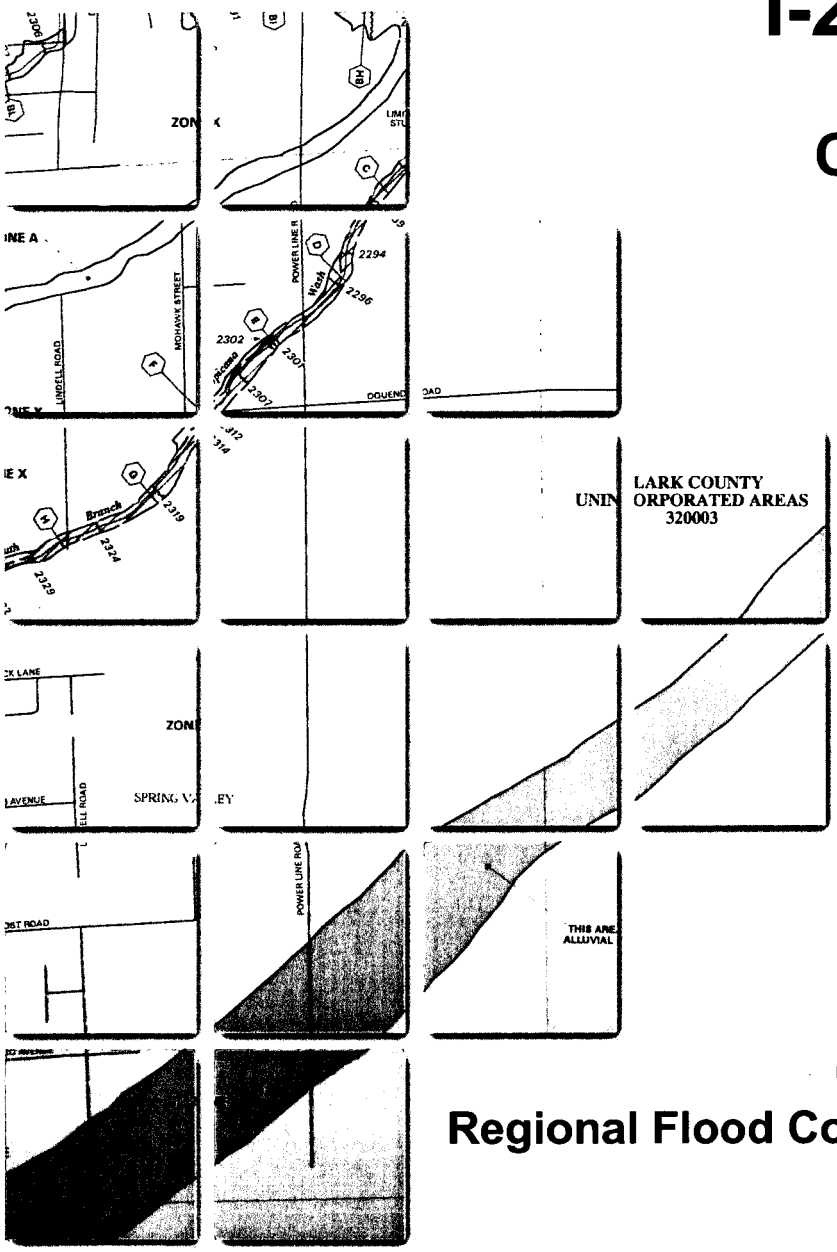
Request for Letter of Map Revision
Blue Diamond Wash
I-215 to Tropicana
Detention Basin
Clark County, Nevada



Submitted to:

Clark County Regional Flood Control District

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

Submitted by:

The Louis Berger Group, Inc.
Las Vegas, Nevada

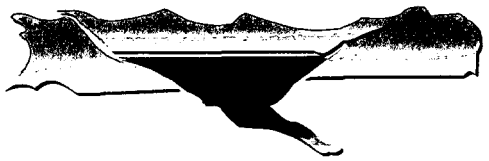
October 1, 2003

04-09-0021P

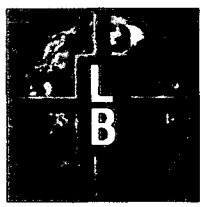
Request for Letter of Map Revision
Blue Diamond Wash
I-215 to Tropicana Detention Basin
Clark County, Nevada

Prepared for:
Clark County
Regional Flood Control District
500 S. Grand Central Parkway
Las Vegas, NV 89155

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT



Prepared by:
THE Louis Berger Group, INC.
500 Amigo Court, Suite 100
Las Vegas, Nevada 89119
(702) 736-6632



October 1, 2003

TABLE OF CONTENTS

APPENDICES

A. FEMA Forms

FEMA 'Overview and Concurrence Form' – MT-2 Form 1
FEMA 'Riverine Hydrology & Hydraulics Form' – MT-2 Form 2
Statement of Explanations

B. Figures

Figure 1 - Existing FEMA Flood Zone Map
Figure 2 - Annotated FEMA Flood Zone Map
Figure 3 - Work Map
Photographs

C. Hydrologic Model and Flow Depth Calculations

Figure D-1 – Drainage Basin Map
Figure D-2 – Soils Map
Revised HEC-1 Model – Basin 13
Cross-section 13A Flow Depth Calculation
Revised Cross-section 34 Flow Depth Calculation

D. Excerpts from the CLOMR for Area Downstream of Upper Blue Diamond Detention Basin

CLOMR HEC-1 Model
CLOMR Cross-section 34
CLOMR Figure 4 - Basin and Cross-section Map

E. Data CD

HEC-1 Model Output
FlowMaster Calculations

I. INTRODUCTION

This submittal package provides hydrologic and hydraulic modeling in support of the request for a Letter of Map Revision for the Blue Diamond Wash between I-215 and the Tropicana Detention Basin in Clark County Nevada.

The Blue Diamond Wash and alluvial fan historically conveyed storm water emanating from the Spring Mountains in the southwestern part of the Las Vegas Valley. The Blue Diamond Detention Basin captures flow at the apex of the fan. Runoff downstream of the detention basin is collected and conveyed by the Blue Diamond Channel to the Tropicana Detention Basin (see Figure 1 in Appendix B). These facilities were constructed as part of the Tropicana and Flamingo Washes Project constructed under the jurisdiction of the US Army Corps of Engineers and Clark County Regional Flood Control District.

II. PREVIOUS STUDIES

The Blue Diamond Wash was recently studied in the "CLOMR for Area Downstream of Upper Blue Diamond Detention Basin" prepared by PBS&J in February 2000, FEMA Case # 01-09-581P (herein after referred to as Blue Diamond CLOMR). The results of this study were used as the basis of the effective Flood Insurance Rate Map (FIRM) for Clark County, dated September 27, 2002. Relevant excerpts from the Blue Diamond CLOMR are contained in Appendix D including a copy of the HEC-1 hydrologic analysis, drainage basin map, and flow depth calculation.

A copy of the FIRM for the study area is provided as Figure 1 in Appendix B. On the FIRM, the alluvial fan area is designated as flood Zone X (shaded) and the Blue Diamond Wash is designated as Zone A.

Flow conveyed in the Blue Diamond Wash is intercepted by the Blue Diamond Channel at I-215 and conveyed within a concrete-lined channel to the Tropicana Detention Basin as shown on Figure 1 in Appendix B. The effects of the Blue Diamond Channel were recognized in the "Flood Insurance Restudy for the Tropicana Wash and Tributaries" prepared by HDR Engineering, Inc. dated November 2001, FEMA Case # 02-09-718P.

III. HYDROLOGIC/HYDRAULIC ANALYSIS

Figure 4 in Appendix D is the drainage basin and cross-section map copied from the Blue Diamond CLOMR. Basin 13 on Figure 4 lies between I-215 and the Tropicana Detention Basin and represents the section of Blue Diamond Wash of

interest to this study. Cross-section 34 on Figure 4 was taken at the downstream end of Basin 13.

Since the construction of the Blue Diamond Channel, all flow conveyed in the Blue Diamond Wash south of I-215 is intercepted at freeway. Therefore, the only area contributing flow to the study area is generated from rainfall directly on Basin 13. For the purposes of this study, Basin 13 was divided into subbasins 13A and 13B to evaluate the revised 100-year flow depth and velocity in the wash (see Figure C-1, Appendix C). Subbasin 13A drains to the Lower Blue Diamond Channel and generates a 100-year flow of 12 cfs. Subbasin 13B drains to the Tropicana Detention Basin and generates a 100-year flow of 66 cfs. Backup material for the revised hydrologic analysis and the HEC-1 model output for basins 13A and 13B are provided in Appendix C.

Normal depth calculations were performed to estimate the 100-year flow depth for the Blue Diamond Wash at the downstream ends of Basins 13A and 13B (see Appendix C). Figure 3 is a work map showing the locations of cross-sections, 13A and 34, used for calculating the flow depth. The flow depth at cross-section 13A is 0.72 ft based on the flow rate of 12 cfs. Hydraulic input for cross-section 34 was adopted from the Blue Diamond CLOMR, although the flow rate was revised to 66 cfs. The revised flow depth is 0.42 ft.

IV. CONCLUSION

The calculated flow depths for the Blue Diamond Wash between I-215 and the Tropicana Detention Basin are less than one-foot. This submittal is to request that the Zone A designation for the study area be revised to Zone X (shaded).

APPENDIX A

FEMA Forms

FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this 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, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM FEMA

This request is for a (check one):

☐ 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, regulatory floodway or flood elevations. (See Parts 60 & 65 of the NFIP Regulations.)

B. OVERVIEW

1. 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	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
320003	Clark County Incorporated Areas	NV	32003C	2553E	9/27/02
320003	Clark County Incorporated Areas	NV	32003C	2554E	9/27/02

2. Flooding Source: Blue Diamond Watershed

3. Project Name/Identifier: Blue Diamond Channel

4. FEMA zone designations affected: A (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

☒ Physical Change ☐ Improved Methodology/Data

☐ Regulatory Floodway Revision ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following types of flooding and structures (check all that apply)

Types of Flooding:	☒ Riverine	☐ Coastal	☐ Shallow Flooding (e.g., Zones AO and AH)
	☐ Alluvial fan	☐ Lakes	☐ Other (Attach Description)
Structures:	☐ Channelization	☐ Levee/Floodwall	☐ Bridge/Culvert
	☐ Dam	☐ Fill	☐ Other, Attach Description

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $EXEMPT

☒ No, Attach Explanation

Please see the FEMA Web site at http://www.fema.gov/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Syndi J. Flippin-Dudley, Ph.D, P.E.	Company: The Louis Berger Group, Inc.	
Mailing Address: 500 East Amigo Court Suite 100 Las Vegas, NV 89119	Daytime Telephone No.: (702)-736-6632	Fax No.: (702)-736-0704
	E-Mail Address: sdudley@louisberger.com	
Signature of Requester (required): Syndi J. Flippin-Dudley		Date: 10/1/03

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Dave Betley, P.E., Principal Engineer, Civil Engineering Division		Telephone No.: (702)-455-4808
Community Name: Clark County Unincorporated Areas	Community Official's Signature (required): Dave Betley	Date: 10/1/03

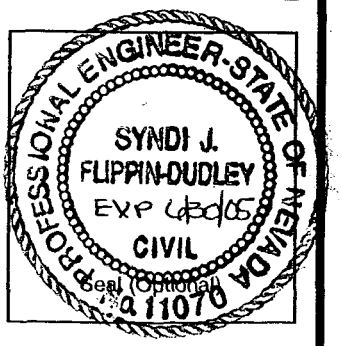
CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Syndi J. Flippin-Dudley	License No.: 11070	Expiration Date: 6/30/05
Company Name: The Louis Berger Group, Inc.	Telephone No.: (702)-733-6632	Fax No.: (702)-736-0704
Signature: Syndi J. Flippin-Dudley		Date: 10/1/03

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☐ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans



FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this 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, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Blue Diamond Watershed
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☒ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)
Basin 13A	0.099	75(Combined)	12
Basin 13B	0.105		66

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	Tropicana Detention Basin	34	N/A	2305.42
Upstream Limit	I-215 Beltway and Jones	13A	N/A	2392.85

2. Hydraulic Method Used

Hydraulic Analysis Flowmaster [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☒ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: N/A	Floodway File Name:
Revised or Post-Project Conditions Model	Natural File Name: N/A	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☒ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

EXPLANATIONS

Review Fee (Form 1, Section C)

This submittal is exempt from the fee due to being based on the federally funded, US Army Corps of Engineers' Blue Diamond Channel.

Effective Hydrology (Form 2, Section A-1)

The effective hydrology was taken from the CLOMR for the Upper Blue Diamond Detention Basin, FEMA Case #00-09-170R.

Sediment Transport (Form 2, Section A-5)

Sediment transport was not considered because it was an approximate study.

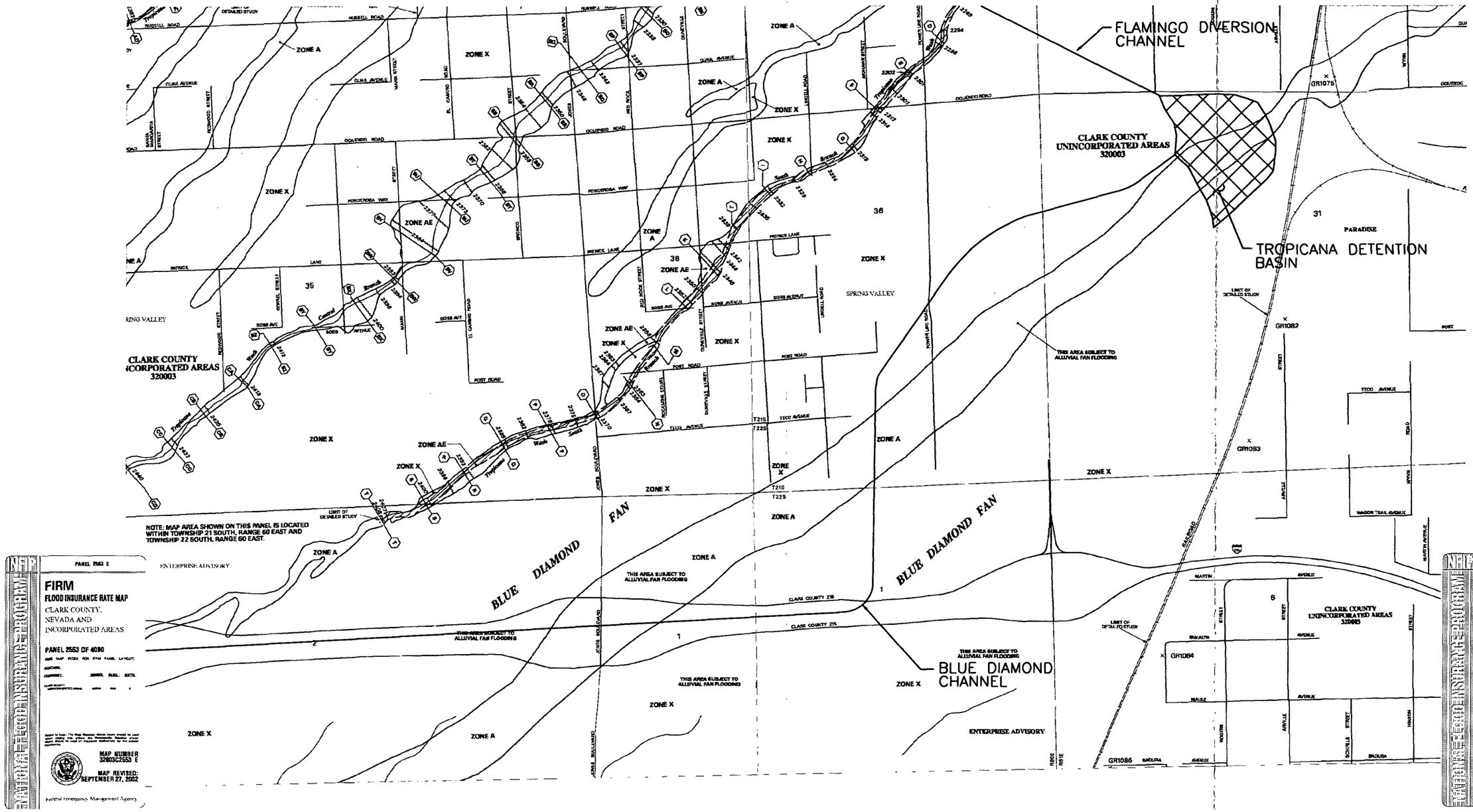
Hydraulic Calculation Method (Form 2, Section B-2)

FlowMaster was used for the hydraulic calculations to determine the 100-year water surface elevations. Manning's Equation was used for the hydraulic calculations. It was used for hydraulic calculations in the CLOMR for the Upper Blue Diamond Detention Basin, FEMA Case #00-09-170R.

FlowMaster performs hydraulics calculations and analysis of pipes, ditches and open channels. To do this, FlowMaster computes flows and pressures based on user selected formulas such as Darcy-Weisbach (Colebrook-White), Hazen-Williams, Kutter's, and Manning's. The program calculates a user selected unknown variable after parameters have been entered. FlowMaster also calculates rating tables, and plots curves and cross sections.

APPENDIX B

Figures



FEMA FLOOD ZONE MAP

FROM FIRM MAP
NUMBER 32003C-2553E AND
NUMBER 32003C-2554E
FIGURE 1

THE LOUIS BERGER GROUP, INC.
LAS VEGAS, NEVADA

FILE NAME: X:\879-Flamingo\Exhibit\879-FIGURE-08.dgn - 9/16/2003 - 11:40:53 JPS

FLAMINGO DIVERSION CHANNEL

DOWNSTREAM LIMITS OF STUDY

TROPICANA DETENTION BASIN

AREA TO BE REMOVED FROM ZONE A AND REMAPPED AS ZONE X SHADED

BLUE DIAMOND CHANNEL

UPSTREAM LIMIT OF STUDY

CLARK COUNTY UNINCORPORATED AREAS 320003

BLUE DIAMOND FAN

SPRING VALLEY

PARADISE

ZONE A

ZONE X

ZONE AE

THIS AREA SUBJECT TO ALLUVIAL FAN FLOODING

ENTERPRISE ADVISORY

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 21 SOUTH, RANGE 60 EAST AND TOWNSHIP 22 SOUTH, RANGE 60 EAST.

PANEL 2553 E

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY, NEVADA AND INCORPORATED AREAS
PANEL 2553 OF 4090

MAP NUMBER 32003C2553 E
MAP REVISED: SEPTEMBER 27, 2002

Federal Emergency Management Agency

PANEL 2554 E

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY, NEVADA AND INCORPORATED AREAS
PANEL 2554 OF 4090

MAP NUMBER 32003C2554 E
MAP REVISED: SEPTEMBER 27, 2002

Federal Emergency Management Agency

ANNOTATED FLOOD ZONE MAP

FIGURE 2

THE LOUIS BERGER GROUP, INC.
LAS VEGAS, NEVADA

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FLAMINGO DIVERSION CHANNEL

OQUENDO ROAD

DOWNSTREAM LIMIT OF STUDY

DECATUR BOULEVARD

TROPICANA DETENTION BASIN

RAIL ROAD

JONES BOULEVARD

PONDEROSA WAY

BLUE DIAMOND CHANNEL

PATRICK LANE

ZONE "X"

ZONE "X" (SHADED)

SOBB AVENUE

POST ROAD

CROSS SECTION 34 FROM CLOMR FOR AREA DOWNSTREAM OF UPPER BLUE DIAMOND DETENTION BASIN, FEMA CASE # 01-09-581P

AREA TO BE REMOVED FROM ZONE "A" AND REMAPPED AS ZONE "X" (SHADED)

TECO AVENUE

CROSS SECTION 13A

TROPICANA WASH SOUTH BRANCH

SUNSET ROAD

PRE-PROJECT LIMITS OF FLOOD ZONE "A"

ZONE "X" (SHADED)

BLUE DIAMOND WASH

BLUE DIAMOND CHANNEL

I-215 BELTWAY

UPSTREAM LIMIT OF STUDY

N

500 250 0 500 1000 2000

WORK MAP

BLUE DIAMOND WASH

FIGURE 3

THE LOUIS BERGER GROUP, INC.
LAS VEGAS, NEVADA

STATE OF NEVADA
REGISTERED ENGINEER
SYNDI A. DUDLEY
No. 11070
EXP 6/30/05
10/1/03

FILE NAME: X:\879-Flamingo\Exhibit\879-FIGURE-07.dgn - 9/16/2003 - 11:32:59 JPS

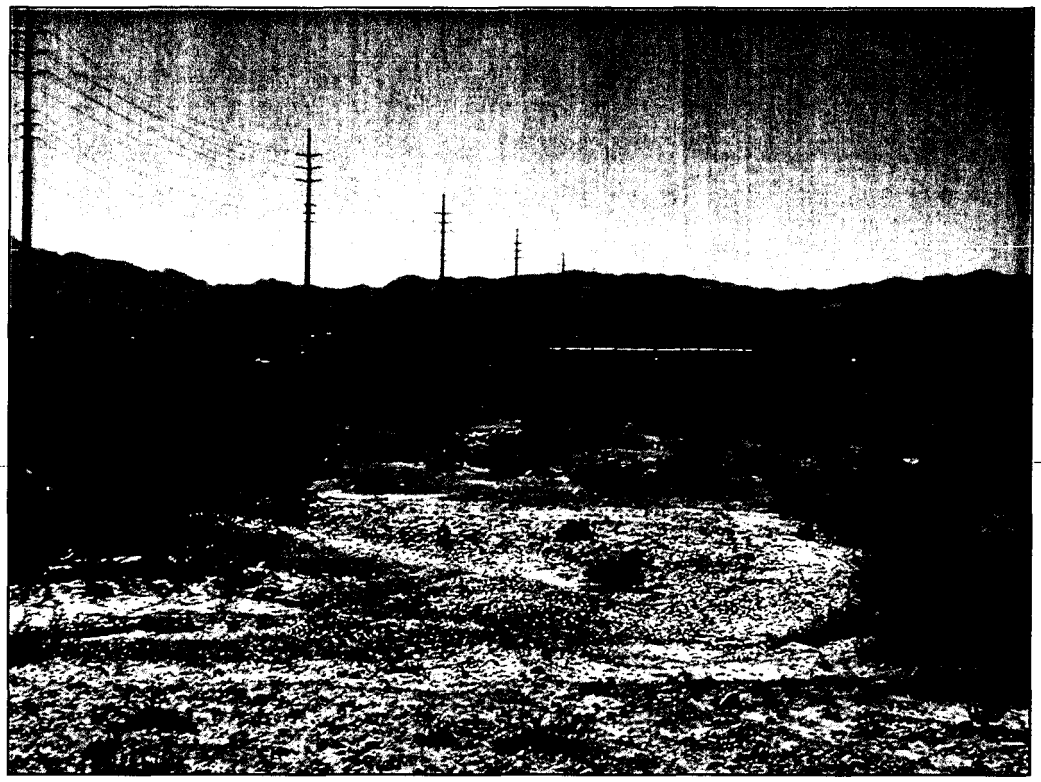


Photo 1: Blue Diamond Wash near Cross Section 13A

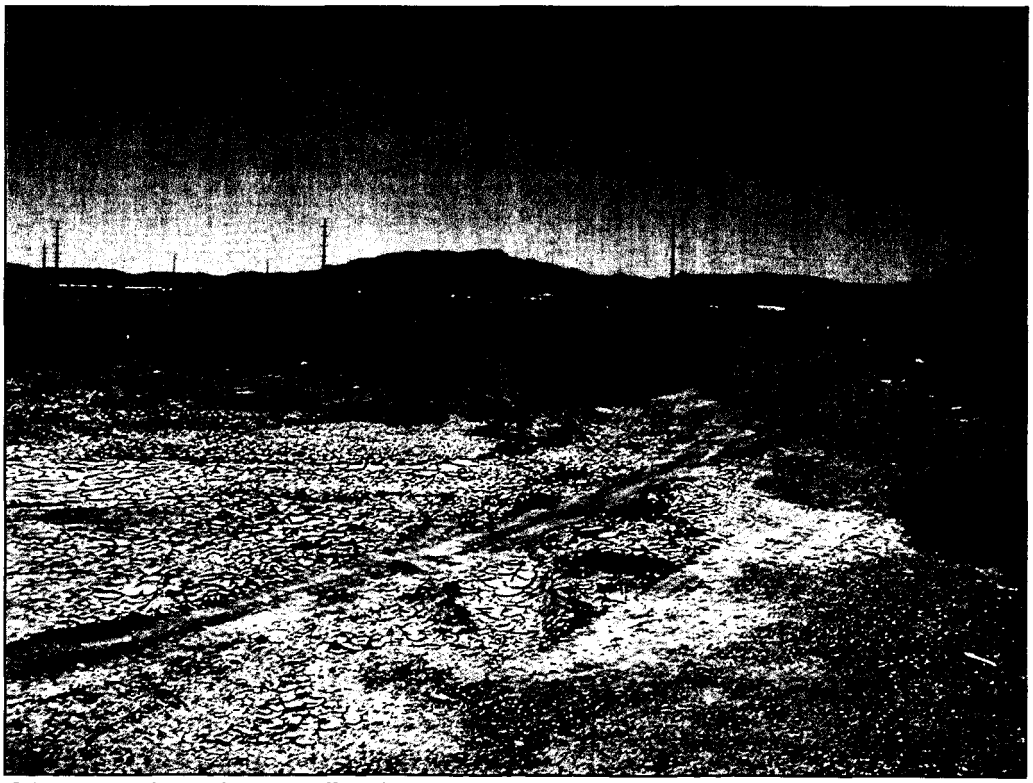
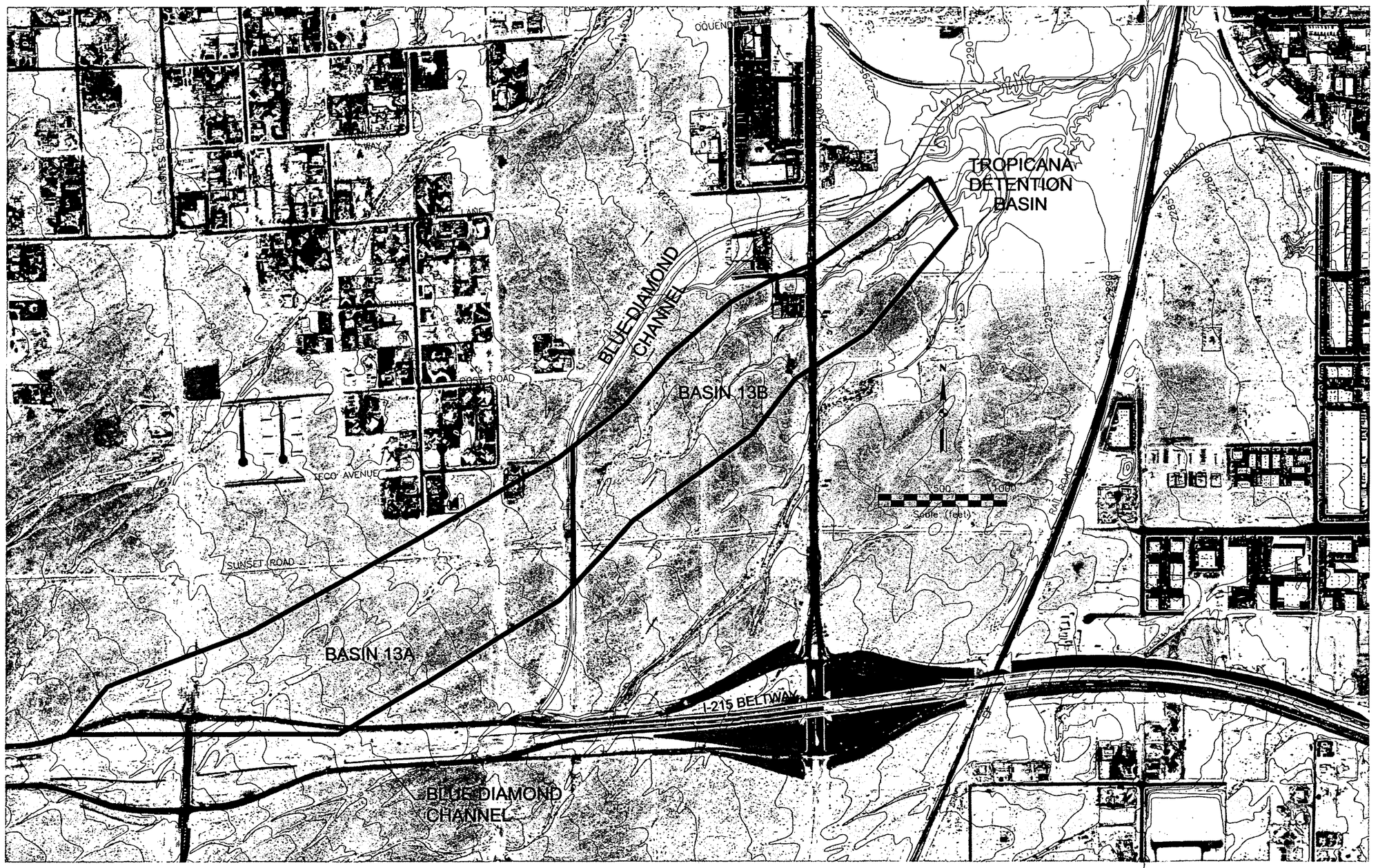


Photo 2: Blue Diamond Wash near Cross Section 34

APPENDIX C

Hydrologic Model and Flow Depth Calculation



DRAINAGE BASIN MAP

BLUE DIAMOND WASH

FIGURE C-1

THE LOUIS BERGER GROUP, INC.
LAS VEGAS, NEVADA

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STANDARD FORM 4
HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
TIME OF CONCENTRATION

Blue Diamond Wash
File: 879 time of concentration.xls
Project No.: CB-879

BY: VS
DATE: 9/15/2003

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check	Tlag
BASIN (1)	DEV./UN. (D or U)	CN	K (2)	AREA Ac (3)	AREA (mi^2)	Lo INITIAL LENGTH (ft) (4)	S SLOPE % (5)	Ti (min) (6)	TRAVEL LENGTH (ft) (7)	SLOPE % (8)	V1 VELOCITY FPS (9a)	V2 VELOCITY FPS (9b)	Tt (min) (10)	(min) (13)	(min) (14)	Tlag= 0.6Tc/60 (hours)
Basin 13A	U	63.0	0.4416	63.4	0.0990	500	0.5	33.4	3757	1.5	2.0	2.0	31.3	64.7	N/A	0.647
Basin 13B	U	83.0	0.7056	67.1	0.1049	500	0.5	20.0	3596	1.5	2.0	2.0	30.0	50.0	N/A	0.500

For Developed basins $V_1 = 20.2 (Slope/100)^{0.5}$ and $V_2 = 30.6 (Slope/100)^{0.5}$
For Existing basins $V_1 = 14.8 (Slope/100)^{0.5}$ and $V_2 = 29.4 (Slope/100)^{0.5}$
If the Travel Length is greater than 500 ft then $T_t = 500/(60\ V_1) + (\text{Travel Length} - 500)/(60\ V_2)$
If the Travel Length is less than 500 ft then $T_t = \text{Travel Length}/(60\ V_2)$
$T_c = T_i + T_t$

Table: Curve number calculations for Basins

Basin ID	Basin Area (ft^2)	Basin Area (mi^2)	Soil Class	Soil Type	Percentage	Existing CN
Basin 13A	2,748,406	0.099	263 - Jean	A	100	63
Basin 13B	2,922,253	0.105	260 - Jean	A	20	63
			240 - Goodsprings	D	80	88
					Weighted =	83

United States Department of Agriculture

Soil Conservation Service

In cooperation with United States Department of the Interior, Bureau of Land Management, and University of Nevada Agricultural Experiment Station

All programs of the U.S. Department of Agriculture are available to everyone without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Soil Survey of Las Vegas Valley Area Nevada

Part of Clark County

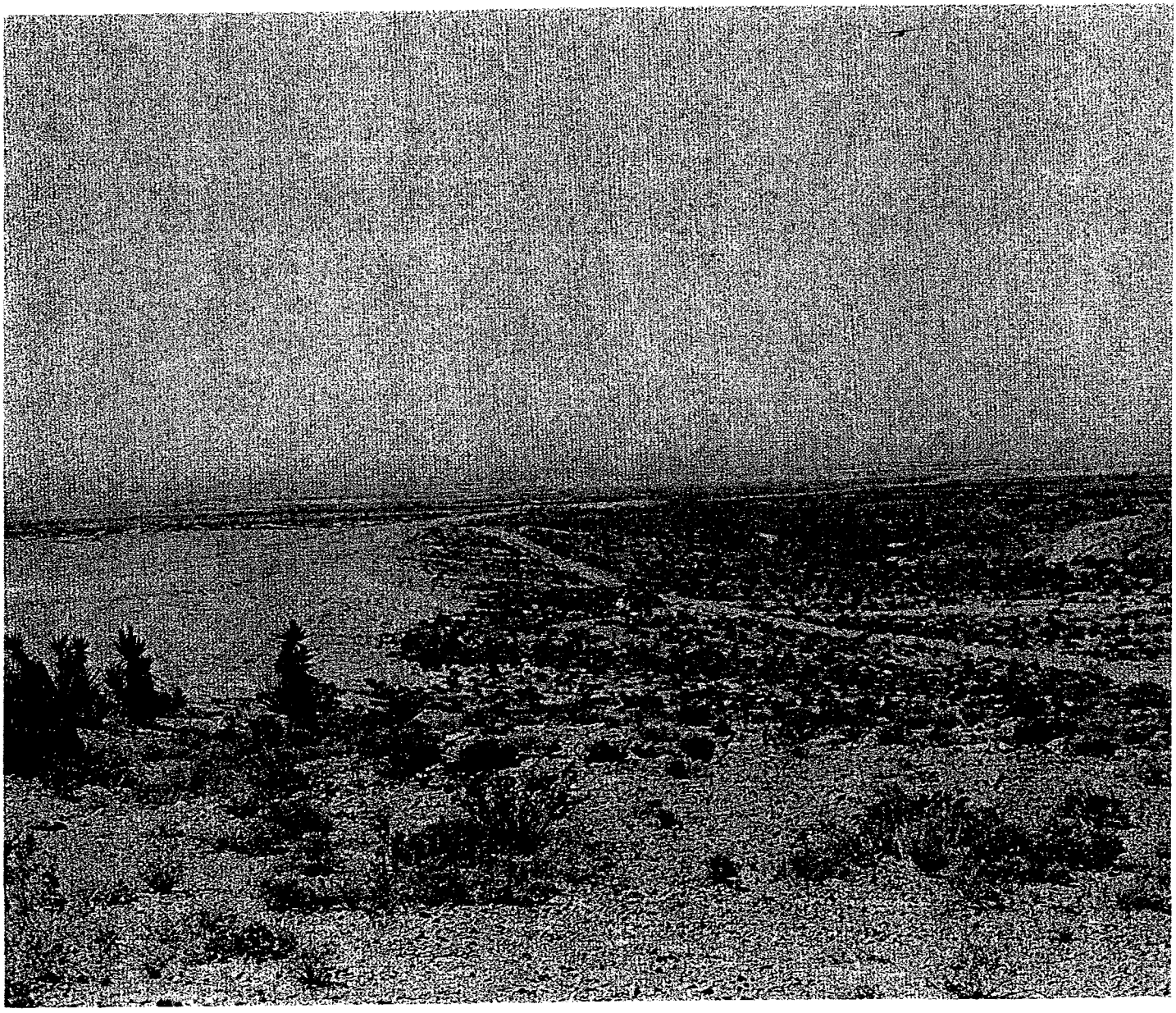


TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding		High water table		Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Months	Depth	Months	Depth	Thickness	Depth	Hardness	Uncoated steel	Concrete
				Ft		In		In			
182*:											
Caliza	B	None	---	>6.0	---	>60	---	---	---	High	Low.
Pittman	C	None	---	>6.0	---	>60	---	20-30	Thick	High	Low.
Arizo	A	Occasional	Mar-Sep	>6.0	---	>60	---	---	---	High	Low.
183--Caliza	B	None	---	>6.0	---	>60	---	---	---	High	Low.
184--Caliza	B	Rare	---	>6.0	---	>60	---	---	---	High	Low.
187--Caliza	B	None	---	>6.0	---	>60	---	---	---	High	Low.
190--Dalian	B	None	---	>6.0	---	>60	---	---	---	High	Low.
191--Dalian	B	Rare	---	>6.0	---	>60	---	---	---	High	Low.
192*:											
Dalian	B	Rare	---	>6.0	---	>60	---	---	---	High	Low.
McCullough	B	Rare	---	>6.0	---	>60	---	---	---	High	Low.
200--Glencarb	B	Rare	---	>6.0	---	>60	---	---	---	High	Moderate.
206--Glencarb	C	Occasional	Jul-Sep	3.0-5.0	Jul-Jun	>60	---	---	---	High	High.
222--Glencarb	C	Rare	---	3.0-5.0	Jul-Jun	>60	---	---	---	High	High.
236--Glencarb	B	Rare	---	>6.0	---	>60	---	---	---	High	High.
237--Glencarb	B	Rare	---	>6.0	---	>60	---	40-60	Thick	High	Low.
240--Goodsprings	D	None	---	>6.0	---	>60	---	9-20	Thick	High	Low.
252, 255--Grapevine	B	Rare	---	>6.0	---	>60	---	---	---	High	High.
260--Jean	A	Rare	---	>6.0	---	>60	---	---	---	High	Low.
262*:											
Jean	A	Rare	---	>6.0	---	>60	---	---	---	High	Low.
Jean	A	Occasional	Jun-Sep	>6.0	---	>60	---	---	---	High	Low.
Goodsprings	D	Rare	---	>6.0	---	>60	---	9-20	Thick	High	Low.
263*:											
Jean	A	Rare	---	>6.0	---	>60	---	---	---	High	Low.
Jean	A	Occasional	Jun-Sep	>6.0	---	>60	---	---	---	High	Low.
264--Jean	A	Rare	---	>6.0	---	>60	---	---	---	High	Low.

See footnote at end of table.

RUNOFF CURVE NUMBERS
(SEMIARID RANGELANDS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition[2]	A[3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

[1]Average runoff condition, and $I_a = 0.2S$.

[2]*Poor:* <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: >70% ground cover.

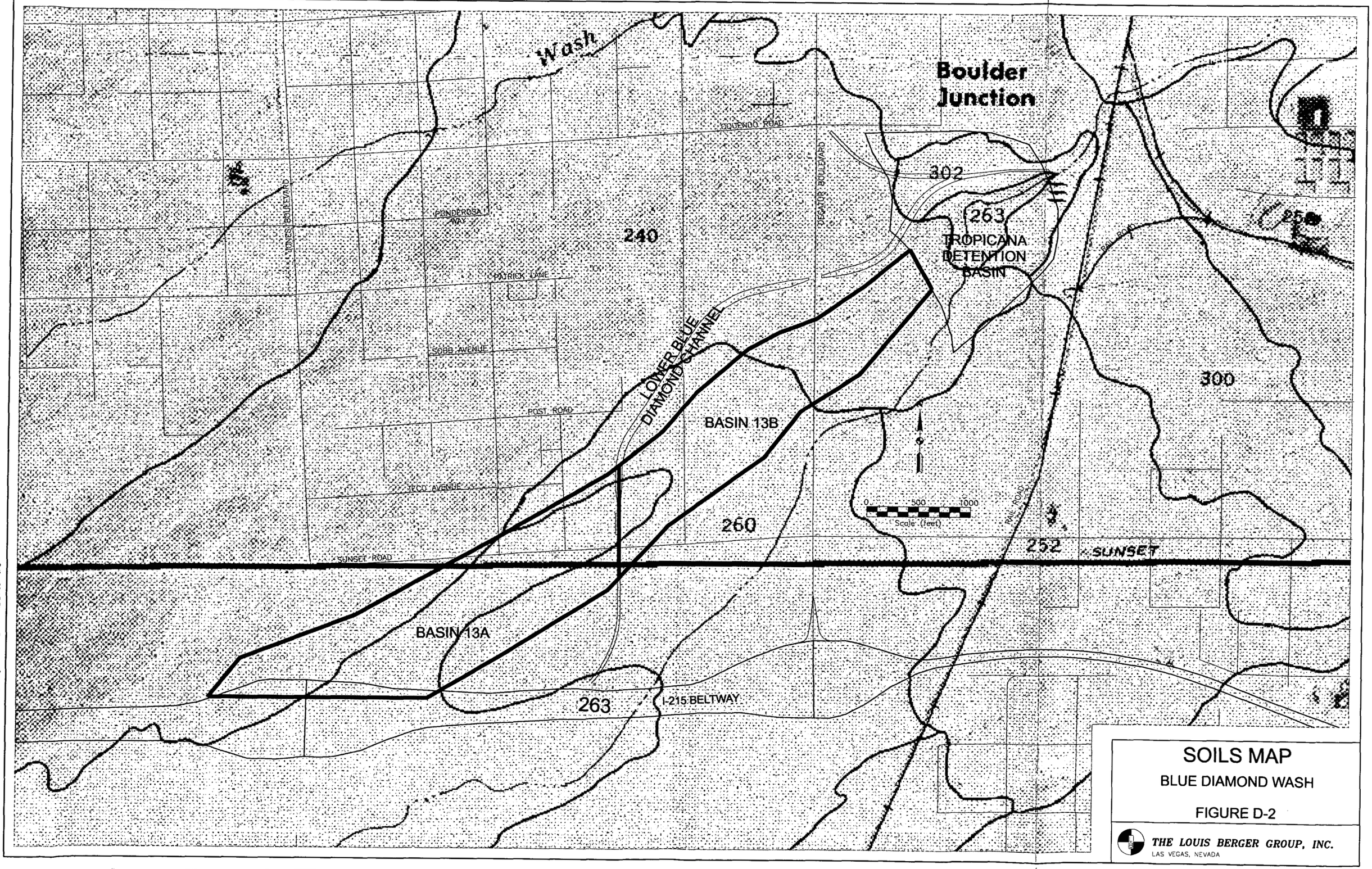
[3]Curve numbers for group A have been developed only for desert shrub.

Revision	Date

WRC ENGINEERING

REFERENCE: SCS TR-55, USDA, June 1986.

TABLE 602
4 of 4



SOILS MAP

BLUE DIAMOND WASH

FIGURE D-2

THE LOUIS BERGER GROUP, INC.
LAS VEGAS, NEVADA

FILE NAME: X:\879-Flamingo\Exhibit\879-FIGURE-11.dgn - 9/17/2003 - 12:24:35 JPS

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   11SEP03  TIME  10:26:06   *
*                                       *
*****************************************
```

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

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

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

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

1 HEC-1 INPUT PAGE 1

```
          LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
                    *DIAGRAM
              1     ID    CB 879                                  DATE: 07/01/03
              2     ID    FILE NAME: 879B13
              3     ID    879B13 = PROJECT 879 BASIN 13
              4     ID    PROJECT NAME: BLUE DIAMOND WASH
              5     ID    I-215 TO TROPICANA DETENTION BASIN LOMR
              6     ID    PREPARED BY; THE LOUIS BERGER GROUP
              7     ID    FOR: THE CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
              8     ID
              9     IT       5       0       0     300
             10     IO       5
             11     IN       5       0       0
             12     JR    PREC     1.0
                    *
             13     KK     13A
             14     KM    RUNOFF FROM THE SUBBASIN 13A
             15     BA   0.099
             16     PB    2.77
             17     PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
             18     PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
             19     PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
             20     PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
             21     PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
             22     PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
             23     PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
             24     PC   0.998   0.999   1.000
             25     LS       0      63
             26     UD    0.65
                    *
             27     KK     13B
             28     KM    RUNOFF FROM THE SUBBASIN 13B
             29     BA   0.105
             30     PB    2.77
             31     LS       0      83
             32     UD    0.50
                    *
             33     ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

    13         13A
                .
                .
    27          .          13B

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


```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   11SEP03  TIME  10:26:06   *
*                                       *
*****************************************
```

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

CB 879 DATE: 07/01/03
FILE NAME: 879B13
879B13 = PROJECT 879 BASIN 13
PROJECT NAME: BLUE DIAMOND WASH
I-215 TO TROPICANA DETENTION BASIN LOMR
PREPARED BY; THE LOUIS BERGER GROUP
FOR: THE CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

10 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	5	MINUTES IN COMPUTATION INTERVAL
IDATE	1 0	STARTING DATE
ITIME	0000	STARTING TIME
NQ	300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	2 0	ENDING DATE
NDTIME	0055	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

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

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
1.00

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION
OPERATION	STATION	AREA	PLAN		RATIO 1
					1.00
HYDROGRAPH AT					
+	13A	.10	1	FLOW	12.
				TIME	4.25
HYDROGRAPH AT					
+	13B	.10	1	FLOW	66.
				TIME	4.00

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

CROSS-SECTION 13A
Worksheet for Irregular Channel

Project Description	
Project File	e:\cb879\xs.fm2
Worksheet	CROSS SECTION 13A
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data	
Channel Slope	0.014910 ft/ft

Elevation range: 2,392.13 ft to 2,403.12 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	2,399.78	0.00	1,299.20	0.030
3.87	2,399.54			
25.46	2,397.27			
55.80	2,395.00			
61.36	2,395.00			
68.59	2,395.00			
93.20	2,395.00			
98.38	2,395.00			
101.45	2,396.15			
162.19	2,397.79			
170.96	2,395.08			
171.30	2,395.00			
179.81	2,392.95			
191.17	2,392.13			
192.72	2,393.22			
192.99	2,395.00			
197.75	2,396.16			
213.10	2,395.97			
214.41	2,395.00			
224.44	2,395.00			
233.91	2,395.00			
240.92	2,396.28			
248.16	2,398.13			
259.23	2,399.66			
278.53	2,400.85			
298.19	2,401.34			
318.54	2,402.16			
337.99	2,402.89			
354.30	2,403.12			
409.03	2,401.68			
425.05	2,401.58			
451.26	2,401.20			
471.38	2,400.58			
473.73	2,400.45			
479.77	2,400.22			
484.92	2,400.31			

491.46	2,400.33
515.90	2,400.11
533.98	2,399.44
554.27	2,398.25
577.11	2,397.88
604.51	2,397.48
622.66	2,395.00
625.85	2,395.00
638.44	2,395.00
642.67	2,394.02
647.18	2,395.00
659.54	2,397.25
670.56	2,398.49
697.15	2,398.51
705.24	2,398.10
725.97	2,396.82
745.65	2,395.36
750.26	2,395.00
768.39	2,393.49
777.99	2,393.27
815.24	2,394.26
826.33	2,395.00
829.92	2,395.35
846.33	2,398.03
862.72	2,400.09
881.77	2,401.79
958.08	2,400.47
971.37	2,399.81
977.08	2,399.58
982.68	2,399.39
989.36	2,399.45
993.69	2,399.36
1,014.27	2,400.49
1,037.02	2,401.58
1,057.89	2,401.47
1,079.78	2,401.37
1,086.30	2,401.14
1,095.02	2,400.85
1,099.20	2,400.84
1,102.91	2,400.94
1,110.44	2,401.29
1,117.48	2,401.33
1,138.69	2,401.73
1,155.70	2,402.17
1,178.85	2,402.42
1,203.89	2,402.49
1,219.60	2,402.38
1,230.86	2,402.16
1,256.08	2,401.76
1,263.66	2,401.64
1,298.95	2,401.30

CROSS-SECTION 13A
Worksheet for Irregular Channel

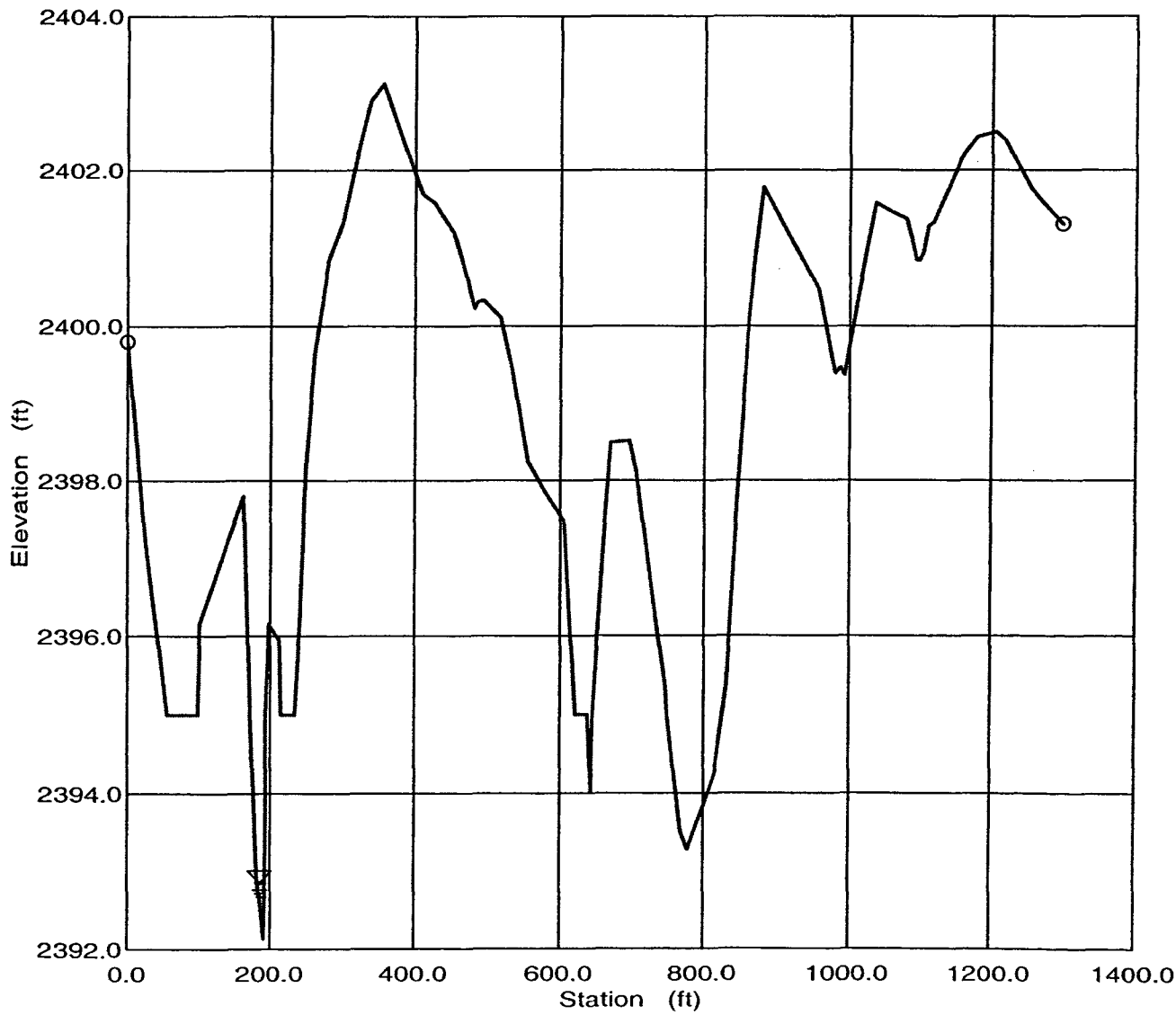
1,299.20	2,401.30	
Discharge	12.00	cfs

Results		
Wtd. Mannings Coefficient	0.030	
Water Surface Elevation	2,392.85	ft
Flow Area	3.98	ft^2
Wetted Perimeter	11.27	ft
Top Width	11.02	ft
Height	0.72	ft
Critical Depth	2,392.82	ft
Critical Slope	0.019301	ft/ft
Velocity	3.02	ft/s
Velocity Head	0.14	ft
Specific Energy	2,392.99	ft
Froude Number	0.89	
Flow is subcritical.		

CROSS-SECTION 13A
Cross Section for Irregular Channel

Project Description	
Project File	e:\cb879\xs.fm2
Worksheet	CROSS SECTION 13A
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.030	
Channel Slope	0.014910	ft/ft
Water Surface Elevation	2,392.85	ft
Discharge	12.00	cfs



REVISED CROSS-SECTION 34
Worksheet for Irregular Channel

Project Description	
Project File	e:\cb879\xs.fm2
Worksheet	CROSS SECTION 13B - XS 34 - LB Flows
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

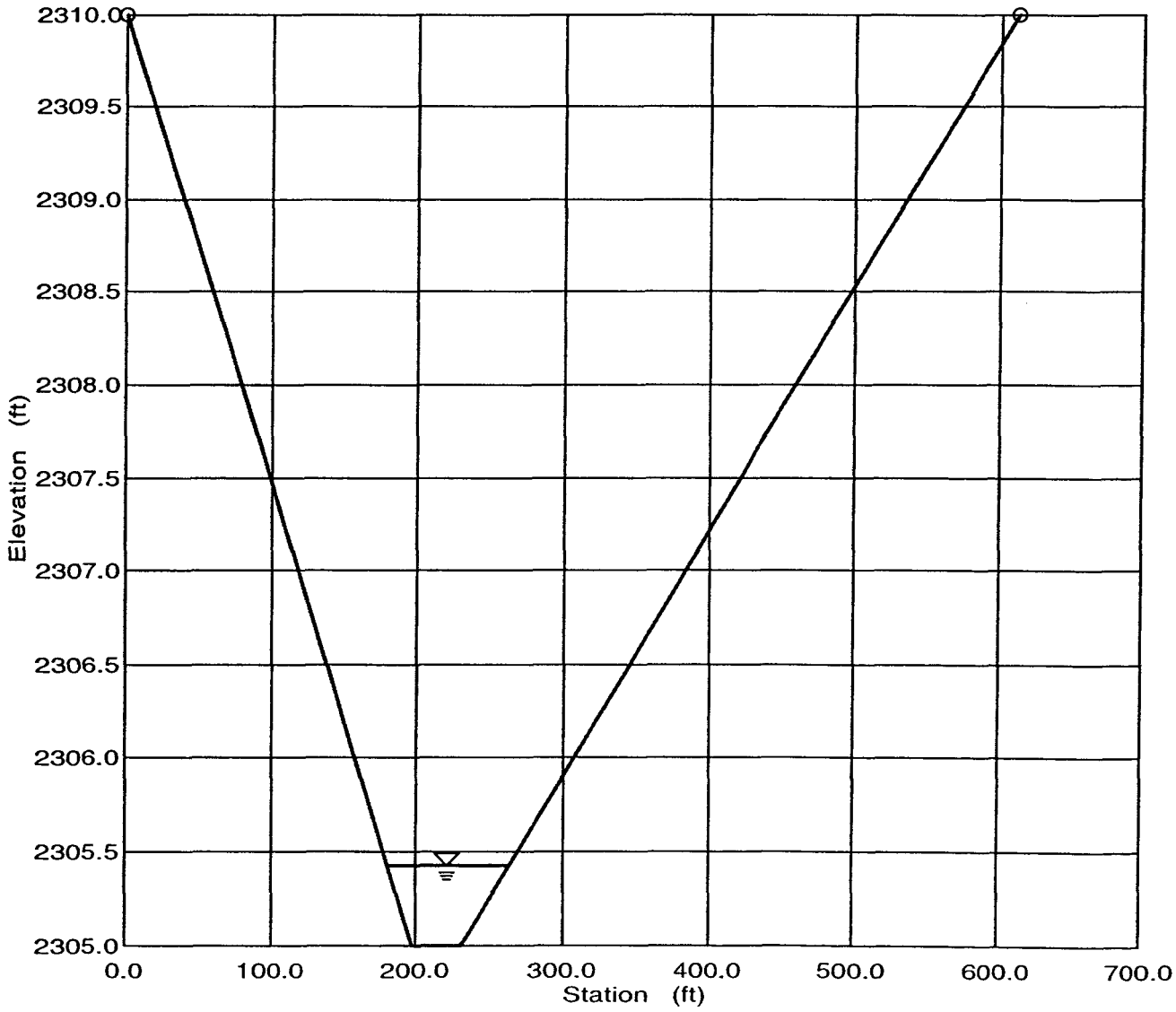
Input Data				
Channel Slope	1.5000 %			
Elevation range: 2,305.00 ft to 2,310.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	2,310.00	0.00	612.00	0.030
198.00	2,305.00			
231.00	2,305.00			
612.00	2,310.00			
Discharge	66.00 cfs			

Results		
Wtd. Mannings Coefficient	0.030	
Water Surface Elevation	2,305.42	ft
Flow Area	24.42	ft^2
Wetted Perimeter	82.14	ft
Top Width	82.13	ft
Height	0.42	ft
Critical Depth	2,305.39	ft
Critical Slope	0.020055	ft/ft
Velocity	2.70	ft/s
Velocity Head	0.11	ft
Specific Energy	2,305.54	ft
Froude Number	0.87	
Flow is subcritical.		

REVISED CROSS-SECTION 34
Cross Section for Irregular Channel

Project Description	
Project File	e:\cb879\xs.fm2
Worksheet	CROSS SECTION 13B - XS 34 - LB Flows
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.030	
Channel Slope	1.5000	%
Water Surface Elevation	2,305.42	ft
Discharge	66.00	cfs



APPENDIX D

Excerpts from the CLOMR for Area Downstream of Upper Blue Diamond Detention Basin

CLOMR HEC-1 Model

```
1****************************************
****************************************
 *                                      *                                      *
 *                                      *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                      *    U.S. ARMY CORPS OF ENGINEERS
 *                                      *                                      *
 *              MAY   1991              *                                      *    HYDROLOGIC ENGINEERING CENTER
 *                                      *                                      *
 *           VERSION 4.0.1E             *                                      *         609 SECOND STREET
 *                                      *                                      *
 *     Lahey F77L-EM/32 version 5.01    *                                      *      DAVIS, CALIFORNIA 95616
 *                                      *                                      *
 *       Dodson & Associates, Inc.      *                                      *          (916) 551-1748
 *                                      *                                      *
 *  RUN DATE  02/19/00  TIME  14:51:22  *                                      *
 *                                      *                                      *
 ****************************************
****************************************
```

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

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

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


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

            1          ID        File: BD.DAT
            2          ID
            3          ID   Post, Buckley, Schuh & Jernigan, Inc.
            4          ID
            5          ID    EXISTING DRAINAGE CONDITIONS RUN
            6          ID
            7          ID   *********************************
            8          ID   *********************************
            9          ID   *                               *
           10          ID   *            CLOMR              *
           11          ID   *                               *
           12          ID   *                               *
           13          ID   *          02/19/00             *
           14          ID   *                               *
           15          ID   *   FILE : BD.DAT               *
           16          ID   *                               *
           17          ID   *                               *
           18          ID   *                               *
           19          ID   *                               *
           20          ID   *          EXISTING             *
           21          ID   *                               *
           22          ID   *         CONDITIONS            *
           23          ID   *********************************
           24          ID   *********************************
           25          ID
           26          ID   THIS ANALYSIS IS TO SIMULATE A 55%/45% FLOW SPLIT
           27          ID
                       *DIAGRAM
*** FREE ***
           28          IT       5       0       0     300
           29          IO       5       0       0
           30          IN       5       0       0
           31          JR    PREC    1.00    0.98    0.57
                       *
           32          ID   * BLUE DIAMOND DETENTION BASINS REFRENCED FROM MPU BASIN DELINEATION BY COE
           33          ID   ***************************************************************************
           34          ID    BLUE DIAMOND DETENTION BASIN DESIGN.....................FILE = BDDB.LA1
           35          ID    SOURCE OF FILE= NEWBDDB1.LA1.....................................
           36          ID    ===========================================================================
           37          ID    MODEL CREATED TO DUPLICATE THE BLUE DIAMOND DETENTION BASIN DESIGN
           38          ID    AS OF JAN 31 1996.
           39          ID    FILE NEWBDDB1.LA1 DATED 6-23-96 WAS USED, AND RAINFALL & PATTERN ADJUSTED
           40          ID    RAIN = 1.76 (CURVE) X 1.26 (TF) = 2.22 IN.  AS STATED IN TROP. DM DRAFT
           41          ID    PATTERN # = 4.95      DA =68.25    DARF =
           42          ID                             JLF  2/1/96
           43          ID                      ****************************************
           44          ID    (A REVISED EL-VOL-STO IS COMING SOON.  THIS DOES NOT INCLUDE IT)
           45          ID    ELEVATIONS ARE NGVD
           46          ID                      ****************************************
           47          ID    COMMENTS BELOW THIS POINT WERE IN FILE NEWBDDB1.LA1 AND THEREFORE
           48          ID    RAIN, DARF & PATTERNS BELOW THIS POINT ARE NOT APPLICABLE TO THIS FILE
           49          ID    ===========================================================================
           50          ID
           51          ID    REVISED TO ESTIMATE RUNOFF FROM 0.6 SQ.MI. AREA CONTRIBUTING TO A CP AT
           52          ID    BLUE DIAMOND ROAD, JUST U/S OF BLUE DIAMOND DB.
```



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

           53          ID
```

```
   54          ID    DEPTH-AREA AND PATTERN FOR AREA ABOVE BLUE DIAMOND DB.
   55          ID    DA = 68.25 MI2.  DARF = . PATTERN # = 4.9.
   56          ID    RAIN =  1.75 (CURVE) X  1.26 (TF) =  2.20 IN.
   57          ID
   58          ID                                    HN 6/22/95
   59          ID    ================================================================================
   60          ID

   61          KK      71
   62          KM    RUNOFF FROM SCS SUBAREA 71
   63          BA     6.9
   64          KM    LAS VEGAS STANDARD PROJECT SUMMER THUNDERSTORM
   65          PB    2.22
   66          PI     .533   1.039    .559    .786    .891    .165    .261    .204    .077    .232
   67          PI     .055    .131    .081    .185    .139    .212    .264    .268    .293    .237
   68          PI     .233    .157    .386    .270    .268    .140    .109    .029    .188    .105
   69          PI     .157    .174    .344    .388    .514    .718    .589   1.256   1.023   1.255
   70          PI    1.842   2.158    .282    .302    .574    .710    .293    .135    .233    .161
   71          PI     .258    .168    .373    .514    .789    .554    .735    .741    .108    .108
   72          PI     .132    .053    .053    .053    .105    .025    .053    .027    .080    .025
   73          PI     .053    .027
   74          LU       0    0.50       0
   75          UD    0.42

   76          KK     71R
   77          KM    ROUTE 71 THRU 501
   78          RM       5    0.39    0.15

   79          KK     501
   80          KM    RUNOFF FROM SCS SUBAREA 501
   81          BA    11.28
   82          KM    LAS VEGAS STANDARD PROJECT SUMMER THUNDERSTORM
   83          PB    2.22
   84          PI     .533   1.039    .559    .786    .891    .165    .261    .204    .077    .232
   85          PI     .055    .131    .081    .185    .139    .212    .264    .268    .293    .237
   86          PI     .233    .157    .386    .270    .268    .140    .109    .029    .188    .105
   87          PI     .157    .174    .344    .388    .514    .718    .589   1.256   1.023   1.255
   88          PI    1.842   2.158    .282    .302    .574    .710    .293    .135    .233    .161
   89          PI     .258    .168    .373    .514    .789    .554    .735    .741    .108    .108
   90          PI     .132    .053    .053    .053    .105    .025    .053    .027    .080    .025
   91          PI     .053    .027
   92          LU       0    0.50       0
   93          UD    0.45

   94          KK     501C
   95          KM    COMBINE 71 AND 501
   96          HC       2

   97          KK     501R
   98          KM    ROUTE 501C THRU 502
   99          RM       5    0.40    0.15
1                                    HEC-1 INPUT                                    PAGE  3

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

  100          KK     502
  101          KM    RUNOFF FROM SCS SUBAREA 502
  102          KM    DRAINAGE AREA CORRECTED BY JP 2/21/92
  103          BA    27.40
  104          KM    LAS VEGAS STANDARD PROJECT SUMMER THUNDERSTORM
  105          PB    2.22
  106          PI     .533   1.039    .559    .786    .891    .165    .261    .204    .077    .232
  107          PI     .055    .131    .081    .185    .139    .212    .264    .268    .293    .237
  108          PI     .233    .157    .386    .270    .268    .140    .109    .029    .188    .105
  109          PI     .157    .174    .344    .388    .514    .718    .589   1.256   1.023   1.255
  110          PI    1.842   2.158    .282    .302    .574    .710    .293    .135    .233    .161
  111          PI     .258    .168    .373    .514    .789    .554    .735    .741    .108    .108
  112          PI     .132    .053    .053    .053    .105    .025    .053    .027    .080    .025
  113          PI     .053    .027
  114          LU       0    0.50       0
  115          UD    0.95

  116          KK     502C
  117          KM    COMBINE 501R AND 502
  118          HC       2

  119          KK      72
  120          KM    RUNOFF FROM SCS SUBAREA 72
  121          BA     6.58
  122          KM    LAS VEGAS STANDARD PROJECT SUMMER THUNDERSTORM
  123          PB    2.22
  124          PI     .533   1.039    .559    .786    .891    .165    .261    .204    .077    .232
  125          PI     .055    .131    .081    .185    .139    .212    .264    .268    .293    .237
  126          PI     .233    .157    .386    .270    .268    .140    .109    .029    .188    .105
  127          PI     .157    .174    .344    .388    .514    .718    .589   1.256   1.023   1.255
  128          PI    1.842   2.158    .282    .302    .574    .710    .293    .135    .233    .161
  129          PI     .258    .168    .373    .514    .789    .554    .735    .741    .108    .108
  130          PI     .132    .053    .053    .053    .105    .025    .053    .027    .080    .025
  131          PI     .053    .027
  132          LU       0    0.50       0
  133          UD    0.46

  134          KK     502CC
  135          KM    COMBINE 72 AND 502C
  136          HC       2

  137          KK     502R
  138          KM    ROUTE 502CC THRU 503
  139          RM       4    0.36    0.15

  140          KK      73
  141          KM    RUNOFF FROM SCS SUBAREA 73
  142          BA     4.02
  143          KM    LAS VEGAS STANDARD PROJECT SUMMER THUNDERSTORM
  144          PB    2.22
  145          PI     .533   1.039    .559    .786    .891    .165    .261    .204    .077    .232
```

```
 146          PI    .055    .131    .081    .185    .139    .212    .264    .268    .293    .237
 147          PI    .233    .157    .386    .270    .268    .140    .109    .029    .188    .105
 148          PI    .157    .174    .344    .388    .514    .718    .589   1.256   1.023   1.255
1                                          HEC-1 INPUT                                          PAGE  4

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

 149          PI   1.842   2.158    .282    .302    .574    .710    .293    .135    .233    .161
 150          PI    .258    .168    .373    .514    .789    .554    .735    .741    .108    .108
 151          PI    .132    .053    .053    .053    .105    .025    .053    .027    .080    .025
 152          PI    .053    .027
 153          LU      0    0.50       0
 154          UD   0.47

 155          KK    73R
 156          KM   ROUTE 73 THRU 503
 157          RM       4    0.36    0.15

 158          KK    503
 159          KM   RUNOFF FROM SCS SUBAREA 503
 160          BA    5.54
 161          KM   LAS VEGAS STANDARD PROJECT SUMMER THUNDERSTORM
 162          PB    2.22
 163          PI    .533   1.039    .559    .786    .891    .165    .261    .204    .077    .232
 164          PI    .055    .131    .081    .185    .139    .212    .264    .268    .293    .237
 165          PI    .233    .157    .386    .270    .268    .140    .109    .029    .188    .105
 166          PI    .157    .174    .344    .388    .514    .718    .589   1.256   1.023   1.255
 167          PI   1.842   2.158    .282    .302    .574    .710    .293    .135    .233    .161
 168          PI    .258    .168    .373    .514    .789    .554    .735    .741    .108    .108
 169          PI    .132    .053    .053    .053    .105    .025    .053    .027    .080    .025
 170          PI    .053    .027
 171          LU      0    0.50       0
 172          UD   0.94

 173          KK    503C
 174          KM   COMBINE 502R, 73, AND 503
 175          HC       3

 176          KK    503R
 177          KM   ROUTE 503 THRU 504
 178          RM       4    0.36    0.15

 179          KK    504
 180          KM   RUNOFF FROM SCS SUBAREA 504
 181          BA    6.53
 182          KM   LAS VEGAS STANDARD PROJECT SUMMER THUNDERSTORM
 183          PB    2.22
 184          PI    .533   1.039    .559    .786    .891    .165    .261    .204    .077    .232
 185          PI    .055    .131    .081    .185    .139    .212    .264    .268    .293    .237
 186          PI    .233    .157    .386    .270    .268    .140    .109    .029    .188    .105
 187          PI    .157    .174    .344    .388    .514    .718    .589   1.256   1.023   1.255
 188          PI   1.842   2.158    .282    .302    .574    .710    .293    .135    .233    .161
 189          PI    .258    .168    .373    .514    .789    .554    .735    .741    .108    .108
 190          PI    .132    .053    .053    .053    .105    .025    .053    .027    .080    .025
 191          PI    .053    .027
 192          LU      0    0.50       0
 193          UD   0.91
1                                          HEC-1 INPUT                                          PAGE  5

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

 194          KK     INBD
 195          KM   COMBINE 503R AND 504 - FLOW ABOVE BLUE DIAMOND
 196          KM   CHANNEL CAPACITY = 12300 CFS
 197          HC       2
              * ===============================================================================

 198          KK      BD
 199          KM   BLUE DIAMOND DETENTION BASIN
 200          KM   100YR COMPUTED PROBABILITY DETENTION DESIGN ... ON-LINE
 201          KM   BROAD-CRESTED WEIR SPILLWAY - 1000 FT LONG
 202          KM   30" DIA OUTLET
 203          KM   SPILLWAY CREST = 2915 FT NGVD
 204          KM   TOP OF DAM = 2930 FT NGVD
 205          RS       1    STOR      -1
 206          SV       0     1.6    12.8    37.2    79.3   150.8   264.7   433.2   668.8   973.4
 207          SV  1340.8  1775.1  2281.8  2398.2  2514.5  2630.9  2747.2  2863.6  3444.8  4026.3
 208          SQ       0      38      74      97     116     132     147     160     172     183
 209          SQ     194     204     214    3716   10117   18406   28221   39354  110911  203572
 210          SE    2857    2860    2865    2870    2875    2880    2885    2890    2895    2900
 211          SE    2905    2910    2915    2916    2917    2918    2919    2920    2925    2930
              * ===============================================================================
              * END OF COE BASINS, BEGIN CLOMR BASINS

 212          KK OFFSITEBASIN
 213          KM   EXISTING OFFSITE BASIN
 214          BA  0.5953
 215          PB    2.77
 216          LS       0      88
 217          UD   0.307
              *

 218          KK  COMB-1
 219          KM   COMBINED BD AND OFFSITE BASIN
 220          HC       2
              *

 221          KK      R0
 222          KM   ROUTE BD THROUGH BASIN-40
 223          RK   11200    0.014    0.030       0    TRAP     100
              *

 224          KKBASIN-40
 225          KM   EXISTING BASIN BASIN-40
 226          BA  0.8775
 227          PB    2.77
```

```
 228          PC    .000    .020    .057    .070    .087    .108    .124    .130    .130    .130
 229          PC    .130    .130    .130    .133    .140    .142    .148    .158    .172    .181
 230          PC    .190    .197    .199    .200    .201    .204    .214    .229    .241    .249
 231          PC    .251    .256    .270    .278    .281    .283    .295    .322    .352    .409
 232          PC    .499    .590    .710    .744    .781    .812    .819    .835    .851    .856
 233          PC    .860    .868    .876    .888    .910    .926    .937    .950    .970    .976
 234          PC    .982    .985    .987    .989    .990    .993    .993    .994    .995    .998
 235          PC    .998    .999   1.00
 236          LS       0      84
1                                        HEC-1 INPUT                                        PAGE  6

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

 237          UD   0.451
              *

 238          KK     C-0
 239          KM   COMBINED R0 AND BASIN-40
 240          HC       2
              *

 241          KK  SPLIT1
 242          KM   45% FLOW DIVERTED FROM BASIN 38 TO BASIN 34
 243          DT  SPLIT1
 244          DI       0     288     577    1153
 245          DQ       0     131     262     523
              *

 246          KKBASIN-38
 247          KM   EXISTING BASIN-38
 248          BA  0.1326
 249          PB    2.77
 250          LS       0      73
 251          UD   0.472
              *

 252          KKBASIN-36
 253          KM   EXISTING BASIN-36
 254          BA  0.0585
 255          PB    2.77
 256          LS       0      88
 257          UD   0.294
              *

 258          KK    C-1A
 259          KM   COMBINED BASIN-36 AND BASIN-38
 260          HC       2
              *

 261          KK     C-1
 262          KM   COMBINED C-1A AND C-0
 263          HC       2
              *

 264          KK      R2
 265          KM   ROUTE C-1 THROUGH BASIN-26
 266          RK    6100   0.017   0.030       0    TRAP     100
              *

 267          KKBASIN-26
 268          KM   EXISTING BASIN-26
 269          BA  0.1432
 270          PB    2.77
 271          LS       0      66
 272          UD   0.589
              *
1                                        HEC-1 INPUT                                        PAGE  7

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

 273          KK     C-2
 274          KM   COMBINED R2 AND BASIN-26
 275          HC       2
              *

 276          KK      R3
 277          KM   ROUTE C-2 THROUGH BASIN-17
 278          RK    6400   0.017   0.030       0    TRAP     100
              *

 279          KKBASIN-17
 280          KM   EXISTING BASIN-17
 281          BA  0.2861
 282          PB    2.77
 283          LS       0      66
 284          UD   0.602
              *

 285          KK     C-3
 286          KM   COMBINED R3 AND BASIN-17
 287          HC       2
              *

 288          KK      R4
 289          KM   ROUTE C-3 THROUGH BASIN-13
 290          RK    6400   0.015   0.030       0    TRAP     100
              *

 291          KKBASIN-13
 292          KM   EXISTING BASIN-13
 293          BA  0.2241
 294          PB    2.77
 295          LS       0      73
 296          UD   0.533
              *
```

```
                297          KK    C-27
                298          KM   COMBINED R4 AND BASIN-13
                299          HC       2
                             *

                300          KKBASIN-28
                301          KM   EXISTING BASIN-28
                302          BA  0.0648
                303          PB    2.77
                304          LS       0      63
                305          UD   0.527
                             *
1                                                  HEC-1 INPUT                                                  PAGE  8

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

                306          KK      R7
                307          KM   ROUTE BASIN-28 THROUGH BASIN-19
                308          RK    5900   0.017   0.030       0    TRAP     100
                             *

                309          KKBASIN-19
                310          KM   EXISTING BASIN-19
                311          BA  0.1372
                312          PB    2.77
                313          LS       0      63
                314          UD   0.640
                             *

                315          KK     C-7
                316          KM   COMBINED R7 AND BASIN-19
                317          HC       2
                             *

                318          KK      R8
                319          KM   ROUTE C-7 THROUGH BASIN-3
                320          RK    4200   0.016   0.030       0    TRAP     100
                             *

                321          KK BASIN-3
                322          KM   EXISTING BASIN-3
                323          BA  0.1105
                324          PB    2.77
                325          LS       0      63
                326          UD   0.595
                             *

                327          KK     C-8
                328          KM   COMBINED R8 AND BASIN-3
                329          HC       2
                             *

                330          KKBASIN-27
                331          KM   EXISTING BASIN-27
                332          BA  0.1462
                333          PB    2.77
                334          LS       0      63
                335          UD   0.795
                             *

                336          KK      R9
                337          KM   ROUTE BASIN 27 THROUGH BASIN-18
                338          RK    5900   0.017   0.030       0    TRAP     100
                             *
1                                                  HEC-1 INPUT                                                  PAGE  9

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

                339          KKBASIN-18
                340          KM   EXISTING BASIN-18
                341          BA  0.1838
                342          PB    2.77
                343          LS       0      63
                344          UD   0.683
                             *

                345          KK     C-9
                346          KM   COMBINED R9 AND BASIN-18
                347          HC       2
                             *

                348          KK     R10
                349          KM   ROUTE C-9 THROUGH BASIN-2
                350          RK    2000   0.016   0.030       0    TRAP     100
                             *

                351          KK BASIN-2
                352          KM   EXISTING BASIN-2
                353          BA  0.0872
                354          PB    2.77
                355          LS       0      63
                356          UD   0.479
                             *

                357          KK    C-10
                358          KM   COMBINED R10 AND BASIN-2
                359          HC       2
                             *

                360          KK    C-29
                361          KM   COMBINED C-10 AND C-8
                362          HC       2
                             *

                363          KK     R18
```

```
364          KM   ROUTE C-27 THROUGH BASIN-22
365          RK    4200   0.015   0.030       0    TRAP     100
             *

366          KKBASIN-22
367          KM   EXISTING BASIN-22
368          BA  0.2131
369          PB    2.77
370          LS       0      69
371          UD   0.489
             *
1                                        HEC-1 INPUT                                        PAGE 10

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

372          KK    C-18
373          KM   COMBINED R18 AND BASIN-22
374          HC       2
             *

375          KKBASIN-37
376          KM   EXISTING BASIN-37
377          BA  0.1229
378          PB    2.77
379          LS       0      83
380          UD   0.396
             *

381          KK     R22
382          KM   ROUTE BASIN 37 THROUGH BASIN-25
383          RK    6100   0.017   0.030       0    TRAP     100
             *

384          KKBASIN-25
385          KM   EXISTING BASIN-25
386          BA  0.1428
387          PB    2.77
388          LS       0      83
389          UD   0.373
             *

390          KK    C-22
391          KM   COMBINED R22 AND BASIN-25
392          HC       2
             *

393          KK     R23
394          KM   ROUTE C-22 THROUGH BASIN-15
395          RK    4900   0.017   0.030       0    TRAP     100
             *

396          KKBASIN-15
397          KM   EXISTING BASIN-15
398          BA  0.0883
399          PB    2.77
400          LS       0      78
401          UD   0.406
             *

402          KK    C-23
403          KM   COMBINED R23 AND BASIN-15
404          HC       2
             *
1                                        HEC-1 INPUT                                        PAGE 11

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

405          KK     R28
406          KM   ROUTE C-23 THROUGH BASIN-1
407          RK    7900   0.014   0.030       0    TRAP     100
             *

408          KK BASIN-1
409          KM   EXISTING BASIN-1
410          BA  0.2419
411          PB    2.77
412          LS       0      83
413          UD   0.444
             *

414          KK    C-28
415          KM   COMBINED R28 AND BASIN-1
416          HC       2
             *

417          KK    C-25
418          KM   COMBINED C-28, C-18, C-27
419          HC       3
             *

420          KK     R33
421          KM   ROUTE C-25 THROUGH BASIN-33
422          RK    2500   0.015   0.030       0    TRAP     100
             *

423          KKBASIN-33
424          KM   EXISTING BASIN-33
425          BA  0.0954
426          PB    2.77
427          LS       0      82
428          UD   0.310
             *

429          KK    C-33
430          KM   COMBINED C-25 AND BASIN-33
```

```
 431          HC       2
              *

 432          KKBASIN-29
 433          KM   EXISTING BASIN-29
 434          BA  0.0422
 435          PB    2.77
 436          LS       0      63
 437          UD   0.533
              *
1                                        HEC-1 INPUT                                        PAGE 12

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

 438          KK     R14
 439          KM   ROUTE BASIN 29 THROUGH BASIN-20
 440          RK    6100   0.018   0.030       0    TRAP     100
              *

 441          KKBASIN-20
 442          KM   EXISTING BASIN-20
 443          BA  0.0812
 444          PB    2.77
 445          LS       0      63
 446          UD   0.675
              *

 447          KK    C-14
 448          KM   COMBINED R14 AND BASIN-20
 449          HC       2
              *

 450          KK     R15
 451          KM   ROUTE C-14 THROUGH BASIN-4
 452          RK    6000   0.016   0.030       0    TRAP     100
              *

 453          KK BASIN-4
 454          KM   EXISTING BASIN-4
 455          BA  0.1402
 456          PB    2.77
 457          LS       0      63
 458          UD   0.600
              *

 459          KK    C-15
 460          KM   COMBINED R15 AND BASIN-4
 461          HC       2
              *

 462          KK     R19
 463          KM   ROUTE C-15 THROUGH BASIN-30
 464          RK    4300   0.012   0.030       0    TRAP     100
              *

 465          KKBASIN-30
 466          KM   EXISTING BASIN-30
 467          BA  0.2100
 468          PB    2.77
 469          LS       0      74
 470          UD   0.448
              *
1                                        HEC-1 INPUT                                        PAGE 13

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

 471          KK    C-19
 472          KM   COMBINED R19 AND BASIN-30
 473          HC       2
              *

 474          KK    C-34
 475          KM   COMBINED C-19 AND C-34
 476          HC       2
              *

 477          KKBASIN-24
 478          KM   EXISTING BASIN-24
 479          BA  0.0875
 480          PB    2.77
 481          LS       0      63
 482          UD   0.713
              *

 483          KK     R11
 484          KM   ROUTE BASIN 33 THROUGH BASIN-11
 485          RK    7850   0.016   0.030       0    TRAP     100
              *

 486          KKBASIN-11
 487          KM   EXISTING BASIN-11
 488          BA  0.2885
 489          PB    2.77
 490          LS       0      63
 491          UD   0.729
              *

 492          KK    C-11
 493          KM   COMBINED R11 AND BASIN-11
 494          HC       2
              *

 495          KKBASIN-21
 496          KM   EXISTING BASIN-21
 497          BA  0.3303
```

```
 498          PB    2.77
 499          LS       0      63
 500          UD   0.687
              *

 501          KK     R12
 502          KM   ROUTE BASIN 21 THROUGH BASIN-6
 503          RK    5500   0.017   0.030       0    TRAP     100
              *
1                                        HEC-1 INPUT                                        PAGE 14

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

 504          KK BASIN-6
 505          KM   EXISTING BASIN-6
 506          BA  0.4666
 507          PB    2.77
 508          LS       0      63
 509          UD   0.564
              *

 510          KK    C-12
 511          KM   COMBINED R12 AND BASIN-6
 512          HC       2
              *

 513          KK     R13
 514          KM   ROUTE C-12 THROUGH BASIN-5
 515          RK    5700   0.016   0.030       0    TRAP     100
              *

 516          KK BASIN-5
 517          KM   EXISTING BASIN-5
 518          BA  0.5443
 519          PB    2.77
 520          LS       0      65
 521          UD   0.537
              *

 522          KK    C-13
 523          KM   COMBINED R13 AND BASIN-5
 524          HC       2
              *

 525          KKBASIN-32
 526          KM   EXISTING BASIN-32
 527          BA  0.0378
 528          PB    2.77
 529          LS       0      63
 530          UD   0.489
              *

 531          KK     R16
 532          KM   ROUTE BASIN 32 THROUGH BASIN-23
 533          RK    5350   0.017   0.030       0    TRAP     100
              *

 534          KKBASIN-23
 535          KM   EXISTING BASIN-23
 536          BA  0.1472
 537          PB    2.77
 538          LS       0      63
 539          UD   0.612
              *
1                                        HEC-1 INPUT                                        PAGE 15

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

 540          KK    C-16
 541          KM   COMBINED R16 AND BASIN-23
 542          HC       2
              *

 543          KK     R17
 544          KM   ROUTE C-16 THROUGH BASIN-7
 545          RK    4400   0.016   0.030       0    TRAP     100
              *

 546          KK BASIN-7
 547          KM   EXISTING BASIN-7
 548          BA  0.1380
 549          PB    2.77
 550          LS       0      63
 551          UD   0.584
              *

 552          KK    C-17
 553          KM   COMBINED R17 AND BASIN-7
 554          HC       2
              *

 555          KKBASIN-10
 556          KM   EXISTING BASIN-10
 557          BA  0.1594
 558          PB    2.77
 559          LS       0      63
 560          UD   0.801
              *

 561          KK BASIN-8
 562          KM   EXISTING BASIN-8
 563          BA  0.0536
 564          PB    2.77
 565          LS       0      63
 566          UD   0.569
```

```
                *

          567   KK BASIN-9
          568   KM   EXISTING BASIN-9
          569   BA  0.0490
          570   PB    2.77
          571   LS       0      63
          572   UD   0.527
                *

          573   KK    C-26
          574   KM   COMBINED C-11, C-13, C-17, C-19, BASINS 8, 9, 10
          575   HC       7
                *
1                                          HEC-1 INPUT                                          PAGE 16

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

          576   KKBASIN-34
          577   KM   EXISTING BASIN-34
          578   BA  0.1932
          579   PB    2.77
          580   LS       0      69
          581   UD   0.654
                *

          582   KK  SPLIT1
          583   KM   RETREIVE FLOW SPLIT FROM BASIN 38
          584   DR  SPLIT1
                *

          585   KKBASIN-35
          586   KM   EXISTING BASIN-35
          587   BA  0.1091
          588   PB    2.77
          589   LS       0      78
          590   UD   0.657
                *

          591   KK    C-1B
          592   KM   COMBINED SPLIT1, BASIN-35, AND BASIN-34
          593   HC       3
                *

          594   KK      R5
          595   KM   ROUTE C-1B THROUGH BASIN-12
          596   RK    7100   0.018   0.030       0    TRAP     100
                *

          597   KKBASIN-12
          598   KM   EXISTING BASIN-12
          599   BA  0.3271
          600   PB    2.77
          601   LS       0      64
          602   UD   0.646
                *

          603   KK     C-5
          604   KM   COMBINED R5 AND BASIN-12
          605   HC       2
                *

          606   KKBASIN-14
          607   KM   EXISTING BASIN-14
          608   BA  0.2730
          609   PB    2.77
          610   LS       0      88
          611   UD   0.578
                *
1                                          HEC-1 INPUT                                          PAGE 17

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

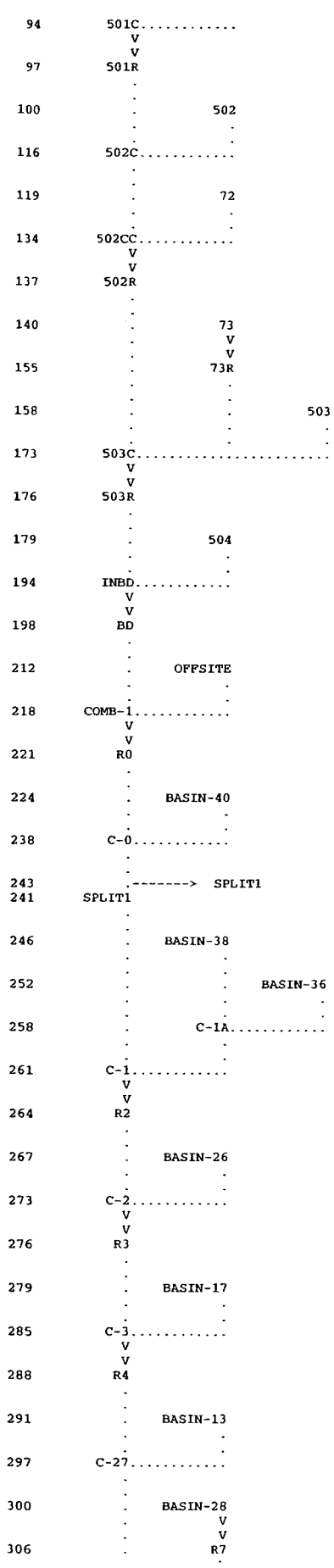
          612   KKBASIN-16
          613   KM   EXISTING BASIN-16
          614   BA  0.2562
          615   PB    2.77
          616   LS       0      88
          617   UD   0.542
                *

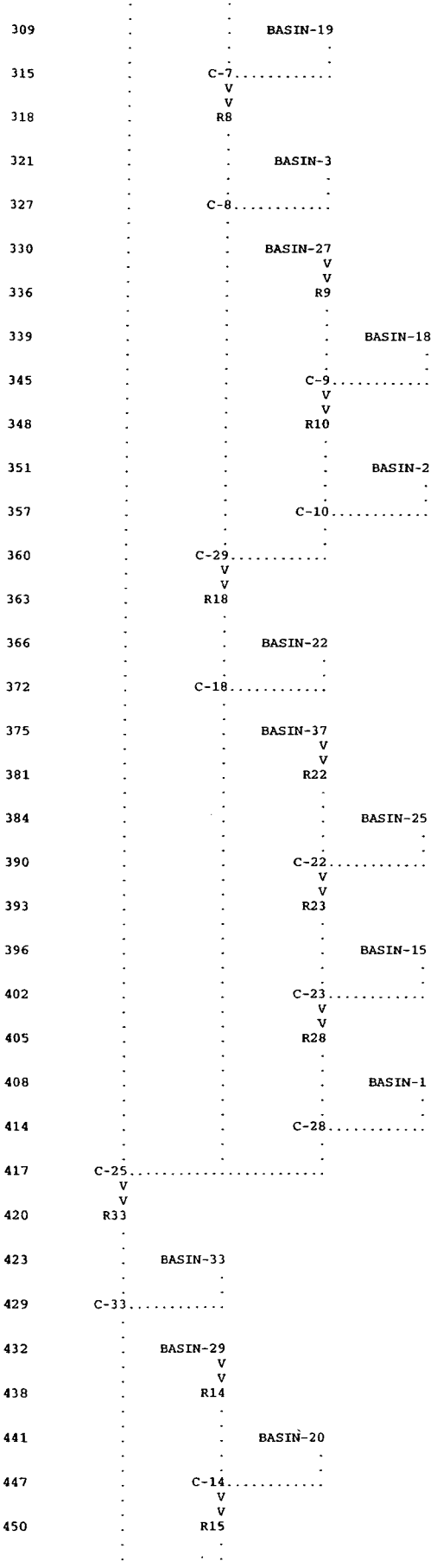
          618   KKBASIN-31
          619   KM   EXISTING BASIN-31
          620   BA  0.1536
          621   PB    2.77
          622   LS       0      88
          623   UD   0.291
                *
          624   ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK

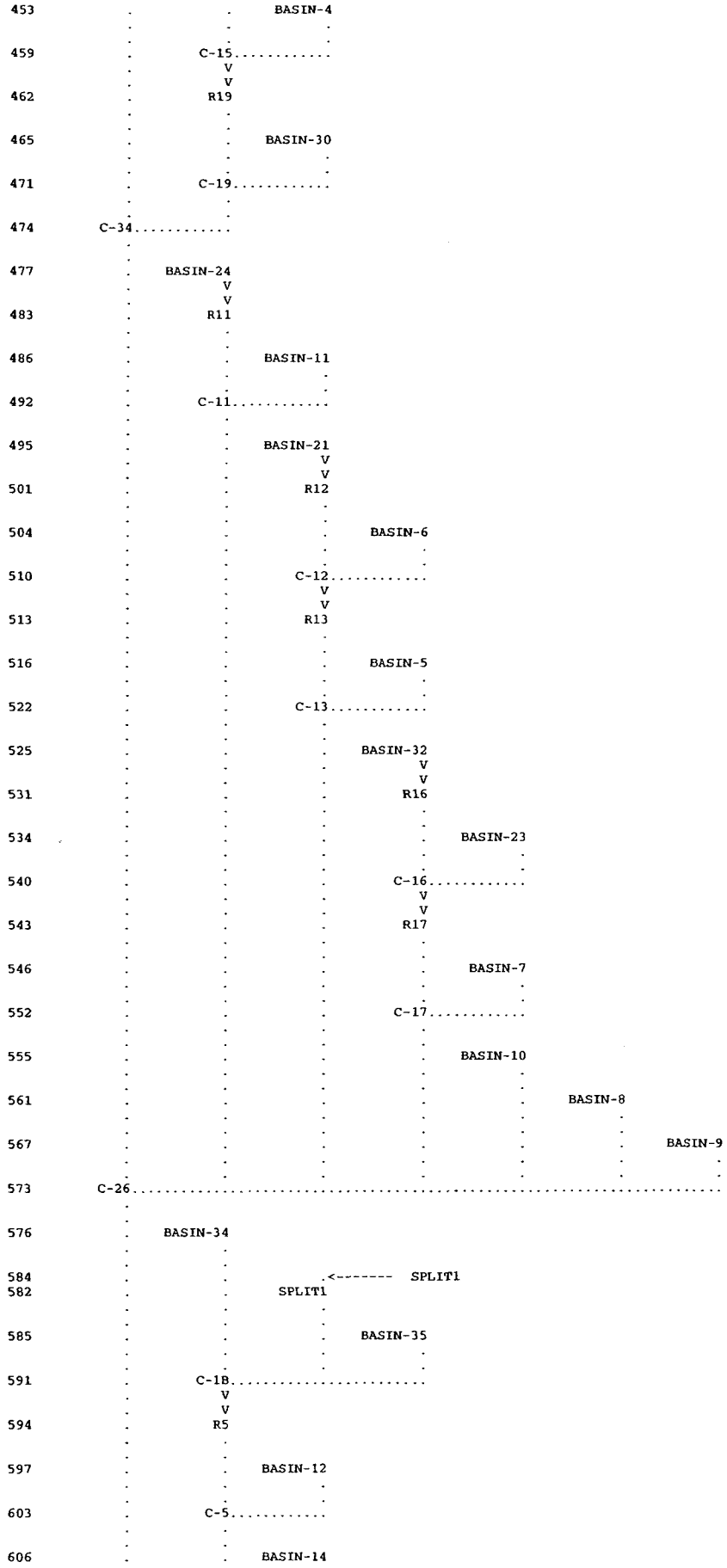
 INPUT
  LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

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

    61          71
                 V
                 V
    76          71R
                  .
                  .
    79            .          501
                  .            .
                  .            .
```


94 501C
97 501R
100 502
116 502C
119 72
134 502CC
137 502R
140 73
155 73R
158 503
173 503C
176 503R
179 504
194 INBD
198 BD
212 OFFSITE
218 COMB-1
221 R0
224 BASIN-40
238 C-0
243
241 SPLIT1
246 BASIN-38
252 BASIN-36
258 C-1A
261 C-1
264 R2
267 BASIN-26
273 C-2
276 R3
279 BASIN-17
285 C-3
288 R4
291 BASIN-13
297 C-27
300 BASIN-28
306 R7


309
BASIN-19
315
C-7
318
R8
321
BASIN-3
327
C-8
330
BASIN-27
336
R9
339
BASIN-18
345
C-9
348
R10
351
BASIN-2
357
C-10
360
C-29
363
R18
366
BASIN-22
372
C-18
375
BASIN-37
381
R22
384
BASIN-25
390
C-22
393
R23
396
BASIN-15
402
C-23
405
R28
408
BASIN-1
414
C-28
417
C-25
420
R33
423
BASIN-33
429
C-33
432
BASIN-29
438
R14
441
BASIN-20
447
C-14
450
R15


453 BASIN-4
459 C-15
462 R19
465 BASIN-30
471 C-19
474 C-34
477 BASIN-24
483 R11
486 BASIN-11
492 C-11
495 BASIN-21
501 R12
504 BASIN-6
510 C-12
513 R13
516 BASIN-5
522 C-13
525 BASIN-32
531 R16
534 BASIN-23
540 C-16
543 R17
546 BASIN-7
552 C-17
555 BASIN-10
561 BASIN-8
567 BASIN-9
573 C-26
576 BASIN-34
584 <------- SPLIT1
582 SPLIT1
585 BASIN-35
591 C-18
594 R5
597 BASIN-12
603 C-5
606 BASIN-14

```
                .           .           .
                .           .           .
   612          .           .           .     BASIN-16
                .           .           .           .
                .           .           .           .
   618          .           .           .           .     BASIN-31

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
****************************************
*                                      *                                        *
*                                      *                                        *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                        *    U.S. ARMY CORPS OF ENGINEERS
*                                      *                                        *
*               MAY   1991             *                                        *    HYDROLOGIC ENGINEERING CENTER
*                                      *                                        *
*            VERSION 4.0.1E            *                                        *         609 SECOND STREET
*                                      *                                        *
*     Lahey F77L-EM/32 version 5.01    *                                        *       DAVIS, CALIFORNIA 95616
*                                      *                                        *
*       Dodson & Associates, Inc.      *                                        *          (916) 551-1748
*                                      *                                        *
*  RUN DATE  02/19/00  TIME  14:51:22  *                                        *
*                                      *                                        *
****************************************
****************************************
```

File: BD.DAT

Post, Buckley, Schuh & Jernigan, Inc.

EXISTING DRAINAGE CONDITIONS RUN

```
**********************************
**********************************
*                                *
*             CLOMR              *
*                                *
*                                *
*           02/19/00             *
*                                *
*   FILE : BD.DAT                *
*                                *
*                                *
*                                *
*                                *
*                                *
*          EXISTING              *
*                                *
*         CONDITIONS             *
**********************************
**********************************
```

THIS ANALYSIS IS TO SIMULATE A 55%/45% FLOW SPLIT

```
 29 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                          * BLUE DIAMOND DETENTION BASINS REFRENCED FROM MPU BASIN DELINEATION BY COE
                          ********************************************************************************
                          BLUE DIAMOND DETENTION BASIN DESIGN.....................FILE = BDDB.LA1
                          SOURCE OF FILE= NEWBDDB1.LA1.....................................................
                          ================================================================================
                          MODEL CREATED TO DUPLICATE THE BLUE DIAMOND DETENTION BASIN DESIGN
                          AS OF JAN 31 1996.
                          FILE NEWBDDB1.LA1 DATED 6-23-96 WAS USED, AND RAINFALL & PATTERN ADJUSTED
                          RAIN = 1.76 (CURVE) X 1.26 (TF) = 2.22 IN.  AS STATED IN TROP. DM DRAFT
                          PATTERN # = 4.95     DA =68.25    DARF =
                                              JLF  2/1/96
                                    ****************************************
                          (A REVISED EL-VOL-STO IS COMING SOON.  THIS DOES NOT INCLUDE IT)
                          ELEVATIONS ARE NGVD
                                    ****************************************
                          COMMENTS BELOW THIS POINT WERE IN FILE NEWBDDB1.LA1 AND THEREFORE
                          RAIN, DARF & PATTERNS BELOW THIS POINT ARE NOT APPLICABLE TO THIS FILE
                          ================================================================================

                          REVISED TO ESTIMATE RUNOFF FROM 0.6 SQ.MI. AREA CONTRIBUTING TO A CP AT
                          BLUE DIAMOND ROAD, JUST U/S OF BLUE DIAMOND DB.

                          DEPTH-AREA AND PATTERN FOR AREA ABOVE BLUE DIAMOND DB.
                          DA = 68.25 MI2.  DARF = . PATTERN # = 4.9.
                          RAIN =  1.75 (CURVE) X  1.26 (TF) =  2.20 IN.

                                                        HN 6/22/95
                        ================================================================================


    IT          HYDROGRAPH TIME DATA
                      NMIN           5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1    0  STARTING DATE
                     ITIME        0000  STARTING TIME
                        NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2    0  ENDING DATE
                    NDTIME         0055  ENDING TIME
                     ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL     0.08 HOURS
                       TOTAL TIME BASE    24.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA         SQUARE MILES
```

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

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
1.00 0.98 0.57

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 0.98	RATIO 3 0.57
HYDROGRAPH AT							
+	71	6.90	1	FLOW	2790.	2699.	984.
				TIME	3.75	3.75	3.83
ROUTED TO							
+	71R	6.90	1	FLOW	2456.	2375.	843.
				TIME	4.17	4.17	4.17
HYDROGRAPH AT							
+	501	11.28	1	FLOW	4356.	4215.	1534.
				TIME	3.83	3.83	3.83
2 COMBINED AT							
+	501C	18.18	1	FLOW	5713.	5518.	1934.
				TIME	3.92	3.92	3.92
ROUTED TO							
+	501R	18.18	1	FLOW	5324.	5139.	1785.
				TIME	4.33	4.33	4.33
HYDROGRAPH AT							
+	502	27.40	1	FLOW	5951.	5737.	1956.
				TIME	4.33	4.33	4.33
2 COMBINED AT							
+	502C	45.58	1	FLOW	11275.	10876.	3741.
				TIME	4.33	4.33	4.33
HYDROGRAPH AT							
+	72	6.58	1	FLOW	2511.	2429.	880.
				TIME	3.83	3.83	3.83
2 COMBINED AT							
+	502CC	52.16	1	FLOW	12220.	11783.	4015.
				TIME	4.25	4.25	4.33
ROUTED TO							
+	502R	52.16	1	FLOW	11697.	11278.	3848.
				TIME	4.67	4.67	4.67
HYDROGRAPH AT							
+	73	4.02	1	FLOW	1513.	1464.	528.
				TIME	3.83	3.83	3.83
ROUTED TO							
+	73R	4.02	1	FLOW	1336.	1291.	459.
				TIME	4.17	4.17	4.25
HYDROGRAPH AT							
+	503	5.54	1	FLOW	1212.	1169.	399.
				TIME	4.33	4.33	4.33
3 COMBINED AT							
+	503C	61.72	1	FLOW	13507.	13020.	4423.
				TIME	4.58	4.58	4.58
ROUTED TO							
+	503R	61.72	1	FLOW	13013.	12542.	4243.
				TIME	4.92	4.92	4.92
HYDROGRAPH AT							
+	504	6.53	1	FLOW	1470.	1418.	484.
				TIME	4.25	4.25	4.25
2 COMBINED AT							
+	INBD	68.25	1	FLOW	13818.	13313.	4489.
				TIME	4.92	4.92	4.92
ROUTED TO							
+	BD	68.25	1	FLOW	213.	211.	164.
				TIME	8.00	7.92	6.92
			** PEAK STAGES IN FEET **				
			1	STAGE	2914.67	2913.62	2891.70
				TIME	8.00	8.00	7.00
HYDROGRAPH AT							
+	OFFSITE	0.60	1	FLOW	431.	419.	175.
				TIME	3.67	3.67	3.67
2 COMBINED AT							
+	COMB-1	68.85	1	FLOW	586.	572.	253.
				TIME	3.67	3.67	5.00

ROUTED TO							
+	R0	68.85	1	FLOW	578.	560.	250.
				TIME	3.92	3.92	5.33
HYDROGRAPH AT							
+	BASIN-40	0.88	1	FLOW	613.	593.	211.
				TIME	3.92	3.92	3.92
2 COMBINED AT							
+	C-0	69.72	1	FLOW	1191.	1153.	450.
				TIME	3.92	3.92	4.00
DIVERSION TO							
+	SPLIT1	69.72	1	FLOW	540.	523.	204.
				TIME	3.92	3.92	4.00
HYDROGRAPH AT							
+	SPLIT1	69.72	1	FLOW	651.	630.	245.
				TIME	3.92	3.92	4.00
HYDROGRAPH AT							
+	BASIN-38	0.13	1	FLOW	48.	46.	9.
				TIME	4.00	4.00	4.08
HYDROGRAPH AT							
+	BASIN-36	0.06	1	FLOW	60.	59.	25.
				TIME	3.75	3.75	3.75
2 COMBINED AT							
+	C-1A	0.19	1	FLOW	99.	95.	29.
				TIME	3.83	3.83	3.83
2 COMBINED AT							
+	C-1	69.91	1	FLOW	745.	721.	270.
				TIME	3.92	3.92	4.00
ROUTED TO							
+	R2	69.91	1	FLOW	738.	715.	269.
				TIME	4.00	4.00	4.17
HYDROGRAPH AT							
+	BASIN-26	0.14	1	FLOW	25.	24.	3.
				TIME	4.17	4.17	5.17
2 COMBINED AT							
+	C-2	70.06	1	FLOW	761.	737.	270.
				TIME	4.00	4.00	4.17
ROUTED TO							
+	R3	70.06	1	FLOW	751.	725.	266.
				TIME	4.08	4.17	4.33
HYDROGRAPH AT							
+	BASIN-17	0.29	1	FLOW	50.	47.	6.
				TIME	4.17	4.17	5.25
2 COMBINED AT							
+	C-3	70.34	1	FLOW	800.	772.	270.
				TIME	4.08	4.17	4.33
ROUTED TO							
+	R4	70.34	1	FLOW	798.	770.	267.
				TIME	4.25	4.25	4.50
HYDROGRAPH AT							
+	BASIN-13	0.22	1	FLOW	75.	71.	13.
				TIME	4.00	4.08	4.17
2 COMBINED AT							
+	C-27	70.57	1	FLOW	863.	833.	277.
				TIME	4.25	4.25	4.50
HYDROGRAPH AT							
+	BASIN-28	0.06	1	FLOW	9.	8.	1.
				TIME	4.08	4.08	5.17
ROUTED TO							
+	R7	0.06	1	FLOW	9.	8.	1.
				TIME	4.92	4.92	7.33
HYDROGRAPH AT							
+	BASIN-19	0.14	1	FLOW	17.	16.	2.
				TIME	4.25	4.25	5.33
2 COMBINED AT							
+	C-7	0.20	1	FLOW	22.	20.	2.
				TIME	4.92	4.92	5.33
ROUTED TO							
+	R8	0.20	1	FLOW	21.	20.	2.
				TIME	5.25	5.33	6.42
HYDROGRAPH AT							
+	BASIN-3	0.11	1	FLOW	14.	13.	1.
				TIME	4.17	4.17	5.25
2 COMBINED AT							
+	C-8	0.31	1	FLOW	32.	30.	2.
				TIME	5.25	5.25	6.42
HYDROGRAPH AT							
+	BASIN-27	0.15	1	FLOW	16.	15.	1.
				TIME	4.42	4.50	5.42
ROUTED TO							
+	R9	0.15	1	FLOW	16.	15.	1.

				TIME	5.08	5.08	7.08
HYDROGRAPH AT							
+	BASIN-18	0.18	1	FLOW	22.	20.	2.
				TIME	4.33	4.33	5.33
2 COMBINED AT							
+	C-9	0.33	1	FLOW	33.	31.	2.
				TIME	5.08	5.08	5.33
ROUTED TO							
+	R10	0.33	1	FLOW	33.	31.	2.
				TIME	5.17	5.25	5.75
HYDROGRAPH AT							
+	BASIN-2	0.09	1	FLOW	13.	12.	1.
				TIME	4.08	4.08	5.17
2 COMBINED AT							
+	C-10	0.42	1	FLOW	41.	38.	3.
				TIME	5.17	5.25	5.67
2 COMBINED AT							
+	C-29	0.73	1	FLOW	72.	68.	4.
				TIME	5.25	5.25	5.58
ROUTED TO							
+	R18	0.73	1	FLOW	71.	67.	4.
				TIME	5.42	5.42	6.42
HYDROGRAPH AT							
+	BASIN-22	0.21	1	FLOW	56.	53.	7.
				TIME	4.00	4.00	5.08
2 COMBINED AT							
+	C-18	0.94	1	FLOW	92.	86.	7.
				TIME	5.42	5.42	5.08
HYDROGRAPH AT							
+	BASIN-37	0.12	1	FLOW	88.	85.	29.
				TIME	3.83	3.83	3.92
ROUTED TO							
+	R22	0.12	1	FLOW	85.	83.	29.
				TIME	4.17	4.08	4.33
HYDROGRAPH AT							
+	BASIN-25	0.14	1	FLOW	105.	102.	35.
				TIME	3.83	3.83	3.83
2 COMBINED AT							
+	C-22	0.27	1	FLOW	161.	156.	45.
				TIME	4.08	4.08	4.33
ROUTED TO							
+	R23	0.27	1	FLOW	157.	154.	43.
				TIME	4.17	4.25	4.67
HYDROGRAPH AT							
+	BASIN-15	0.09	1	FLOW	47.	45.	12.
				TIME	3.92	3.92	3.92
2 COMBINED AT							
+	C-23	0.35	1	FLOW	191.	182.	48.
				TIME	4.17	4.17	4.67
ROUTED TO							
+	R28	0.35	1	FLOW	185.	182.	46.
				TIME	4.42	4.50	5.25
HYDROGRAPH AT							
+	BASIN-1	0.24	1	FLOW	162.	157.	54.
				TIME	3.92	3.92	3.92
2 COMBINED AT							
+	C-28	0.60	1	FLOW	260.	251.	66.
				TIME	4.42	4.42	5.25
3 COMBINED AT							
+	C-25	72.11	1	FLOW	1159.	1110.	307.
				TIME	4.25	4.33	4.50
ROUTED TO							
+	R33	72.11	1	FLOW	1159.	1108.	304.
				TIME	4.33	4.33	4.58
HYDROGRAPH AT							
+	BASIN-33	0.10	1	FLOW	73.	71.	23.
				TIME	3.75	3.75	3.75
2 COMBINED AT							
+	C-33	72.20	1	FLOW	1181.	1130.	311.
				TIME	4.33	4.33	4.58
HYDROGRAPH AT							
+	BASIN-29	0.04	1	FLOW	6.	5.	1.
				TIME	4.17	4.17	5.17
ROUTED TO							
+	R14	0.04	1	FLOW	6.	5.	1.
				TIME	5.08	5.08	7.75
HYDROGRAPH AT							
+	BASIN-20	0.08	1	FLOW	10.	9.	1.
				TIME	4.33	4.33	5.33
2 COMBINED AT							

*	C-14	0.12	1	FLOW	13.	13.	1.
				TIME	5.08	5.08	5.33
ROUTED TO							
+	R15	0.12	1	FLOW	13.	13.	1.
				TIME	5.75	5.83	7.42
HYDROGRAPH AT							
+	BASIN-4	0.14	1	FLOW	18.	17.	2.
				TIME	4.17	4.25	5.25
2 COMBINED AT							
+	C-15	0.26	1	FLOW	23.	21.	2.
				TIME	5.08	5.08	5.25
ROUTED TO							
+	R19	0.26	1	FLOW	23.	21.	2.
				TIME	5.50	5.50	6.58
HYDROGRAPH AT							
+	BASIN-30	0.21	1	FLOW	83.	80.	16.
				TIME	3.92	3.92	4.00
2 COMBINED AT							
+	C-19	0.47	1	FLOW	83.	80.	16.
				TIME	3.92	3.92	4.00
2 COMBINED AT							
+	C-34	72.68	1	FLOW	1232.	1178.	320.
				TIME	4.33	4.33	4.58
HYDROGRAPH AT							
+	BASIN-24	0.09	1	FLOW	10.	9.	1.
				TIME	4.33	4.33	5.33
ROUTED TO							
+	R11	0.09	1	FLOW	10.	9.	1.
				TIME	5.33	5.42	8.08
HYDROGRAPH AT							
+	BASIN-11	0.29	1	FLOW	33.	30.	3.
				TIME	4.33	4.33	5.42
2 COMBINED AT							
+	C-11	0.38	1	FLOW	36.	34.	3.
				TIME	5.25	5.33	5.42
HYDROGRAPH AT							
+	BASIN-21	0.33	1	FLOW	39.	36.	4.
				TIME	4.33	4.33	5.33
ROUTED TO							
+	R12	0.33	1	FLOW	39.	36.	4.
				TIME	4.67	4.67	6.42
HYDROGRAPH AT							
+	BASIN-6	0.47	1	FLOW	63.	58.	6.
				TIME	4.17	4.17	5.25
2 COMBINED AT							
+	C-12	0.80	1	FLOW	83.	76.	6.
				TIME	4.58	4.67	5.25
ROUTED TO							
+	R13	0.80	1	FLOW	81.	76.	6.
				TIME	4.83	4.92	6.17
HYDROGRAPH AT							
+	BASIN-5	0.54	1	FLOW	93.	87.	10.
				TIME	4.08	4.08	5.17
2 COMBINED AT							
+	C-13	1.34	1	FLOW	139.	131.	10.
				TIME	4.92	5.00	5.17
HYDROGRAPH AT							
+	BASIN-32	0.04	1	FLOW	6.	5.	0.
				TIME	4.08	4.08	5.17
ROUTED TO							
+	R16	0.04	1	FLOW	5.	5.	0.
				TIME	4.92	4.92	7.58
HYDROGRAPH AT							
+	BASIN-23	0.15	1	FLOW	19.	17.	2.
				TIME	4.25	4.25	5.25
2 COMBINED AT							
+	C-16	0.19	1	FLOW	19.	18.	2.
				TIME	5.00	5.00	5.25
ROUTED TO							
+	R17	0.19	1	FLOW	19.	18.	2.
				TIME	5.42	5.50	6.42
HYDROGRAPH AT							
+	BASIN-7	0.14	1	FLOW	18.	17.	2.
				TIME	4.17	4.17	5.25
2 COMBINED AT							
+	C-17	0.32	1	FLOW	32.	29.	2.
				TIME	4.58	4.67	6.42
HYDROGRAPH AT							
+	BASIN-10	0.16	1	FLOW	17.	16.	2.
				TIME	4.50	4.50	5.42

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 HYDROGRAPH AT
+                BASIN-8       0.05     1   FLOW          7.       7.       1.
                                           TIME        4.17     4.17     5.25

 HYDROGRAPH AT
+                BASIN-9       0.05     1   FLOW          7.       6.       1.
                                           TIME        4.08     4.08     5.17

  7 COMBINED AT
+                  C-26       74.98     1   FLOW       1442.    1370.     329.
                                           TIME        4.33     4.33     4.58

 HYDROGRAPH AT
+               BASIN-34       0.19     1   FLOW         42.      39.       6.
                                           TIME        4.17     4.25     5.25

 HYDROGRAPH AT
+                SPLIT1       0.00     1   FLOW        540.     523.     204.
                                           TIME        3.92     3.92     4.00

 HYDROGRAPH AT
+               BASIN-35       0.11     1   FLOW         44.      42.      11.
                                           TIME        4.17     4.17     4.25

  3 COMBINED AT
+                  C-1B       0.30     1   FLOW        609.     588.     217.
                                           TIME        3.92     3.92     4.00

 ROUTED TO
+                   R5        0.30     1   FLOW        605.     584.     215.
                                           TIME        4.08     4.08     4.25

 HYDROGRAPH AT
+               BASIN-12       0.33     1   FLOW         45.      42.       5.
                                           TIME        4.25     4.25     5.25

  2 COMBINED AT
+                  C-5        0.63     1   FLOW        646.     623.     217.
                                           TIME        4.08     4.08     4.25

 HYDROGRAPH AT
+               BASIN-14       0.27     1   FLOW        197.     192.      79.
                                           TIME        4.00     4.00     4.08

 HYDROGRAPH AT
+               BASIN-16       0.26     1   FLOW        193.     187.      78.
                                           TIME        4.00     4.00     4.00

 HYDROGRAPH AT
+               BASIN-31       0.15     1   FLOW        159.     155.      65.
                                           TIME        3.75     3.75     3.75
1
                                SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                    (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                  INTERPOLATED TO
                                                                  COMPUTATION INTERVAL
          ISTAQ    ELEMENT      DT        PEAK    TIME TO PEAK    VOLUME      DT        PEAK    TIME TO PEAK    VOLUME
                                (MIN)      (CFS)      (MIN)        (IN)     (MIN)      (CFS)      (MIN)         (IN)

        FOR PLAN = 1  RATIO= 1.00
             R0  MANE          4.90     581.70     235.69        0.12      5.00     578.13     235.00         0.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4484E+03 EXCESS=0.0000E+00 OUTFLOW=0.4394E+03 BASIN STORAGE=0.9989E+01 PERCENT ERROR=  -0.2

        FOR PLAN = 1  RATIO= 0.98
             R0  MANE          4.87     563.83     237.49        0.12      5.00     560.09     235.00         0.12

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4429E+03 EXCESS=0.0000E+00 OUTFLOW=0.4340E+03 BASIN STORAGE=0.9930E+01 PERCENT ERROR=  -0.2

        FOR PLAN = 1  RATIO= 0.57
             R0  MANE          5.00     252.10     241.64        0.08      5.00     250.21     320.00         0.08

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3074E+03 EXCESS=0.0000E+00 OUTFLOW=0.2991E+03 BASIN STORAGE=0.8802E+01 PERCENT ERROR=  -0.2

        FOR PLAN = 1  RATIO= 1.00
             R2  MANE          2.97     738.00     239.35        0.08      5.00     737.86     240.00         0.07

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2829E+03 EXCESS=0.0000E+00 OUTFLOW=0.2804E+03 BASIN STORAGE=0.3116E+01 PERCENT ERROR=  -0.2

        FOR PLAN = 1  RATIO= 0.98
             R2  MANE          3.09     718.63     240.85        0.07      5.00     714.81     240.00         0.07

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2784E+03 EXCESS=0.0000E+00 OUTFLOW=0.2754E+03 BASIN STORAGE=0.3098E+01 PERCENT ERROR=  -0.1

        FOR PLAN = 1  RATIO= 0.57
             R2  MANE          4.50     268.73     249.98        0.05      5.00     268.71     250.00         0.05

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1775E+03 EXCESS=0.0000E+00 OUTFLOW=0.1747E+03 BASIN STORAGE=0.2556E+01 PERCENT ERROR=   0.1

        FOR PLAN = 1  RATIO= 1.00
             R3  MANE          3.21     755.42     245.65        0.07      5.00     750.95     245.00         0.07
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CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2828E+03 EXCESS=0.0000E+00 OUTFLOW=0.2793E+03 BASIN STORAGE=0.3271E+01 PERCENT ERROR= 0.1

FOR PLAN = 1 RATIO= 0.98

R3	MANE	3.13	733.99	247.08	0.07	5.00	725.43	250.00	0.07

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2782E+03 EXCESS=0.0000E+00 OUTFLOW=0.2751E+03 BASIN STORAGE=0.3251E+01 PERCENT ERROR= -0.1

FOR PLAN = 1 RATIO= 0.57

R3	MANE	4.80	267.37	258.43	0.05	5.00	266.22	260.00	0.05

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1751E+03 EXCESS=0.0000E+00 OUTFLOW=0.1727E+03 BASIN STORAGE=0.2684E+01 PERCENT ERROR= -0.2

FOR PLAN = 1 RATIO= 1.00

R4	MANE	3.29	799.55	252.30	0.08	5.00	797.84	255.00	0.08

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2859E+03 EXCESS=0.0000E+00 OUTFLOW=0.2825E+03 BASIN STORAGE=0.3397E+01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.98

R4	MANE	3.31	770.83	256.28	0.07	5.00	770.43	255.00	0.07

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2810E+03 EXCESS=0.0000E+00 OUTFLOW=0.2775E+03 BASIN STORAGE=0.3376E+01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.57

R4	MANE	4.87	268.34	268.85	0.05	5.00	267.23	270.00	0.05

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1731E+03 EXCESS=0.0000E+00 OUTFLOW=0.1708E+03 BASIN STORAGE=0.2789E+01 PERCENT ERROR= -0.3

FOR PLAN = 1 RATIO= 1.00

R7	MANE	5.00	9.01	292.34	0.40	5.00	8.95	295.00	0.40

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1178E+01 EXCESS=0.0000E+00 OUTFLOW=0.1382E+01 BASIN STORAGE=0.5064E-02 PERCENT ERROR= -17.8

FOR PLAN = 1 RATIO= 0.98

R7	MANE	5.00	8.36	294.76	0.38	5.00	8.36	295.00	0.38

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1106E+01 EXCESS=0.0000E+00 OUTFLOW=0.1300E+01 BASIN STORAGE=0.5093E-02 PERCENT ERROR= -18.0

FOR PLAN = 1 RATIO= 0.57

R7	MANE	5.00	0.80	438.67	0.04	5.00	0.80	440.00	0.04

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.8999E-01 EXCESS=0.0000E+00 OUTFLOW=0.1464E+00 BASIN STORAGE=0.4877E-02 PERCENT ERROR= -68.1

FOR PLAN = 1 RATIO= 1.00

R8	MANE	5.00	21.50	313.77	0.36	5.00	21.48	315.00	0.36

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3875E+01 EXCESS=0.0000E+00 OUTFLOW=0.3911E+01 BASIN STORAGE=0.1027E-01 PERCENT ERROR= -1.2

FOR PLAN = 1 RATIO= 0.98

R8	MANE	5.00	20.28	316.42	0.34	5.00	20.24	320.00	0.34

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3642E+01 EXCESS=0.0000E+00 OUTFLOW=0.3692E+01 BASIN STORAGE=0.1093E-01 PERCENT ERROR= -1.7

FOR PLAN = 1 RATIO= 0.57

R8	MANE	4.97	1.57	389.03	0.03	5.00	1.56	385.00	0.03

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3369E+00 EXCESS=0.0000E+00 OUTFLOW=0.3596E+00 BASIN STORAGE=0.1170E-01 PERCENT ERROR= -10.2

FOR PLAN = 1 RATIO= 1.00

R9	MANE	5.00	15.74	303.59	0.34	5.00	15.69	305.00	0.34

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2657E+01 EXCESS=0.0000E+00 OUTFLOW=0.2680E+01 BASIN STORAGE=0.5574E-02 PERCENT ERROR= -1.1

FOR PLAN = 1 RATIO= 0.98

R9	MANE	5.00	14.66	306.15	0.32	5.00	14.65	305.00	0.32

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2495E+01 EXCESS=0.0000E+00 OUTFLOW=0.2516E+01 BASIN STORAGE=0.5477E-02 PERCENT ERROR= -1.1

FOR PLAN = 1 RATIO= 0.57

R9	MANE	5.00	1.49	425.03	0.03	5.00	1.49	425.00	0.03

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2030E+00 EXCESS=0.0000E+00 OUTFLOW=0.2603E+00 BASIN STORAGE=0.5422E-02 PERCENT ERROR= -30.9

FOR PLAN = 1 RATIO= 1.00

R10	MANE	3.50	32.78	311.37	0.34	5.00	32.76	310.00	0.34

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6021E+01 EXCESS=0.0000E+00 OUTFLOW=0.6016E+01 BASIN STORAGE=0.3565E-02 PERCENT ERROR= 0.0

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          FOR PLAN = 1  RATIO= 0.98
               R10  MANE          3.65     30.78    314.39      0.32      5.00     30.75    315.00         0.32

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5650E+01 EXCESS=0.0000E+00 OUTFLOW=0.5651E+01 BASIN STORAGE=0.3749E-02 PERCENT ERROR=  -0.1

          FOR PLAN = 1  RATIO= 0.57
               R10  MANE          5.00      2.04    347.20      0.03      5.00      2.03    345.00         0.03

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5156E+00 EXCESS=0.0000E+00 OUTFLOW=0.5169E+00 BASIN STORAGE=0.4346E-02 PERCENT ERROR=  -1.1

          FOR PLAN = 1  RATIO= 1.00
               R18  MANE          5.00     71.43    324.31      0.35      5.00     71.31    325.00         0.35

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1352E+02 EXCESS=0.0000E+00 OUTFLOW=0.1351E+02 BASIN STORAGE=0.1980E-01 PERCENT ERROR=  -0.1

          FOR PLAN = 1  RATIO= 0.98
               R18  MANE          5.00     67.34    327.38      0.33      5.00     66.78    325.00         0.33

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1271E+02 EXCESS=0.0000E+00 OUTFLOW=0.1272E+02 BASIN STORAGE=0.1817E-01 PERCENT ERROR=  -0.3

          FOR PLAN = 1  RATIO= 0.57
               R18  MANE          4.95      3.51    384.91      0.03      5.00      3.51    385.00         0.03

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1150E+01 EXCESS=0.0000E+00 OUTFLOW=0.1125E+01 BASIN STORAGE=0.2628E-01 PERCENT ERROR=  -0.1

          FOR PLAN = 1  RATIO= 1.00
               R22  MANE          5.00     87.04    247.39      1.28      5.00     85.36    250.00         1.27

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.8283E+01 EXCESS=0.0000E+00 OUTFLOW=0.8362E+01 BASIN STORAGE=0.5664E-02 PERCENT ERROR=  -1.0

          FOR PLAN = 1  RATIO= 0.98
               R22  MANE          5.00     83.71    249.17      1.23      5.00     82.95    245.00         1.23

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.8000E+01 EXCESS=0.0000E+00 OUTFLOW=0.8067E+01 BASIN STORAGE=0.5337E-02 PERCENT ERROR=  -0.9

          FOR PLAN = 1  RATIO= 0.57
               R22  MANE          4.70     28.89    262.53      0.46      5.00     28.65    260.00         0.46

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2785E+01 EXCESS=0.0000E+00 OUTFLOW=0.3039E+01 BASIN STORAGE=0.5811E-02 PERCENT ERROR=  -9.3

          FOR PLAN = 1  RATIO= 1.00
               R23  MANE          4.47    160.29    252.69      1.27      5.00    157.41    250.00         1.27

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1798E+02 EXCESS=0.0000E+00 OUTFLOW=0.1798E+02 BASIN STORAGE=0.1135E-01 PERCENT ERROR=  -0.1

          FOR PLAN = 1  RATIO= 0.98
               R23  MANE          4.54    155.13    254.52      1.23      5.00    153.98    255.00         1.23

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1737E+02 EXCESS=0.0000E+00 OUTFLOW=0.1740E+02 BASIN STORAGE=0.1054E-01 PERCENT ERROR=  -0.2

          FOR PLAN = 1  RATIO= 0.57
               R23  MANE          5.00     43.35    278.76      0.46      5.00     42.66    280.00         0.46

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6273E+01 EXCESS=0.0000E+00 OUTFLOW=0.6462E+01 BASIN STORAGE=0.1146E-01 PERCENT ERROR=  -3.2

          FOR PLAN = 1  RATIO= 1.00
               R28  MANE          5.00    188.26    268.39      1.19      5.00    185.36    265.00         1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2253E+02 EXCESS=0.0000E+00 OUTFLOW=0.2252E+02 BASIN STORAGE=0.4503E-01 PERCENT ERROR=  -0.2

          FOR PLAN = 1  RATIO= 0.98
               R28  MANE          5.00    181.86    270.33      1.15      5.00    181.63    270.00         1.15

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2179E+02 EXCESS=0.0000E+00 OUTFLOW=0.2178E+02 BASIN STORAGE=0.4023E-01 PERCENT ERROR=  -0.1

          FOR PLAN = 1  RATIO= 0.57
               R28  MANE          5.00     47.44    312.47      0.43      5.00     46.29    315.00         0.43

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7736E+01 EXCESS=0.0000E+00 OUTFLOW=0.8148E+01 BASIN STORAGE=0.4995E-01 PERCENT ERROR=  -6.0

          FOR PLAN = 1  RATIO= 1.00
               R33  MANE          1.07   1158.92    257.24      0.09      5.00   1158.55    260.00         0.09

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3495E+03 EXCESS=0.0000E+00 OUTFLOW=0.3485E+03 BASIN STORAGE=0.1328E+01 PERCENT ERROR=  -0.1

          FOR PLAN = 1  RATIO= 0.98
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      R33  MANE        1.15   1108.80    261.21      0.09      5.00   1107.75    260.00        0.09

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3417E+03 EXCESS=0.0000E+00 OUTFLOW=0.3406E+03 BASIN STORAGE=0.1320E+01 PERCENT ERROR=  -0.1

 FOR PLAN = 1  RATIO= 0.57
      R33  MANE        1.88    306.13    273.31      0.05      5.00    304.13    275.00        0.05

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1879E+03 EXCESS=0.0000E+00 OUTFLOW=0.1868E+03 BASIN STORAGE=0.1091E+01 PERCENT ERROR=   0.0

 FOR PLAN = 1  RATIO= 1.00
      R14  MANE        5.00      5.82    303.46      0.42      5.00      5.80    305.00        0.42

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7670E+00 EXCESS=0.0000E+00 OUTFLOW=0.9516E+00 BASIN STORAGE=0.5482E-02 PERCENT ERROR= -24.8

 FOR PLAN = 1  RATIO= 0.98
      R14  MANE        4.93      5.41    304.61      0.40      5.00      5.40    305.00        0.40

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7200E+00 EXCESS=0.0000E+00 OUTFLOW=0.9072E+00 BASIN STORAGE=0.5442E-02 PERCENT ERROR= -26.7

 FOR PLAN = 1  RATIO= 0.57
      R14  MANE        5.00      0.52    468.25      0.05      5.00      0.52    470.00        0.05

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5861E-01 EXCESS=0.0000E+00 OUTFLOW=0.1054E+00 BASIN STORAGE=0.4953E-02 PERCENT ERROR= -88.2

 FOR PLAN = 1  RATIO= 1.00
      R15  MANE        5.00     13.33    344.84      0.40      5.00     13.32    345.00        0.40

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2427E+01 EXCESS=0.0000E+00 OUTFLOW=0.2633E+01 BASIN STORAGE=0.1885E-01 PERCENT ERROR=  -9.2

 FOR PLAN = 1  RATIO= 0.98
      R15  MANE        5.00     12.55    347.54      0.38      5.00     12.51    350.00        0.38

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2292E+01 EXCESS=0.0000E+00 OUTFLOW=0.2492E+01 BASIN STORAGE=0.1887E-01 PERCENT ERROR=  -9.5

 FOR PLAN = 1  RATIO= 0.57
      R15  MANE        5.00      0.90    444.62      0.04      5.00      0.90    445.00        0.04

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2181E+00 EXCESS=0.0000E+00 OUTFLOW=0.2639E+00 BASIN STORAGE=0.2020E-01 PERCENT ERROR= -30.3

 FOR PLAN = 1  RATIO= 1.00
      R19  MANE        4.74     22.80    329.14      0.37      5.00     22.76    330.00        0.37

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5182E+01 EXCESS=0.0000E+00 OUTFLOW=0.5270E+01 BASIN STORAGE=0.2544E-01 PERCENT ERROR=  -2.2

 FOR PLAN = 1  RATIO= 0.98
      R19  MANE        4.91     21.37    327.75      0.35      5.00     21.37    330.00        0.35

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4880E+01 EXCESS=0.0000E+00 OUTFLOW=0.4961E+01 BASIN STORAGE=0.2515E-01 PERCENT ERROR=  -2.2

 FOR PLAN = 1  RATIO= 0.57
      R19  MANE        5.00      1.66    390.67      0.03      5.00      1.65    395.00        0.03

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4581E+00 EXCESS=0.0000E+00 OUTFLOW=0.4772E+00 BASIN STORAGE=0.2995E-01 PERCENT ERROR= -10.7

 FOR PLAN = 1  RATIO= 1.00
      R11  MANE        5.00     10.06    322.70      0.41      5.00     10.03    320.00        0.41

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1590E+01 EXCESS=0.0000E+00 OUTFLOW=0.1908E+01 BASIN STORAGE=0.1120E-01 PERCENT ERROR= -20.7

 FOR PLAN = 1  RATIO= 0.98
      R11  MANE        5.00      9.34    325.75      0.38      5.00      9.33    325.00        0.38

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1493E+01 EXCESS=0.0000E+00 OUTFLOW=0.1796E+01 BASIN STORAGE=0.1102E-01 PERCENT ERROR= -21.0

 FOR PLAN = 1  RATIO= 0.57
      R11  MANE        5.00      0.94    488.38      0.04      5.00      0.94    485.00        0.04

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1215E+00 EXCESS=0.0000E+00 OUTFLOW=0.2049E+00 BASIN STORAGE=0.1054E-01 PERCENT ERROR= -77.3

 FOR PLAN = 1  RATIO= 1.00
      R12  MANE        5.00     38.88    277.89      0.34      5.00     38.82    280.00        0.34

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6004E+01 EXCESS=0.0000E+00 OUTFLOW=0.6044E+01 BASIN STORAGE=0.5619E-02 PERCENT ERROR=  -0.8

 FOR PLAN = 1  RATIO= 0.98
      R12  MANE        5.00     36.23    279.69      0.32      5.00     36.21    280.00        0.32
```

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5636E+01 EXCESS=0.0000E+00 OUTFLOW=0.5662E+01 BASIN STORAGE=0.4580E-02 PERCENT ERROR= -0.5

FOR PLAN = 1 RATIO= 0.57

R12	MANE	5.00	3.65	382.10	0.03	5.00	3.63	385.00	0.03

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4587E+00 EXCESS=0.0000E+00 OUTFLOW=0.4777E+00 BASIN STORAGE=0.4449E-02 PERCENT ERROR= -5.1

FOR PLAN = 1 RATIO= 1.00

R13	MANE	5.00	81.60	294.04	0.34	5.00	81.47	290.00	0.34

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1452E+02 EXCESS=0.0000E+00 OUTFLOW=0.1459E+02 BASIN STORAGE=0.1499E-01 PERCENT ERROR= -0.6

FOR PLAN = 1 RATIO= 0.98

R13	MANE	5.00	75.94	296.59	0.32	5.00	75.89	295.00	0.32

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1363E+02 EXCESS=0.0000E+00 OUTFLOW=0.1368E+02 BASIN STORAGE=0.1679E-01 PERCENT ERROR= -0.5

FOR PLAN = 1 RATIO= 0.57

R13	MANE	5.00	5.66	368.44	0.03	5.00	5.64	370.00	0.03

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1125E+01 EXCESS=0.0000E+00 OUTFLOW=0.1165E+01 BASIN STORAGE=0.1799E-01 PERCENT ERROR= -5.2

FOR PLAN = 1 RATIO= 1.00

R16	MANE	5.00	5.51	296.47	0.41	5.00	5.49	295.00	0.41

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6871E+00 EXCESS=0.0000E+00 OUTFLOW=0.8355E+00 BASIN STORAGE=0.4265E-02 PERCENT ERROR= -22.2

FOR PLAN = 1 RATIO= 0.98

R16	MANE	5.00	5.10	299.12	0.39	5.00	5.07	295.00	0.39

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6450E+00 EXCESS=0.0000E+00 OUTFLOW=0.7861E+00 BASIN STORAGE=0.3883E-02 PERCENT ERROR= -22.5

FOR PLAN = 1 RATIO= 0.57

R16	MANE	5.00	0.48	452.08	0.05	5.00	0.48	455.00	0.05

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5249E-01 EXCESS=0.0000E+00 OUTFLOW=0.9222E-01 BASIN STORAGE=0.3684E-02 PERCENT ERROR= -82.7

FOR PLAN = 1 RATIO= 1.00

R17	MANE	4.76	19.03	323.72	0.36	5.00	18.99	325.00	0.36

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3511E+01 EXCESS=0.0000E+00 OUTFLOW=0.3512E+01 BASIN STORAGE=0.1006E-01 PERCENT ERROR= -0.3

FOR PLAN = 1 RATIO= 0.98

R17	MANE	4.83	17.98	326.25	0.33	5.00	17.87	330.00	0.33

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3298E+01 EXCESS=0.0000E+00 OUTFLOW=0.3297E+01 BASIN STORAGE=0.9974E-02 PERCENT ERROR= -0.3

FOR PLAN = 1 RATIO= 0.57

R17	MANE	5.00	1.72	384.33	0.03	5.00	1.72	385.00	0.03

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2965E+00 EXCESS=0.0000E+00 OUTFLOW=0.3131E+00 BASIN STORAGE=0.1113E-01 PERCENT ERROR= -9.3

FOR PLAN = 1 RATIO= 1.00

R5	MANE	3.68	606.85	243.65	14.63	5.00	604.93	245.00	14.58

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2386E+03 EXCESS=0.0000E+00 OUTFLOW=0.2359E+03 BASIN STORAGE=0.3199E+01 PERCENT ERROR= -0.2

FOR PLAN = 1 RATIO= 0.98

R5	MANE	3.90	586.30	243.87	14.38	5.00	584.46	245.00	14.34

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2347E+03 EXCESS=0.0000E+00 OUTFLOW=0.2318E+03 BASIN STORAGE=0.3180E+01 PERCENT ERROR= -0.1

FOR PLAN = 1 RATIO= 0.57

R5	MANE	5.00	215.98	254.43	9.03	5.00	215.06	255.00	9.00

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1480E+03 EXCESS=0.0000E+00 OUTFLOW=0.1456E+03 BASIN STORAGE=0.2623E+01 PERCENT ERROR= -0.2

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

CLOMR Cross Section 34

CLOMR - CROSS-SECTION 34
Worksheet for Irregular Channel

Project Description	
Project File	e:\cb879\xs.fm2
Worksheet	CROSS-SECTION 34
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	1.5000 %	
Elevation range: 2,305.00 ft to 2,310.00 ft.		
Discharge	833.00	cfs

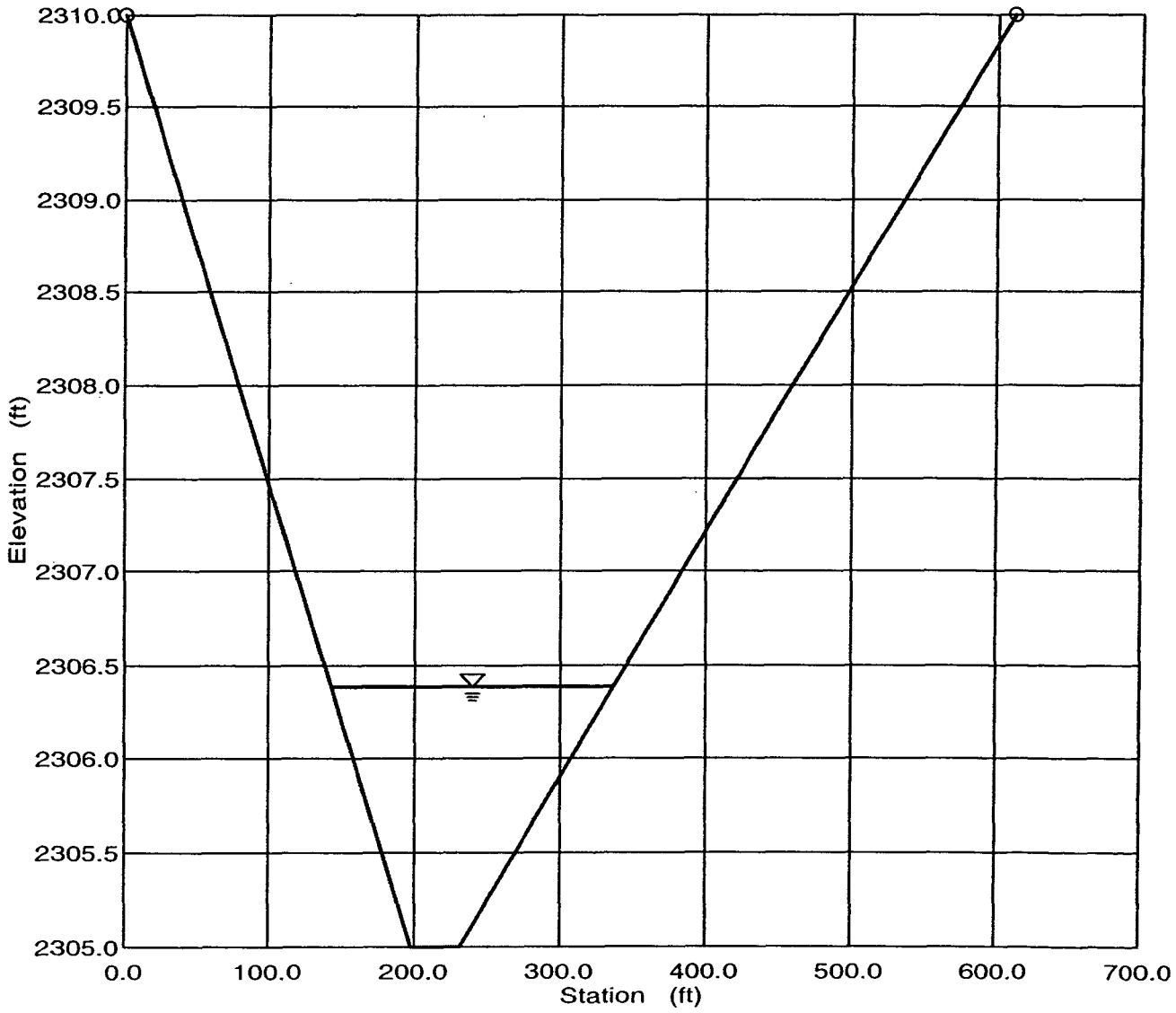
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	2,310.00	0.00	612.00	0.030
198.00	2,305.00			
231.00	2,305.00			
612.00	2,310.00			

Results		
Wtd. Mannings Coefficient	0.030	
Water Surface Elevation	2,306.39	ft
Flow Area	157.65	ft²
Wetted Perimeter	193.94	ft
Top Width	193.91	ft
Height	1.39	ft
Critical Depth	2,306.41	ft
Critical Slope	0.013992	ft/ft
Velocity	5.28	ft/s
Velocity Head	0.43	ft
Specific Energy	2,306.82	ft
Froude Number	1.03	
Flow is supercritical.		

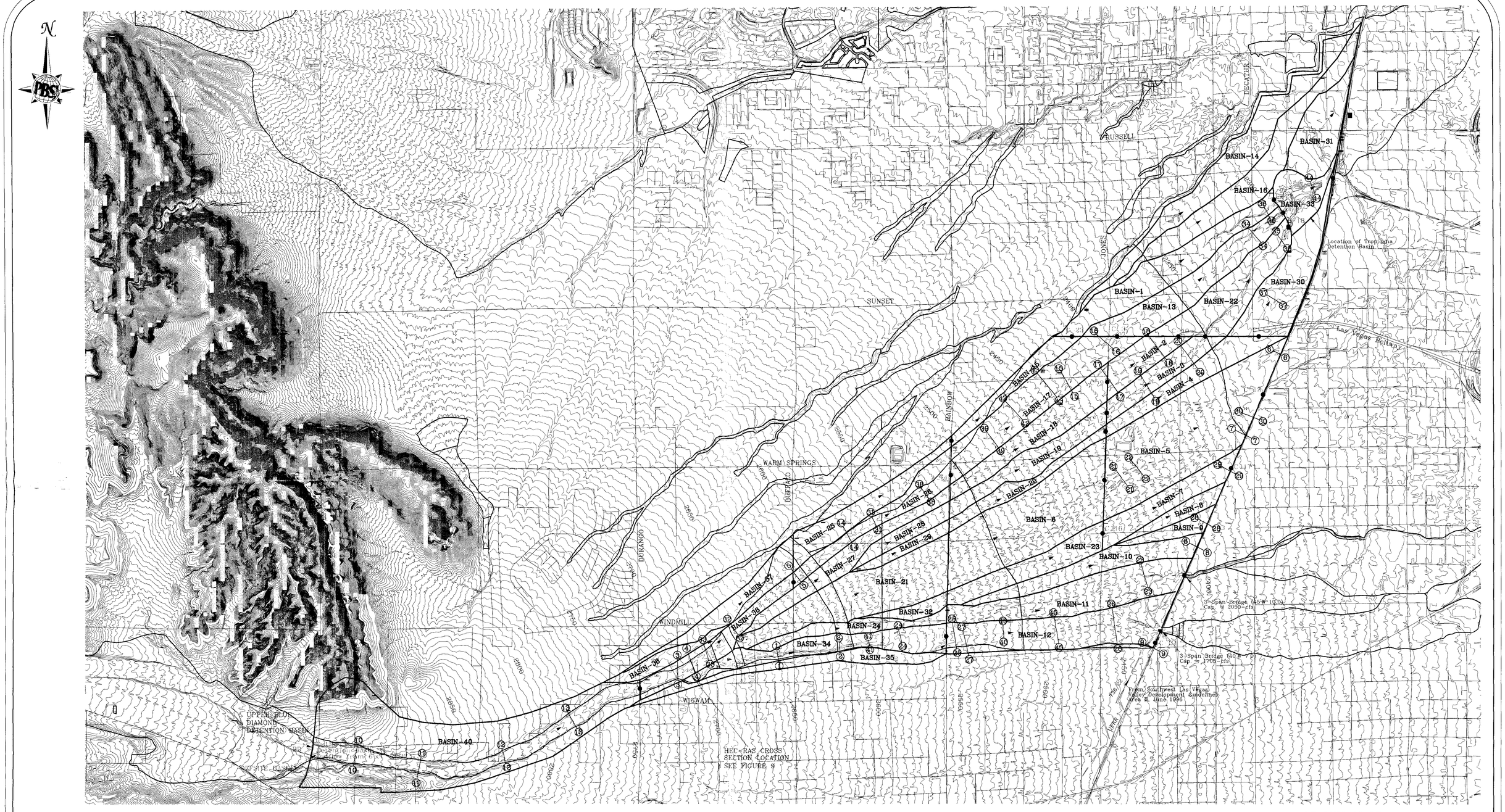
CLOMR - CROSS-SECTION 34
Cross Section for Irregular Channel

Project Description	
Project File	e:\cb879\xs.fm2
Worksheet	CROSS-SECTION 34
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.030	
Channel Slope	1.5000	%
Water Surface Elevation	2,306.39	ft
Discharge	833.00	cfs



CLOMR Figure 4 – Basin and Cross Section Map



(1)——(1) CROSS SECTION LOCATION

GRAPHIC SCALE

1500 0 750 1500 3000 6000

(IN FEET)

1 inch = 1500 ft.

FIGURE 4 BASIN AND CROSS SECTION MAP

PBS&J
901 N. Green Valley Pkwy, Suite 160
Henderson, Nevada 89014
Telephone: 702.263.4275
Fax: 702.263.4200
ENGINEERING • PLANNING • SURVEYING • CONSTRUCTION SERVICES

Figure 4

APPENDIX E

Data CD

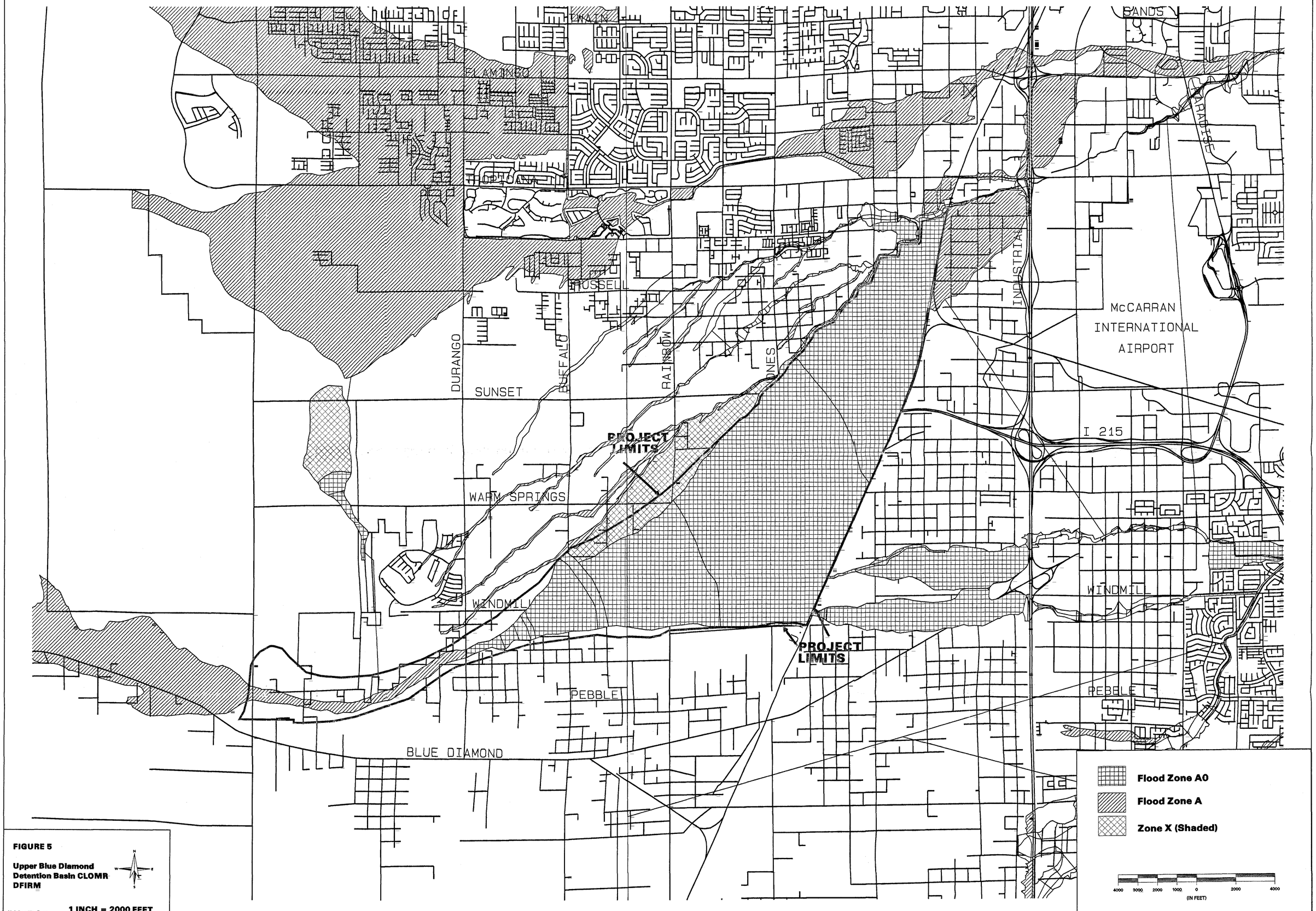


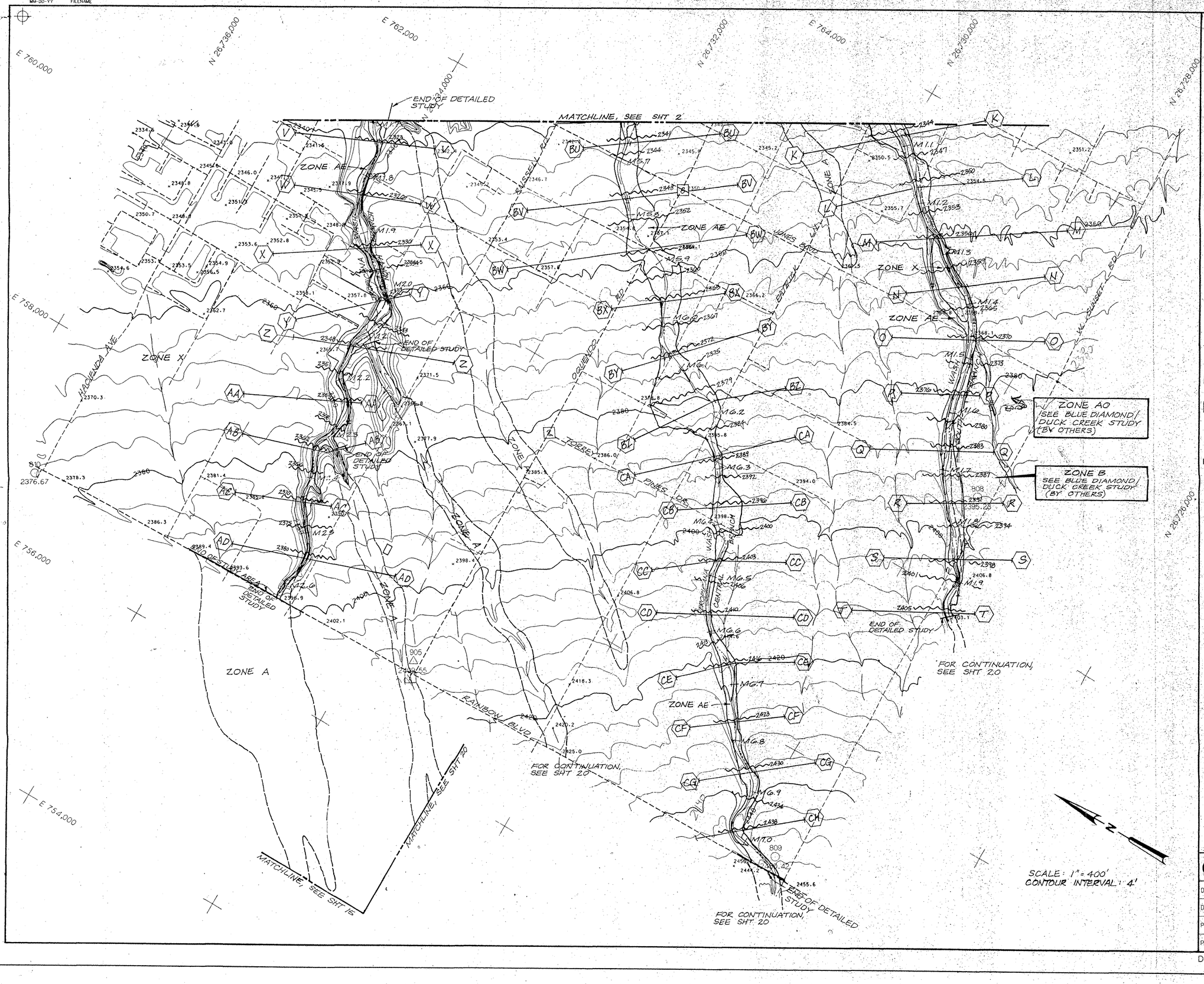
FIGURE 5

Upper Blue Diamond Detention Basin CLOMR DFIRM

1 INCH = 2000 FEET

d:\wbd\wmdfirm5.grs

MM-DD-YY FILENAME



CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

LEGEND

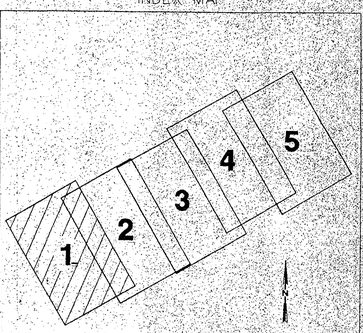
City of Las Vegas	Corporate Limits
(Name) Area Not Included	Excluded Areas
	100-Year Floodplain Boundary
	Floodway Boundary
	Approximate (100-Year) Floodplain Boundary
	Channel Centerline
A — A	Cross Section
M 1.5	River Mile
580	Base Flood Elevations
(EL 15) (DEPTH 2)	Base Flood Elevation for Depth (Uniform)
ZONE AE	Zone Designations

ELEVATION REFERENCE MARKS

1. Brass Cap ¢ Intersection Rainbow Blvd.& Oquendo Rd., Elev 2412.24
2. Aluminum Cap "DUCHARME" ¢ Intersection Torrey Pines Dr. & Oquendo Rd., Elev 2381.44
3. 2" Pipe ¢ Intersection Jones Blvd & Oquendo Rd., Elev 2350.35

NOTES

INDEX MAP



Flood Insurance Study
Restudy

Tropicana Wash and Tributaries
Clark County, Nevada
(Unincorporated Areas)
Community Number 320003

CH2M HILL

CH2M HILL, NEVADA
2030 EAST FLAMINGO ROAD, SUITE 250
LAS VEGAS, NV 89119 (702) 369-6175

DESIGN			SUBMITTED BY	DATE SHEET
DESIGN CHK			RECOMMENDED BY	
PLANS			APPROVED BY	
PLANS CHK			CHIEF ENGINEER AND GENERAL MANAGER OF	

DATE OF PHOTOGRAPHY: 5-30-92 BY CH2M HILL

PRELIMINARY