1370.00	.00	38293.86	706.14	1370.00	920.00	860.00	2100.00	2290.00
*	8.750	1378.13	.00	1380.10	873.48	.00	39000.00	.00	.00	.00	1065.00	2040.00	.00
*	8.750	1378.13	.00	1380.10	873.25	.00	39000.00	.00	899.00	1130.00	1065.00	2040.00	2029.00
*	8.890	1382.88	.00	1383.87	650.53	.00	39000.00	.00	.00	.00	1550.00	2300.00	.00
*	8.890	1382.88	.00	1383.87	650.52	.00	39000.00	.00	652.00	1624.00	1550.00	2300.00	2276.00
*	8.965	1383.12	.00	1385.79	354.86	.00	39000.00	.00	.00	.00	1710.00	2110.00	.00
*	8.965	1383.12	.00	1385.79	354.50	.00	39000.00	.00	363.00	1730.00	1710.00	2110.00	2093.00
	9.050	1385.60	.00	1387.64	368.50	.00	39000.00	.00	.00	.00	1905.00	2320.00	.00
	9.050	1385.60	.00	1387.64	368.49	.00	39000.00	.00	370.00	1920.00	1905.00	2320.00	2290.00
*	9.115	1394.05	.00	1395.45	1889.27	619.76	26821.17	11559.07	3355.00	110.00	1790.00	2300.00	3465.00
*	9.115	1394.81	.75	1396.64	1265.00	1727.33	32878.63	4394.04	1265.00	1310.00	1790.00	2300.00	2575.00
*	9.210	1397.62	.00	1398.62	1565.00	5362.71	21995.27	11642.03	1565.00	1385.00	1865.00	2190.00	2950.00
*	9.210	1398.42	.79	1399.35	1215.00	7176.11	23086.50	8737.38	1215.00	1380.00	1865.00	2190.00	2595.00
*	9.310	1401.27	.00	1402.80	1450.00	9465.02	20507.60	9027.37	1450.00	1110.00	1930.00	2115.00	2560.00
*	9.310	1401.77	.50	1403.69	1120.00	9339.56	23158.75	6501.69	1120.00	1280.00	1930.00	2115.00	2400.00
	9.400	1403.70	.00	1405.28	1420.00	12129.88	24224.23	2645.89	1420.00	980.00	1940.00	2200.00	2400.00
	9.400	1404.46	.76	1406.09	1070.00	9158.70	26185.38	3655.93	1070.00	1330.00	1940.00	2200.00	2400.00
	9.480	1406.49	.00	1407.71	1300.00	6643.32	30223.19	2133.49	1300.00	1170.00	1945.00	2300.00	2470.00
	9.480	1406.99	.49	1408.32	930.00	3807.32	32489.66	2703.01	930.00	1540.00	1945.00	2300.00	2470.00
	9.580	1408.57	.00	1410.49	935.00	1952.02	32448.57	4599.41	935.00	1600.00	1910.00	2340.00	2535.00
	9.580	1408.98	.41	1410.82	720.00	549.31	33387.38	5063.30	720.00	1815.00	1910.00	2340.00	2535.00
*	9.670	1411.69	.00	1414.27	641.43	2041.00	13893.48	23065.53	710.00	1770.00	1970.00	2060.00	2480.00
*	9.670	1411.65	-.05	1414.29	631.22	1899.40	13976.73	23123.88	700.00	1780.00	1970.00	2060.00	2480.00
*	9.750	1415.42	.00	1418.41	547.02	4148.68	23067.74	11783.58	.00	.00	1910.00	2035.00	.00
*	9.750	1415.42	.00	1418.41	547.01	4148.47	23068.13	11783.40	.00	.00	1910.00	2035.00	.00
	9.840	1418.70	.00	1420.76	529.24	4666.80	29924.91	4408.30	.00	.00	1955.00	2160.00	.00
	9.840	1418.71	.00	1420.76	529.25	4667.19	29924.29	4408.52	.00	.00	1955.00	2160.00	.00
	9.940	1420.54	.00	1422.43	505.85	10190.94	25413.95	3395.11	.00	.00	1960.00	2120.00	.00
	9.940	1420.54	.00	1422.42	505.85	10190.68	25414.45	3394.87	.00	.00	1960.00	2120.00	.00
	10.040	1422.23	.00	1424.11	553.65	3275.11	32028.22	3696.66	.00	.00	1920.00	2160.00	.00
	10.040	1422.23	.00	1424.11	553.66	3275.22	32027.83	3696.95	.00	.00	1920.00	2160.00	.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=      8.750  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      8.750  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      8.750  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      8.750  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      8.750  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      8.750  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=      8.890  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      8.890  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      8.965  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      8.965  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      9.115  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.115  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.115  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      9.115  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.115  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.115  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=      9.210  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      9.210  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      9.310  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.310  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.310  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      9.310  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.310  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.310  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      9.670  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.670  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.670  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.670  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      9.750  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.750  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.750  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      9.750  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.750  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.750  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

FLOODWAY DATA, SKUNK CREEK FLOODPLAIN,
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
8.690	1370.	12451.	3.1	1378.0	1378.0	.0
8.750	895.	3465.	11.3	1378.1	1378.1	.0
8.890	651.	4872.	8.0	1382.9	1382.9	.0
8.965	355.	2975.	13.1	1383.1	1383.1	.0
9.050	368.	3404.	11.5	1385.6	1385.6	.0
9.115	1265.	4090.	9.5	1394.9	1394.1	.8
9.210	1215.	5827.	6.7	1398.4	1397.6	.8
9.310	1120.	4710.	8.3	1401.8	1401.3	.5
9.400	1070.	4642.	8.4	1404.5	1403.7	.8
9.480	930.	4765.	8.2	1407.0	1406.5	.5
9.580	720.	3847.	10.1	1409.0	1408.6	.4
9.670	631.	3388.	11.5	1411.7	1411.7	.0
9.750	547.	3363.	11.6	1415.4	1415.4	.0
9.840	529.	3918.	10.0	1418.7	1418.7	.0
9.940	506.	4046.	9.6	1420.5	1420.5	.0
10.040	554.	3983.	9.8	1422.2	1422.2	.0

Duplicate Effective Model #2

SKUNKFIS.OH2

(RM 9.09 – 11.40)

```
1*******************************************
 *  HEC-2 WATER SURFACE PROFILES            *
 *                                          *
 *  Version   4.6.2;  May 1991              *
 *                                          *
 *  RUN DATE    17SEP02    TIME   17:16:29  *
 *******************************************
```

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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

THIS RUN EXECUTED 17SEP02 17:16:29

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**************************************


T1       SKUNK CREEK REGULATORY FLOODPLAIN & FLOODWAY
T2       INCLUDES ADOBE SUBDIVISION (BAKER ENGINEERS)
T3       SKUNKFIS.DAT            100-YEAR BASE FLOOD ELEVATION

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                                         1377.8

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1                  -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         1         2        26         8         4        25        68        53
     54       150       200

NC     .045      .045      .035       .1        .3
QT       2     39000     39000
ET    8.69                 9.1                                                          820      2420
X1    8.69        19      1979      2118
GR    1380       452      1378       815      1378       877      1378       990      1378      1448
GR    1376      1481      1372      1542      1374      1675      1376      1727      1376      1979
GR  1369.8      2000      1370      2038      1372      2100      1376      2118    1376.2      2181
GR    1376      2278      1376      3560      1378      3560      1380      3890

ET    8.75                 9.1                                                          900      2290
X1    8.75        26      1800      2040       835       733       739
GR    1390       170      1388       235      1386       420      1384       510      1383       820
GR    1382      1190      1382      1435      1384      1470      1384      1490      1382      1500
GR    1380      1560      1378      1573      1378      1600      1380      1625      1378      1740
GR    1378      1790      1376      1800      1376      1958      1372      1975      1371      2000
GR    1380      2040      1381      2290      1382      2650      1382      3790      1384      4050
GR    1386      4190

ET    8.89       5.1       9.1                 870      3730                                1280      2470
X1    8.89        21      1900      2240       565       650       840
GR    1392       675      1386       780      1386      1765      1384      1775      1384      1805
GR    1386      1815      1384      1865      1384      1900      1382      1950      1382      1970
GR    1378      2000      1380      2030      1382      2090      1382      2230      1384      2240
GR    1386      2260      1387      3440    1386.5      3770      1387      4080      1388      4230
GR    1390      4440
```

ET	8.965	5.1	9.1		1085	3575			1380	2575
X1	8.965	17	1955	2330	275	410	400			
GR	1392	780	1390	830	1388	880	1388	1580	1390	1915
GR	1390	1945	1388	1955	1386	1975	1381	2000	1382	2025
GR	1384	2105	1386	2240	1388	2330	1388	2560	1390	2920
GR	1390	4120	1392	4570						
ET	9.05	5.1	9.1		1370	3415			1375	2525
X1	9.05	21	1905	2140	410	370	550			
GR	1398	700	1396	720	1394	780	1392	840	1390	1250
GR	1389	1645	1388	1905	1386	1910	1386	1925	1388	1935
GR	1386	1940	1384	1970	1382	2000	1382	2040	1384	2050
GR	1386	2095	1388	2100	1390	2140	1390	2950	1392	4220
GR	1394	4570								
ET	9.09	5.1	9.1		110	3465			1310	2580
X1	9.09	22	1720	2575	328	278	348			
GR	1400	110	1398	385	1396	660	1394.9	1310	1394.1	1530
GR	1394	1580	1393.5	1670	1393	1720	1392.2	1787	1391.2	1855
GR	1390.2	1935.0	1389.7	2015	1389.6	2055	1389.8	2135	1390.8	2235
GR	1392.7	2575	1393	2624	1393	2700	1394	2800	1394.2	2977
GR	1394.2	3692	1394	4025						
NC			.016							
ET	9.1	5.1	9.1		110	3465			1310	2580
X1	9.1		1720	2575	1	1	1			
ET	9.115	5.1	9.1		110	2580			1310	2580
X1	9.115	20	1630	2575	22	22	22			
GR	1400	110	1398	385	1396	660	1394.9	1310	1394.5	1530
GR	1394	1630	1393	1748	1392	1820	1391	1888	1390	1995
GR	1389.9	2055	1391	2230	1392	2315	1393	2575	1393	2624
GR	1393	2700	1394	2800	1394.2	2977	1394.2	3692	1394	4175
ET	9.19	5.1	9.1		110	2580			1310	2580
X1	9.19	20	1720	2575	37	37	37			
GR	1400	110	1398	385	1396	660	1394.8	1200	1393.8	1530
GR	1393.4	1640	1392.8	1720	1392	1805	1391	1895	1390.4	1975
GR	1390.2	2055	1390.4	2155	1391.7	2315	1392.2	2415	1392.4	2495
GR	1392.4	2575	1392.3	2624	1393	2700	1394	2800	1394.2	2977
NC			.035							
ET	9.2	5.1	9.1		110	2580			1310	2580
X1	9.2		1720	2575	1	1	1			
NH	5	.045	1865	.035	1920	.03	2514	.016	2540	.04
NH	4000									
ET	9.21	5.1	9.1		1380	2550			1380	2550
X1	9.21	32	1865	2540	422	462	562			
GR	1402	140	1402	300	1400	350	1398	510	1396	565
GR	1394	650	1394	670	1396	695	1396	720	1394	760
GR	1394	880	1396	1050	1396	1130	1394	1145	1394	1225
GR	1396	1290	1396	1510	1394	1720	1394	1735	1394	1765

GR	1394	1865	1393	1920	1392	1942	1391	2040	1390.6	2110
GR	1391	2190	1392	2362	1393	2514	1398.5	2540	1398	2580
GR	1398.5	2950	1398.5	4000						
NH	5	.045	1930	.035	2037	.03	2348	.016	2388	.045
NH	3200									
ET	9.31	5.1	9.1		1110	2410			1280	2410
X1	9.31	27	1930	2403	400	480	650			
GR	1406	20	1404	90	1402	310	1400	410	1398	425
GR	1398	820	1396	900	1398	940	1398	1130	1398	1225
GR	1398	1250	1399	1300	1398	1330	1399	1350	1399	1845
GR	1398	1930	1395	1940	1393	1950	1392	2037	1391.5	2080
GR	1392	2220	1393	2348	1398	2388	1400	2392	1401	2403
GR	1402	2410	1402.7	3200						
NC	0.040	0.040	0.035							
ET	9.40	5.1	9.1		980	2460			1330	2460
X1	9.40	34	1940	2454	370	420	510			
GR	1410	110	1408	140	1406	180	1404	330	1402	510
GR	1400	635	1400	965	1400	995	1400	1030	1400	1150
GR	1402	1250	1402	1550	1400	1620	1400	1650	1402	1770
GR	1402	1940	1400	1975	1396	1990	1394.4	2000	1396	2040
GR	1396	2085	1394	2100	1394	2180	1400	2200	1402	2225
GR	1400	2235	1395	2260	1394	2270	1393.6	2310	1394	2348
GR	1395	2410	1402	2440	1405	2454	1405.5	2600		
NH	4	0.045	1945	0.035	2040	0.05	2600	0.04	4130	
ET	9.48	5.1	9.1		1170	2470			1540	2470
X1	9.48	41	1945	2300	370	420	490			
GR	1412	330	1410	350	1410	440	1411.7	500	1410	560
GR	1410	640	1408	665	1406	690	1404	720	1402	770
GR	1402	800	1402	830	1402	860	1402	970	1404	1200
GR	1404	1400	1404	1640	1406	1715	1406	1725	1406	1750
GR	1404	1890	1404	1930	1404	1945	1398	1970	1396.5	2000
GR	1398	2040	1398	2190	1396	2255	1398	2280	1402	2300
GR	1404	2370	1404	2600	1403	2750	1404	2850	1406	2870
GR	1408	2920	1409	3020	1408	3100	1406.5	3290	1408	3450
GR	1410	4130								
NC	0.045	0.045	0.035							
ET	9.58	5.1	9.1		1600	2535			1815	2535
X1	9.58	29	1910	2340	390	460	450			
GR	1412	625	1410	645	1408	675	1406	870	1404	1000
GR	1406	1040	1406	1080	1404	1110	1404	1280	1406	1520
GR	1407.5	1910	1406	1965	1402	1990	1398.5	2000	1400	2060
GR	1402	2160	1400	2240	1404	2290	1406	2340	1406	2410
GR	1404	2430	1404	2500	1406	2550	1406	2720	1407	2880
GR	1406	3025	1406	3095	1408	3255	1410	3400		

ET	9.67	5.1	9.1		1770				1820	
X1	9.67	24	1970	2060	470	420	410			
GR	1414	530	1412	540	1410	810	1408	945	1406	970
GR	1408	1010	1407	1055	1408	1130	1408	1480	1410	1840
GR	1410	1910	1408	1970	1400	2000	1402	2050	1408	2060
GR	1408	2085	1404	2110	1404	2250	1406	2270	1406	2350
GR	1405	2370	1406	2385	1420	2450	1426	2480		
X1	9.75	21	1910	2035	390	410	370			
GR	1424	1710	1416	1740	1414	1750	1412	1760	1410	1790
GR	1410	1800	1412	1815	1412	1890	1410	1910	1404	1935
GR	1402	1990	1401.7	2000	1402	2005	1410	2035	1408	2040
GR	1407	2070	1408	2090	1410	2175	1412	2200	1412	2270
GR	1424	2340								
X1	9.84	12	1955	2160	500	490	480			
GR	1430	1720	1414	1780	1414	1955	1404	1985	1403	2000
GR	1406	2020	1408	2115	1410	2160	1412	2180	1414	2260
GR	1416	2280	1430	2340						
X1	9.94	16	1960	2120	430	470	520			
GR	1430	1715	1416	1770	1414	1800	1412	1940	1410	1960
GR	1408	1975	1406	2000	1406	2025	1408	2065	1410	2090
GR	1412	2120	1414	2155	1416	2175	1418	2225	1420	2255
GR	1430	2310								
X1	10.04	17	1920	2160	540	540	540			
GR	1428	1795	1418	1840	1416	1880	1414	1920	1412	1950
GR	1410	1970	1409	2000	1410	2070	1412	2115	1414	2160
GR	1416	2180	1418	2230	1420	2315	1422	2370	1424	2410
GR	1426	2420	1430	2445						
X1	10.12	16	1900	2100	450	420	380			
GR	1430	1720	1422	1760	1422	1820	1420	1860	1414	1900
GR	1412	1915	1411.5	2000	1412	2035	1414	2055	1416	2100
GR	1418	2135	1420	2165	1422	2180	1421	2260	1424	2300
GR	1430	2330								
X1	10.21	18	1880	2050	490	475	450			
GR	1436	1755	1426	1810	1424	1840	1420	1880	1418	1930
GR	1416	1970	1415.5	2000	1416	2020	1418	2030	1418	2050
GR	1418	2065	1420	2085	1420	2100	1420	2150	1422	2240
GR	1424	2250	1424	2310	1436	2400				
NC		0.050	0.04							
X1	10.30	20	1860	2080	460	450	440			
GR	1438	1750	1430	1790	1428	1830	1426	1845	1424	1860
GR	1422	1930	1420.8	2000	1422	2070	1424	2080	1425	2100
GR	1424	2151	1428	2210	1428	2350	1428	2380	1430	2475
GR	1430	2530	1428	2620	1426	2650	1426	2700	1438	2745

X1	10.40	29	1870	2120	480	470	460			
X3				950		2490				
GR	1436	655	1434	730	1432	1090	1431	1210	1430	1310
GR	1430	1320	1431	1560	1430	1730	1432	1820	1430	1870
GR	1424	1895	1422	1940	1422	2000	1424	2080	1428	2120
GR	1430	2250	1430	2280	1430	2370	1428	2380	1428	2390
GR	1430	2400	1430	2480	1430	2505	1432	2515	1434	2525
GR	1434	2550	1432	2580	1434	2610	1440	2665		
X1	10.49	17	1885	2185	420	450	470			
X3				720						
GR	1440	560	1438	680	1436	815	1434	1220	1434	1230
GR	1436	1805	1434	1850	1434	1885	1430	1935	1428	1970
GR	1426.5	2000	1428	2020	1430	2160	1432	2185	1434	2265
GR	1436	2300	1440	2310						
NC			.035							
X1	10.62	23	1795	2020	605	600	590			
X3				655						
GR	1444	310	1442	340	1440	500	1440	905	1442	1010
GR	1442	1040	1440	1070	1438	1110	1438	1180	1438	1280
GR	1438	1600	1438	1635	1438	1710	1438	1735	1436	1760
GR	1432	1795	1430	1980	1429.2	2000	1430	2010	1432	2020
GR	1438	2090	1440	2105	1444	2125				
X1	10.70	34	1915	2100	405	390	380			
X3				800						
GR	1450	295	1448	410	1446	450	1446	590	1447	645
GR	1446	680	1447	920	1446	1145	1444	1210	1444	1315
GR	1442	1340	1441	1440	1440	1615	1440	1645	1442	1690
GR	1442	1760	1440	1855	1438	1880	1436	1915	1434	1930
GR	1432.5	2000	1434	2090	1436	2100	1438	2115	1436	2125
GR	1436	2130	1438	2140	1440	2155	1442	2160	1450	2180
GR	1436	2180	1440	2190	1440	2230	1450	2255		
X1	10.83	37	1830	2030	645	650	650			
X3				1080						
GR	1452	565	1450	635	1449	800	1450	970	1450	1015
GR	1449	1150	1448	1230	1448	1330	1449.5	1450	1448	1550
GR	1446	1630	1444	1685	1446	1730	1444	1830	1442	1840
GR	1442	1890	1440	1910	1438	1965	1436	2000	1438	2015
GR	1444	2030	1445	2160	1444	2410	1442	2420	1438	2440
GR	1438	2450	1442	2470	1443	2565	1442	2600	1442	2630
GR	1442	2730	1438	2760	1438	2770	1444	2795	1446	2820
GR	1448	2840	1452	2875						
X1	10.93	38	1910	2085	500	500	500			
X3				1360		2965				
GR	1456	570	1454	645	1452.5	810	1453	1040	1452	1515
GR	1451	1640	1450	1750	1448	1805	1448	1815	1444	1860
GR	1448	1910	1444	1930	1442	1970	1441	2000	1442	2015
GR	1444	2025	1444	2050	1448	2085	1448	2160	1446	2180
GR	1448	2190	1448	2220	1446	2225	1446	2360	1446	2380

GR	1447	2435	1447	2500	1448	2610	1448.5	2720	1449	3160
GR	1448	3225	1448	3270	1442	3290	1448	3305	1448.5	3510
GR	1450	3660	1452	3825	1454	3980				
X1	11.04	35	1955	2065	500	500	500			
X3				1440		2540				
GR	1462	170	1460	400	1458	710	1458	800	1458	980
GR	1456	1300	1456	1440	1444	1505	1444	1550	1446	1570
GR	1448	1610	1448	1650	1448	1680	1450	1740	1451	1850
GR	1450	1955	1449	2000	1450	2065	1451	2240	1451.5	2540
GR	1451.5	2700	1451	2880	1451.5	3040	1450	3120	1450	3160
GR	1450.5	3220	1450	3290	1446	3300	1452	3330	1452	3350
GR	1452	3480	1454	3740	1456	3800	1460	3840	1462	3850
NC			0.020							
X1	11.20	4	1834.5	2165.5	680	755	770			
GR	1467	1834.5	1452	1864.5	1452	2135.5	1467	2165.5		
X1	11.3	4	1831.5	2169.5	528	528	528			
GR	1469	1831.5	1452.5	1864.5	1452.5	2135.5	1469.5	2169.5		
X1	11.40	4	1829.5	2171.5	528	528	528			
GR	1471.5	1829.5	1454	1864.5	1454	2135.5	1472	2171.5		

```
   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*PROF 1
0

CCHV=      .100 CEHV=      .300
*SECNO 8.690
3720 CRITICAL DEPTH ASSUMED
     8.690       8.44   1378.24   1378.24   1377.80   1379.34       1.10        .00        .00   1376.00
   39000.0    11671.8   12167.9   15160.4    1888.8     954.5     3221.5         .0         .0   1376.00
       .00       6.18     12.75      4.71      .045      .035       .045       .000    1369.80    771.11
   .006997         0.        0.        0.         0         7          0        .00    2828.79   3599.90

*SECNO 8.750

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     8.750      12.33   1383.33   1383.33       .00   1384.43       1.10       4.03        .00   1376.00
   39000.0     8827.1   20987.9    9185.0    1946.6    1925.9     2999.0      113.5       53.5   1380.00
       .03       4.53     10.90      3.06      .045      .035       .045       .000    1371.00    717.45
   .004134       835.      739.      733.         2        11          0        .00    3210.50   3963.01

*SECNO 8.890
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      870.0    3730.0  TYPE=      1  TARGET=     2860.000
     8.890      10.06   1388.06   1388.06       .00   1389.09       1.04       3.29        .01   1384.00
   39000.0     9383.6   22673.0    6943.4    2316.7    2208.7     2265.7      220.3       98.0   1384.00
       .06       4.05     10.27      3.06      .045      .035       .045       .000    1378.00    870.00
   .004833       565.      840.      650.         3        14          0        .00    2860.00   3730.00

*SECNO 8.965
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1085.0    3575.0  TYPE=      1  TARGET=     2490.000
     8.965       9.85   1390.85   1390.85       .00   1391.91       1.06       1.88        .01   1388.00
   39000.0     9151.4   23073.8    6774.8    2074.1    2258.6     1877.6      274.2      120.2   1388.00
       .07       4.41     10.22      3.61      .045      .035       .045       .000    1381.00   1085.00
   .005296       275.      400.      410.         2         6          0        .00    2490.00   3575.00
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 9.050

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.40

3470 ENCROACHMENT STATIONS=      1370.0     3415.0  TYPE=       1  TARGET=      2045.000
     9.050      11.05    1393.05       .00        .00    1393.68       .63       1.72        .04    1388.00
   39000.0     9702.8    16281.0    13016.2     2201.6     1867.0    3720.0      344.1      141.3    1390.00
       .09       4.41       8.72       3.50       .045       .035      .045       .000    1382.00    1370.00
   .002688       410.       550.       370.          2          0         0        .00    2045.00    3415.00

*SECNO 9.090
3280 CROSS SECTION       9.09 EXTENDED       1.22 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=       110.0     3465.0  TYPE=       1  TARGET=      3355.000
     9.090       5.62    1395.22    1395.22       .00    1396.43      1.20       1.38        .17    1393.00
   39000.0     1507.4    33327.2     4165.4     480.5     3537.9    1156.7      391.4      156.9    1392.70
       .10       3.14       9.42       3.60       .045       .035      .045       .000    1389.60    1118.41
   .007410       328.       348.       278.        20          8         0        .00    2346.59    3465.00

*SECNO 9.100
3280 CROSS SECTION       9.10 EXTENDED       1.21 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=       110.0     3465.0  TYPE=       1  TARGET=      3355.000
     9.100       5.61    1395.21    1395.21       .00    1396.73      1.52        .00        .10    1393.00
   39000.0      739.1    36211.2     2049.7     473.4     3527.8    1146.1      391.5      156.9    1392.70
       .10       1.56      10.26       1.79       .045       .016      .045       .000    1389.60    1125.41
   .001846         1.         1.         1.        20          5         0        .00    2339.59    3465.00
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SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 9.115
3280 CROSS SECTION      9.11 EXTENDED      1.53 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      110.0    2580.0  TYPE=      1  TARGET=     2470.000
     9.115      5.63   1395.53   1395.53       .00   1397.25      1.72       .04       .06   1394.00
   39000.0     566.0   38406.5      27.5     429.7    3626.7      12.7     393.8     157.9   1393.00
       .10      1.32     10.59      2.17      .045      .016      .045      .000   1389.90    936.13
   .002164       22.       22.       22.        20         5         0       .00   1643.87   2580.00

*SECNO 9.190
3280 CROSS SECTION      9.19 EXTENDED      2.08 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.44

3470 ENCROACHMENT STATIONS=      110.0    2580.0  TYPE=      1  TARGET=     2470.000
     9.190      6.08   1396.28       .00       .00   1397.37      1.08       .05       .06   1392.80
   39000.0    2767.6   36197.4      34.9    1686.0    4183.6      19.4     398.1     159.5   1392.40
       .10      1.64      8.65      1.80      .045      .016      .045      .000   1390.20    621.14
   .001045       37.       37.       37.         6         0         0       .00   1958.86   2580.00

*SECNO 9.200
3280 CROSS SECTION      9.20 EXTENDED      2.55 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .60

3470 ENCROACHMENT STATIONS=      110.0    2580.0  TYPE=      1  TARGET=     2470.000
     9.200      6.55   1396.75       .00       .00   1397.41       .66       .00       .04   1392.80
   39000.0    6793.2   32138.7      68.1    2213.6    4582.5      21.8     398.2     159.5   1392.40
       .10      3.07      7.01      3.13      .045      .035      .045      .000   1390.20    556.99
   .002909        1.        1.        1.         3         0         0       .00   2023.01   2580.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 9.210
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

3470 ENCROACHMENT STATIONS= 1380.0 2550.0 TYPE= 1 TARGET= 1170.000

9.210	7.41	1398.01	.00	.00	1398.94	.94	1.45	.08	1394.00
39000.0	5242.9	33757.1	.0	1472.8	4102.5	.0	472.2	177.4	1398.50
.12	3.56	8.23	.00	.045	.030	.000	.000	1390.60	1380.00
.002477	422.	562.	462.	2	0	0	.00	1157.66	2537.66

1490 NH CARD USED
*SECNO 9.310

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1110.0 2410.0 TYPE= 1 TARGET= 1300.000

9.310	7.88	1399.38	1399.38	.00	1401.62	2.24	2.07	.39	1398.00
39000.0	1081.4	37918.6	.0	541.5	3113.7	.0	535.3	191.8	1401.00
.14	2.00	12.18	.00	.045	.030	.000	.000	1391.50	1110.00
.004598	400.	650.	480.	2	8	0	.00	1280.75	2390.75

*SECNO 9.400

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 980.0 2460.0 TYPE= 1 TARGET= 1480.000

9.400	8.97	1402.57	1402.32	.00	1404.10	1.53	2.41	.07	1402.00
39000.0	4677.9	34322.1	.0	1243.4	3271.1	.0	580.2	205.0	1405.00
.15	3.76	10.49	.00	.040	.035	.000	.000	1393.60	980.00
.005073	370.	510.	420.	6	8	0	.00	1462.69	2442.69

1490 NH CARD USED
*SECNO 9.480

3265 DIVIDED FLOW

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 SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
 Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
 TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
 SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1170.0    2470.0  TYPE=      1  TARGET=     1300.000
     9.480      9.82   1405.82   1405.82       .00   1407.61      1.79       2.97        .08   1404.00
   39000.0    4709.5   32535.0    1755.5    1139.0    2804.4     379.8      626.4      217.8   1402.00
       .16      4.13     11.60      4.62      .045      .045      .050       .000    1396.00   1170.00
   .007937      370.      490.      420.         4         8         0        .00    1245.88   2470.00

*SECNO 9.580

3470 ENCROACHMENT STATIONS=     1600.0    2535.0  TYPE=      1  TARGET=      935.000
     9.580     10.39   1408.89       .00       .00   1410.54      1.66       2.92        .01   1407.50
   39000.0    2369.1   31865.3    4765.7     615.6    2863.9     769.0      669.6      228.4   1406.00
       .18      3.85     11.13      6.20      .045      .035      .045       .000    1398.50   1600.00
   .005501      390.      450.      460.         2         0         0        .00     935.00   2535.00

*SECNO 9.670

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1770.0    2480.0  TYPE=      1  TARGET=    -1770.000
     9.670     11.66   1411.66   1411.66       .00   1414.27      2.61       2.80        .28   1408.00
   39000.0    2008.8   13924.7   23066.4     406.3     829.7    2182.6      706.7      236.2   1408.00
       .19      4.94     16.78     10.57      .045      .035      .045       .000    1400.00   1770.00
   .008413      470.      410.      420.         3         8         0        .00     641.29   2411.29

*SECNO 9.750
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     9.750     13.72   1415.42   1415.42       .00   1418.41      3.00       2.85        .12   1410.00
   39000.0    4148.5   23068.1   11783.4     626.7    1379.3    1357.0      737.4      241.6   1410.00
       .19      6.62     16.72      8.68      .045      .035      .045       .000    1401.70   1742.92
   .006437      390.      370.      410.        20        11         0        .00     547.01   2289.93
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.840

3301 HV CHANGED MORE THAN HVINS

9.840	15.71	1418.71	.00	.00	1420.76	2.05	2.25	.09	1414.00
39000.0	4667.2	29924.3	4408.5	865.1	2352.3	700.4	778.0	247.7	1410.00
.21	5.39	12.72	6.29	.045	.035	.045	.000	1403.00	1762.35
.003512	500.	480.	490.	2	0	0	.00	529.25	2291.60

*SECNO 9.940

9.940	14.54	1420.54	.00	.00	1422.42	1.89	1.65	.02	1410.00
39000.0	10190.7	25414.4	3394.9	1454.1	1992.1	599.3	822.4	253.3	1412.00
.22	7.01	12.76	5.66	.045	.035	.045	.000	1406.00	1752.15
.003139	430.	520.	470.	2	0	0	.00	505.85	2258.00

*SECNO 10.040

10.040	13.23	1422.23	.00	.00	1424.11	1.88	1.69	.00	1414.00
39000.0	3275.2	32027.8	3697.0	538.8	2695.4	749.0	872.2	259.9	1414.00
.23	6.08	11.88	4.94	.045	.035	.045	.000	1409.00	1820.96
.003118	540.	540.	540.	2	0	0	.00	553.66	2374.62

*SECNO 10.120

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

10.120	11.74	1423.24	1423.24	.00	1426.51	3.27	1.62	.41	1414.00
39000.0	2729.8	32820.7	3449.5	418.0	2108.7	552.5	904.4	265.0	1416.00
.24	6.53	15.56	6.24	.045	.035	.045	.000	1411.50	1753.78
.005823	450.	380.	420.	4	11	0	.00	536.13	2289.91

*SECNO 10.210

10.210	11.15	1426.65	.00	.00	1429.44	2.79	2.88	.05	1420.00
39000.0	1599.7	24565.1	12835.2	236.6	1582.9	1445.2	938.0	270.7	1418.00
.25	6.76	15.52	8.88	.045	.035	.045	.000	1415.50	1806.43
.006835	490.	450.	475.	4	0	0	.00	523.44	2329.87

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 SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
 Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
 TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
 SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 10.300

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   10.300       9.78    1430.58    1430.58        .00    1432.76       2.19       3.25        .06    1424.00
  39000.0     1381.3    26114.0    11504.7      201.1     1890.5     1837.4      974.8      278.2    1424.00
     .26       6.87      13.81       6.26       .045       .040       .050       .000    1420.80    1787.12
 .007865       460.       440.       450.          3         15          0        .00     930.03    2717.16

*SECNO 10.400

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.79


3470 ENCROACHMENT STATIONS=      950.0    2490.0  TYPE=      1  TARGET=     1540.000
   10.400      12.01    1434.01        .00        .00    1434.78        .78       1.88        .14    1430.00
  39000.0     9772.1    22609.9     6618.1     2778.8     2592.2     1653.3     1033.7      291.6    1428.00
     .28       3.52       8.72       4.00       .045       .040       .050       .000    1422.00     950.00
 .002450       480.       460.       470.          2          0          0        .00    1540.00    2490.00

*SECNO 10.490

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      720.0    2310.0  TYPE=      1  TARGET=     -720.000
   10.490      10.55    1437.05    1437.05        .00    1438.61       1.55       1.71        .23    1434.00
  39000.0     9898.8    26844.5     2256.7     2280.8     2303.8      397.7     1095.1      307.0    1432.00
     .29       4.34      11.65       5.68       .045       .040       .050       .000    1426.50     743.82
 .006504       420.       470.       450.         20          9          0        .00    1558.81    2302.64
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 10.620

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 655.0 2125.0 TYPE= 1 TARGET= -655.000

10.620	11.23	1440.43	1440.43	.00	1442.40	1.97	3.21	.12	1432.00
39000.0	8586.2	28009.6	2404.2	2002.3	2164.1	402.2	1160.7	326.9	1432.00
.31	4.29	12.94	5.98	.045	.035	.050	.000	1429.20	655.00
.004549	605.	590.	600.	3	8	0	.00	1316.30	2107.16

*SECNO 10.700

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 800.0 2255.0 TYPE= 1 TARGET= -800.000

10.700	11.08	1443.58	1443.58	.00	1445.90	2.32	1.88	.11	1436.00
39000.0	8806.0	26686.6	3507.3	1686.0	1867.1	567.8	1199.7	337.0	1436.00
.32	5.22	14.29	6.18	.045	.035	.050	.000	1432.50	1320.26
.005209	405.	380.	390.	20	5	0	.00	902.63	2238.95

*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 1080.0 2875.0 TYPE= 1 TARGET= -1080.000

10.830	11.88	1447.88	.00	.00	1448.78	.90	2.74	.14	1444.00
39000.0	2425.7	16273.7	20300.6	650.3	1618.6	3818.4	1275.8	353.3	1444.00
.34	3.73	10.05	5.32	.045	.035	.050	.000	1436.00	1554.28
.003489	645.	650.	650.	2	0	0	.00	1284.65	2838.93

*SECNO 10.930

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1360.0 2965.0 TYPE= 1 TARGET= 1605.000

10.930	9.95	1450.95	1450.95	.00	1452.50	1.54	2.42	.19	1448.00
39000.0	4531.6	17013.2	17455.1	657.5	1269.3	2962.1	1338.8	368.2	1448.00
.36	6.89	13.40	5.89	.045	.035	.050	.000	1441.00	1645.16
.007148	500.	500.	500.	20	10	0	.00	1319.84	2965.00

*SECNO 11.040

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 1440.0 2540.0 TYPE= 1 TARGET= 1100.000

11.040	10.66	1454.66	.00	.00	1455.61	.95	3.05	.06	1450.00
39000.0	24784.6	5212.3	9003.1	2984.6	567.0	1748.5	1397.2	382.1	1450.00
.38	8.30	9.19	5.15	.045	.035	.050	.000	1444.00	1447.29
.005265	500.	500.	500.	2	0	0	.00	1092.71	2540.00

*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

11.200	8.42	1460.42	1460.42	.00	1464.44	4.02	2.89	.92	1467.00
39000.0	.0	39000.0	.0	.0	2422.8	.0	1462.1	393.8	1467.00
.39	.00	16.10	.00	.000	.020	.000	.000	1452.00	1847.67
.003008	680.	770.	755.	20	15	0	.00	304.67	2152.33

*SECNO 11.300

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.50

11.300	10.71	1463.21	.00	.00	1465.62	2.41	1.02	.16	1469.00
39000.0	.0	39000.0	.0	.0	3127.9	.0	1495.7	397.6	1469.50
.40	.00	12.47	.00	.000	.020	.000	.000	1452.50	1843.11
.001341	528.	528.	528.	3	0	0	.00	313.79	2156.89

*SECNO 11.400

3301 HV CHANGED MORE THAN HVINS

11.400	9.61	1463.61	.00	.00	1466.65	3.03	.84	.19	1471.50
39000.0	.0	39000.0	.0	.0	2790.3	.0	1531.6	401.4	1472.00
.41	.00	13.98	.00	.000	.020	.000	.000	1454.00	1845.27
.001922	528.	528.	528.	3	0	0	.00	309.46	2154.73

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T1      SKUNK CREEK REGULATORY FLOODPLAIN & FLOODWAY
T2      INCLUDES ADOBE SUBDIVISION (BAKER ENGINEERS)
T3      SKUNKFIS.DAT            100-YEAR BASE FLOOD ELEVATION

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

                3                                                           1377.8

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     15                 -1
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 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 2
0

CCHV=     .100 CEHV=     .300
*SECNO 8.690
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      820.0    2420.0  TYPE=      1  TARGET=     1600.000
     8.690      9.38   1379.18   1379.18   1378.24   1380.64      1.46       .00       .00   1376.00
   39000.0   18816.1   14760.2    5423.8    2966.7    1084.6     943.6        .0        .0   1376.00
       .00      6.34     13.61      5.75      .045      .035      .045      .000   1369.80    820.00
   .006725        0.        0.        0.         0         7         0       .00   1600.00   2420.00

*SECNO 8.750

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=      900.0    2290.0  TYPE=      1  TARGET=     1390.000
     8.750     12.56   1383.56       .00   1383.33   1385.17      1.61      4.48       .04   1376.00
   39000.0   10979.9   24268.1    3752.0    2093.6    1981.0     765.1      88.9      27.3   1380.00
       .02      5.24     12.25      4.90      .045      .035      .045      .000   1371.00    900.00
   .005032      835.      739.      733.         3         0         0       .00   1360.11   2290.00

*SECNO 8.890
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1280.0    2470.0  TYPE=      1  TARGET=     1190.000
     8.890     10.46   1388.46   1388.46   1388.06   1390.09      1.62      4.08       .01   1384.00
   39000.0    8845.1   27537.1    2617.8    1727.4    2347.6     567.9     165.3      46.1   1384.00
       .04      5.12     11.73      4.61      .045      .035      .045      .000   1378.00   1280.00
   .005818      565.      840.      650.         2        10         0       .00   1190.00   2470.00

*SECNO 8.965
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1380.0    2575.0  TYPE=      1  TARGET=     1195.000
     8.965     10.10   1391.10   1391.10   1390.85   1392.77      1.67      2.35       .01   1388.00
   39000.0    6845.9   27817.4    4336.7    1378.3    2353.0     759.2     203.0      55.4   1388.00
       .05      4.97     11.82      5.71      .045      .035      .045      .000   1381.00   1380.00
   .006714      275.      400.      410.         2        10         0       .00   1195.00   2575.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.050

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.60

3470 ENCROACHMENT STATIONS= 1375.0 2525.0 TYPE= 1 TARGET= 1150.000

9.050	11.97	1393.97	.00	1393.05	1394.80	.84	1.95	.08	1388.00
39000.0	13267.0	19303.0	6430.0	2669.2	2081.8	1526.6	259.7	67.2	1390.00
.07	4.97	9.27	4.21	.045	.035	.045	.000	1382.00	1375.00
.002628	410.	550.	370.	2	0	0	.00	1150.00	2525.00

*SECNO 9.090
3280 CROSS SECTION 9.09 EXTENDED 1.19 FEET

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1310.0 2580.0 TYPE= 1 TARGET= 1270.000

9.090	5.59	1395.19	1395.19	1395.22	1396.88	1.70	1.53	.26	1393.00
39000.0	1599.4	37344.6	56.0	434.1	3506.0	12.4	298.6	76.3	1392.70
.08	3.68	10.65	4.53	.045	.035	.045	.000	1389.60	1310.00
.009589	328.	348.	278.	4	14	0	.00	1270.00	2580.00

*SECNO 9.100
3280 CROSS SECTION 9.10 EXTENDED 1.14 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1310.0 2580.0 TYPE= 1 TARGET= 1270.000

9.100	5.54	1395.14	1395.14	1395.21	1397.00	1.86	.00	.05	1393.00
39000.0	713.1	38260.9	26.0	414.4	3464.9	12.1	298.7	76.3	1392.70
.08	1.72	11.04	2.14	.045	.016	.045	.000	1389.60	1310.00
.002188	1.	1.	1.	3	5	0	.00	1270.00	2580.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

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*SECNO 9.115
3280 CROSS SECTION      9.11 EXTENDED      1.50 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1310.0    2580.0  TYPE=      1  TARGET=     1270.000
     9.115      5.60   1395.50   1395.50   1395.53   1397.26      1.76       .05       .01   1394.00
   39000.0     460.6   38512.0      27.4     299.6    3591.6      12.5     300.7      77.0   1393.00
       .08      1.54     10.72      2.20      .045      .016      .045      .000   1389.90   1310.00
   .002247       22.       22.       22.        20         5         0       .00   1270.00   2580.00

*SECNO 9.190
3280 CROSS SECTION      9.19 EXTENDED      1.97 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     1310.0    2580.0  TYPE=      1  TARGET=     1270.000
     9.190      5.97   1396.17       .00   1396.28   1397.37      1.21       .06       .06   1392.80
   39000.0    1999.4   36965.0      35.6     975.8    4086.1      18.9     304.5      78.0   1392.40
       .08      2.05      9.05      1.89      .045      .016      .045      .000   1390.20   1310.00
   .001178       37.       37.       37.         5         0         0       .00   1270.00   2580.00

*SECNO 9.200
3280 CROSS SECTION      9.20 EXTENDED      2.35 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =    .56

3470 ENCROACHMENT STATIONS=     1310.0    2580.0  TYPE=      1  TARGET=     1270.000
     9.200      6.35   1396.55       .00   1396.75   1397.41       .86       .00       .03   1392.80
   39000.0    4558.1   34369.1      72.7    1130.6    4409.1      20.8     304.6      78.1   1392.40
       .08      4.03      7.80      3.50      .045      .035      .045      .000   1390.20   1310.00
   .003783        1.        1.        1.         3         0         0       .00   1270.00   2580.00
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SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

1490 NH CARD USED
*SECNO 9.210
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

3470 ENCROACHMENT STATIONS=     1380.0    2550.0  TYPE=      1  TARGET=     1170.000
     9.210      7.51   1398.11      .00   1398.01   1399.01      .90      1.59       .01   1394.00
   39000.0    5364.1   33635.9       .0    1524.5    4174.2       .0     373.0      92.3   1398.50
       .11      3.52      8.06      .00      .045      .030     .000      .000   1390.60   1380.00
   .002322      422.      562.     462.         2         0        0       .00   1158.17   2538.17

1490 NH CARD USED
*SECNO 9.310

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .64


3470 ENCROACHMENT STATIONS=     1280.0    2410.0  TYPE=      1  TARGET=     1130.000
     9.310      7.57   1399.07   1399.01   1399.38   1401.71     2.64      2.18       .52   1398.00
   39000.0     150.5   38849.5       .0     116.4    2972.0       .0     433.8     106.0   1401.00
       .12      1.29     13.07      .00      .045      .030     .000      .000   1391.50   1280.00
   .005637      400.      650.     480.         6         5        0       .00   1110.14   2390.14

*SECNO 9.400

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=     1330.0    2460.0  TYPE=      1  TARGET=     1130.000
     9.400      9.22   1402.82      .00   1402.57   1404.50     1.68      2.69       .10   1402.00
   39000.0    2571.3   36428.7       .0     755.5    3398.1       .0     474.8     117.0   1405.00
       .13      3.40     10.72      .00      .040      .035     .000      .000   1393.60   1330.00
   .005049      370.      510.     420.         3         0        0       .00   1113.87   2443.87

1490 NH CARD USED
*SECNO 9.480
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1540.0 2470.0 TYPE= 1 TARGET= 930.000

9.480	9.78	1405.78	1405.78	1405.82	1408.07	2.28	3.26	.18	1404.00
39000.0	1808.9	35322.9	1868.2	447.3	2790.5	373.1	516.5	126.7	1402.00
.14	4.04	12.66	5.01	.045	.045	.050	.000	1396.00	1540.00
.009511	370.	490.	420.	3	8	0	.00	871.69	2470.00

*SECNO 9.580

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.44

3470 ENCROACHMENT STATIONS= 1815.0 2535.0 TYPE= 1 TARGET= 720.000

9.580	10.92	1409.42	.00	1408.89	1411.00	1.57	2.86	.07	1407.50
39000.0	720.3	32963.4	5316.4	199.9	3092.6	872.7	556.4	134.6	1406.00
.16	3.60	10.66	6.09	.045	.035	.045	.000	1398.50	1815.00
.004556	390.	450.	460.	2	0	0	.00	720.00	2535.00

*SECNO 9.670

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1820.0 2480.0 TYPE= 1 TARGET= -1820.000

9.670	11.58	1411.58	1411.58	1411.66	1414.36	2.78	2.58	.36	1408.00
39000.0	1511.1	14170.2	23318.7	297.5	821.8	2151.8	592.1	141.0	1408.00
.17	5.08	17.24	10.84	.045	.035	.045	.000	1400.00	1820.00
.008994	470.	410.	420.	4	8	0	.00	590.89	2410.89

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.750
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

9.750	13.72	1415.42	1415.42	1415.42	1418.41	3.00	2.94	.06	1410.00
39000.0	4147.6	23069.7	11782.7	626.5	1379.2	1356.7	622.1	146.2	1410.00
.17	6.62	16.73	8.68	.045	.035	.045	.000	1401.70	1742.92
.006440	390.	370.	410.	4	11	0	.00	547.00	2289.93

*SECNO 9.840

3301 HV CHANGED MORE THAN HVINS

9.840	15.71	1418.71	.00	1418.71	1420.76	2.05	2.25	.09	1414.00
39000.0	4667.5	29923.8	4408.7	865.2	2352.3	700.5	662.8	152.3	1410.00
.19	5.39	12.72	6.29	.045	.035	.045	.000	1403.00	1762.35
.003512	500.	480.	490.	2	0	0	.00	529.25	2291.60

*SECNO 9.940

9.940	14.54	1420.54	.00	1420.54	1422.43	1.89	1.65	.02	1410.00
39000.0	10190.9	25413.9	3395.1	1454.2	1992.2	599.4	707.2	157.9	1412.00
.20	7.01	12.76	5.66	.045	.035	.045	.000	1406.00	1752.14
.003138	430.	520.	470.	2	0	0	.00	505.85	2258.00

*SECNO 10.040

10.040	13.23	1422.23	.00	1422.23	1424.11	1.88	1.69	.00	1414.00
39000.0	3275.2	32027.8	3697.0	538.8	2695.4	749.0	756.9	164.4	1414.00
.21	6.08	11.88	4.94	.045	.035	.045	.000	1409.00	1820.96
.003118	540.	540.	540.	2	0	0	.00	553.66	2374.62

*SECNO 10.120

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

10.120	11.74	1423.24	1423.24	1423.24	1426.51	3.27	1.62	.41	1414.00
39000.0	2729.9	32820.6	3449.6	418.0	2108.7	552.5	789.1	169.6	1416.00
.22	6.53	15.56	6.24	.045	.035	.045	.000	1411.50	1753.78
.005822	450.	380.	420.	4	11	0	.00	536.13	2289.92

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 10.210
   10.210      11.15    1426.65        .00    1426.65    1429.44       2.79       2.88        .05    1420.00
  39000.0     1599.6    24565.3    12835.1      236.6     1582.9     1445.2      822.7      175.3    1418.00
      .23       6.76      15.52       8.88       .045       .035       .045       .000    1415.50    1806.43
 .006836       490.       450.       475.          4          0          0        .00     523.44    2329.87

*SECNO 10.300

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   10.300       9.78    1430.58    1430.58    1430.58    1432.76       2.19       3.25        .06    1424.00
  39000.0     1381.3    26114.3    11504.4      201.1     1890.5     1837.3      859.6      182.8    1424.00
      .24       6.87      13.81       6.26       .045       .040       .050       .000    1420.80    1787.12
 .007865       460.       440.       450.          3         15          0        .00     930.03    2717.16

*SECNO 10.400

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.79


3470 ENCROACHMENT STATIONS=      950.0    2490.0  TYPE=      1  TARGET=     1540.000
   10.400      12.01    1434.01        .00    1434.01    1434.78        .78       1.88        .14    1430.00
  39000.0     9772.4    22609.5     6618.1     2778.9     2592.3     1653.3      918.5      196.2    1428.00
      .26       3.52       8.72       4.00       .045       .040       .050       .000    1422.00     950.00
 .002450       480.       460.       470.          2          0          0        .00    1540.00    2490.00

*SECNO 10.490

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      720.0    2310.0  TYPE=      1  TARGET=     -720.000
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 SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 10.490     10.55   1437.05   1437.05   1437.05   1438.61      1.55      1.71       .23   1434.00
39000.0    9898.8   26844.5    2256.7    2280.8    2303.8     397.7     979.9     211.6   1432.00
    .27      4.34     11.65      5.68      .045      .040      .050      .000   1426.50    743.82
.006504      420.      470.      450.        20         9         0       .00   1558.81   2302.64

*SECNO 10.620

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      655.0    2125.0  TYPE=      1  TARGET=     -655.000
 10.620     11.23   1440.43   1440.43   1440.43   1442.40      1.97      3.21       .12   1432.00
39000.0    8586.2   28009.6    2404.2    2002.3    2164.1     402.2    1045.4     231.4   1432.00
    .29      4.29     12.94      5.98      .045      .035      .050      .000   1429.20    655.00
.004549      605.      590.      600.         3         8         0       .00   1316.30   2107.16

*SECNO 10.700

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      800.0    2255.0  TYPE=      1  TARGET=     -800.000
 10.700     11.08   1443.58   1443.58   1443.58   1445.90      2.32      1.88       .11   1436.00
39000.0    8806.0   26686.6    3507.3    1686.0    1867.1     567.8    1084.5     241.6   1436.00
    .30      5.22     14.29      6.18      .045      .035      .050      .000   1432.50   1320.26
.005209      405.      380.      390.        20         5         0       .00    902.63   2238.95

*SECNO 10.830

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     1080.0    2875.0  TYPE=      1  TARGET=    -1080.000
 10.830     11.88   1447.88       .00   1447.88   1448.78       .90      2.74       .14   1444.00
39000.0    2425.7   16273.7   20300.6     650.3    1618.6    3818.4    1160.5     257.9   1444.00
    .32      3.73     10.05      5.32      .045      .035      .050      .000   1436.00   1554.28
.003489      645.      650.      650.         2         0         0       .00   1284.65   2838.93
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 10.930

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1360.0     2965.0  TYPE=      1  TARGET=     1605.000
   10.930       9.95    1450.95    1450.95    1450.95    1452.50       1.54       2.42        .19    1448.00
   39000.0    4531.6    17013.2    17455.1      657.5     1269.3     2962.1     1223.5      272.8    1448.00
       .34       6.89      13.40       5.89       .045       .035       .050       .000    1441.00    1645.16
   .007148      500.       500.       500.         20         10          0        .00    1319.84    2965.00

*SECNO 11.040

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     1440.0     2540.0  TYPE=      1  TARGET=     1100.000
   11.040      10.66    1454.66        .00    1454.66    1455.61        .95       3.05        .06    1450.00
   39000.0   24784.6     5212.3     9003.1     2984.6      567.0     1748.5     1282.0      286.7    1450.00
       .36       8.30       9.19       5.15       .045       .035       .050       .000    1444.00    1447.29
   .005265      500.       500.       500.          2          0          0        .00    1092.71    2540.00

*SECNO 11.200

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   11.200       8.42    1460.42    1460.42    1460.42    1464.44       4.02       2.89        .92    1467.00
   39000.0        .0    39000.0        .0         .0     2422.8         .0     1346.8      298.4    1467.00
       .37        .00      16.10        .00       .000       .020       .000       .000    1452.00    1847.67
   .003008      680.       770.       755.         20         15          0        .00     304.67    2152.33

*SECNO 11.300
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.50

11.300	10.71	1463.21	.00	1463.21	1465.62	2.41	1.02	.16	1469.00
39000.0	.0	39000.0	.0	.0	3127.9	.0	1380.5	302.2	1469.50
.38	.00	12.47	.00	.000	.020	.000	.000	1452.50	1843.11
.001341	528.	528.	528.	3	0	0	.00	313.79	2156.89

*SECNO 11.400

3301 HV CHANGED MORE THAN HVINS

11.400	9.61	1463.61	.00	1463.61	1466.65	3.03	.84	.19	1471.50
39000.0	.0	39000.0	.0	.0	2790.3	.0	1416.3	305.9	1472.00
.39	.00	13.98	.00	.000	.020	.000	.000	1454.00	1845.27
.001922	528.	528.	528.	3	0	0	.00	309.46	2154.73

THIS RUN EXECUTED 17SEP02 17:16:30

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SKUNKFIS.DAT

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS	VCH	DEPTH	TOPWID	AREA	FRCH	SSTA	ENDST
*	8.690	39000.00	1378.24	1378.24	12.75	8.44	2828.79	6064.83	.86	771.11	3599.90
*	8.690	39000.00	1379.18	1379.18	13.61	9.38	1600.00	4994.88	.86	820.00	2420.00
*	8.750	39000.00	1383.33	1383.33	10.90	12.33	3210.50	6871.51	.68	717.45	3963.01
	8.750	39000.00	1383.56	.00	12.25	12.56	1360.11	4839.63	.75	900.00	2290.00
*	8.890	39000.00	1388.06	1388.06	10.27	10.06	2860.00	6791.17	.71	870.00	3730.00
*	8.890	39000.00	1388.46	1388.46	11.73	10.46	1190.00	4643.02	.79	1280.00	2470.00
*	8.965	39000.00	1390.85	1390.85	10.22	9.85	2490.00	6210.22	.73	1085.00	3575.00
*	8.965	39000.00	1391.10	1391.10	11.82	10.10	1195.00	4490.59	.83	1380.00	2575.00
*	9.050	39000.00	1393.05	.00	8.72	11.05	2045.00	7788.61	.55	1370.00	3415.00
*	9.050	39000.00	1393.97	.00	9.27	11.97	1150.00	6277.56	.55	1375.00	2525.00
*	9.090	39000.00	1395.22	1395.22	9.42	5.62	2346.59	5175.09	.82	1118.41	3465.00
*	9.090	39000.00	1395.19	1395.19	10.65	5.59	1270.00	3952.48	.93	1310.00	2580.00
*	9.100	39000.00	1395.21	1395.21	10.26	5.61	2339.59	5147.35	.89	1125.41	3465.00
*	9.100	39000.00	1395.14	1395.14	11.04	5.54	1270.00	3891.40	.97	1310.00	2580.00
*	9.115	39000.00	1395.53	1395.53	10.59	5.63	1643.87	4069.06	.95	936.13	2580.00
*	9.115	39000.00	1395.50	1395.50	10.72	5.60	1270.00	3903.66	.97	1310.00	2580.00
*	9.190	39000.00	1396.28	.00	8.65	6.08	1958.86	5889.06	.69	621.14	2580.00
	9.190	39000.00	1396.17	.00	9.05	5.97	1270.00	5080.78	.73	1310.00	2580.00
*	9.200	39000.00	1396.75	.00	7.01	6.55	2023.01	6817.93	.53	556.99	2580.00
*	9.200	39000.00	1396.55	.00	7.80	6.35	1270.00	5560.44	.60	1310.00	2580.00
	9.210	39000.00	1398.01	.00	8.23	7.41	1157.66	5575.23	.59	1380.00	2537.66
	9.210	39000.00	1398.11	.00	8.06	7.51	1158.17	5698.63	.57	1380.00	2538.17

	SECNO	Q	CWSEL	CRIWS	VCH	DEPTH	TOPWID	AREA	FRCH	SSTA	ENDST
*	9.310	39000.00	1399.38	1399.38	12.18	7.88	1280.75	3655.24	.83	1110.00	2390.75
*	9.310	39000.00	1399.07	1399.01	13.07	7.57	1110.14	3088.45	.91	1280.00	2390.14
	9.400	39000.00	1402.57	1402.32	10.49	8.97	1462.69	4514.44	.72	980.00	2442.69
	9.400	39000.00	1402.82	.00	10.72	9.22	1113.87	4153.60	.73	1330.00	2443.87
*	9.480	39000.00	1405.82	1405.82	11.60	9.82	1245.88	4323.12	.73	1170.00	2470.00
*	9.480	39000.00	1405.78	1405.78	12.66	9.78	871.69	3610.99	.80	1540.00	2470.00
	9.580	39000.00	1408.89	.00	11.13	10.39	935.00	4248.48	.76	1600.00	2535.00
*	9.580	39000.00	1409.42	.00	10.66	10.92	720.00	4165.26	.70	1815.00	2535.00
*	9.670	39000.00	1411.66	1411.66	16.78	11.66	641.29	3418.59	.97	1770.00	2411.29
*	9.670	39000.00	1411.58	1411.58	17.24	11.58	590.89	3271.11	1.01	1820.00	2410.89
*	9.750	39000.00	1415.42	1415.42	16.72	13.72	547.01	3363.03	.89	1742.92	2289.93
*	9.750	39000.00	1415.42	1415.42	16.73	13.72	547.00	3362.49	.89	1742.92	2289.93
	9.840	39000.00	1418.71	.00	12.72	15.71	529.25	3917.81	.66	1762.35	2291.60
	9.840	39000.00	1418.71	.00	12.72	15.71	529.25	3918.00	.66	1762.35	2291.60
	9.940	39000.00	1420.54	.00	12.76	14.54	505.85	4045.56	.64	1752.15	2258.00
	9.940	39000.00	1420.54	.00	12.76	14.54	505.85	4045.80	.64	1752.14	2258.00
	10.040	39000.00	1422.23	.00	11.88	13.23	553.66	3983.22	.62	1820.96	2374.62
	10.040	39000.00	1422.23	.00	11.88	13.23	553.66	3983.22	.62	1820.96	2374.62
*	10.120	39000.00	1423.24	1423.24	15.56	11.74	536.13	3079.19	.84	1753.78	2289.91
*	10.120	39000.00	1423.24	1423.24	15.56	11.74	536.13	3079.25	.84	1753.78	2289.92
	10.210	39000.00	1426.65	.00	15.52	11.15	523.44	3264.75	.90	1806.43	2329.87
	10.210	39000.00	1426.65	.00	15.52	11.15	523.44	3264.69	.90	1806.43	2329.87
*	10.300	39000.00	1430.58	1430.58	13.81	9.78	930.03	3929.00	.83	1787.12	2717.16
*	10.300	39000.00	1430.58	1430.58	13.81	9.78	930.03	3928.89	.83	1787.12	2717.16
*	10.400	39000.00	1434.01	.00	8.72	12.01	1540.00	7024.27	.48	950.00	2490.00
*	10.400	39000.00	1434.01	.00	8.72	12.01	1540.00	7024.46	.48	950.00	2490.00
*	10.490	39000.00	1437.05	1437.05	11.65	10.55	1558.81	4982.26	.74	743.82	2302.64
*	10.490	39000.00	1437.05	1437.05	11.65	10.55	1558.81	4982.26	.74	743.82	2302.64
*	10.620	39000.00	1440.43	1440.43	12.94	11.23	1316.30	4568.57	.74	655.00	2107.16
*	10.620	39000.00	1440.43	1440.43	12.94	11.23	1316.30	4568.57	.74	655.00	2107.16
*	10.700	39000.00	1443.58	1443.58	14.29	11.08	902.63	4120.92	.79	1320.26	2238.95
*	10.700	39000.00	1443.58	1443.58	14.29	11.08	902.63	4120.92	.79	1320.26	2238.95
	10.830	39000.00	1447.88	.00	10.05	11.88	1284.65	6087.34	.62	1554.28	2838.93
	10.830	39000.00	1447.88	.00	10.05	11.88	1284.65	6087.34	.62	1554.28	2838.93

	SECNO	Q	CWSEL	CRIWS	VCH	DEPTH	TOPWID	AREA	FRCH	SSTA	ENDST
*	10.930	39000.00	1450.95	1450.95	13.40	9.95	1319.84	4888.90	.88	1645.16	2965.00
*	10.930	39000.00	1450.95	1450.95	13.40	9.95	1319.84	4888.90	.88	1645.16	2965.00
	11.040	39000.00	1454.66	.00	9.19	10.66	1092.71	5300.16	.71	1447.29	2540.00
	11.040	39000.00	1454.66	.00	9.19	10.66	1092.71	5300.16	.71	1447.29	2540.00
*	11.200	39000.00	1460.42	1460.42	16.10	8.42	304.67	2422.81	1.01	1847.67	2152.33
*	11.200	39000.00	1460.42	1460.42	16.10	8.42	304.67	2422.81	1.01	1847.67	2152.33
*	11.300	39000.00	1463.21	.00	12.47	10.71	313.79	3127.86	.70	1843.11	2156.89
*	11.300	39000.00	1463.21	.00	12.47	10.71	313.79	3127.86	.70	1843.11	2156.89
	11.400	39000.00	1463.61	.00	13.98	9.61	309.46	2790.26	.82	1845.27	2154.73
	11.400	39000.00	1463.61	.00	13.98	9.61	309.46	2790.26	.82	1845.27	2154.73

SKUNKFIS.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	8.690	.00	.00	.00	1369.80	39000.00	1378.24	1378.24	1379.34	69.97	12.75	6064.83	4662.50
*	8.690	.00	.00	.00	1369.80	39000.00	1379.18	1379.18	1380.64	67.25	13.61	4994.88	4755.59
*	8.750	739.00	.00	.00	1371.00	39000.00	1383.33	1383.33	1384.43	41.34	10.90	6871.51	6065.57
	8.750	739.00	.00	.00	1371.00	39000.00	1383.56	.00	1385.17	50.32	12.25	4839.63	5498.13
*	8.890	840.00	.00	.00	1378.00	39000.00	1388.06	1388.06	1389.09	48.33	10.27	6791.17	5609.63
*	8.890	840.00	.00	.00	1378.00	39000.00	1388.46	1388.46	1390.09	58.18	11.73	4643.02	5113.00
*	8.965	400.00	.00	.00	1381.00	39000.00	1390.85	1390.85	1391.91	52.96	10.22	6210.22	5359.17
*	8.965	400.00	.00	.00	1381.00	39000.00	1391.10	1391.10	1392.77	67.14	11.82	4490.59	4759.54
*	9.050	550.00	.00	.00	1382.00	39000.00	1393.05	.00	1393.68	26.88	8.72	7788.61	7522.88
*	9.050	550.00	.00	.00	1382.00	39000.00	1393.97	.00	1394.80	26.28	9.27	6277.56	7607.77
*	9.090	348.00	.00	.00	1389.60	39000.00	1395.22	1395.22	1396.43	74.10	9.42	5175.09	4530.71
*	9.090	348.00	.00	.00	1389.60	39000.00	1395.19	1395.19	1396.88	95.89	10.65	3952.48	3982.66
*	9.100	1.00	.00	.00	1389.60	39000.00	1395.21	1395.21	1396.73	18.46	10.26	5147.35	9078.11
*	9.100	1.00	.00	.00	1389.60	39000.00	1395.14	1395.14	1397.00	21.88	11.04	3891.40	8337.84
*	9.115	22.00	.00	.00	1389.90	39000.00	1395.53	1395.53	1397.25	21.64	10.59	4069.06	8384.14
*	9.115	22.00	.00	.00	1389.90	39000.00	1395.50	1395.50	1397.26	22.47	10.72	3903.66	8226.85
*	9.190	37.00	.00	.00	1390.20	39000.00	1396.28	.00	1397.37	10.45	8.65	5889.06	12066.44
	9.190	37.00	.00	.00	1390.20	39000.00	1396.17	.00	1397.37	11.78	9.05	5080.78	11360.58
*	9.200	1.00	.00	.00	1390.20	39000.00	1396.75	.00	1397.41	29.09	7.01	6817.93	7231.06
*	9.200	1.00	.00	.00	1390.20	39000.00	1396.55	.00	1397.41	37.83	7.80	5560.44	6340.60
	9.210	562.00	.00	.00	1390.60	39000.00	1398.01	.00	1398.94	24.77	8.23	5575.23	7836.50
	9.210	562.00	.00	.00	1390.60	39000.00	1398.11	.00	1399.01	23.22	8.06	5698.63	8093.61
*	9.310	650.00	.00	.00	1391.50	39000.00	1399.38	1399.38	1401.62	45.98	12.18	3655.24	5751.80
*	9.310	650.00	.00	.00	1391.50	39000.00	1399.07	1399.01	1401.71	56.37	13.07	3088.45	5194.55
	9.400	510.00	.00	.00	1393.60	39000.00	1402.57	1402.32	1404.10	50.73	10.49	4514.44	5475.67
	9.400	510.00	.00	.00	1393.60	39000.00	1402.82	.00	1404.50	50.49	10.72	4153.60	5488.43
*	9.480	490.00	.00	.00	1396.00	39000.00	1405.82	1405.82	1407.61	79.37	11.60	4323.12	4377.59
*	9.480	490.00	.00	.00	1396.00	39000.00	1405.78	1405.78	1408.07	95.11	12.66	3610.99	3998.90
	9.580	450.00	.00	.00	1398.50	39000.00	1408.89	.00	1410.54	55.01	11.13	4248.48	5258.47
*	9.580	450.00	.00	.00	1398.50	39000.00	1409.42	.00	1411.00	45.56	10.66	4165.26	5777.89
*	9.670	410.00	.00	.00	1400.00	39000.00	1411.66	1411.66	1414.27	84.13	16.78	3418.59	4252.01
*	9.670	410.00	.00	.00	1400.00	39000.00	1411.58	1411.58	1414.36	89.94	17.24	3271.11	4112.37

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	9.750	370.00	.00	.00	1401.70	39000.00	1415.42	1415.42	1418.41	64.37	16.72	3363.03	4861.02
*	9.750	370.00	.00	.00	1401.70	39000.00	1415.42	1415.42	1418.41	64.40	16.73	3362.49	4859.97
	9.840	480.00	.00	.00	1403.00	39000.00	1418.71	.00	1420.76	35.12	12.72	3917.81	6580.62
	9.840	480.00	.00	.00	1403.00	39000.00	1418.71	.00	1420.76	35.12	12.72	3918.00	6581.08
	9.940	520.00	.00	.00	1406.00	39000.00	1420.54	.00	1422.42	31.39	12.76	4045.56	6961.26
	9.940	520.00	.00	.00	1406.00	39000.00	1420.54	.00	1422.43	31.38	12.76	4045.80	6961.85
	10.040	540.00	.00	.00	1409.00	39000.00	1422.23	.00	1424.11	31.18	11.88	3983.22	6983.81
	10.040	540.00	.00	.00	1409.00	39000.00	1422.23	.00	1424.11	31.18	11.88	3983.22	6983.81
*	10.120	380.00	.00	.00	1411.50	39000.00	1423.24	1423.24	1426.51	58.23	15.56	3079.19	5110.93
*	10.120	380.00	.00	.00	1411.50	39000.00	1423.24	1423.24	1426.51	58.22	15.56	3079.25	5111.06
	10.210	450.00	.00	.00	1415.50	39000.00	1426.65	.00	1429.44	68.35	15.52	3264.75	4717.23
	10.210	450.00	.00	.00	1415.50	39000.00	1426.65	.00	1429.44	68.36	15.52	3264.69	4717.10
*	10.300	440.00	.00	.00	1420.80	39000.00	1430.58	1430.58	1432.76	78.65	13.81	3929.00	4397.61
*	10.300	440.00	.00	.00	1420.80	39000.00	1430.58	1430.58	1432.76	78.65	13.81	3928.89	4397.46
*	10.400	460.00	.00	.00	1422.00	39000.00	1434.01	.00	1434.78	24.50	8.72	7024.27	7878.74
*	10.400	460.00	.00	.00	1422.00	39000.00	1434.01	.00	1434.78	24.50	8.72	7024.46	7879.01
*	10.490	470.00	.00	.00	1426.50	39000.00	1437.05	1437.05	1438.61	65.04	11.65	4982.26	4835.91
*	10.490	470.00	.00	.00	1426.50	39000.00	1437.05	1437.05	1438.61	65.04	11.65	4982.26	4835.91
*	10.620	590.00	.00	.00	1429.20	39000.00	1440.43	1440.43	1442.40	45.49	12.94	4568.57	5782.30
*	10.620	590.00	.00	.00	1429.20	39000.00	1440.43	1440.43	1442.40	45.49	12.94	4568.57	5782.30
*	10.700	380.00	.00	.00	1432.50	39000.00	1443.58	1443.58	1445.90	52.09	14.29	4120.92	5403.75
*	10.700	380.00	.00	.00	1432.50	39000.00	1443.58	1443.58	1445.90	52.09	14.29	4120.92	5403.75
	10.830	650.00	.00	.00	1436.00	39000.00	1447.88	.00	1448.78	34.89	10.05	6087.34	6602.20
	10.830	650.00	.00	.00	1436.00	39000.00	1447.88	.00	1448.78	34.89	10.05	6087.34	6602.20
*	10.930	500.00	.00	.00	1441.00	39000.00	1450.95	1450.95	1452.50	71.48	13.40	4888.90	4612.99
*	10.930	500.00	.00	.00	1441.00	39000.00	1450.95	1450.95	1452.50	71.48	13.40	4888.90	4612.99
	11.040	500.00	.00	.00	1444.00	39000.00	1454.66	.00	1455.61	52.65	9.19	5300.16	5374.88
	11.040	500.00	.00	.00	1444.00	39000.00	1454.66	.00	1455.61	52.65	9.19	5300.16	5374.88
*	11.200	770.00	.00	.00	1452.00	39000.00	1460.42	1460.42	1464.44	30.08	16.10	2422.81	7110.69
*	11.200	770.00	.00	.00	1452.00	39000.00	1460.42	1460.42	1464.44	30.08	16.10	2422.81	7110.69
*	11.300	528.00	.00	.00	1452.50	39000.00	1463.21	.00	1465.62	13.41	12.47	3127.86	10650.88
*	11.300	528.00	.00	.00	1452.50	39000.00	1463.21	.00	1465.62	13.41	12.47	3127.86	10650.88
	11.400	528.00	.00	.00	1454.00	39000.00	1463.61	.00	1466.65	19.22	13.98	2790.26	8894.99
	11.400	528.00	.00	.00	1454.00	39000.00	1463.61	.00	1466.65	19.22	13.98	2790.26	8894.99

SKUNKFIS.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	8.690	39000.00	1378.24	.00	.00	.44	2828.79	.00
*	8.690	39000.00	1379.18	.94	.00	.94	1600.00	.00
*	8.750	39000.00	1383.33	.00	5.09	.00	3210.50	739.00
	8.750	39000.00	1383.56	.23	4.38	.23	1360.11	739.00
*	8.890	39000.00	1388.06	.00	4.72	.00	2860.00	840.00
*	8.890	39000.00	1388.46	.41	4.90	.41	1190.00	840.00
*	8.965	39000.00	1390.85	.00	2.79	.00	2490.00	400.00
*	8.965	39000.00	1391.10	.25	2.64	.25	1195.00	400.00
*	9.050	39000.00	1393.05	.00	2.20	.00	2045.00	550.00
*	9.050	39000.00	1393.97	.91	2.86	.91	1150.00	550.00
*	9.090	39000.00	1395.22	.00	2.17	.00	2346.59	348.00
*	9.090	39000.00	1395.19	-.04	1.22	-.04	1270.00	348.00
*	9.100	39000.00	1395.21	.00	-.01	.00	2339.59	1.00
*	9.100	39000.00	1395.14	-.07	-.05	-.07	1270.00	1.00
*	9.115	39000.00	1395.53	.00	.32	.00	1643.87	22.00
*	9.115	39000.00	1395.50	-.04	.36	-.04	1270.00	22.00
*	9.190	39000.00	1396.28	.00	.75	.00	1958.86	37.00
	9.190	39000.00	1396.17	-.12	.67	-.12	1270.00	37.00
*	9.200	39000.00	1396.75	.00	.47	.00	2023.01	1.00
*	9.200	39000.00	1396.55	-.21	.38	-.21	1270.00	1.00
	9.210	39000.00	1398.01	.00	1.25	.00	1157.66	562.00
	9.210	39000.00	1398.11	.11	1.56	.11	1158.17	562.00
*	9.310	39000.00	1399.38	.00	1.37	.00	1280.75	650.00
*	9.310	39000.00	1399.07	-.31	.96	-.31	1110.14	650.00
	9.400	39000.00	1402.57	.00	3.19	.00	1462.69	510.00
	9.400	39000.00	1402.82	.25	3.75	.25	1113.87	510.00
*	9.480	39000.00	1405.82	.00	3.25	.00	1245.88	490.00
*	9.480	39000.00	1405.78	-.04	2.96	-.04	871.69	490.00
	9.580	39000.00	1408.89	.00	3.06	.00	935.00	450.00
*	9.580	39000.00	1409.42	.54	3.64	.54	720.00	450.00
*	9.670	39000.00	1411.66	.00	2.78	.00	641.29	410.00
*	9.670	39000.00	1411.58	-.09	2.15	-.09	590.89	410.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	9.750	39000.00	1415.42	.00	3.75	.00	547.01	370.00
*	9.750	39000.00	1415.42	.00	3.84	.00	547.00	370.00
	9.840	39000.00	1418.71	.00	3.29	.00	529.25	480.00
	9.840	39000.00	1418.71	.00	3.29	.00	529.25	480.00
	9.940	39000.00	1420.54	.00	1.83	.00	505.85	520.00
	9.940	39000.00	1420.54	.00	1.83	.00	505.85	520.00
	10.040	39000.00	1422.23	.00	1.69	.00	553.66	540.00
	10.040	39000.00	1422.23	.00	1.69	.00	553.66	540.00
*	10.120	39000.00	1423.24	.00	1.01	.00	536.13	380.00
*	10.120	39000.00	1423.24	.00	1.01	.00	536.13	380.00
	10.210	39000.00	1426.65	.00	3.41	.00	523.44	450.00
	10.210	39000.00	1426.65	.00	3.41	.00	523.44	450.00
*	10.300	39000.00	1430.58	.00	3.92	.00	930.03	440.00
*	10.300	39000.00	1430.58	.00	3.92	.00	930.03	440.00
*	10.400	39000.00	1434.01	.00	3.43	.00	1540.00	460.00
*	10.400	39000.00	1434.01	.00	3.43	.00	1540.00	460.00
*	10.490	39000.00	1437.05	.00	3.05	.00	1558.81	470.00
*	10.490	39000.00	1437.05	.00	3.05	.00	1558.81	470.00
*	10.620	39000.00	1440.43	.00	3.38	.00	1316.30	590.00
*	10.620	39000.00	1440.43	.00	3.38	.00	1316.30	590.00
*	10.700	39000.00	1443.58	.00	3.15	.00	902.63	380.00
*	10.700	39000.00	1443.58	.00	3.15	.00	902.63	380.00
	10.830	39000.00	1447.88	.00	4.31	.00	1284.65	650.00
	10.830	39000.00	1447.88	.00	4.31	.00	1284.65	650.00
*	10.930	39000.00	1450.95	.00	3.07	.00	1319.84	500.00
*	10.930	39000.00	1450.95	.00	3.07	.00	1319.84	500.00
	11.040	39000.00	1454.66	.00	3.70	.00	1092.71	500.00
	11.040	39000.00	1454.66	.00	3.70	.00	1092.71	500.00
*	11.200	39000.00	1460.42	.00	5.76	.00	304.67	770.00
*	11.200	39000.00	1460.42	.00	5.76	.00	304.67	770.00
*	11.300	39000.00	1463.21	.00	2.79	.00	313.79	528.00
*	11.300	39000.00	1463.21	.00	2.79	.00	313.79	528.00
	11.400	39000.00	1463.61	.00	.41	.00	309.46	528.00
	11.400	39000.00	1463.61	.00	.41	.00	309.46	528.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=      8.690  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      8.690  PROFILE=  2  CRITICAL DEPTH ASSUMED

CAUTION SECNO=      8.750  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      8.750  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      8.890  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      8.890  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      8.890  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      8.890  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      8.965  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      8.965  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      8.965  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      8.965  PROFILE=  2  MINIMUM SPECIFIC ENERGY

WARNING SECNO=      9.050  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      9.050  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      9.090  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.090  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.090  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      9.090  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.090  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      9.100  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.100  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.100  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      9.100  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.100  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      9.115  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.115  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.115  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      9.115  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.115  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.115  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=      9.190  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      9.200  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      9.200  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      9.310  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.310  PROFILE=  1  MINIMUM SPECIFIC ENERGY
WARNING SECNO=      9.310  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      9.480  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.480  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.480  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.480  PROFILE=  2  MINIMUM SPECIFIC ENERGY
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WARNING SECNO=      9.580  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      9.670  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.670  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.670  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.670  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      9.750  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.750  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      9.750  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      9.750  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      9.750  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     10.120  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.120  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     10.120  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.120  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     10.300  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.300  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     10.300  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.300  PROFILE=  2  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     10.400  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     10.400  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     10.490  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.490  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     10.490  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     10.490  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.490  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     10.490  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     10.620  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.620  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     10.620  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.620  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     10.700  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.700  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     10.700  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     10.700  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.700  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     10.700  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     10.930  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.930  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     10.930  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     10.930  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     10.930  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     10.930  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     11.200  PROFILE=  1  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=     11.200  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     11.200  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     11.200  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     11.200  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     11.200  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     11.300  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     11.300  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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FLOODWAY DATA, SKUNKFIS.DAT
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
8.690	1600.	4995.	7.8	1379.1	1378.2	.9
8.750	1390.	4840.	8.1	1383.5	1383.3	.2
8.890	1190.	4643.	8.4	1388.5	1388.1	.4
8.965	1195.	4491.	8.7	1391.1	1390.8	.3
9.050	1150.	6278.	6.2	1394.0	1393.1	.9
9.090	1270.	3952.	9.9	1395.2	1395.2	.0
9.100	1270.	3891.	10.0	1395.1	1395.2	-.1
9.115	1270.	3904.	10.0	1395.5	1395.5	.0
9.190	1270.	5081.	7.7	1396.2	1396.3	-.1
9.200	1270.	5560.	7.0	1396.6	1396.8	-.2
9.210	1158.	5699.	6.8	1398.1	1398.0	.1
9.310	1110.	3088.	12.6	1399.1	1399.4	-.3
9.400	1114.	4154.	9.4	1402.9	1402.6	.3
9.480	930.	3611.	10.8	1405.8	1405.8	.0
9.580	720.	4165.	9.4	1409.4	1408.9	.5
9.670	591.	3271.	11.9	1411.6	1411.7	-.1
9.750	547.	3362.	11.6	1415.4	1415.4	.0
9.840	529.	3918.	10.0	1418.7	1418.7	.0
9.940	506.	4046.	9.6	1420.5	1420.5	.0
10.040	554.	3983.	9.8	1422.2	1422.2	.0
10.120	536.	3079.	12.7	1423.2	1423.2	.0
10.210	523.	3265.	11.9	1426.7	1426.7	.0
10.300	930.	3929.	9.9	1430.6	1430.6	.0
10.400	1540.	7024.	5.6	1434.0	1434.0	.0
10.490	1559.	4982.	7.8	1437.1	1437.1	.0
10.620	1452.	4569.	8.5	1440.4	1440.4	.0
10.700	919.	4121.	9.5	1443.6	1443.6	.0
10.830	1285.	6087.	6.4	1447.9	1447.9	.0
10.930	1320.	4889.	8.0	1451.0	1451.0	.0
11.040	1093.	5300.	7.4	1454.7	1454.7	.0
11.200	305.	2423.	16.1	1460.4	1460.4	.0
11.300	314.	3128.	12.5	1463.2	1463.2	.0
11.400	309.	2790.	14.0	1463.6	1463.6	.0

Revised Model and Cross-section Plots

SKNKLOMR.OH2

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1*******************************************
 *  HEC-2 WATER SURFACE PROFILES            *
 *                                          *
 *  Version    4.6.2;  May 1991             *
 *                                          *
 *  RUN DATE     04NOV02     TIME    17:06:30  *
 *******************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*           (916) 756-1104              *
*****************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

QT	1	39000								
NC	0.045	0.045	0.035	0.1	0.3					
ET		5.1			4025.25	5073.77				
X1	8.69	95	4025.25	5073.77						
GR	1380.0	3796.61	1380.00	3854.47	1379.00	3861.47	1378.00	3868.42	1378.00	3878.69
GR	1378.6	3884.04	1380.00	3896.01	1380.00	3907.92	1379.82	3923.26	1379.91	3925.58
GR	1380.0	4002.41	1380.54	4004.61	1382.00	4011.19	1382.00	4016.12	1381.16	4025.25
GR	1380.0	4037.88	1379.55	4039.54	1378.00	4045.04	1376.66	4058.92	1376.33	4063.23
GR	1376.0	4067.80	1375.66	4071.80	1374.51	4084.66	1374.14	4088.53	1374.00	4090.42
GR	1373.8	4091.18	1373.53	4092.99	1372.00	4102.33	1371.23	4129.14	1370.00	4171.62
GR	1370.0	4446.38	1370.04	4448.91	1372.00	4550.37	1372.00	4583.65	1371.80	4601.95
GR	1371.2	4726.77	1371.45	4741.81	1371.10	4787.06	1371.00	4796.71	1370.54	4837.32
GR	1370.6	4872.36	1370.52	4876.45	1370.60	4881.98	1370.60	4882.00	1370.82	4897.47
GR	1371.4	4906.65	1371.83	4913.95	1372.00	4917.45	1372.34	4920.12	1374.00	4933.03
GR	1374.3	4936.71	1374.00	4958.00	1373.51	4959.38	1372.00	4963.60	1371.80	4964.16
GR	1370.0	4969.21	1368.37	4973.77	1368.00	4974.80	1366.00	4980.35	1365.56	4981.39
GR	1364.7	4987.21	1364.21	4990.25	1364.00	4992.46	1364.00	5000.00	1364.00	5003.25
GR	1365.5	5010.85	1365.78	5012.36	1366.00	5013.46	1366.52	5014.69	1368.00	5018.15
GR	1368.3	5018.85	1370.00	5022.82	1370.70	5024.49	1372.00	5027.49	1373.05	5031.15
GR	1374.0	5034.40	1375.00	5039.27	1376.00	5044.17	1376.23	5045.52	1377.39	5052.81
GR	1378.0	5059.14	1378.78	5065.36	1379.49	5073.77	1379.70	5074.11	1379.26	5077.51
GR	1378.7	5079.93	1378.00	5082.02	1378.00	5116.40	1378.13	5146.24	1378.00	5177.10
GR	1378.0	5181.33	1377.50	5273.67	1377.18	5375.38	1377.56	5451.37	1377.29	5556.89
ET		5.1			4095.41	5039.30				
X1	8.79	89	4095.41	5039.30	530	546	539			
GR	1384.0	3855.70	1384.00	3973.82	1382.64	3980.66	1384.00	3998.09	1382.65	4051.20
GR	1382.6	4058.69	1382.49	4060.23	1382.89	4064.63	1384.00	4067.90	1384.00	4095.41
GR	1382.2	4107.84	1382.00	4109.37	1380.85	4117.39	1380.00	4123.50	1378.49	4137.14
GR	1378.0	4141.55	1376.51	4154.98	1376.00	4159.65	1374.00	4171.01	1373.84	4176.47
GR	1372.0	4222.80	1372.00	4265.74	1371.40	4267.19	1370.00	4271.65	1370.02	4277.10
GR	1370.5	4303.75	1372.00	4387.79	1372.60	4464.89	1373.01	4509.16	1373.45	4564.23
GR	1373.6	4589.91	1374.00	4659.42	1374.00	4677.54	1373.79	4707.25	1374.00	4731.92
GR	1375.0	4815.01	1375.48	4838.28	1375.82	4866.71	1375.01	4881.51	1374.70	4887.04
GR	1374.0	4898.81	1374.00	4914.20	1376.00	4932.06	1377.09	4941.83	1377.77	4948.33
GR	1378.0	4950.51	1378.00	4973.99	1377.74	4974.57	1376.00	4978.35	1375.92	4978.54
GR	1375.3	4979.92	1374.00	4982.54	1373.68	4983.19	1372.00	4986.64	1371.40	4987.87
GR	1370.0	4990.74	1369.23	4992.31	1368.00	4994.83	1367.12	4996.63	1366.00	4998.93
GR	1366.0	5000.00	1367.19	5002.89	1368.00	5004.26	1369.43	5006.66	1370.00	5007.63
GR	1371.8	5010.72	1372.00	5011.01	1372.55	5011.93	1374.00	5014.64	1374.46	5015.50
GR	1376.0	5018.37	1377.54	5024.62	1378.00	5026.26	1378.19	5027.55	1378.48	5029.47
GR	1380.0	5039.30	1380.47	5053.53	1381.00	5070.14	1381.05	5074.82	1381.51	5092.11
GR	1381.8	5130.27	1381.56	5144.28	1381.81	5200.42	1381.90	5207.46	1381.92	5219.18
GR	1382.0	5303.86	1382.00	5320.81	1381.88	5345.60	1381.56	5475.95		
ET		5.1			4541.12	5252.00				
X1	8.93	71	4541.12	5252.00	565	711	722			
GR	1386.3	4279.99	1386.00	4295.47	1386.34	4315.43	1386.00	4350.00	1385.51	4354.32
GR	1386.0	4371.17	1386.00	4454.56	1386.25	4457.97	1387.66	4480.76	1388.00	4485.92
GR	1388.0	4526.66	1386.72	4541.12	1386.00	4552.20	1385.40	4560.69	1385.02	4564.36
GR	1384.5	4569.41	1384.00	4573.51	1382.63	4586.39	1382.43	4588.53	1382.00	4594.51

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QT        1      23500

NC    0.035      0.035      0.035
ET               5.1                          4835.60     5165.24
X1     9.14         94    4835.60    5165.24      288         385        333
GR   1392.1    4525.85    1392.00    4598.96   1391.59     4608.73    1390.99    4723.68    1391.42    4775.78
GR   1391.5    4789.87    1391.64    4805.14   1391.00     4830.80    1390.59    4832.90    1390.00    4835.60
GR   1389.7    4836.69    1389.00    4839.12   1388.44     4841.11    1388.00    4842.60    1387.57    4843.96
GR   1387.0    4845.55    1386.47    4846.70   1386.00     4847.68    1385.71    4848.28    1385.00    4849.75
GR   1384.7    4850.41    1384.00    4851.87   1383.84     4852.20    1383.32    4853.25    1383.00    4853.91
GR   1382.8    4854.33    1382.00    4856.07   1381.65     4856.77    1381.00    4858.07    1380.00    4860.14
GR   1379.7    4861.00    1379.19    4861.98   1379.00     4862.42    1378.49    4863.58    1378.00    4864.71
GR   1377.4    4866.13    1377.00    4867.28   1376.43     4869.03    1376.00    4869.56    1375.54    4872.43
GR   1374.5    4874.14    1374.00    4875.08   1374.00     5000.00    1374.00    5062.13    1374.39    5091.47
GR   1375.0    5121.35    1375.00    5125.45   1375.71     5129.68    1376.00    5131.10    1376.94    5133.66
GR   1377.0    5134.06    1377.77    5135.68   1378.00     5136.16    1379.00    5138.25    1379.92    5140.18
GR   1380.0    5140.35    1380.80    5142.03   1381.00     5142.44    1381.45    5143.38    1382.00    5144.53
GR   1382.9    5146.34    1383.00    5146.63   1383.72     5148.14    1384.00    5148.75    1384.46    5149.37
GR   1385.0    5150.09    1385.25    5150.43   1386.00     5151.41    1386.80    5152.48    1387.00    5152.75
GR   1387.2    5153.56    1388.00    5156.83   1388.60     5159.29    1389.00    5160.92    1389.34    5162.35
GR   1389.7    5164.16    1390.00    5165.24   1390.00     5165.45    1390.42    5166.34    1391.00    5168.32
GR   1391.8    5170.94    1391.91    5171.50   1392.00     5171.73    1392.22    5174.81    1392.64    5180.92
GR   1393.0    5184.53    1392.55    5196.46   1392.91     5224.81    1392.45    5256.91    1392.29    5293.65
GR   1392.1    5328.16    1392.00    5380.42   1392.00     5416.53    1391.87    5437.55
  DOWNSTREAM FACE OF PINNACLE PEAK ROAD BRIDGE

X1    9.145         66       5015       5325         8           8          8
X3       10          0          0          0         0           0          0     1392.2     1393.1
BT      -16       5015     1394.5     1394.5   5015.01      1394.5       1390       5045     1394.8     1390.3
BT                5085     1395.2     1390.7   5088.75      1395.2     1390.8    5093.75     1395.3     1390.8
BT                5125     1395.6     1391.1      5170      1395.7     1391.2       5205     1395.7     1391.2
BT                5245     1395.5       1391   5246.25      1395.5       1391    5251.25     1395.5       1391
BT                5285     1395.2     1390.7      5295      1395.1     1390.6    5324.99     1394.7     1390.2
BT                5325     1394.7     1394.7
GR   1395.6    3767.9     1395.5     3820.9    1395.4     3873.6     1395.4     3891.5     1395.4     3939.2
GR   1395.2    3990.7     1395.4     4052.6    1395.4     4113.7     1395.3     4176.6     1395.1     4229.3
GR   1395.1    4287.4     1394.9     4334.4    1394.8     4385.2     1394.7     4450.4     1394.8     4489.6
GR   1394.5    4524.7     1394.1     4576.1      1394     4617.7     1393.7     4656.6     1393.2     4693.1
GR   1393.1    4730.9     1392.4       4761    1392.2       4821     1392.4       4881    1393.59       4956
GR   1394.4      5006     1394.5       5015      1390    5015.01    1374.94       5045    1374.94       5085
GR   1374.9    5088.74    1390.80    5088.75    1390.80    5093.75    1374.94    5093.76    1374.94       5125
GR   1374.9    5167.49     1391.2     5167.5    1391.2       5170     1391.2     5172.5    1374.94    5172.51
GR   1374.9      5205     1374.94       5245    1374.94    5246.24       1391    5246.25       1391    5251.25
GR   1374.9    5251.26    1374.94       5285    1374.94       5295     1390.2    5324.99     1394.7       5325
GR   1394.8      5326     1393.95       5376    1393.27       5453    1393.07       5520     1393.1     5541.9
GR   1392.9    5588.6      1392.7     5636.9     1392.7     5681.4     1392.5     5740.6     1392.6     5796.6
GR   1392.6    5855.7      1392.4     5922.7     1392.3       5988     1392.3     6032.1     1392.1     6079.5
GR   1392.1      6085
  UPSTREAM FACE OF PINNACLE PEAK ROAD BRIDGE
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X1      9.21         7      4732    5174.57       145       355       279
GR      1389      4732      1376      4765      1376      4901      1376      5000      1376   5140.72
GR      1391   5174.57      1392   5190.05

  TOP OF DROP STRUCTURE

NC     0.040     0.035     0.035
ET                5.1                          4664   5314.09
X1      9.22        14      4664   5192.98       122       104        39
GR      1395      4664      1390      4708      1390   4871.20      1390      5000      1390   5167.75
GR      1391   5173.76      1392   5177.14      1393   5179.36      1394   5181.58      1395   5184.44
GR      1396   5187.36      1397   5192.98      1398   5219.20      1399   5314.09

  REMOVED NON-CONVEYING DEPRESSION BETWEEN STA 3874 AND 4000
  LEFT BANK ENCROACHMENT SET AT FLOW SPLIT BOUNDARY FOR BREAKOUT WSEL MATCHING

ET                5.1                       4738.18   5304.55
X1      9.25        37      4825   5285.60       155        82       141
GR    1393.5      3762      1394      3874      1394      3898      1394   4003.81      1394   4062.18
GR      1395   4283.87      1395   4298.29      1395   4301.25      1395   4365.84      1395    4385.4
GR    1395.7   4563.07      1396   4565.34      1397   4570.45   1397.57   4572.95   1397.46   4582.97
GR      1397   4585.82      1396   4590.84      1395   4598.19      1395   4614.18      1395   4621.31
GR      1394   4735.08      1394      4825      1394   4838.32      1393   4871.51      1392   4892.27
GR      1392      5000      1392    5077.8      1393   5179.38      1394   5266.49      1395   5275.95
GR      1396   5278.52      1397   5281.09      1398   5283.83   1398.64    5285.6      1399   5290.86
GR      1400   5304.55      1399   5325.36

  END FLOW SPLIT; RETURN TO FULL FLOW

QT         1     39000
  LEFT BANK ENCROACHMENT SET AT FLOW SPLIT BOUNDARY
ET                5.1                       4703.41   5290.19
X1      9.30        42   4779.69   5280.97       262       282       261
GR      1395      3820      1394      3930      1394   4045.09      1395   4108.19      1395      4117
GR      1396   4323.15   1396.42   4425.34      1397   4429.71   1397.92   4434.42   1397.94    4441.5
GR      1397   4445.67      1396    4449.8      1395   4453.93   1394.13   4458.61      1394   4462.74
GR      1393   4494.69      1393   4512.86      1394   4520.79      1395   4539.92      1395   4544.55
GR      1395   4549.38      1396   4554.31      1397    4672.3      1397   4703.41      1397   4730.49
GR      1397   4737.81    1396.5      4750      1396   4768.57      1395   4779.69      1394    4811.1
GR      1393    4973.9      1393      5000      1393   5090.01      1394   5237.22      1395   5265.28
GR      1395   5270.89      1396   5273.07      1397   5275.25      1398   5277.47      1399   5279.81
GR    1399.5   5280.97      1400   5290.19

  LEFT BANK ENCROACHMENT SET AT FLOW SPLIT BOUNDARY

ET                5.1                       4657.95   5287.77
X1      9.35        53      4775   5275.88       291       274       274
GR      1397      3873      1396      3970      1396   4133.14      1397   4227.56      1398   4246.88
GR      1399   4251.02    1399.3   4252.38   1399.19   4261.99      1399   4262.89      1398   4266.45
GR      1397   4272.25      1396   4279.28      1395   4304.83      1395   4325.29      1396    4342.7
GR      1397   4379.18      1398    4402.1      1399   4459.05      1399   4467.32      1399   4490.46
GR      1399   4657.95      1399   4675.14      1399      4775      1399   4817.89      1398   4824.28
GR      1398   4830.91      1398   4833.58      1397   4841.76      1396   4854.67      1395   4861.17
GR      1394   4882.23      1393   4897.87      1392   4929.89      1392   4995.23   1392.23      5000
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NC	0.035	0.040	0.040							
ET		5.1			4663.35	5177				
X1	9.54	85	4685.93	5177	410	515	500			
GR	1456	4000	1456	4021.5	1454	4238.02	1454	4370.23	1456	4373.71
GR	1458	4382.67	1460	4392.58	1462	4402.82	1464	4414.23	1464	4416.59
GR	1462	4419.16	1460	4421.73	1458	4424.3	1456	4426.86	1454	4429.43
GR	1452	4432.03	1450	4434.89	1448	4437.71	1446	4440.53	1444	4443.94
GR	1442	4455.27	1440	4466.36	1438	4475.82	1436	4485.28	1434	4494.74
GR	1432	4503.98	1430	4512.83	1428	4521.68	1426	4530.63	1424	4537.95
GR	1422	4543.4	1420	4548.8	1418	4566.76	1416	4576.41	1414	4588.78
GR	1412	4606.7	1410	4618.24	1408	4626.12	1406	4646.3	1405.45	4653.56
GR	1406	4654.9	1408	4659.52	1409.53	4663.35	1409.41	4679.83	1408	4685.93
GR	1406	4694.77	1404	4704.62	1402	4714.47	1400	4759.39	1399	4817.12
GR	1399	4833.11	1399	4849.47	1399	4877	1398	4880.23	1397	4889.16
GR	1397	4922.52	1398	4930.18	1398	4954.06	1397	4978.17	1397	5000
GR	1397	5021.85	1398	5031.11	1399	5044.96	1400	5072.02	1401	5077.75
GR	1402	5083.41	1403	5099.61	1404	5131.49	1404	5150.42	1404	5168.37
GR	1404	5177	1404	5197.33	1404	5199.5	1404	5210.97	1404	5253.08
GR	1404	5391.09	1403	5589.76	1403	5598.79	1404	5665.44	1405	5677.3
GR	1406	5688.92	1407	5698.83	1408	5708.08	1408.1	5709.05	1408	5712.42
ET		5.1			4736.39	5231.86				
X1	9.65	77	4754.19	5231.86	475	503	558			
GR	1464	4000	1464	4008.95	1464	4009.76	1462	4321.74	1460	4399.87
GR	1458	4431.45	1456	4444.62	1454	4455.94	1452	4520.78	1450	4527.92
GR	1448	4534.57	1446	4541.22	1444	4547.9	1442	4555.79	1440	4564.66
GR	1438	4573.56	1436	4582.53	1434	4591.5	1432	4600.47	1430	4609.44
GR	1428	4617.73	1426	4626.65	1424	4636.67	1422	4647.12	1420	4657.56
GR	1418	4668.01	1416	4678.25	1415.47	4681.09	1414	4684.72	1412	4698.82
GR	1410	4712.91	1408.84	4718.95	1410	4724.03	1412	4732.19	1412.28	4733.95
GR	1412.3	4736.39	1412.23	4752.15	1412.23	4753.27	1412	4754.19	1410	4762.26
GR	1408	4770.81	1406	4779.35	1404	4787.89	1402	4808.39	1402	4880.47
GR	1402	5000	1402	5117.6	1402	5177.99	1404	5201.2	1406	5208.98
GR	1408	5216.75	1410	5224.53	1411.67	5231.28	1411.74	5231.86	1411.54	5244.69
GR	1411.6	5244.92	1410	5251.38	1408	5258.75	1406	5266.02	1405	5297.23
GR	1405	5320.44	1406	5347.25	1406	5388.09	1406	5408.08	1407	5541.7
GR	1407	5718.14	1406	5754.4	1406	5784.09	1406	5792.77	1406	5810.87
GR	1406	5820.41	1406	5838.97	1407	5936.82	1408	6017.23	1409	6081.83
GR	1410	6155.49	1411	6165.28						
NC	0.035	0.035	0.035							
ET		5.1			4752.73	5283.89				
X1	9.70	45	4757.14	5273.18	253	259	256			
GR	1466	4109	1464	4316.8	1462	4420.43	1460	4447.14	1458	4478.14
GR	1456	4489.46	1454	4500.45	1452	4509.98	1450	4519.51	1448	4529.04
GR	1446	4538.57	1444	4548.1	1442	4557.38	1440	4566.27	1438	4575.05
GR	1436	4583.83	1434	4592.61	1432	4601.39	1430	4609.72	1428	4617.43
GR	1426	4627.56	1424	4668.02	1422	4677.03	1420	4686.23	1418	4694.23
GR	1416	4702.22	1414	4725.62	1413.09	4738.64	1413.15	4752.73	1412	4757.14
GR	1410	4765.55	1408	4773.94	1406	4782.3	1404	4790.65	1404	5000
GR	1404	5228.02	1406	5244.34	1408	5253.96	1412	5273.18	1412.96	5277.81

ET		5.1			4813.54	5284.14				
X1	9.98	68	4828.11	5274.26	462	469	475			
GR	1476	4020	1476	4135.18	1474	4180.69	1472	4242.44	1472	4405.93
GR	1474	4459.87	1474	4532.3	1472	4564.64	1470	4600.47	1468	4627.43
GR	1466	4644.39	1464	4650.73	1462	4658.68	1460	4666.95	1458	4675.21
GR	1456	4683.48	1454	4692.64	1452	4702.53	1450	4711.67	1448	4720.68
GR	1446	4728.08	1444	4734.3	1442	4740.53	1440	4746.75	1438	4752.97
GR	1436	4759.19	1434	4766.97	1432	4775.44	1430	4783.95	1428	4813.54
GR	1428	4821.2	1428.96	4826.63	1428	4828.11	1426	4830.93	1425.95	4831.02
GR	1425.7	4834.7	1424	4840.53	1422	4847.1	1420	4853.67	1418	4860.24
GR	1416	4866.81	1414	4874.06	1412	4895.31	1410	4925.82	1410	4957.15
GR	1410	4985.2	1410	5000	1410	5196.05	1412	5234.32	1414	5243.75
GR	1416	5253.18	1418	5262.85	1420	5274.26	1421.67	5284.14	1421.15	5293.67
GR	1420	5297.1	1418.2	5302.27	1420	5323.38	1422	5337.3	1424	5349.84
GR	1426	5361.61	1428	5370.82	1430	5379.99	1432	5389.15	1434	5398.3
GR	1436	5407.46	1438	5416.8	1440	5427.51				

ET		5.1			4840.61	5275.34				
X1	10.08	60	4841.72	5274.76	508	514	511			
GR	1476	4000	1478	4028.78	1480	4085.32	1480	4214.24	1478	4270.59
GR	1476	4333.92	1474	4385.59	1472	4415.91	1470	4435.24	1468	4453.48
GR	1466	4471.72	1464	4489.47	1462	4507.08	1460	4524.24	1458	4540.43
GR	1456	4560.04	1454	4579.47	1452	4664.02	1450	4686.12	1448	4711.59
GR	1446	4736.49	1444	4743.04	1442	4749.49	1440	4755.86	1438	4761.79
GR	1436	4767.07	1434	4772.52	1432	4778.04	1430	4783.56	1428	4789.08
GR	1426	4795.68	1426	4838.85	1426.35	4840.61	1426	4841.72	1424	4848.12
GR	1422	4854.53	1420	4861.27	1418	4869.07	1416	4880.94	1414	4903.67
GR	1412.5	5000	1412	5028.73	1412	5119.72	1414	5215.45	1416	5233.54
GR	1418	5244.05	1420	5254.55	1422	5265.05	1424	5274.76	1424.17	5275.34
GR	1424	5277.85	1423.5	5284.05	1422	5288.76	1420	5294.8	1420	5307.7
GR	1422	5411.56	1424	5519.39	1426	5568.38	1428	5584.58	1430	5600.76

ET		5.1			4784.92	5288.33				
X1	10.16	48	4797.94	5270.13	447	418	430			
GR	1438	4000	1436	4021.6	1434	4039.29	1432	4060.58	1430	4087.84
GR	1428	4116.35	1426	4163.37	1426	4172.5	1426	4329.8	1424	4615.05
GR	1422	4727.69	1422	4765.14	1424	4772.65	1426	4779.85	1427.4	4784.92
GR	1426.9	4794.24	1426	4797.94	1424	4806.13	1422	4814.72	1420	4823.31
GR	1418	4831.89	1416	4850.45	1416	5000	1416	5206.7	1418	5231.48
GR	1420	5241.03	1422	5250.58	1424	5260.12	1426	5270.13	1426.69	5273.76
GR	1426.8	5288.33	1426	5290.46	1424	5295.56	1423.73	5296.35	1424	5299.13
GR	1426	5318.58	1428	5331.54	1430	5343.77	1432	5355.48	1434	5367.2
GR	1436	5379.53	1438	5392.13	1440	5404.93	1442	5417.74	1444	5430.71
GR	1446	5445.59	1448	5460.48	1450	5475.78				

NC	0.035	0.035	0.035							
ET		5.1			4783.08	5262.74				
X1	10.41	52	4791.83	5251.18	198	142	171			
GR	1434	4064	1434	4072.38	1436	4078.9	1438	4083.68	1440	4114.64
GR	1442	4124.08	1444	4141.29	1444	4186.45	1442	4196.42	1438	4216.34
GR	1436	4223.27	1434	4229.95	1432	4236.99	1432	4370.62	1434	4373.56
GR	1436	4376.5	1438	4379.45	1440	4383.45	1440	4469.41	1438	4505.1
GR	1436	4516.74	1434	4526.64	1432	4535.95	1432	4754.33	1434	4759.91
GR	1435.7	4764.94	1436	4772.28	1436	4782.06	1438.34	4782.07	1438.34	4783.07
GR	1436	4783.08	1436	4791.83	1434	4800.27	1432	4808.85	1430	4817.15
GR	1428	4863.1	1428	5000	1428	5071.88	1428	5119.31	1428	5202.52
GR	1430	5229.35	1432	5236.74	1434	5244.12	1436	5251.18	1436	5262.73
GR	1438.9	5262.74	1438.9	5262.75	1436	5262.76	1436	5274.27	1434	5279.7
GR	1432	5285.08	1430	5290.4						
ET		5.1			4758.78	5239.41				
X1	10.42	46	4772.17	5239.37	70	58	64			
GR	1434	4057	1434	4122.12	1434	4141.01	1432	4192.42	1432	4500.07
GR	1434	4518.47	1436	4524.56	1438	4530.85	1438	4566	1436	4602.78
GR	1434	4617.91	1432	4648.14	1432	4733.89	1434	4738.7	1436	4743.37
GR	1436	4757.77	1439	4757.78	1439	4758.78	1436	4758.79	1436	4772.17
GR	1434	4781.27	1432	4790.3	1431.35	4793.22	1430	4857.83	1428	4863.2
GR	1426	4872.34	1426	5000	1426	5035.16	1428	5059.55	1430	5071.52
GR	1430	5178.76	1430	5209.5	1432	5217.1	1434	5224.61	1436	5232.04
GR	1438	5239.37	1438	5239.40	1439.8	5239.41	1439.8	5240.41	1438	5240.42
GR	1438	5240.71	1437.62	5260.38	1436	5263.54	1434	5267.47	1432	5271.31
GR	1430	5275.13								
ET		5.1			4717.29	5219.45				
X1	10.51	35	4720.44	5201.75	439	487	472			
GR	1443.2	4716.29	1443.2	4717.29	1440.66	4717.32	1440	4720.44	1438	4729.62
GR	1436	4738.8	1434	4747.98	1432.68	4754.05	1434	4795.05	1434	4811.47
GR	1432	4826.23	1430	4844.12	1428	4880.89	1428	4916.32	1428	4916.6
GR	1428	4924.94	1430	4975.63	1430	4993.27	1430	5000	1430	5004.42
GR	1430	5038.01	1430	5060.04	1432	5076.82	1434	5173.28	1436	5182.8
GR	1438	5192.33	1440	5201.75	1440	5219.44	1443.73	5219.45	1443.73	5220.45
GR	1440.7	5220.46	1440.7	5237.12	1442	5243.12	1444	5251.74	1444	5270.2
NC	0.035	0.05	0.035							
ET		5.1			4664.91	5132.57				
X1	10.62	37	4665.97	5128.07	535	618	596			
GR	1445.7	4664.91	1444	4664.92	1444	4665.97	1443.33	4681.76	1442	4687.65
GR	1440	4696.48	1438	4705.29	1436.53	4711.79	1436	4760.05	1434	4774.11
GR	1432	4791.7	1432	4792.06	1434	4804.84	1434	4812.38	1434	4844.64
GR	1434	4908.11	1432	4978.39	1430	4993.25	1430	5000	1430	5019.08
GR	1432	5025.21	1434	5047.48	1436	5072.96	1436.27	5078.41	1438	5088.52
GR	1440	5100.18	1442	5111.6	1444	5128.07	1444.34	5132.57	1446	5140.61
GR	1448	5150.2	1450	5159.88	1452	5169.67	1454	5179.15	1454	5200.76
GR	1454	5213.3	1456	5219.38						

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GR     1446     5026.06     1448     5043.9     1448     5055.01     1446     5062.54     1444     5069.86
GR     1442      5077.4     1442    5100.06     1444     5110.31     1446     5120.83     1448     5131.74
GR     1448    5143.33     1448    5159.14     1450     5172.98     1452     5186.65     1454        5200
GR     1456    5213.08     1458    5227.34     1460     5242.36  1460.78     5249.29   1460.5     5289.31
GR     1460    5290.38     1458    5301.57     1456     5314.34     1454     5329.62

NC    0.050      0.035    0.035
ET                 5.1                         4762     5149.91
X1    11.14         32     4762    5149.91      606         610      606
GR     1460    4331.11     1460    4359.12     1458     4450.29     1456     4510.13     1454     4516.73
GR     1452    4523.33     1450    4529.82     1450     4653.75     1452     4685.50     1452       4762
GR     1452    4830.94     1450    4913.55     1450     4965.11     1448     4975.89     1448       5000
GR     1448    5056.87     1450    5060.92     1452     5064.99     1452     5097.48     1454     5121.70
GR     1456    5126.41     1458    5131.13     1460     5135.85     1462     5140.57     1464     5145.28
GR     1466    5149.91     1466    5173.09     1464     5177.70     1462     5182.56     1460     5187.75
GR     1458    5192.64     1456    5197.53

  BEGIN CORPS LEVEES

NC    0.035      0.035    0.020
ET                 5.1                      4825.06     5165.90
X1    11.19         80  4825.06    5161.07      277         212      225
GR   1466.0    4799.55  1466.00    4823.70  1466.00     4825.06  1465.44     4826.50  1464.00     4830.18
GR   1463.6    4831.26  1462.00    4835.30  1461.78     4835.87  1460.47     4839.23  1460.00     4840.18
GR   1459.8    4840.67  1458.00    4844.27  1457.08     4846.17  1456.00     4848.37  1454.68     4851.08
GR   1454.0    4852.47  1452.35    4858.63  1452.00     4861.70  1452.00     4865.26  1452.00     4867.38
GR   1452.0    4906.20  1452.00    4944.98  1452.00     4945.21  1452.00     4948.20  1452.00     4955.59
GR   1452.0    4974.23  1452.00    4983.63  1452.00     5000.00  1452.00     5052.40  1452.00     5075.88
GR   1452.0    5079.43  1452.00    5080.15  1452.00     5083.16  1452.00     5085.12  1452.21     5091.07
GR   1452.2    5091.41  1452.82    5104.84  1453.40     5118.66  1453.68     5124.97  1454.00     5131.82
GR   1455.9    5136.57  1456.00    5136.91  1456.04     5136.99  1458.00     5141.74  1458.38     5142.66
GR   1460.0    5146.57  1460.56    5147.92  1462.00     5151.40  1462.67     5153.01  1464.00     5156.23
GR   1464.7    5158.02  1466.00    5161.07  1466.79     5162.98  1468.00     5165.90  1468.00     5172.97
GR   1468.0    5198.33  1468.00    5198.71  1468.00     5208.06  1467.82     5208.79  1467.42     5210.39
GR   1466.0    5213.89  1464.59    5217.33  1464.00     5218.79  1462.10     5223.33  1462.00     5223.58
GR   1461.9    5223.73  1460.00    5228.27  1459.05     5230.49  1458.00     5232.96  1456.96     5238.16
GR   1456.5    5239.87  1456.32    5241.27  1456.00     5249.77  1456.00     5262.87  1455.84     5273.99
GR   1456.0    5290.85  1456.15    5294.26  1456.26     5305.86  1456.31     5328.45  1456.18     5342.81

ET                 5.1                      4827.39     5184.66
X1    11.29         94  4827.39    5184.66      486         591      536
GR   1458.6    4498.36  1458.15    4531.48  1458.00     4544.39  1457.54     4552.02  1456.00     4556.76
GR   1455.7    4557.78  1454.54    4561.02  1454.00     4562.59  1454.00     4605.58  1454.95     4629.82
GR   1456.0    4655.24  1456.33    4661.92  1456.76     4672.63  1456.93     4675.47  1457.17     4678.43
GR   1457.5    4684.77  1456.93    4728.58  1456.76     4749.58  1457.01     4757.49  1457.65     4782.78
GR   1458.0    4791.03  1459.18    4795.59  1460.00     4799.16  1461.62     4803.60  1462.00     4804.63
GR   1462.5    4805.93  1464.00    4810.36  1464.90     4812.84  1466.00     4815.95  1466.99     4818.67
GR   1468.0    4821.53  1469.43    4825.50  1469.95     4827.39  1469.68     4829.36  1468.00     4841.57
GR   1466.8    4844.22  1466.00    4846.08  1464.73     4848.95  1464.00     4850.59  1462.59     4853.77
GR   1462.0    4855.10  1460.39    4858.74  1460.00     4859.58  1459.55     4860.64  1458.00     4864.17
GR   1456.8    4866.84  1456.00    4868.69  1454.77     4871.46  1454.00     4873.20  1453.89     4874.55
GR   1454.0    4879.94  1453.00    5000.00  1452.00     5012.73  1452.37     5018.03  1454.00     5112.94
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END CORPS LEVEES; BEGIN BOX CHANNEL UNDER I-17

ET		5.1			4845.32	5152.45				
X1	11.56	87	4845.32	5152.45	386	396	390			
GR	1471.8	4676.86	1471.19	4685.14	1470.77	4690.44	1470.54	4693.47	1470.29	4696.28
GR	1470.3	4700.82	1470.50	4703.37	1470.83	4707.69	1471.29	4713.13	1472.00	4721.56
GR	1472.0	4845.32	1470.73	4853.22	1470.34	4856.19	1470.00	4857.83	1469.42	4859.18
GR	1468.0	4862.39	1467.55	4863.42	1466.00	4867.01	1464.74	4869.91	1464.00	4871.63
GR	1462.4	4875.29	1462.00	4876.26	1460.24	4880.32	1460.00	4880.88	1459.55	4891.07
GR	1459.2	4900.27	1459.14	4911.50	1459.18	4917.72	1459.27	4936.45	1459.28	4951.90
GR	1459.3	4956.77	1459.32	4970.56	1459.36	4977.34	1459.35	4986.98	1459.40	5000.00
GR	1459.5	5006.02	1459.50	5012.85	1459.48	5022.30	1459.43	5032.20	1459.31	5049.20
GR	1459.3	5049.41	1459.31	5049.51	1459.31	5049.72	1459.30	5060.17	1459.48	5072.34
GR	1459.5	5084.60	1459.48	5091.51	1459.47	5098.77	1459.30	5109.95	1459.40	5114.80
GR	1459.6	5117.41	1459.59	5117.63	1460.00	5124.33	1461.59	5127.25	1461.65	5127.38
GR	1462.0	5128.28	1462.29	5129.00	1462.54	5129.65	1463.39	5131.68	1464.00	5133.13
GR	1465.0	5135.40	1466.00	5137.90	1466.70	5139.56	1468.00	5142.66	1468.53	5143.93
GR	1470.0	5147.43	1470.90	5149.69	1472.00	5152.45	1472.00	5165.70	1471.55	5168.67
GR	1471.2	5170.75	1470.00	5178.38	1470.00	5225.76	1470.27	5226.00	1472.00	5227.56
GR	1472.5	5228.46	1472.76	5229.77	1472.00	5233.24	1471.71	5234.57	1471.42	5235.87
GR	1471.4	5236.02	1470.93	5237.02	1470.00	5239.41	1470.00	5268.37	1470.59	5293.04
GR	1470.9	5296.51	1471.02	5306.55						

OUTLET OF I-17 CROSSING

ET		5.1			4880.47	5126.63				
X1	11.57	92	4880.47	5126.63	72	75	73			
GR	1470.8	4670.15	1471.04	4676.02	1471.81	4692.20	1472.00	4696.83	1472.63	4707.63
GR	1472.8	4711.11	1473.05	4715.60	1473.66	4746.09	1473.57	4751.49	1473.41	4760.54
GR	1474.0	4769.16	1474.00	4816.39	1473.19	4827.23	1472.71	4833.86	1472.64	4834.85
GR	1472.0	4844.37	1472.00	4861.16	1472.54	4870.52	1472.00	4880.47	1471.79	4880.62
GR	1470.1	4881.77	1470.00	4881.79	1468.35	4882.11	1468.00	4882.18	1466.41	4882.49
GR	1466.0	4882.57	1464.43	4882.88	1464.00	4882.96	1462.45	4883.27	1462.00	4883.35
GR	1461.6	4896.00	1461.53	4899.52	1461.22	4909.97	1461.03	4926.96	1460.86	4934.09
GR	1460.6	4946.27	1460.36	4961.63	1460.29	4993.04	1460.30	5000.00	1460.41	5002.11
GR	1460.5	5010.81	1460.63	5019.07	1461.14	5020.57	1461.34	5048.98	1461.18	5074.02
GR	1460.9	5090.68	1461.37	5103.14	1461.81	5115.32	1461.86	5116.93	1462.00	5120.67
GR	1462.6	5120.78	1464.00	5121.06	1464.40	5121.17	1466.00	5121.48	1466.51	5121.56
GR	1467.1	5121.69	1468.00	5121.86	1469.43	5122.14	1470.00	5122.25	1470.50	5123.25
GR	1471.7	5125.87	1472.00	5126.63	1472.00	5154.31	1471.46	5159.70	1470.38	5170.04
GR	1470.4	5174.42	1470.49	5174.60	1470.77	5175.42	1472.00	5179.41	1472.00	5180.09
GR	1471.6	5182.32	1470.00	5193.35	1470.00	5209.59	1470.38	5210.71	1471.63	5215.00
GR	1472.0	5216.25	1472.00	5216.38	1472.00	5218.35	1471.83	5219.05	1470.00	5223.24
GR	1470.0	5225.98	1470.22	5226.92	1470.00	5227.88	1470.00	5234.90	1470.81	5241.05
GR	1470.8	5241.43	1471.05	5249.44	1470.99	5250.35	1470.90	5250.66	1470.72	5261.88
GR	1471.0	5291.96	1471.60	5306.88						

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 4817.3 5340.9 TYPE= 1 TARGET= 523.590

9.010	9.39	1381.58	1381.58	.00	1385.28	3.70	2.09	.76	1386.00
39000.0	.0	39000.0	.0	.0	2527.1	.0	183.1	29.1	100000.00
.05	.00	15.43	.00	.000	.035	.000	.000	1372.19	4835.91
.009403	363.	430.	558.	0	15	0	.00	346.63	5182.54

*SECNO 9.080

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.76

3470 ENCROACHMENT STATIONS= 4796.9 5198.8 TYPE= 1 TARGET= 401.920

9.080	11.94	1385.41	1382.13	.00	1387.26	1.86	1.80	.18	1388.00
39000.0	.0	39000.0	.0	.0	3568.2	.0	208.7	32.0	100000.00
.06	.00	10.93	.00	.000	.035	.000	.000	1373.47	4830.35
.003031	432.	365.	165.	2	11	0	.00	350.18	5180.53

*SECNO 9.140

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 4835.6 5165.2 TYPE= 1 TARGET= 329.640

9.140	13.32	1387.32	1380.44	.00	1387.94	.62	.56	.12	1390.00
23500.0	.0	23500.0	.0	.0	3721.7	.0	236.5	34.6	100000.00
.07	.00	6.31	.00	.000	.035	.000	.000	1374.00	4844.65
.000823	288.	333.	385.	2	11	0	.00	309.42	5154.07

*SECNO 9.145

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.210

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.23

3470 ENCROACHMENT STATIONS= 4732.0 5190.0 TYPE= 1 TARGET= 458.050

9.210	11.94	1387.94	1380.89	.00	1388.31	.37	.09	.03	1439.00
23500.0	.0	23500.0	.0	.0	4830.0	.0	270.7	37.5	1391.00
.09	.00	4.87	.00	.000	.020	.000	.000	1376.00	4734.68
.000175	145.	279.	355.	2	18	0	.00	433.00	5167.68

*SECNO 9.220

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 4664.0 5314.1 TYPE= 1 TARGET= 650.090

9.220	4.23	1394.23	1394.23	.00	1396.25	2.02	.02	.49	1445.00
23500.0	.0	23500.0	.0	.0	2062.4	.0	273.8	38.0	1397.00
.09	.00	11.39	.00	.000	.035	.000	.000	1390.00	4670.75
.011250	122.	39.	104.	0	18	0	.00	511.50	5182.25

*SECNO 9.250
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 4738.2 5304.5 TYPE= 1 TARGET= 566.370

9.250	4.82	1396.82	1396.82	.00	1398.77	1.95	1.57	.01	1394.00
23500.0	1864.5	21635.5	.0	245.0	1886.7	.0	280.6	39.7	1398.64
.10	7.61	11.47	.00	.040	.035	.000	.000	1392.00	4738.18
.010984	155.	141.	82.	0	8	0	.00	542.45	5280.63

*SECNO 9.300

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

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*SECNO 9.540
3280 CROSS SECTION        9.54 EXTENDED        .08 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.66

3470 ENCROACHMENT STATIONS=     4663.4    5177.0  TYPE=      1  TARGET=      513.650
     9.540      11.08   1408.08   1405.70       .00   1409.58      1.50      3.39       .10   1408.00
   39000.0         .0   39000.0        .0        .0    3969.8        .0     409.1      61.0 100000.00
       .14        .03      9.82       .00      .035      .040      .000      .000   1397.00   4685.57
   .004373       410.      500.      515.         3        15         0       .00    491.43   5177.00

*SECNO 9.650

3470 ENCROACHMENT STATIONS=     4736.4    5231.9  TYPE=      1  TARGET=      495.470
     9.650       8.57   1410.57   1408.58       .00   1412.32      1.75      2.66       .07   1412.00
   39000.0         .0   39000.0        .0        .0    3675.9        .0     458.0      67.1 100000.00
       .15        .00     10.61       .00      .000      .040      .000      .000   1402.00   4759.95
   .005233       475.      558.      503.         3        14         0       .00    466.90   5226.85

*SECNO 9.700

3470 ENCROACHMENT STATIONS=     4752.7    5283.9  TYPE=      1  TARGET=      531.160
     9.700       7.86   1411.86   1410.07       .00   1413.53      1.67      1.20       .01   1412.00
   39000.0         .0   39000.0        .0        .0    3760.4        .0     479.9      70.0   1412.00
       .16        .00     10.37       .00      .000      .035      .000      .000   1404.00   4757.74
   .004227       253.      256.      259.         2        19         0       .00    514.76   5272.50

*SECNO 9.730

3470 ENCROACHMENT STATIONS=     4762.0    5298.7  TYPE=      1  TARGET=      536.690
     9.730       8.83   1412.83   1410.11       .00   1414.14      1.31       .58       .04   1414.00
   39000.0         .0   38997.0       3.0        .0    4238.3       2.4     495.4      72.0   1412.00
       .17        .00      9.20      1.25      .000      .035      .035      .000   1404.00   4767.98
   .002853       187.      169.      151.         2        15         0       .00    522.66   5290.64
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SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 10.160

3470 ENCROACHMENT STATIONS=     4784.9    5288.3  TYPE=      1  TARGET=      503.410
   10.160      8.09   1424.09   1422.72       .00   1426.19      2.10       2.27        .02   1426.00
  39000.0        .0   39000.0        .0        .0   3356.1        .0      667.6       94.0   1426.00
      .22       .00     11.62       .00      .000      .035      .000       .000    1416.00   4805.77
  .005237      447.      430.      418.         2        19         0        .00     454.78   5260.56

*SECNO 10.250

3470 ENCROACHMENT STATIONS=     4772.9    5313.0  TYPE=      1  TARGET=      540.110
   10.250      6.71   1426.71   1426.31       .00   1429.30      2.59       2.96        .15   1429.70
  39000.0        .0   39000.0        .0        .0   3020.8        .0      701.3       99.0 100000.00
      .23       .00     12.91       .00      .000      .035      .000       .000    1420.00   4791.56
  .008124      496.      460.      420.         2        15         0        .00     486.32   5277.88

*SECNO 10.330
3280 CROSS SECTION     10.33 EXTENDED       .13 FEET

3470 ENCROACHMENT STATIONS=     4766.4    5272.0  TYPE=      1  TARGET=      505.590
   10.330      8.13   1430.13   1429.33       .00   1432.58      2.45       3.27        .01   1435.17
  39000.0        .0   39000.0        .0        .0   3105.0        .0      732.5      103.8   1434.00
      .24       .00     12.56       .00      .000      .035      .000       .000    1422.00   4802.19
  .006697      519.      444.      373.         3         8         0        .00     450.34   5252.54

*SECNO 10.340
3280 CROSS SECTION     10.34 EXTENDED       .57 FEET

3470 ENCROACHMENT STATIONS=     4756.9    5252.6  TYPE=      1  TARGET=      495.720
   10.340      8.57   1430.57   1429.81       .00   1433.09      2.53        .49        .02   1435.00
  39000.0        .0   39000.0        .0        .0   3058.0        .0      737.6      104.5   1434.00
      .24       .00     12.75       .00      .000      .035      .000       .000    1422.00   4792.27
  .006769      104.       73.       42.         2         8         0        .00     436.81   5229.07

*SECNO 10.380
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 SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
 Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
 TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
 SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 10.510

3470 ENCROACHMENT STATIONS=     4717.3    5219.5  TYPE=      1  TARGET=      502.160
   10.510     10.61   1438.61   1437.36       .00   1440.72       2.11       2.36        .06   1440.00
  39000.0        .0   39000.0        .0        .0    3346.4         .0      801.0      113.6   1440.00
      .26       .00     11.65       .00      .000      .035       .000       .000    1428.00   4726.81
  .005501      439.      472.      487.         3        11          0        .00     468.40   5195.21

*SECNO 10.620

3470 ENCROACHMENT STATIONS=     4664.9    5132.6  TYPE=      1  TARGET=      467.660
   10.620     11.81   1441.81   1440.69       .00   1444.20       2.39       3.40        .08   1444.00
  39000.0        .0   39000.0        .0        .0    3143.4         .0      845.4      119.7   1444.00
      .27       .00     12.41       .00      .000      .035       .000       .000    1430.00   4688.49
  .005909      535.      596.      618.         2         5          0        .00     422.02   5110.51

*SECNO 10.700

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     4748.1    5211.3  TYPE=      1  TARGET=      463.190
   10.700     10.16   1444.16   1444.03       .00   1447.38       3.22       2.93        .25   1446.20
  39000.0        .0   39000.0        .0        .0    2707.8         .0      872.4      123.5   1446.48
      .28       .00     14.40       .00      .000      .035       .000       .000    1434.00   4766.96
  .009224      390.      402.      382.         2        15          0        .00     406.49   5173.45

*SECNO 10.830
3280 CROSS SECTION     10.83 EXTENDED      6.36 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     4782.3    5310.0  TYPE=      1  TARGET=      527.740
   10.830     12.36   1450.36   1448.93       .00   1452.32       1.95       4.81        .13   1452.00
  39000.0        .0   39000.0        .0        .0    3476.2         .0      923.3      130.9   1452.00
      .30       .00     11.22       .00      .000      .035       .000       .000    1438.00   4807.00
  .005100      642.      717.      704.         2         8          0        .00     485.67   5292.67
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SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

3280 CROSS SECTION     11.19 EXTENDED      4.38 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4825.1    5165.9  TYPE=      1  TARGET=      340.840
   11.190      8.56   1460.56   1460.56       .00   1464.54      3.99      1.12       .13   1466.00
  39000.0        .0   39000.0       .0        .0    2434.4        .0    1069.9     150.3   1466.00
      .34       .00     16.02       .00      .000      .020      .000      .000   1452.00   4839.01
 .003003      277.      225.      212.         0        11         0       .00    308.90   5147.91

*SECNO 11.290
3280 CROSS SECTION     11.29 EXTENDED       .87 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     4827.4    5184.7  TYPE=      1  TARGET=      357.270
   11.290     10.88   1462.88   1461.79       .00   1465.93      3.05      1.29       .09   1469.95
  39000.0        .0   39000.0       .0        .0    2784.2        .0    1102.0     154.2 100000.00
      .35       .00     14.01       .00      .000      .020      .000      .000   1452.00   4853.13
 .001977      486.      536.      591.         3         8         0       .00    315.16   5168.30

*SECNO 11.390

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     4826.5    5170.5  TYPE=      1  TARGET=      344.010
   11.390     11.17   1464.58   1462.10       .00   1466.85      2.28       .85       .08   1470.00
  39000.0        .0   39000.0       .0        .0    3220.8        .0    1139.8     158.2 100000.00
      .36       .00     12.11       .00      .000      .020      .000      .000   1453.41   4838.52
 .001250      520.      548.      577.         2        15         0       .00    320.78   5159.30

*SECNO 11.480

3470 ENCROACHMENT STATIONS=     4831.9    5174.6  TYPE=      1  TARGET=      342.710
   11.480     11.32   1465.32   1462.48       .00   1467.45      2.13       .58       .01   1470.00
  39000.0        .0   39000.0       .0        .0    3329.2        .0    1176.4     161.7 100000.00
      .38       .00     11.71       .00      .000      .020      .000      .000   1454.00   4842.57
 .001125      443.      487.      532.         2        15         0       .00    321.86   5164.43
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THIS RUN EXECUTED 04NOV02 17:06:30

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MPLETED SEPTEMBER 2002 B

SUMMARY PRINTOUT

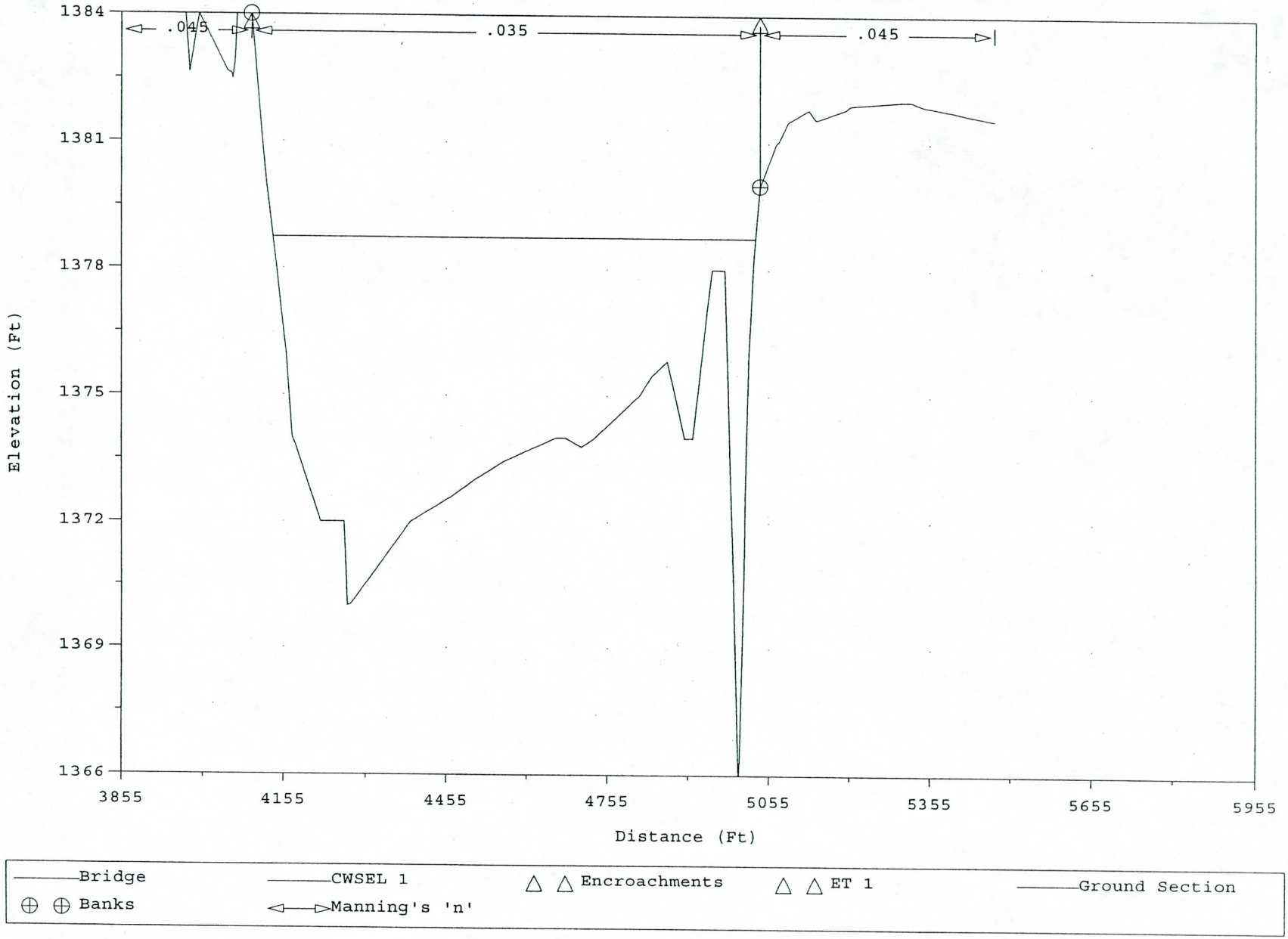
	SECNO	Q	CWSEL	CRIWS	VCH	DEPTH	TOPWID	AREA	FRCH	SSTA	ENDST
	8.690	39000.00	1378.00	1374.50	5.55	14.00	1014.10	7026.52	.37	4045.04	5059.14
*	8.790	39000.00	1378.75	1377.37	8.33	12.75	896.38	4679.32	.64	4134.82	5031.20
	8.930	39000.00	1381.24	1378.60	8.67	11.24	616.60	4495.85	.57	4600.57	5217.16
*	9.010	39000.00	1381.58	1381.58	15.43	9.39	346.63	2527.10	1.01	4835.91	5182.54
*	9.080	39000.00	1385.41	1382.13	10.93	11.94	350.18	3568.19	.60	4830.35	5180.53
	9.140	23500.00	1387.32	1380.44	6.31	13.32	309.42	3721.66	.32	4844.65	5154.07
*	9.145	23500.00	1387.17	1381.55	7.41	12.27	283.37	3172.47	.40	5020.65	5319.03
	9.155	23500.00	1387.30	1381.75	7.44	12.20	283.74	3156.66	.40	5020.46	5319.22
*	9.160	23500.00	1387.54	1380.83	6.47	13.54	302.78	3630.89	.33	4857.05	5159.82
*	9.210	23500.00	1387.94	1380.89	4.87	11.94	433.00	4829.99	.26	4734.68	5167.68
*	9.220	23500.00	1394.23	1394.23	11.39	4.23	511.50	2062.39	1.00	4670.75	5182.25
*	9.250	23500.00	1396.82	1396.82	11.47	4.82	542.45	2131.66	.99	4738.18	5280.63
*	9.300	39000.00	1399.25	1399.25	13.25	6.25	576.97	3037.84	.98	4703.41	5280.38
*	9.350	39000.00	1402.10	1399.99	9.37	10.10	629.82	4372.60	.58	4657.95	5287.77
	9.420	39000.00	1403.33	1401.68	9.88	10.33	681.37	4191.30	.63	4549.48	5230.85
*	9.450	39000.00	1403.53	1403.53	12.98	10.53	648.26	3134.99	.95	4560.74	5209.00
*	9.540	39000.00	1408.08	1405.70	9.82	11.08	491.43	3969.81	.61	4685.57	5177.00

	SECNO	Q	CWSEL	CRIWS	VCH	DEPTH	TOPWID	AREA	FRCH	SSTA	ENDST
*	11.570	39000.00	1470.39	1470.39	17.38	10.10	241.45	2243.58	1.00	4881.57	5123.02

SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

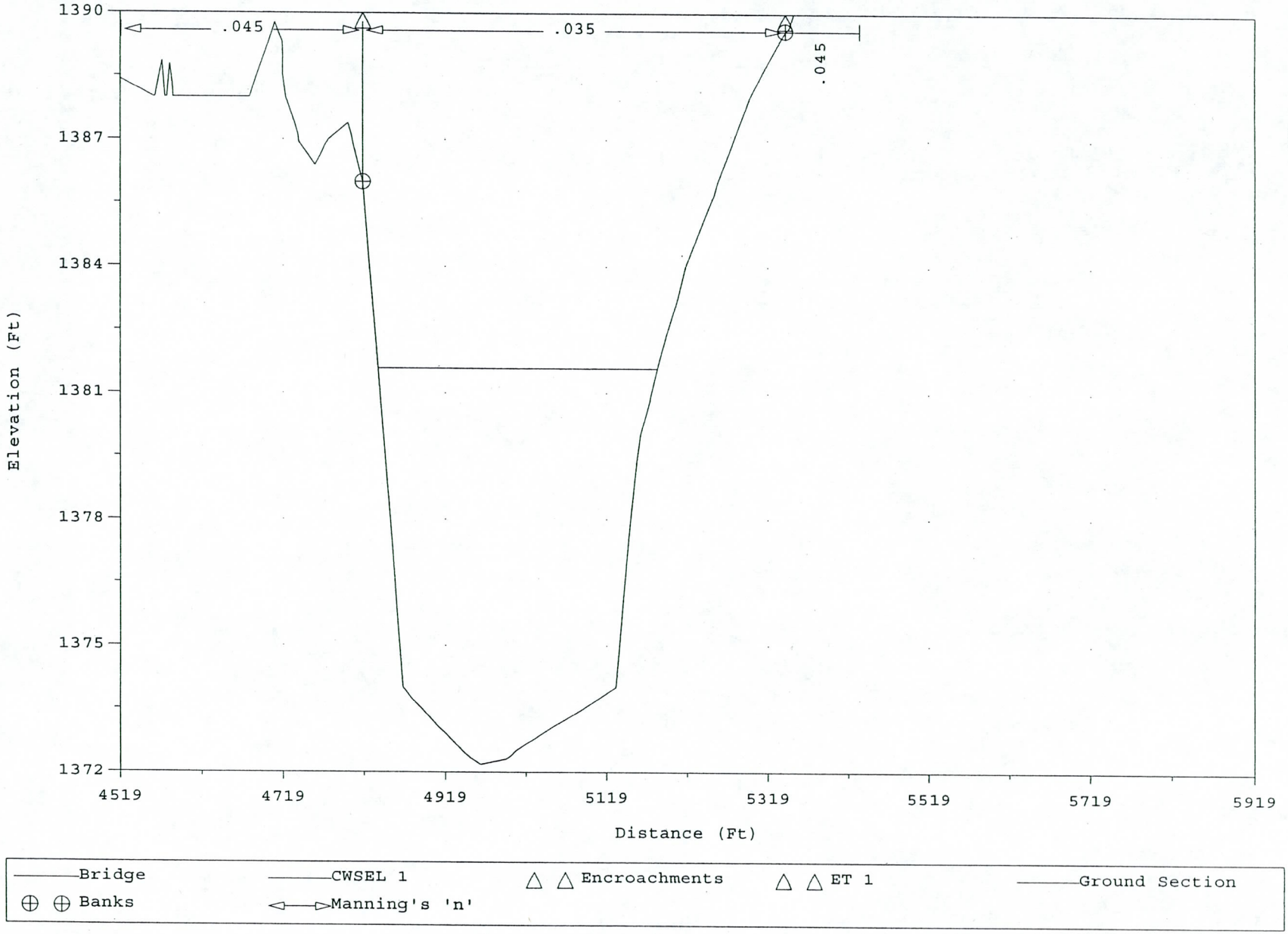
Cross-Section 8.79



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

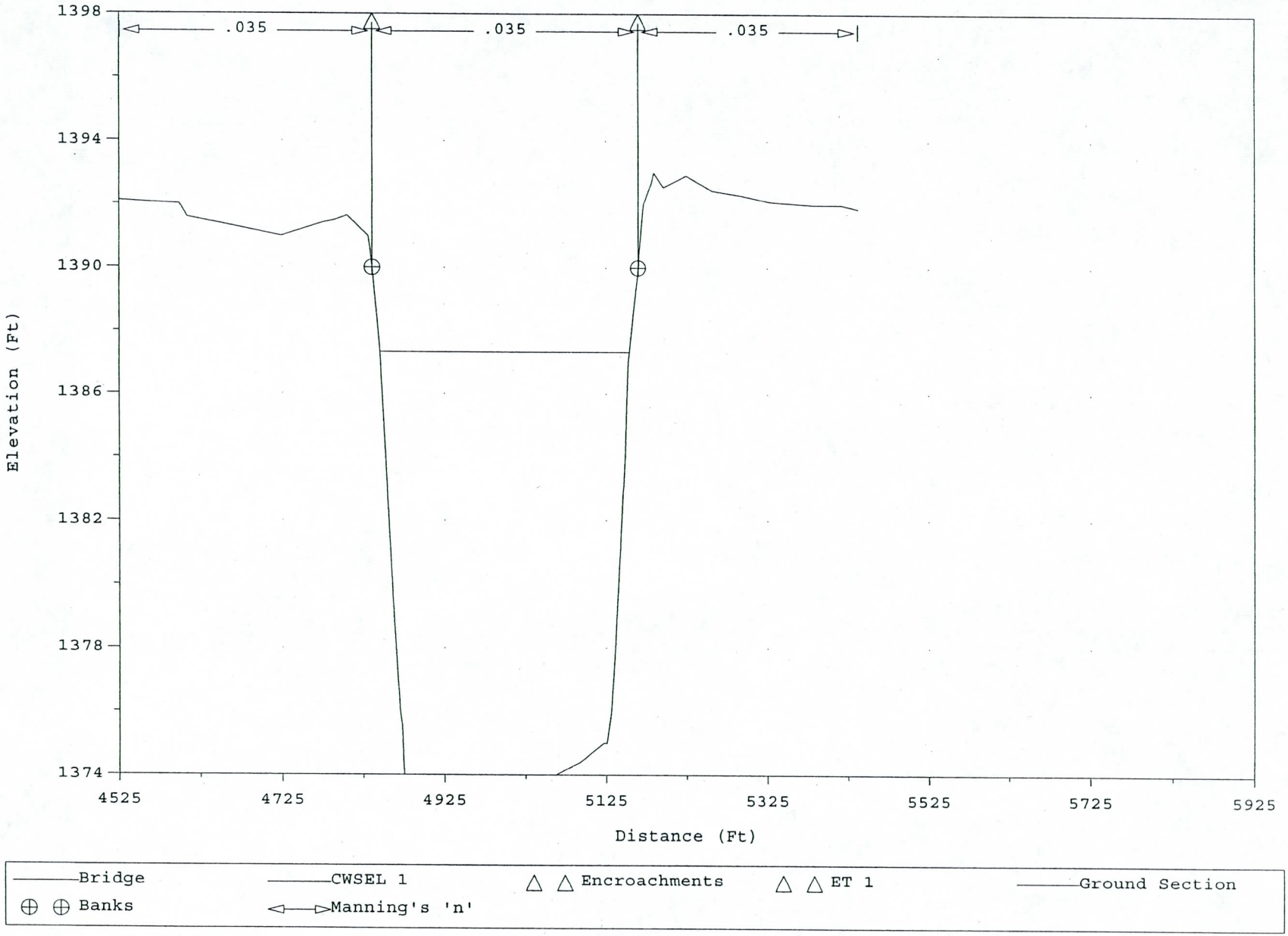
Cross-Section 9.01



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

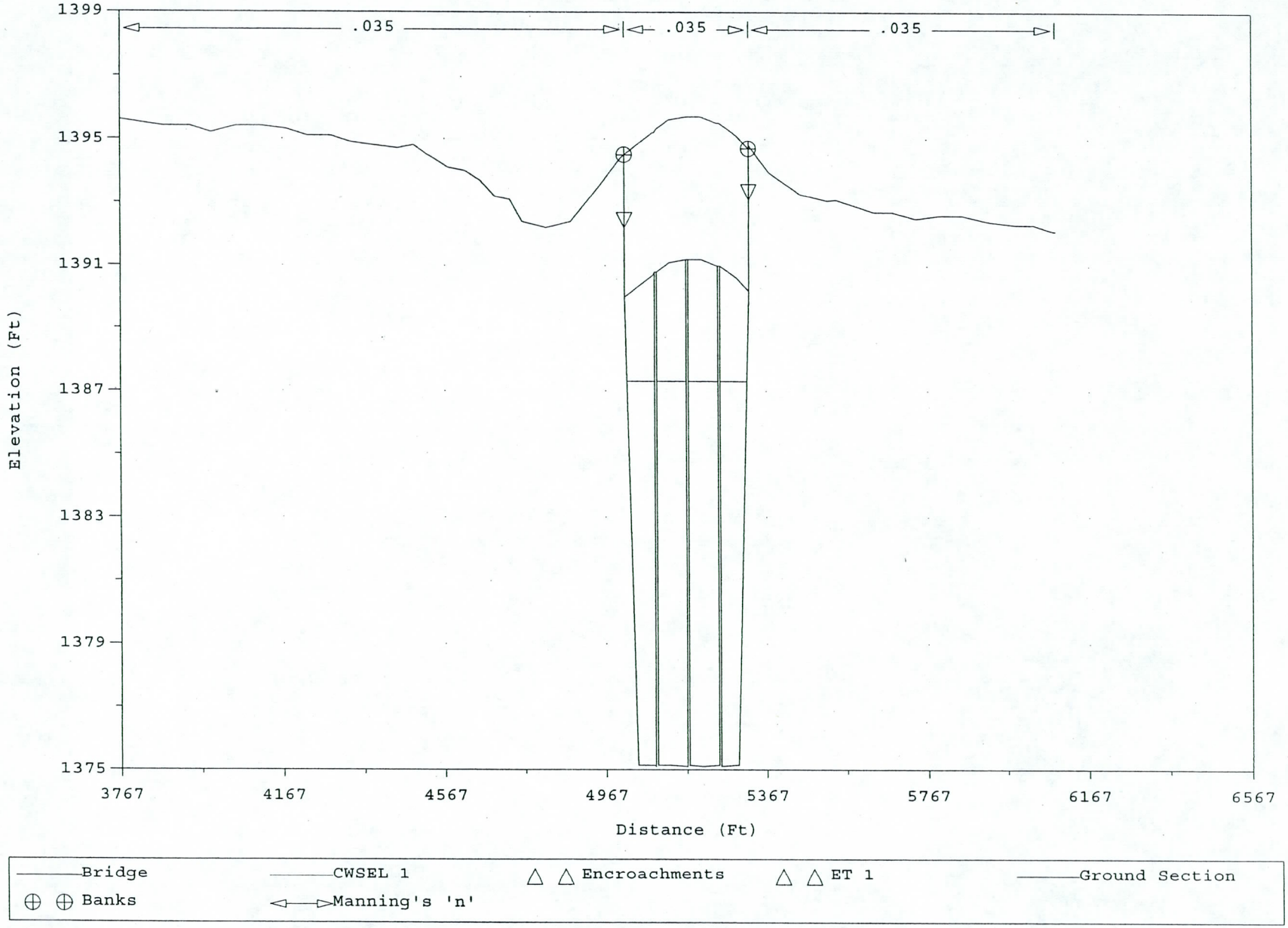
Cross-Section 9.14



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

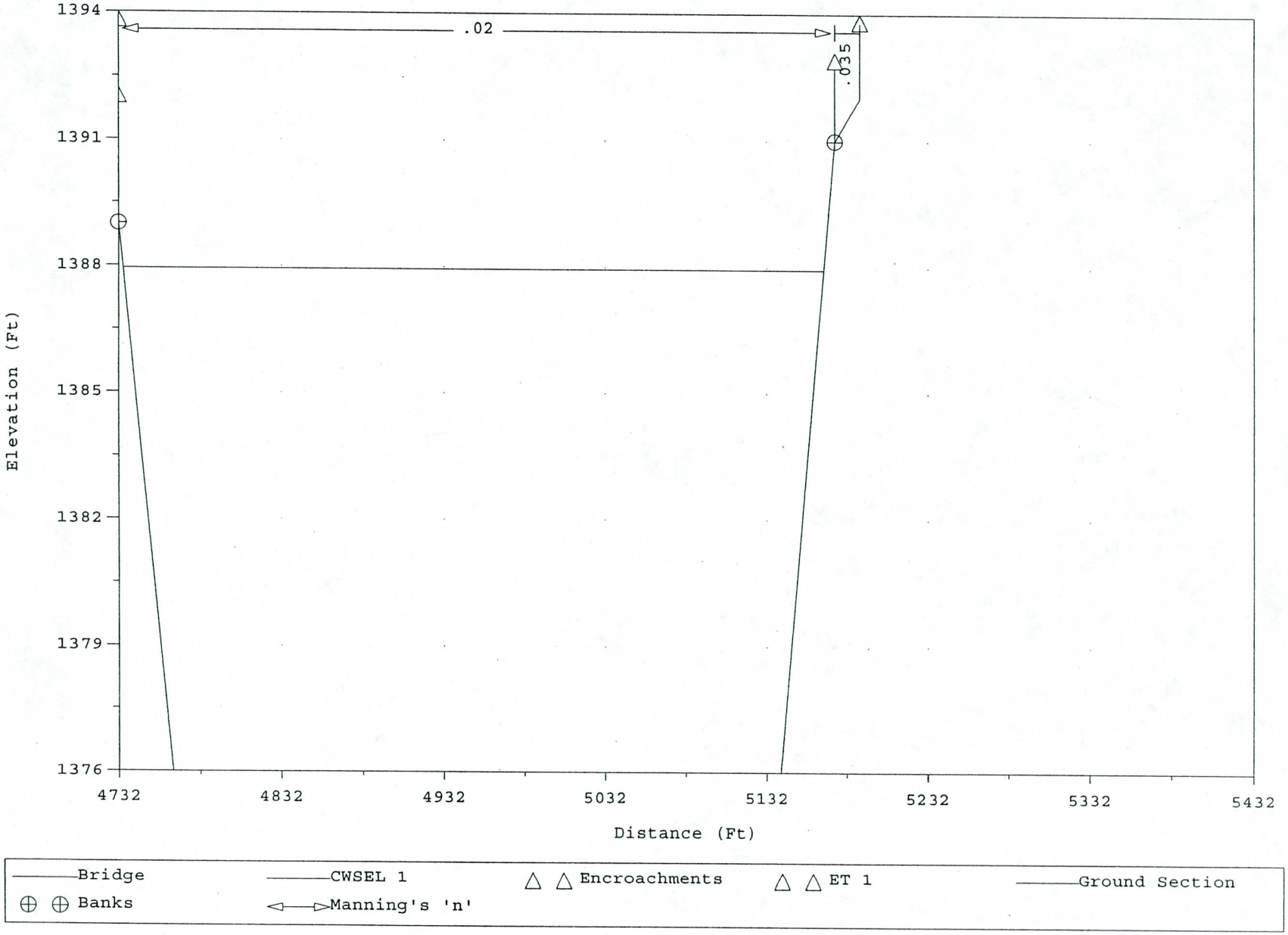
Cross-Section 9.155



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

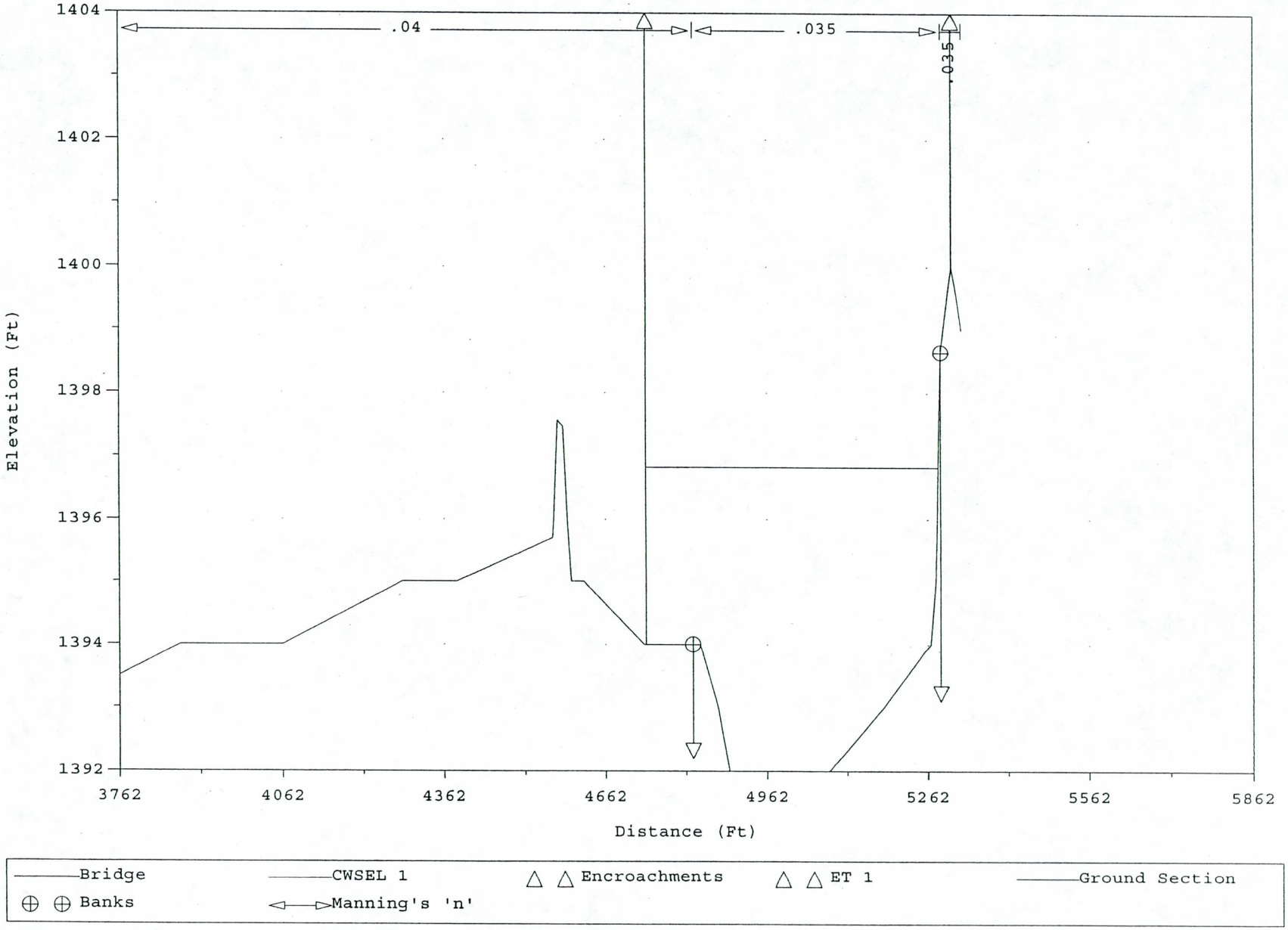
Cross-Section 9.21



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

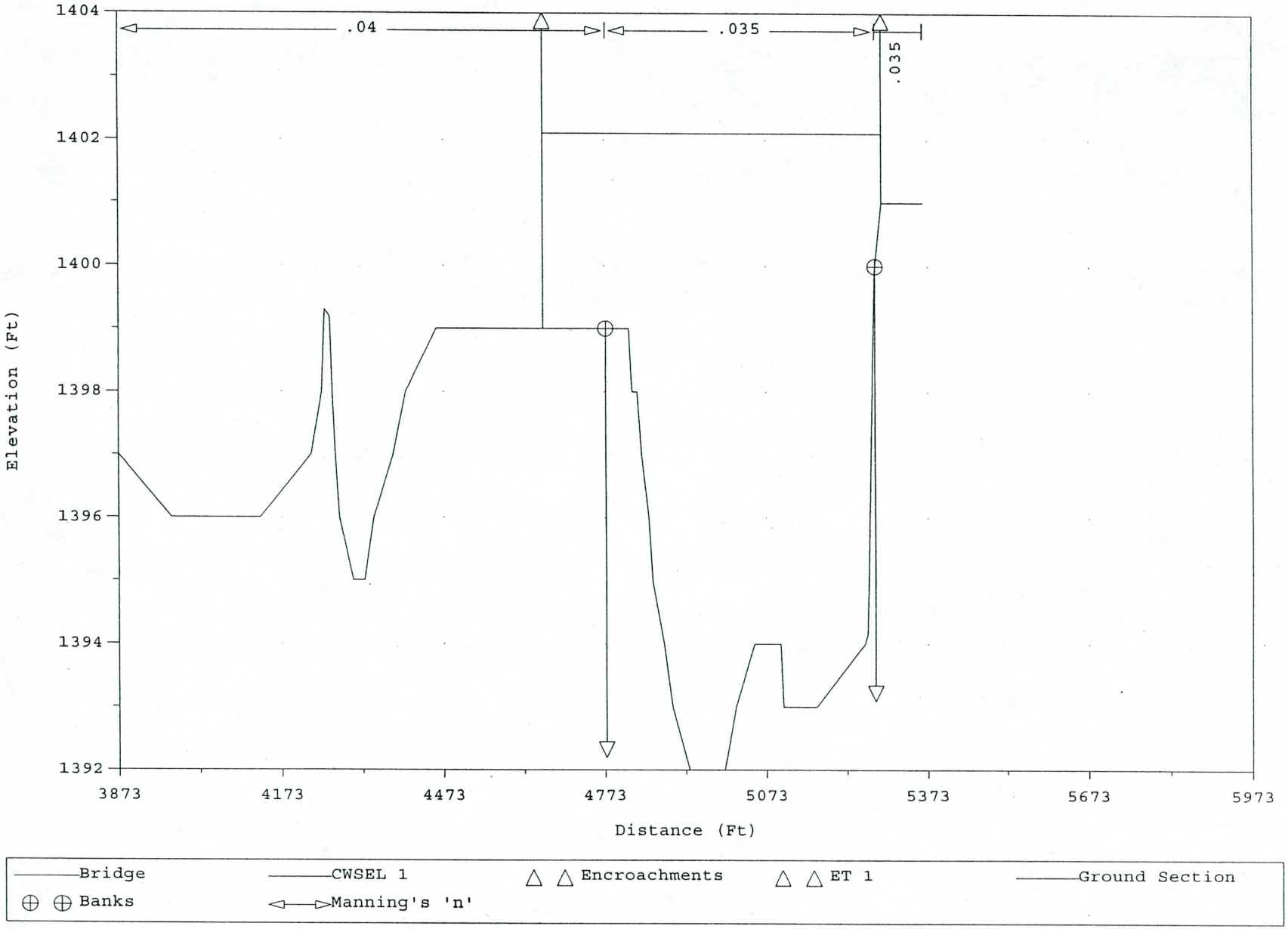
Cross-Section 9.25



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

Cross-Section 9.35



SKUNK CREEK LETTER OF MAP REVISION

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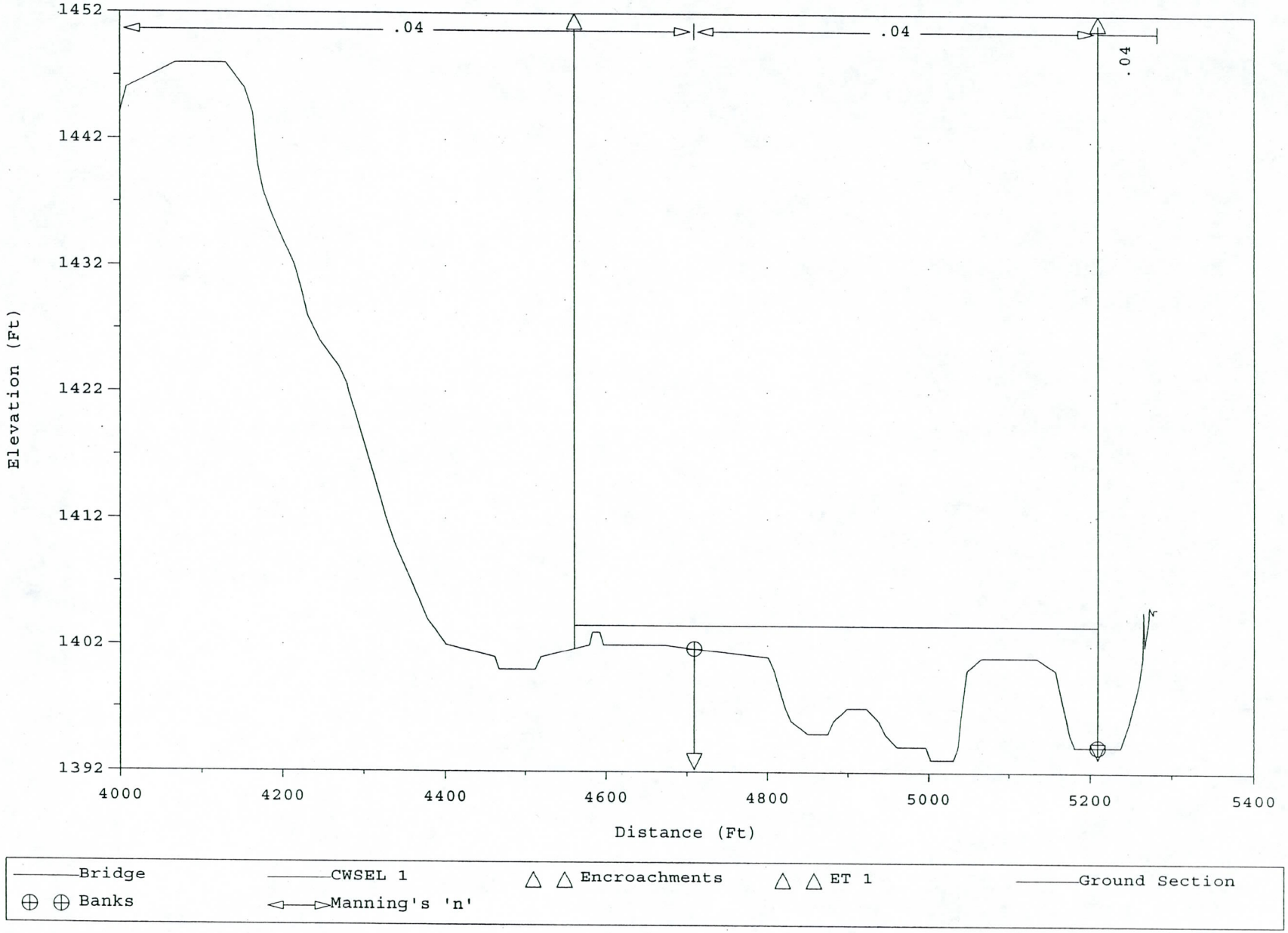
Cross-Section 9.45



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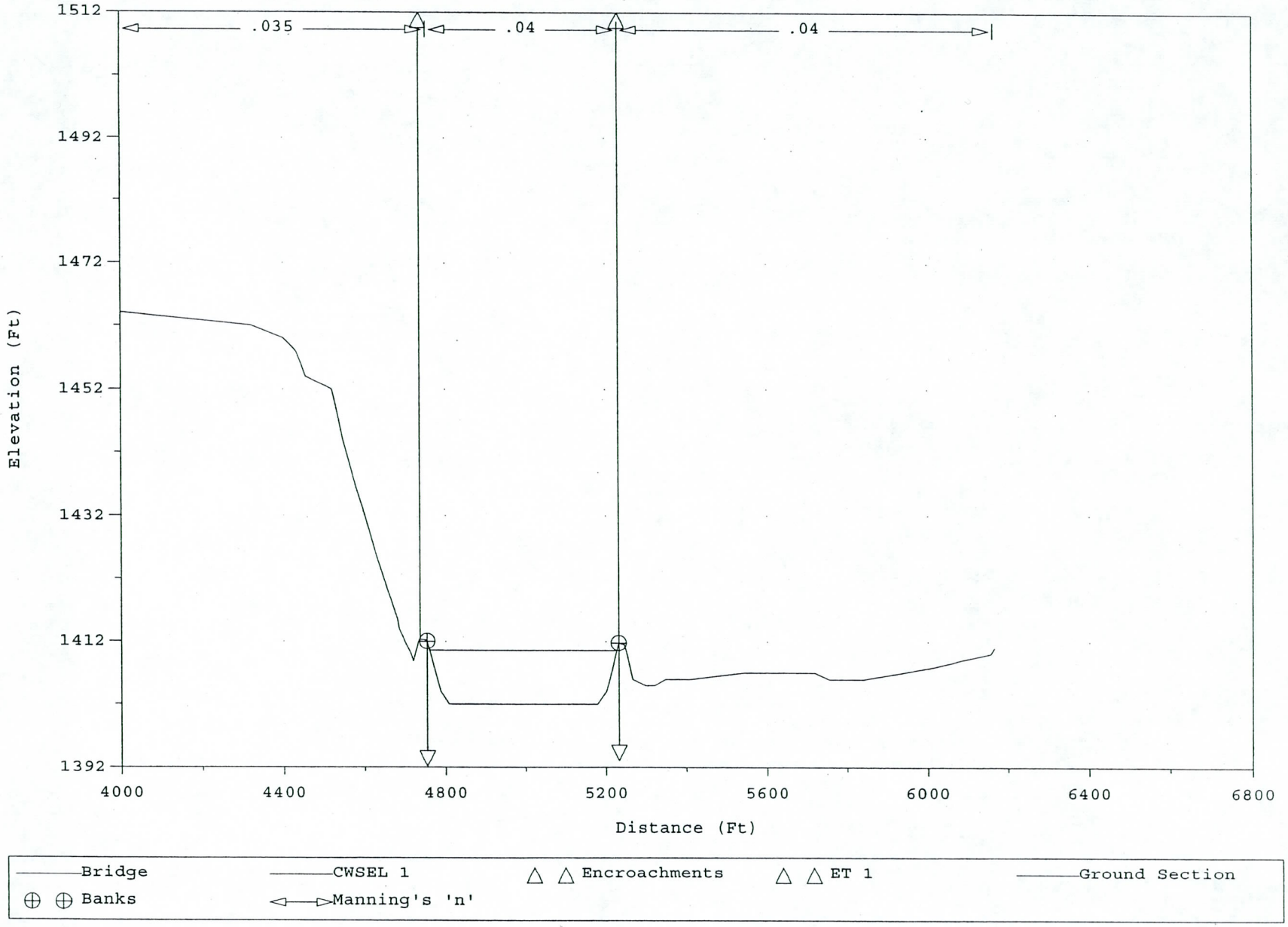
REVISED MODEL: **SKUNKLOMR.IH2**

Cross-Section 9.65



SKUNK CREEK LETTER OF MAP REVISION

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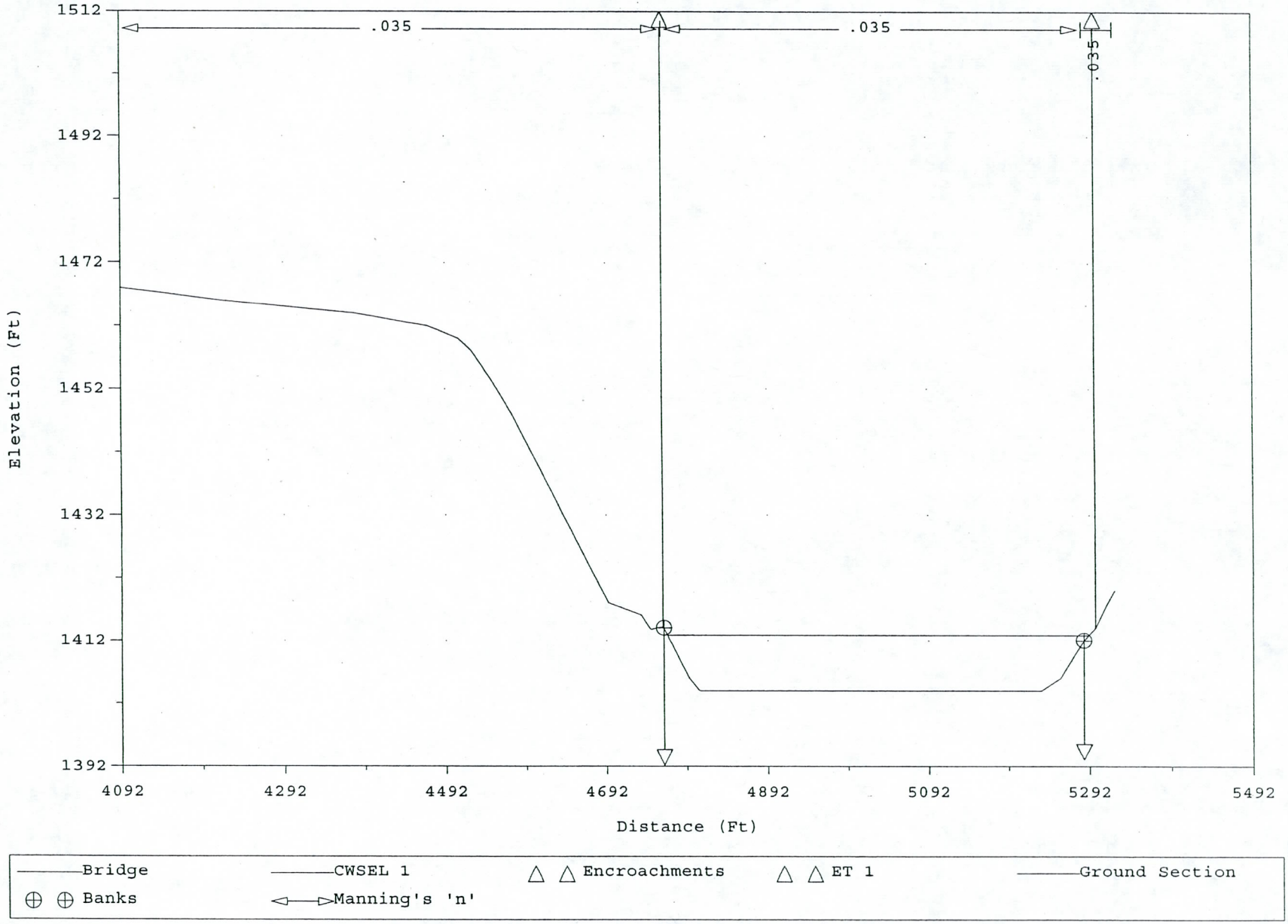
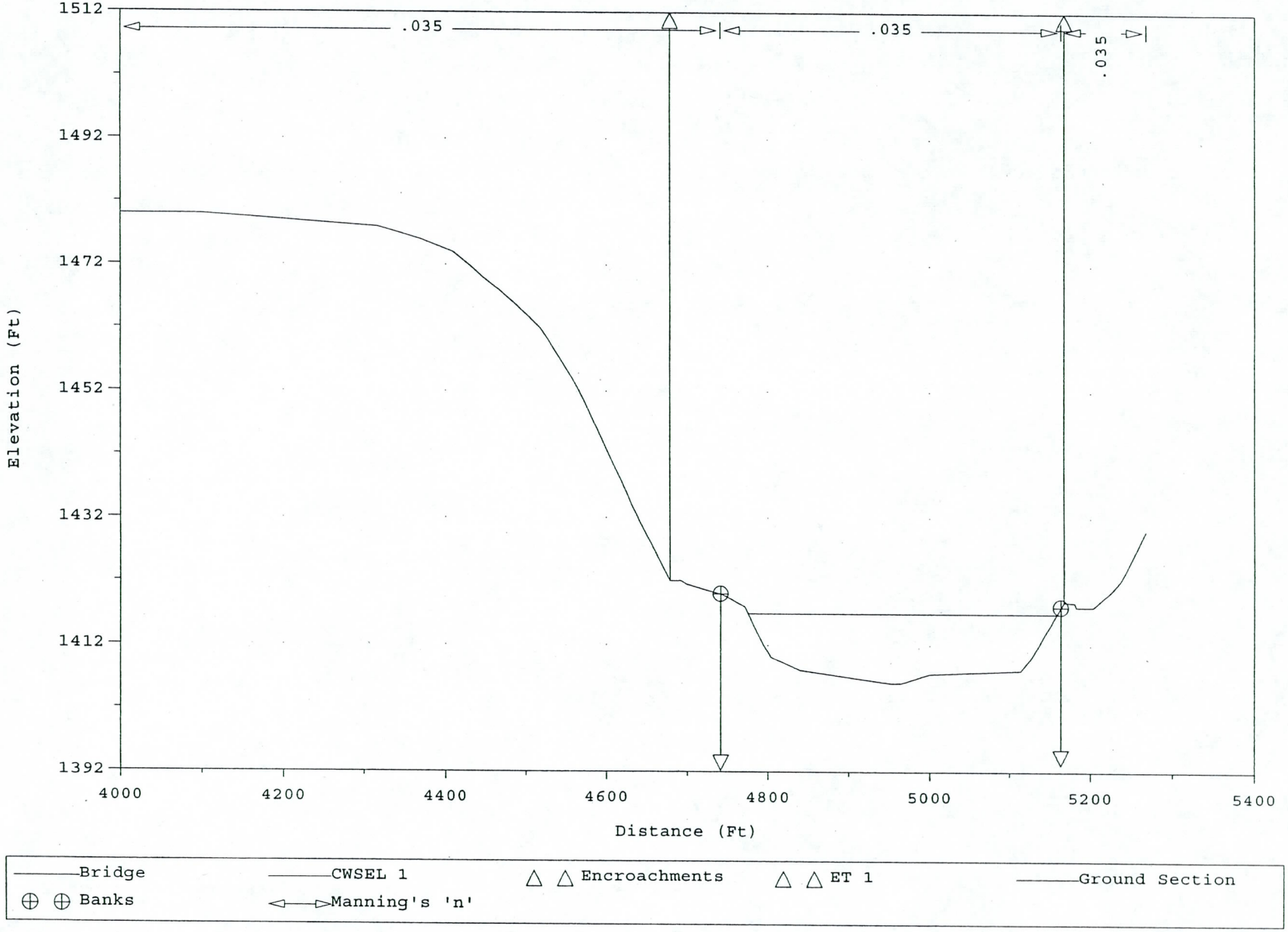
Cross-Section 9.73



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

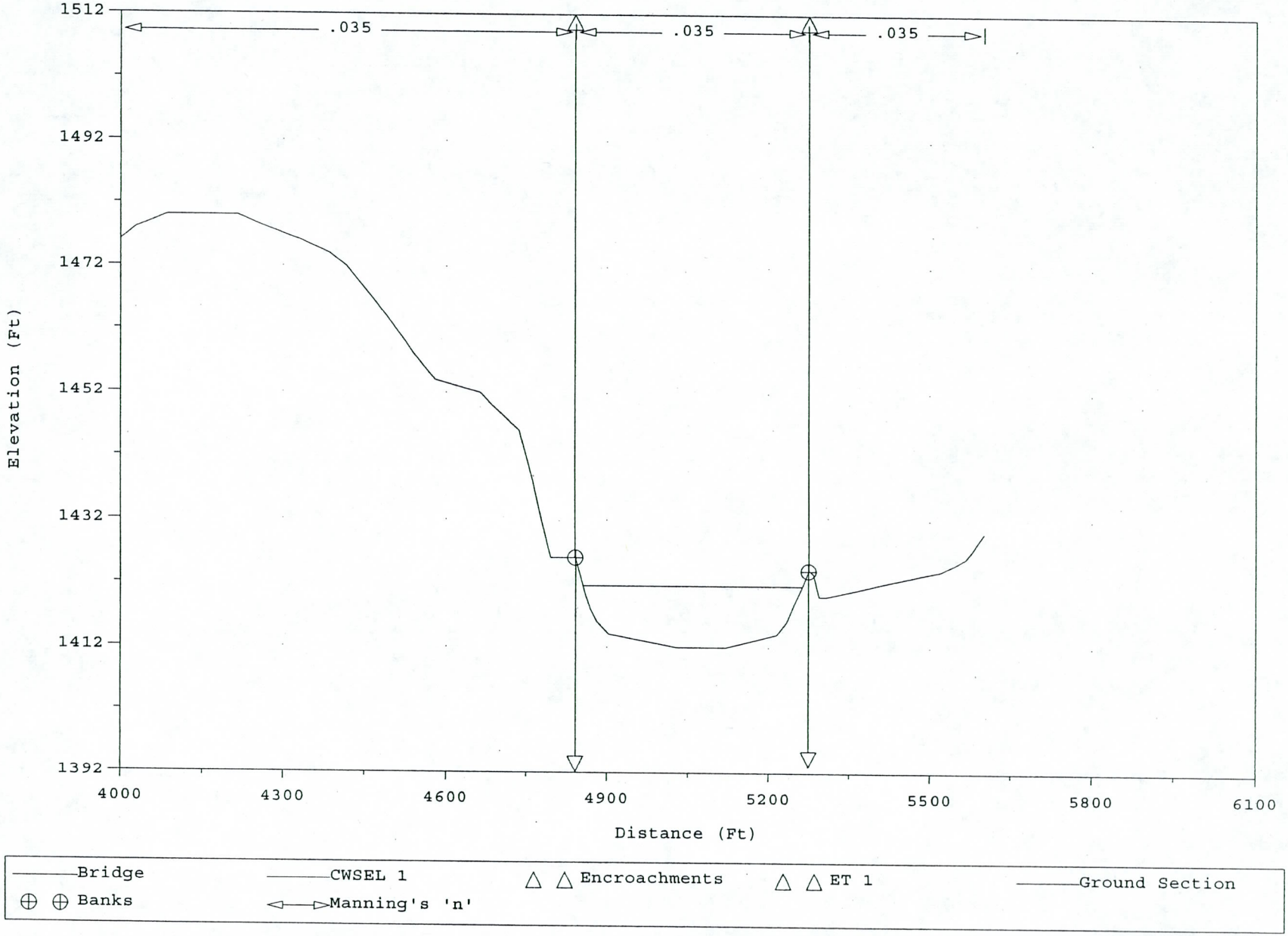
Cross-Section 9.89



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

Cross-Section 10.08



SKUNK CREEK LETTER OF MAP REVISION

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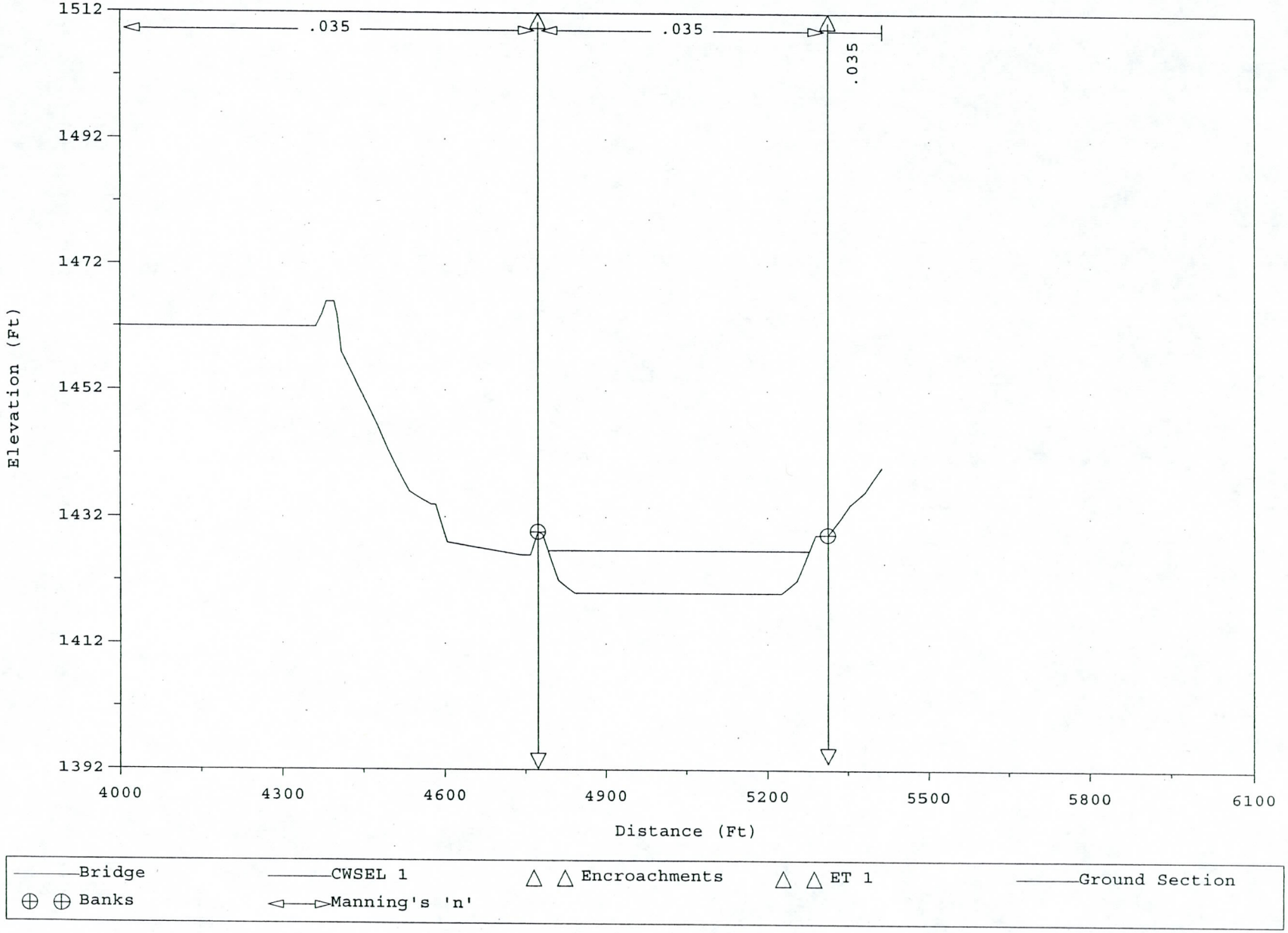
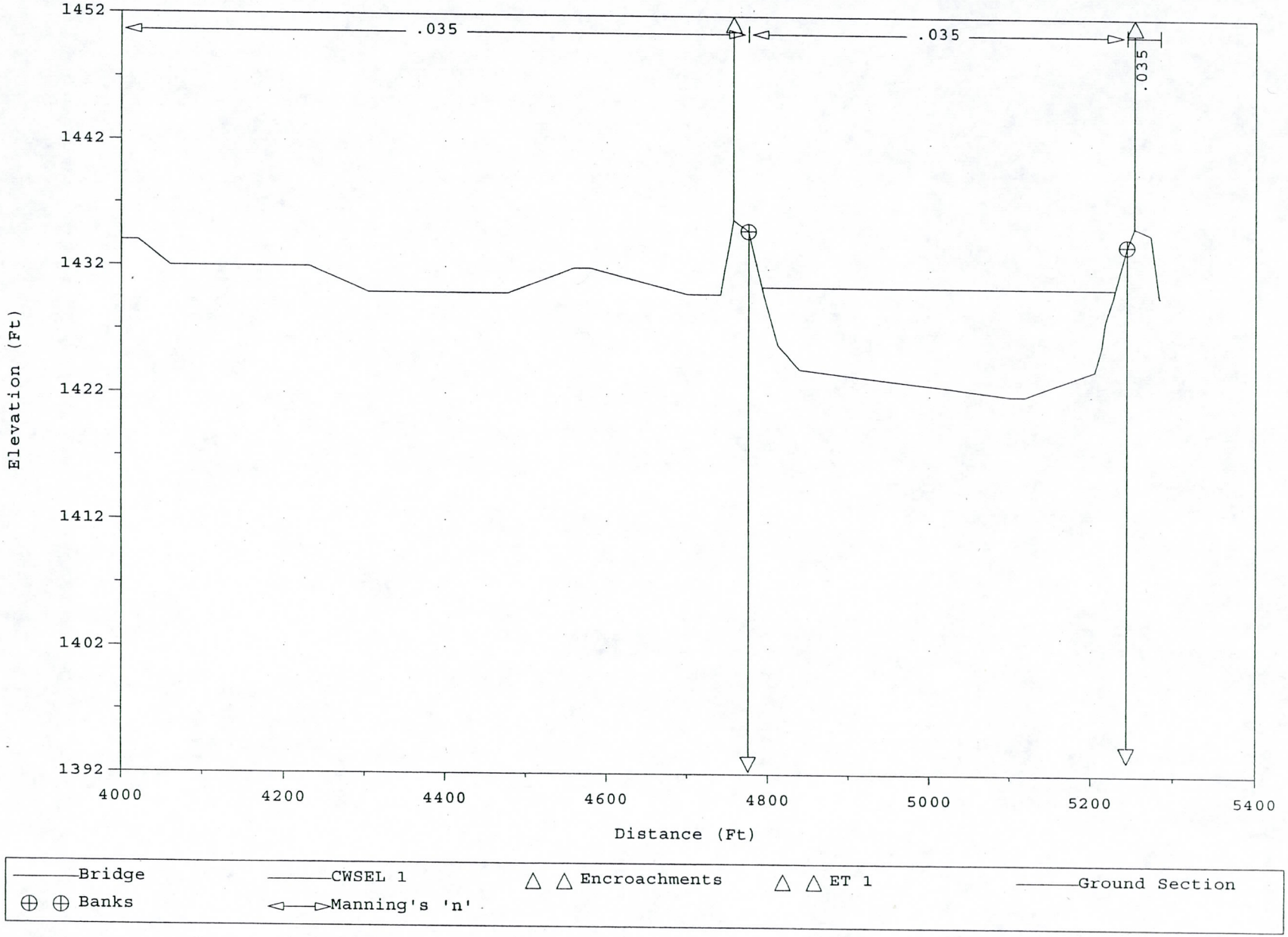
Cross-Section 10.25



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

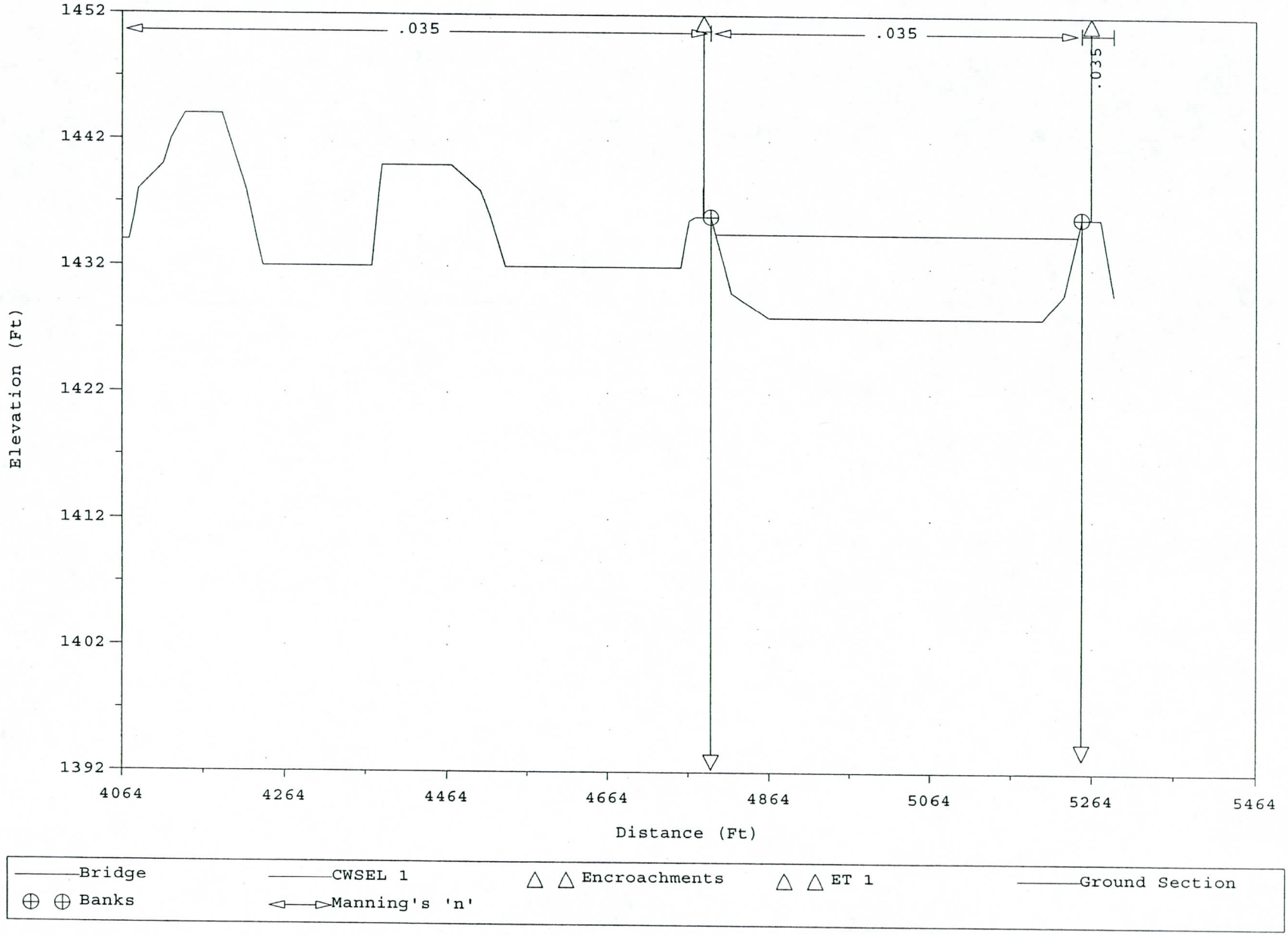
Cross-Section 10.34



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

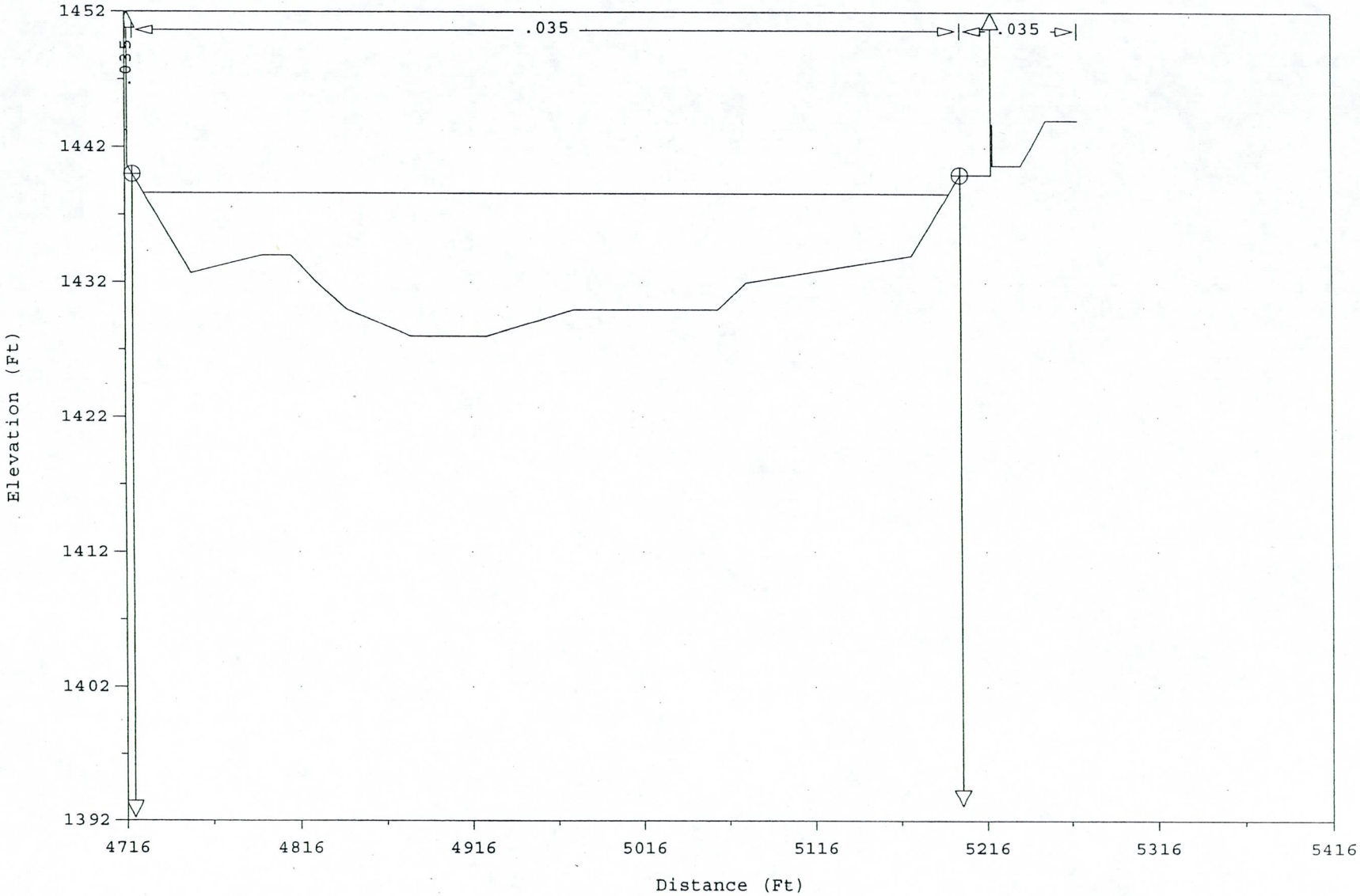
Cross-Section 10.41



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

Cross-Section 10.51



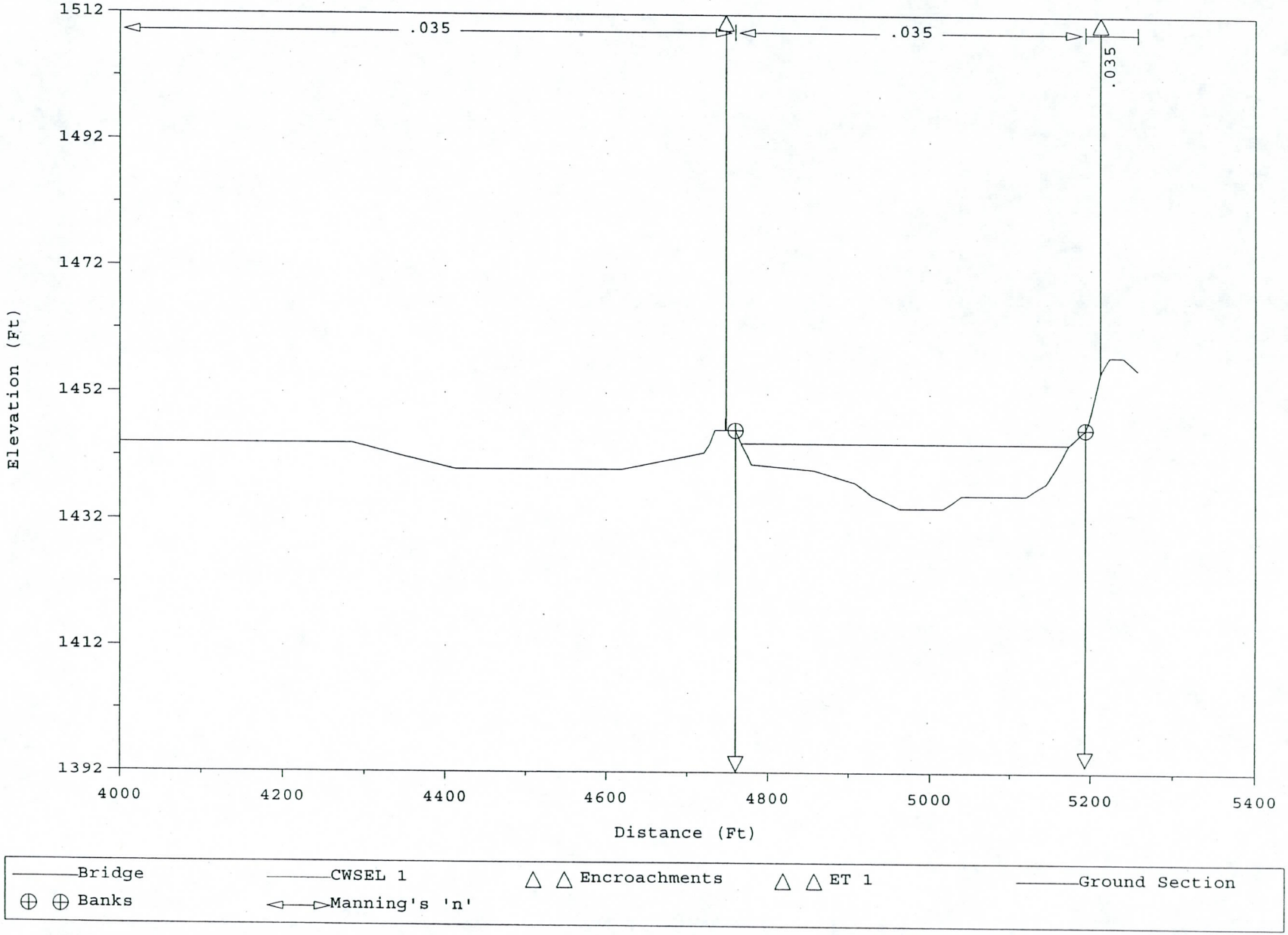
Bridge | CWSEL 1 | Encroachments | ET 1 | Ground Section

Banks | Manning's 'n'

SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

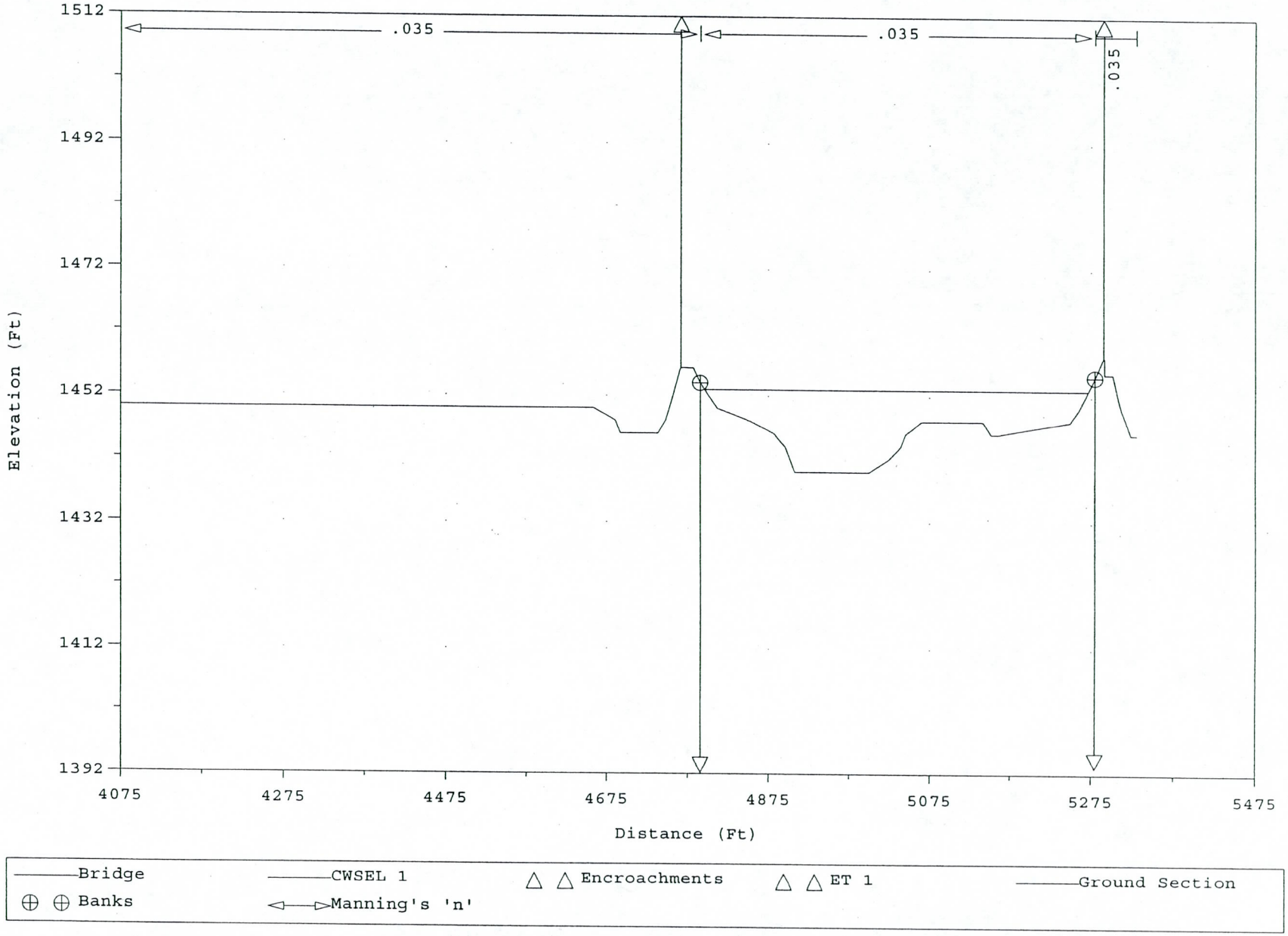
Cross-Section 10.7



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

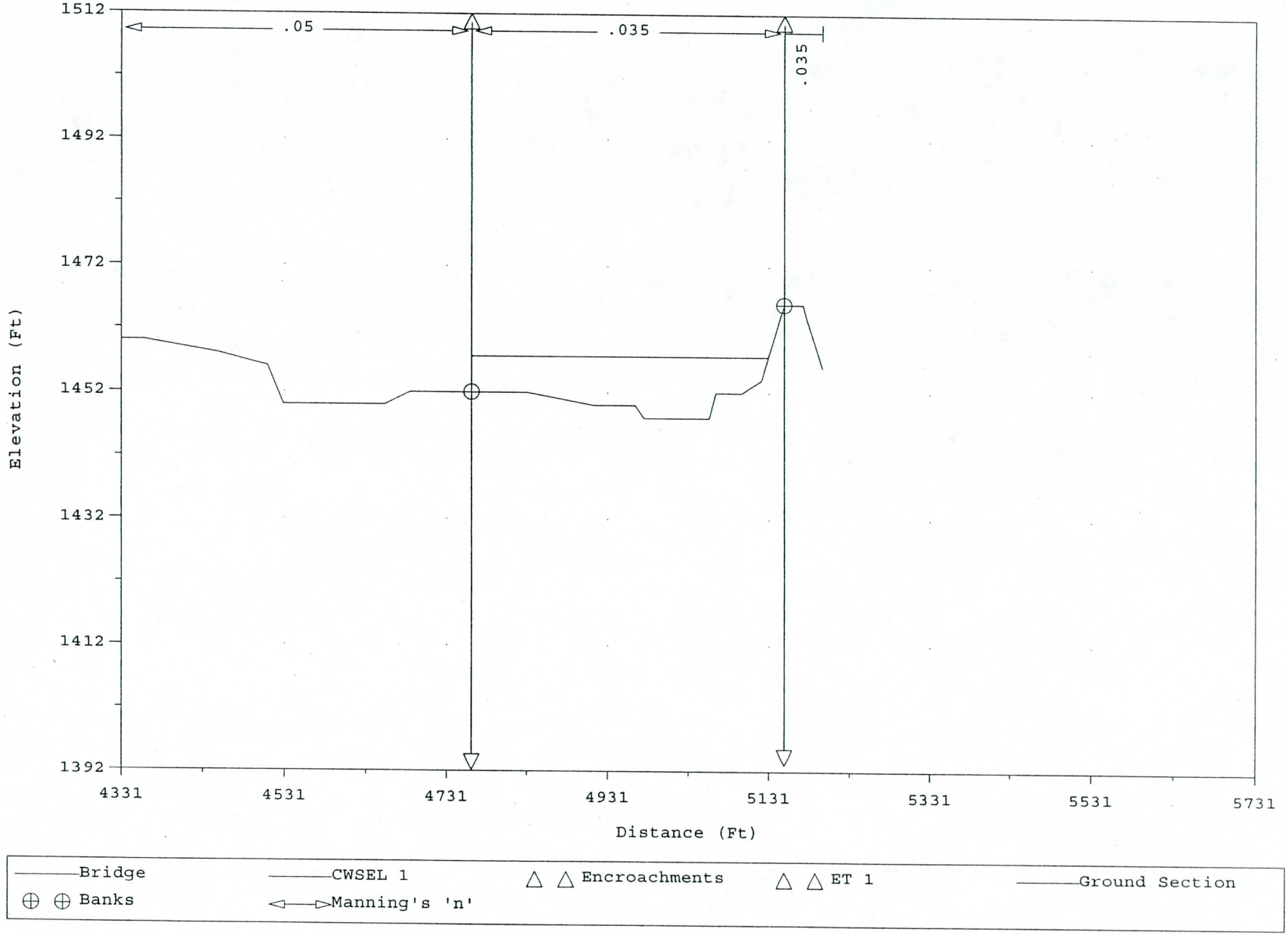
Cross-Section 10.93



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

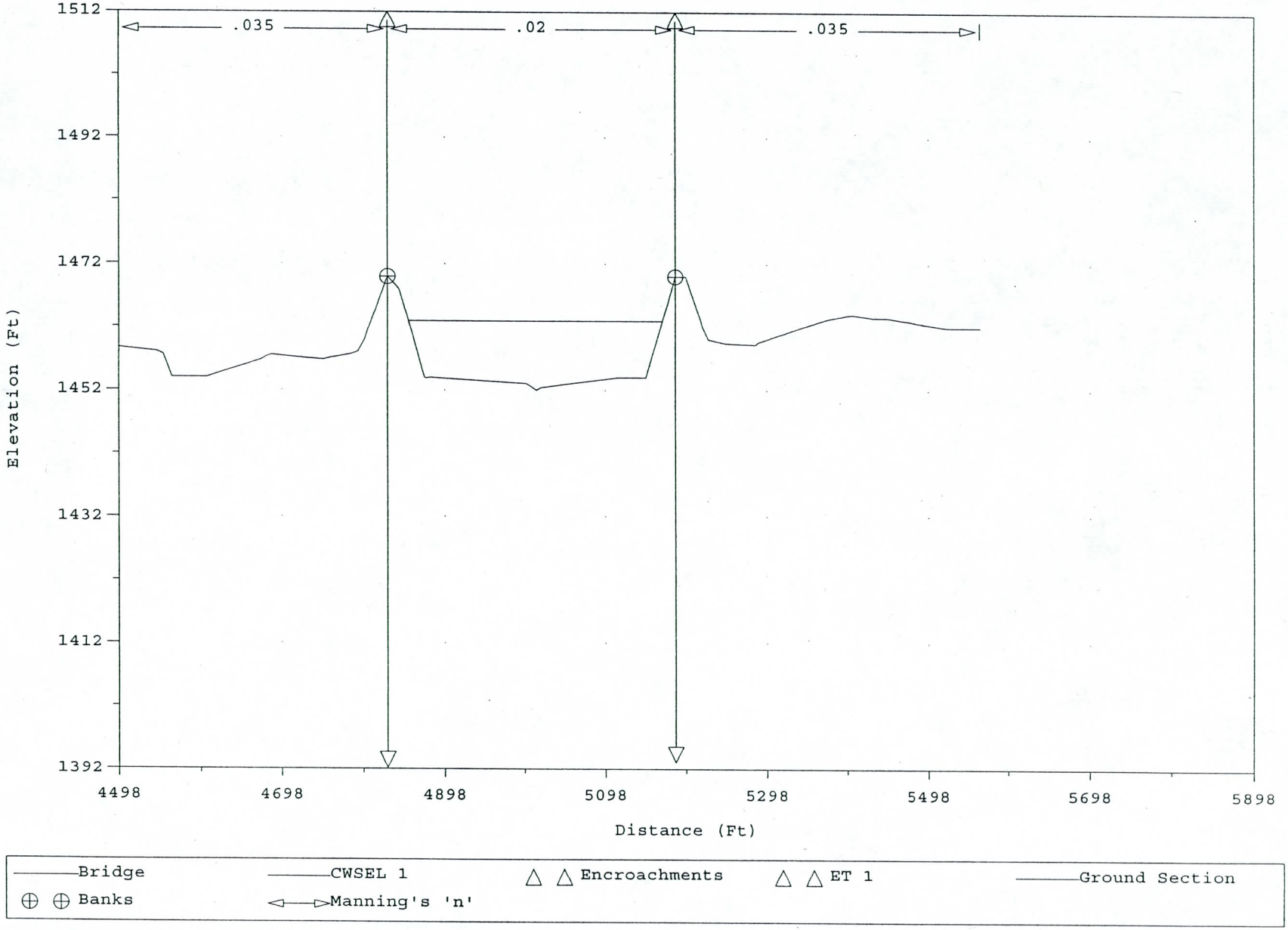
Cross-Section 11.14



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

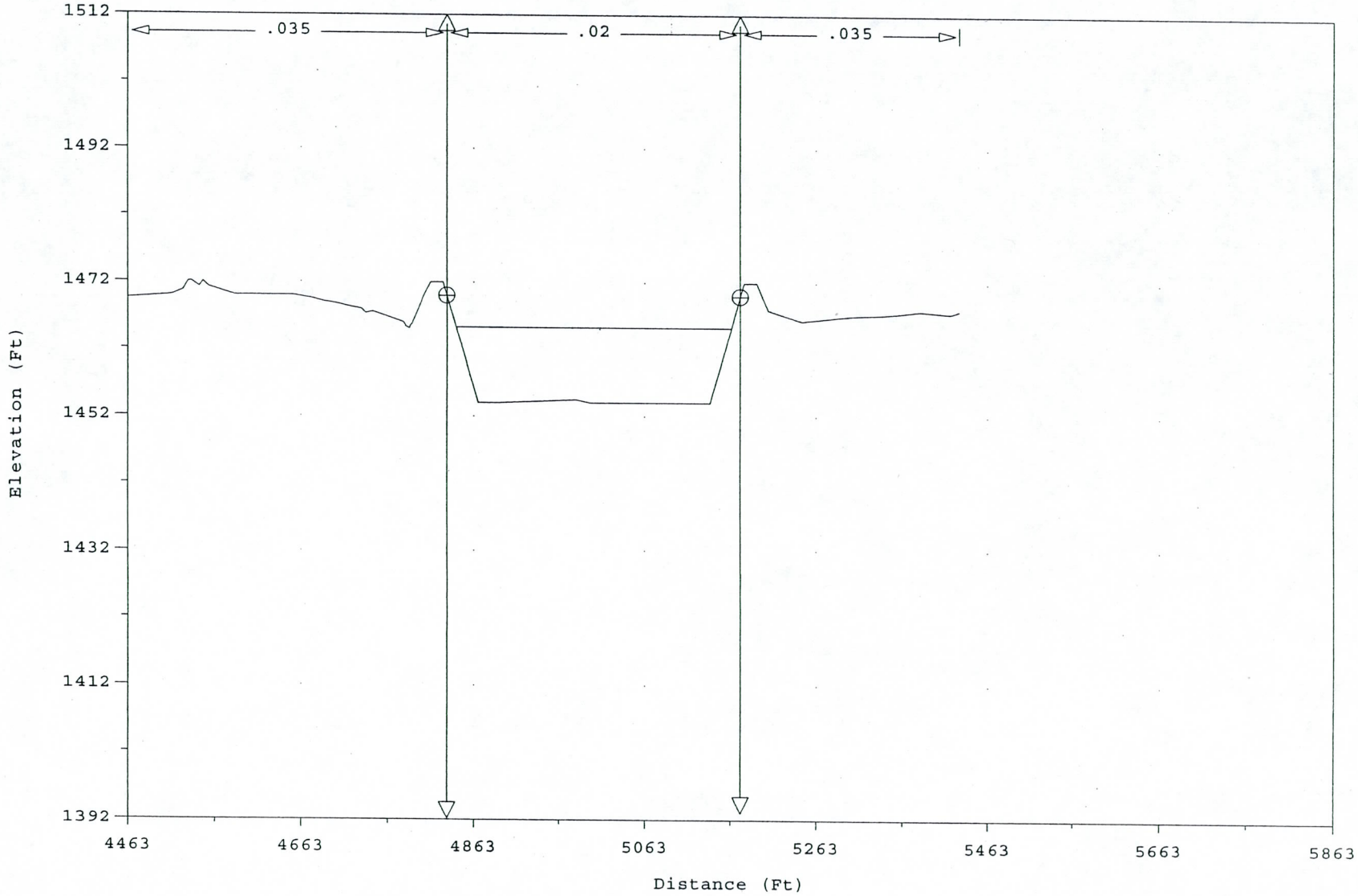
Cross-Section 11.29



SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

Cross-Section 11.48



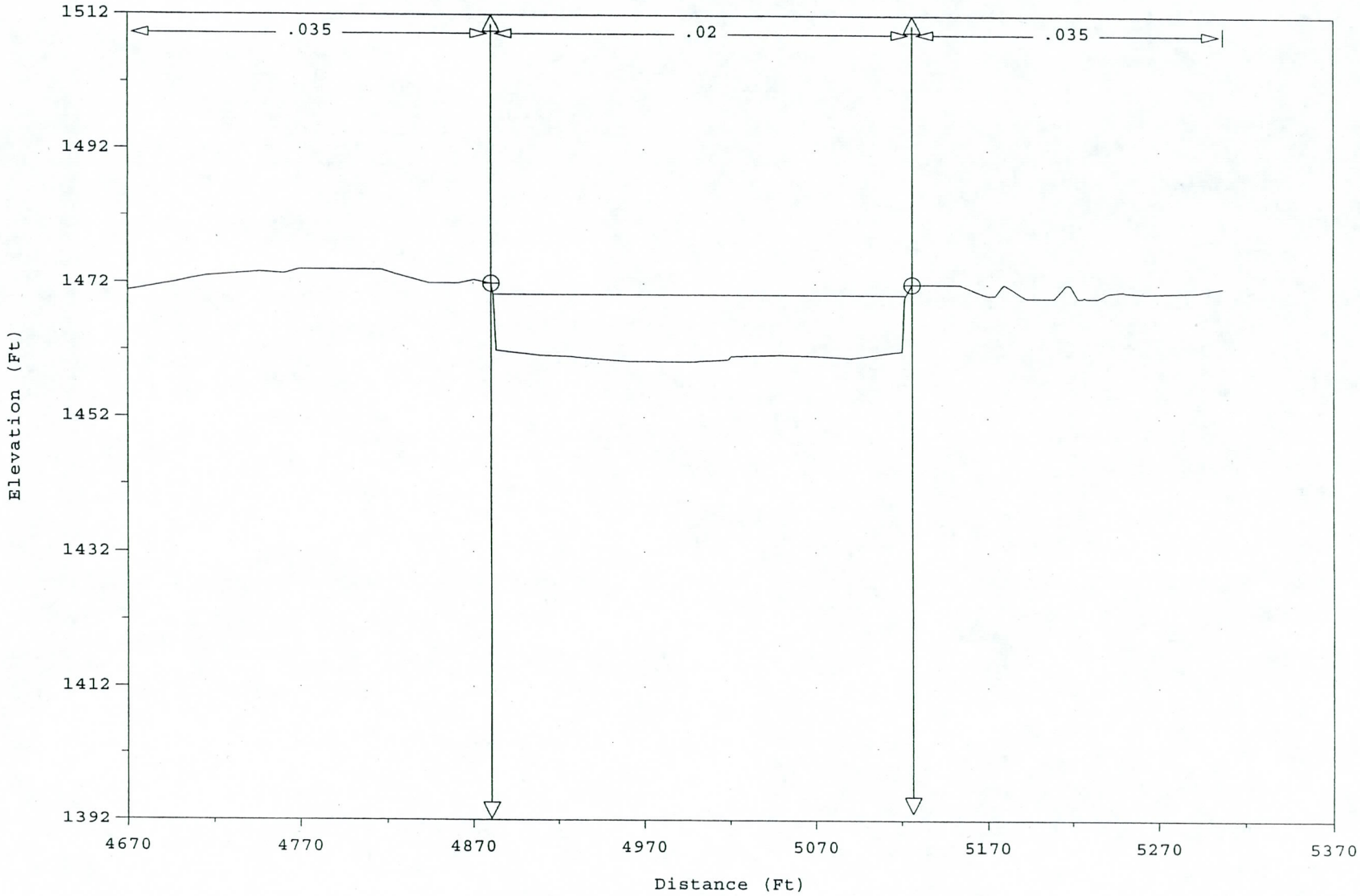
Bridge | CWSEL 1 | Encroachments | ET 1 | Ground Section

Banks | Manning's 'n'

SKUNK CREEK LETTER OF MAP REVISION

REVISED MODEL: **SKUNKLOMR.IH2**

Cross-Section 11.57



Bridge | CWSEL 1 | Encroachments | ET 1 | Ground Section

Banks | Manning's 'n'

Split Flow Models

EASTSPLT.OH2

WESTSPLT.OH2

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1*******************************************
 *  HEC-2 WATER SURFACE PROFILES            *
 *                                          *
 *  Version   4.6.2;  May 1991              *
 *                                          *
 *  RUN DATE    17SEP02    TIME   17:07:43  *
 *******************************************
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

```
T1     100-YEAR FLOW BREAKOUT AT 35TH AVE NORTH OF PINNACLE PEAK ROAD
T2    EASTSPLT.IH2
T3    COMPLETED SEPTEMBER 2002 BY TETRA TECH, INC.
```

This model was used solely to determine the peak breakout flow on LOB north of Pinnacle Peak Road. The breakout peak flow was determined by WSEL matching at X-sec 9.25.

Results of this model are NOT used to model breakout flow hydraulics or delineate the 100-year floodplain. The breakout flow hydraulics and floodplain are analyzed in a separate model, prepared by Coe & Van Loo Consultants, submitted under separate cover.

```
J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0         2                           0.007                   0         0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1         0        -1         0         0                  -1         0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         1         2        26         8         4        25         5        68
     39        23        24

QT        1     15500

NC    0.040     0.040     0.040       0.1       0.3
ET                5.1                          4177      5024
X1     8.79        14      4932      5000
  Future berm north of Parkside Drive
GR   1387.3      4177    1387.48      4286   1387.70      4392   1387.70      4470   1387.70      4580
GR   1387.7      4701     1387.7      4867    1387.7      4932   1383.82      5000      1384      5046
GR     1384      5074      1382      5088      1380      5102      1378      5120

ET                5.1                       4242.71   5109.89
X1     8.92        16    4982.84   5017.85       537       537       537
GR     1388   4144.94      1390   4199.29      1392   4242.71      1390   4326.28      1388   4373.82
GR     1386   4404.95      1386   4516.00      1386   4905.80      1386   4982.84   1386.64      5000
GR     1386   5017.85      1386   5064.51      1388   5095.28      1389   5109.89      1388   5138.75
GR     1386   5160.47
```

```
X1      9.15        11    4994.21    5082.19        43        43        43
GR      1398   3719.90      1396    3900.98      1394   4069.81      1393   4325.58      1393      4814
GR      1393   4994.21      1393       5000      1393   5082.19      1392   5210.16      1392   5403.10
GR      1392   5443.67
  REMOVED NON-CONVEYING DEPRESSION BETWEEN STA 3874 AND 4000
  RIGHT BANK ENCROACHMENT SET AT FLOW SPLIT BOUNDARY FOR BREAKOUT WSEL MATCHING

ET                 5.1                            3762   4738.18
X1      9.25        36    4301.25    4365.84       234       368       310
GR    1393.5      3762      1394       3874      1394      3898      1394   4003.81      1394   4062.18
GR      1395   4283.87      1395    4298.29      1395   4301.25      1395   4365.84      1395    4385.4
GR    1395.7   4563.07      1396    4565.34      1397   4570.45   1397.57   4572.95   1397.46   4582.97
GR      1397   4585.82      1396    4590.84      1395   4598.19      1395   4614.18      1395   4621.31
GR      1394   4735.08      1394    4738.18      1394   4838.32      1393   4871.51      1392   4892.27
GR      1392    5077.8      1393    5179.38      1394   5266.49      1395   5275.95      1396   5278.52
GR      1397   5281.09      1398    5283.83   1398.64    5285.6      1399   5290.86   1399.98   5304.55
GR      1399   5325.36
```

```
SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 9.020
3280 CROSS SECTION      9.02 EXTENDED      5.42 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.63

3470 ENCROACHMENT STATIONS=     4003.9    5065.9  TYPE=      1  TARGET=     1061.970
     9.020      5.42   1391.42   1390.80   1391.42   1391.74       .32       1.71        .01   1388.00
    7235.4    6178.0     934.4     123.0    1362.8     200.8      35.1       27.4       13.7   1390.00
       .07      4.53      4.65      3.51      .040      .040      .040       .000    1386.00   4227.33
   .006037      210.      210.      210.         4        14         0        .00     838.55   5065.88

*SECNO 9.050
3280 CROSS SECTION      9.05 EXTENDED      6.39 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.56

3470 ENCROACHMENT STATIONS=     3969.5    5073.1  TYPE=      1  TARGET=     1103.600
     9.050      6.39   1392.39   1391.38   1392.39   1392.64       .26        .90        .01   1390.00
    8650.0    7277.6     961.0     411.4    1774.8     248.6     107.5       36.0       17.7   1390.00
       .09      4.10      3.87      3.83      .040      .040      .040       .000    1386.00   4188.76
   .003567      202.      202.      202.         3         6         0        .00     884.31   5073.07

*SECNO 9.090
3280 CROSS SECTION      9.09 EXTENDED      5.31 FEET

3470 ENCROACHMENT STATIONS=     4010.9    5125.9  TYPE=      1  TARGET=     1115.020
     9.090      5.31   1393.31   1392.88   1393.31   1393.78       .47       1.07        .07   1391.00
   10767.2    7555.9    1863.3    1348.0    1464.3     290.0     220.8       45.5       22.0   1390.00
       .10      5.16      6.43      6.10      .040      .040      .040       .000    1388.00   4146.32
   .007835      202.      202.      202.         3        14         0        .00     979.56   5125.88

CCHV=     .100 CEHV=     .300
*SECNO 9.130
3280 CROSS SECTION      9.13 EXTENDED      3.22 FEET
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .38

3470 ENCROACHMENT STATIONS= 3762.0 4738.2 TYPE= 1 TARGET= 976.180

9.250	4.81	1396.81	1396.58	1396.81	1397.64	.82	.99	.19	1395.00
15500.0	10983.0	707.9	3809.1	1421.3	117.7	627.4	82.6	36.9	1395.00
.12	7.73	6.02	6.07	.040	.040	.040	.000	1392.00	3762.00
.011790	234.	310.	368.	2	8	0	.00	959.00	4738.18

THIS RUN EXECUTED 17SEP02 17:07:43

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MPLETED SEPTEMBER 2002 B

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS	VCH	DEPTH	TOPWID	AREA	10*KS	FRCH	XLCH	XLBEL	RBEL
*	8.790	703.96	1387.01	1387.01	3.55	9.01	79.87	164.45	49.06	.50	.00	1387.70	1383.82
*	8.920	5571.10	1388.50	1387.31	2.99	2.50	740.83	1738.87	22.84	.36	537.00	1386.00	1386.00
*	8.980	6325.81	1389.55	1389.29	4.85	3.55	783.56	1166.63	122.97	.76	269.00	1388.00	1388.00
*	9.020	7235.41	1391.42	1390.80	4.65	5.42	838.55	1598.68	60.37	.57	210.00	1388.00	1390.00
*	9.050	8650.04	1392.39	1391.38	3.87	6.39	884.31	2130.88	35.67	.45	202.00	1390.00	1390.00
	9.090	10767.16	1393.31	1392.88	6.43	5.31	979.56	1975.14	78.35	.69	202.00	1391.00	1390.00
*	9.130	15500.00	1395.22	1395.22	5.70	4.22	1298.22	2464.11	15.18	.71	207.00	1393.50	1393.00
*	9.140	15500.00	1395.54	1395.54	5.76	4.04	1290.40	2450.10	15.37	.72	33.00	1394.00	1393.00
	9.150	15500.00	1396.26	1394.53	3.35	4.26	1281.74	4429.40	16.83	.33	43.00	1393.00	1393.00
*	9.250	15500.00	1396.81	1396.58	6.02	4.81	959.00	2166.34	117.90	.79	310.00	1395.00	1395.00

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1*********************************************
 *  HEC-2 WATER SURFACE PROFILES             *
 *                                           *
 *  Version   4.6.2;  May 1991               *
 *                                           *
 *  RUN DATE    17SEP02    TIME   17:08:12   *
 *********************************************
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*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
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T1 FLOODPLAIN STUDY - SKUNK CREEK FROM ADOBE DAM TO I-17
T2 WESTSPLT.IH2 100-YR BASE FLOOD ELEVATION
T3 COMPLETED SEPTEMBER 2002 BY TETRA TECH, INC.

This model was used solely to determine the peak breakout flow on ROB north of Pinnacle Peak Road.

Results of this model are NOT used to model breakout flow hydraulics or delineate the 100-year floodplain.

Starting WSEL is Adobe Dam reservoir 100-yr WSEL from effective FIS study.

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2			0		0	0	1378.00	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1	0	0		-1	0		

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38 43 1 2 26 8 4 25 68 53
54

100-yr peak discharge is from effective FIS study.

QT	1	39000								
NC	0.045	0.045	0.035	0.1	0.3					
ET		5.1			4025.25	5073.77				
X1	8.69	95	4025.25	5073.77						
GR	1380.0	3796.61	1380.00	3854.47	1379.00	3861.47	1378.00	3868.42	1378.00	3878.69
GR	1378.6	3884.04	1380.00	3896.01	1380.00	3907.92	1379.82	3923.26	1379.91	3925.58
GR	1380.0	4002.41	1380.54	4004.61	1382.00	4011.19	1382.00	4016.12	1381.16	4025.25
GR	1380.0	4037.88	1379.55	4039.54	1378.00	4045.04	1376.66	4058.92	1376.33	4063.23
GR	1376.0	4067.80	1375.66	4071.80	1374.51	4084.66	1374.14	4088.53	1374.00	4090.42
GR	1373.8	4091.18	1373.53	4092.99	1372.00	4102.33	1371.23	4129.14	1370.00	4171.62
GR	1370.0	4446.38	1370.04	4448.91	1372.00	4550.37	1372.00	4583.65	1371.80	4601.95
GR	1371.2	4726.77	1371.45	4741.81	1371.10	4787.06	1371.00	4796.71	1370.54	4837.32
GR	1370.6	4872.36	1370.52	4876.45	1370.60	4881.98	1370.60	4882.00	1370.82	4897.47
GR	1371.4	4906.65	1371.83	4913.95	1372.00	4917.45	1372.34	4920.12	1374.00	4933.03
GR	1374.3	4936.71	1374.00	4958.00	1373.51	4959.38	1372.00	4963.60	1371.80	4964.16
GR	1370.0	4969.21	1368.37	4973.77	1368.00	4974.80	1366.00	4980.35	1365.56	4981.39
GR	1364.7	4987.21	1364.21	4990.25	1364.00	4992.46	1364.00	5000.00	1364.00	5003.25
GR	1365.5	5010.85	1365.78	5012.36	1366.00	5013.46	1366.52	5014.69	1368.00	5018.15
GR	1368.3	5018.85	1370.00	5022.82	1370.70	5024.49	1372.00	5027.49	1373.05	5031.15
GR	1374.0	5034.40	1375.00	5039.27	1376.00	5044.17	1376.23	5045.52	1377.39	5052.81
GR	1378.0	5059.14	1378.78	5065.36	1379.49	5073.77	1379.70	5074.11	1379.26	5077.51
GR	1378.7	5079.93	1378.00	5082.02	1378.00	5116.40	1378.13	5146.24	1378.00	5177.10
GR	1378.0	5181.33	1377.50	5273.67	1377.18	5375.38	1377.56	5451.37	1377.29	5556.89

```
GR   1372.4    5000.00   1372.50   5005.13   1373.08   5052.28   1373.49   5089.07   1373.86   5118.83
GR   1374.0    5130.57   1375.57   5137.72   1376.00   5139.67   1377.54   5146.76   1378.00   5149.27
GR   1379.4    5157.21   1380.00   5161.68   1380.57   5169.64   1380.83   5173.36   1380.91   5174.01
GR   1381.2    5177.53   1381.59   5182.69   1382.00   5188.14   1382.37   5193.51   1383.14   5206.05
GR   1384.0    5217.34   1385.32   5244.41   1385.68   5252.28   1386.00   5257.06   1387.77   5292.41
GR   1388.0    5296.60   1388.84   5320.16   1389.58   5340.88   1389.68   5346.00   1390.00   5351.31
GR   1390.0    5433.52

ET                 5.1                       4796.92   5198.84
X1     9.08         70   4796.92   5198.84       432       165       365
GR   1391.1    4515.30   1390.24   4539.50   1390.00   4540.45   1390.00   4625.97   1390.21   4628.50
GR   1390.6    4632.33   1390.69   4632.97   1390.44   4647.05   1390.08   4647.52   1390.00   4647.64
GR   1389.6    4649.23   1388.00   4655.18   1388.00   4670.31   1388.16   4671.07   1388.14   4787.35
GR   1388.0    4796.92   1387.24   4809.20   1386.69   4817.41   1386.00   4827.18   1384.79   4833.74
GR   1384.0    4837.38   1383.79   4838.28   1382.78   4842.68   1382.00   4845.64   1381.40   4847.91
GR   1380.0    4853.19   1378.86   4857.51   1378.00   4860.75   1377.03   4864.25   1376.00   4868.13
GR   1375.1    4871.58   1374.00   4875.67   1373.97   4878.43   1373.92   4884.08   1373.76   4895.74
GR   1373.7    4902.64   1373.65   4905.82   1373.59   4911.57   1373.49   4920.43   1373.47   5000.00
GR   1373.5    5095.48   1373.56   5107.93   1373.59   5109.03   1373.62   5112.59   1373.70   5119.31
GR   1373.8    5122.87   1373.82   5124.67   1373.85   5126.00   1373.92   5128.16   1373.94   5130.06
GR   1374.0    5131.14   1374.13   5131.77   1376.00   5140.79   1377.41   5147.57   1378.00   5150.02
GR   1378.6    5152.38   1380.00   5158.25   1381.29   5163.54   1382.00   5166.47   1383.45   5172.44
GR   1384.0    5174.70   1385.73   5181.83   1386.00   5182.93   1387.10   5187.46   1388.00   5190.99
GR   1388.1    5191.61   1389.08   5195.22   1390.00   5198.84   1390.04   5199.45   1390.27   5233.18
  FLOW REDUCTION DUE TO SPLIT FLOW UPSTREAM OF BRIDGE

QT        1      23500

NC    0.035      0.035     0.035
ET                 5.1                       4835.60   5165.24
X1     9.14         94   4835.60   5165.24       288       385       333
GR   1392.1    4525.85   1392.00   4598.96   1391.59   4608.73   1390.99   4723.68   1391.42   4775.78
GR   1391.5    4789.87   1391.64   4805.14   1391.00   4830.80   1390.59   4832.90   1390.00   4835.60
GR   1389.7    4836.69   1389.00   4839.12   1388.44   4841.11   1388.00   4842.60   1387.57   4843.96
GR   1387.0    4845.55   1386.47   4846.70   1386.00   4847.68   1385.71   4848.28   1385.00   4849.75
GR   1384.7    4850.41   1384.00   4851.87   1383.84   4852.20   1383.32   4853.25   1383.00   4853.91
GR   1382.8    4854.33   1382.00   4856.07   1381.65   4856.77   1381.00   4858.07   1380.00   4860.14
GR   1379.7    4861.00   1379.19   4861.98   1379.00   4862.42   1378.49   4863.58   1378.00   4864.71
GR   1377.4    4866.13   1377.00   4867.28   1376.43   4869.03   1376.00   4869.56   1375.54   4872.43
GR   1374.5    4874.14   1374.00   4875.08   1374.00   5000.00   1374.00   5062.13   1374.39   5091.47
GR   1375.0    5121.35   1375.00   5125.45   1375.71   5129.68   1376.00   5131.10   1376.94   5133.66
GR   1377.0    5134.06   1377.77   5135.68   1378.00   5136.16   1379.00   5138.25   1379.92   5140.18
GR   1380.0    5140.35   1380.80   5142.03   1381.00   5142.44   1381.45   5143.38   1382.00   5144.53
GR   1382.9    5146.34   1383.00   5146.63   1383.72   5148.14   1384.00   5148.75   1384.46   5149.37
GR   1385.0    5150.09   1385.25   5150.43   1386.00   5151.41   1386.80   5152.48   1387.00   5152.75
GR   1387.2    5153.56   1388.00   5156.83   1388.60   5159.29   1389.00   5160.92   1389.34   5162.35
GR   1389.7    5164.16   1390.00   5165.24   1390.00   5165.45   1390.42   5166.34   1391.00   5168.32
GR   1391.8    5170.94   1391.91   5171.50   1392.00   5171.73   1392.22   5174.81   1392.64   5180.92
GR   1393.0    5184.53   1392.55   5196.46   1392.91   5224.81   1392.45   5256.91   1392.29   5293.65
GR   1392.1    5328.16   1392.00   5380.42   1392.00   5416.53   1391.87   5437.55
  DOWNSTREAM FACE OF PINNACLE PEAK ROAD BRIDGE
```

```
ET                 5.1                          4852.56     5164.29
X1      9.16        89     4852.56     5164.29        8           8           8
GR    1392.6   4528.66     1392.16     4581.89  1392.81     4592.32     1392.00     4643.39     1391.85     4708.61
GR    1392.0   4756.55     1392.50     4805.50  1392.00     4836.76     1391.23     4838.82     1391.00     4839.41
GR    1390.5   4842.05     1390.00     4852.56  1389.00     4854.43     1388.00     4856.29     1387.00     4857.94
GR    1386.0   4859.59     1385.00     4861.24  1384.00     4862.89     1383.40     4863.88     1383.00     4864.54
GR    1382.5   4865.33     1382.00     4866.18  1381.00     4867.82     1380.61     4868.61     1380.00     4869.92
GR    1379.8   4870.35     1379.00     4872.01  1378.40     4873.27     1378.00     4874.11     1377.29     4875.60
GR    1377.0   4876.20     1376.18     4877.92  1376.00     4878.30     1375.00     4880.39     1374.81     4915.05
GR    1374.0   4961.04     1374.20     5000.00  1374.50     5083.02     1374.70     5107.91     1375.00     5129.31
GR    1375.6   5132.84     1376.00     5135.04  1377.00     5138.70     1378.00     5140.93     1379.00     5142.76
GR    1379.6   5143.88     1380.00     5144.79  1380.41     5145.63     1381.00     5146.82     1381.33     5147.49
GR    1382.0   5148.85     1382.47     5149.81  1383.64     5152.18     1384.00     5152.91     1384.55     5154.02
GR    1385.0   5154.94     1386.00     5156.58  1386.42     5157.20     1387.00     5158.07     1388.00     5161.31
GR    1388.6   5162.08     1389.00     5162.75  1389.58     5163.63     1390.00     5164.29     1390.52     5165.66
GR    1390.7   5169.65     1390.00     5170.91  1390.00     5171.15     1390.65     5172.70     1391.00     5173.49
GR    1391.5   5174.67     1392.00     5175.74  1392.49     5177.88     1393.00     5180.15     1393.00     5215.17
GR    1392.8   5239.51     1393.00     5302.86  1393.00     5330.00     1393.00     5335.30     1393.52     5343.99
GR    1394.0   5352.89     1394.20     5356.22  1394.67     5363.95     1395.00     5372.98     1395.00     5394.93
GR    1394.9   5404.04     1394.00     5430.80  1393.15     5432.47     1393.36     5445.27

  BOTTOM OF DROP STRUCTURE

NC     0.035     0.035       0.020
ET                 5.1                           4732     5190.05
X1      9.21         7       4732     5174.57     145         355         279
GR      1389      4732       1376        4765    1376        4901        1376        5000        1376     5140.72
GR      1391   5174.57       1392     5190.05

  TOP OF DROP STRUCTURE

NC     0.040     0.035       0.035
ET                 5.1                           4664     5314.09
X1      9.22        14       4664     5192.98     122         104          39
GR      1395      4664       1390        4708    1390     4871.20        1390        5000        1390     5167.75
GR      1391   5173.76       1392     5177.14    1393     5179.36        1394     5181.58        1395     5184.44
GR      1396   5187.36       1397     5192.98    1398     5219.20        1399     5314.09

  REMOVED NON-CONVEYING DEPRESSION BETWEEN STA 3874 AND 4000
  LEFT BANK ENCROACHMENT SET AT FLOW SPLIT BOUNDARY FOR BREAKOUT WSEL MATCHING

ET                 5.1                          4738.18     5304.55
X1      9.25        37       4825     5285.60     155          82         141
GR    1393.5      3762       1394        3874    1394        3898        1394     4003.81        1394     4062.18
GR      1395   4283.87       1395     4298.29    1395     4301.25        1395     4365.84        1395      4385.4
GR    1395.7   4563.07       1396     4565.34    1397     4570.45     1397.57     4572.95     1397.46     4582.97
GR      1397   4585.82       1396     4590.84    1395     4598.19        1395     4614.18        1395     4621.31
GR      1394   4735.08       1394        4825    1394     4838.32        1393     4871.51        1392     4892.27
GR      1392      5000       1392      5077.8    1393     5179.38        1394     5266.49        1395     5275.95
GR      1396   5278.52       1397     5281.09    1398     5283.83     1398.64      5285.6        1399     5290.86
GR      1400   5304.55       1399     5325.36

  END FLOW SPLIT; RETURN TO FULL FLOW
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LEFT BANK ENCROACHMENT SET AT FLOW SPLIT BOUNDARY

NC	0.040	0.040	0.040							
ET		5.1			4560.74	5209				
X1	9.45	97	4709	5209	93	126	118			
GR	1444	4000	1446	4007.9	1448	4067.98	1448	4129.56	1446	4153.01
GR	1444	4163.3	1442	4166.26	1440	4169.22	1438	4175.44	1436	4186.62
GR	1434	4200.28	1432	4214.71	1430	4223.41	1428	4230.51	1426	4245.88
GR	1424	4268.57	1422.59	4278.96	1422	4280.89	1420	4290.71	1418	4299.79
GR	1416	4308.72	1414	4317.57	1412	4326.42	1410	4337.33	1408	4350.71
GR	1406	4364.09	1404	4377.47	1402	4400.54	1401	4461.44	1400	4466.82
GR	1400	4480.64	1400	4491.26	1400	4512.14	1401	4518.92	1401.69	4560.74
GR	1402	4579.32	1403	4582.89	1403	4591.95	1402	4596.75	1402	4660
GR	1402	4672.46	1401.7	4709	1401	4801.15	1400	4808.19	1399	4812.86
GR	1398	4817.28	1397	4822.04	1396	4829.31	1395	4850.48	1395	4874.85
GR	1396	4881.97	1397	4899.1	1397	4923.02	1396	4938.23	1395	4946.05
GR	1394	4960.72	1394	4965.12	1394	4968.36	1394	4997.02	1393.39	5000
GR	1393	5001.91	1393	5029.22	1394	5035.16	1395	5037.25	1396	5039.33
GR	1397	5041.64	1398	5043.96	1399	5046.15	1400	5048.19	1401	5065.48
GR	1401	5071.95	1401	5081.45	1401	5133.8	1400	5156.91	1399	5160.41
GR	1398	5163.93	1397	5167.45	1396	5170.97	1395	5174.49	1394	5180.55
GR	1394	5209	1394	5237.19	1395	5242.58	1396	5247.96	1397	5251.97
GR	1398	5255.85	1399	5259.53	1400	5261.9	1401	5264.27	1404.8	5265.18
GR	1402	5266.67	1403	5269.03	1404	5271.38	1405.2	5272.32	1404.6	5276.7
GR	1405	5277.23	1405	5281.63						

NC	0.035	0.040	0.040							
ET		5.1			4663.35	5177				
X1	9.54	85	4685.93	5177	410	515	500			
GR	1456	4000	1456	4021.5	1454	4238.02	1454	4370.23	1456	4373.71
GR	1458	4382.67	1460	4392.58	1462	4402.82	1464	4414.23	1464	4416.59
GR	1462	4419.16	1460	4421.73	1458	4424.3	1456	4426.86	1454	4429.43
GR	1452	4432.03	1450	4434.89	1448	4437.71	1446	4440.53	1444	4443.94
GR	1442	4455.27	1440	4466.36	1438	4475.82	1436	4485.28	1434	4494.74
GR	1432	4503.98	1430	4512.83	1428	4521.68	1426	4530.63	1424	4537.95
GR	1422	4543.4	1420	4548.8	1418	4566.76	1416	4576.41	1414	4588.78
GR	1412	4606.7	1410	4618.24	1408	4626.12	1406	4646.3	1405.45	4653.56
GR	1406	4654.9	1408	4659.52	1409.53	4663.35	1409.41	4679.83	1408	4685.93
GR	1406	4694.77	1404	4704.62	1402	4714.47	1400	4759.39	1399	4817.12
GR	1399	4833.11	1399	4849.47	1399	4877	1398	4880.23	1397	4889.16
GR	1397	4922.52	1398	4930.18	1398	4954.06	1397	4978.17	1397	5000
GR	1397	5021.85	1398	5031.11	1399	5044.96	1400	5072.02	1401	5077.75
GR	1402	5083.41	1403	5099.61	1404	5131.49	1404	5150.42	1404	5168.37
GR	1404	5177	1404	5197.33	1404	5199.5	1404	5210.97	1404	5253.08
GR	1404	5391.09	1403	5589.76	1403	5598.79	1404	5665.44	1405	5677.3
GR	1406	5688.92	1407	5698.83	1408	5708.08	1408.1	5709.05	1408	5712.42

ET		5.1			4698.37	5217.67				
X1	9.80	62	4738.89	5206.55	383	349	365			
GR	1476	4000	1476	4071.22	1474	4291.9	1472	4368.03	1470	4404.99
GR	1468	4419.78	1466	4435.01	1464	4454.29	1462	4489.38	1460	4517.69
GR	1458	4526.82	1456	4535.94	1454	4545.06	1452	4554.19	1450	4563.31
GR	1448	4572.44	1446	4580.51	1444	4588.95	1442	4597.51	1440	4606.07
GR	1438	4614.65	1436	4623.22	1434	4631.58	1432	4639.42	1430	4647.25
GR	1428	4655.08	1426	4662.93	1424	4670.84	1422	4678.74	1420	4686.85
GR	1418	4698.37	1416	4738.89	1416	4742.87	1416	4745.09	1415.15	4749.88
GR	1415.7	4766.09	1414	4773.04	1412	4781.48	1410	4789.92	1408	4798.11
GR	1406	4814.33	1406	5000	1406	5168.2	1408	5177.78	1410	5187.37
GR	1412	5196.96	1414	5206.55	1414.61	5209.05	1414.9	5217.67	1416	5221.57
GR	1418	5228.59	1420	5235.61	1422	5242.63	1424	5250.86	1426	5260.4
GR	1428	5270.06	1430	5279.73	1432	5290	1434	5301.13	1436	5313.24
GR	1438	5329.65	1440	5350.74						

ET		5.1			4678.48	5167.47				
X1	9.89	61	4741.17	5163.70	509	484	495			
GR	1480	4000	1480	4097.31	1478	4315.5	1476	4369.55	1474	4409.22
GR	1472	4428.88	1470	4447.01	1468	4467.06	1466	4484.74	1464	4501.35
GR	1462	4517.81	1460	4528.28	1458	4538.09	1456	4547.75	1454	4557.31
GR	1452	4566.31	1450	4574.08	1448	4581.28	1446	4588.48	1444	4595.7
GR	1442	4603.03	1440	4610.35	1438	4617.67	1436	4624.99	1434	4631.68
GR	1432	4638.82	1430	4646.76	1428	4654.71	1426	4662.61	1424	4670.44
GR	1422	4678.48	1422	4689.89	1422.06	4691.09	1422	4691.98	1421.45	4699.1
GR	1420	4741.17	1418	4771.38	1416	4778.99	1414	4786.68	1412	4794.99
GR	1410	4803.8	1408	4840.1	1406	4951.17	1406	4964.91	1407.43	5000
GR	1408	5114.09	1410	5126.94	1412	5136.13	1414	5145.32	1416	5154.51
GR	1418	5163.7	1418.8	5167.47	1418.7	5180.97	1418	5182.68	1418	5202.91
GR	1420	5221.64	1422	5236.46	1424	5244.79	1426	5252.68	1428	5260.3
GR	1430	5267.91								

ET		5.1			4813.54	5284.14				
X1	9.98	68	4828.11	5274.26	462	469	475			
GR	1476	4020	1476	4135.18	1474	4180.69	1472	4242.44	1472	4405.93
GR	1474	4459.87	1474	4532.3	1472	4564.64	1470	4600.47	1468	4627.43
GR	1466	4644.39	1464	4650.73	1462	4658.68	1460	4666.95	1458	4675.21
GR	1456	4683.48	1454	4692.64	1452	4702.53	1450	4711.67	1448	4720.68
GR	1446	4728.08	1444	4734.3	1442	4740.53	1440	4746.75	1438	4752.97
GR	1436	4759.19	1434	4766.97	1432	4775.44	1430	4783.95	1428	4813.54
GR	1428	4821.2	1428.96	4826.63	1428	4828.11	1426	4830.93	1425.95	4831.02
GR	1425.7	4834.7	1424	4840.53	1422	4847.1	1420	4853.67	1418	4860.24
GR	1416	4866.81	1414	4874.06	1412	4895.31	1410	4925.82	1410	4957.15
GR	1410	4985.2	1410	5000	1410	5196.05	1412	5234.32	1414	5243.75
GR	1416	5253.18	1418	5262.85	1420	5274.26	1421.67	5284.14	1421.15	5293.67
GR	1420	5297.1	1418.2	5302.27	1420	5323.38	1422	5337.3	1424	5349.84
GR	1426	5361.61	1428	5370.82	1430	5379.99	1432	5389.15	1434	5398.3
GR	1436	5407.46	1438	5416.8	1440	5427.51				

GR	1422	5172.18	1424	5223.94	1426	5234.36	1428	5243.12	1430	5251.96
GR	1432	5260.8	1434	5269.64	1434.83	5271.99	1434.09	5290.23	1434	5290.52
GR	1432	5296.74	1430	5302.97						

ET		5.1			4756.86	5252.58				
X1	10.34	38	4775.45	5243.36	104	42	73			
GR	1434	4000	1434	4020.85	1432	4060.47	1432	4210.33	1432	4230.74
GR	1430	4304	1430	4351	1430	4400.08	1430	4476.92	1432	4558.77
GR	1432	4579.43	1430	4699.87	1430	4741.11	1432	4746.28	1434	4751.62
GR	1435.9	4756.86	1435	4775.45	1434	4779.27	1432	4786.85	1430	4794.42
GR	1428	4803.16	1426	4811.92	1424	4839.17	1422.77	5000	1422	5099.99
GR	1422	5118.31	1424	5204.31	1426	5212.97	1428	5217.15	1430	5226.8
GR	1432	5234.78	1434	5243.36	1435.48	5252.58	1434.92	5272.38	1434	5274.21
GR	1432	5278.35	1430	5282.48	1430	5283.56				

HAPPY VALLEY ROAD CROSSING

NC	0.030	0.030	0.030							
ET		5.1			4823.21	5272				
X1	10.38	34	4823.21	5293.86	173	143	162			
GR	1432	4050	1432	4345.47	1434	4359.49	1436	4382.17	1436	4444.22
GR	1434	4514.59	1434	4523.97	1436	4605.62	1436	4667.41	1434	4710.47
GR	1434	4776.7	1435.99	4798.29	1435.82	4823.21	1434	4831.49	1432	4838.95
GR	1430	4845.97	1428	4854.29	1426	4860.89	1424	4952.8	1424	5000
GR	1424	5110.95	1426	5223.7	1428	5293.86	1430	5418.28	1432	5426.63
GR	1434	5436.09	1436	5445.55	1436	5462.06	1438.33	5462.07	1438.33	5463.07
GR	1436	5463.08	1436	5478.57	1435.96	5479.62	1434	5488.87		

NC	0.035	0.035	0.035							
ET		5.1			4783.08	5262.74				
X1	10.41	52	4791.83	5251.18	198	142	171			
GR	1434	4064	1434	4072.38	1436	4078.9	1438	4083.68	1440	4114.64
GR	1442	4124.08	1444	4141.29	1444	4186.45	1442	4196.42	1438	4216.34
GR	1436	4223.27	1434	4229.95	1432	4236.99	1432	4370.62	1434	4373.56
GR	1436	4376.5	1438	4379.45	1440	4383.45	1440	4469.41	1438	4505.1
GR	1436	4516.74	1434	4526.64	1432	4535.95	1432	4754.33	1434	4759.91
GR	1435.7	4764.94	1436	4772.28	1436	4782.06	1438.34	4782.07	1438.34	4783.07
GR	1436	4783.08	1436	4791.83	1434	4800.27	1432	4808.85	1430	4817.15
GR	1428	4863.1	1428	5000	1428	5071.88	1428	5119.31	1428	5202.52
GR	1430	5229.35	1432	5236.74	1434	5244.12	1436	5251.18	1436	5262.73
GR	1438.9	5262.74	1438.9	5262.75	1436	5262.76	1436	5274.27	1434	5279.7
GR	1432	5285.08	1430	5290.4						

ET		5.1			4758.78	5239.41				
X1	10.42	46	4772.17	5239.37	70	58	64			
GR	1434	4057	1434	4122.12	1434	4141.01	1432	4192.42	1432	4500.07
GR	1434	4518.47	1436	4524.56	1438	4530.85	1438	4566	1436	4602.78
GR	1434	4617.91	1432	4648.14	1432	4733.89	1434	4738.7	1436	4743.37
GR	1436	4757.77	1439	4757.78	1439	4758.78	1436	4758.79	1436	4772.17
GR	1434	4781.27	1432	4790.3	1431.35	4793.22	1430	4857.83	1428	4863.2
GR	1426	4872.34	1426	5000	1426	5035.16	1428	5059.55	1430	5071.52

NC	0.035	0.035	0.035							
ET		5.1			4748.11	5211.3				
X1	10.70	43	4759.88	5193.3	390	382	402			
GR	1444	4000	1444	4038.07	1444	4066.66	1444	4284.59	1442	4345.59
GR	1440	4412.2	1440	4618.19	1442	4696.02	1442.67	4720.77	1444	4727.26
GR	1446.2	4734.32	1446.2	4747.10	1448.10	4747.11	1448.10	4748.11	1446.2	4748.12
GR	1446.2	4759.88	1444	4767.51	1442	4775.38	1440.89	4779.56	1440	4856.65
GR	1438	4908.41	1436	4929.27	1434	4963.32	1434	5000	1434	5015.86
GR	1436	5039.71	1436	5072.24	1436	5119.55	1438	5144.54	1440	5154.48
GR	1442	5163.53	1444	5172.15	1446	5188.42	1446.48	5193.3	1448	5197.69
GR	1450	5201.41	1452	5205.12	1454	5208.74	1455.47	5211.3	1456	5213.46
GR	1458	5222.24	1458	5238.92	1456	5256.86				
ET		5.1			4782.29	5310.03				
X1	10.83	54	4800.8	5298.85	642	704	717			
GR	1448	4234	1448	4375.81	1448	4583.91	1446	4610.95	1446	4656.3
GR	1446	4742.93	1444.39	4761.2	1446	4765.18	1448	4769.97	1450	4774.76
GR	1452	4779.31	1452	4781.28	1454.60	4781.29	1454.60	4782.29	1452	4782.30
GR	1452	4800.8	1450	4808.34	1448	4816.39	1446	4825.37	1444	4844.86
GR	1442	4867.57	1440	4888.99	1438	4911.48	1438	4931.3	1440	4955.08
GR	1440	4961.15	1440	5000	1440	5073.72	1442	5081.76	1444	5085.61
GR	1446	5088.41	1446	5095.29	1446	5268.61	1448	5283.3	1450	5291.33
GR	1452	5298.85	1452	5310.02	1454.25	5310.03	1454.25	5311.03	1452	5311.04
GR	1452	5321.19	1450	5325.84	1448	5330.48	1446	5352.1	1444	5429.4
GR	1442	5433.87	1442	5453.7	1442	5462.01	1440	5467.15	1438	5472.69
GR	1438	5487.43	1440	5493.52	1442	5499.62	1444	5505.79		
ET		5.1			4766.74	5290				
X1	10.93	47	4790.58	5279.54	456	557	516			
GR	1450	4075	1450	4401.05	1450	4472.44	1450	4658.68	1448	4685.74
GR	1446	4692.07	1446	4738.32	1448	4747.74	1450	4752.28	1452	4756.82
GR	1454	4761.36	1456	4765.91	1456.34	4766.74	1456.31	4782.2	1456	4783.11
GR	1454	4790.58	1452	4801.13	1450	4811.94	1448	4852.07	1446	4882.26
GR	1444	4895.5	1442	4901.64	1440	4907.78	1440	4909.75	1440	5000
GR	1442	5025.23	1444	5039.36	1446	5045.88	1448	5065.33	1448	5141.49
GR	1446	5151.73	1446	5160.63	1448	5249	1450	5259.77	1452	5267.62
GR	1454	5275.29	1455.1	5279.54	1458.23	5290	1458.23	5291	1455.6	5291.01
GR	1455.6	5301.19	1454	5303.86	1452	5307.17	1450	5311.25	1448	5317.12
GR	1446	5322.99	1446	5329.64						

CONFLUENCE WITH BUCHANAN WASH

ET		5.1			4581.43	5120.83				
X1	11.03	59	4598.63	5120.83	506	504	525			
GR	1454	4082	1454	4316.5	1454	4398.81	1454	4405.76	1454	4444.05
GR	1454	4463.63	1452	4472.52	1452	4546.98	1452	4556.11	1451.02	4559.09
GR	1452	4561.67	1454	4566.38	1456	4571.08	1458	4575.79	1460	4580.49
GR	1460.3	4581.43	1460.24	4597.21	1460	4598.63	1458	4606.22	1456	4613.78
GR	1454	4621.09	1452	4629.76	1450	4642.89	1449	4647.63	1448	4693.69
GR	1448	4736.54	1450	4814.76	1450	4864.18	1448	4942.71	1446	4949.67
GR	1444	4956.46	1442	4984.22	1442	5000	1442	5002.45	1444	5021.76

GR	1454.0	5148.06	1456.00	5152.69	1458.00	5157.26	1460.00	5161.76	1462.00	5166.34
GR	1464.0	5170.83	1466.00	5175.45	1467.53	5178.97	1468.00	5180.06	1469.67	5183.89
GR	1470.0	5184.66	1470.00	5197.62	1468.00	5202.94	1466.00	5208.26	1464.00	5213.46
GR	1463.4	5215.12	1462.00	5218.65	1460.33	5224.18	1460.00	5225.24	1459.63	5239.24
GR	1459.4	5247.72	1459.19	5284.15	1459.63	5287.69	1460.00	5297.44	1461.23	5325.09
GR	1462.0	5340.83	1463.27	5373.45	1463.76	5392.61	1463.91	5397.59	1464.00	5403.23
GR	1464.0	5404.95	1463.47	5430.53	1463.48	5446.78	1463.10	5468.14	1463.01	5472.72
GR	1462.8	5480.65	1462.48	5495.44	1462.00	5521.62	1462.00	5562.61		

ET		5.1			4826.47	5170.48				
X1	11.39	88	4826.47	5170.48	520	577	548			
GR	1463.4	4540.53	1462.24	4575.55	1462.00	4587.19	1461.52	4589.31	1460.82	4592.35
GR	1460.0	4595.75	1459.40	4598.25	1458.00	4604.08	1457.77	4611.59	1457.02	4638.45
GR	1456.6	4651.90	1456.25	4664.52	1456.00	4673.48	1456.00	4685.48	1457.34	4692.89
GR	1458.0	4696.00	1458.60	4698.45	1460.00	4704.69	1460.84	4725.05	1461.22	4734.45
GR	1461.5	4742.42	1461.65	4747.02	1462.00	4766.90	1462.17	4770.00	1464.00	4788.85
GR	1465.9	4795.51	1466.00	4795.86	1468.00	4802.87	1469.82	4809.24	1470.00	4809.88
GR	1470.0	4826.47	1469.00	4828.70	1468.00	4830.90	1466.98	4833.16	1466.00	4835.34
GR	1465.0	4837.62	1464.00	4839.77	1462.95	4842.10	1462.00	4844.21	1460.92	4846.60
GR	1460.0	4848.64	1458.80	4851.31	1458.00	4853.08	1456.24	4856.99	1456.00	4857.51
GR	1454.1	4861.74	1454.00	4861.94	1453.77	4869.54	1453.41	4939.48	1453.70	5000.00
GR	1454.0	5052.77	1454.00	5137.60	1454.79	5139.20	1456.00	5141.80	1457.23	5144.29
GR	1458.0	5145.86	1459.52	5148.94	1460.00	5149.91	1461.94	5153.84	1462.00	5153.96
GR	1462.2	5154.43	1464.00	5158.09	1464.41	5158.94	1466.00	5162.22	1466.71	5163.68
GR	1468.0	5166.35	1468.90	5168.21	1470.00	5170.48	1471.01	5177.47	1471.30	5178.73
GR	1471.0	5187.97	1470.52	5189.60	1470.00	5191.33	1469.06	5193.63	1468.00	5196.22
GR	1466.9	5199.00	1466.00	5201.12	1464.50	5204.79	1464.00	5205.96	1463.56	5227.10
GR	1463.3	5302.27	1463.50	5392.62	1464.00	5459.82	1464.00	5496.38	1464.34	5500.49
GR	1466.0	5520.78	1466.48	5534.57	1467.00	5553.06				

ET		5.1			4831.85	5174.56				
X1	11.48	93	4831.85	5174.56	443	532	487			
GR	1469.5	4463.12	1470.00	4514.20	1470.67	4526.19	1472.00	4532.14	1472.00	4536.27
GR	1471.2	4545.52	1472.00	4549.52	1471.16	4556.05	1470.89	4562.81	1470.59	4569.92
GR	1470.0	4586.17	1470.00	4654.03	1469.53	4674.85	1469.10	4688.69	1468.83	4699.75
GR	1468.6	4709.20	1468.27	4720.52	1468.00	4733.02	1467.35	4737.19	1467.59	4745.21
GR	1467.3	4752.17	1466.00	4781.13	1465.37	4784.00	1465.14	4788.41	1465.46	4789.08
GR	1465.9	4791.67	1466.00	4791.93	1467.84	4797.88	1468.00	4798.37	1468.75	4800.80
GR	1469.1	4801.97	1469.53	4803.27	1470.00	4804.79	1472.00	4813.30	1472.00	4827.27
GR	1471.5	4828.31	1470.00	4831.85	1469.59	4832.79	1468.00	4836.43	1467.65	4837.23
GR	1466.0	4841.01	1465.73	4841.62	1464.00	4845.59	1463.85	4845.93	1462.31	4849.46
GR	1462.0	4850.16	1461.96	4850.24	1460.00	4854.68	1459.78	4855.19	1458.00	4859.04
GR	1456.8	4861.86	1456.00	4863.63	1454.62	4866.83	1454.00	4868.24	1454.00	4891.27
GR	1454.5	4982.94	1454.00	5000.00	1454.00	5139.53	1455.68	5143.25	1456.00	5143.95
GR	1457.7	5147.78	1458.00	5148.36	1459.81	5152.35	1460.00	5152.78	1461.90	5156.97
GR	1462.0	5157.19	1463.56	5160.62	1464.00	5161.59	1466.00	5165.91	1468.00	5170.24
GR	1468.3	5170.98	1470.00	5174.56	1471.57	5177.96	1472.00	5179.19	1472.00	5194.00
GR	1470.3	5199.62	1470.00	5200.65	1468.88	5204.39	1468.00	5207.39	1467.56	5217.72
GR	1466.9	5233.75	1466.58	5241.08	1466.33	5246.90	1466.40	5250.99	1466.61	5264.73
GR	1467.0	5289.91	1467.20	5306.66	1467.34	5341.05	1467.60	5361.43	1467.94	5383.99
GR	1467.8	5395.19	1467.56	5419.40	1468.00	5430.41				

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 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
0

CCHV=     .100 CEHV=     .300
*SECNO 8.690
3280 CROSS SECTION      8.69 EXTENDED       .71 FEET

3470 ENCROACHMENT STATIONS=     4025.3    5073.8  TYPE=      1  TARGET=     1048.520
     8.690     14.00   1378.00   1374.24   1378.00   1378.45       .45       .00       .00   1381.16
   37972.4        .0   37972.4        .0        .0    7026.5        .0        .0        .0 100000.00
       .00       .00      5.40       .00      .000      .035      .000      .000   1364.00   4045.04
   .001233        0.        0.        0.         0        12         0       .00   1014.10   5059.14

*SECNO 8.790

3301 HV CHANGED MORE THAN HVINS

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .54

3470 ENCROACHMENT STATIONS=     4095.4    5039.3  TYPE=      1  TARGET=      943.890
     8.790     12.71   1378.71   1377.30   1378.71   1379.74      1.04      1.12       .18   1384.00
   37972.4        .0   37972.4        .0        .0    4643.9        .0      72.2      11.8 100000.00
       .02       .00      8.18       .00      .000      .035      .000      .000   1366.00   4135.18
   .004174      530.      539.      546.         3        14         0       .00    895.76   5030.94

*SECNO 8.930

3470 ENCROACHMENT STATIONS=     4541.1    5252.0  TYPE=      1  TARGET=      710.880
     8.930     11.14   1381.14   1378.50   1381.14   1382.27      1.14      2.50       .03   1386.72
   37972.4        .0   37972.4        .0        .0    4439.0        .0     147.5      24.3 100000.00
       .04       .00      8.55       .00      .000      .035      .000      .000   1370.00   4601.03
   .002915      565.      722.      711.         3        19         0       .00    614.82   5215.85

*SECNO 9.010
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .70

3370 NORMAL BRIDGE, NRD= 16 MIN ELTRD= 1394.50 MAX ELLC= 1394.70

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1392.20 ELREA= 1393.10

9.145	12.10	1387.00	1381.37	1387.00	1387.80	.80	.01	.07	1394.50
22472.4	.0	22472.4	.0	.0	3126.9	.0	234.8	34.5	1394.70
.07	.00	7.19	.00	.000	.035	.000	.000	1374.90	5020.97
.001610	8.	8.	8.	2	19	0	.00	282.74	5318.72

*SECNO 9.155

3265 DIVIDED FLOW

3370 NORMAL BRIDGE, NRD= 16 MIN ELTRD= 1394.50 MAX ELLC= 1394.70

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1392.20 ELREA= 1393.10

9.155	12.03	1387.13	1381.56	1387.13	1387.94	.81	.13	.00	1394.50
22472.4	.0	22472.4	.0	.0	3107.1	.0	240.5	35.1	1394.70
.08	.00	7.23	.00	.000	.035	.000	.000	1375.10	5020.81
.001643	80.	80.	80.	2	19	0	.00	283.04	5318.87

*SECNO 9.160

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

3470 ENCROACHMENT STATIONS= 4852.6 5164.3 TYPE= 1 TARGET= 311.730

9.160	13.35	1387.35	1380.64	1387.35	1387.97	.61	.01	.02	1390.00
22472.4	.0	22472.4	.0	.0	3574.0	.0	241.1	35.1	100000.00
.08	.00	6.29	.00	.000	.035	.000	.000	1374.00	4857.36
.000834	8.	8.	8.	3	11	0	.00	301.85	5159.21

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 SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
 Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
 TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
 SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3470 ENCROACHMENT STATIONS=     4703.4    5290.2  TYPE=      1  TARGET=      586.780
     9.300      6.15   1399.15   1399.15   1399.15   1401.76      2.61       2.66        .22   1395.00
   37972.4    1381.3   36591.1        .0     198.0    2786.4        .0      292.6       43.0   1399.50
       .10      6.98     13.13       .00      .040      .035      .000       .000    1393.00   4703.41
   .009718      262.      261.      282.         0        11         0        .00     576.76   5280.17

*SECNO 9.350
3280 CROSS SECTION      9.35 EXTENDED       .95 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.77

3470 ENCROACHMENT STATIONS=     4658.0    5287.8  TYPE=      1  TARGET=      629.820
     9.350      9.96   1401.96   1399.95   1401.96   1403.30      1.34       1.41        .13   1399.00
   38529.6    1473.9   37005.2      50.5     345.8    3918.5      17.3      315.5       46.8   1400.00
       .11      4.26      9.44      2.92      .040      .035      .035       .000    1392.00   4657.95
   .003199      291.      274.      274.         3        11         0        .00     629.82   5287.77

*SECNO 9.420

3470 ENCROACHMENT STATIONS=     4549.5    5239.7  TYPE=      1  TARGET=      690.250
     9.420     10.24   1403.24   1401.67   1403.24   1404.75      1.51       1.39        .05   1401.00
   39000.0    1464.1   37520.2      15.7     375.3    3745.6       7.7      354.0       52.8   1402.00
       .12      3.90     10.02      2.03      .040      .035      .035       .000    1393.00   4549.48
   .003829      400.      399.      402.         2        12         0        .00     680.46   5229.94

*SECNO 9.450

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4560.7    5209.0  TYPE=      1  TARGET=      648.260
     9.450     10.53   1403.53   1403.53   1403.53   1406.08      2.55        .73        .31   1401.70
   39000.0    1197.1   37802.9        .0     221.7    2910.2        .0      363.7       54.5 100000.00
       .13      5.40     12.99       .00      .040      .040      .000       .000    1393.00   4560.74
   .012069       93.      118.      126.         0         8         0        .00     648.26   5209.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 9.800

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

3470 ENCROACHMENT STATIONS= 4698.4 5217.7 TYPE= 1 TARGET= 519.300

9.800	7.43	1413.43	1412.91	1413.43	1416.18	2.76	1.60	.43	1416.00
39000.0	.0	39000.0	.0	.0	2927.5	.0	520.6	75.9	1414.00
.17	.00	13.32	.00	.000	.035	.000	.000	1406.00	4775.44
.007627	383.	365.	349.	3	15	0	.00	428.38	5203.82

*SECNO 9.890

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 4678.5 5167.5 TYPE= 1 TARGET= 488.990

9.890	10.90	1416.90	1415.10	1416.90	1419.13	2.23	2.90	.05	1420.00
39000.0	.0	39000.0	.0	.0	3254.0	.0	555.7	80.5	1418.00
.19	.00	11.99	.00	.000	.035	.000	.000	1406.00	4775.55
.004627	509.	495.	484.	3	11	0	.00	383.11	5158.66

*SECNO 9.980

3470 ENCROACHMENT STATIONS= 4813.5 5284.1 TYPE= 1 TARGET= 470.600

9.980	9.25	1419.25	1417.47	1419.25	1421.32	2.08	2.18	.02	1428.00
39000.0	.0	39000.0	.0	.0	3373.2	.0	591.9	84.9	1420.00
.20	.00	11.56	.00	.000	.035	.000	.000	1410.00	4856.13
.004545	462.	475.	469.	3	14	0	.00	413.85	5269.98

*SECNO 10.080

3470 ENCROACHMENT STATIONS= 4840.6 5275.3 TYPE= 1 TARGET= 434.730

10.080	9.59	1421.59	1420.21	1421.59	1423.90	2.31	2.51	.07	1426.00
39000.0	.0	39000.0	.0	.0	3197.1	.0	630.4	89.7	1424.00
.21	.00	12.20	.00	.000	.035	.000	.000	1412.00	4855.91
.005310	508.	511.	514.	2	11	0	.00	407.00	5262.90

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 SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
 Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
 TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
 SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 10.380

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4823.2    5272.0  TYPE=      1  TARGET=      448.790
    10.380       7.33   1431.33   1431.33   1431.33   1434.50      3.17       1.13        .20   1435.82
   39000.0        .0   39000.0        .0        .0    2728.3        .0      743.6      106.0 100000.00
       .24       .00     14.29       .00      .000      .030      .000       .000    1424.00   4841.32
   .007209      173.      162.      143.         0        11         0        .00     430.68   5272.00

*SECNO 10.410
3280 CROSS SECTION     10.41 EXTENDED      4.66 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4783.1    5262.7  TYPE=      1  TARGET=      479.660
    10.410       6.66   1434.66   1434.66   1434.66   1437.76      3.11       1.44        .01   1436.00
   39000.0        .0   39000.0        .0        .0    2756.2        .0      754.4      107.8   1436.00
       .25       .00     14.15       .00      .000      .035      .000       .000    1428.00   4797.50
   .009916      198.      171.      142.         0        11         0        .00     448.93   5246.44

*SECNO 10.420
3280 CROSS SECTION     10.42 EXTENDED      6.41 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.48

3470 ENCROACHMENT STATIONS=     4758.8    5239.4  TYPE=      1  TARGET=      480.630
    10.420      10.40   1436.40   1434.71   1436.40   1438.30      1.90        .41        .12   1436.00
   39000.0        8.3   38991.7        .0       5.4    3526.7        .0      759.0      108.4   1438.00
       .25       1.53     11.06       .00      .035      .035      .000       .000    1426.00   4758.79
   .004531        70.       64.       58.         5        11         0        .00     474.74   5233.53
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 10.930
3280 CROSS SECTION     10.93 EXTENDED      6.95 FEET

3470 ENCROACHMENT STATIONS=     4766.7    5290.0  TYPE=      1  TARGET=      523.260
    10.930     12.95   1452.95   1451.39   1452.95   1454.89      1.94       2.57        .00   1454.00
   39000.0        .0   39000.0        .0        .0    3488.5        .0      959.8      136.5   1455.10
       .31       .00     11.18       .00      .000      .035      .000       .000    1440.00   4796.14
   .004893      456.      516.      557.         2        15         0        .00     475.11   5271.25

*SECNO 11.030
3280 CROSS SECTION     11.03 EXTENDED      1.59 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     4581.4    5120.8  TYPE=      1  TARGET=      539.400
    11.030     13.58   1455.58   1453.00   1455.58   1456.98      1.39       2.03        .05   1460.00
   39000.0        .0   39000.0        .0        .0    4116.1        .0     1005.6      142.4 100000.00
       .33       .00      9.47       .00      .000      .035      .000       .000    1442.00   4615.29
   .003143      506.      525.      504.         2        15         0        .00     505.54   5120.83

*SECNO 11.140
3280 CROSS SECTION     11.14 EXTENDED      1.62 FEET

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4762.0    5149.9  TYPE=      1  TARGET=      387.910
    11.140      9.62   1457.62   1457.62   1457.62   1461.19      3.57       3.11        .65   1452.00
   39000.0        .0   39000.0        .0        .0    2572.4        .0     1052.2      148.5 100000.00
       .34       .00     15.16       .00      .000      .035      .000       .000    1448.00   4762.00
   .009810      606.      606.      610.         0        19         0        .00     368.24   5130.24

*SECNO 11.190
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

```
*SECNO 11.560

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4845.3    5152.5  TYPE=      1  TARGET=      307.130
    11.560      9.29   1468.43   1468.43   1468.43   1472.66      4.23       .67       .63   1472.00
   39000.0        .0   39000.0        .0        .0    2361.6        .0    1197.1     164.4 100000.00
       .38       .00     16.51       .00      .000      .020      .000      .000   1459.14   4861.43
   .002957      386.      390.      396.         0        15         0       .00    282.26   5143.68

*SECNO 11.570
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4880.5    5126.6  TYPE=      1  TARGET=      246.160
    11.570     10.10   1470.39   1470.39   1470.39   1475.08      4.69       .22       .14   1472.00
   39000.0        .0   39000.0        .0        .0    2243.2        .0    1200.9     164.8 100000.00
       .38       .00     17.39       .00      .000      .020      .000      .000   1460.29   4881.58
   .003016       72.       73.       75.         0         8         0       .00    241.45   5123.02
```

THIS RUN EXECUTED 17SEP02 17:08:13

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MPLETED SEPTEMBER 2002 B

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS	VCH	DEPTH	TOPWID	AREA	FRCH	SSTA	ENDST
	8.690	37972.39	1378.00	1374.24	5.40	14.00	1014.10	7026.52	.36	4045.04	5059.14
*	8.790	37972.39	1378.71	1377.30	8.18	12.71	895.76	4643.88	.63	4135.18	5030.94
	8.930	37972.39	1381.14	1378.50	8.55	11.14	614.82	4438.96	.56	4601.03	5215.85
*	9.010	37972.39	1381.46	1381.43	15.27	9.27	344.56	2486.22	1.00	4836.41	5180.98
*	9.080	37972.39	1385.23	1381.99	10.84	11.76	348.40	3503.29	.60	4831.36	5179.76
	9.140	22472.39	1387.15	1380.26	6.12	13.15	308.27	3670.01	.31	4845.11	5153.38
*	9.145	22472.39	1387.00	1381.37	7.19	12.10	282.74	3126.90	.39	5020.97	5318.72
	9.155	22472.39	1387.13	1381.56	7.23	12.03	283.04	3107.12	.39	5020.81	5318.87
*	9.160	22472.39	1387.35	1380.64	6.29	13.35	301.85	3573.98	.32	4857.36	5159.21
*	9.210	22472.39	1387.73	1380.76	4.74	11.73	432.02	4742.14	.25	4735.19	5167.22
*	9.220	22472.39	1394.09	1394.09	11.28	4.09	509.88	1991.51	1.01	4671.97	5181.85
*	9.250	22472.39	1396.71	1396.71	11.29	4.71	542.17	2071.48	.99	4738.18	5280.35
*	9.300	37972.39	1399.15	1399.15	13.13	6.15	576.76	2984.32	.98	4703.41	5280.17
*	9.350	38529.61	1401.96	1399.95	9.44	9.96	629.82	4281.57	.60	4657.95	5287.77
	9.420	39000.00	1403.24	1401.67	10.02	10.24	680.46	4128.63	.64	4549.48	5229.94
*	9.450	39000.00	1403.53	1403.53	12.99	10.53	648.26	3131.90	.95	4560.74	5209.00
*	9.540	39000.00	1408.09	1405.70	9.82	11.09	491.43	3970.47	.61	4685.57	5177.00

	SECNO	Q	CWSEL	CRIWS	VCH	DEPTH	TOPWID	AREA	FRCH	SSTA	ENDST
*	11.570	39000.00	1470.39	1470.39	17.39	10.10	241.45	2243.23	1.01	4881.58	5123.02

HES HARZA ENVIRONMENTAL SERVICES, INC.

SUBJECT	CONFIRMATION OF BANK SCOUR DEPTH PROTECTION	PROJECT	Skunk Creek
		FILE NUMBER	1639G
COMPUTED	REM	DATE	2-2-87
CHECKED			Page 1 of 3 Pages

BACKGROUND

Improvements to Skunk Creek are required through the landfill site to protect the channel sides from erosion and prevent flooding of the landfill site. Initial studies with HEC-2 indicated channel cross sections could be modified and the banks lined to meet the objectives and maintain close to the same velocities as represented by a 1984 COE HEC-2 analysis of "existing" conditions. Adjustments were made to the cross sections and channel slope during final design to balance cut and fill. More recent topographic data were also used to depict the "existing" channel bottom. The final design shows continuation of the soil cement lining at a 1:1 slope for 10 feet below the new channel bottom. This extension of the lining is provided to prevent under cutting of the lined bank.

The cross sections shown in the final design were input to HEC-2 to check the 100 year flood profile against the top of bank design. With the final design cross sections the free board at Sta. 46+45 is about 1' for the 100 year flood. Adjustment to the top of bank profile needs to be made to provide 3' free board along improved channel.

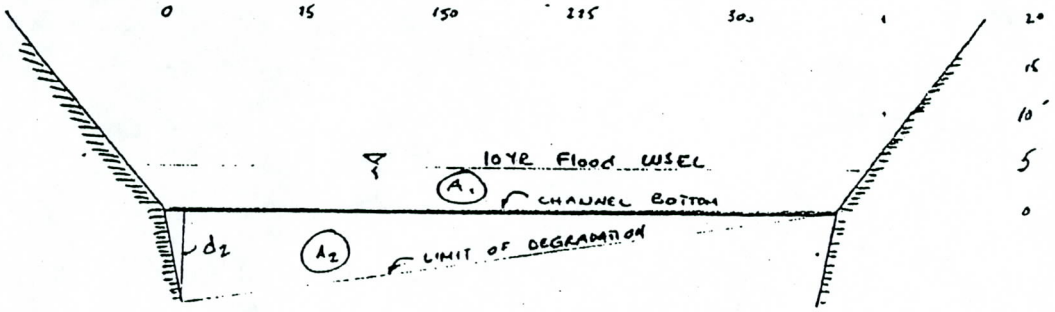
Scour of the channel bottom is expected to occur where the velocity increases and the bed load capacity is increased. For the 10 year flood there are sections where the velocity will increase from 4 to 5 fps. At one channel cross section (R.M. 10.30) the velocity is 5.6 fps and the velocity at the downstream cross section is 10.3 fps. The limit of channel degradation in the higher velocity section will be met when the bottom material is scoured sufficiently to provide a cross section with a 5.6 fps velocity. This would result in an 85% increase in cross sectional area.

HES HARZA ENVIRONMENTAL SERVICES, INC.

SUBJECT Scour depth protection	PROJECT Skunk Creek
	FILE NUMBER 16396
COMPUTED RCM CHECKED	DATE 2-2-87 Page 2 of 3 Pages

As the creek is flooded from time to time there will be shifts in the channel bottom. Some areas will degrade and others will aggrade. Because the flow entering the site is coming at high velocity and is assumed to be carrying its full bed load, the long term effect should be a slight overall aggradation of the improved channel. Localized scour will, however, occur. To assess the potential for localized scour the following are assumed:

1) Upstream velocity = 5 fps
2) Degrading channel section velocity = 11 fps
3) Channel bottom will erode on one side, not uniformly.
4) Typical bottom channel width of degrading section is 350'



At 11 fps for 15,000 cfs (10 yr flood), $A_1 = 15000/11 = 1363 ft^2$

At 5 fps for 15,000 cfs, $A_1 + A_2 = 15,000/5 = 3000 ft^2$ $\therefore A_2 = 1637 ft^2$

$A_2 \simeq \frac{1}{2}(350)(d_2) = 1637$

$d_2 = 9.35'$

Provision of 10' extension from toe of bank to protect from scour undercutting bank slope is adequate for nonuniform channel degradation

HES HARZA ENVIRONMENTAL SERVICES, INC.

SUBJECT	Scour depth protection	PROJECT	Skunk Creek
		FILE NUMBER	1639G
COMPUTED	REM	DATE	2-2-87
CHECKED			Page 3 of 3 Pages

Check to see if degradation limited by armouring

Tractive force (TF) = $\gamma d s$ in #/ft²

$\gamma = 62.4$ #/ft³

d = depth of flow, ft, assume 3.5' for 15,000 cfs through high velocity section

s = bottom slope (ft/ft) - channel slope varies in final design from 0.000 to over 0.01. Use $s = .005$ as example case

$$TF = 62.4 \times 3.5 \times .005$$
$$= 1.09 \text{ \#/ft}^2$$

From Fig 14-14 of Tractive Force versus transportable sediment size in Design of Small Dams, pg 792, Second Ed 1973, Bur. Rec.

the diameter would be ~ 60 mm

∴ try 60 mm as representative armouring size

depth of scour, $y_d = y_a \left(\frac{1}{\Delta p} - 1\right)$

where y_a = thickness of armouring layer

Δp = decimal % of material larger than armouring size

if $y_d = 10'$ and $y_a = 0.5'$

$$\Delta p = \left(\frac{y_d}{y_a} + 1\right)^{-1} = \frac{1}{21} = .047$$

∴ to armour at or before 10' depth of scour, ~ 4.7% of bed material must larger than 60mm (2.3")

The material gradation throughout the study reach is highly variable and essentially indeterminate for the purpose of "fine tuning" the depth of bank toe protection.

∴ No change in selection of 10' depth of bank toe protection

PHASE 1, DESIGN OPTION REPORT
PINNACLE PEAK ROAD BRIDGE
OVER SKUNK CREEK
BR-922765
ADDENDUM

November 16, 1993

Prepared for:

CITY OF PHOENIX
Street Transportation Department
1034 East Madison Street
Phoenix, AZ 85034
(602) 495-2050

In Association With:

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2929 East Camelback Road
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Pinnacle Peak Road Bridge
over Skunk Creek
ADDENDUM
BR-922765

November 16, 1993

INTRODUCTION

The initial report entitled Phase 1, Design Option Report, Pinnacle Peak Road Bridge over Skunk Creek, July 15, 1993, prepared by Alpha Engineering Group, Inc. in association with Wood, Patel & Associates, Inc. presented numerous design options ranging from a 2-year level of service to a 100-year level of service. Discussions with City of Phoenix personnel indicated that the primary goal of the project was to provide a 100-year crossing of Skunk Creek at Pinnacle Peak Road.

Each of the 100-year level of service alternatives were in excess of the $2 million allocated budget (ranging from $4 million to $6.5 million). City personnel attempted to allocate additional funding sources to construct both the bridge structure and the required channelization. Unfortunately, additional funding was not available. Therefore, the City requested that the project team reanalyze the alternatives and determine the optimum design for the $2 million budget.

The preferred alternative consists of a bridge capable of passing the 100-year event and channelization capable of passing a minimum of the 10-year event. (Based on 31-year history, max event is 10-year event) In addition, the design should be easily expandable to the ultimate (fully channelized) condition in the future.

The following paragraphs describe the recommended alternative in detail. In addition, key design issues for the project are listed.

PURPOSE

The purpose of the addendum is to identify the design alternative that provides the highest interim level of service and capability for expansion to the ultimate design within the allotted construction budget. Initially, both the 10-year and 100-year levels of service were investigated for the project. The 10-year level of service was investigated for both the crossing and channel design. Results of the 10-year analysis showed that the project could be constructed within the allotted budgetary constraints. However, the ultimate goal of the project -- to provide 100-year access of Skunk Creek -- was not accomplished. Results of the 100-year analysis indicated that construction of these facilities would be cost-prohibitive due to the fixed budget of $2 million.

Therefore, the interim design concept was developed (see plate 1). The interim design consists of the construction of a 100-year bridge structure across Skunk Creek at Pinnacle Peak Road and a 100-year capacity earth lined channel south of Pinnacle Peak Road. Upstream of Pinnacle Peak Road a 100-year capacity soil cement lined channel will be constructed to the drop structure located west of 35th Avenue (approximately 300 feet north of the bridge). The drop structure will be constructed of roller compacted concrete (RCC) with 6-foot horizontal to 1-foot vertical steps. Guide banks will be constructed to redirect stormwater into the channel. Minor grading will be required adjacent to the drainage facilities to provide a smooth transition to natural ground.

The interim facility will provide a crossing of Skunk Creek capable of passing slightly less than the 100-year storm event. A small amount of flow from the 100-year storm - ? 8200 may overtop the guide banks and flow to the intersection of 35th Avenue and Pinnacle Peak Road. This breakout ensures that the residential area located west of Skunk Creek will not be adversely impacted by the 100-year event. The 35th Avenue roadway will be permanently closed north of Pinnacle Peak Road and Soft Wind Drive will also be permanently closed at the intersection with 35th Avenue. Flows in excess of the 10-year event may cause some damage to the guide banks. A maintenance program needs to be implemented to repair damage to the drainage facilities.

The proposed interim design can be easily expanded to provide the ultimate crossing of Skunk Creek (100-year). The only major component of the design that is not reusable is the drop structure. In the ultimate design the drop structure will be excavated to the design invert of Skunk Creek. The remaining components of the project may be incorporated into the 100-year design.

The following paragraphs describe in detail the selection process of the recommended alternative for the Pinnacle Peak Road bridge over Skunk Creek.

Recommended Design Option

The recommended alternative provides a solution to numerous site specific, political, and budgetary constraints. A few of the design constraints and/or key issues for the project are highlighted below.

1) No impact to the APS power lines along 35th Avenue (230-kv & 12-kv);

2) No impact to the water mains along 35th Avenue (36" & 12");

3) Maintain existing intersection of 35th Avenue and Pinnacle Peak Road (horizontal and vertical alignment);

4) Meet minimum geometric design criteria for Pinnacle Peak Road (dictates horizontal and vertical alignment of bridge);

5) Provide corridor for the Multiple Use Recreation Train (MURT) and/or future roadway northwest of the structure;

6) No adverse flooding impact to adjacent property (the area currently is subject to flooding in the 100-year event);

7) The project must be expandable for future upstream channelization for the 100-year storm.

8) The project cost shall not exceed $2 million.

The recommended alternative combines a 100-year bridge crossing at Pinnacle Peak Road and a unique channel system with approximately a 100-year capacity upstream of Pinnacle Peak Road and a 100-year capacity downstream of Pinnacle Peak Road. The recommended design consists of the following parameters:

1) **A 320-foot cast-in-place post tensioned concrete box girder bridge crossing at Pinnacle Peak Road.** The ultimate design bridge (100-year crossing) will be constructed at Pinnacle Peak Road. In accordance with FHWA and ADOT policies, the bridge will be designed to survive the forces generated by the 500-year event.

2) **An incised, earth-lined channel with a 100-year capacity downstream of Pinnacle Peak Road.** The channel will be excavated to the ultimate cross section (250-feet bottom width) and 4:1 side slopes. A portion of the excess material will be placed along 35th Avenue (buffer area) to protect the roadway from erosion. The future ultimate design will provide embankment protection for the drainage channel.

3) **An incised channel with soil cement bank protection upstream of Pinnacle Peak Road to the proposed drop structure.** Soil cement bank lining will be constructed from the bridge at Pinnacle Peak Road to the downstream end of the drop structure. In general, a toe down depth of 10 feet is proposed. A freeboard allowance of 1.5 feet is proposed for the soil cement bank protection in the incised channel section. The soil cement will be placed in 8-foot-wide, 8-inch thick lifts throughout the reach.

   Soil cement toedown for the east embankment is extended an additional 6 feet (16 feet below the channel invert) between the drop structure and Pinnacle Peak Road to protect the structure from scour due to weir flow over the embankment. Additional soil cement protection is provided at the top of the embankment to prevent damage from lateral flows during large flood events. Plate 2 shows the typical section for channel lining on the east bank.

4) **A roller compacted concrete drop structure west of 35th Avenue.** The stepped RCC drop structure proposed for this project has been analyzed using methods

studied by Chamani (1993), Rajaratnam (1990), and the Federal Highway Administration in their publication HEC-14. The proposed structure is designed to convey the portion of the 100-year event that would pass over it (approximately 22,000 cfs). The remainder of the 100-year flow will pass over the east and west channel embankments or the guide bank between Pinnacle Peak Road and the drop structure.

The drop structure consists of six concrete steps (approximately 6 foot horizontal to 2 foot vertical) extending across the incised channel. The structure includes a concrete stilling basin to induce a controlled hydraulic jump, upstream and downstream concrete cutoff walls to relieve uplift forces, and rip rap channel protection upstream and downstream of the structure.

5) **500-year (superflood) scour protection for the bridge.** The bridge will be designed to survive forces created by the 500-year event in accordance with procedures outlined by FHWA and ADOT. Procedures and methodologies outlined in HEC-18 will be utilized to quantify scour parameters for bridge design.

6) **Structural guide bank east of 35th Avenue.** A guide bank will be constructed to redirect stormwater to the drainage channel. The bank will consist of a 3 to 4 foot high levee constructed with a concrete cutoff wall protected by a rip-rap. Plate 3 shows a typical section of the guide bank.

7) **Temporary guide bank to redirect the 10-year runoff into the drop structure.** In order to redirect flows up to and including the 10-year event directly over the drop structure and into the downstream incised channel, temporary "sugar" dikes are proposed at the crest of the drop structure. These dikes are composed of (compacted) fill material from onsite and are intended to serve as a temporary means of redirecting minor flows into the channelized portion of Skunk Creek. During flows greater than the 10-year event, these "sugar" dikes would fail. Flow would then be directed into the channelized reach by the structural guide bank.

Cost estimates for the project are described on the following Table 1.

11/16/93

TABLE 1

CHANNEL IMPROVEMENT QUANTITIES & COSTS

PINNACLE PEAK ROAD BRIDGE OVER SKUNK CREEK

100-YEAR BRIDGE WITH 10-YEAR CHANNEL DESIGN

PHASE 2, CONCEPT REFINEMENTS

LEVEE IMPROVEMENTS

DROP STRUCTURE APPROX 300 FEET NORTH OF PINNACLE PEAK ROAD

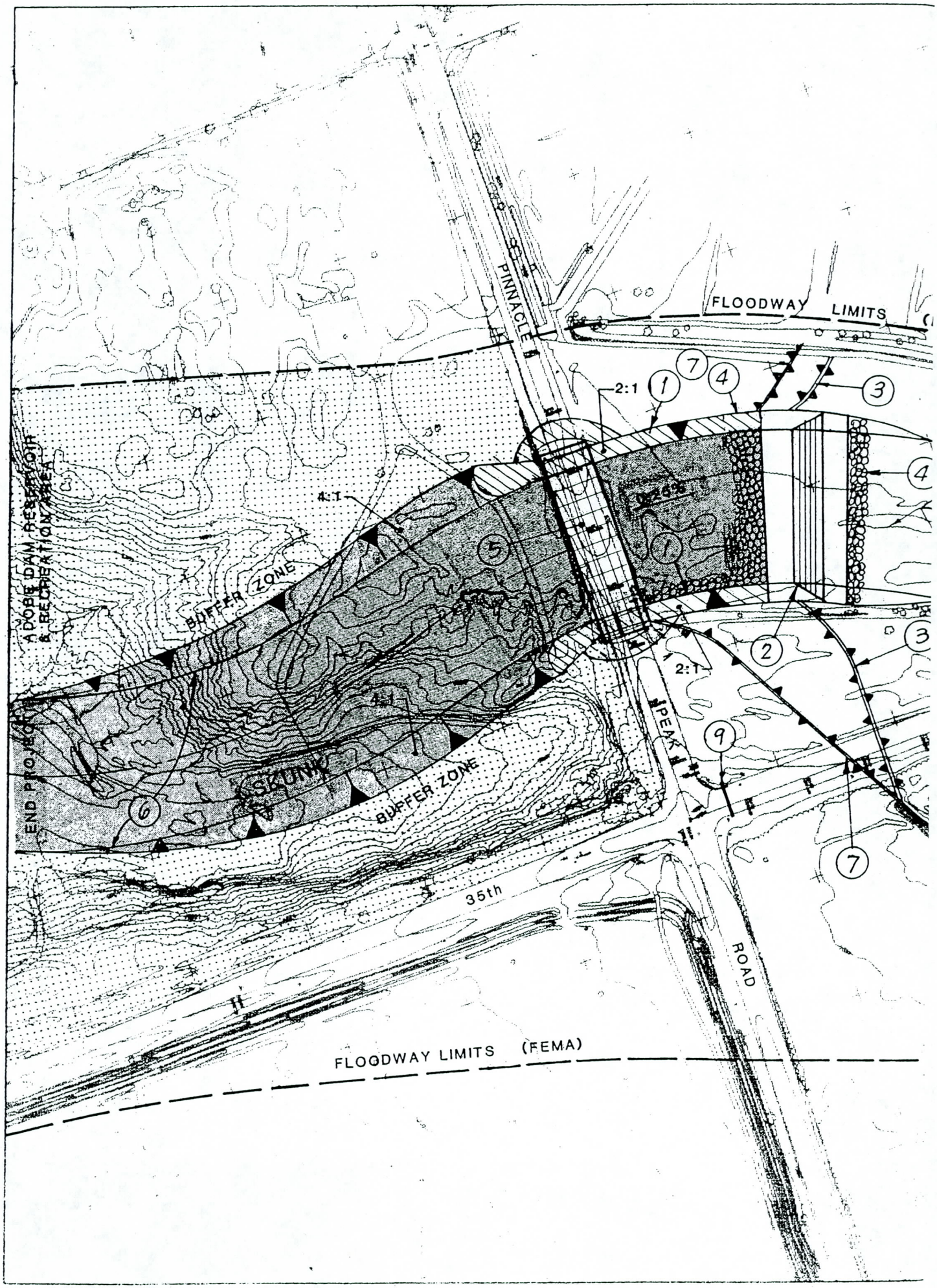
325-FOOT BRIDGE SPAN

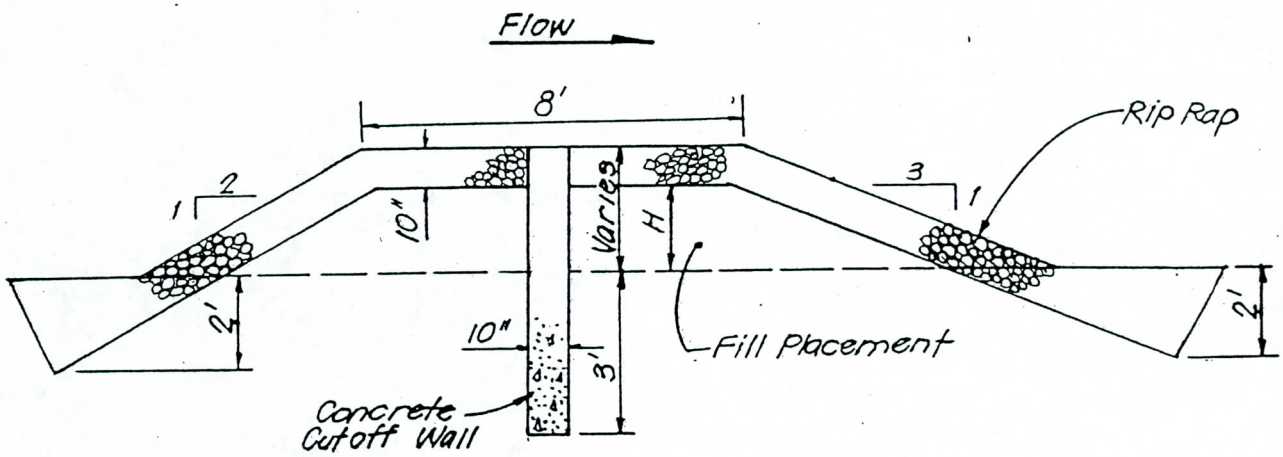
ITEM	*DESCRIPTION*	*QUANTITY*	*UNIT*	*UNIT COST*	*AMOUNT*
1	BRIDGE	26900	SF	$35.00	$941,500
2	DROP STRUCTURE/CUTOFF WALLS	1	ea	$180,000.00	$180,000
3	EXCAVATION - PLACE ONSITE	17500	CY	$1.00	$17,500
4	EXCAVATION - HAUL OFFSITE	173100	CY	$2.00	$346,200
5	SOIL CEMENT	6300	CY	$20.00	$126,000
6	RIPRAP (TOE OF EMBANKMENT)	500	CY	$10.00	$5,000
7	100-YEAR LEVEE IMPROVEMENTS	1	LS	$37,500.00	$37,500
8	10-YEAR "SUGAR" DIKES	1	LS	$12,000.00	$12,000
9	SOFT WIND DRIVE WALL	1	LS	$10,000.00	$10,000
10	SOIL CEMENT BRIDGE PROTECTION	3200	CY	$20.00	$64,000
11	UTILITY RELOCATION				
	- Realign 8" Water (b)	520	LF	$50.00	$26,000
	- Realign 12" ACP Water (b)	520	LF	$70.00	$36,400
	- Realign 12" Force Main (b)	620	LF	$102.00	$63,200
	UTILITY RELOCATION TOTAL				$125,600
12	PAVEMENT				
	- Subgrade Preparation	2053	SY	$2.00	$4,100
	- 1 1/2: AC Surface CSE (D 1/2)	173	ton	$32.00	$5,500
	- 6" AC Surface SCE (A 1 1/2)	693	ton	$32.00	$22,200
	- Tack Coat (2 ea.)	1.7	ton	$250.00	$400
	- Concrete Curb & Gutter	2000	LF	$8.00	$16,000
	- Signing & Striping (a)	1	LS	$6,070.00	$6,100
	- Fill	2500	CY	$5.00	$12,500
	PAVEMENT TOTAL				$66,800
	SUBTOTAL				$1,932,100
	CONTINGENCIES	3.5	%		$67,900
	TOTAL				***$2,000,000***

(a) 10% of new roadway improvements

(b) Replace with a DIP Cl 52

q:\skunk\propcst.wq1


PINNACLE
FLOODWAY LIMITS
2:1
1
7
4
3
4
4:1
5
1
BUFFER ZONE
ADOBE DAM RESERVOIR
& RECREATION AREA
END PROJECT
SKUNK
6
BUFFER ZONE
2
3
2:1
PEAK
9
7
35th
ROAD
FLOODWAY LIMITS (FEMA)



GUIDE BANK SECTION

PLATE 3

WOOD/PATEL
ASSOCIATES
Civil Engineers
Hydrologists
Land Surveyors
(602) 234-1344

VALUE ENGINEERING PAYS

GILA RIVER BASIN
NEW RIVER AND PHOENIX CITY STREAMS, ARIZONA
SKUNK CREEK CHANNEL AND LEVEES
VICINITY OF BLACK CANYON HIGHWAY (I-17)
MARICOPA COUNTY, ARIZONA

ENVIRONMENTAL ENGINEERING THRU ENGINEERING

INDEX TO CONTRACT DRAWINGS

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252/75	GENERAL PLAN - SHEET 1	C-3
252/76	GENERAL PLAN - SHEET 2	C-4
252/77	PLAN OF EXPLORATION	C-5
252/78	SOIL LOGS	C-6
252/79	BORROW & MISCELLANEOUS FILL DETAILS - SHEET 1	C-7
252/80	BORROW & MISCELLANEOUS FILL DETAILS - SHEET 2	C-8
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252/82	WEST LEVEE - PLAN AND PROFILE STA. 162+00 TO 148+15.87	C-10
252/83	WEST LEVEE - PLAN AND PROFILE STA. 148+15.87 TO 138+00	C-11
252/84	WEST LEVEE - PLAN AND PROFILE STA. 138+00 TO 127+00	C-12
252/85	WEST LEVEE - PLAN AND PROFILE STA. 127+00 TO 116+00	C-13
252/86	WEST LEVEE - PLAN AND PROFILE STA. 116+00 TO 106+28.67	C-14
252/87	EAST LEVEE - PLAN AND PROFILE STA. 137+50 TO 128+00	C-15
252/88	EAST LEVEE - PLAN AND PROFILE STA. 128+00 TO 117+00	C-16
252/89	EAST LEVEE - PLAN AND PROFILE STA. 117+00 TO 106+28.67	C-17
252/90	CHANNEL - PLAN AND PROFILE STA. 106+28.67 TO 98+20	C-18
252/91	CHANNEL - PLAN AND PROFILE STA. 98+20 TO 93+44.02	C-19
252/92	CHANNEL - PLAN AND PROFILE STA. 93+44.02 TO 86+50	C-20
252/93	CHANNEL - PLAN AND PROFILE STA. 86+50 TO 79+00	C-21
252/94	CHANNEL - PLAN AND PROFILE STA. 79+00 TO 73+00	C-22
252/95	WEST LEVEE SECTIONS STA. 168+00 TO 128+00	C-23
252/96	WEST LEVEE SECTIONS STA. 124+00 TO 106+30	C-24
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LIST OF ABBREVIATIONS

B.C.	Begin Curve	E.S.	Each Side
E.C.	End Curve	E.W.	Each Way
B.V.C.	Begin Vertical Curve	Exist.	Existing
P.V.I.	Point of Vertical Intersection	Exp. Jt. Mat'l.	Expansion Joint Material
E.V.C.	End Vertical Curve	Horiz.	Horizontal
R/W	Right-of-Way	Lg.	Long
Int.	Intersection	Min.	Minimum
Pvmt.	Pavement	Opp. Hd.	Opposite Hand
A.C.	Asphaltic Concrete	R.	Radius
Tel. Co.	Telephone Cable	Ref.	Reference
Grd.	Ground	Reinf.	Reinforcing
Conc.	Concrete	Sim.	Similar
SEC.	Section	Sta.	Station
COR.	Corner	Thru	Through
Alt.	Alternate	Typ.	Typical
C.J.	Construction Joint	@	and
Cl.	Clear	#	at
Clr.	Clear	℄	centerline
Cont.	Continuous	#	diameter
dia.	Diameter	′/′	feet per foot
Dim.	Dimension	#	number
ds	Ditto		
E.P.	Edge Pave		
E.F.R.	Edge Ironing Road		
Ex.	Excavation		
Elev.	Elevation		

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

Sverdrup — Sverdrup & Parcel and Associates, Inc. Engineers Architects Planners 1500 North Kentucky Drive Tucson, Arizona 85745 (602) 624-8345

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

DESIGNED BY: F.R.B.
DRAWN BY: D.A.L.
CHECKED BY: M.R.S.

GILA RIVER BASIN
NEW RIVER AND PHOENIX CITY STREAMS, ARIZONA
SKUNK CREEK CHANNEL AND LEVEES
VICINITY OF BLACK CANYON HIGHWAY (I-17)

TITLE SHEET AND INDEX TO CONTRACT DRAWINGS

APPROVAL RECOMMENDED: Walter Kahelich, CHIEF, DESIGN BRANCH
APPROVAL RECOMMENDED: Lloyd W. Lindsey, CHIEF, SAFETY OFFICE

SIGNATURES AFFIXED HEREON INDICATE OFFICAL RECOMMENDATION AND APPROVAL OF ALL DRAWINGS IN THIS SET AS INDEXED ON THIS SHEET.

SUBMITTED BY: Paul W. Taylor
PREPARED UNDER THE DIRECTION OF: PAUL W. TAYLOR, COL., CORPS OF ENGINEERS, U.S.A. DISTRICT ENGINEER

APPROVED: Robert Hall, CHIEF ENGINEERING DIV.
DATE: 12 10 81
SPEC. NO. DACW09-82-B-0004
DISTRICT FILE NO.
SHEET: C-1

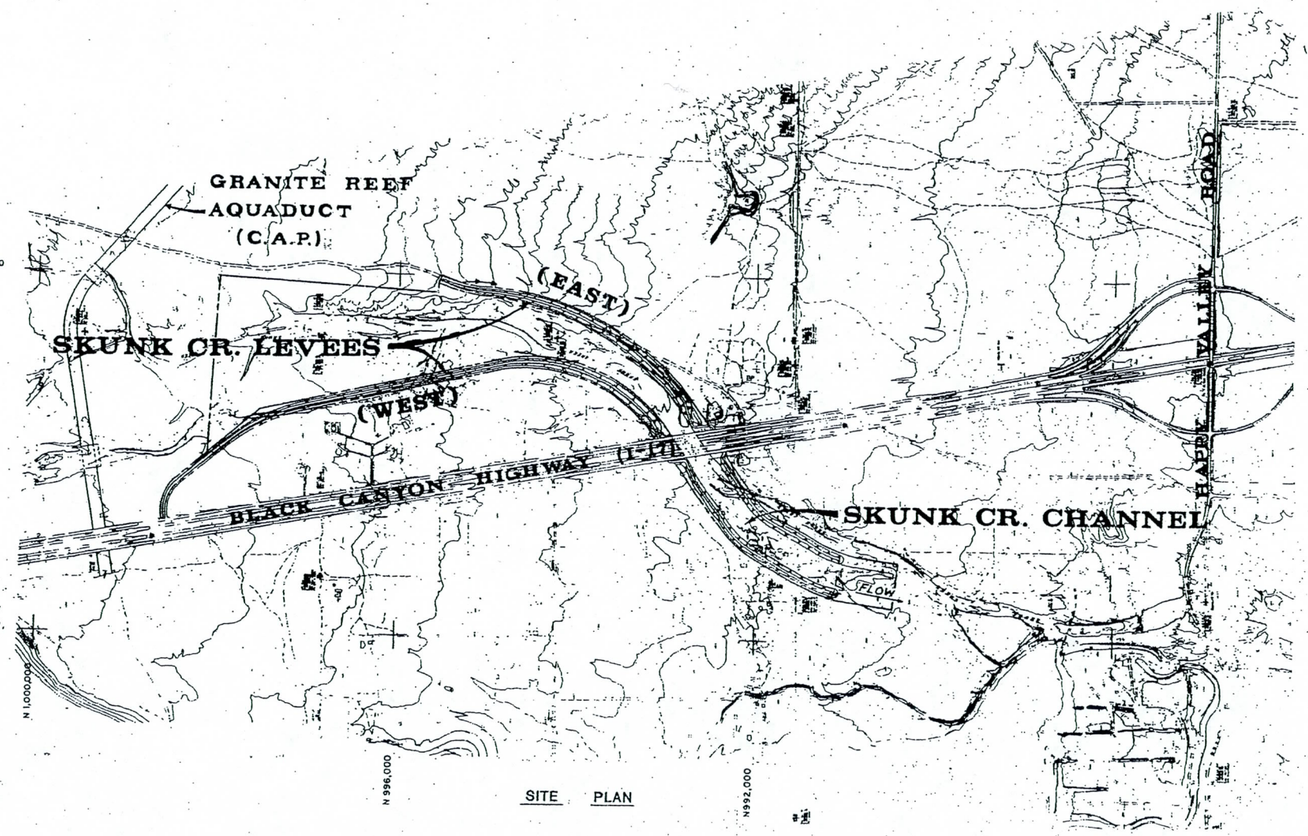
CENTRAL FILES
DRAWER # 215

OFFICE USE ONLY
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
CONSTRUCTION AND OPERATIONS DIVISION
DRAWER # [redacted]

Skunk Creek Channel & Levees
Vicinity of Black Canyon Hwy I-17
DACW09-82-B0004

SAFETY PAYS

ENVIRONMENTAL ENHANCEMENT THRU ENGINEERING

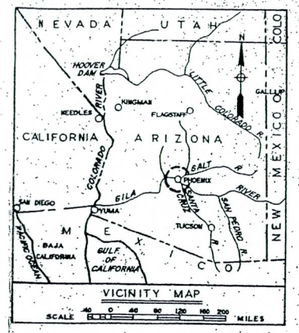


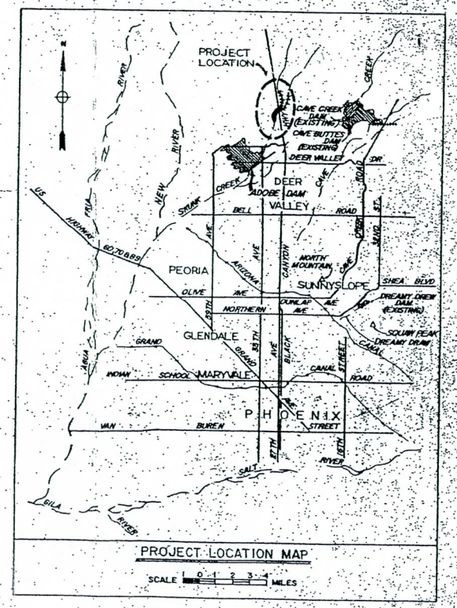
SITE PLAN

SCALE: 1 IN = 600 FT.

500 0 500 1000 1500

CONTOUR INTERVAL: 2 FT.





DATUM IS MEAN SEA LEVEL

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

Sverdrup

Sverdrup & Parcel and Associates, Inc.
Engineers Architects Planners
1550 West Horsetail Drive
Tempe, Arizona 85282 (602)893-8100

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

DESIGNED BY: CRB

DRAWN BY: D.A.L.

CHECKED BY: MRS

GILA RIVER BASIN
NEW RIVER AND PHOENIX CITY STREAMS, ARIZONA

SKUNK CREEK CHANNEL AND LEVEES
VICINITY OF BLACK CANYON HIGHWAY (I-17)

PROJECT LOCATION

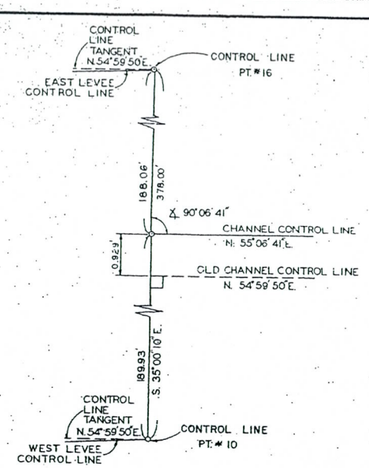
SUBMITTED BY:

DATE APPROVED: 12 15 81

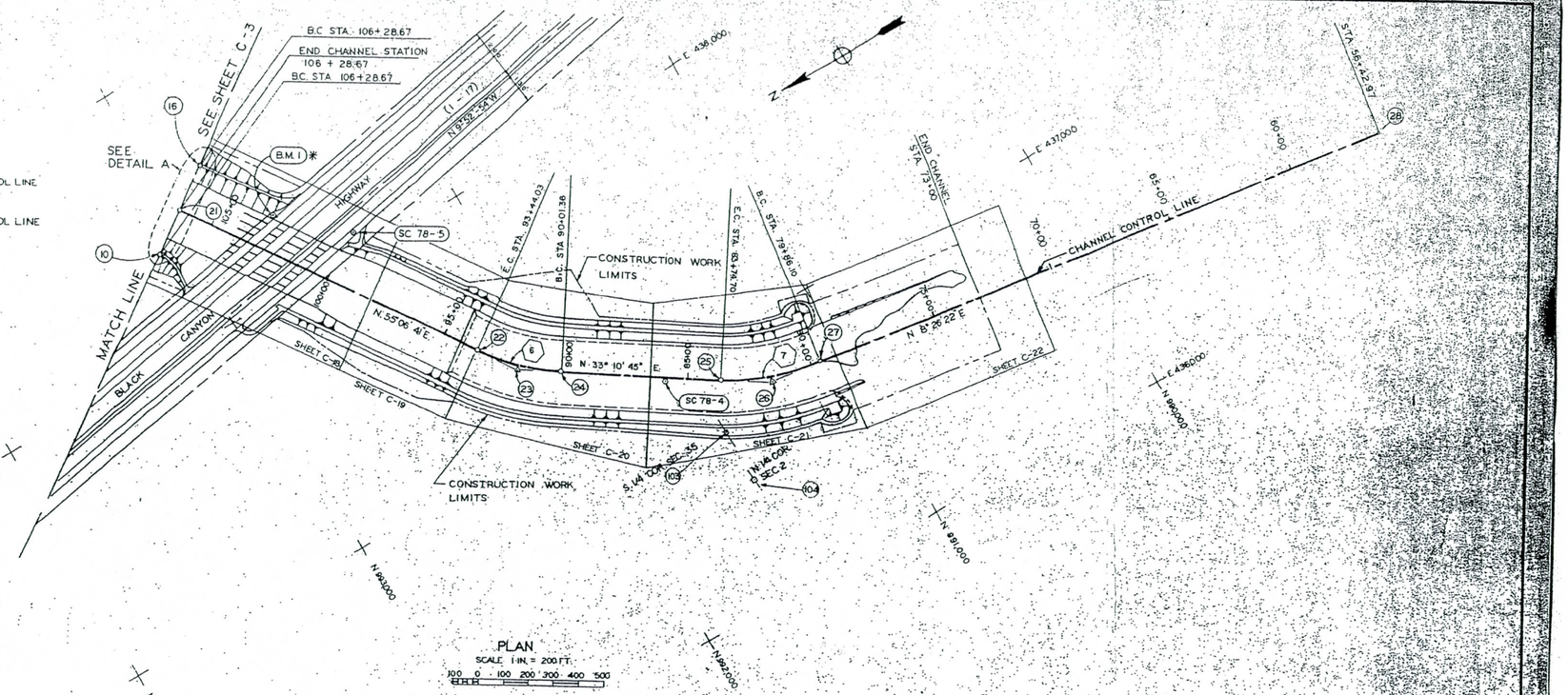
SPEC. NO. DACW09-82-B-0006

DISTRICT FILE NO. 252/74

SHEET C-2



DETAIL A



PLAN
SCALE 1 IN. = 200 FT.
100 0 100 200 300 400 500

ENVIRONMENTAL ENHANCEMENT THRU ENGINEERING

* NOTE
Bench Mark # 1 as stamped on B.M. 1
Datum Elevation 1475.18 Tab [illegible]
correct M.S.L. Elevation [illegible]
Corps of Engineers Elevation [illegible]
Brass Cap, East Frontage Road [illegible]
Bridge Monument, Right Curb

CONTROL LINE COORDINATES			REFERENCE POINT COORDINATES		
CHANNEL					
Nº	NORTH	EAST	Nº	NORTH	EAST
10	993,116.130	438384.220	103	991,551.29	436692.82
16	992806.510	438601.040	104	991,548.43	436445.56
21	992,960.555	438,493.166	SC 78-5	992408.25	438084.89
22	992,225.764	437,439.423	SC 78-4	991,673.90	436,973.56
23	992,126.548	437,297.140			
24	991,981.369	437,202.212			
25	991,456.880	436,859.268			
26	991,291.680	436,751.250			
27	991,096.437	436,722.282			
28	988,778.690	436,378.400			

CONTROL LINE CURVE DATA					
Nº	Δ	Dc	R	T	L
6	21°55'56"	6° 24'01"	895.20'	173.46'	342.67'
7	24°44'23"	6° 21'59"	899.99'	197.38'	388.61'

BENCH MARKS			
Nº	ELEV.	DESCRIPTION	
BM. 1	* 1474.25	ARIZONA HIGHWAY DEPT. SURVEY MARKER LOCATED ON SE CORNER OF EAST FRONTAGE ROAD BRIDGE	* See Note
SC 78-5	1473.29	'COPPERWELD' ROD	
SC 78-4	1458.81	ALUM. CAP & REBAR	

DATUM IS MEAN SEA LEVEL

SYMBOL	DESCRIPTIONS	DATE	APPROVAL
	REVISIONS		

Sverdrup — Sverdrup & Parcel and Associates, Inc. — Engineers — Architects — Planners — 1998 River Aberdeen Drive, Tempe, Arizona 85282 — 602 966-8600

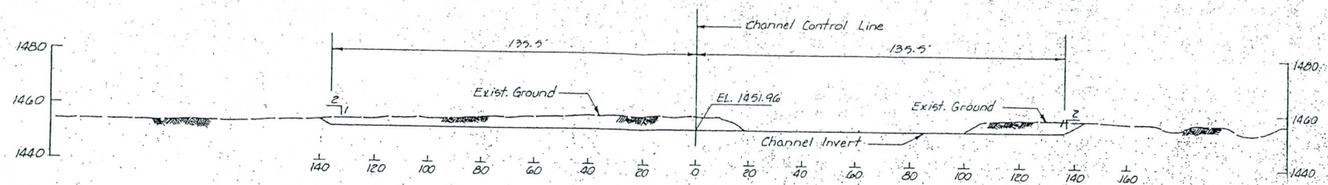
U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

GILA RIVER BASIN
NEW RIVER AND PHOENIX CITY STREAMS, ARIZONA

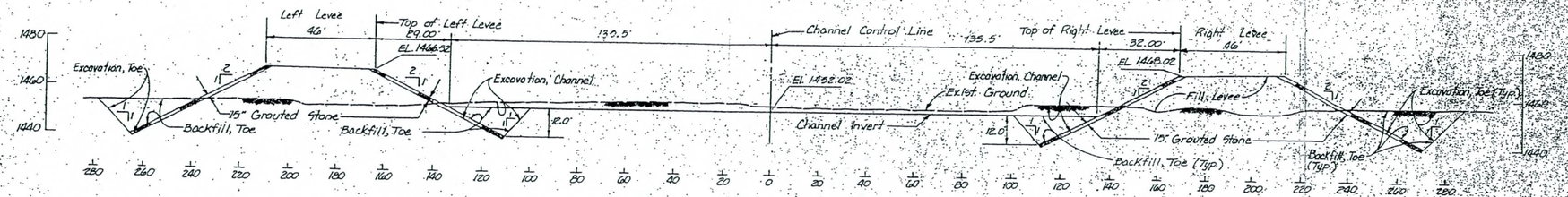
SKUNK CREEK CHANNEL AND LEVEES
VICINITY OF BLACK CANYON HIGHWAY (I-17)

GENERAL PLAN – SHEET 2

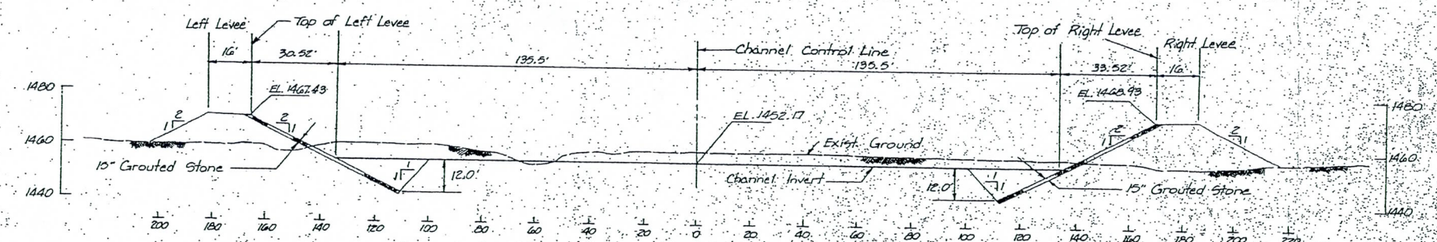
DESIGNED BY: C.R.B.
DRAWN BY: D.A.L.
CHECKED BY: M.R.S.
SUBMITTED BY:
DATE APPROVED: 12-15-81
SPEC. NO. DACW09-82-B-0004
DISTRICT FILE NO. 25-2-276
SHEET 2 OF 2



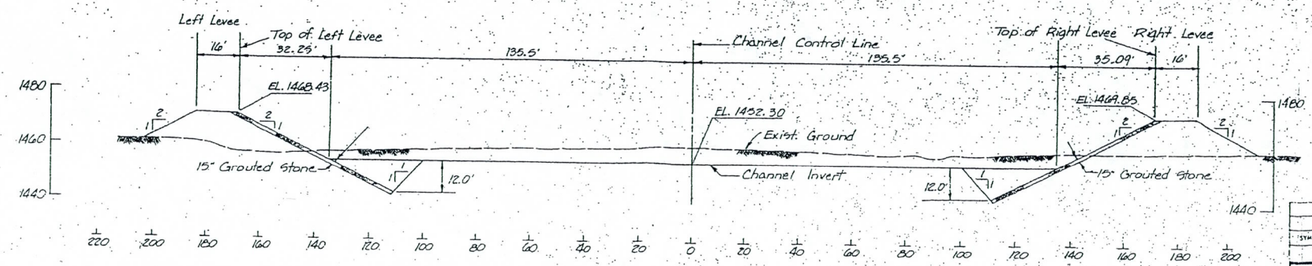
STA. 79+00
Scale: Horiz. 1"=20'
Vert. 1"=20'



STA. 79+86
Scale: Horiz. 1"=20'
Vert. 1"=20'



STA. 82+00
Scale: Horiz. 1"=20'
Vert. 1"=20'



STA. 84+00
Scale: Horiz. 1"=20'
Vert. 1"=20'

NOTE: All sections are drawn looking downstream.

DATUM IS MEAN SEA LEVEL

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

Sverdrup — Sverdrup & Parcel and Associates, Inc. — U.S. ARMY ENGINEER DISTRICT, LOS ANGELES, CORPS OF ENGINEERS

DESIGNED BY: M.R.S.
DRAWN BY: K.M.B.
CHECKED BY: M.R.S.
SUBMITTED BY:
DATE APPROVED: 12-15-81

GILA RIVER BASIN
NEW RIVER AND PHOENIX CITY STREAMS, ARIZONA
SKUNK CREEK CHANNEL AND LEVEES
VICINITY OF BLACK CANYON HIGHWAY (I-17)
CHANNEL SECTIONS
STA. 84+00 TO STA. 79+00

SPEC. NO. DACW 09-82-B-0004
DISTRICT FILE NO. 252/101
SHEET C-29

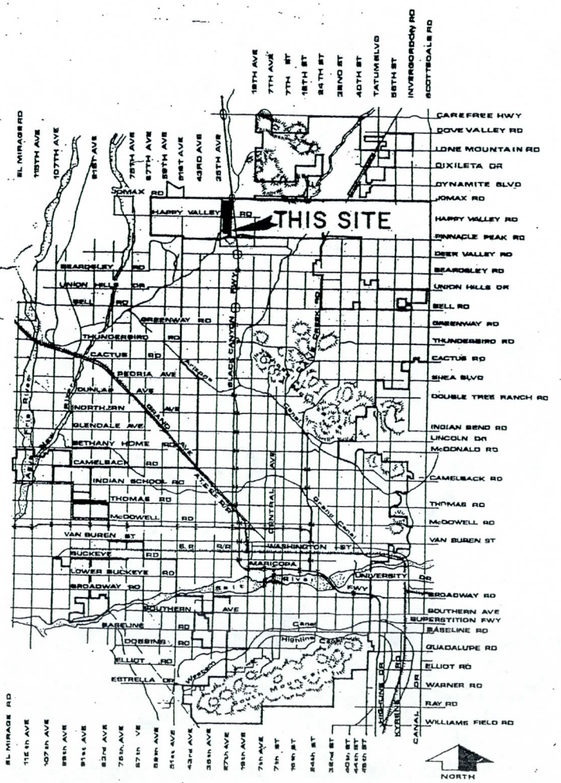
ENVIRONMENTAL ENHANCEMENT THRU ENGINEERING

CITY OF PHOENIX

ENGINEERING & ARCHITECTURAL SERVICES
PROJECT MANAGEMENT

SKUNK CREEK CHANNEL IMPROVEMENTS
INDEX NUMBER SA-884080

1992



Vicinity Map

MAYOR

PAUL JOHNSON

CITY COUNCIL

DISTRICT NO. 1 THELDA WILLIAMS
DISTRICT NO. 2 FRANCES BARWOOD
DISTRICT NO. 3 SKIP RIMSZA
DISTRICT NO. 4 CRAIG TRIBKEN
DISTRICT NO. 5 JOHN NELSON
DISTRICT NO. 6 KATHY DUBS
DISTRICT NO. 7 MARY ROSE WILCOX
DISTRICT NO. 8 CALVIN C. GOODE

CITY MANAGER - FRANK FAIRBANKS

CITY ENGINEER - KENNY HARRIS, P.E.

APPROVALS

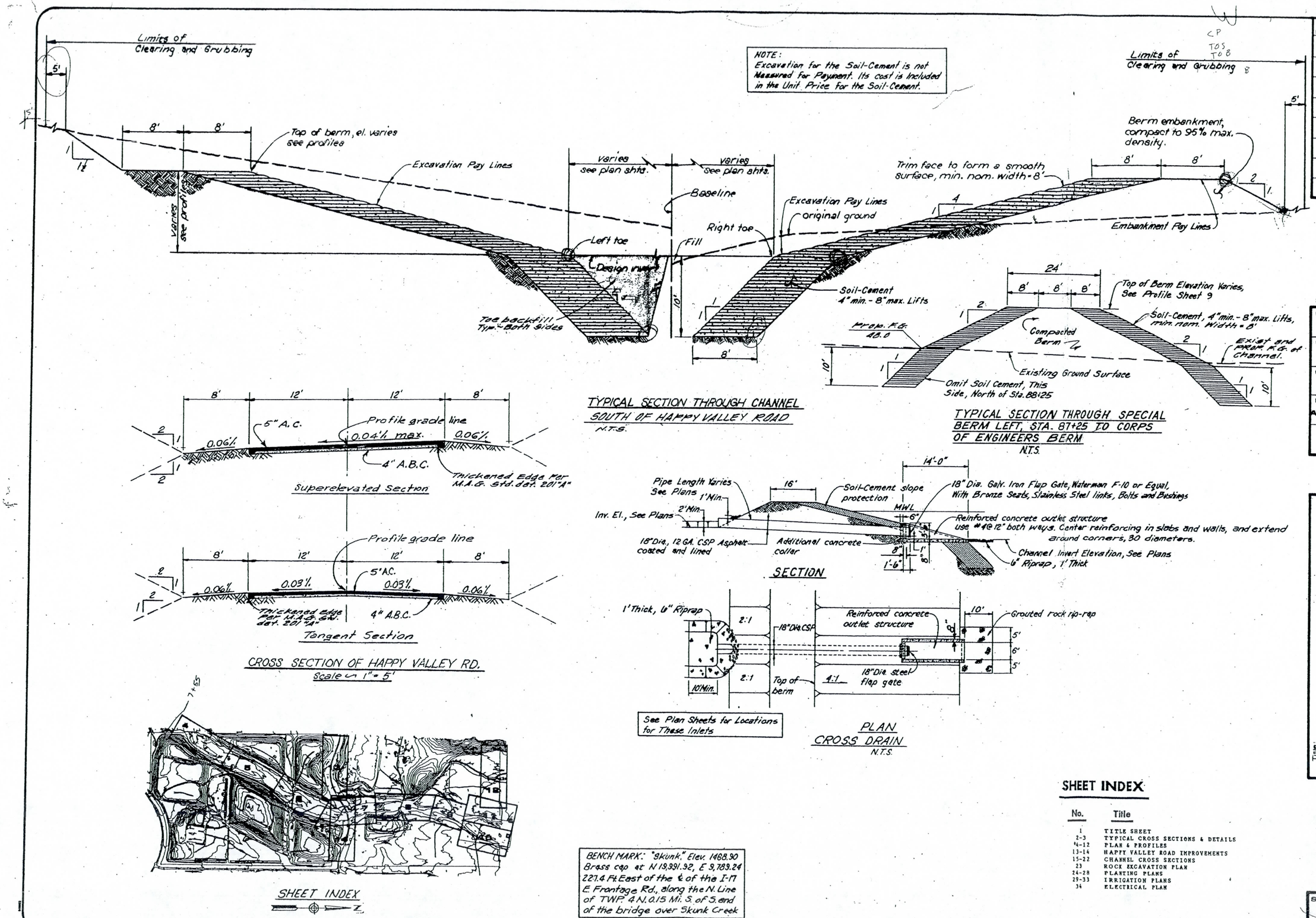
ENGINEERING SUPERVISOR — DATE 4/21/92

PUBLIC WORKS DIRECTOR — DATE

Registered Professional Engineer — Certificate No. 12479 — Claudia Morea — Arizona — 4/24/92

MOREA·HALL engineering, inc.
1820 W. Maricopa Freeway
Phoenix, Arizona 85007
Phone: 602-258-4428

1997 - SKUNK CREEK PLANNING INFORMATION



NOTE: Excavation for the Soil-Cement is not Measured for Payment. Its cost is included in the Unit Price for the Soil-Cement.

BENCH MARK: "Skunk." Elev. 1468.30 Brass cap at N 19,991.92, E 9,789.24 227.4 Ft East of the ℄ of the I-17 E Frontage Rd., along the N. Line of TWP 4 N. 0.15 Mi. S. of S. end of the bridge over Skunk Creek

SHEET INDEX

No.	Title
1	TITLE SHEET
2-3	TYPICAL CROSS SECTIONS & DETAILS
4-12	PLAN & PROFILES
13-14	HAPPY VALLEY ROAD IMPROVEMENTS
15-22	CHANNEL CROSS SECTIONS
23	ROCK EXCAVATION PLAN
24-28	PLANTING PLANS
29-33	IRRIGATION PLANS
34	ELECTRICAL PLAN

Revisions	Date

Seal

Designed By: C. MOREA

Drawn By: M. CROSS

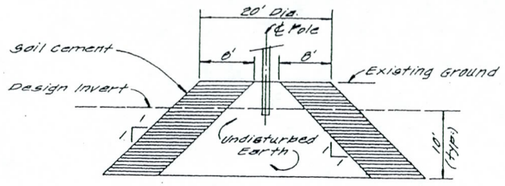
Checked By: C. MOREA

Date: APR. 24, 1992

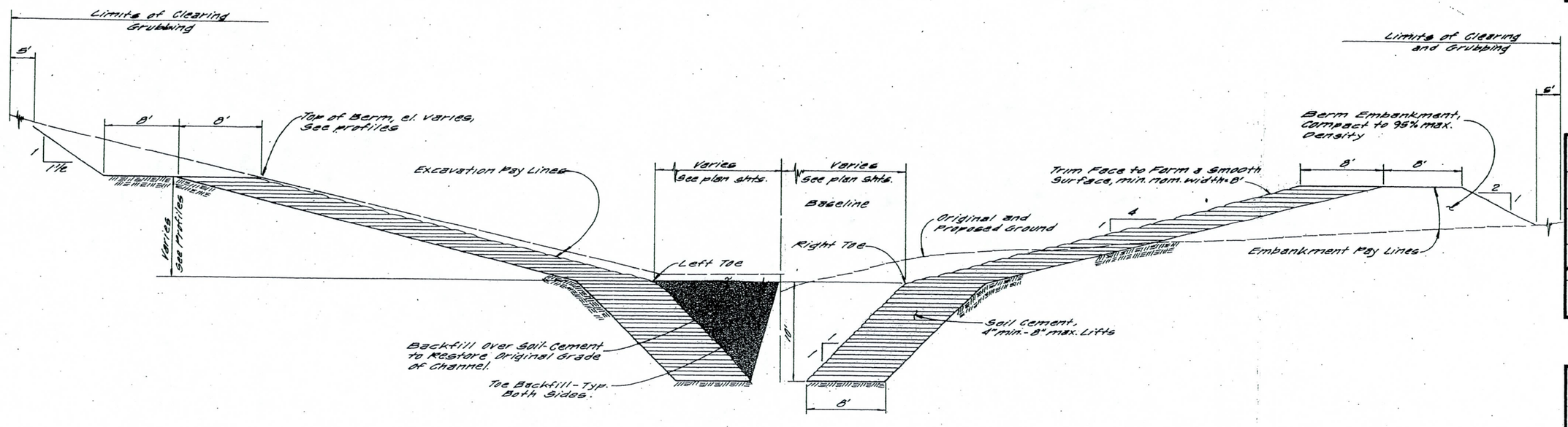
Title: SKUNK CREEK CHANNEL IMPROVEMENTS INDEX NO. SA-884080

Sheet 2 of 34

CITY OF PHOENIX • ENGINEERING DEPARTMENT • DESIGN DIVISION



SOIL CEMENT AROUND POLE



TYPICAL SECTION THROUGH CHANNEL
NORTH OF HAPPY VALLEY ROAD
N.T.S.

Revisions	Date

Seal

Designed By: C. MOREA

Drawn By: M. CROSS

Checked By: C. MOREA

Date: APR. 24, 1992

Title: SKUNK CREEK CHANNEL IMPROVEMENTS INDEX NO. SA-884080

Sheet

CITY OF PHOENIX • ENGINEERING DEPARTMENT • DESIGN DIVISION

LAYOUT GEOMETRY BASELINE/TOE OF SLOPE								
PT.	@ STA.	OFFSET LT.	OFFSET RT.	CURVE DATA Δ	R	T	L	C
TTE	88+55.32	45.50		27°03'24"	1900'	479.50'	929.34'	50.75'

Revisions | Date

Seal

Designed By: C. MOREA

Drawn By: M. CROSS

Checked By: C. MOREA

Date: APR. 24, 1992

Title: SKUNK CREEK CHANNEL IMPROVEMENTS INDEX NO. SA-884080

Sheet 12 of 34

CITY OF PHOENIX • ENGINEERING DEPARTMENT • DESIGN DIVISION

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTER AND COMMUNITY OFFICIAL**	O.M.B No. 3067-0148 Expires April 30, 2001

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

1. REQUESTED RESPONSE FROM FEMA

This request is for a:

☐ CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60,65 & 72).

☒ LOMR A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, floodway or flood elevations. LOMRs typically decrease flood hazards. (See 44 CFR Ch. 1 Parts 60 & 65.)

☐ Other Describe: _____

2. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

☒ Physical Change ☒ Improved Methodology/Data ☐ Floodway Revision

☐ Other Describe: _____

Note: A photograph is not required, but is very helpful during review.

2. Flooding Source: Skunk Creek

3. Project Name/Identifier: Skunk Creek Landfill Plan Modification and Update

4. FEMA zone designations affected: A, AE, X
(example: A, AH, AO, A1-A30, A99, AE, V, V1-V30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	Katy, City Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90
040051	Phoenix, City of	AZ	04013C	1185G	07/19/01
040051	Phoenix, City of	AZ	04013C	1205F	07/19/01

6. The area of revision encompasses the following types of flooding and structures. Check all that apply.

Types of Flooding	Structures
☒ Riverine	☒ Channelization
☐ Coastal	☐ Levee/Floodwall
☐ Alluvial fan	☒ Bridge/Culvert
☐ Shallow Flooding (e.g. Zones AO and AH)	☐ Dam
☐ Lakes	☐ Fill
☐ Other (describe)	☐ Other (describe)

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?
   ☐ Yes ☒ No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? ☒ Yes ☐ No ☐ N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? ☒ Yes ☐ No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(Name)
flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Operation and maintenance plans are attached. ☐ **Yes** ☐ **No** ☒ **N/A**

6. REVIEW FEE

The review fee for the appropriate request category has been included. ☒ Yes Fee amount: $4,000.00

OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt.
☐ Yes

Please see Instructions for Fee Amounts

7. SIGNATURE

Note: **I understand that my signature indicates that all information submitted in support of this request is correct**

_____
Signature of Revision Requester

Pedro A. Calza, P.E.
Printed Name and Title of Revision Requester

Tetra Tech Inc.
Company Name

Telephone No.: 602.682.3300 Date: _____

Note: **Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.**

_____
Signature of Community Official

Hasan Mushtaq, P.E. Floodplain Manager
Printed Name and Title of Community Official

City of Phoenix, Arizona
Community Name

Telephone No.: 602.262.4026 Date: _____

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2

_____
Signature

Pedro A. Calza, P.E.
Printed Name and Title of Revision Requester

Registr No. 30493 Expires (Date) 9/30/05 State AZ

Type of License/Expertise: Civil Engineer

Check which forms have been included with this request

Form Name and (Number)	Required if .....
☐ **Hydrologic** (3)	new or revised discharges
☒ **Hydraulic** (4)	new or revised water-surface elevations
☒ **Mapping** (5)	floodplain/floodway changes
☒ **Channelization** (6)	channel is modified
☒ **Bridge/Culvert** (7)	addition/revision of bridge/culvert
☐ **Levee/Floodwall** (8)	addition/revision of levee/floodwall
☐ **Coastal** (9)	new or revised coastal elevations
☐ **Coastal Structures** (10)	addition/revision of coastal structure
☐ **Dam** (11)	addition/revision of dam
☐ **Alluvial Fan** (12)	structures proposed on alluvial fan

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS**	O.M.B No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: City of Phoenix

Flooding Source: Skunk Creek

Project Name/Identifier: Skunk Creek Landfill Modifications and Update

1. REACH TO BE REVISED

Describe the limits of the revision OR submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes

Downstream Limit: RM 8.69

Upstream Limit: RM 11.57

2. MODELS SUBMITTED

Requirements: for areas which have detailed flooding:
Full input and output listings along with files on diskette for each of the models listed below (items 1-4) and a summary of the source of input parameters used in the models must be provided. The summary must include a description of any changes made from model to model (e.g., Duplicate Effective model to Corrected Effective model). At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.

for areas which do not have detailed flooding:
Only the 100-year (Base) flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses (including all calculations) for existing or pre-project conditions and revised or post-project conditions must be submitted.

1. Duplicate Effective Model ☒ **Natural** **File Name** SKUNKCRK, SKUNKFIS PF#1 ☒ **Floodway** **File Name** SKUNKCRK, SKUNKFIS PF#2
Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (10-, 50-, 100-, and 500-year multi-profile runs and the floodway run) must be obtained and then reproduced on the requester's equipment to produce the Duplicate Effective model. This is required to assure that the effective models input data has been transferred correctly to the requester's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____
The Corrected Effective model is the model that corrects any errors that occur in the Duplicate Effective model, adds any additional cross sections to the Duplicate Effective model, or incorporates more detailed topographic information than that used in the currently effective model. The Corrected Effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____
The Duplicate Effective model or Corrective Effective model is modified to produce the Existing or Pre-Project Conditions model to reflect any modifications that have occurred within the floodplain since the date of the Effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the Corrected Effective model or Duplicate Effective model.

4. Revised or Post-Project Conditions Model ☒ **Natural** **File Name** SKNKLOMR ☐ **Floodway** **File Name** _____
The Existing or Pre-Project Conditions model (or Duplicate Effective model or Corrected Effective model, as appropriate) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for the proposed project this model must reflect proposed conditions.

5. Other – Please attach a sheet describing all other models submitted along with the file names. ☒ **Natural** ☐ **Floodway**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

3. STARTING WATER-SURFACE ELEVATIONS

Explain how they were determined. Explanation Attached? ☒ Yes ☐ No

NOTE: If the effective study is an approximate study, the slope/area method is recommended.
For detailed analysis studies, using a known water-surface elevation is recommended.

4. RESULTS (from the model used to revise the 100-year water surface elevations)

If the results indicate any of the following, attach an explanation - to this form, or to the hydraulic model printout- as to the reasonableness of the situation.

☐ Supercritical depth ☒ Critical Depth ☐ Drawdowns ☐ Negative Floodway Surcharges

☐ Floodway Surcharges Greater Than Maximum Allowed by Community/State

☒ Water surface elevations higher than the end points of cross sections.

☐ Floodway discharge is different than the Natural 100-year (base) flood discharge.

☒ Project causes 100-year floodplain or floodway elevations to increase (state if increases are located off the requester's property)

Explanation attached with Form ☐ **Explanation provided on attached printout** ☒

If Hydraulic model used is HEC-2, has it been checked with FEMA'S CHECK-2 computer program? ☒ **Yes** ☐ **No**
(see instructions for information on how to obtain CHECK-2)

5. REVISED FIRM/FBFM AND FLOOD PROFILES

1. Profile Transition

a. 100-Year Water-Surface Elevations - indicate the difference in water surface elevations where the project 100-year elevations tie into the existing 100-year water surface elevations at each end of the project.

Downstream End 8.69 within 0.0 (feet) *Cross-Section #* Upstream End N/A within _____ (feet) *Cross-Section #*

b. Floodway Elevations - indicate the difference in water surface elevations where the project floodway elevations tie into the existing floodway water surface elevations at each end of the project.

Downstream End 8.69 within 0.0 (feet) *Cross-Section #* Upstream End N/A within _____ (feet) *Cross-Section #*

c. Floodway widths - indicate the difference in floodway widths where the project floodway widths tie into the existing floodway width at each end of the project.

Downstream End 8.79 within 1.5 (feet) *Cross-Section #* Upstream End N/A within _____ (feet) *Cross-Section #*

2. Profile Checklist (check box if information has been provided on profile)

The following information (unless in parentheses) must be included at the same scale as the existing profiles for this project:

☒ Stream Name ☒ Community Name ☒ Corporate Limits labeled ☒ Study limits labeled

☒ Confluences labeled ☒ Channel Stationing ☒ Streambed profiled ☒ Cross Sections labeled

☒ Horizontal/Vertical Scales indicated ☒ 100-year elevs profiled*

☒ Road Crossings ☐ Labeled ☐ Low Chord Elevations ☐ Top of Road Elevations

*All recurrence intervals in the effective study must also be profiled.

Floodway Data Table

Attach a Floodway Data Table for each cross section listed in the published Floodway Data table in the FIS report.

Floodway Data Table Attached ☒ **Yes** ☐ **Not Required**

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE / COASTAL MAPPING**	O.M.B No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: Phoenix, City of

Flooding Source: Skunk Creek

Project Name/Identifier: Skunk Creek Landfill Modification and Update

This is a ☒ Manual ☐ Digital submission. *Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance as possible.*

1. MAPPING CHANGES

1. A topographic workmap must be submitted showing the following information (check N/A when not applicable):

a. Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
b. Revised detailed 100- and 500-year floodplain boundaries.	☒ Yes	☐ No	☐ N/A
c. Revised floodway boundaries	☒ Yes	☐ No	☐ N/A
d. Location and alignment of all cross sections with stationing control indicated.	☒ Yes	☐ No	☐ N/A
e. Stream alignments, road alignments and dam alignments.	☒ Yes	☐ No	☐ N/A
f. Current community boundaries.	☒ Yes	☐ No	☐ N/A
g. Effective 100- year floodplain and floodway boundaries from FIRM/FBFM reduced or enlarged to the scale of the topographic workmap	☒ Yes	☐ No	☐ N/A
h. Tie-ins between the effective and revised 100-, 500-year and floodway boundaries	☐ Yes	☐ No	☒ N/A
i. The requester's property boundaries and community easements	☒ Yes	☐ No	☐ N/A
j. The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
k. Location and description of reference marks	☒ Yes	☐ No	☐ N/A
l. Vertical datum (example: NGVD, NAVD)	☒ Yes	☐ No	☐ N/A
m. Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
n. Location and alignment of all coastal transects used to revise the coastal analyze	☐ Yes	☐ No	☒ N/A
o. V-zone has been delineated to extend landward to the heel of the primary frontal dune	☐ Yes	☐ No	☒ N/A

If any items are marked No or N/A please attach an explanation.

2. What is the source and date of the updated topographic information (example: orthophoto maps, July 1985; filed survey, May 1979, beach profile, June 1987 etc.)? Orthophoto maps, 1/7/98 & 2/11/00

3. What is the scale and contour interval of the following workmaps?

Effective FIS Scale 1"= 200' Contour Interval 2'

Revision Request Scale 1"= 200' Contour Interval 2'

NOTE: Revised topographic information must be of equal or greater detail than effective.

4. Attach an annotated FIRM/FBFM at the scale of the effective FIRM/FBFM showing the revised 100- and 500-year floodplain and the floodway boundaries and how they tie into those shown on the effective FIRM/FBFM downstream and upstream of the revisions or adjacent to the area of revision for coastal studies. **FIRM/FBFM attached?** ☒ **Yes** ☐ **No**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

2. EARTH FILL PLACEMENT

1. The fill is: ☒ Existing ☐ Proposed

2. Has fill been/will be placed in the regulatory floodway? ☒ Yes ☐ No
   If Yes, please attach completed Riverine Hydraulic Analysis Form (Form 4).

3. Has fill been/will be placed in floodway fringe (*area between the floodway and 100-year floodplain boundaries*)? ☒ Yes ☐ No

   If Yes, then complete A, B, C, and D below.

   a. Are fill slopes for granular materials steeper than one vertical on one-and-one-half horizontal? ☐ Yes ☒ No

      If Yes, justify steeper slopes _____

   b. Is adequate erosion protection provided for fill slopes exposed to moving flood waters? (*Slopes exposed to flows with velocities of up to 5 feet per second (fps) during the 100-year flood must, at a minimum, be protected by a cover of grass, vines, weeds, or similar vegetation; slopes exposed to flows with velocities greater than 5 fps during the 100-year flood must, at a minimum, be protected by stone or rock riprap.)*

      ☒ Yes ☐ No

      If No, describe erosion protection provided _____

   c. Has all fill placed in revised 100-year floodplain been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test Method or acceptable equivalent method? ☐ Yes ☐ No

   d. Can structures conceivably be constructed on the fill at any time in the future? ☐ Yes ☒ No

   If Yes, attach certification of fill compaction (item 3c. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer in accordance with Subparagraph 65.5(a)(6) of the NFIP regulations.

   Fill certification attached ☐ **Yes** ☒ **No**

4. Has fill been/will be placed in a V zone? ☐ Yes ☒ No

   If Yes, is the fill protected from erosion by a flood control structure such as a revetment or seawall?

   ☐ Yes ☐ No

   If Yes, attach the Coastal Structures Form (Form 10).

FEDERAL EMERGENCY MANAGEMENT AGENCY **CHANNELIZATION**	O.M.B. Burden No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Community Name: Phoenix, City of

Flooding Source: Skunk Creek

Project Name/Identifier: Skunk Creek Landfill Modification and Update

1. REACH TO BE REVISED

Describe the limits of the revision **OR** submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes

Downstream Limit: 8.69

Upstream Limit: 11.57

2. CHANNEL DESCRIPTION

Attach the following information about the channel (check box if information has been provided):

☒ Description of the inlet and outlet

☒ Description of the shape of the channel *(both cross sectional and planimetric configuration)* and its lining *(channel bottom and sides)*:

3. ACCESSORY STRUCTURES

The channelization includes:

- ☒ Levees *(Attach Levee/Floodwall System Analysis Form - Form 8)*
- ☒ Drop structures
- ☐ Superelevated sections
- ☒ Transitions in cross sectional geometry
- ☐ Debris basin/detention basin
- ☐ Energy dissipater
- ☐ Other (Describe):

4. DRAWING CHECKLIST

Attach the plans of the channelization certified by a registered professional engineer. The plan detail and information should include (check box if information has been provided):

☒ Channel alignment and locations of inlet, outlet, and accessory structures

☒ Channel lining

☒ Typical cross sections and profiles of channel banks and invert

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

5. HYDRAULIC CONSIDERATIONS

1. The channel was designed to carry 39,000 (cfs) and/or the 100-year flood.

2. The design elevation in the channel based on:

   ☒ Subcritical flow

   ☐ Critical flow

   ☐ Supercritical flow

   ☐ Energy grade line

3. **If there is the potential for a hydraulic jump at the following locations, check the box(es) that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.**

Inlet to channel?	☐ Yes
Outlet of channel?	☐ Yes
At Drop Structures?	☒ Yes
At Transitions?	☐ Yes
Other locations?	☐ Yes

Explanation Attached? ☒ **Yes** ☐ **No** ☐ **N/A**

6. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year (base flood) water-surface elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including sewer and deposition) to affect the base flood water-surface elevations, then provide the following information **(Check the box if provided):**

☐ Estimated sediment load

☐ Method used to estimate sediment transport

☐ Method used to estimate scour and/or deposition

☐ Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT**	O.M.B. Burden No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Community Name: Phoenix, City of

Flooding Source: Skunk Creek

Project Name/Identifier: Skunk Creek Landfill Modification and Update

1. IDENTIFIER

1. Name of structure (roadway, railroad, etc.): Pinnacle Peak Road Bridge

2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier):

   Cross-sections 9.145 - 9.155

3. This revision reflects (check one of the following):

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

4. Hydraulic model used to analyze the structure *(e.g., HEC-2 with special bridge routine, WSPRO, HY8)*

   HEC-2 with normal bridge routine

   If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

   Justification attached ☐ **Yes** ☐ **No** ☒ **N/A**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

2. DRAWING CHECKLIST

Attach plans of the structure(s) certified by a registered professional engineer. The plan detail and information should include the following (check the boxes if the information has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☐ Shape (culverts only)
- ☒ Material
- ☒ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Low Chord Elevations - Upstream and Downstream
- ☒ Top of Road Elevations - Upstream and Downstream
- ☒ Structure Invert Elevations - Upstream and Downstream
- ☒ Stream Invert Elevations - Upstream and Downstream
- ☒ Skew Angle
- ☒ Cross-Section Locations
- ☒ Distances Between Cross Sections
- ☒ Erosion Protection

3. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year (base flood) water-surface elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including sewer and deposition) to affect the base flood elevations, then provide the following information **(Check the box if provided):**

- ☐ Estimated sediment load
- ☐ Method used to estimate sediment transport
- ☐ Method used to estimate scour and/or deposition
- ☐ Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTER AND COMMUNITY OFFICIAL**	O.M.B No. 3067-0148 Expires April 30, 2001

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

1. REQUESTED RESPONSE FROM FEMA

This request is for a:

☐ CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60,65 & 72).

☒ LOMR A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, floodway or flood elevations. LOMRs typically decrease flood hazards. (See 44 CFR Ch. 1 Parts 60 & 65.)

☐ Other Describe: _____

2. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

☒ Physical Change ☒ Improved Methodology/Data ☐ Floodway Revision

☐ Other Describe: _____

Note: A photograph is not required, but is very helpful during review.

2. Flooding Source: Skunk Creek

3. Project Name/Identifier: Skunk Creek Landfill Plan Modification and Update

4. FEMA zone designations affected: A, AE, X
(example: A, AH, AO, A1-A30, A99, AE, V, V1-V30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	Katy, City Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90
040051	Phoenix, City of	AZ	04013C	1185G	07/19/01
040051	Phoenix, City of	AZ	04013C	1205F	07/19/01

6. The area of revision encompasses the following types of flooding and structures. Check all that apply.

Types of Flooding	Structures
☒ Riverine	☒ Channelization
☐ Coastal	☐ Levee/Floodwall
☐ Alluvial fan	☒ Bridge/Culvert
☐ Shallow Flooding (e.g. Zones AO and AH)	☐ Dam
☐ Lakes	☐ Fill
☐ Other (describe)	☐ Other (describe)

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?
   ☐ Yes ☒ No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? ☒ Yes ☐ No ☐ N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? ☒ Yes ☐ No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(Name)
flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Operation and maintenance plans are attached. ☐ **Yes** ☐ **No** ☒ **N/A**

6. REVIEW FEE

The review fee for the appropriate request category has been included. ☒ Yes Fee amount: $4,000.00

OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt.
☐ Yes

Please see Instructions for Fee Amounts

7. SIGNATURE

Note: **I understand that my signature indicates that all information submitted in support of this request is correct**

_____
Signature of Revision Requester

Pedro A. Calza, P.E.
Printed Name and Title of Revision Requester

Tetra Tech Inc.
Company Name

Telephone No.: 602.682.3300 Date: _____

Note: **Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.**

_____
Signature of Community Official

Hasan Mushtaq, P.E. Floodplain Manager
Printed Name and Title of Community Official

City of Phoenix, Arizona
Community Name

Telephone No.: 602.262.4026 Date: _____

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2

_____
Signature

Pedro A. Calza, P.E.
Printed Name and Title of Revision Requester

Registr No. 30493 Expires (Date) 9/30/05 State AZ

Type of License/Expertise: Civil Engineer

Check which forms have been included with this request

Form Name and (Number)	Required if .....
☐ **Hydrologic** (3)	new or revised discharges
☒ **Hydraulic** (4)	new or revised water-surface elevations
☒ **Mapping** (5)	floodplain/floodway changes
☒ **Channelization** (6)	channel is modified
☒ **Bridge/Culvert** (7)	addition/revision of bridge/culvert
☐ **Levee/Floodwall** (8)	addition/revision of levee/floodwall
☐ **Coastal** (9)	new or revised coastal elevations
☐ **Coastal Structures** (10)	addition/revision of coastal structure
☐ **Dam** (11)	addition/revision of dam
☐ **Alluvial Fan** (12)	structures proposed on alluvial fan

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS**	O.M.B No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: City of Phoenix

Flooding Source: Skunk Creek

Project Name/Identifier: Skunk Creek Landfill Modifications and Update

1. REACH TO BE REVISED

Describe the limits of the revision OR submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes

Downstream Limit: RM 8.69

Upstream Limit: RM 11.57

2. MODELS SUBMITTED

Requirements: for areas which have detailed flooding:
Full input and output listings along with files on diskette for each of the models listed below (items 1-4) and a summary of the source of input parameters used in the models must be provided. The summary must include a description of any changes made from model to model (e.g., Duplicate Effective model to Corrected Effective model). At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.

for areas which do not have detailed flooding:
Only the 100-year (Base) flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses (including all calculations) for existing or pre-project conditions and revised or post-project conditions must be submitted.

1. Duplicate Effective Model ☒ **Natural** **File Name** SKUNKCRK, SKUNKFIS PF#1 ☒ **Floodway** **File Name** SKUNKCRK, SKUNKFIS PF#2

Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (10-, 50-, 100-, and 500-year multi-profile runs and the floodway run) must be obtained and then reproduced on the requester's equipment to produce the Duplicate Effective model. This is required to assure that the effective models input data has been transferred correctly to the requester's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____

The Corrected Effective model is the model that corrects any errors that occur in the Duplicate Effective model, adds any additional cross sections to the Duplicate Effective model, or incorporates more detailed topographic information than that used in the currently effective model. The Corrected Effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____

The Duplicate Effective model or Corrective Effective model is modified to produce the Existing or Pre-Project Conditions model to reflect any modifications that have occurred within the floodplain since the date of the Effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the Corrected Effective model or Duplicate Effective model.

4. Revised or Post-Project Conditions Model ☒ **Natural** **File Name** SKNKLOMR ☐ **Floodway** **File Name** _____

The Existing or Pre-Project Conditions model (or Duplicate Effective model or Corrected Effective model, as appropriate) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for the proposed project this model must reflect proposed conditions.

. Other – Please attach a sheet describing all other models submitted along with the file names. ☒ **Natural** ☐ **Floodway**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

3. STARTING WATER-SURFACE ELEVATIONS

Explain how they were determined. Explanation Attached? ☒ Yes ☐ No

NOTE: If the effective study is an approximate study, the slope/area method is recommended. For detailed analysis studies, using a known water-surface elevation is recommended.

4. RESULTS (from the model used to revise the 100-year water surface elevations)

If the results indicate any of the following, attach an explanation - to this form, or to the hydraulic model printout- as to the reasonableness of the situation.

☐ Supercritical depth ☒ Critical Depth ☐ Drawdowns ☐ Negative Floodway Surcharges

☐ Floodway Surcharges Greater Than Maximum Allowed by Community/State

☒ Water surface elevations higher than the end points of cross sections.

☐ Floodway discharge is different than the Natural 100-year (base) flood discharge.

☒ Project causes 100-year floodplain or floodway elevations to increase (state if increases are located off the requester's property)

Explanation attached with Form ☐ **Explanation provided on attached printout** ☒

If Hydraulic model used is HEC-2, has it been checked with FEMA'S CHECK-2 computer program? ☒ **Yes** ☐ **No**
(see instructions for information on how to obtain CHECK-2)

5. REVISED FIRM/FBFM AND FLOOD PROFILES

1. Profile Transition

a. 100-Year Water-Surface Elevations - indicate the difference in water surface elevations where the project 100-year elevations tie into the existing 100-year water surface elevations at each end of the project.

Downstream End 8.69 within 0.0 (feet) *Cross-Section #* Upstream End N/A within _____ (feet) *Cross-Section #*

b. Floodway Elevations - indicate the difference in water surface elevations where the project floodway elevations tie into the existing floodway water surface elevations at each end of the project.

Downstream End 8.69 within 0.0 (feet) *Cross-Section #* Upstream End N/A within _____ (feet) *Cross-Section #*

c. Floodway widths - indicate the difference in floodway widths where the project floodway widths tie into the existing floodway width at each end of the project.

Downstream End 8.79 within 1.5 (feet) *Cross-Section #* Upstream End N/A within _____ (feet) *Cross-Section #*

2. Profile Checklist (check box if information has been provided on profile)

The following information (unless in parentheses) must be included at the same scale as the existing profiles for this project:

☒ Stream Name ☒ Community Name ☒ Corporate Limits labeled ☒ Study limits labeled

☒ Confluences labeled ☒ Channel Stationing ☒ Streambed profiled ☒ Cross Sections labeled

☒ Horizontal/Vertical Scales indicated ☒ 100-year elevs profiled*

☒ Road Crossings ☐ Labeled ☐ Low Chord Elevations ☐ Top of Road Elevations

*All recurrence intervals in the effective study must also be profiled.

Floodway Data Table

Attach a Floodway Data Table for each cross section listed in the published Floodway Data table in the FIS report.

Floodway Data Table Attached ☒ **Yes** ☐ **Not Required**

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE / COASTAL MAPPING**	O.M.B No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

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You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: Phoenix, City of

Flooding Source: Skunk Creek

Project Name/Identifier: Skunk Creek Landfill Modification and Update

This is a ☒ Manual ☐ Digital submission. *Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance as possible.*

1. MAPPING CHANGES

1. A topographic workmap must be submitted showing the following information (check N/A when not applicable):

a. Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
b. Revised detailed 100- and 500-year floodplain boundaries.	☒ Yes	☐ No	☐ N/A
c. Revised floodway boundaries	☒ Yes	☐ No	☐ N/A
d. Location and alignment of all cross sections with stationing control indicated.	☒ Yes	☐ No	☐ N/A
e. Stream alignments, road alignments and dam alignments.	☒ Yes	☐ No	☐ N/A
f. Current community boundaries.	☒ Yes	☐ No	☐ N/A
g. Effective 100- year floodplain and floodway boundaries from FIRM/FBFM reduced or enlarged to the scale of the topographic workmap	☒ Yes	☐ No	☐ N/A
h. Tie-ins between the effective and revised 100-, 500-year and floodway boundaries	☐ Yes	☐ No	☒ N/A
i. The requester's property boundaries and community easements	☒ Yes	☐ No	☐ N/A
j. The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
k. Location and description of reference marks	☒ Yes	☐ No	☐ N/A
l. Vertical datum (example: NGVD, NAVD)	☒ Yes	☐ No	☐ N/A
m. Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
n. Location and alignment of all coastal transects used to revise the coastal analyze	☐ Yes	☐ No	☒ N/A
o. V-zone has been delineated to extend landward to the heel of the primary frontal dune	☐ Yes	☐ No	☒ N/A

If any items are marked No or N/A please attach an explanation.

2. What is the source and date of the updated topographic information (example: orthophoto maps, July 1985; filed survey, May 1979, beach profile, June 1987 etc.)? Orthophoto maps, 1/7/98 & 2/11/00

3. What is the scale and contour interval of the following workmaps?

Effective FIS Scale 1"= 200' Contour Interval 2'

Revision Request Scale 1"= 200' Contour Interval 2'

NOTE: Revised topographic information must be of equal or greater detail than effective.

4. Attach an annotated FIRM/FBFM at the scale of the effective FIRM/FBFM showing the revised 100- and 500-year floodplain and the floodway boundaries and how they tie into those shown on the effective FIRM/FBFM downstream and upstream of the revisions or adjacent to the area of revision for coastal studies. **FIRM/FBFM attached?** ☒ **Yes** ☐ **No**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

2. EARTH FILL PLACEMENT

1. The fill is: ☒ Existing ☐ Proposed

2. Has fill been/will be placed in the regulatory floodway? ☒ Yes ☐ No
If Yes, please attach completed Riverine Hydraulic Analysis Form (Form 4).

3. Has fill been/will be placed in floodway fringe (*area between the floodway and 100-year floodplain boundaries*)? ☒ Yes ☐ No

If Yes, then complete A, B, C, and D below.

a. Are fill slopes for granular materials steeper than one vertical on one-and-one-half horizontal? ☐ Yes ☒ No

If Yes, justify steeper slopes _____

b. Is adequate erosion protection provided for fill slopes exposed to moving flood waters? (*Slopes exposed to flows with velocities of up to 5 feet per second (fps) during the 100-year flood must, at a minimum, be protected by a cover of grass, vines, weeds, or similar vegetation; slopes exposed to flows with velocities greater than 5 fps during the 100-year flood must, at a minimum, be protected by stone or rock riprap.)*

☒ Yes ☐ No

If No, describe erosion protection provided _____

c. Has all fill placed in revised 100-year floodplain been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test Method or acceptable equivalent method? ☐ Yes ☐ No

d. Can structures conceivably be constructed on the fill at any time in the future? ☐ Yes ☒ No

If Yes, attach certification of fill compaction (item 3c. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer in accordance with Subparagraph 65.5(a)(6) of the NFIP regulations.

Fill certification attached ☐ **Yes** ☒ **No**

4. Has fill been/will be placed in a V zone? ☐ Yes ☒ No

If Yes, is the fill protected from erosion by a flood control structure such as a revetment or seawall?

☐ Yes ☐ No

If Yes, attach the Coastal Structures Form (Form 10).

FEDERAL EMERGENCY MANAGEMENT AGENCY **CHANNELIZATION**	O.M.B. Burden No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Community Name: Phoenix, City of

Flooding Source: Skunk Creek

Project Name/Identifier: Skunk Creek Landfill Modification and Update

1. REACH TO BE REVISED

Describe the limits of the revision **OR** submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes

Downstream Limit: 8.69

Upstream Limit: 11.57

2. CHANNEL DESCRIPTION

Attach the following information about the channel (check box if information has been provided):

☒ Description of the inlet and outlet

☒ Description of the shape of the channel *(both cross sectional and planimetric configuration)* and its lining *(channel bottom and sides)*:

3. ACCESSORY STRUCTURES

The channelization includes:

- ☒ Levees *(Attach Levee/Floodwall System Analysis Form - Form 8)*
- ☒ Drop structures
- ☐ Superelevated sections
- ☒ Transitions in cross sectional geometry
- ☐ Debris basin/detention basin
- ☐ Energy dissipater
- ☐ Other (Describe):

4. DRAWING CHECKLIST

Attach the plans of the channelization certified by a registered professional engineer. The plan detail and information should include (check box if information has been provided):

☒ Channel alignment and locations of inlet, outlet, and accessory structures

☒ Channel lining

☒ Typical cross sections and profiles of channel banks and invert

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

5. HYDRAULIC CONSIDERATIONS

1. The channel was designed to carry 39,000 (cfs) and/or the 100-year flood.

2. The design elevation in the channel based on:

   ☒ Subcritical flow

   ☐ Critical flow

   ☐ Supercritical flow

   ☐ Energy grade line

3. **If there is the potential for a hydraulic jump at the following locations, check the box(es) that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.**

Inlet to channel?	☐ Yes
Outlet of channel?	☐ Yes
At Drop Structures?	☒ Yes
At Transitions?	☐ Yes
Other locations?	☐ Yes

Explanation Attached? ☒ **Yes** ☐ **No** ☐ **N/A**

6. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year (base flood) water-surface elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including sewer and deposition) to affect the base flood water-surface elevations, then provide the following information **(Check the box if provided):**

☐ Estimated sediment load

☐ Method used to estimate sediment transport

☐ Method used to estimate scour and/or deposition

☐ Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT**	O.M.B. Burden No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

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Community Name: Phoenix, City of

Flooding Source: Skunk Creek

Project Name/Identifier: Skunk Creek Landfill Modification and Update

1. IDENTIFIER

1. Name of structure (roadway, railroad, etc.): Pinnacle Peak Road Bridge

2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier):

   Cross-sections 9.145 - 9.155

3. This revision reflects (check one of the following):

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

4. Hydraulic model used to analyze the structure *(e.g., HEC-2 with special bridge routine, WSPRO, HY8)*

   HEC-2 with normal bridge routine

   If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

   Justification attached ☐ **Yes** ☐ **No** ☒ **N/A**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

2. DRAWING CHECKLIST

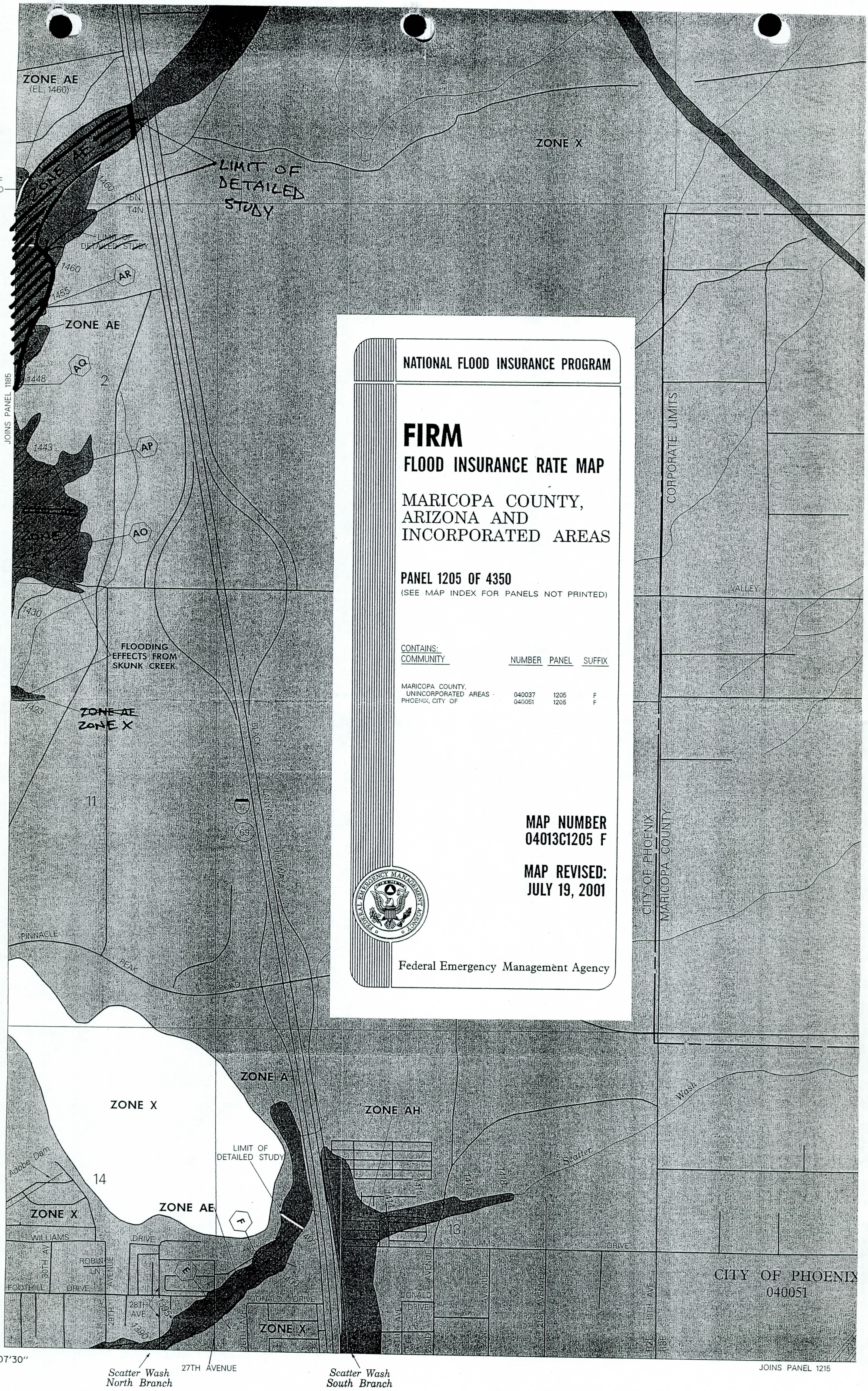
Attach plans of the structure(s) certified by a registered professional engineer. The plan detail and information should include the following (check the boxes if the information has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☐ Shape (culverts only)
- ☒ Material
- ☒ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Low Chord Elevations - Upstream and Downstream
- ☒ Top of Road Elevations - Upstream and Downstream
- ☒ Structure Invert Elevations - Upstream and Downstream
- ☒ Stream Invert Elevations - Upstream and Downstream
- ☒ Skew Angle
- ☒ Cross-Section Locations
- ☒ Distances Between Cross Sections
- ☒ Erosion Protection

3. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year (base flood) water-surface elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including sewer and deposition) to affect the base flood elevations, then provide the following information **(Check the box if provided):**

- ☐ Estimated sediment load
- ☐ Method used to estimate sediment transport
- ☐ Method used to estimate scour and/or deposition
- ☐ Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport



NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 1205 OF 4350

(SEE MAP INDEX FOR PANELS NOT PRINTED)

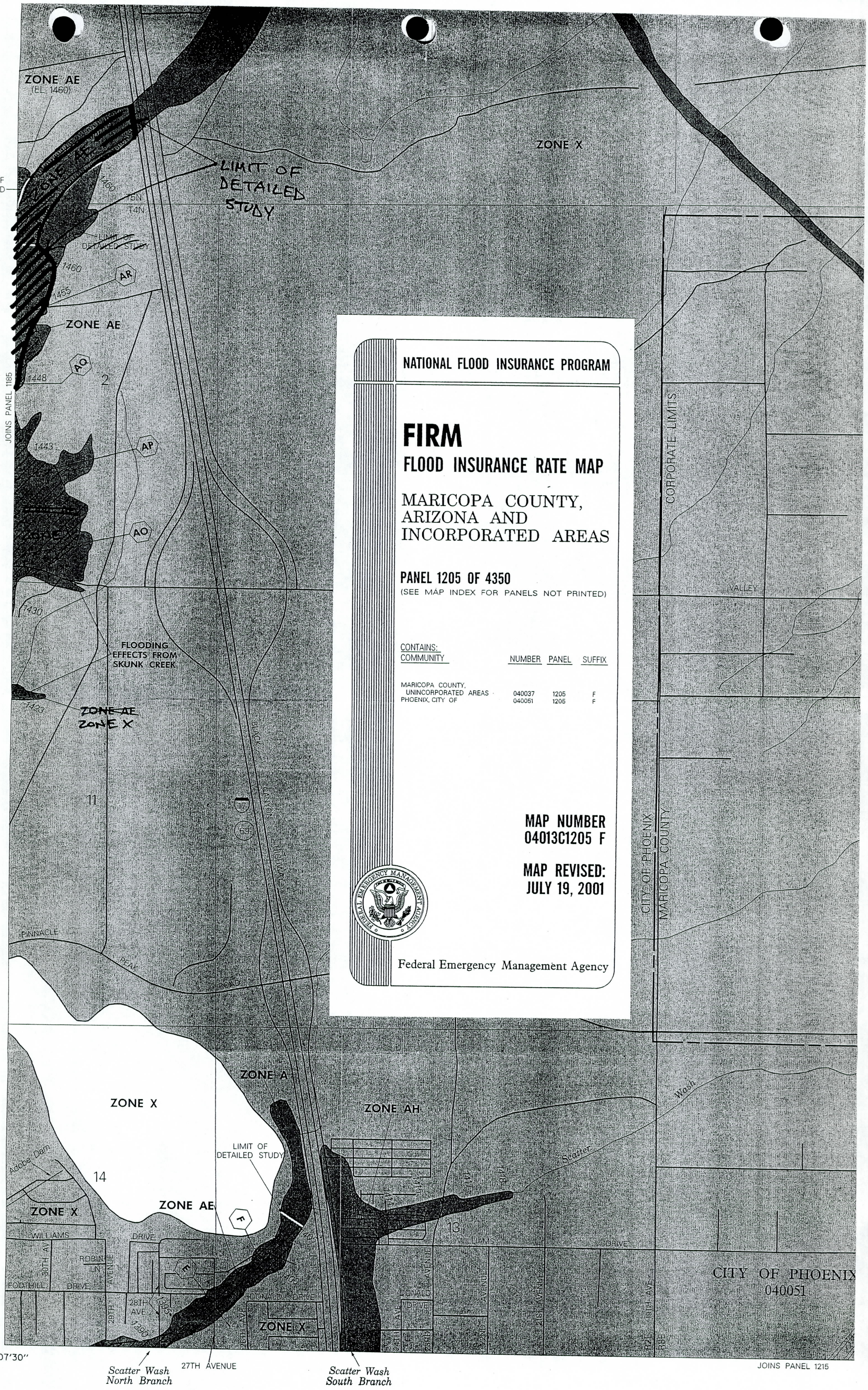
CONTAINS:

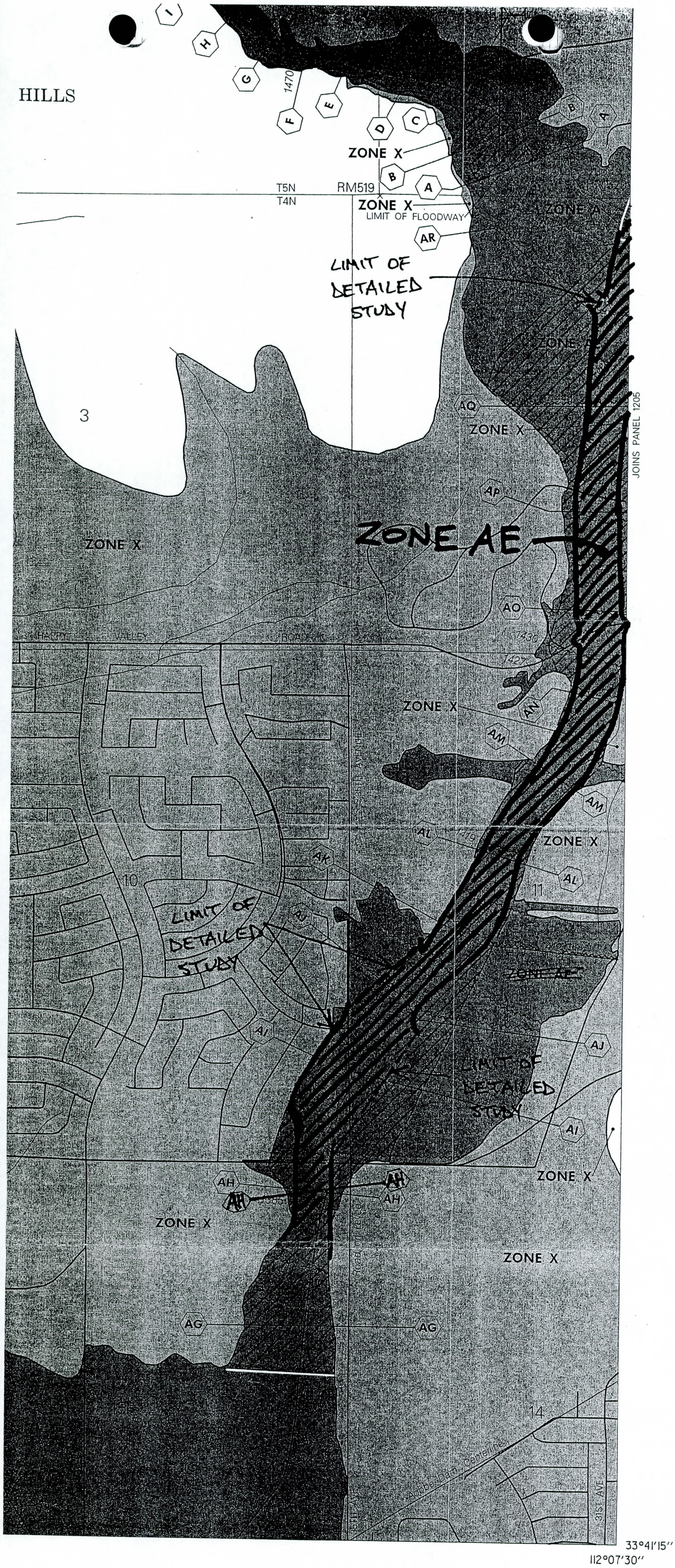
COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY, UNINCORPORATED AREAS	040037	1205	F
PHOENIX, CITY OF	040051	1205	F

MAP NUMBER 04013C1205 F

MAP REVISED: JULY 19, 2001

Federal Emergency Management Agency


NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS
PANEL 1205 OF 4350
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
MARICOPA COUNTY, UNINCORPORATED AREAS 040037 1205 F
PHOENIX, CITY OF 040051 1205 F
MAP NUMBER 04013C1205 F
MAP REVISED: JULY 19, 2001
Federal Emergency Management Agency
ZONE AE
(EL 1460)
ZONE X
LIMIT OF DETAILED STUDY
MIT OF ETAILED STUDY
JOINS PANEL 1185
ZONE AE
ZONE AE
ZONE X
FLOODING EFFECTS FROM SKUNK CREEK
ZONE AE
ZONE X
ZONE X
ZONE A
ZONE AH
ZONE AE
ZONE X
ZONE X
LIMIT OF DETAILED STUDY
Adobe Dam
Scatter Wash
CORPORATE LIMITS
CITY OF PHOENIX
MARICOPA COUNTY
CITY OF PHOENIX
040051
Scatter Wash North Branch
27TH AVENUE
Scatter Wash South Branch
JOINS PANEL 1215
112°07'30"



(EL 987)

RM7

• M2

97°07'30", 32°22'30"

Base Flood Elevation in Feet Where Uniform Within Zone. See Map Index Elevation Datum.

Elevation Reference Mark

River Mile

Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for more detailed data on BFE's, and for any information on floodway delineations, prior to use of this map for property purchase or construction purposes.

Areas of Special Flood Hazard (100-year flood) include Zones A, AE, A1-A30, AH, AO, A99, V, VE and V1-V30.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown at 1/20 inch.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and /or Otherwise Protected Areas established under the Coastal Barrier Improvement Act of 1990 (PL 101-591).

For community map revision history prior to countywide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index

EFFECTIVE DATE OF
COUNTYWIDE FLOOD INSURANCE RATE MAP:
APRIL 15, 1988

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:
SEPTEMBER 29, 1989, SEPTEMBER 4, 1991

Map revised July 19, 2001 to update corporate limits, to change base flood elevations, to add base flood elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET
1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 1185 OF 4350
(SEE MAP INDEX FOR PANELS NOT PRINTED)

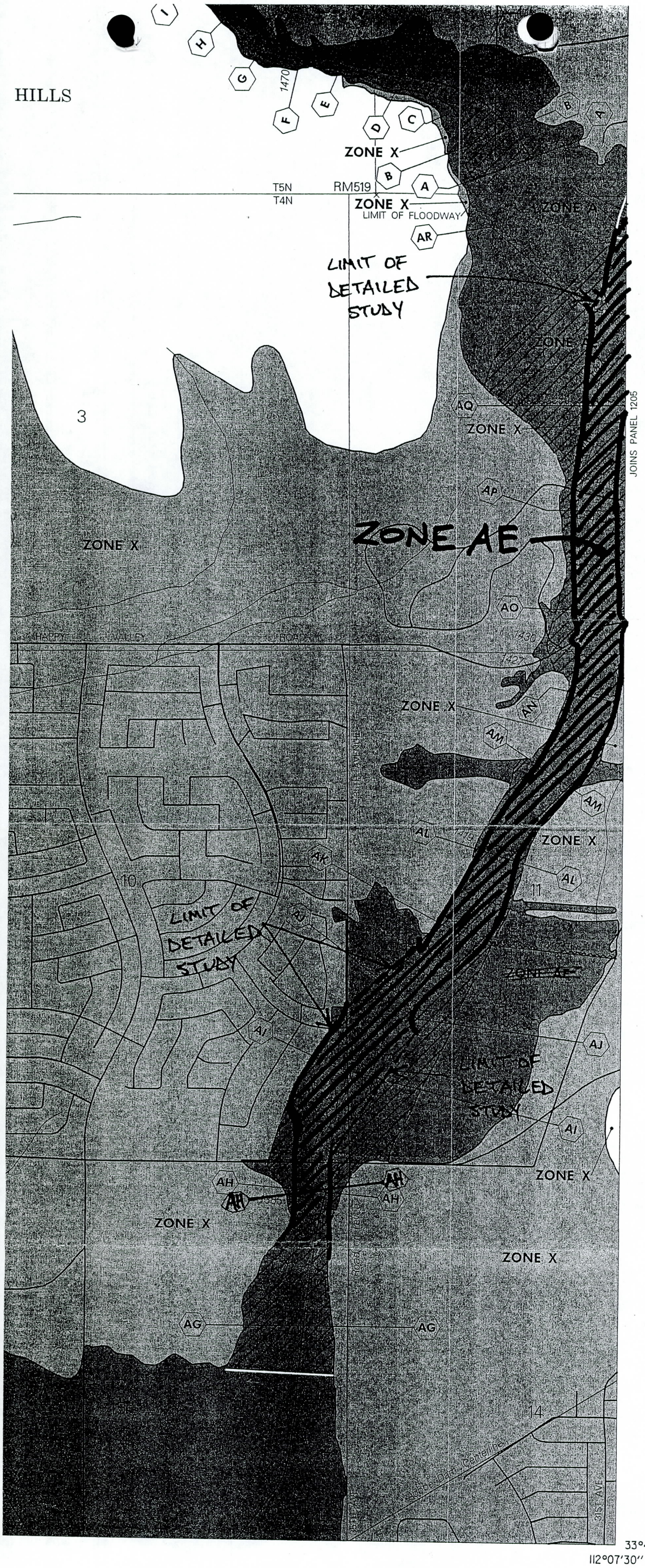
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GLENDALE, CITY OF	040045	1185	G
PHOENIX, CITY OF	040051	1185	G

MAP NUMBER
04013C1185 G

MAP REVISED:
JULY 19, 2001

Federal Emergency Management Agency



(EL 987)

RM7

● M2

97°07'30", 32°22'30"

Base Flood Elevation in Feet Where Unif[illegible] Within Zone. See Map Ind[illegible]vation Datum.

Elevation Referenc[illegible]rk

River Mile

Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

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COUNTYWIDE FLOOD INSURANCE RATE MAP:
APRIL 15, 1988

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:
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1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 1185 OF 4350
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CONTAINS:

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MAP NUMBER
04013C1185 G

MAP REVISED:
JULY 19, 2001

Federal Emergency Management Agency