ADOBE DAM/DESERT HILLS

AREA DRAINAGE MASTER PLAN

Part 3

Biscuit Flat Area Hydrology Technical Data Notebook

Volume 3

Flood Control District of Maricopa County

September 2003

Biscuit Flats Area Hydrology

Technical Data Notebook

September 2003

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ENCLOSED DATA CD INCLUDES:

- **Digital Copy of Report in PDF Format**
- **Digital Copies of DDMSW and HEC-1 files**
- **GIS Shapefile Coverages of Project Elements**

SECTION 1: INTRODUCTION

1.1 Purpose of study

This study was a hydrologic modeling study done in support and in conjunction with the Adobe Dam / Desert Hills Area Drainage Master Plan (ADMP). The hydrology of the Biscuit Flats area was analyzed to provide a basis for delineation of floodplains in the area. Additionally, the HEC-1 models developed will serve as a basis for evaluation of flood control alternatives developed for the ADMP. The hydrologic impact of future development was also examined in the hydrologic modeling in support of the ADMP.

The primary purpose of the current study was to develop an HEC-1 model using methods consistent with the most recent version of the Drainage Design Manual for Maricopa County, Volume I, Hydrology (Drainage Design Manual for Maricopa County). In addition, future conditions land use was also evaluated. Finally, the existing and future conditions land use models served as a basis for the alternatives formulation and evaluation for the ADMP.

1.2 Authority for study

This study was authorized by the Flood Control District of Maricopa County under contract FCD 2002C001 as part of the scope of services for the Adobe Dam / Desert Hills ADMP.

1.3 Location of study

The study area is located in the northern portions of the City of Phoenix in Maricopa County, Arizona. Figure 1.1 shows the general vicinity of the study area. The area is generally bounded by Interstate 17 on the east, Carefree Highway on the north, the Central Arizona Project (CAP) canal on the south, and the drainage divide to Deadman Wash on the west. The watershed drains from north to south with the CAP metering the flows into Buchanan Wash and further down into Skunk Creek.

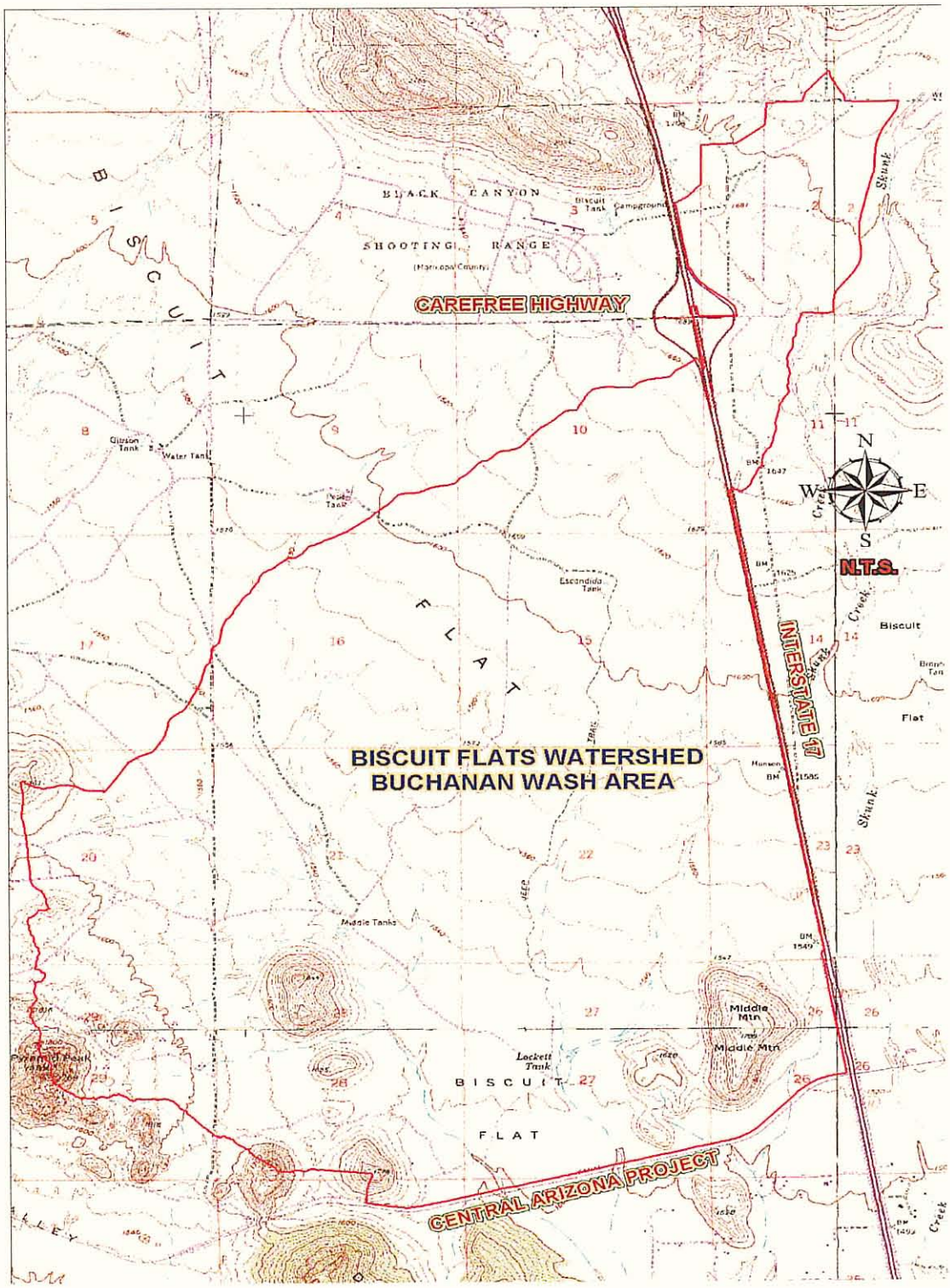

Figure 1.1

Location Map

1.4 Methodology

The methods employed in this study were those outlined in the Drainage Design Manuals for Maricopa County.

1.4.1 Hydrology

The U.S. Army Corps of Engineers HEC-1 model (version 4.1) was used to compute runoff hydrographs and peak discharges.

1.4.2 Hydraulics

Hydraulic analyses performed in this study were associated with the outflow pipes or weirs from storage routings with the HEC-1 models. However, no floodplains were delineated using conventional step-backwater approaches using the 24-hour models presented in this volume. A 100-year, 6-hour HEC-1 model was run and used for floodplain delineation. This model and supporting documentation can be found in the *Approximate Zone A Floodplain Delineation Study of Biscuit Flat Area, Part 4, Volumes 5 and 6* performed by JE Fuller/ Hydrology & Geomorphology, Inc. and dated September 2003. The 24-hour models, matched up with the existing models already performed in the study area, are intended for planning analysis and the 6-hour models create a more conservative peak discharge that is more appropriate for floodplain delineation.

1.5 Acknowledgements

This study was funded entirely by the Flood Control District of Maricopa County. Assistance and review from their staff was critical to the success of this project. In addition, staff at the Central Arizona Project, the City of Phoenix, and the Arizona State Land Department also supplied valuable information used in the completion of this project.

1.6 Study results

The study resulted in the development of rainfall-runoff models for the 2-year, 10-year, and 100-year events of both 6- and 24-hour durations for the watershed. Approximate zone A floodplains were delineated on 8.3 miles of washes using the peak discharges from the 100-year 6-hour model. The 100-year, 6-hour model is provided in the *Approximate Zone A Floodplain Delineation Study of Biscuit Flat Area,* performed by JE Fuller/ Hydrology & Geomorphology, Inc. and dated July 2003. The existing and future condition 2-, 10-, and 100-year, 6-hour models are provided in the enclosed data CD. These conditions were modeled, but not used for alternatives analysis. Therefore, they are provided as a courtesy, but not documented within this report. This report does document the results of the 24-hour models. These models encompass the 24-hour events for the 9.62 square mile watershed.

SECTION 2: ADWR/FEMA FORMS

This study was not performed for the purpose of a floodplain delineation study. Therefore, no FEMA forms were completed.

SECTION 3: MAPPING AND SURVEY INFORMATION

3.1 Field Survey Information

Refer to the Flood Control District of Maricopa County for field survey information associated with the various topographic mapping used in the current study.

3.2 Mapping

The Flood Control District provided new 2-foot contour mapping and DTM data for use in the Floodplain Delineations. This mapping, along with USGS quadrangle maps, was used to delineate the watershed. The 2-foot contour mapping was done under separate contract by Cooper Aerial for the FCDMC in 2002. The flight date of the mapping was 5-2-02.

SECTION 4: HYDROLOGY

4.1 Method Description

The methods employed in this study were those outlined in the *Hydrology Design Manual for Maricopa County,* Arizona (January 9, 1997 update) and 2003 draft revised Hydrology Manual, referred to herein as the Maricopa County Hydrology Manual. The DDMSW version 2.1 was used to assist in the development of the HEC-1 models. The U.S. Army Corps of Engineers HEC-1 computer program, version 4.1, June 1998, was used to compute runoff hydrographs and peak discharges.

Rainfall losses were calculated by use of the Green and Ampt infiltration equation with an allowance for surface retention loss within HEC-1. Channel routing was performed using normal depth Modified Puls method.

Peak discharges were estimated at various concentration points. Rainfall-runoff models were generated for the 2-, 10-, and 100-year return periods. Generally, the 2-year and 10-year models use a ratio of the 100-year results to compute peak discharges and hydrographs per the 2003 draft Hydrology Manual.

Two land use conditions were evaluated: 1) existing conditions (c.a Dec. 2002) and 2) full build-out of watershed per Maricopa Association of Governments (MAG) land use plan provided by the District.

4.2 Parameter Estimation

4.2.1 Drainage Area Boundaries

The study area watershed and hydrologic subbasins are shown on Exhibit A. The watershed is approximately 9.62 square miles in area. The watershed generally drains from

north to south, discharging at a point located at the Central Arizona Project Canal (CAP canal).

4.2.2 Watershed Work Maps

Refer to Exhibit A for the watershed work maps for HEC-1 modeling. Exhibit B shows the soils data. Exhibit C shows the existing land use distribution used in this analysis. Exhibit D shows the future conditions land use distribution.

4.2.3 Gage Data

No gage data was available for the Biscuit Flats watershed. However, streamflow data have been collected on the larger watersheds surrounding the study area. Cave Creek, Skunk Creek, and the New River all have gage records of over 30 years. These data as well as the USGS regional regression equations are compared to the results of the rainfall-runoff modeling in Section 4.5.

4.2.4 Statistical Parameters

The only statistical data for the Biscuit Flats watershed is for precipitation and those statistics were obtained from the NOAA Atlas 2, Arizona. The statistics from the NOAA Atlas were analyzed to develop the rainfall depth-duration-frequency table for the watershed. The analysis was performed using the PREFRE program. The program output is shown in Table 4.1.

4.2.5 Precipitation

The rainfall depths used for the HEC-1 model were obtained from Table 4.1. Figure 4.1 shows the location of the watershed on the NOAA maps for the data required for input into the PREFRE program. The multiple storm option (JD records) were used to determine

the critical storm at each concentration point in the HEC-1 model. The depth-area reduction factors were applied via the DDMSW 2.1 computer program for used with HEC-1.

The storm duration modeled was the 24-hour storm as described in the drainage Design Manual for Maricopa County. The temporal distributions for the 24-hour storms with the JD records were implemented via the DDMSW program. The 500 square mile index storm was removed from the final models as it was not needed for a 9.62 square mile watershed.

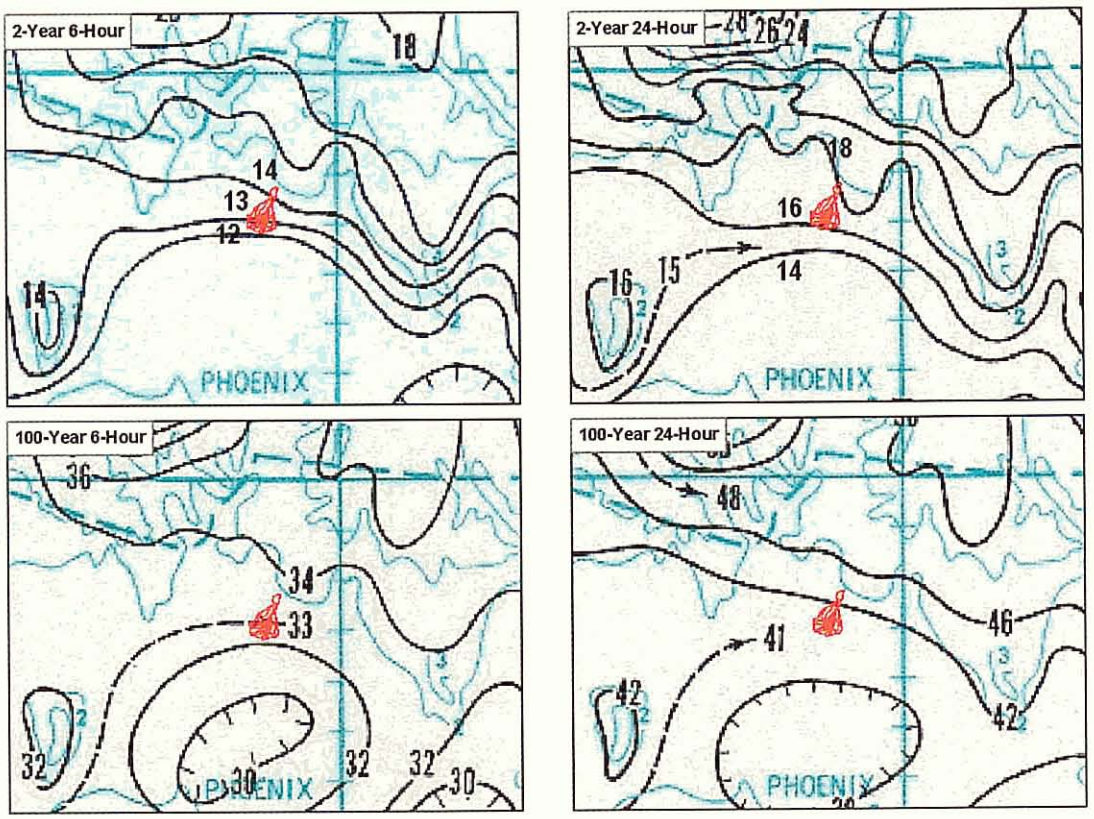

Figure 4.1

Location of the Watershed in Relation to the NOAA Atlas 2, Arizona

Table 4.1

Rainfall Depth Duration Frequency Table for Point Rainfall in the Biscuit Flats Watershed

1

*** O U T P U T D A T A ***

REVISED JUNE 1988 TO UPDATE COMPUTATION OF SHORT-DURATION VALUES

PRECIPITATION FREQUENCY VALUES FOR Biscuit Flats Rainfall
PRIMARY ZONE NUMBER= 7
SHORT-DURATION ZONE NUMBER= 8

POINT VALUES

RETURN PERIOD

DURATION	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR	500-YR	
5-MIN	.31	.42	.49	.59	.67	.74	.92	5-MIN
10-MIN	.47	.64	.75	.90	1.02	1.14	1.41	10-MIN
15-MIN	.57	.79	.94	1.14	1.30	1.46	1.82	15-MIN
30-MIN	.76	1.06	1.27	1.55	1.76	1.98	2.48	30-MIN
1-HR	.93	1.31	1.57	1.93	2.20	2.48	3.11	1-HR
2-HR	1.05	1.48	1.76	2.15	2.46	2.76	3.45	2-HR
3-HR	1.14	1.59	1.89	2.30	2.63	2.94	3.68	3-HR
6-HR	1.30	1.79	2.13	2.59	2.95	3.30	4.12	6-HR
12-HR	1.50	2.05	2.42	2.93	3.33	3.72	4.64	12-HR
24-HR	1.70	2.30	2.71	3.27	3.71	4.15	5.16	24-HR

* IF YOUR SITE IS IN ARIZONA OR NEW MEXICO, PLEASE CONSULT THE FOLLOWING PAPER FOR REVISED DEPTH-AREA VALUES:
DEPTH-AREA RATIOS IN THE SEMI-ARID SOUTHWEST UNITED STATES
NOAA TECHNICAL MEMORANDUM NWS HYDRO-40
ZEHR AND MYERS
AUGUST 1984

INPUT DATA

PROJECT NAME=Biscuit Flats Rainfall
ZONE= 7 SHORT-DURATION ZONE= 8
LATITUDE= .00 LONGITUDE= 100.00 ELEVATION= 0
2-YR, 6-HR PCPN= 1.30 100-YR, 6-HR PCPN= 3.30
2-YR, 24-HR PCPN= 1.70 100-YR, 24-HR PCPN= 4.15

* * * * E N D O F R U N * * * *

The 10-year and 2-year models were computed by use of field 3 on the BA record in HEC-1. A ratio of 0.35 was applied to the 100-year models to compute the 10-year discharge for all of the area. A ratio of 0.10 was applied to the 100-year model in a similar fashion for the 2-year discharge computations. These ratios were selected based on the recommendations in Chapter 6 of the 2003 draft Drainage Design Manual, Hydrology.

4.2.6 Physical Parameters

Rainfall Losses

Rainfall losses were computed using the Green and Ampt method as outlined in the Maricopa County Hydrology Manual. The County's preprocessing program for HEC-1, DDMSW, version 2.1 was used to perform the lumped parameter calculations and to develop the draft HEC-1 models. The development of the soils, land use and subbasin data for use in the DDMSW is described briefly below.

Soils

Based on the NRCS (formerly SCS) Soil Survey of Aguila-Carefree Area (Camp, 1986), there are sixteen different soils in the Biscuit Flats watershed. Descriptions of the soils present on the watershed are contained in Appendix A of the Maricopa County Hydrology Manual, Aguila-Carefree loss rate parameters. The loss rates from Appendix A of the Maricopa County Hydrology manual are integrated into the DDMSW. The spatial distribution of the soil map units for the watershed area is shown on Exhibit B.

Areas of each soil unit in each subbasin were computed using ArcMap-ArcView 8.2 software. These data were imported into the DDMSW. Average subbasin XKSAT values were then computed using logarithmic averaging as implemented in the DDMSW version 2.1.

Refer to Appendix D.1 for all soils data and calculations.

Land Use Information

Two land use conditions were evaluated for the ADMP -- 1) existing land uses, and 2) future build-out land uses based on a Maricopa Association of Governments (MAG) land use plan provided by the District. The future conditions analysis was performed to provide a baseline against which flood control alternatives developed in the ADMP can be measured. Existing land use conditions were evaluated based on GIS files provided by the Flood Control District of Maricopa County and updated to reflect conditions shown in aerial photographs dated February 2002. Future land uses were estimated based on MAG general plan data provided via the Flood Control District. In addition, the data were modified to be comparable with the existing conditions land uses. Exhibit C and Exhibit D show the existing and future land use distributions for the study area, respectively.

Table 4.2 summarizes the hydrologic parameters related to the land use categories used in the existing and future condition analyses for estimation of rainfall excess using the Green and Ampt method and Maricopa County procedures. These parameters include surface retention loss (IA), effective impervious area (RTIMP), surface roughness (Kb Type), vegetation cover (%), and antecedent moisture conditions (DTHETA Condition). The antecedent moisture condition for all areas was assumed to be NORMAL as defined in the Maricopa County Hydrology Manual.

Refer to Appendix D.2 for all land use information and calculations.

Table 4.2

Land Use Types and Hydrologic Parameters (Existing and Future Conditions)

Land Use Code	Description	DTHETA Condition	Vegetation Cover (%)	RTIMP (%)	IA (in)	Kb Type
OPEN	Open Space	Normal	15.00	0	0.35	Low
M.D.R.	Medium Density Residential (1/4 to 1/2 acre lots)	Normal	50.00	30	0.25	Low
M.F.R.	Multiple Family Residential	Normal	50.00	45	0.25	Low
COMM	Commercial	Normal	75.00	80	0.10	Min
IND	Industrial	Normal	60.00	55	0.15	Min
WATER	Lake or Ponding Area	Normal	0.00	100	0.00	Max

Unit Hydrograph

The Clark unit hydrograph method as outlined in the Maricopa County Hydrology Manual was used in the HEC-1 modeling of the watershed. Watershed drainage areas, time of concentration path lengths and slopes were computed using ArcMap – ArcView 8.2 GIS software and examination of the 2002 aerial photographs, 2001 10-foot contour data, and 2-foot contour data available for portions of the area.

Time-area relationships were assigned either 'Urban', 'Natural', or 'HEC-1 default' based on examination of the watershed shapes. That is, the watershed shape and its influence on the time-area relationship were emphasized rather than the name assigned to the time-area distribution in the Maricopa County Hydrology Manual. Therefore, undeveloped watersheds that contribute approximately the same amount of area per unit Tc were assigned the HEC-1 default time-area curve rather than the Natural curve as it is believed to be more representative of the actual hydrologic response. Time-area relationships for the existing and future conditions were assumed to be the same.

Surface roughness values were assigned as shown in Table 4.2 described above.

Time of concentration (Tc) and the Clark storage coefficient (R) were computed using the DDMSW version 2.1 based on the geometric and land use parameters provided. Tables summarizing the Clark unit hydrograph parameters for the existing and future conditions are provided in Appendix D.3.

Routing Parameters

Channel Routing – Routing of the model subbasin hydrographs was done using the Modified Puls normal depth channel option in HEC-1. The routing reach paths are shown on Exhibit A. Each route is identified by a name consisting of the upper and lower subbasin and/or concentration point numbers defining the reach. Reach B10B11, for instance, starts at the outlet of subbasin B10 at the upper end and extends to concentration point B11C at the lower end.

The routing reaches, routing parameters, and related routing information are provided in Appendix D.4. The watershed mapping was used to delineate the routing reaches and estimate the elevations at the end of each channel routing reach. Reach lengths were computed in the ArcMap – ArcView GIS software.

The eight-point channel cross sections input to HEC-1 were estimated from the best available topographic data for that reach. Manning's n values were selected based on field reconnaissance and verified per the Maricopa County Hydrology Manual. The selected cross sections are referenced in the HEC-1 models. A plot of each cross section is provided in Appendix D.4.

The number of routing steps for input to the HEC-1 models was estimated using an iterative process. An initial NSTEP value was estimated based on an estimated channel

velocity divided by the channel length and the model time interval. The HEC-1 models were then run using the assumed values. The reach travel time was then compared to the computed travel time from the HEC-1 model run. This process was repeated until the HEC-1 travel time from the previous run equals the travel time from the current run within the variation possible given the 5 minute time step used in the HEC-1 model.

Channel infiltration losses were not included in the routing computations. These losses were considered negligible for this area. This assumption is supported by the presence of clay at shallow depths below channels in the area as described in excavations performed for the Skunk Creek and Cave Creek Watercourse Master Plans. In addition, XKSAT values in the study area are generally very low which supports the idea of very low to negligible transmission losses.

Reservoir Routing -- Three reservoir routes were performed within the 100-year HEC-1 models – 1) A large stock tank online in Buchanan Wash (RRB5C), 2) The outlet from the Tramonto master planned community (RRB17), and 3) The impoundment area upstream of the CAP (RRB22C). Additional reservoir routes were added in the higher frequency models. RRB4C is added due to the two stock tanks located on Buchanan Wash becoming hydraulically separate in the higher frequency events. Therefore the two stock tanks act as separate storage facilities. Similarly, RRB21C becomes hydraulically disconnected to RRB22C in more frequent events. This route was only added in the 2-year models. Rating curves were established based on available storage volume, outlet structures, and weir sections above outlet structures. Outflow discharges were estimated using HY8 and the culvert geometry found in the field. These analyses are provided in Appendix D.5.

Storage route RRB17 is handled in a slightly different way than the other routes. An overall storage volume was taken from the *Conceptual Master Drainage Report for Tramonto*, prepared for Communities Southwest by Hoskins Engineering Consultants in association with Carter Burgess, Inc., submitted to the City of Phoenix, and dated February 3, 1999. This storage volume was placed at the lower end of the rating curve and therefore

diverted off of the watershed. Above this volume, the rating curve is based on HY8 output from the actual crossings at the Carefree Highway and vertical volume above the diverted volume. Note that not all of the area west of Skunk Creek from Tramonto is contributing area to RRB17. Basin D and portions of F1, C1, and B1, totaling 1.18 ac-ft of retention volume, do not contribute making the total retained volume 27.39 ac-ft and not 28.57. This was confirmed by field reconnaissance. Refer to Appendix D.5 for the related references.

Multiple Frequency Models

Existing Conditions - The 10-year and 2-year discharges were computed based on ratios of the 100-year results as described in the 2003 draft Hydrology Manual. The 2003 Manual recommends computation of the 10-year peak discharge as 35% of the 100-year value. The 2-year peak discharge can be estimated as 10% of the 100-year result. The ratios were applied on field 3 of the BA record in copies of the 100-year HEC-1 model.

Future Conditions – The future condition 10-year and 2-year discharges were computed in a similar manner to the existing condition. To simulate the build-out conditions needed for the ADMP alternatives analysis, each basin's Green and Ampt parameters were recalculated using the MAG general plan data provided by the district. Retention was simulated using formula 3.4 of the Maricopa County Hydrology Manual. This simulation involves taking the 100-year, 2-hour rainfall depth from the PREFRE output and multiplying it by the basin area and an averaged "C" value taken from Table 3.2 of the Maricopa County Hydrology Manual. This calculated volume was then diverted out of the model for each of the individual subbasins.

4.3 Problems Encountered During the Study

4.3.1 Special Problems and Solutions

One special problem was addressed by the use of a diversion operation. As the flow exits Basin B18, it flows into a culvert under Interstate 17. This box culvert is a double 10'x5' reinforced concrete box culvert (RCBC). This structure cannot handle the volume of flow entering it, so it sends a portion of the flow south along Interstate 17. The diversion operation added to the HEC-1 file reflects this problem. The diverted flow from this location is approximately 92 cfs in the 100-year event. This flow eventually enters Skunk Creek upstream of the CAP. The addition of this flow to the Skunk Creek flow would produce little to no changes since the flow is gone before the peak occurs. Refer to Appendix D.6 for HECRAS output and supporting data for this diversion.

4.3.2 Modeling Warning and Error Messages

The HEC-1 models contain numerous warning messages. They are related to "routed flow greater than maximum outflow". This results from the use of JD records and index storms which produce maximum routed discharges greater than the capacity of the normal-depth routing section. These warnings do not affect the results for the basin area of interest at those routing blocks which generate the warning messages.

4.4 Calibration

No calibration of the model was performed as part of this study. However, the results were compared to previous studies such as the *Hydrologic Analyses for Buchanan Wash,* performed by AGK Engineering, Inc. in 1987, as well as the regional regression equations and found to be reasonable. In addition, the methods used in this study have been designed for application to the area and have been found to produce reasonable results in hundreds of studies throughout Maricopa County. At the CAP canal, the 100-year peak discharge from the AGK model was 1,308 cfs as compared with 1,243 from this model. The results are very similar.

4.5 Final Results

4.5.1 Hydrologic analysis results

The results of the modeling are shown in Tables 4.3 through 4.5. Table 4.3 shows the estimated peak discharges, Table 4.4 shows the runoff volume results, and Table 4.5 summarizes the results at key locations within the watershed.

Table 4.3

Summary of Peak Discharge Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Time of Peak						Peak Discharge					
		Existing			Future			Existing			Future		
		2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
Channel Route Operations													
B3B4	2.66	12.83	12.83	12.75	0.00	0.00	13.92	223	787	2278	0	0	772
B6B8	3.86	12.92	13.00	12.92	0.00	0.00	14.17	254	892	2635	0	0	756
B8B10	4.35	13.00	13.08	13.00	0.00	0.00	14.33	281	979	2901	0	0	842
B10B11	4.80	12.92	13.17	13.00	0.00	0.00	14.50	289	994	2964	0	0	834
B11B22	5.21	13.00	13.33	13.17	0.00	0.00	14.75	293	979	2941	0	0	798
B15B16	0.55	12.83	12.67	12.67	0.00	0.00	13.83	37	137	397	0	0	167
B17B18	0.64	0.00	15.92	13.00	0.00	14.50	12.92	0	9	464	0	23	584
B18B19	0.87	13.67	13.08	13.83	0.00	16.25	13.75	18	85	396	0	19	422
B19B20	1.44	13.25	13.50	13.42	0.00	17.58	14.25	45	198	598	0	17	509
B20B22	2.80	13.83	13.33	13.08	0.00	20.25	14.67	115	481	1457	0	14	738
Sub-basin Operations													
B1	0.74	12.50	12.50	12.50	12.50	12.50	12.50	78	275	784	84	295	842
B2	0.91	12.67	12.67	12.67	12.58	12.58	12.58	76	266	759	85	297	849
B3	1.01	12.67	12.67	12.67	12.50	12.50	12.50	82	287	819	96	335	956
B4	0.58	12.25	12.25	12.25	12.25	12.25	12.25	88	308	879	90	315	900

Table 4.3

Summary of Peak Discharge Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Time of Peak						Peak Discharge					
		Existing			Future			Existing			Future		
		2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
B5	0.07	12.17	12.17	12.17	12.17	12.17	12.17	11	37	107	11	38	108
B6	0.54	12.17	12.17	12.17	12.17	12.17	12.17	70	243	695	79	278	795
B7	0.08	12.08	12.08	12.08	12.08	12.08	12.08	16	55	157	16	57	163
B8	0.41	12.58	12.58	12.58	12.58	12.58	12.58	34	118	338	35	124	353
B9	0.38	12.17	12.17	12.17	12.17	12.17	12.17	50	174	499	55	191	546
B10	0.07	12.33	12.33	12.33	12.33	12.33	12.33	7	23	65	7	23	67
B11	0.41	12.08	12.08	12.08	12.08	12.08	12.08	55	193	552	61	213	608
B12	0.21	12.33	12.33	12.33	12.33	12.33	12.33	28	97	278	28	96	276
B13	0.50	12.75	12.75	12.75	12.75	12.75	12.75	34	120	344	35	124	354
B14	0.43	12.67	12.67	12.67	12.58	12.58	12.58	31	107	305	35	124	355
B15	0.12	12.25	12.25	12.25	12.25	12.25	12.25	15	52	148	15	53	151
B16	0.03	12.08	12.08	12.08	12.08	12.08	12.08	5	16	47	5	16	47
B17	0.64	12.17	12.17	12.17	12.17	12.17	12.17	93	326	931	101	352	1006
B18	0.22	12.25	12.25	12.25	12.17	12.17	12.17	37	130	371	45	159	455
B19	0.57	12.50	12.50	12.50	12.33	12.33	12.33	51	179	512	71	250	714

Table 4.3

Summary of Peak Discharge Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Time of Peak						Peak Discharge					
		Existing			Future			Existing			Future		
		2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
B20	0.78	12.50	12.50	12.50	12.42	12.42	12.42	91	319	911	97	338	965
B22	0.36	12.42	12.42	12.42	12.50	12.50	12.50	47	166	474	42	147	420
B21	0.54	12.50	12.50	12.50	12.42	12.42	12.42	36	128	365	45	156	445
Concentration Points													
B3C	2.66	12.58	12.58	12.58	0.00	0.00	13.50	231	810	2314	0	0	861
B4C	3.25	12.75	12.75	12.67	0.00	0.00	13.92	249	885	2581	0	0	808
B5C	3.32	12.83	12.75	12.67	0.00	0.00	13.92	250	897	2620	0	0	812
B6C	3.86	12.83	12.83	12.75	0.00	0.00	14.00	255	907	2671	0	0	784
B8CR	3.94	12.92	12.92	12.92	0.00	0.00	14.17	254	892	2637	0	0	759
B8C	4.35	12.92	12.92	12.83	0.00	0.00	14.17	282	989	2926	0	0	860
B10CL	4.73	12.92	13.00	12.92	0.00	0.00	14.33	285	990	2950	0	0	839
B10C	4.80	12.92	13.00	12.92	0.00	0.00	14.33	290	1004	2993	0	0	853
B11C	5.21	12.75	13.08	13.00	0.00	0.00	14.50	294	1001	2992	0	0	832
B22CR	5.42	12.92	13.33	13.17	0.00	0.00	14.75	302	993	2996	0	0	806
B22CC	5.92	12.83	13.33	13.17	0.00	0.00	14.67	334	1082	3276	0	0	918

Table 4.3

Summary of Peak Discharge Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Time of Peak						Peak Discharge					
		Existing			Future			Existing			Future		
		2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
B15C	0.55	12.58	12.58	12.58	0.00	0.00	13.67	40	141	402	0	0	196
B20CR	0.57	12.75	12.67	12.58	0.00	0.00	13.83	38	142	412	0	0	170
B18C	0.87	12.25	12.25	13.00	0.00	14.50	12.83	37	128	544	0	23	651
B19C	1.44	12.58	12.92	12.75	0.00	16.25	13.67	51	211	617	0	19	544
B20CL	2.22	12.50	12.58	12.58	0.00	17.58	14.17	94	380	1096	0	17	615
B20C	2.80	12.58	12.58	12.58	0.00	17.58	14.08	128	517	1499	0	17	761
B22CC	3.16	13.83	13.25	13.00	0.00	20.25	14.58	121	526	1637	0	14	778
B22CL	3.70	13.83	13.25	13.00	0.00	20.25	14.58	135	606	1916	0	14	849
B22C	9.62	13.42	13.25	13.08	0.00	20.33	14.67	399	1676	5120	0	13	1732
Storage Route Operations													
RRB4C	3.25	12.83	---	---	0.00	---	---	247	---	---	0	---	---
RRB5C	3.32	12.92	12.83	12.83	0.00	0.00	14.003	248	875	2554	0	0	787
RRB17	0.64	0.00	14.92	12.50	0.00	13.92	12.42	0	10	602	0	23	752
RRB21C	0.54	13.92	---	---	0.00	---	---	14	---	---	0	---	---
RRB22C	9.62	13.50	14.33	15.50	0.00	20.33	15.67	398	946	1243	0	13	934
Diversion Operations													

Table 4.3

Summary of Peak Discharge Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Time of Peak						Peak Discharge					
		Existing			Future			Existing			Future		
		2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
R1OUT	0.74	---	---	---	12.50	12.50	12.50	---	---	---	84	295	842
RETB1	0.74	---	---	---	0.00	0.00	13.83	---	---	---	0	0	179
R2OUT	0.91	---	---	---	12.58	12.58	12.58	---	---	---	85	297	849
RETB2	0.91	---	---	---	0.00	0.00	13.50	---	---	---	0	0	394
R3OUT	1.01	---	---	---	12.50	12.50	12.50	---	---	---	96	335	956
RETB3	1.01	---	---	---	0.00	0.00	13.50	---	---	---	0	0	421
R4OUT	0.58	---	---	---	12.25	12.25	12.25	---	---	---	90	315	900
RETB4	0.58	---	---	---	0.00	0.00	13.08	---	---	---	0	0	141
R5OUT	0.07	---	---	---	12.17	12.17	12.17	---	---	---	11	38	108
RETB5	0.07	---	---	---	0.00	0.00	12.75	---	---	---	0	0	24
R6OUT	0.54	---	---	---	12.17	12.17	12.17	---	---	---	79	278	795
RETB6	0.54	---	---	---	0.00	0.00	16.92	---	---	---	0	0	5
R7OUT	0.08	---	---	---	12.08	12.08	12.08	---	---	---	16	57	163
RETB7	0.08	---	---	---	0.00	0.00	12.83	---	---	---	0	0	7
R8OUT	0.41	---	---	---	12.58	12.58	12.58	---	---	---	35	124	353

Table 4.3

Summary of Peak Discharge Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Time of Peak						Peak Discharge					
		Existing			Future			Existing			Future		
		2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
RETB8	0.41	---	---	---	0.00	0.00	13.42	---	---	---	0	0	192
R9OUT	0.38	---	---	---	12.17	12.17	12.17	---	---	---	55	191	546
RETB9	0.38	---	---	---	0.00	0.00	15.00	---	---	---	0	0	5
R10OUT	0.07	---	---	---	12.33	12.33	12.33	---	---	---	7	23	67
RETB10	0.07	---	---	---	0.00	0.00	13.25	---	---	---	0	0	35
R11OUT	0.41	---	---	---	12.08	12.08	12.08	---	---	---	61	213	608
RETB11	0.41	---	---	---	0.00	0.00	15.42	---	---	---	0	0	5
R12OUT	0.21	---	---	---	12.33	12.33	12.33	---	---	---	28	96	276
RETB12	0.21	---	---	---	0.00	0.00	12.92	---	---	---	0	0	113
R13OUT	0.50	---	---	---	12.75	12.75	12.75	---	---	---	35	124	354
RETB13	0.50	---	---	---	0.00	0.00	13.75	---	---	---	0	0	210
R14OUT	0.43	---	---	---	12.58	12.58	12.58	---	---	---	35	124	355
RETB14	0.43	---	---	---	0.00	0.00	13.67	---	---	---	0	0	171
R15OUT	0.12	---	---	---	12.25	12.25	12.25	---	---	---	15	53	151
RETB15	0.12	---	---	---	0.00	0.00	12.83	---	---	---	0	0	73

Table 4.3

Summary of Peak Discharge Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Time of Peak						Peak Discharge					
		Existing			Future			Existing			Future		
		2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (hrs)	10-Yr (hrs)	100-Yr (hrs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
R16OUT	0.03	---	---	---	12.08	12.08	12.08	---	---	---	5	16	47
RETB16	0.03	---	---	---	0.00	0.00	12.42	---	---	---	0	0	25
R18OUT	0.22	---	---	---	12.17	12.17	12.17	---	---	---	45	159	455
RETB18	0.22	---	---	---	0.00	0.00	12.50	---	---	---	0	0	165
DIV18	0.87	0.00	0.00	13.00	0.00	0.00	12.83	0	0	92	0	0	154
B18D	0.87	12.25	12.25	13.00	0.00	14.58	12.83	37	128	452	0	22	497
R19OUT	0.57	---	---	---	12.33	12.33	12.33	---	---	---	71	250	714
RETB19	0.57	---	---	---	0.00	0.00	13.00	---	---	---	0	0	307
R20OUT	0.78	---	---	---	12.42	12.42	12.42	---	---	---	97	338	965
RETB20	0.78	---	---	---	0.00	0.00	13.25	---	---	---	0	0	347
R22OUT	0.36	---	---	---	12.50	12.50	12.50	---	---	---	42	147	420
RETB22	0.36	---	---	---	0.00	0.00	12.75	---	---	---	0	0	336
R21OUT	0.54	---	---	---	12.42	12.42	12.42	---	---	---	45	156	445
RETB21	0.54	---	---	---	0.00	0.00	13.83	---	---	---	0	0	146

Table 4.4

Summary of Runoff Volume Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Rainfall Excess						Runoff Volume					
		Existing			Future			Existing			Future		
		2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)
Channel Route Operations													
B3B4	2.66	0.279	0.977	2.792	0.000	0.000	1.066	39.58	138.60	396.09	0.00	0.00	151.23
B6B8	3.86	0.243	0.850	2.428	0.000	0.000	0.814	50.03	174.99	499.84	0.00	0.00	167.58
B8B10	4.35	0.246	0.861	2.460	0.000	0.000	0.851	57.07	199.75	570.72	0.00	0.00	197.43
B10B11	4.80	0.237	0.829	2.370	0.000	0.000	0.794	60.67	212.22	606.72	0.00	0.00	203.26
B11B22	5.21	0.228	0.797	2.278	0.000	0.000	0.734	63.35	221.46	632.98	0.00	0.00	203.95
B15B16	0.55	0.306	1.071	3.060	0.000	0.000	1.319	8.97	31.42	89.76	0.00	0.00	38.69
B17B18	0.64	0.000	0.123	1.834	0.000	0.267	2.247	0.00	4.20	62.60	0.00	9.11	76.70
B18B19	0.87	0.066	0.320	1.907	0.000	0.195	1.837	3.06	14.85	88.48	0.00	9.05	85.24
B19B20	1.44	0.141	0.543	2.150	0.000	0.115	1.594	10.83	41.70	165.12	0.00	8.83	122.42
B20B22	2.80	0.205	0.741	2.428	0.000	0.058	1.329	30.61	110.66	362.58	0.00	8.66	198.46
Sub-basin Operations													
B1	0.74	0.228	0.798	2.279	0.284	0.994	2.841	9.00	31.49	89.94	11.21	39.23	112.12
B2	0.91	0.304	1.065	3.043	0.352	1.232	3.520	14.75	51.69	147.69	17.08	59.79	170.84
B3	1.01	0.304	1.063	3.039	0.342	1.198	3.424	16.38	57.26	163.70	18.42	64.53	184.44

Table 4.4

Summary of Runoff Volume Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Rainfall Excess						Runoff Volume					
		Existing			Future			Existing			Future		
		2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)
B4	0.58	0.207	0.725	2.072	0.262	0.916	2.616	6.40	22.43	64.09	8.10	28.33	80.92
B5	0.07	0.213	0.747	2.133	0.259	0.908	2.594	0.80	2.79	7.96	0.97	3.39	9.68
B6	0.54	0.123	0.430	1.229	0.204	0.714	2.041	3.54	12.38	35.40	5.88	20.56	58.78
B7	0.08	0.159	0.555	1.587	0.236	0.827	2.362	0.68	2.37	6.77	1.01	3.53	10.08
B8	0.41	0.307	1.075	3.070	0.340	1.190	3.400	6.71	23.51	67.13	7.43	26.02	74.35
B9	0.38	0.132	0.461	1.317	0.210	0.736	2.101	2.68	9.34	26.69	4.26	14.92	42.58
B10	0.07	0.313	1.096	3.132	0.346	1.212	3.462	1.17	4.09	11.69	1.29	4.52	12.92
B11	0.41	0.128	0.449	1.282	0.208	0.727	2.077	2.80	9.82	28.03	4.55	15.90	45.42
B12	0.21	0.186	0.649	1.856	0.268	0.938	2.679	2.08	7.27	20.79	3.00	10.51	30.00
B13	0.50	0.306	1.072	3.064	0.342	1.198	3.424	8.16	28.59	81.71	9.12	31.95	91.31
B14	0.43	0.307	1.074	3.068	0.341	1.192	3.406	7.04	24.63	70.36	7.82	27.34	78.11
B15	0.12	0.312	1.090	3.115	0.344	1.206	3.445	2.00	6.98	19.94	2.20	7.72	22.05
B16	0.03	0.317	1.108	3.166	0.350	1.224	3.497	0.51	1.77	5.07	0.56	1.96	5.60
B17	0.64	0.263	0.921	2.633	0.305	1.066	3.046	8.98	31.44	89.87	10.41	36.39	103.97
B18	0.22	0.260	0.910	2.601	0.363	1.272	3.633	3.05	10.68	30.52	4.26	14.92	42.63

Table 4.4

Summary of Runoff Volume Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Rainfall Excess						Runoff Volume					
		Existing			Future			Existing			Future		
		2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)
B19	0.57	0.257	0.899	2.567	0.357	1.249	3.568	7.81	27.33	78.04	10.85	37.97	108.47
B20	0.78	0.260	0.910	2.600	0.295	1.033	2.952	10.82	37.86	108.16	12.27	42.97	122.80
B22	0.36	0.260	0.910	2.599	0.318	1.113	3.181	4.99	17.47	49.90	6.11	21.37	61.08
B21	0.54	0.195	0.681	1.946	0.285	0.998	2.851	5.62	19.61	56.04	8.21	28.74	82.11
Concentration Points													
B3C	2.66	0.279	0.977	2.792	0.000	0.000	1.066	39.58	138.60	396.09	0.00	0.00	151.23
B4C	3.25	0.265	0.927	2.648	0.000	0.000	0.958	45.93	160.68	458.99	0.00	0.00	166.05
B5C	3.32	0.263	0.922	2.635	0.000	0.000	0.948	46.57	163.26	466.57	0.00	0.00	167.86
B6C	3.86	0.243	0.850	2.428	0.000	0.000	0.815	50.03	174.99	499.84	0.00	0.00	167.78
B8CR	3.94	0.241	0.843	2.409	0.000	0.000	0.803	50.64	177.14	506.21	0.00	0.00	168.74
B8C	4.35	0.246	0.861	2.460	0.000	0.000	0.851	57.07	199.75	570.72	0.00	0.00	197.43
B10CL	4.73	0.236	0.826	2.361	0.000	0.000	0.786	59.53	208.37	595.60	0.00	0.00	198.28
B10C	4.80	0.237	0.829	2.370	0.000	0.000	0.794	60.67	212.22	606.72	0.00	0.00	203.26
B11C	5.21	0.228	0.797	2.278	0.000	0.000	0.734	63.35	221.46	632.98	0.00	0.00	203.95
B22CR	5.42	0.226	0.790	2.258	0.000	0.000	0.737	65.33	228.36	652.71	0.00	0.00	213.04

Table 4.4

Summary of Runoff Volume Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Rainfall Excess						Runoff Volume					
		Existing			Future			Existing			Future		
		2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)
B22CC	5.92	0.232	0.811	2.317	0.000	0.000	0.794	73.25	256.06	731.55	0.00	0.00	250.69
B15C	0.55	0.306	1.071	3.060	0.000	0.000	1.319	8.98	31.42	89.76	0.00	0.00	38.69
B20CR	0.57	0.306	1.070	3.058	0.000	0.000	1.323	9.30	32.53	92.96	0.00	0.00	40.22
B18C	0.87	0.066	0.320	2.014	0.000	0.198	1.990	3.06	14.85	93.45	0.00	9.19	92.34
B19C	1.44	0.141	0.543	2.150	0.000	0.118	1.594	10.83	41.70	165.12	0.00	9.06	122.42
B20CL	2.22	0.181	0.664	2.287	0.000	0.075	1.352	21.43	78.62	270.78	0.00	8.88	160.08
B20C	2.80	0.205	0.741	2.428	0.000	0.058	1.329	30.61	110.66	362.58	0.00	8.66	198.46
B22CC	3.16	0.210	0.756	2.436	0.000	0.051	1.358	35.39	127.41	410.55	0.00	8.60	228.87
B22CL	3.70	0.207	0.741	2.353	0.000	0.043	1.265	40.85	146.22	464.33	0.00	8.49	249.63
B22C	9.62	0.220	0.777	2.310	0.000	0.016	0.955	112.87	398.65	1185.18	0.00	8.21	489.98
Storage Route Operations													
RRB4C	3.25	0.265	---	---	0.000	---	---	45.93	---	---	0.00	---	---
RRB5C	3.32	0.263	0.922	2.635	0.000	0.000	0.948	46.57	163.26	466.57	0.00	0.00	167.86
RRB17	0.64	0.000	0.123	1.834	0.000	0.267	2.247	0.00	4.20	62.60	0.00	9.11	76.70
RRB21C	0.54	0.195	---	---	0.000	---	---	5.62	---	---	0.00	---	---

Table 4.4

Summary of Runoff Volume Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Rainfall Excess						Runoff Volume					
		Existing			Future			Existing			Future		
		2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)
RRB22C	9.62	0.220	0.777	2.311	0.000	0.016	0.955	112.87	398.65	1185.70	0.00	8.21	489.98
Diversion Operations													
R1OUT	0.74	---	---	---	0.284	0.994	2.182	---	---	---	11.21	39.23	86.12
RETB1	0.74	---	---	---	0.000	0.000	0.659	---	---	---	0.00	0.00	26.01
R2OUT	0.91	---	---	---	0.352	1.232	2.189	---	---	---	17.08	59.79	106.24
RETB2	0.91	---	---	---	0.000	0.000	1.331	---	---	---	0.00	0.00	64.60
R3OUT	1.01	---	---	---	0.342	1.198	2.202	---	---	---	18.42	64.53	118.61
RETB3	1.01	---	---	---	0.000	0.000	1.222	---	---	---	0.00	0.00	65.83
R4OUT	0.58	---	---	---	0.262	0.916	2.071	---	---	---	8.10	28.33	64.06
RETB4	0.58	---	---	---	0.000	0.000	0.545	---	---	---	0.00	0.00	16.86
R5OUT	0.07	---	---	---	0.259	0.908	1.957	---	---	---	0.97	3.39	7.31
RETB5	0.07	---	---	---	0.000	0.000	0.637	---	---	---	0.00	0.00	2.38
R6OUT	0.54	---	---	---	0.204	0.714	1.976	---	---	---	5.88	20.56	56.91
RETB6	0.54	---	---	---	0.000	0.000	0.066	---	---	---	0.00	0.00	1.90
R7OUT	0.08	---	---	---	0.236	0.827	1.957	---	---	---	1.01	3.53	8.35

Table 4.4

Summary of Runoff Volume Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Rainfall Excess						Runoff Volume					
		Existing			Future			Existing			Future		
		2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)
RETB7	0.08	---	---	---	0.000	0.000	0.405	---	---	---	0.00	0.00	1.73
R8OUT	0.41	---	---	---	0.340	1.190	1.969	---	---	---	7.43	26.02	43.06
RETB8	0.41	---	---	---	0.000	0.000	1.432	---	---	---	0.00	0.00	31.31
R9OUT	0.38	---	---	---	0.210	0.736	1.961	---	---	---	4.26	14.92	39.74
RETB9	0.38	---	---	---	0.000	0.000	0.141	---	---	---	0.00	0.00	2.86
R10OUT	0.07	---	---	---	0.346	1.212	1.955	---	---	---	1.29	4.52	7.30
RETB10	0.07	---	---	---	0.000	0.000	1.507	---	---	---	0.00	0.00	5.63
R11OUT	0.41	---	---	---	0.208	0.727	1.957	---	---	---	4.55	15.90	42.79
RETB11	0.41	---	---	---	0.000	0.000	0.120	---	---	---	0.00	0.00	2.62
R12OUT	0.21	---	---	---	0.268	0.938	1.741	---	---	---	3.00	10.51	19.50
RETB12	0.21	---	---	---	0.000	0.000	0.938	---	---	---	0.00	0.00	10.51
R13OUT	0.50	---	---	---	0.342	1.198	1.893	---	---	---	9.12	31.95	50.48
RETB13	0.50	---	---	---	0.000	0.000	1.530	---	---	---	0.00	0.00	40.80
R14OUT	0.43	---	---	---	0.341	1.192	2.107	---	---	---	7.82	27.34	48.32
RETB14	0.43	---	---	---	0.000	0.000	1.299	---	---	---	0.00	0.00	29.79

Table 4.4

Summary of Runoff Volume Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Rainfall Excess						Runoff Volume					
		Existing			Future			Existing			Future		
		2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)
R15OUT	0.12	---	---	---	0.344	1.206	1.963	---	---	---	2.20	7.72	12.56
RETB15	0.12	---	---	---	0.000	0.000	1.482	---	---	---	0.00	0.00	9.48
R16OUT	0.03	---	---	---	0.350	1.224	1.958	---	---	---	0.56	1.96	3.13
RETB16	0.03	---	---	---	0.000	0.000	1.539	---	---	---	0.00	0.00	2.46
R18OUT	0.22	---	---	---	0.363	1.272	2.303	---	---	---	4.26	14.92	27.02
RETB18	0.22	---	---	---	0.000	0.000	1.331	---	---	---	0.00	0.00	15.62
DIV18	0.87	0.000	0.000	0.107	0.000	0.000	0.153	0.00	0.00	4.96	0.00	0.00	7.10
B18D	0.87	0.066	0.320	1.907	0.000	0.195	1.837	3.06	14.85	88.48	0.00	9.05	85.24
R19OUT	0.57	---	---	---	0.357	1.249	2.291	---	---	---	10.85	37.97	69.65
RETB19	0.57	---	---	---	0.000	0.000	1.278	---	---	---	0.00	0.00	38.85
R20OUT	0.78	---	---	---	0.295	1.033	1.989	---	---	---	12.27	42.97	82.74
RETB20	0.78	---	---	---	0.000	0.000	0.963	---	---	---	0.00	0.00	40.06
R22OUT	0.36	---	---	---	0.318	1.113	1.496	---	---	---	6.11	21.37	28.72
RETB22	0.36	---	---	---	0.000	0.000	1.685	---	---	---	0.00	0.00	32.35
R21OUT	0.54	---	---	---	0.285	0.998	2.044	---	---	---	8.21	28.74	58.87

Table 4.4

Summary of Runoff Volume Results for the Biscuit Flats HEC-1 Models

HEC-1 ID	Drainage Area (sq. mi.)	Rainfall Excess						Runoff Volume					
		Existing			Future			Existing			Future		
		2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (in)	10-Yr (in)	100-Yr (in)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)	2-Yr (ac-ft)	10-Yr (ac-ft)	100-Yr (ac-ft)
RETB21	0.54	---	---	---	0.000	0.000	0.807	---	---	---	0.00	0.00	23.24

Table 4.5

Summary of Results at Key Locations within the Watershed

Concentration Point Location	HEC-1 ID	Drainage Area (sq. mi.)	Peak Discharge					
			Existing			Future		
			2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
Carefree Highway below Tramonto	RRB17	0.64	0	10	602	0	23	752
I17	B18D	0.87	37	128	452	0	22	497
Diverted Flow south along east side of I17	DIV18	0.87	0	0	92	0	0	154
Central Arizona Project (CAP) Canal	RRB22C	9.62	398	946	1243	0	13	934

4.5.2 Verification of Results

HEC-1 modeling results were verified using the indirect methods documented in Chapter 10 of the *ADOT Highway Drainage Design Manual: Hydrology* (ADOT Manual). Three procedures are provided for obtaining estimates of peak discharges for watershed in Arizona. The Biscuit Flats watershed is well suited for a comparative analysis using these methods because it is hydrologically similar to the watershed used to develop the indirect methods. The Biscuit Flats watershed, in general, is undeveloped, natural land, with soil and vegetation conditions that are conducive to neither very low rainfall losses or to excessive rainfall losses. The watershed slopes are not exceptionally steep or flat and there are no significant distributary flow areas. Because of the storage routes, it is necessary to compare the results in two separate categories: 1) HEC-1 operations that are upstream of storage routes and not affected by them and 2) HEC-1 operations that fall below storage routes. Storage routes tend to make the results appear lower than comparative subbasins due to the loss of volume and reduction of the peak discharge. A summary of the verification results is given in the following paragraphs. The future condition models were not used in the verification process. This is due to the fact that hypothetical modeling of retention was performed to simulate build out conditions within the watershed. This type of modeling will skew the results when comparing them to existing condition watersheds. Only the existing conditions models were compared.

<u>Indirect Method 1: Unit Peak Discharge Curves</u>

Figure 10-1 in the ADOT Manual shows peak discharge relations and envelope curves from 10 different hydrologic studies. Curves C, G, and H represent data sets from 100-year peak discharge studies. The unit peak discharge from the Biscuit Flats model falls within the area bounded by these three curves. Refer to Figure 4.2 for indirect method 1 comparison.

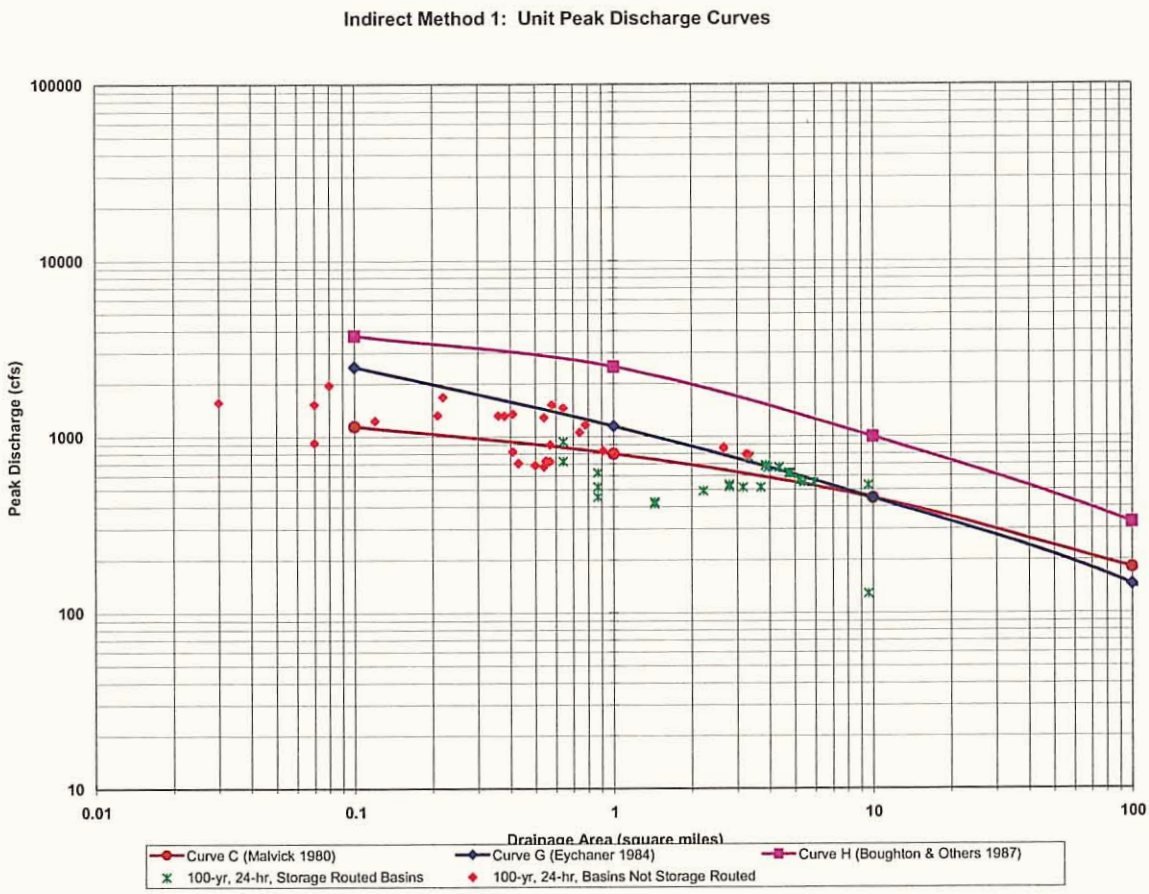

Figure 4.2

Indirect Method 1 Comparison

Indirect Method 2: USGS Data for Arizona

The U.S. Geological Survey analyzed streamflow data from 314 gaging stations in Arizona. Figure 10-3 in the ADOT Manual is a plot of the 100-year peak discharge and the maximum recorded discharge for each gaging station versus drainage area. The least squares method was used to fit lines to the two log-transformed data sets. The peak discharge from the Biscuit Flats model falls within the tolerance limits for the fitted 100-year peak discharge line and is not outside of the scattered "cloud" of data point used to make the graph. Refer to Figure 4.3 for indirect method 2 comparison.

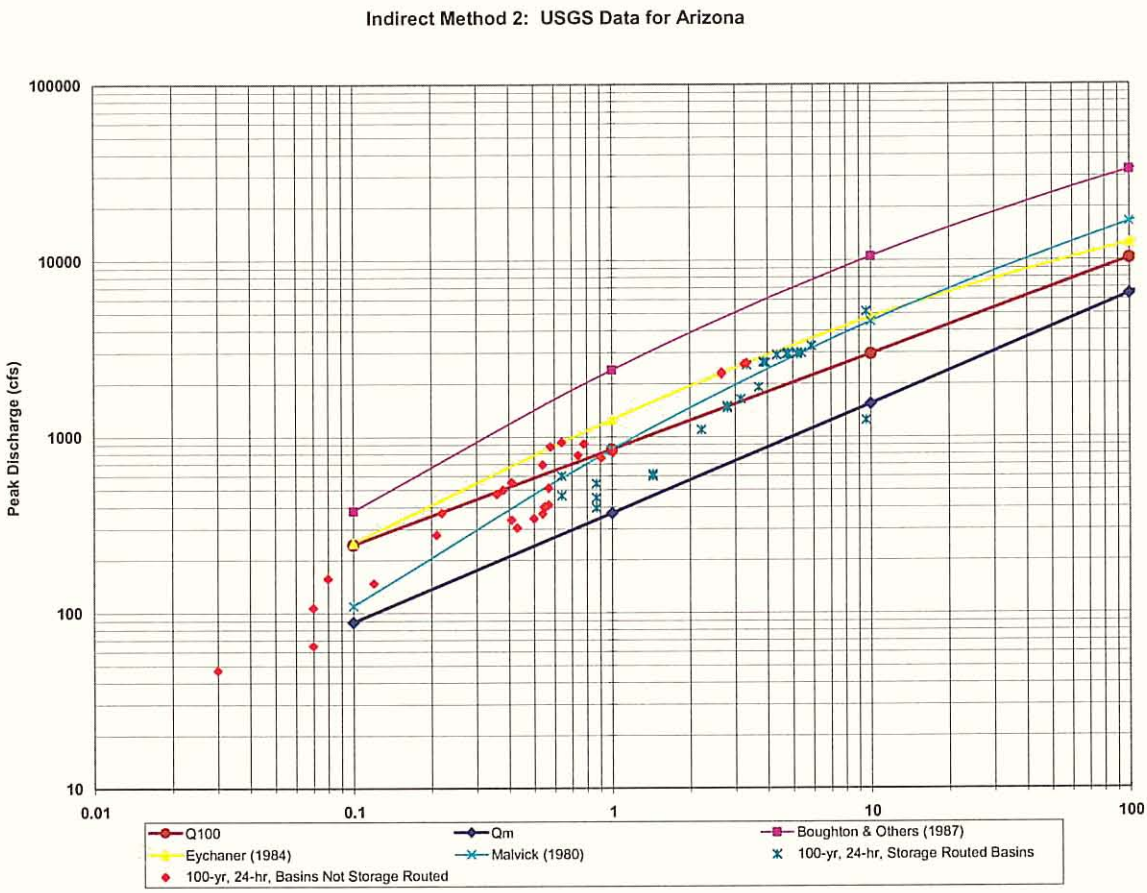

Figure 4.3

Indirect Method 2 Comparison

Indirect Method 3: Regional Regression Equations

Sixteen sets of regional regression equations were developed from streamflow data for a study area comprised of 10 western states. Seven of the regions are in Arizona. Biscuit Flats falls in Region 12. Figure 4.4 shows a comparison of the regional regression equations, overall envelope curve, and HEC-1 operation results from this study. The mean basin elevation versus drainage area for Biscuit Flats falls along or just below the curve.

The results of all three methods, show that the peak discharges in this study fall well within the range of acceptable results. Refer to Appendix D for all hydrologic supporting data.

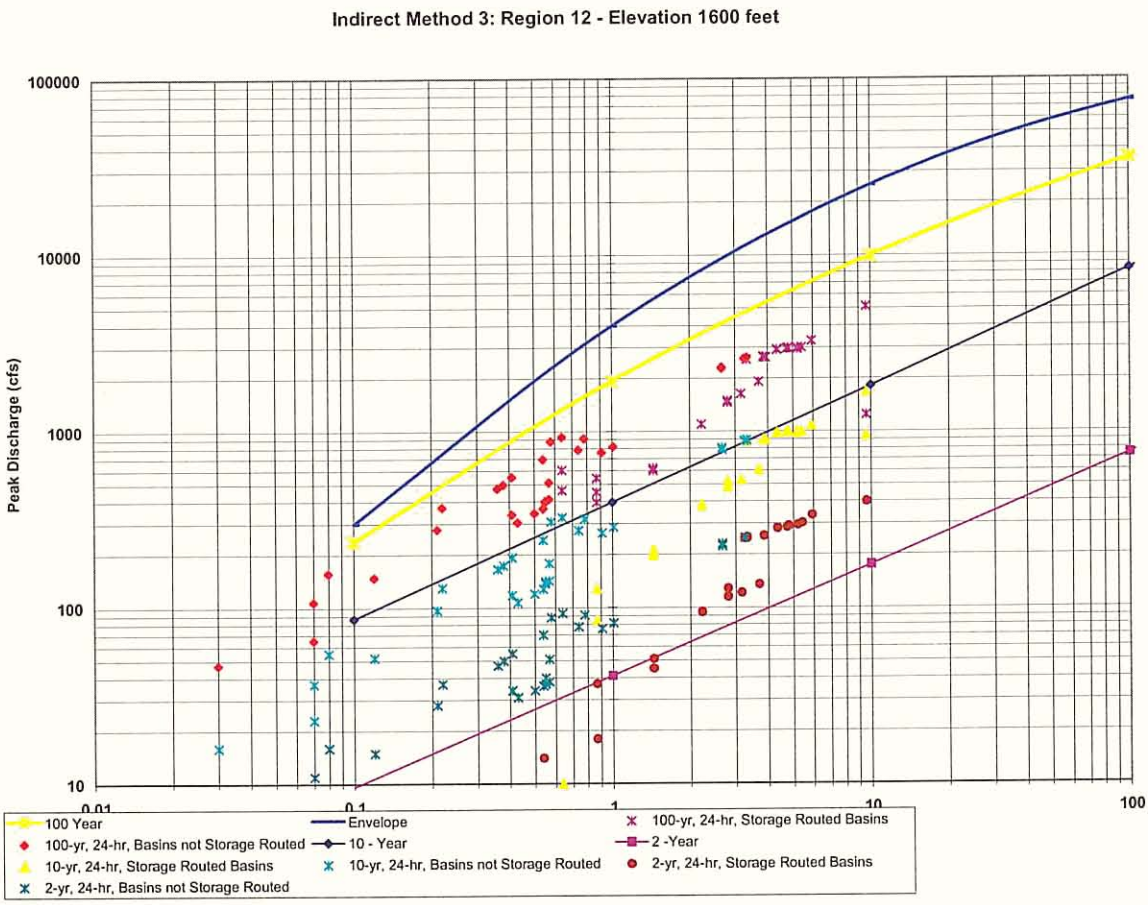

Figure 4.4

Indirect Method 3 Comparison

SECTION 5: HYDRAULICS

Floodplain delineation in the Biscuit Flats area is provided under a different cover. This report was not performed for the purposes of a floodplain delineation study. Therefore, no hydraulic modeling is presented in this Technical Data Notebook. Hydraulic modeling performed in conjunction with the rainfall-runoff modeling is presented in Section 4 and Appendix D.

SECTION 6: SEDIMENT TRANSPORT/EROSION

No sediment transport modeling was performed as a part of the hydrology study for the ADMP.

SECTION 7: DRAFT FIS

Floodplain delineation was performed under a separate cover. This report was not performed for the purpose of a floodplain delineation study. Therefore, a Draft FIS is not presented.

Appendices

Appendix A

Bibliography

Flood Control District of Maricopa County, 2003, *draft Drainage Design Manual, Volume I, Hydrology*, draft revisions to the 1995 edition.

Flood Control District of Maricopa County, 1995, *Drainage Design Manual, Volume I, Hydrology*, as revised January 1, 1995.

U.S. Army Corps of Engineers, 1990, HEC-*1 Flood Hydrograph Package, User's Manual*, CPD-1A.

Arizona Department of Transportation, April 1994, *Highway Drainage Manual – Hydrology*, Phoenix, Arizona.

Maricopa Association of Governments, 1995, *General Plan Land Use Database*, a GIS database.

U.S. Department of the Interior, 1994, *Methods for Estimating Magnitude and Frequency of Floods in the Southwestern United States,* U.S. Geological Survey Open-File Report 93-419.

AGK Engineering, Inc., 1987, *Hydrologic Analyses for Buchanan Wash Maricopa County, Arizona*, Performed for the Maricopa County Flood Control District.

Appendix B

Correspondence

Message 1:

From: Ted Lehman [ted@jefuller.com]
Sent: Monday, March 03, 2003 1:25 PM
To: pat deschamps
Cc: Jeff Despain
Subject: Future Conditions Hydrology for Bisquit Flat

Pat,

This message is to inform you of my recommendations for the future conditions land use assumptions for the hydrologic modeling for the Bisquit Flat area for the Adobe Dam / Desert Hills ADMP.

As you know we had been waiting for the conclusions of your discussions with ASLD regarding disposition, etc. of much of the property within the area before making a decision. It seems from those discussions that no definitive plan is likely to be decided upon within the time frame needed for our analyses. Therefore, I am making the recommendation that we proceed with an assumption of medium density residential land use over the entire watershed minus the steep areas around the Deems Hills. This assumption appears reasonable for the purposes of the ADMP for a number of reasons.

1) Whatever development that occurs in the area, 100-year 2-hour retention will almost certainly be required. Therefore, the future conditions runoff will be less than or similar to the existing runoff conditions.
2) Medium density residential has a sort of middle of the road set of hydrologic parameters that would be similar to the average of some higher intensity land uses like commercial sites and lower density residential and/or open space uses. Since we are using a lumped parameter modeling approach, an average land use should yield hydrologic parameters similar to an average of different land uses.
3) Uncertainties about the precise future land use distributions will not be worked out until very shortly before construction.
4) Future development within this area is within the City of Phoenix and will be required to submit detailed engineering plans including drainage for any development in the watershed.

Therefore, unless I hear otherwise from you in the next few days, we will proceed with an assumption of medium density residential land use for the Bisquit Flat area for the future conditions hydrology.

Ted Lehman, P.E.
JE Fuller/ Hydrology & Geomorphology, Inc.
Tempe, AZ

Message 2:

From: Pat Deschamps [pat@jefuller.com]
Sent: Monday, March 03, 2003 1:38 PM
To: Ted Lehman
Cc: Jeff Despain
Subject: RE: Future Conditions Hydrology for Bisquit Flat

Ted,
I agree with your justification for use of an assumed future condition of medium density residential land use for the Bisquit Flat area. Please proceed with the future condition hydrologic analysis for this watershed on this basis as outlined in your message.

Thank you,
Pat

-----Original Message-----
From: Ted Lehman [mailto:ted@jefuller.com]
Sent: Monday, March 03, 2003 1:25 PM
To: pat deschamps
Cc: Jeff Despain
Subject: Future Conditions Hydrology for Bisquit Flat

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As you know we had been waiting for the conclusions of your discussions with ASLD regarding disposition, etc. of much of the property within the area before making a decision. It seems from those discussions that no definitive plan is likely to be decided upon within the time frame needed for our analyses. Therefore, I am making the recommendation that we proceed with an assumption of medium density residential land use over the entire watershed minus the steep areas around the Deems Hills. This assumption appears reasonable for the purposes of the ADMP for a number of reasons.

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2) Medium density residential has a sort of middle of the road set of hydrologic parameters that would be similar to the average of some higher intensity land uses like commercial sites and lower density residential and/or open space uses. Since we are using a lumped parameter modeling approach, an average land use should yield hydrologic parameters similar to an average of different land uses.
3) Uncertainties about the precise future land use distributions will not be worked out until very shortly before construction.

4) Future development within this area is within the City of Phoenix and will be required to submit detailed engineering plans including drainage for any development in the watershed.

Therefore, unless I hear otherwise from you in the next few days, we will proceed with an assumption of medium density residential land use for the Bisquit Flat area for the future conditions hydrology.

Ted Lehman, P.E.
JE Fuller/ Hydrology & Geomorphology, Inc.
Tempe, AZ

Message 3:

From: Pat Deschamps [pat@jefuller.com]
Sent: Tuesday, June 17, 2003 3:30 PM
To: Afshin Ahouraiyan
Cc: Dave Degerness; Jeff Despain
Subject: Upper Buchanan Wash hydrology

Afshin,
Jeff Despain tells me that Dave Degerness has reviewed the reanalysis of that portion of the upper Buchanan Wash hydrology model which includes the revisions to account for the Tramanto basins. Dave told Jeff that he is ok with our rating curve analysis. We need written approval from you stating it is ok to use the current model for existing conditions. Clearly, this also affects the I-17 flow split and the floodplain delineation downstream of I-17.

Also, we need some direction on whether you want us to use the rating curve for the future condition model. Jeff and Dave also talked about what general land use data should be used for the future condition model.

Can you coordinate with Dave and let us know how you want us to proceed with the existing condition, future condition, and floodplain delineation models? Please contact Jeff directly if you need further information or have any questions.

Thank you,
Pat

Message 4:

From: Jeff Despain [jeff@jefuller.com]
Sent: Monday, June 30, 2003 2:06 PM
To: Dave Degerness
Cc: Afshin Ahouraiyan; Pat Deschamps
Subject: Bisquit Flats Landuse file

Dave,

I have attached two .jpg files showing the difference between the file that we already received during data collection, and the one that I received from you on 6/16. We just need to know which one we should use. We only want to cut the file once, so your timely response would be appreciated. It appears to me that they are the same file with the one that you provided being a more simplistic version. I would prefer to use your file, because the landuses are simplified. Let me know.

Thanks,

Jeffrey A. Despain, P.E.

Water Resources Engineer

JE Fuller Hydrology & Geomorphology, Inc.

480-752-2124 Ext. 25

FAX 480-839-2193

jeff@jefuller.com

Message 5:

From: Dave Degerness - FCDX [djd@mail.maricopa.gov]
Sent: Tuesday, July 01, 2003 6:04 AM
To: 'Jeff Despain'
Cc: Kevin LaVallee - FCDX
Subject: RE: Bisquit Flats Landuse file

Jeff,

I was out yesterday and today I am going out into the field till 12 noon. I believe that what I gave to you was the latest mag update for future landuse conditions. I have asked Kevin of our GIS dept to look into this. If he doesn't respond to either you or me, go ahead and use the file I provided to you. Thanks

Dave Degerness

-----Original Message-----
From: Jeff Despain [mailto:jeff@jefuller.com]
Sent: Monday, June 30, 2003 2:06 PM
To: Dave Degerness
Cc: Afshin Ahouraiyan; Pat Deschamps
Subject: Bisquit Flats Landuse file

Dave,

I have attached two .jpg files showing the difference between the file that we already received during data collection, and the one that I received from you on 6/16. We just need to know which one we should use. We only want to cut the file once, so your timely response would be appreciated. It appears to me that they are the same file with the one that you provided being a more simplistic version. I would prefer to use your file, because the landuses are simplified. Let me know.

Thanks,

Jeffrey A. Despain, P.E.

Water Resources Engineer

JE Fuller Hydrology & Geomorphology, Inc.

480-752-2124 Ext. 25

FAX 480-839-2193

jeff@jefuller.com

Message 6:

From: Pat Deschamps [pat@jefuller.com]
Sent: Wednesday, July 02, 2003 9:40 AM
To: Afshin Ahouraiyan
Cc: Brian Iserman; Jeff Despain; Dave Degerness
Subject: Upper Buchanan Wash hydrology approval

Importance: High

Afshin,
Jeff Despain tells me that Dave Degerness has reviewed and approved the revised hydrology for upper Buchanan Wash which incorporates the Tramanto basins and revises the flow split discharges at the I-17 culvert. We are finalizing the hydrology report for this area and we would like to finish and submit the upper Buchanan Wash floodplain delineation study also. Although we have verbal approval from Dave, I request written approval from you before we complete the FDS as it is dependent upon approval of the revised discharges.

Could you please send a letter of written approval as soon as possible?

Thank you,
Pat

Message 7:

FW: Upper Buchanan Wash hydrologyFrom: Afshin Ahouraiyan - FCDX [afa@mail.maricopa.gov]
Sent: Wednesday, July 02, 2003 2:08 PM
To: Patricia Deschamps (pat@jefuller.com)
Cc: Jeff Despain; Dave Degerness - FCDX
Subject: FW: Upper Buchanan Wash hydrology

My apologies for the delay. I did not get this to you on time. This is the only comment that Dave had on the submittal. I believe we are asking for more ID cards in the HEC-1 explaining the assumptions for the modeling of detention basins in Tramonto and in the TDN.

The Qs are approved but additional explanation is requested for the TDN and in the HEC-1 model. You can consider this email as approval of the Qs for the hydrology to be used for the delineation. The added explanation would be the pending item. If you can bring a write up of this explanation to the next monthly meeting, we can see if it covers what we are looking for.

Thank you and again I am so sorry for not forwarding this email to you when I actually got it back in mid June.

Afshin

-----Original Message-----
From: Dave Degerness - FCDX
Sent: Tuesday, June 17, 2003 4:37 PM
To: Afshin Ahouraiyan - FCDX
Subject: RE: Upper Buchanan Wash hydrology

Afshin,

I have reviewed the additional hec-1 sequences for the detention of stormwater on Tramonto and the diversion of flow from the I-17 culvert into Skunk Creek. I have at this time no comments on the modeling, but sufficent explanation should be provided in the TDN for the Biscuit Flats Hydology/Hydraulics on how the Tramonto detention was modeled. Included with this should be supporting documentation (hy8/culvertmaster analysis), and as-builts for the culverts (especially if we submit to FEMA.

Dave

-----Original Message-----
From: Afshin Ahouraiyan - FCDX
Sent: Tuesday, June 17, 2003 3:48 PM
To: Dave Degerness - FCDX
Subject: FW: Upper Buchanan Wash hydrology

Can I have a response from you regarding their rating curve and whether we are okay with the hydro for that portion of the study?

Thanks,
Afshin

-----Original Message-----
From: Pat Deschamps [mailto:pat@jefuller.com]
Sent: Tuesday, June 17, 2003 3:30 PM
To: Afshin Ahouraiyan
Cc: Dave Degerness; Jpeff Despain
Subject: Upper Buchanan Wash hydrology

Afshin,
Jeff Despain tells me that Dave Degerness has reviewed the reanalysis of that portion of the upper Buchanan Wash hydrology model which includes the revisions to account for the Tramanto basins. Dave told Jeff that he is ok with our rating curve analysis. We need written approval from you stating it is ok to use the current model for existing conditions. Clearly, this also affects the I-17 flow split and the floodplain delineation downstream of I-17.

Also, we need some direction on whether you want us to use the rating curve for the future condition model. Jeff and Dave also talked about what general land use data should be used for the future condition model.

Can you coordinate with Dave and let us know how you want us to proceed with the existing condition, future condition, and floodplain delineation models? Please contact Jeff directly if you need further information or have any questions.

Thank you,
Pat

Message 8:

FW: Upper Buchanan Wash hydrologyFrom: Pat Deschamps [pat@jefuller.com]
Sent: Wednesday, July 02, 2003 3:39 PM
To: Brian Iserman; Jeff Despain
Subject: FW: Upper Buchanan Wash hydrology

Importance: High

Looks like we are approved for Qs for the FDS, but need some more narrative in the TDN.
Pat

-----Original Message-----
From: Afshin Ahouraiyan - FCDX [mailto:afa@mail.maricopa.gov]
Sent: Wednesday, July 02, 2003 2:08 PM
To: Patricia Deschamps (pat@jefuller.com)
Cc: Jeff Despain; Dave Degerness - FCDX
Subject: FW: Upper Buchanan Wash hydrology

My apologies for the delay. I did not get this to you on time. This is the only comment that Dave had on the submittal. I believe we are asking for more ID cards in the HEC-1 explaining the assumptions for the modeling of detention basins in Tramonto and in the TDN.

The Qs are approved but additional explanation is requested for the TDN and in the HEC-1 model. You can consider this email as approval of the Qs for the hydrology to be used for the delineation. The added explanation would be the pending item. If you can bring a write up of this explanation to the next monthly meeting, we can see if it covers what we are looking for.

Thank you and again I am so sorry for not forwarding this email to you when I actually got it back in mid June.

Afshin

-----Original Message-----
From: Dave Degerness - FCDX
Sent: Tuesday, June 17, 2003 4:37 PM
To: Afshin Ahouraiyan - FCDX
Subject: RE: Upper Buchanan Wash hydrology

Afshin,

I have reviewed the additional hec-1 sequences for the detention of stormwater on Tramonto and the diversion of flow from the I-17 culvert into Skunk Creek. I have at this time no comments on the modeling, but sufficent explanation should be provided in the TDN for the Biscuit Flats Hydology/Hydraulics on how the Tramonto detention was modeled. Included

with this should be supporting documentation (hy8/culvertmaster analysis), and as-builts for the culverts (especially if we submit to FEMA.

Dave

-----Original Message-----
From: Afshin Ahouraiyan - FCDX
Sent: Tuesday, June 17, 2003 3:48 PM
To: Dave Degerness - FCDX
Subject: FW: Upper Buchanan Wash hydrology

Can I have a response from you regarding their rating curve and whether we are okay with the hydro for that portion of the study?

Thanks,
Afshin

-----Original Message-----
From: Pat Deschamps [mailto:pat@jefuller.com]
Sent: Tuesday, June 17, 2003 3:30 PM
To: Afshin Ahouraiyan
Cc: Dave Degerness; Jpeff Despain
Subject: Upper Buchanan Wash hydrology

Afshin,
Jeff Despain tells me that Dave Degerness has reviewed the reanalysis of that portion of the upper Buchanan Wash hydrology model which includes the revisions to account for the Tramanto basins. Dave told Jeff that he is ok with our rating curve analysis. We need written approval from you stating it is ok to use the current model for existing conditions. Clearly, this also affects the I-17 flow split and the floodplain delineation downstream of I-17.

Also, we need some direction on whether you want us to use the rating curve for the future condition model. Jeff and Dave also talked about what general land use data should be used for the future condition model.

Can you coordinate with Dave and let us know how you want us to proceed with the existing condition, future condition, and floodplain delineation models? Please contact Jeff directly if you need further information or have any questions.

Thank you,
Pat

Appendix C

Mapping & Survey

Refer to the Flood Control District of Maricopa County for field survey information associated with the various topographic mapping used in the current study.

Appendix D

Supporting Documentation for Hydrology

Appendix D.1

Subbasin Soil Data

Existing Conditions

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

Soil Data

7/10/2003

Sub Basin ID	Soil Survey	Map Unit	Area	Area Pct (%)	XKSAT	Rock Outcrop (%)	Effective (%)
B1	Aguila/Carefree	12	0.482	65.1	0.01		
	Aguila/Carefree	18	0.024	3.2	0.33	15.0	100
	Aguila/Carefree	100	0.002	0.3	0.40	20.0	100
	Aguila/Carefree	110	0.054	7.3	0.13		
	Aguila/Carefree	112	0.175	23.6	0.39		
	Aguila/Carefree	123	0.004	0.6	0.37		
B10	Aguila/Carefree	12	0.070	100.0	0.01		
B11	Aguila/Carefree	12	0.013	3.1	0.01		
	Aguila/Carefree	18	0.077	18.7	0.33	15.0	100
	Aguila/Carefree	98	0.196	47.7	0.37		
	Aguila/Carefree	100	0.026	6.2	0.40	20.0	100
	Aguila/Carefree	110	0.020	4.8	0.13		
	Aguila/Carefree	112	0.055	13.4	0.39		
	Aguila/Carefree	123	0.025	6.0	0.37		
B12	Aguila/Carefree	12	0.084	40.6	0.01		
	Aguila/Carefree	18	0.055	26.5	0.33	15.0	100
	Aguila/Carefree	98	0.000		0.37		
	Aguila/Carefree	110	0.017	8.3	0.13		
	Aguila/Carefree	112	0.051	24.6	0.39		
B13	Aguila/Carefree	12	0.501	99.9	0.01		
	Aguila/Carefree	112	0.000	0.1	0.39		
B14	Aguila/Carefree	12	0.430	99.9	0.01		
	Aguila/Carefree	98	0.001	0.1	0.37		
B15	Aguila/Carefree	12	0.115	100.0	0.01		
B16	Aguila/Carefree	12	0.027	100.0	0.01		
B17	Aguila/Carefree	12	0.546	84.9	0.01		
	Aguila/Carefree	44	0.023	3.6	0.03		
	Aguila/Carefree	52	0.008	1.3	0.16	20.0	100
	Aguila/Carefree	110	0.031	4.9	0.13		
	Aguila/Carefree	112	0.035	5.4	0.39		

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

Soil Data

7/10/2003

Sub Basin ID	Soil Survey	Map Unit	Area	Area Pct (%)	XKSAT	Rock Outcrop (%)	Effective (%)
B18	Aguila/Carefree	12	0.169	75.1	0.01		
	Aguila/Carefree	98	0.028	12.6	0.37		
	Aguila/Carefree	110	0.028	12.3	0.13		
B19	Aguila/Carefree	12	0.500	87.2	0.01		
	Aguila/Carefree	98	0.073	12.8	0.37		
B2	Aguila/Carefree	12	0.912	99.8	0.01		
	Aguila/Carefree	110	0.002	0.2	0.13		
B20	Aguila/Carefree	12	0.621	79.5	0.01		
	Aguila/Carefree	18	0.132	16.8	0.33	15.0	100
	Aguila/Carefree	68	0.002	0.2	0.63		
	Aguila/Carefree	110	0.027	3.5	0.13		
B21	Aguila/Carefree	12	0.259	47.6	0.01		
	Aguila/Carefree	18	0.180	33.1	0.33	15.0	100
	Aguila/Carefree	68	0.029	5.3	0.63		
	Aguila/Carefree	75	0.056	10.2	0.23		
	Aguila/Carefree	110	0.021	3.8	0.13		
B22	Aguila/Carefree	12	0.310	85.7	0.01		
	Aguila/Carefree	18	0.031	8.4	0.33	15.0	100
	Aguila/Carefree	44	0.008	2.1	0.03		
	Aguila/Carefree	68	0.012	3.4	0.63		
	Aguila/Carefree	110	0.000		0.13		
	Aguila/Carefree	112	0.001	0.3	0.39		
B3	Aguila/Carefree	12	0.981	97.1	0.01		
	Aguila/Carefree	110	0.030	2.9	0.13		
B4	Aguila/Carefree	12	0.379	64.9	0.01		
	Aguila/Carefree	98	0.024	4.1	0.37		
	Aguila/Carefree	100	0.006	0.9	0.40	20.0	100
	Aguila/Carefree	112	0.151	25.8	0.39		
	Aguila/Carefree	118	0.009	1.5	0.42		
	Aguila/Carefree	123	0.016	2.7	0.37		
B5	Aguila/Carefree	12	0.044	63.6	0.01		
	Aguila/Carefree	112	0.025	36.4	0.39		

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

Soil Data

7/10/2003

Sub Basin ID	Soil Survey	Map Unit	Area	Area Pct (%)	XKSAT	Rock Outcrop (%)	Effective (%)
B6	Aguila/Carefree	12	0.007	1.2	0.01		
	Aguila/Carefree	18	0.047	8.7	0.33	15.0	100
	Aguila/Carefree	98	0.186	34.3	0.37		
	Aguila/Carefree	100	0.070	12.9	0.40	20.0	100
	Aguila/Carefree	110	0.013	2.4	0.13		
	Aguila/Carefree	112	0.064	11.8	0.39		
	Aguila/Carefree	118	0.036	6.6	0.42		
	Aguila/Carefree	123	0.120	22.1	0.37		
B7	Aguila/Carefree	12	0.009	11.4	0.01		
	Aguila/Carefree	18	0.052	64.5	0.33	15.0	100
	Aguila/Carefree	110	0.002	2.8	0.13		
	Aguila/Carefree	112	0.017	21.4	0.39		
B8	Aguila/Carefree	12	0.402	99.3	0.01		
	Aguila/Carefree	112	0.003	0.7	0.39		
B9	Aguila/Carefree	12	0.021	5.4	0.01		
	Aguila/Carefree	18	0.068	17.6	0.33	15.0	100
	Aguila/Carefree	98	0.188	48.9	0.37		
	Aguila/Carefree	100	0.027	7.1	0.40	20.0	100
	Aguila/Carefree	110	0.023	5.9	0.13		
	Aguila/Carefree	112	0.024	6.1	0.39		
	Aguila/Carefree	118	0.007	1.7	0.42		
	Aguila/Carefree	123	0.029	7.4	0.37		

Jeffrey A. Despain (soildata)

* Custom Value (not default value)

Future Conditions

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Soil Data

7/10/2003

Sub Basin ID	Soil Survey	Map Unit	Area	Area Pct (%)	XKSAT	Rock Outcrop	(%)	Effective (%)
B1	Aguila/Carefree	12	0.482	65.1	0.01			
	Aguila/Carefree	18	0.024	3.2	0.33		15.0	100
	Aguila/Carefree	100	0.002	0.3	0.40		20.0	100
	Aguila/Carefree	110	0.054	7.3	0.13			
	Aguila/Carefree	112	0.175	23.6	0.39			
	Aguila/Carefree	123	0.004	0.6	0.37			
B10	Aguila/Carefree	12	0.070	100.0	0.01			
B11	Aguila/Carefree	12	0.013	3.1	0.01			
	Aguila/Carefree	18	0.077	18.7	0.33		15.0	100
	Aguila/Carefree	98	0.196	47.7	0.37			
	Aguila/Carefree	100	0.026	6.2	0.40		20.0	100
	Aguila/Carefree	110	0.020	4.8	0.13			
	Aguila/Carefree	112	0.055	13.4	0.39			
	Aguila/Carefree	123	0.025	6.0	0.37			
B12	Aguila/Carefree	12	0.084	40.6	0.01			
	Aguila/Carefree	18	0.055	26.5	0.33		15.0	100
	Aguila/Carefree	98	0.000		0.37			
	Aguila/Carefree	110	0.017	8.3	0.13			
	Aguila/Carefree	112	0.051	24.6	0.39			
B13	Aguila/Carefree	12	0.501	99.9	0.01			
	Aguila/Carefree	112	0.000	0.1	0.39			
B14	Aguila/Carefree	12	0.430	99.9	0.01			
	Aguila/Carefree	98	0.001	0.1	0.37			
B15	Aguila/Carefree	12	0.115	100.0	0.01			
B16	Aguila/Carefree	12	0.027	100.0	0.01			
B17	Aguila/Carefree	12	0.546	84.9	0.01			
	Aguila/Carefree	44	0.023	3.6	0.03			
	Aguila/Carefree	52	0.008	1.3	0.16		20.0	100
	Aguila/Carefree	110	0.031	4.9	0.13			
	Aguila/Carefree	112	0.035	5.4	0.39			
B18	Aguila/Carefree	12	0.169	75.1	0.01			
	Aguila/Carefree	98	0.028	12.6	0.37			

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Soil Data

7/10/2003

Sub Basin ID	Soil Survey	Map Unit	Area	Area Pct (%)	XKSAT	Rock Outcrop	(%)	Effective (%)
	Aguila/Carefree	110	0.028	12.3	0.13			
B19	Aguila/Carefree	12	0.500	87.2	0.01			
	Aguila/Carefree	98	0.073	12.8	0.37			
B2	Aguila/Carefree	12	0.912	99.8	0.01			
	Aguila/Carefree	110	0.002	0.2	0.13			
B20	Aguila/Carefree	12	0.621	79.5	0.01			
	Aguila/Carefree	18	0.132	16.8	0.33		15.0	100
	Aguila/Carefree	68	0.002	0.2	0.63			
	Aguila/Carefree	110	0.027	3.5	0.13			
B21	Aguila/Carefree	12	0.259	47.6	0.01			
	Aguila/Carefree	18	0.180	33.1	0.33		15.0	100
	Aguila/Carefree	68	0.029	5.3	0.63			
	Aguila/Carefree	75	0.056	10.2	0.23			
	Aguila/Carefree	110	0.021	3.8	0.13			
B22	Aguila/Carefree	12	0.310	85.7	0.01			
	Aguila/Carefree	18	0.031	8.4	0.33		15.0	100
	Aguila/Carefree	44	0.008	2.1	0.03			
	Aguila/Carefree	68	0.012	3.4	0.63			
	Aguila/Carefree	110	0.000		0.13			
	Aguila/Carefree	112	0.001	0.3	0.39			
B3	Aguila/Carefree	12	0.981	97.1	0.01			
	Aguila/Carefree	110	0.030	2.9	0.13			
B4	Aguila/Carefree	12	0.379	64.9	0.01			
	Aguila/Carefree	98	0.024	4.1	0.37			
	Aguila/Carefree	100	0.006	0.9	0.40		20.0	100
	Aguila/Carefree	112	0.151	25.8	0.39			
	Aguila/Carefree	118	0.009	1.5	0.42			
	Aguila/Carefree	123	0.016	2.7	0.37			
B5	Aguila/Carefree	12	0.044	63.6	0.01			
	Aguila/Carefree	112	0.025	36.4	0.39			
B6	Aguila/Carefree	12	0.007	1.2	0.01			
	Aguila/Carefree	18	0.047	8.7	0.33		15.0	100
	Aguila/Carefree	98	0.186	34.3	0.37			
	Aguila/Carefree	100	0.070	12.9	0.40		20.0	100

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Soil Data

7/10/2003

Sub Basin ID	Soil Survey	Map Unit	Area	Area Pct (%)	XKSAT	Rock Outcrop	(%)	Effective (%)
	Aguila/Carefree	110	0.013	2.4	0.13			
	Aguila/Carefree	112	0.064	11.8	0.39			
	Aguila/Carefree	118	0.036	6.6	0.42			
	Aguila/Carefree	123	0.120	22.1	0.37			
B7	Aguila/Carefree	12	0.009	11.4	0.01			
	Aguila/Carefree	18	0.052	64.5	0.33		15.0	100
	Aguila/Carefree	110	0.002	2.8	0.13			
	Aguila/Carefree	112	0.017	21.4	0.39			
B8	Aguila/Carefree	12	0.402	99.3	0.01			
	Aguila/Carefree	112	0.003	0.7	0.39			
B9	Aguila/Carefree	12	0.021	5.4	0.01			
	Aguila/Carefree	18	0.068	17.6	0.33		15.0	100
	Aguila/Carefree	98	0.188	48.9	0.37			
	Aguila/Carefree	100	0.027	7.1	0.40		20.0	100
	Aguila/Carefree	110	0.023	5.9	0.13			
	Aguila/Carefree	112	0.024	6.1	0.39			
	Aguila/Carefree	118	0.007	1.7	0.42			
	Aguila/Carefree	123	0.029	7.4	0.37			

Jeffrey A. Despain (soildata)

* Custom Value (not default value)

Appendix D.2

Subbasin Land Use Data

Existing Conditions

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

Land Use Data

7/10/2003

Sub Basin ID	Land Use Code	Area	Area Pct (%)	DTHETA Condition	Vegetation Cover (%)	RTIMP (%)	IA (in)	Kn	Kb Type	Kb
B1	DESERT	0.741	100.0	Normal	15.0		0.35	0.030	Low	0.043
B2	DESERT	0.913	100.0	Normal	15.0		0.35	0.030	Low	0.042
B3	DESERT	1.011	100.0	Normal	15.0		0.35	0.030	Low	0.041
B4	DESERT	0.584	100.0	Normal	15.0		0.35	0.030	Low	0.045
B5	DESERT	0.069	100.0	Normal	15.0		0.35	0.030	Low	0.057
B6	DESERT	0.543	100.0	Normal	15.0		0.35	0.030	Low	0.045
B7	DESERT	0.080	100.0	Normal	15.0		0.35	0.030	Low	0.057
B8	DESERT	0.405	100.0	Normal	15.0		0.35	0.030	Low	0.047
B9	DESERT	0.385	100.0	Normal	15.0		0.35	0.030	Low	0.047
B10	DESERT	0.070	100.0	Normal	15.0		0.35	0.030	Low	0.057
B11	DESERT	0.410	100.0	Normal	15.0		0.35	0.030	Low	0.047
B12	DESERT	0.206	100.0	Normal	15.0		0.35	0.030	Low	0.051
B13	DESERT	0.502	100.0	Normal	15.0		0.35	0.030	Low	0.046
B14	DESERT	0.431	100.0	Normal	15.0		0.35	0.030	Low	0.046
B15	DESERT	0.115	100.0	Normal	15.0		0.35	0.030	Low	0.054
B16	DESERT	0.027	100.0	Normal	15.0		0.35	0.030	Low	0.063
B17	DESERT	0.269	41.9	Normal	15.0		0.35	0.030	Low	0.049
B18	DESERT	0.225	100.0	Normal	15.0		0.35	0.030	Low	0.050
B19	DESERT	0.574	100.0	Normal	15.0		0.35	0.030	Low	0.045
B20	DESERT	0.781	100.0	Normal	15.0		0.35	0.030	Low	0.043
B21	DESERT	0.544	100.0	Normal	15.0		0.35	0.030	Low	0.045
B22	DESERT	0.361	100.0	Normal	15.0		0.35	0.030	Low	0.047
B17	M.D.R.	0.366	56.8	Normal	50.0	30	0.25	0.050	Low	0.047
	V.L.D.R.	0.009	1.3	Normal	20.0	5	0.30	0.050	Low	0.070

Jeffrey A. Despain

(landdata)

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

Land Use Defaults - Green-Ampt Loss Method

7/10/2003

Land Use Code	Description	DTHETA Condition	Vegetation Cover (%)	RTIMP (%)	IA (in)	Kn	Kb Type
DESERT	Desert	Normal	15.00		0.35	0.030	Low
OPEN	Open Space	Normal	10.00		0.10	0.020	Min
V.L.D.R.	*Very Low Density Residential*	Normal	20.00	5	0.30	0.050	Low
L.D.R.	Low Density Residential	Normal	50.00	15	0.30	0.050	Low
M.D.R.	Medium Density Residential	Normal	50.00	30	0.25	0.050	Low
M.F.R.	Multiple Family Residential	Normal	50.00	45	0.25	0.050	Low
IND	Industrial	Normal	60.00	55	0.15	0.030	Min
COMM	Commercial	Normal	75.00	80	0.10	0.020	Min
PARK	Parks	Normal	90.00		0.20	0.100	Hi
ROWCROP	Agriculture	Normal	85.00		0.50	0.100	Hi

Jeffrey A. Despain

(landfact)

Future Conditions

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Land Use Data

7/10/2003

Sub Basin ID	Land Use Code	Area	Area Pct (%)	DTHETA Condition	Vegetation Cover (%)	RTIMP (%)	IA (in)	Kn	Kb Type	Kb
B12	WATER	0.023	11.2	Normal		100		0.100	Max	0.165
B13	WATER	0.018	3.5	Normal		100		0.100	Max	0.168
B21	WATER	0.004	0.8	Normal		100		0.100	Max	0.187
B22	WATER	0.085	23.7	Normal		100		0.100	Max	0.148
B1	M.D.R.	0.392	52.9	Normal	50.0	30	0.25	0.050	Low	0.047
	M.F.R.	0.350	47.1	Normal	50.0	45	0.25	0.050	Low	0.048
B10	M.D.R.	0.070	100.0	Normal	50.0	30	0.25	0.050	Low	0.057
B11	M.D.R.	0.410	100.0	Normal	50.0	30	0.25	0.050	Low	0.047
B12	M.D.R.	0.183	88.8	Normal	50.0	30	0.25	0.050	Low	0.052
B13	M.D.R.	0.479	95.5	Normal	50.0	30	0.25	0.050	Low	0.046
	M.F.R.	0.005	1.0	Normal	50.0	45	0.25	0.050	Low	0.073
B14	M.D.R.	0.269	62.3	Normal	50.0	30	0.25	0.050	Low	0.049
	M.F.R.	0.008	1.9	Normal	50.0	45	0.25	0.050	Low	0.070
B15	M.D.R.	0.115	100.0	Normal	50.0	30	0.25	0.050	Low	0.054
B16	M.D.R.	0.027	100.0	Normal	50.0	30	0.25	0.050	Low	0.063
B17	M.D.R.	0.431	67.0	Normal	50.0	30	0.25	0.050	Low	0.046
	M.F.R.	0.071	11.0	Normal	50.0	45	0.25	0.050	Low	0.057
B18	M.D.R.	0.023	10.3	Normal	50.0	30	0.25	0.050	Low	0.064
B19	M.D.R.	0.081	14.1	Normal	50.0	30	0.25	0.050	Low	0.056
B2	M.D.R.	0.431	47.2	Normal	50.0	30	0.25	0.050	Low	0.046
	M.F.R.	0.275	30.1	Normal	50.0	45	0.25	0.050	Low	0.049
B20	M.D.R.	0.724	92.6	Normal	50.0	30	0.25	0.050	Low	0.043
B21	M.D.R.	0.398	73.2	Normal	50.0	30	0.25	0.050	Low	0.047
B22	M.D.R.	0.276	76.4	Normal	50.0	30	0.25	0.050	Low	0.049
B3	M.D.R.	0.419	41.4	Normal	50.0	30	0.25	0.050	Low	0.047
	M.F.R.	0.204	20.2	Normal	50.0	45	0.25	0.050	Low	0.051
B4	M.D.R.	0.445	76.2	Normal	50.0	30	0.25	0.050	Low	0.046
	M.F.R.	0.139	23.8	Normal	50.0	45	0.25	0.050	Low	0.053

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Land Use Data

7/10/2003

Sub Basin ID	Land Use Code	Area	Area Pct (%)	DTHETA Condition	Vegetation Cover (%)	RTIMP (%)	IA (in)	Kn	Kb Type	Kb
B5	M.D.R.	0.069	100.0	Normal	50.0	30	0.25	0.050	Low	0.057
B6	M.D.R.	0.522	96.2	Normal	50.0	30	0.25	0.050	Low	0.045
	M.F.R.	0.021	3.8	Normal	50.0	45	0.25	0.050	Low	0.065
B7	M.D.R.	0.080	100.0	Normal	50.0	30	0.25	0.050	Low	0.057
B8	M.D.R.	0.396	97.8	Normal	50.0	30	0.25	0.050	Low	0.047
	M.F.R.	0.009	2.2	Normal	50.0	45	0.25	0.050	Low	0.070
B9	M.D.R.	0.385	100.0	Normal	50.0	30	0.25	0.050	Low	0.047
B14	COMM	0.155	35.9	Normal	75.0	80	0.10	0.020	Min	0.028
B17	COMM	0.120	18.6	Normal	75.0	80	0.10	0.020	Min	0.028
	IND	0.007	1.0	Normal	60.0	55	0.15	0.030	Min	0.036
	OPEN	0.015	2.4	Normal	10.0		0.10	0.020	Min	0.034
B18	COMM	0.202	89.7	Normal	75.0	80	0.10	0.020	Min	0.027
B19	COMM	0.493	85.9	Normal	75.0	80	0.10	0.020	Min	0.024
B2	COMM	0.208	22.7	Normal	75.0	80	0.10	0.020	Min	0.027
B20	COMM	0.058	7.4	Normal	75.0	80	0.10	0.020	Min	0.030
B21	COMM	0.141	26.0	Normal	75.0	80	0.10	0.020	Min	0.028
B3	COMM	0.388	38.4	Normal	75.0	80	0.10	0.020	Min	0.025

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* Custom Value (not default value)

(landdata)

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Land Use Defaults - Green-Ampt Loss Method

7/10/2003

Land Use Code	Description	DTHETA Condition	Vegetation Cover (%)	RTIMP (%)	IA (in)	Kn	Kb Type
DESERT	Desert	Normal	15.00		0.35	0.030	Low
OPEN	Open Space	Normal	10.00		0.10	0.020	Min
V.L.D.R.	Very Low Density Residential	Normal	20.00	5	0.30	0.050	Low
L.D.R.	Low Density Residential	Normal	50.00	15	0.30	0.050	Low
M.D.R.	Medium Density Residential	Normal	50.00	30	0.25	0.050	Low
M.F.R.	Multiple Family Residential	Normal	50.00	45	0.25	0.050	Low
IND	Industrial	Normal	60.00	55	0.15	0.030	Min
COMM	Commercial	Normal	75.00	80	0.10	0.020	Min
PARK	Parks	Normal	90.00		0.20	0.100	Hi
ROWCROP	Agriculture	Normal	85.00		0.50	0.100	Hi
WATER	Lake or Ponding Area	Normal		100		0.100	Max

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(landfact)

Appendix D.3

Unit Hydrograph Data

Existing Conditions

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

Sub Basin Data

7/10/2003

Storms: Multiple | Duration: 24 Hour | Loss Method: Green-Ampt | Unit Hydrograph: Clark

Sub Basin ID	Sub Basin Parameters: Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Rainfall Losses: Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		Return Period (Years): 2	5	10	25	50	100
B1	0.74	2.02	31.7	31.7	Natural	0.043	0.35	0.13	10.10	0.03	1	Tc (hrs)	1.35	1.08	0.98	1.50	0.82	0.77
												Vel (f/s)	2.20	2.75	3.04	1.91	3.61	3.84
												R (hrs)	1.07	0.84	0.75	1.26	0.62	0.58
B10	0.07	1.04	42.5	42.5	HEC-1 Default	0.057	0.35	0.05	12.40	0.01		Tc (hrs)	0.80	0.68	0.63	0.58	0.54	0.51
												Vel (f/s)	1.92	2.23	2.41	2.63	2.81	2.97
												R (hrs)	1.35	1.14	1.05	0.95	0.88	0.83
B11	0.41	1.74	437.9	298.0	Urban	0.047	0.35	0.25	4.45	0.34	4	Tc (hrs)	0.61	0.47	0.42	0.37	0.34	0.32
												Vel (f/s)	4.20	5.42	6.06	6.88	7.46	7.95
												R (hrs)	0.55	0.42	0.37	0.32	0.29	0.27
B12	0.21	0.92	35.0	35.0	Natural	0.051	0.35	0.15	7.60	0.09	4	Tc (hrs)	0.88	0.69	0.62	0.55	0.52	0.49
												Vel (f/s)	1.54	1.96	2.19	2.44	2.61	2.77
												R (hrs)	0.73	0.56	0.50	0.44	0.41	0.38
B13	0.50	2.84	38.0	38.0	HEC-1 Default	0.046	0.35	0.05	12.40	0.01		Tc (hrs)	1.50	1.28	1.50	1.07	1.00	0.94
												Vel (f/s)	2.78	3.27	2.72	3.90	4.17	4.42
												R (hrs)	1.98	1.65	2.03	1.36	1.26	1.18
B14	0.43	2.67	40.4	40.4	HEC-1 Default	0.046	0.35	0.05	12.40	0.01		Tc (hrs)	1.39	1.18	1.09	0.99	0.93	0.88
												Vel (f/s)	2.81	3.31	3.59	3.95	4.22	4.46
												R (hrs)	1.89	1.58	1.45	1.30	1.21	1.14
B15	0.12	0.92	50.2	50.2	HEC-1 Default	0.054	0.35	0.05	12.40	0.01		Tc (hrs)	0.65	0.56	0.52	0.48	0.45	0.43

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

Sub Basin Data

7/10/2003

Storms: Multiple | Duration: 24 Hour | Loss Method: Green-Ampt | Unit Hydrograph: Clark

Sub Basin ID	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2	5	10	25	50	100
	Sub Basin Parameters						Rainfall Losses						Return Period (Years)					
												Vel (f/s)	2.09	2.42	2.61	2.84	2.97	3.12
												R (hrs)	0.73	0.62	0.57	0.52	0.49	0.47
B16	0.03	0.37	59.0	59.0	HEC-1 Default	0.063	0.35	0.05	12.40	0.01		Tc (hrs)	0.37	0.33	0.31	0.28	0.27	0.25
												Vel (f/s)	1.46	1.65	1.76	1.92	2.03	2.14
												R (hrs)	0.44	0.38	0.36	0.32	0.30	0.29
B17	0.64	1.53	49.1	49.1	Urban	0.048	0.29	0.10	11.20	0.03	17	Tc (hrs)	0.83	0.72	0.67	0.61	0.58	0.55
												Vel (f/s)	2.69	3.11	3.36	3.66	3.88	4.05
												R (hrs)	0.55	0.47	0.43	0.39	0.37	0.35
B18	0.23	0.88	45.2	45.2	Natural	0.050	0.35	0.10	11.20	0.02		Tc (hrs)	0.65	0.55	0.50	0.46	0.44	0.42
												Vel (f/s)	2.00	2.36	2.58	2.79	2.95	3.07
												R (hrs)	0.48	0.40	0.36	0.33	0.31	0.30
B19	0.57	2.31	43.0	43.0	HEC-1 Default	0.045	0.35	0.10	11.20	0.02		Tc (hrs)	1.27	1.05	0.95	0.86	0.81	0.76
												Vel (f/s)	2.67	3.24	3.55	3.93	4.19	4.44
												R (hrs)	1.29	1.04	0.94	0.84	0.78	0.73
B2	0.91	2.97	39.1	39.1	HEC-1 Default	0.042	0.35	0.05	12.40	0.01		Tc (hrs)	1.43	1.21	1.12	1.02	0.95	0.90
												Vel (f/s)	3.05	3.59	3.90	4.28	4.57	4.84
												R (hrs)	1.38	1.15	1.05	0.95	0.88	0.83
B20	0.78	2.08	39.5	39.5	Natural	0.043	0.35	0.10	11.20	0.02	3	Tc (hrs)	1.15	0.96	0.88	0.80	0.75	0.71
												Vel (f/s)	2.65	3.17	3.45	3.81	4.07	4.31

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

Sub Basin Data

7/10/2003

Storms: Multiple | Duration: 24 Hour | Loss Method: Green-Ampt | Unit Hydrograph: Clark

Sub Basin ID	Sub Basin Parameters: Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Rainfall Losses: Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		Return Period (Years): 2	5	10	25	50	100
												R (hrs)	0.89	0.73	0.67	0.60	0.56	0.52
B21	0.54	2.63	39.6	39.6	Urban	0.045	0.35	0.15	8.40	0.07	5	Tc (hrs)	1.50	1.30	1.15	1.02	0.95	0.89
												Vel (f/s)	2.57	2.97	3.35	3.78	4.08	4.34
												R (hrs)	1.78	1.52	1.33	1.16	1.07	0.99
B22	0.36	1.27	33.0	33.0	Natural	0.047	0.35	0.10	11.20	0.02	1	Tc (hrs)	0.93	0.78	0.72	0.65	0.61	0.58
												Vel (f/s)	2.00	2.38	2.60	2.85	3.04	3.22
												R (hrs)	0.74	0.61	0.55	0.50	0.47	0.44
B3	1.01	3.21	39.8	39.8	HEC-1 Default	0.041	0.35	0.05	12.40	0.01		Tc (hrs)	1.48	1.25	1.15	1.05	0.98	0.93
												Vel (f/s)	3.19	3.75	4.09	4.50	4.79	5.07
												R (hrs)	1.44	1.20	1.09	0.98	0.92	0.86
B4	0.58	1.60	96.8	96.8	HEC-1 Default	0.045	0.35	0.15	9.70	0.04		Tc (hrs)	0.71	0.57	0.52	0.48	0.45	0.43
												Vel (f/s)	3.31	4.11	4.54	4.94	5.21	5.47
												R (hrs)	0.50	0.39	0.35	0.32	0.30	0.29
B5	0.07	0.61	62.8	62.8	HEC-1 Default	0.057	0.35	0.15	9.70	0.04		Tc (hrs)	0.50	0.43	0.39	0.36	0.34	0.32
												Vel (f/s)	1.79	2.11	2.28	2.50	2.62	2.79
												R (hrs)	0.53	0.44	0.40	0.37	0.35	0.32
B6	0.54	1.96	359.2	280.0	Natural	0.045	0.35	0.25	4.25	0.39	4	Tc (hrs)	0.69	0.52	0.46	0.41	0.38	0.35
												Vel (f/s)	4.15	5.52	6.21	7.05	7.67	8.21
												R (hrs)	0.60	0.44	0.38	0.33	0.30	0.28

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

Sub Basin Data

7/10/2003

Storms: Multiple | Duration: 24 Hour | Loss Method: Green-Ampt | Unit Hydrograph: Clark

Sub Basin ID	Sub Basin Parameters: Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Rainfall Losses: Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		Return Period (Years): 2	5	10	25	50	100
B7	0.08	0.60	526.8	306.0	Natural	0.057	0.35	0.25	5.10	0.24	10	Tc (hrs)	0.30	0.25	0.23	0.21	0.20	0.19
												Vel (f/s)	2.97	3.52	3.84	4.13	4.40	4.58
												R (hrs)	0.27	0.22	0.20	0.19	0.17	0.17
B8	0.41	2.17	38.8	38.8	HEC-1 Default	0.047	0.35	0.05	12.40	0.01		Tc (hrs)	1.24	1.05	0.97	0.88	0.83	0.78
												Vel (f/s)	2.57	3.02	3.28	3.60	3.84	4.06
												R (hrs)	1.46	1.22	1.11	1.00	0.94	0.88
B9	0.39	1.79	423.1	298.0	HEC-1 Default	0.047	0.35	0.25	4.60	0.31	4	Tc (hrs)	0.61	0.48	0.42	0.38	0.35	0.33
												Vel (f/s)	4.32	5.53	6.24	7.00	7.59	8.08
												R (hrs)	0.59	0.45	0.39	0.34	0.31	0.29

Jeffrey A. Despain

* Non default value

(subbasn1)

Future Conditions

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Sub Basin Data

7/10/2003

Storms: Multiple | Duration: 24 Hour | Loss Method: Green-Ampt | Unit Hydrograph: Clark

Sub Basin ID	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2	5	10	25	50	100
	Sub Basin Parameters						Rainfall Losses						Return Period (Years)					
B1	0.74	2.02	31.7	31.7	Natural	0.043	0.25	0.13	10.10	0.04	38	**Tc (hrs)**	1.10	0.95	0.88	1.50	0.77	0.73
												Vel (f/s)	2.70	3.12	3.36	1.90	3.86	4.06
												R (hrs)	0.85	0.73	0.67	1.26	0.57	0.54
B10	0.07	1.04	42.5	42.5	HEC-1 Default	0.057	0.25	0.05	12.40	0.01	30	**Tc (hrs)**	0.70	0.63	0.59	0.55	0.53	0.50
												Vel (f/s)	2.17	2.44	2.59	2.77	2.91	3.03
												R (hrs)	1.18	1.03	0.96	0.90	0.85	0.81
B11	0.41	1.74	437.9	298.0	Urban	0.047	0.25	0.25	4.45	0.43	34	**Tc (hrs)**	0.45	0.39	0.36	0.33	0.32	0.30
												Vel (f/s)	5.67	6.51	7.03	7.66	8.05	8.39
												R (hrs)	0.40	0.34	0.31	0.28	0.27	0.26
B12	0.21	0.92	35.0	35.0	Natural	0.060	0.22	0.15	7.60	0.11	42	**Tc (hrs)**	0.78	0.67	0.62	0.57	0.55	0.52
												Vel (f/s)	1.74	2.01	2.17	2.36	2.47	2.59
												R (hrs)	0.64	0.55	0.50	0.46	0.44	0.41
B13	0.50	2.84	38.0	38.0	HEC-1 Default	0.048	0.24	0.05	12.40	0.01	33	**Tc (hrs)**	1.35	1.20	1.12	1.03	0.98	0.93
												Vel (f/s)	3.08	3.48	3.73	4.05	4.27	4.50
												R (hrs)	1.77	1.54	1.43	1.30	1.23	1.16
B14	0.43	2.67	40.4	40.4	HEC-1 Default	0.039	0.20	0.05	12.40	0.02	48	**Tc (hrs)**	1.06	0.94	0.88	0.81	0.77	0.73
												Vel (f/s)	3.70	4.16	4.46	4.82	5.08	5.34
												R (hrs)	1.40	1.23	1.14	1.04	0.98	0.93
B15	0.12	0.92	50.2	50.2	HEC-1 Default	0.054	0.25	0.05	12.40	0.01	30	**Tc (hrs)**	0.58	0.52	0.49	0.46	0.44	0.43

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Sub Basin Data

7/10/2003

Storms: Multiple | Duration: 24 Hour | Loss Method: Green-Ampt | Unit Hydrograph: Clark

Sub Basin ID	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2	5	10	25	50	100
	Sub Basin Parameters						Rainfall Losses						Return Period (Years)					
												Vel (f/s)	2.35	2.59	2.74	2.91	3.05	3.17
												R (hrs)	0.64	0.58	0.54	0.51	0.48	0.46
B16	0.03	0.37	59.0	59.0	HEC-1 Default	0.063	0.25	0.05	12.40	0.01	30	Tc (hrs)	0.33	0.31	0.30	0.28	0.27	0.25
												Vel (f/s)	1.63	1.73	1.83	1.95	2.03	2.14
												R (hrs)	0.39	0.36	0.34	0.32	0.30	0.29
B17	0.64	1.53	49.1	49.1	Urban	0.040	0.22	0.10	11.20	0.03	41	Tc (hrs)	0.67	0.59	0.56	0.52	0.50	0.48
												Vel (f/s)	3.36	3.79	4.02	4.31	4.49	4.68
												R (hrs)	0.43	0.37	0.35	0.32	0.31	0.30
B18	0.23	0.88	45.2	45.2	Natural	0.029	0.12	0.10	11.20	0.03	75	Tc (hrs)	0.39	0.35	0.34	0.32	0.30	0.29
												Vel (f/s)	3.29	3.65	3.82	4.07	4.25	4.42
												R (hrs)	0.28	0.25	0.23	0.22	0.21	0.20
B19	0.57	2.31	43.0	43.0	HEC-1 Default	0.027	0.12	0.10	11.20	0.03	73	Tc (hrs)	0.72	0.64	0.60	0.55	0.53	0.51
												Vel (f/s)	4.73	5.31	5.68	6.12	6.40	6.67
												R (hrs)	0.69	0.60	0.56	0.52	0.49	0.47
B2	0.91	2.97	39.1	39.1	HEC-1 Default	0.038	0.22	0.05	12.40	0.01	46	Tc (hrs)	1.13	1.01	0.95	0.87	0.83	0.79
												Vel (f/s)	3.84	4.32	4.60	5.00	5.28	5.53
												R (hrs)	1.07	0.94	0.88	0.80	0.75	0.71
B20	0.78	2.08	39.5	39.5	Natural	0.041	0.24	0.10	11.20	0.03	36	Tc (hrs)	0.96	0.84	0.78	0.73	0.68	0.65
												Vel (f/s)	3.18	3.64	3.90	4.21	4.47	4.66

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Sub Basin Data

7/10/2003

Storms: Multiple | Duration: 24 Hour | Loss Method: Green-Ampt | Unit Hydrograph: Clark

Sub Basin ID	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2	5	10	25	50	100
												R (hrs)	0.73	0.63	0.58	0.54	0.50	0.48
B21	0.54	2.63	39.6	39.6	Urban	0.040	0.21	0.15	8.40	0.09	49	Tc (hrs)	1.15	1.00	0.93	0.85	0.80	0.76
												Vel (f/s)	3.34	3.86	4.17	4.56	4.85	5.09
												R (hrs)	1.33	1.14	1.04	0.94	0.88	0.84
B22	0.36	1.27	33.0	33.0	Natural	0.067	0.19	0.10	11.20	0.03	48	Tc (hrs)	1.03	0.91	0.85	0.78	1.50	0.71
												Vel (f/s)	1.81	2.04	2.19	2.38	1.19	2.63
												R (hrs)	0.83	0.72	0.67	0.61	1.31	0.55
B3	1.01	3.21	39.8	39.8	HEC-1 Default	0.034	0.19	0.05	12.40	0.02	52	Tc (hrs)	1.10	0.98	0.91	0.84	0.80	0.76
												Vel (f/s)	4.28	4.83	5.16	5.59	5.89	6.17
												R (hrs)	1.04	0.91	0.84	0.77	0.73	0.69
B4	0.58	1.60	96.8	96.8	HEC-1 Default	0.045	0.25	0.15	9.70	0.06	34	Tc (hrs)	0.58	0.52	0.48	0.45	0.43	0.42
												Vel (f/s)	4.03	4.54	4.86	5.17	5.42	5.63
												R (hrs)	0.40	0.35	0.33	0.31	0.29	0.28
B5	0.07	0.61	62.8	62.8	HEC-1 Default	0.057	0.25	0.15	9.70	0.06	30	Tc (hrs)	0.43	0.39	0.37	0.34	0.33	0.32
												Vel (f/s)	2.07	2.28	2.44	2.62	2.72	2.82
												R (hrs)	0.45	0.40	0.38	0.35	0.33	0.32
B6	0.54	1.96	359.2	280.0	Natural	0.045	0.25	0.25	4.25	0.49	34	Tc (hrs)	0.49	0.43	0.40	0.36	0.34	0.33
												Vel (f/s)	5.84	6.76	7.26	7.92	8.41	8.85
												R (hrs)	0.41	0.35	0.32	0.29	0.27	0.26

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Sub Basin Data

7/10/2003

Storms: Multiple | Duration: 24 Hour | Loss Method: Green-Ampt | Unit Hydrograph: Clark

Sub Basin ID	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2	5	10	25	50	100
	Sub Basin Parameters						Rainfall Losses						Return Period (Years)					
B7	0.08	0.60	526.8	306.0	Natural	0.056	0.25	0.25	5.10	0.31	40	Tc (hrs)	0.25	0.23	0.22	0.21	0.20	0.19
												Vel (f/s)	3.52	3.84	3.98	4.23	4.49	4.68
												R (hrs)	0.22	0.20	0.19	0.18	0.17	0.16
B8	0.41	2.17	38.8	38.8	HEC-1 Default	0.047	0.25	0.05	12.40	0.01	30	Tc (hrs)	1.09	0.96	0.90	0.83	0.78	0.75
												Vel (f/s)	2.93	3.30	3.54	3.84	4.06	4.24
												R (hrs)	1.26	1.10	1.02	0.94	0.88	0.84
B9	0.39	1.79	423.1	298.0	HEC-1 Default	0.047	0.25	0.25	4.60	0.39	34	Tc (hrs)	0.45	0.40	0.37	0.34	0.32	0.31
												Vel (f/s)	5.78	6.63	7.15	7.77	8.18	8.52
												R (hrs)	0.42	0.36	0.33	0.30	0.29	0.28

Jeffrey A. Despain

* Non default value

(subbasn1)

Appendix D.4

Channel Routing Data

Existing Conditions

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

Routing Data - Normal Depth

7/15/2003

RS Card					RC Card			RX and RY Cards								
Reach ID	NSTPS	ANL	ANCH	ANR	RLNTH (ft)	SEL (ft/ft)	ELMAX		1	2	LB	4	5	RB	7	8
B3B4	3	0.080	0.050	0.080	1401	0.0020		Sta	0.0	250.0	275.0	280.0	290.0	295.0	320.0	570.0
								Elev	110.0	99.0	98.0	95.0	95.0	98.0	99.0	110.0
B4B5	2	0.080	0.050	0.080	1014	0.0010		Sta	0.0	250.0	275.0	280.0	290.0	295.0	320.0	570.0
								Elev	110.0	99.0	98.0	95.0	95.0	98.0	99.0	110.0
B6B8	2	0.080	0.050	0.080	1909	0.0047		Sta	0.0	250.0	275.0	280.0	290.0	295.0	320.0	570.0
								Elev	112.0	101.0	100.0	95.0	95.0	100.0	101.0	112.0
B8B10	2	0.080	0.050	0.080	1700	0.0047		Sta	0.0	250.0	275.0	280.0	290.0	295.0	320.0	570.0
								Elev	112.0	101.0	100.0	95.0	95.0	100.0	101.0	112.0
B10B11	1	0.080	0.050	0.080	1236	0.0040		Sta	0.0	25.0	50.0	55.0	70.0	75.0	100.0	515.0
								Elev	106.0	101.0	100.0	95.0	95.0	100.0	101.0	106.0
B11B22	2	0.080	0.050	0.080	2644	0.0042		Sta	0.0	25.0	200.0	206.0	230.0	236.0	336.0	536.0
								Elev	106.0	102.0	100.0	97.0	95.0	100.0	102.0	106.0
B15B16	1	0.080	0.050	0.080	1669	0.0084		Sta	0.0	20.0	40.0	65.0	85.0	110.0	130.0	150.0
								Elev	100.0	98.0	96.0	96.0	96.0	96.0	98.0	100.0
B17B18	5	0.080	0.050	0.080	4738	0.0084		Sta	0.0	40.0	110.0	115.0	130.0	135.0	205.0	240.0
								Elev	100.0	98.0	96.0	95.0	95.0	96.0	98.0	100.0
B18B19	9	0.080	0.050	0.080	10091	0.0078		Sta	0.0	70.0	120.0	125.0	145.0	150.0	200.0	270.0
								Elev	100.0	98.0	96.0	95.0	95.0	96.0	98.0	100.0

Flood Control District of Maricopa County

BF_EX24 - Buchanan Wash Existing Conditions Hydrology for Adobe Dam / Desert Hills ADMP

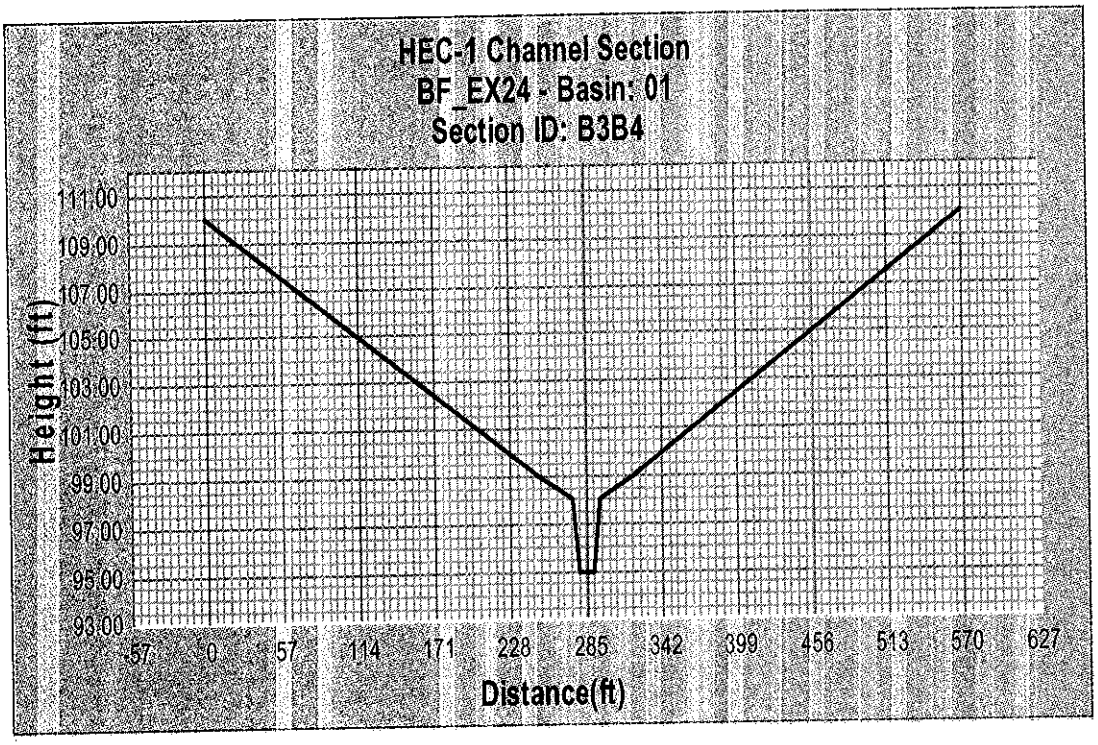
Routing Data - Normal Depth

7/15/2003

RS Card					RC Card			RX and RY Cards								
Reach ID	NSTPS	ANL	ANCH	ANR	RLNTH (ft)	SEL (ft/ft)	ELMAX		1	2	LB	4	5	RB	7	8
B19B20	6	0.080	0.050	0.080	6629	0.0068		Sta	0.0	70.0	120.0	125.0	145.0	150.0	200.0	270.0
								Elev	100.0	98.0	96.0	95.0	95.0	96.0	98.0	100.0
B20B22	8	0.080	0.070	0.080	4576	0.0039		Sta	0.0	200.0	250.0	275.0	325.0	400.0	450.0	500.0
								Elev	104.0	99.0	98.0	98.0	98.0	98.0	99.0	104.0

Jeffrey A. Despain

(routend)


HEC-1 Channel Section
BF_EX24 - Basin: 01
Section ID: B3B4
Height (ft)
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109.00
107.00
105.00
103.00
101.00
99.00
97.00
95.00
93.00
-57
0
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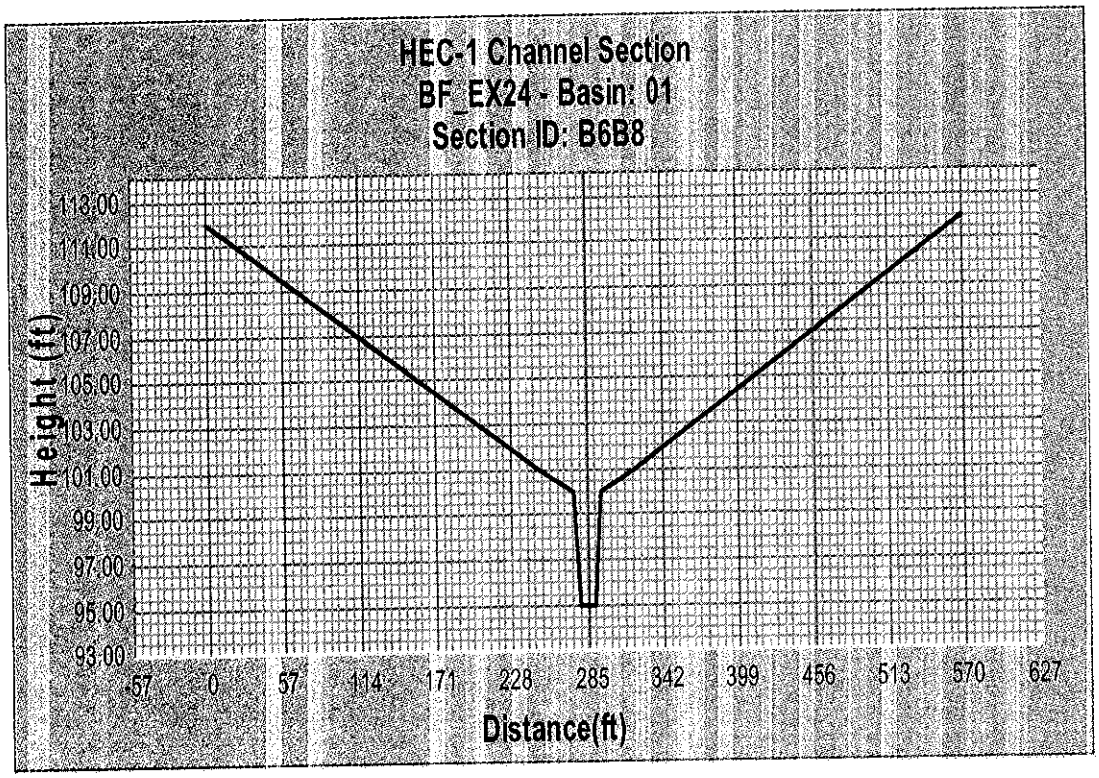
114
171
228
285
342
399
456
513
570
627
Distance(ft)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BF_EX24 - Basin: 01
Section ID: B6B8
Height (ft)
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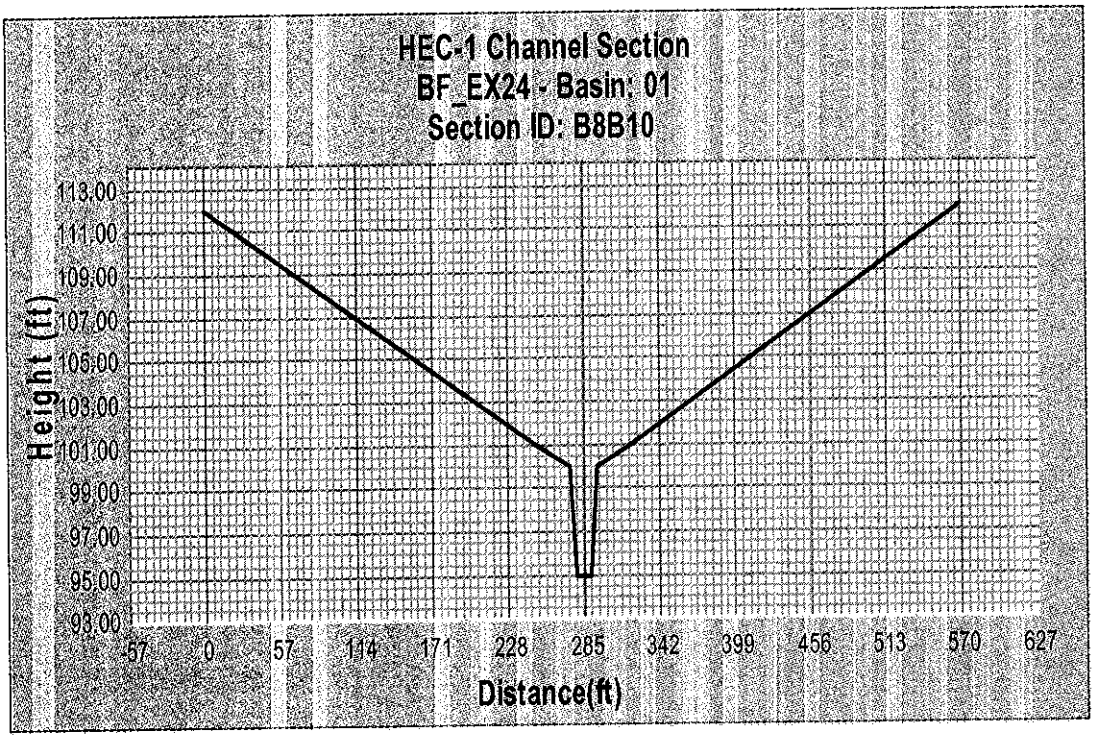
111.00
109.00
107.00
105.00
103.00
101.00
99.00
97.00
95.00
93.00
-57
0
57
114
171
228
285
342
399
456
513
570
627
Distance(ft)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BF_EX24 - Basin: 01
Section ID: B8B10
Height (ft)
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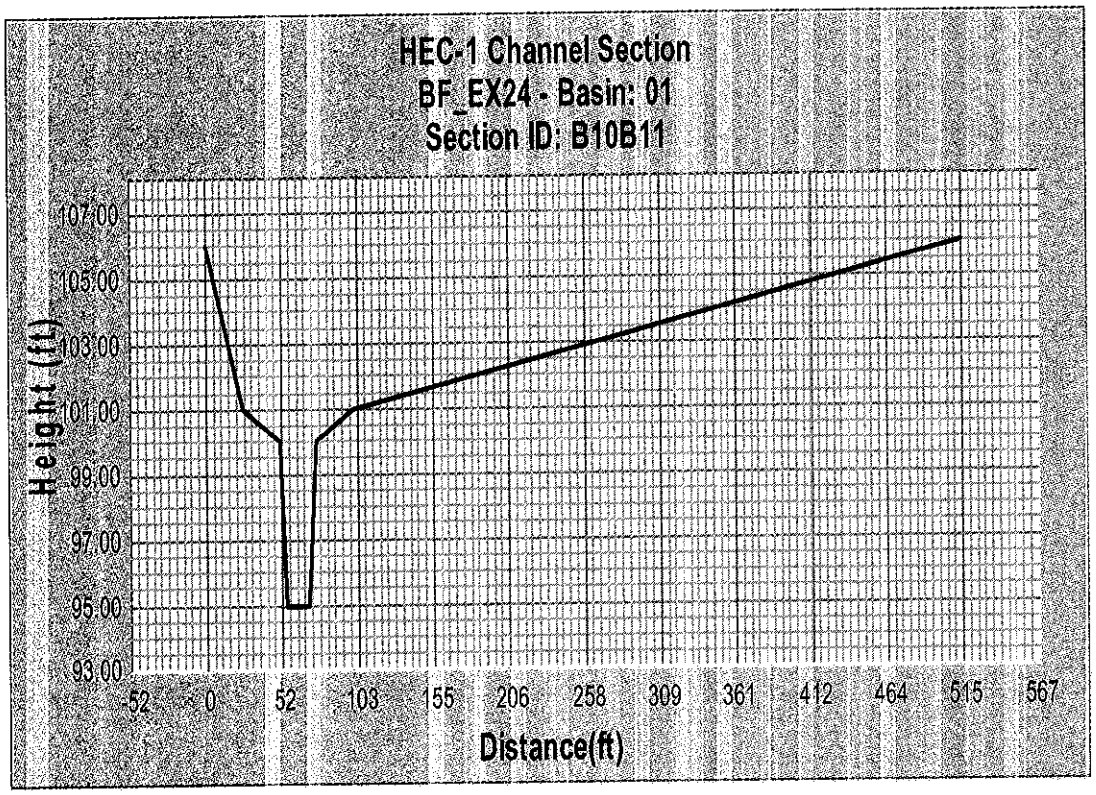
111.00
109.00
107.00
105.00
103.00
101.00
99.00
97.00
95.00
93.00
-57
0
57
114
171
228
285
342
399
456
513
570
627
Distance(ft)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BF_EX24 - Basin: 01
Section ID: B10B11
Height (ft)
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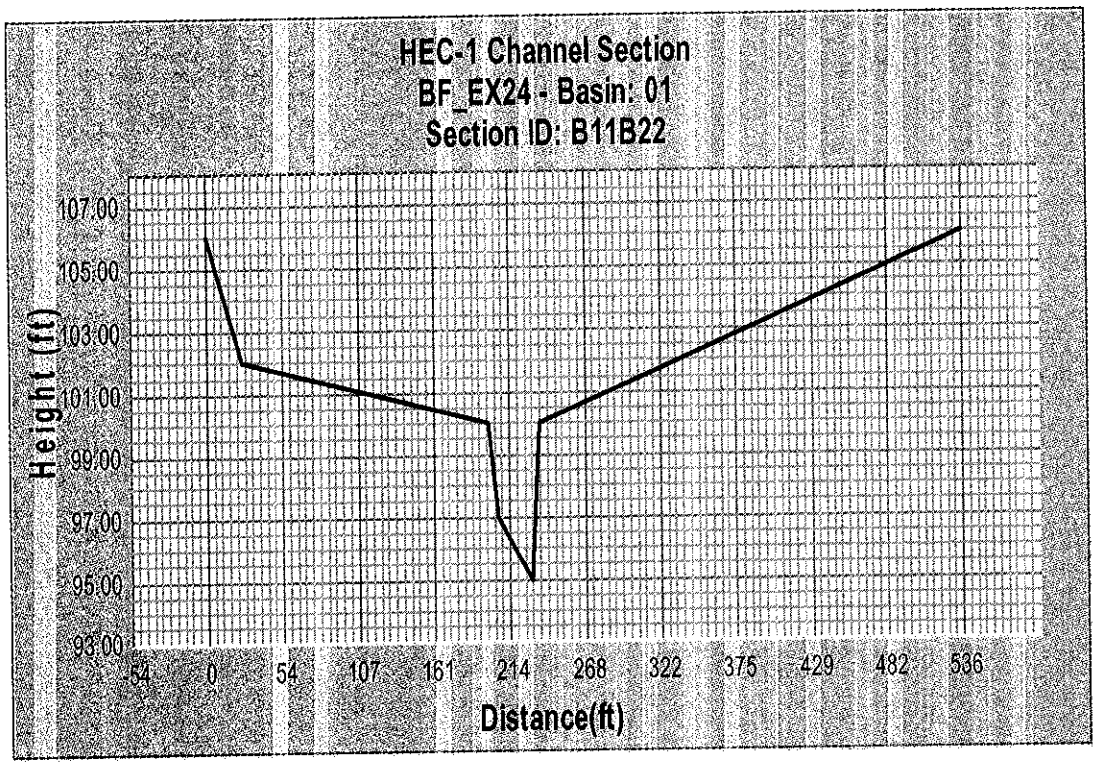
105.00
103.00
101.00
99.00
97.00
95.00
93.00
-52
0
52
103
155
206
258
309
361
412
464
515
567
Distance(ft)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BF_EX24 - Basin: 01
Section ID: B11B22
Height (ft)
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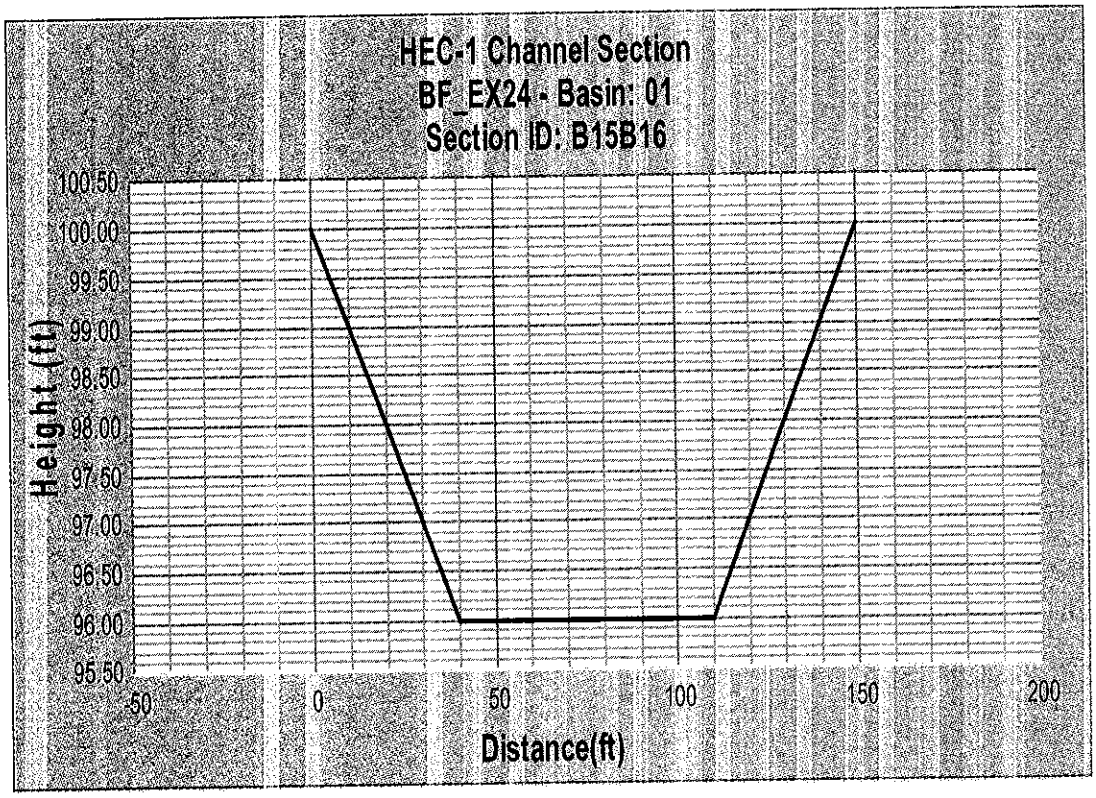
105.00
103.00
101.00
99.00
97.00
95.00
93.00
-54
0
54
107
161
214
268
322
375
429
482
536
Distance(ft)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BF_EX24 - Basin: 01
Section ID: B15B16
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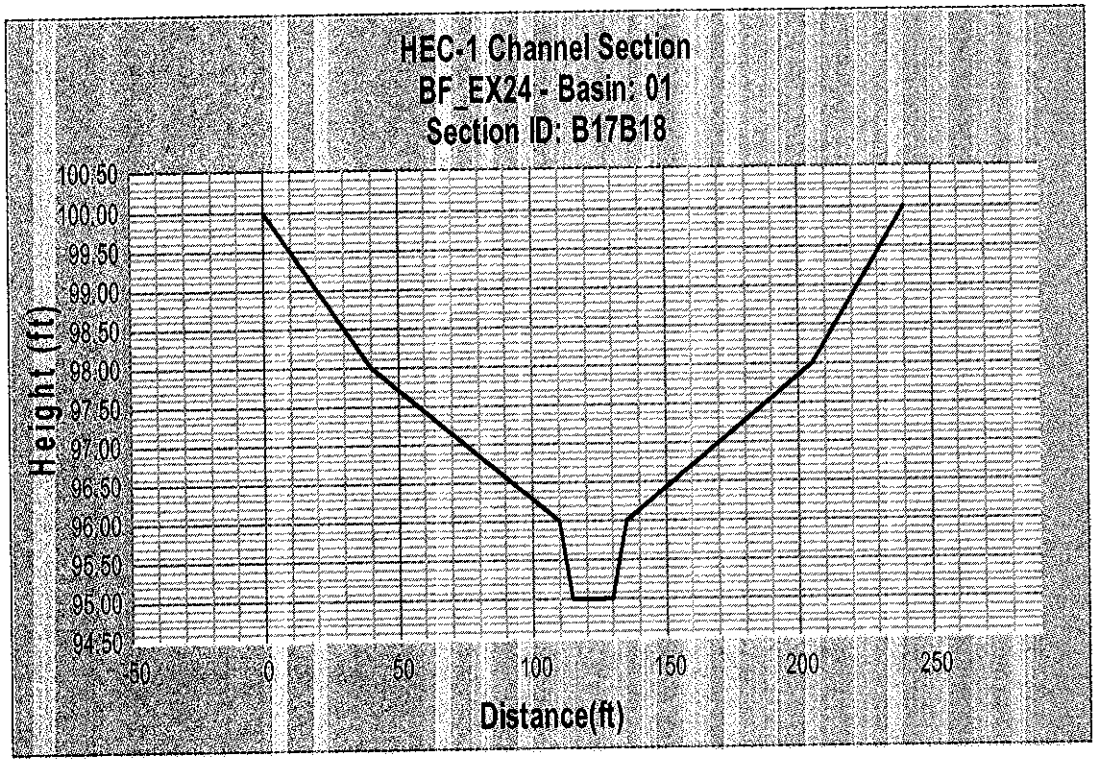
99.50
99.00
98.50
98.00
97.50
97.00
96.50
96.00
95.50
-50
0
50
100
150
200
Distance(ft)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Section ID: B17B18
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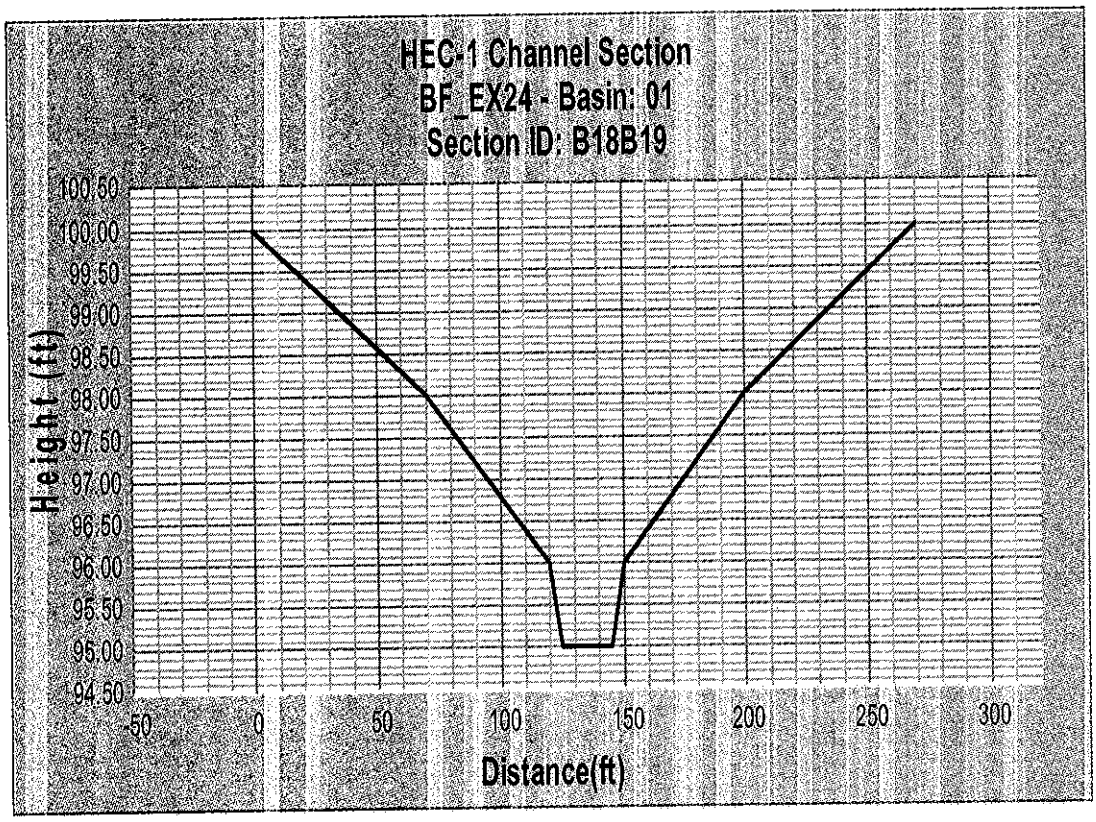
99.50
99.00
98.50
98.00
97.50
97.00
96.50
96.00
95.50
95.00
94.50
-50
0
50
100
150
200
250
Distance(ft)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BF_EX24 - Basin: 01
Section ID: B18B19
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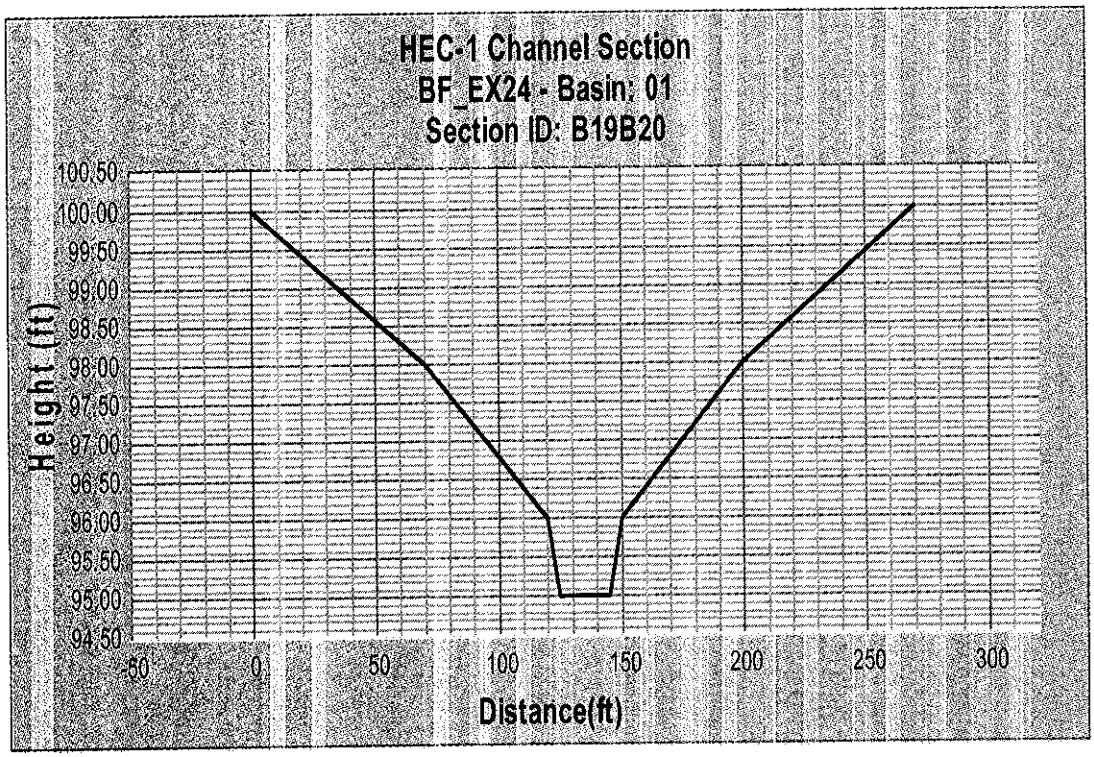
99.50
99.00
98.50
98.00
97.50
97.00
96.50
96.00
95.50
95.00
94.50
-50
0
50
100
150
200
250
300
Distance(ft)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BF_EX24 - Basin: 01
Section ID: B19B20
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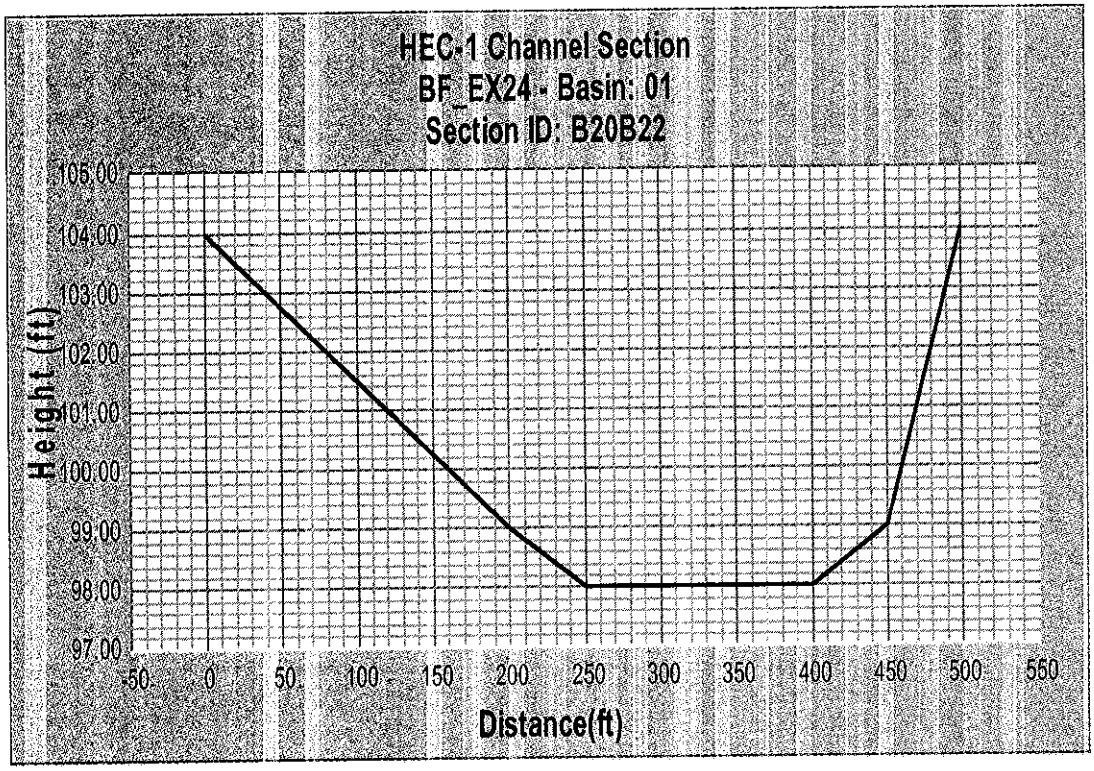
100.00
99.50
99.00
98.50
98.00
97.50
97.00
96.50
96.00
95.50
95.00
94.50
-50
0
50
100
150
200
250
300
Distance(ft)


HEC-1 Channel Section
BF_EX24 - Basin: 01
Section ID: B20B22
Height (ft)
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104.00
103.00
102.00
101.00
100.00
99.00
98.00
97.00
-50
0
50
100
150
200
250
300
350
400
450
500
550
Distance(ft)

Future Conditions

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

Routing Data - Normal Depth

7/15/2003

RS Card					RC Card				RX and RY Cards							
Reach ID	NSTPS NSTPS	ANL	ANCH	ANR	RLNTH (ft)	SEL (ft/ft)	ELMAX		1	2	LB	4	5	RB	7	8
B3B4	3	0.080	0.050	0.080	1401	0.0020		Sta	0.0	250.0	275.0	280.0	290.0	295.0	320.0	570.0
								Elev	110.0	99.0	98.0	95.0	95.0	98.0	99.0	110.0
B4B5	2	0.080	0.050	0.080	1014	0.0010		Sta	0.0	250.0	275.0	280.0	290.0	295.0	320.0	570.0
								Elev	110.0	99.0	98.0	95.0	95.0	98.0	99.0	110.0
B6B8	2	0.080	0.050	0.080	1909	0.0047		Sta	0.0	250.0	275.0	280.0	290.0	295.0	320.0	570.0
								Elev	112.0	101.0	100.0	95.0	95.0	100.0	101.0	112.0
B8B10	2	0.080	0.050	0.080	1700	0.0047		Sta	0.0	250.0	275.0	280.0	290.0	295.0	320.0	570.0
								Elev	112.0	101.0	100.0	95.0	95.0	100.0	101.0	112.0
B10B11	1	0.080	0.050	0.080	1236	0.0040		Sta	0.0	25.0	50.0	55.0	70.0	75.0	100.0	515.0
								Elev	106.0	101.0	100.0	95.0	95.0	100.0	101.0	106.0
B11B22	2	0.080	0.050	0.080	2644	0.0042		Sta	0.0	25.0	200.0	206.0	230.0	236.0	336.0	536.0
								Elev	106.0	102.0	100.0	97.0	95.0	100.0	102.0	106.0
B15B16	1	0.080	0.050	0.080	1669	0.0084		Sta	0.0	20.0	40.0	65.0	85.0	110.0	130.0	150.0
								Elev	100.0	98.0	96.0	96.0	96.0	96.0	98.0	100.0
B17B18	5	0.080	0.050	0.080	4738	0.0084		Sta	0.0	40.0	110.0	115.0	130.0	135.0	205.0	240.0
								Elev	100.0	98.0	96.0	95.0	95.0	96.0	98.0	100.0
B18B19	9	0.080	0.050	0.080	10091	0.0078		Sta	0.0	70.0	120.0	125.0	145.0	150.0	200.0	270.0
								Elev	100.0	98.0	96.0	95.0	95.0	96.0	98.0	100.0

Flood Control District of Maricopa County

BF_FU24 - Buchanan Wash Future Conditions Hydrology for Adobe Dam / Desert Hills A

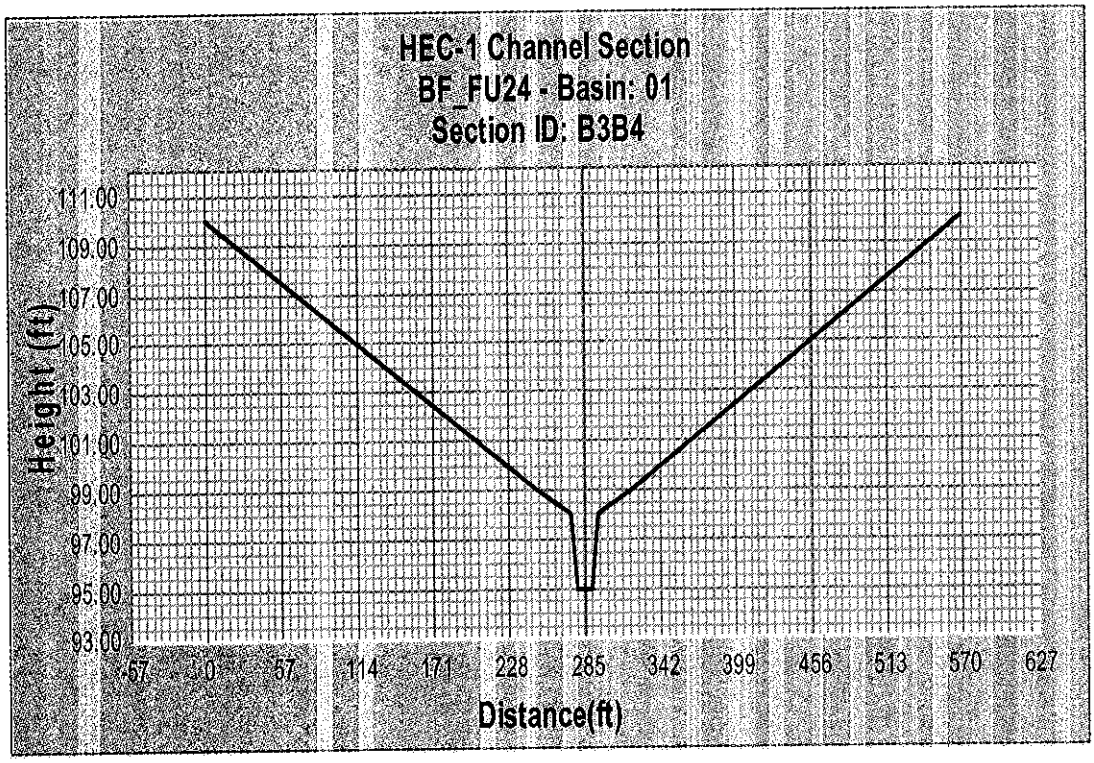
Routing Data - Normal Depth

7/15/2003

RS Card					RC Card			RX and RY Cards								
Reach ID	NSTPS NSTPS	ANL	ANCH	ANR	RLNTH (ft)	SEL (ft/ft)	ELMAX		1	2	LB	4	5	RB	7	8
B19B20	6	0.080	0.050	0.080	6629	0.0068		Sta	0.0	70.0	120.0	125.0	145.0	150.0	200.0	270.0
								Elev	100.0	98.0	96.0	95.0	95.0	96.0	98.0	100.0
B20B22	8	0.080	0.070	0.080	4576	0.0039		Sta	0.0	200.0	250.0	275.0	325.0	400.0	450.0	500.0
								Elev	104.0	99.0	98.0	98.0	98.0	98.0	99.0	104.0

Jeffrey A. Despain

(routend)


HEC-1 Channel Section
BF_FU24 - Basin: 01
Section ID: B3B4
Height (ft)
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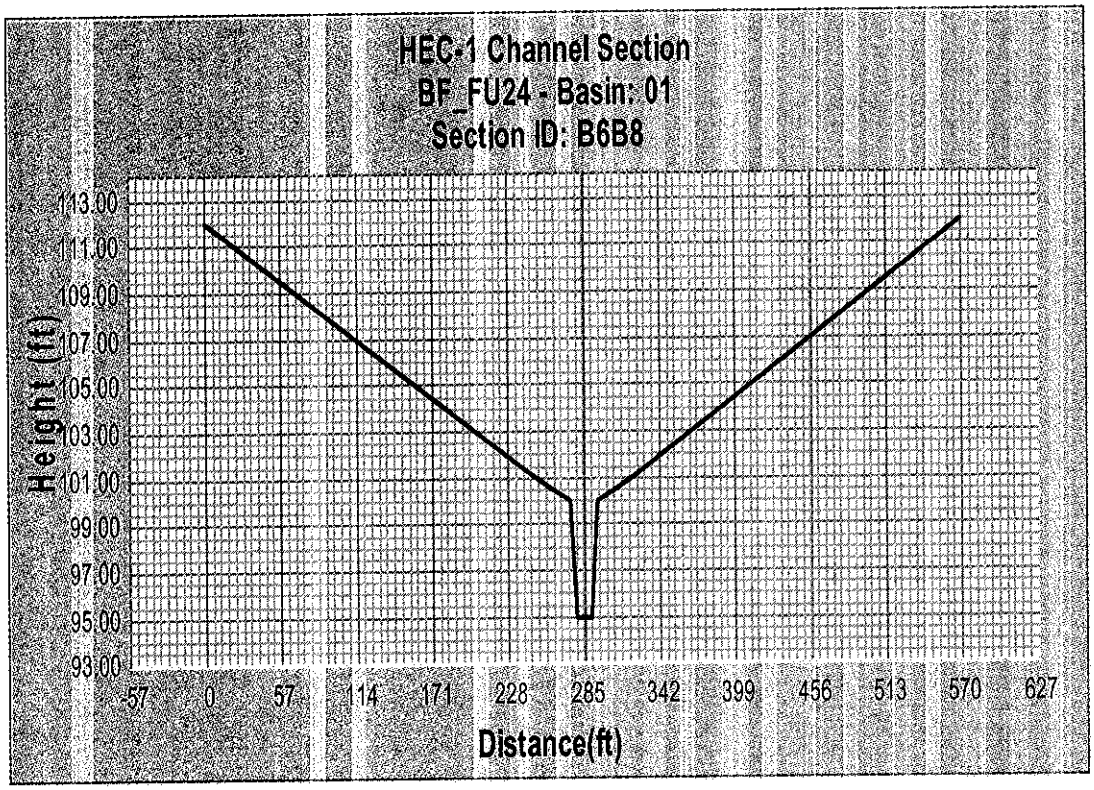
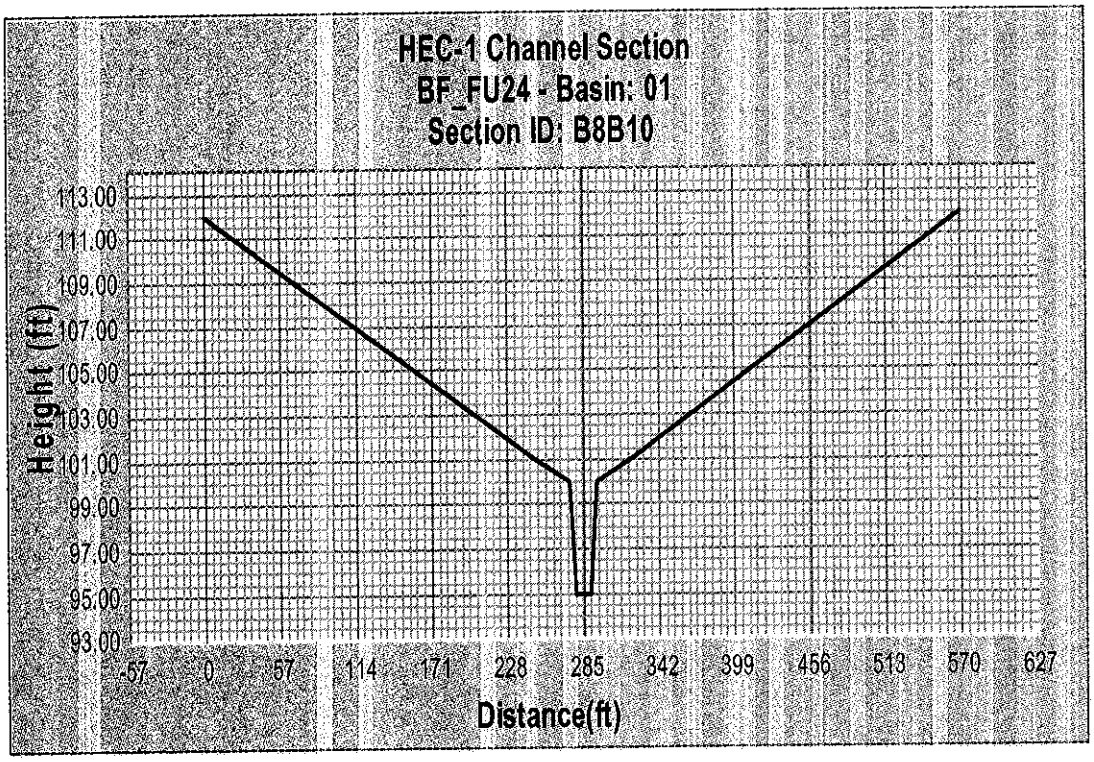
109.00
107.00
105.00
103.00
101.00
99.00
97.00
95.00
93.00
-57
0
57
114
171
228
285
342
399
456
513
570
627
Distance(ft)


HEC-1 Channel Section
BF_FU24 - Basin: 01
Section ID: B6B8
Height (ft)
113.00
111.00
109.00
107.00
105.00
103.00
101.00
99.00
97.00
95.00
93.00
-57
0
57
114
171
228
285
342
399
456
513
570
627
Distance(ft)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BF_FU24 - Basin: 01
Section ID: B8B10
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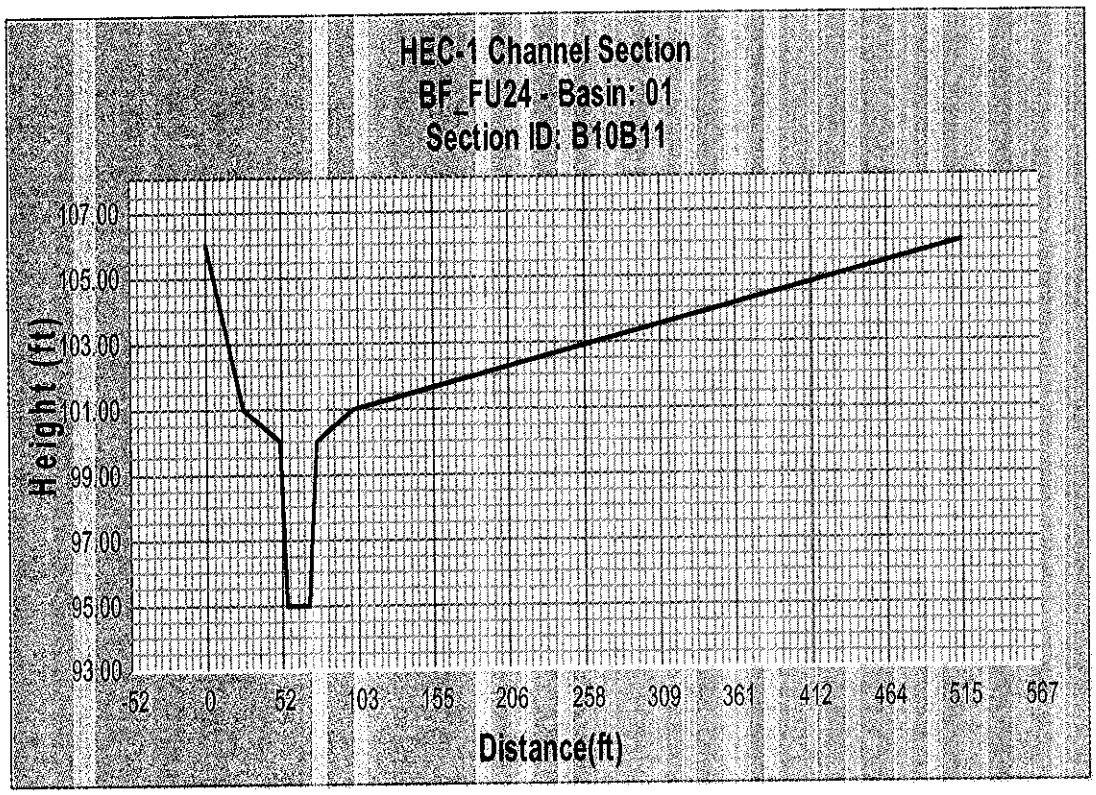
107.00
105.00
103.00
101.00
99.00
97.00
95.00
93.00
-57
0
57
114
171
228
285
342
399
456
513
570
627
Distance(ft)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BF_FU24 - Basin: 01
Section ID: B10B11
Height (ft)
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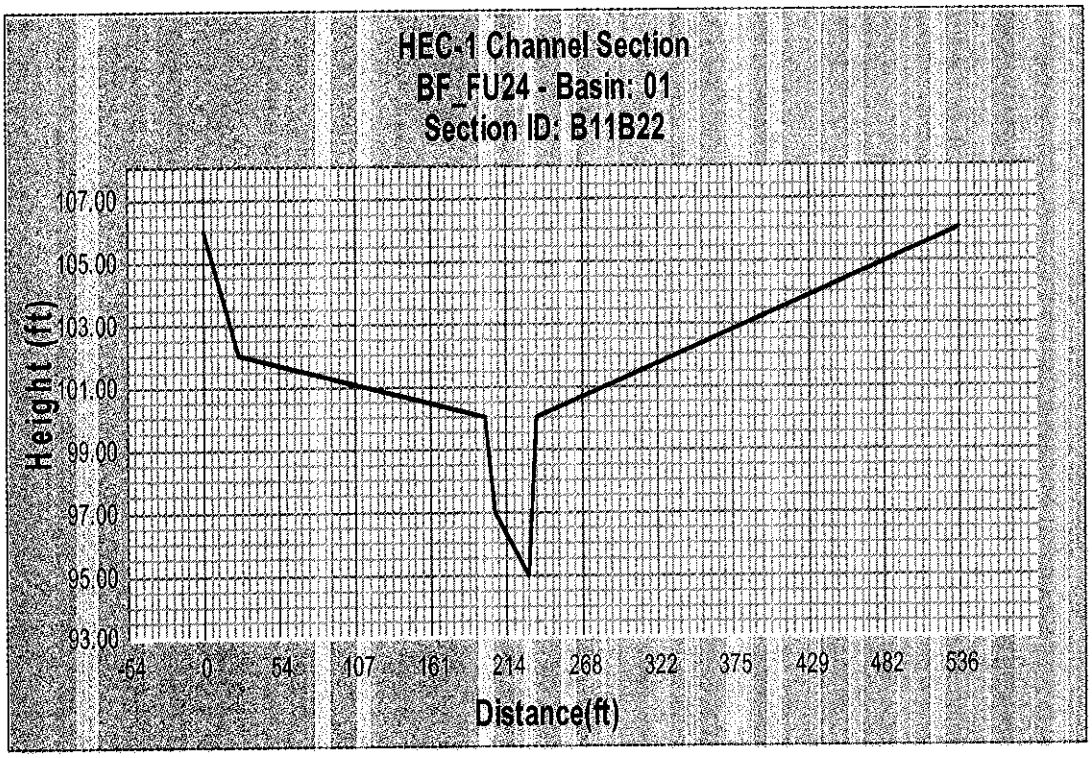
105.00
103.00
101.00
99.00
97.00
95.00
93.00
-52
0
52
103
155
206
258
309
361
412
464
515
567
Distance(ft)


HEC-1 Channel Section
BF_FU24 - Basin: 01
Section ID: B11B22
Height (ft)
107.00
105.00
103.00
101.00
99.00
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95.00
93.00
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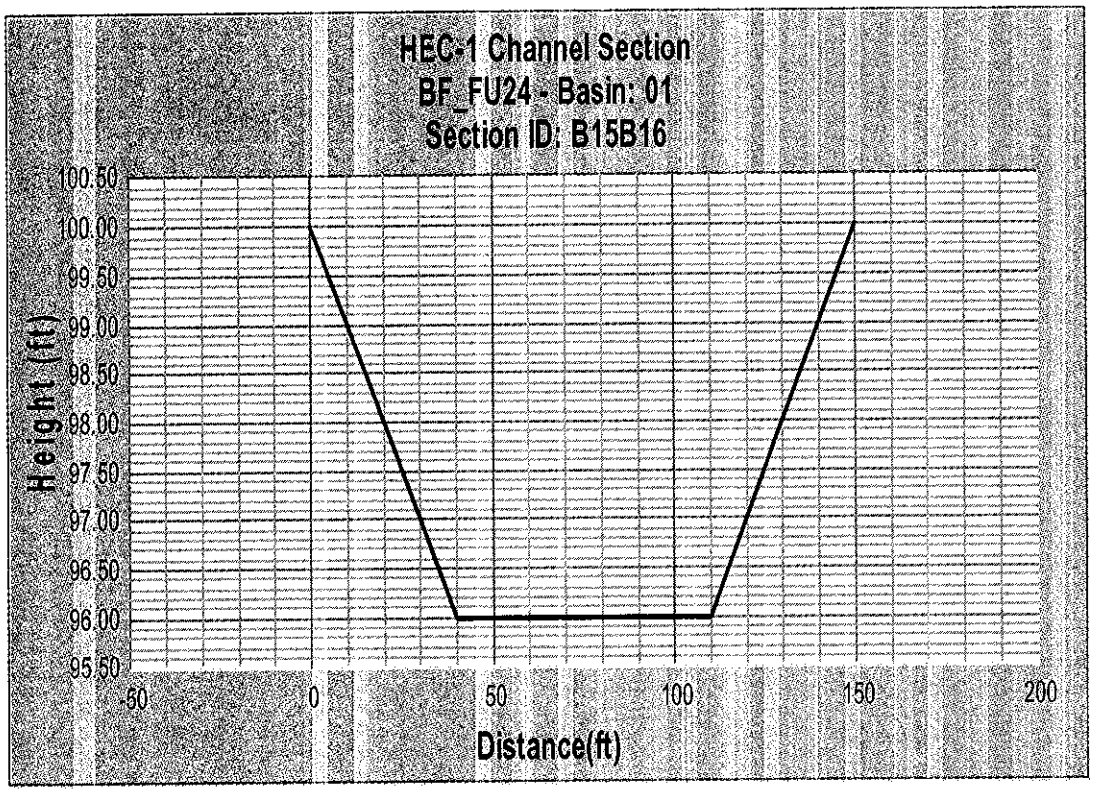
107
161
214
268
322
375
429
482
536
Distance(ft)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BF_FU24 - Basin: 01
Section ID: B15B16
Height (ft)
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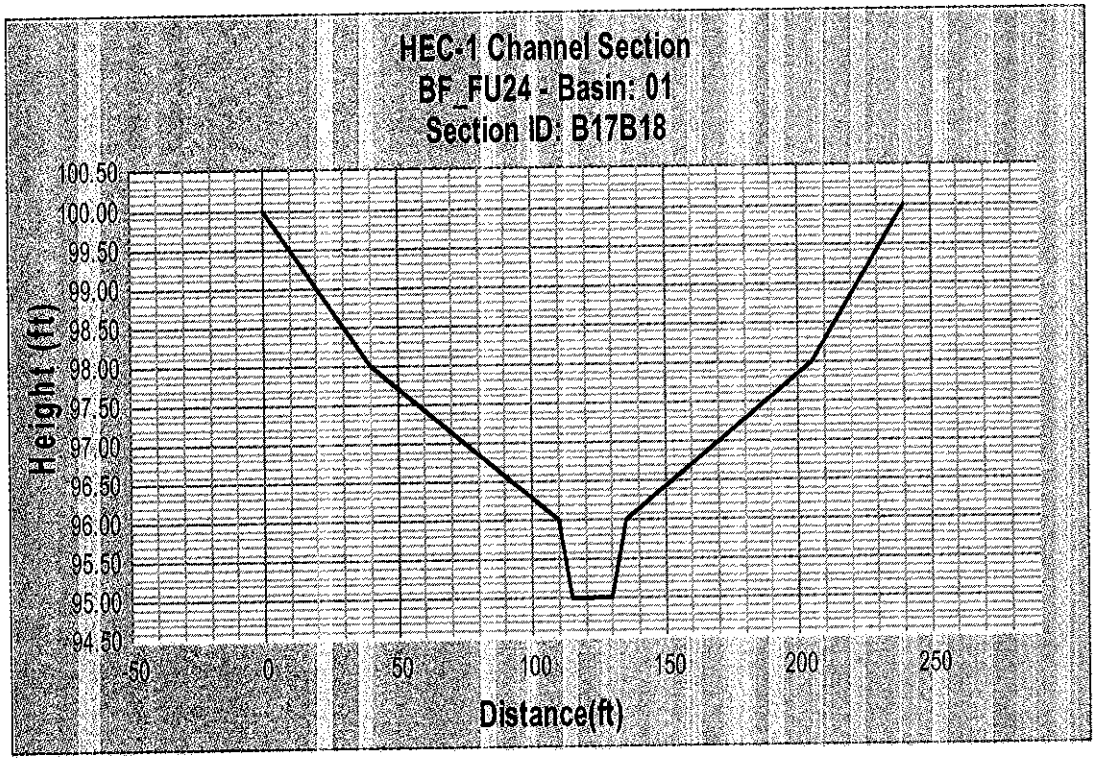
100.00
99.50
99.00
98.50
98.00
97.50
97.00
96.50
96.00
95.50
-50
0
50
100
150
200
Distance(ft)


HEC-1 Channel Section
BF_FU24 - Basin: 01
Section ID: B17B18
Height (ft)
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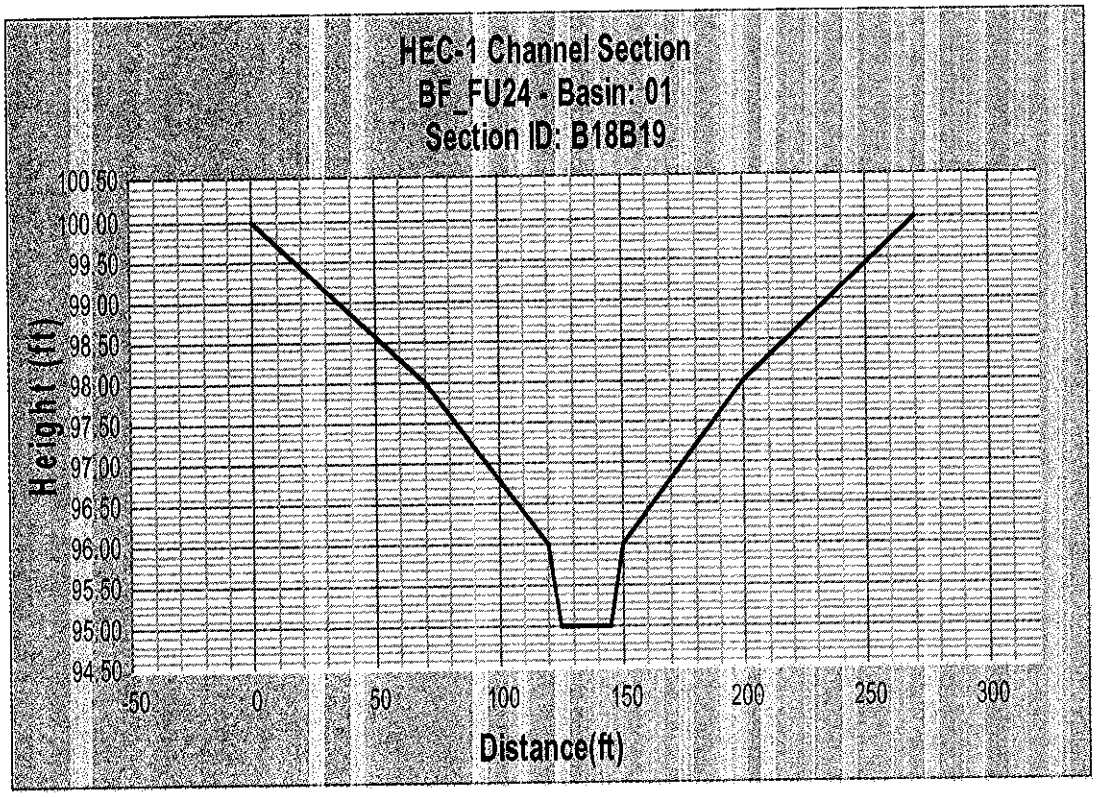
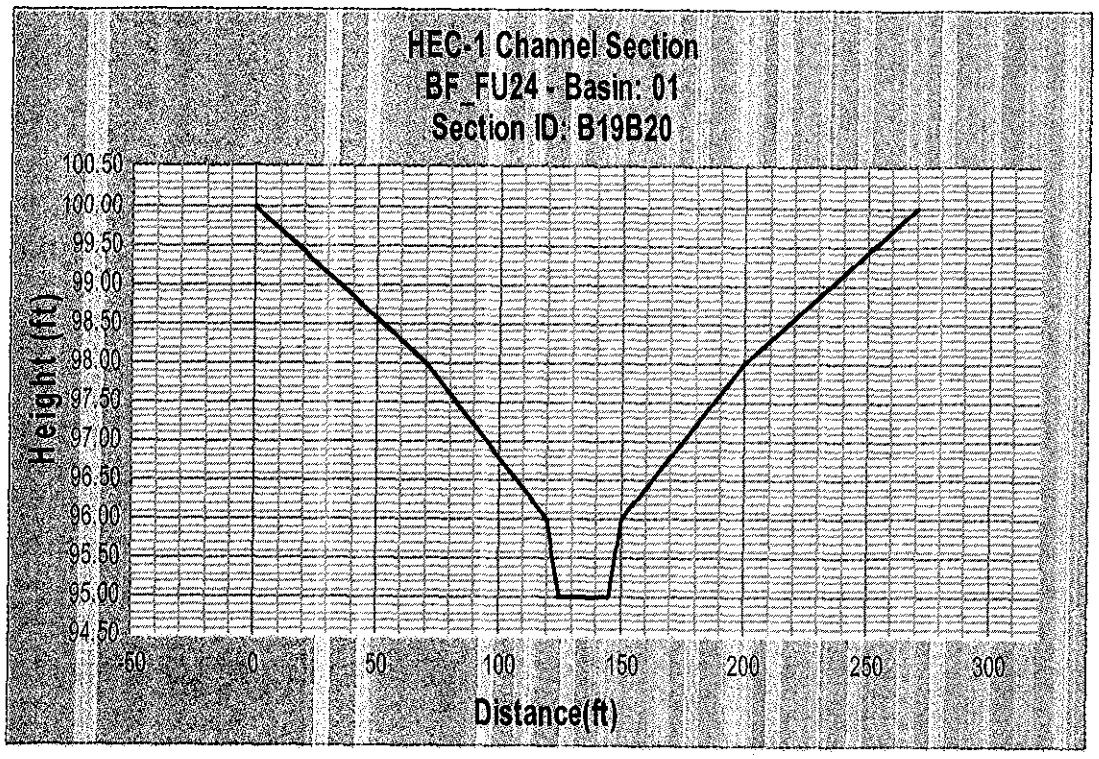
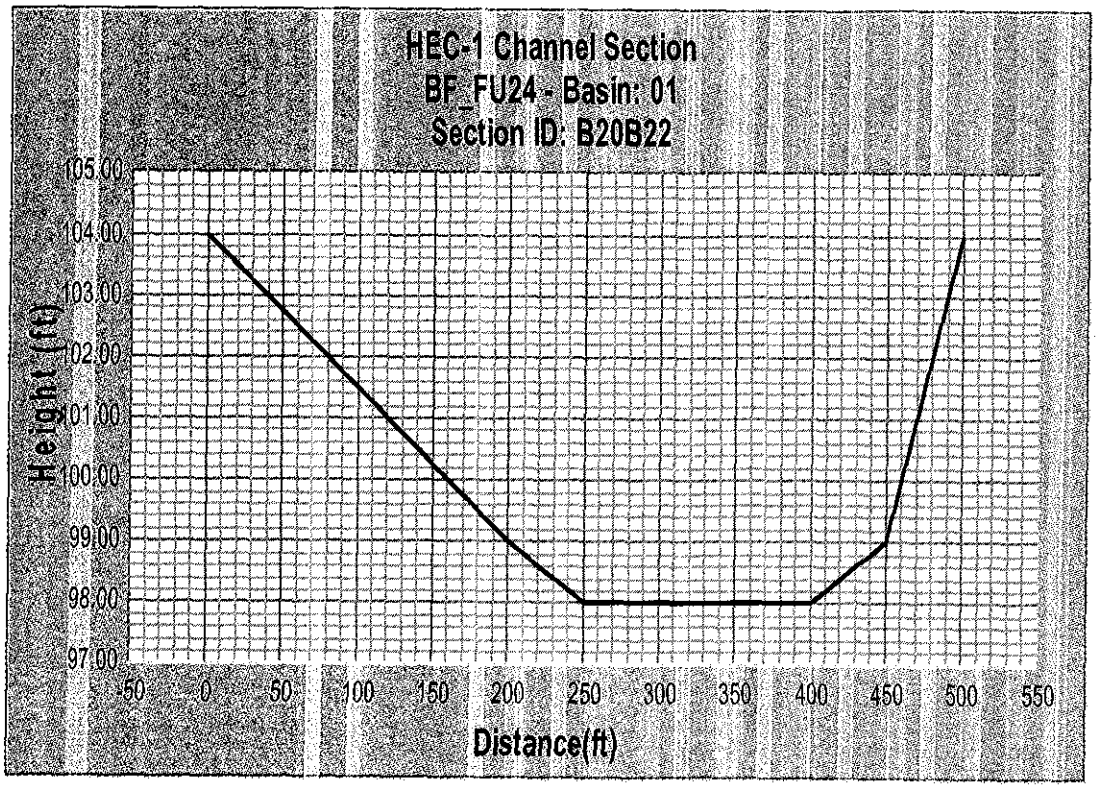
100.00
99.50
99.00
98.50
98.00
97.50
97.00
96.50
96.00
95.50
95.00
94.50
-50
0
50
100
150
200
250
Distance(ft)


HEC-1 Channel Section
BF_FU24 - Basin: 01
Section ID: B18B19
Height (ft)
100.50
100.00
99.50
99.00
98.50
98.00
97.50
97.00
96.50
96.00
95.50
95.00
94.50
-50
0
50
100
150
200
250
300
Distance(ft)


HEC-1 Channel Section
BF_FU24 - Basin: 01
Section ID: B19B20
Height (ft)
100.50
100.00
99.50
99.00
98.50
98.00
97.50
97.00
96.50
96.00
95.50
95.00
94.50
-50
0
50
100
150
200
250
300
Distance(ft)

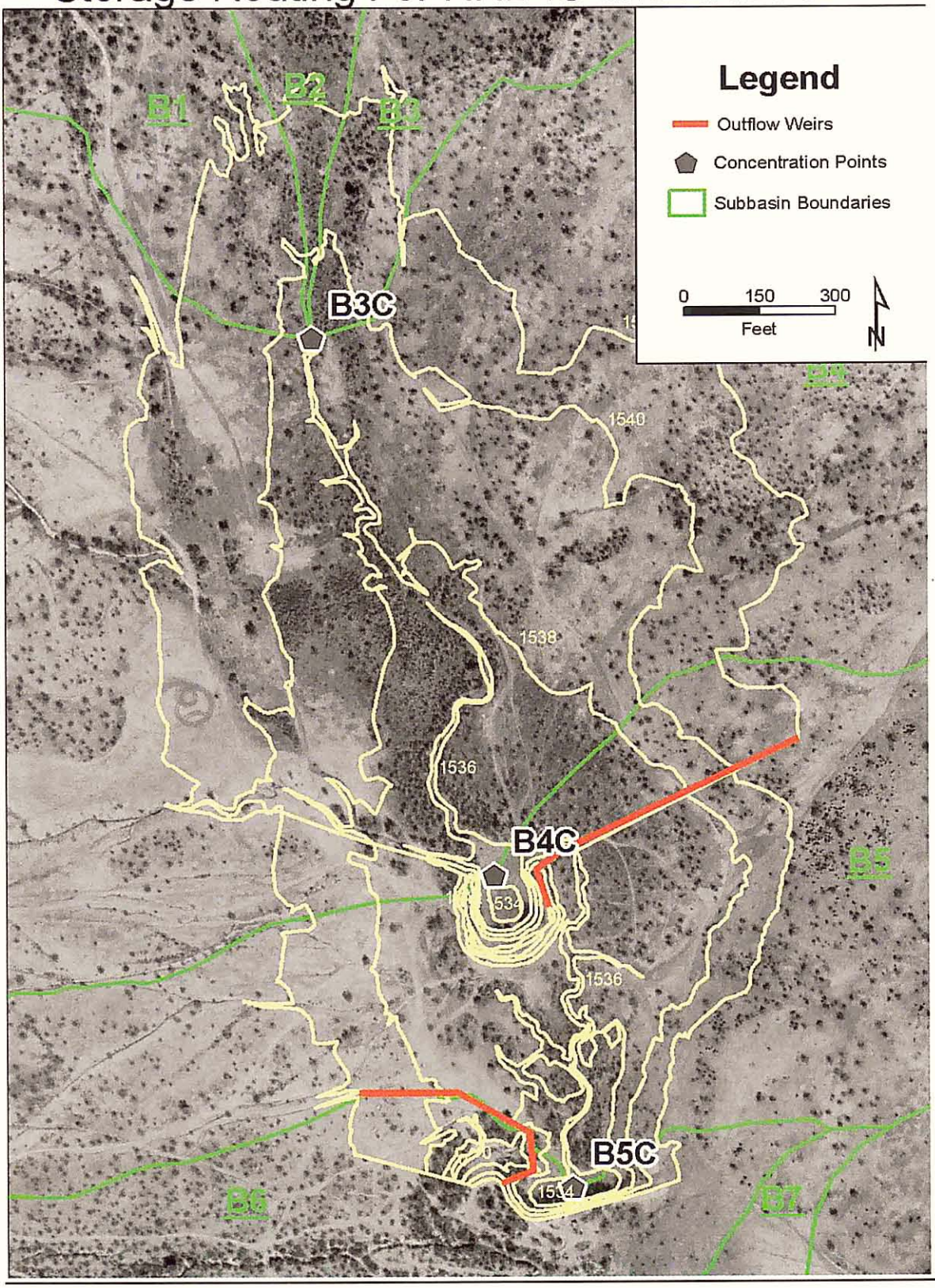

HEC-1 Channel Section
BF_FU24 - Basin: 01
Section ID: B20B22
Height (ft)
105.00
104.00
103.00
102.00
101.00
100.00
99.00
98.00
97.00
-50
0
50
100
150
200
250
300
350
400
450
500
550
Distance(ft)

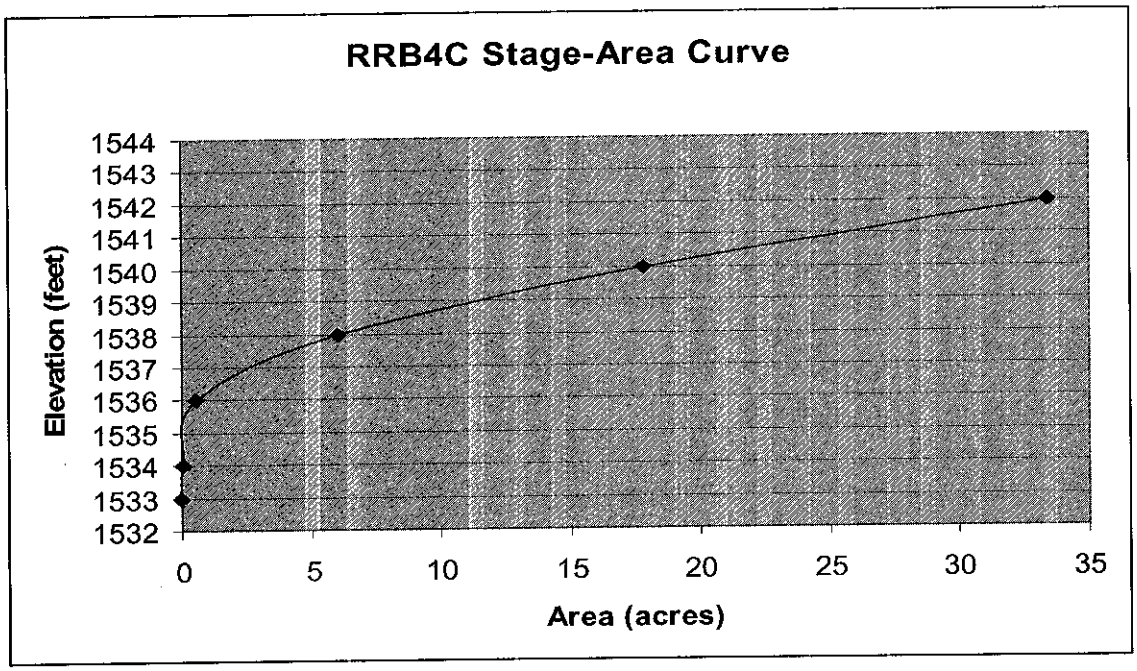
Appendix D.5

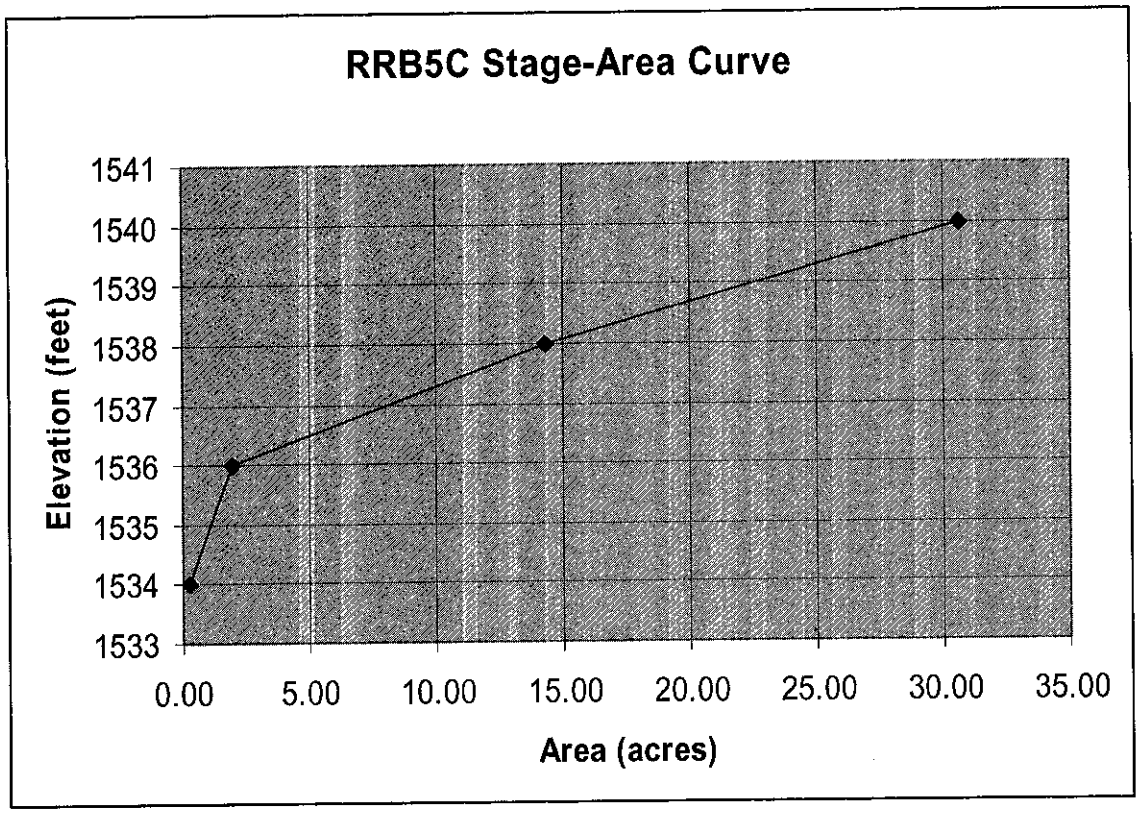
Storage Routing Data

RRB4C and RRB5C

Storage Routing For RRB4C and RRB5C




RRB4C Stage-Area Curve
Elevation (feet)
1544
1543
1542
1541
1540
1539
1538
1537
1536
1535
1534
1533
1532
0
5
10
15
20
25
30
35
Area (acres)


RRB5C Stage-Area Curve
Elevation (feet)
1541
1540
1539
1538
1537
1536
1535
1534
1533
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Area (acres)

RRB4C: Spillway Discharge Computations

```
*******************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
*******************************************


    PROJECT:  BISQUIT FLAT FDS
    ENGINEER:  TED LEHMAN
    DATE:   2/ 7/2003
    TIME:  16:55.25




-------------------------------------------
    INPUT PARAMETERS
-------------------------------------------


    STARTING WSEL:       1536.00
    MAXIMUM WSEL:        1542.00
    STEP SIZE:              0.50
    BREADTH OF WEIR:       25.00


*******************************************
    INPUT ELEVATION/STATION TABLE.
    PROJECT:  BISQUIT FLAT FDS
    DATE:   2/ 7/2003
    TIME:  16:55.25
*******************************************
```

POINT	ELEVATION	STATION
1	1542.00	0.00
2	1540.00	100.00
3	1538.00	150.00
4	1536.00	165.00
5	1536.00	175.00
6	1538.00	425.00
7	1540.00	525.00
8	1542.00	675.00

```
*******************************************
    WEIR COEFFICIENT TABLE
    PROJECT:  BISQUIT FLAT FDS
    DATE:   2/ 7/2003
    TIME:  16:55.25
*******************************************
```

REFERENCE: COE CHART - LOWER CURVE

POINT	HEAD	COEFFICIENT
1	0.00	2.5000
2	0.50	2.5667
3	1.00	2.6333
4	1.50	2.7000
5	2.00	2.7714
6	2.50	2.7742
7	3.00	2.7770
8	3.50	2.7798
9	4.00	2.7826
10	4.50	2.7853
11	5.00	2.7881
12	5.50	2.7909
13	6.00	2.7937

```
*******************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  BISQUIT FLAT FDS
    DATE:   2/ 7/2003
    TIME:  16:55.25
*******************************************
```

ELEVATION	DISCHARGE (CFS)
1536.00	0.00
1536.50	32.81
1537.00	162.37
1537.50	429.33
1538.00	867.90
1538.50	1511.93
1539.00	2364.11
1539.50	3361.41
1540.00	4546.67
1540.50	5947.22
1541.00	7598.19
1541.50	9485.82
1542.00	11652.08

RRB5C: Spillway Discharge Computations

```
*******************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
*******************************************

    PROJECT:  BISQUIT FLAT FDS
    ENGINEER:  TED LEHMAN
    DATE:   2/ 6/2003
    TIME:  15:56.21

-------------------------------------------
    INPUT PARAMETERS
-------------------------------------------

    STARTING WSEL:       1536.00
    MAXIMUM WSEL:        1540.00
    STEP SIZE:              0.50
    BREADTH OF WEIR:       25.00

*******************************************
    INPUT ELEVATION/STATION TABLE.
    PROJECT:  BISQUIT FLAT FDS
    DATE:   2/ 6/2003
    TIME:  15:56.21
*******************************************
```

POINT	ELEVATION	STATION
1	1540.00	0.00
2	1538.00	12.00
3	1536.00	60.00
4	1536.00	150.00
5	1538.00	335.00
6	1540.00	500.00

```
*******************************************
    WEIR COEFFICIENT TABLE
    PROJECT:  BISQUIT FLAT FDS
    DATE:   2/ 6/2003
    TIME:  15:56.21
*******************************************
```

REFERENCE: COE CHART - LOWER CURVE

POINT	HEAD	COEFFICIENT
1	0.00	2.5000
2	0.50	2.5667
3	1.00	2.6333
4	1.50	2.7000
5	2.00	2.7714
6	2.50	2.7742
7	3.00	2.7770
8	3.50	2.7798
9	4.00	2.7826

```
*******************************************
    UNEVEN WEIR FLOW PROGRAM
    FORTRAN VERSION 1.0
    PROJECT:  BISQUIT FLAT FDS
    DATE:   2/ 6/2003
    TIME:  15:56.21
*******************************************
```

ELEVATION	DISCHARGE (CFS)
1536.00	0.00
1536.50	102.54
1537.00	356.61
1537.50	780.30
1538.00	1399.65
1538.50	2223.91
1539.00	3273.58
1539.50	4498.26
1540.00	5939.76

RRB17

980034StrHyd_rev1.xls 11/10/98

TRAMONTO
Hydrology & Street Hydraulics

Project Location:	City of North Phoenix
Selected Rainfall Intensity Chart	Maricopa County
10-Year, 6-hour Precip.	2.19 inches
Typical 1/2 Street Width	17.5 ft to B/C
Typical Street Cross-Slope	2.00%

Concentration Point	Area (Ac)	C2-10 *	Init. Flow (min)	Tc (min.)	i2	i10	i100	Q2	Q10	Q100
WEST OF SKUNK CREEK										
A1	10.30	0.65	20	20	2.19	3.49	5.40	15	23	45
A2	7.80	0.65	20	20	2.19	3.49	5.40	11	18	34
A3	0.96	0.85	5	5	4.02	6.14	9.52	3	5	9
A4	8.21	0.85	5	5	4.02	6.14	9.52	28	43	74
A5	9.65	0.65	20	20	2.19	3.49	5.40	14	22	42
A6	3.78	0.65	20	20	2.19	3.49	5.40	5	9	17
A7	10.67	0.65	20	20	2.19	3.49	5.40	15	24	47
A8	12.96	0.65	20	20	2.19	3.49	5.40	18	29	57
A9	10.22	0.65	20	20	2.19	3.49	5.40	15	23	45
A10	2.70	0.65	20	20	2.19	3.49	5.40	4	6	12
B1	16.38	0.65	20	20	2.19	3.49	5.40	23	37	72
C1	7.53	0.65	20	20	2.19	3.49	5.40	11	17	33
C2	3.93	0.85	5	5	4.02	6.14	9.52	13	20	36
D1	7.17	0.65	20	20	2.19	3.49	5.40	10	16	31
E1	10.48	0.65	20	20	2.19	3.49	5.40	15	24	46
E2	15.62	0.65	20	20	2.19	3.49	5.40	22	35	68
E3	1.76	0.85	5	5	4.02	6.14	9.52	6	9	16
F1	20.60	0.65	20	20	2.19	3.49	5.40	29	47	90
F2	14.52	0.65	20	20	2.19	3.49	5.40	21	33	64
F3	1.09	0.85	5	5	4.02	6.14	9.52	4	6	10
G1	8.69	0.35	20	20	2.19	3.49	5.40	7	11	45
H1	13.84	0.65	20	20	2.19	3.49	5.40	20	31	71
J1	10.64	0.80	20	20	2.19	3.49	5.40	19	30	55
K1	14.19	0.65	20	20	2.19	3.49	5.40	20	32	73
L1	9.91	0.55	20	20	2.19	3.49	5.40	12	19	51
M1	8.92	0.65	20	20	2.19	3.49	5.40	13	20	46
N1	12.52	0.55	20	20	2.19	3.49	5.40	15	24	64
O1	14.68	0.65	20	20	2.19	3.49	5.40	21	33	75
O2	26.01	0.65	20	20	2.19	3.49	5.40	37	59	133
P1	11.37	0.85	5	5	4.02	6.14	9.52	39	59	103
S1	3.01	0.85	5	5	4.02	6.14	9.52	10	16	27
S2	2.72	0.85	5	5	4.02	6.14	9.52	9	14	25
S3	14.88	0.65	20	20	2.19	3.49	5.40	21	34	65
S4	4.65	0.65	20	20	2.19	3.49	5.40	7	11	20
S5	3.23	0.65	20	20	2.19	3.49	5.40	5	7	14
S6	3.18	0.65	20	20	2.19	3.49	5.40	5	7	14
S7	6.33	0.65	20	20	2.19	3.49	5.40	9	14	28
S8	17.46	0.55	20	20	2.19	3.49	5.40	21	34	65
S9	9.67	0.55	20	20	2.19	3.49	5.40	12	19	36
S10	1.91	0.85	5	5	4.02	6.14	9.52	7	10	19
S11	1.07	0.85	5	5	4.02	6.14	9.52	4	6	11
S12	6.20	0.85	5	5	4.02	6.14	9.52	21	32	63

Note: * C2-10 is shown; C100 is adjusted by 1.25 per *Drainage Design Manual for Maricopa County, Arizona -- Volume I Hydrology*.

Haskin Engineering Consultants

980034SrHyd_rev1.xls 11/10/98

TRAMONTO
Hydrology & Street Hydraulics

Project Location:	City of North Phoenix
Selected Rainfall Intensity Chart	*Maricopa County*
10-Year, 6-hour Precip.	2.19 inches
Typical 1/2 Street Width	17.5 ft to B/C
Typical Street Cross-Slope	2.00%

Concentration Point	Area (Ac)	C2-10 *	Init. Flow (min)	Tc (min.)	i2	i10	i100	Q2	Q10	Q100	
EAST OF SKUNK CREEK											
A1	21.72	0.46	12	12	2.88	4.47	6.96	29	45	87	
A2	23.94	0.40	14	14	2.67	4.19	6.52	26	40	78	
B1	11.98	0.60	12	12	2.88	4.47	6.96	21	32	62	
B2	32.25	0.55	12	12	2.88	4.47	6.96	51	79	154	
B3	41.29	0.42	12	12	2.88	4.47	6.96	50	78	151	
C1	32.63	0.47	14	14	2.67	4.19	6.52	41	64	125	
C2	12.23	0.50	14	14	2.67	4.19	6.52	16	26	50	
C3	3.39	0.42	14	14	2.67	4.19	6.52	4	6	12	
C4	19.00	0.50	12	12	2.88	4.47	6.96	27	42	83	
D1	36.05	0.65	14	14	2.67	4.19	6.52	62	98	191	
D2	6.74	0.45	12	12	2.88	4.47	6.96	9	14	26	
D3	2.21	0.40	12	12	2.88	4.47	6.96	3	4	8	
D4	11.19	0.40	12	12	2.88	4.47	6.96	13	20	39	
D5	14.96	0.46	14	14	2.67	4.19	6.52	18	29	56	
D6	14.96	0.52	12	12	2.88	4.47	6.96	22	35	68	
D7	4.59	0.45	12	12	2.88	4.47	6.96	6	9	18	
E1	39.89	0.60	12	12	2.88	4.47	6.96	69	107	208	
E2	8.93	0.64	12	12	2.88	4.47	6.96	16	26	50	
F1	12.29	0.50	14	14	2.67	4.19	6.52	16	26	50	
F2	22.79	0.35	14	14	2.67	4.19	6.52	21	33	65	
F3	12.94	0.50	14	14	2.67	4.19	6.52	17	27	53	
F4	8.90	0.35	14	14	2.67	4.19	6.52	8	13	25	
G1	17.10	0.46	12	12	2.88	4.47	6.96	23	35	68	
S10	23.46	0.43	12	12	2.88	4.47	6.96	29	45	88	
OFFSITE J	67.60	0.64	9.3	9	3.28	4.97	7.72	142	215	418	(1)
OFFSITE H	23.50	0.64	7.3	7	3.65	5.50	8.46	55	83	159	(1)
OFFSITE J+A1	89.32	0.60	13	13	2.77	4.33	6.74	148	231	449	(1)
OFFSITE J+A1+A2	113.27	0.55	16	16	2.49	3.91	6.08	157	246	478	(1)
B1+B2	44.23	0.56	12	12	2.88	4.47	6.96	72	111	217	
B1+B2+B3	85.51	0.49	16	16	2.49	3.91	6.08	105	165	321	
C1+C2	44.86	0.48	15	15	2.57	4.02	6.24	55	86	167	
C1+C2+C3	48.25	0.47	16	16	2.49	3.91	6.08	57	90	174	
D3+D4	13.40	0.40	13	13	2.77	4.33	6.74	15	23	45	
D3+D4+D1	49.45	0.58	14	14	2.67	4.19	6.52	77	121	235	
D3+D4+D1+D2	56.19	0.57	14	14	2.67	4.19	6.52	85	133	259	
D3+D4+D1+D2+D6+D7	75.73	0.54	17	17	2.42	3.81	5.92	99	156	303	
D3+D4+D1+D2+D6+D7+D5	90.69	0.54	18	18	2.34	3.71	5.76	115	182	352	
E1+E2	48.82	0.61	15	15	2.57	4.02	6.24	76	119	231	
F1+F2	35.08	0.40	18	18	2.34	3.71	5.76	33	52	102	

Notes * C2-10 is shown; C100 is adjusted by 1.25 per *Drainage Design Manual for Maricopa County, Arizona -- Volume I Hydrology*

(1) Refer to Rational Program for Tc calculations

Haskin Engineering Consultants

980034SubHyd_rev2.xls

TRAMONTO
Retention Computations

100-Year, 2-hour Precip. = 2.72 inches

Sub-Basin I.D.	Drainage Area (Ac)	Runoff Coefficient C	100-year 2-hr Runoff Volume (AF)	Volume Required (AF)	Excess Volume (1) (AF)	Comment
WEST OF SKUNK CREEK						
Basin A						
A1	10.30	0.65	1.52	1.52	0.00	
A2	7.80	0.65	1.15	1.15	0.00	
A3	0.96	0.85	0.18	0.18	0.00	
A4	8.21	0.85	1.58	1.58	0.00	
A5	9.65	0.65	1.42	1.42	0.00	
A6	3.78	0.65	0.56	0.56	0.00	
A7	10.67	0.65	1.57	1.57	0.00	
A8	12.96	0.65	1.91	1.91	0.00	
A9	10.22	0.65	1.51	1.51	0.00	
A10	2.70	0.65	0.40	0.40	0.00	
Basin A Area	23.91	0.25	1.35	1.35	0.00	
Sub-Total	101.15		13.15	13.15	0.00	
Basin B						
B1	16.38	0.65	2.41	2.41	0.00	
Basin B Area	1.19	0.25	0.07	0.07	0.00	
Sub-Total	17.56		2.48	2.48	0.00	
Basin C						
C1	7.53	0.65	1.11	1.11	0.00	
C2	3.93	0.85	0.76	0.76	0.00	
Basin C Area	1.84	0.25	0.10	0.10	0.00	
Sub-Total	13.30		1.97	1.97	0.00	
Basin D						
D1	7.17	0.65	1.06	1.06	0.00	
Basin D Area	0.98	0.25	0.06	0.06	0.00	
Sub-Total	8.15		1.11	1.11	0.00	
Basin E						
E1	10.48	0.65	1.54	1.54	0.00	
E2	15.62	0.65	2.30	2.30	0.00	
E3	1.76	0.85	0.34	0.34	0.00	
Basin E Area	2.44	0.25	0.14	0.14	0.00	
Sub-Total	30.30		4.32	4.32	0.00	

Hoskin Engineering Consultants

980034SrHyd_rev2.xls

TRAMONTO
Retention Computations

100-Year, 2-hour Precip. = 2.72 inches

Sub-Basin I.D.	Drainage Area (Ac)	Runoff Coefficient C	100-year 2-hr Runoff Volume (AF)	Volume Required (AF)	Excess Volume (1) (AF)	Comment
Basin F						
F1	20.60	0.65	3.03	3.03	0.00	
F2	14.52	0.65	2.14	2.14	0.00	
F3	1.09	0.85	0.21	0.21	0.00	
Basin F Area	2.74	0.25	0.16	0.16	0.00	
Sub-Total	38.96		5.54	5.54	0.00	
Onsite						
G1	8.69	0.35	0.69	0.69	0.00	Retain flow onsite
H1	13.84	0.65	2.04	2.04	0.00	Retain flow onsite
J1	10.64	0.80	1.93	1.93	0.00	Retain flow onsite
K1	14.19	0.65	2.09	2.09	0.00	Retain flow onsite
L1	9.91	0.55	1.24	1.24	0.00	Retain flow onsite
M1	8.92	0.65	1.31	1.31	0.00	Retain flow onsite
N1	12.52	0.55	1.56	1.56	0.00	Retain flow onsite
O1	14.68	0.65	2.16	2.16	0.00	Retain flow onsite
O2	26.01	0.65	3.83	3.83	0.00	Retain flow onsite
P1	11.37	0.85	2.19	2.19	0.00	
Sub-Total	130.77		19.05	19.05	0.00	
Skunk Creek						
S1	3.01	0.85	0.58	0.00		Drains to Skunk Creek
S2	2.72	0.85	0.52	0.00		Drains to Skunk Creek
S3	14.88	0.65	2.19	0.00		Drains to Skunk Creek
S4	4.65	0.65	0.69	0.00		Drains to Skunk Creek
S5	3.23	0.65	0.48	0.00		Drains to Skunk Creek
S6	3.18	0.65	0.47	0.00		Drains to Skunk Creek
S7	6.33	0.65	0.93	0.00		Drains to Skunk Creek
S8	17.46	0.55	2.18	0.00		Drains to Skunk Creek
S9	9.67	0.55	1.21	0.00		Drains to Skunk Creek
S10	1.91	0.85	0.37	0.00		Drains to Skunk Creek
S11	1.07	0.85	0.21	0.00		Drains to Skunk Creek
S12	6.20	0.85	1.19	0.00		Drains to Skunk Creek
Sub-Total	74.32		11.01	0.00		
EST TOTAL	414.50		58.63	47.62	0.00	

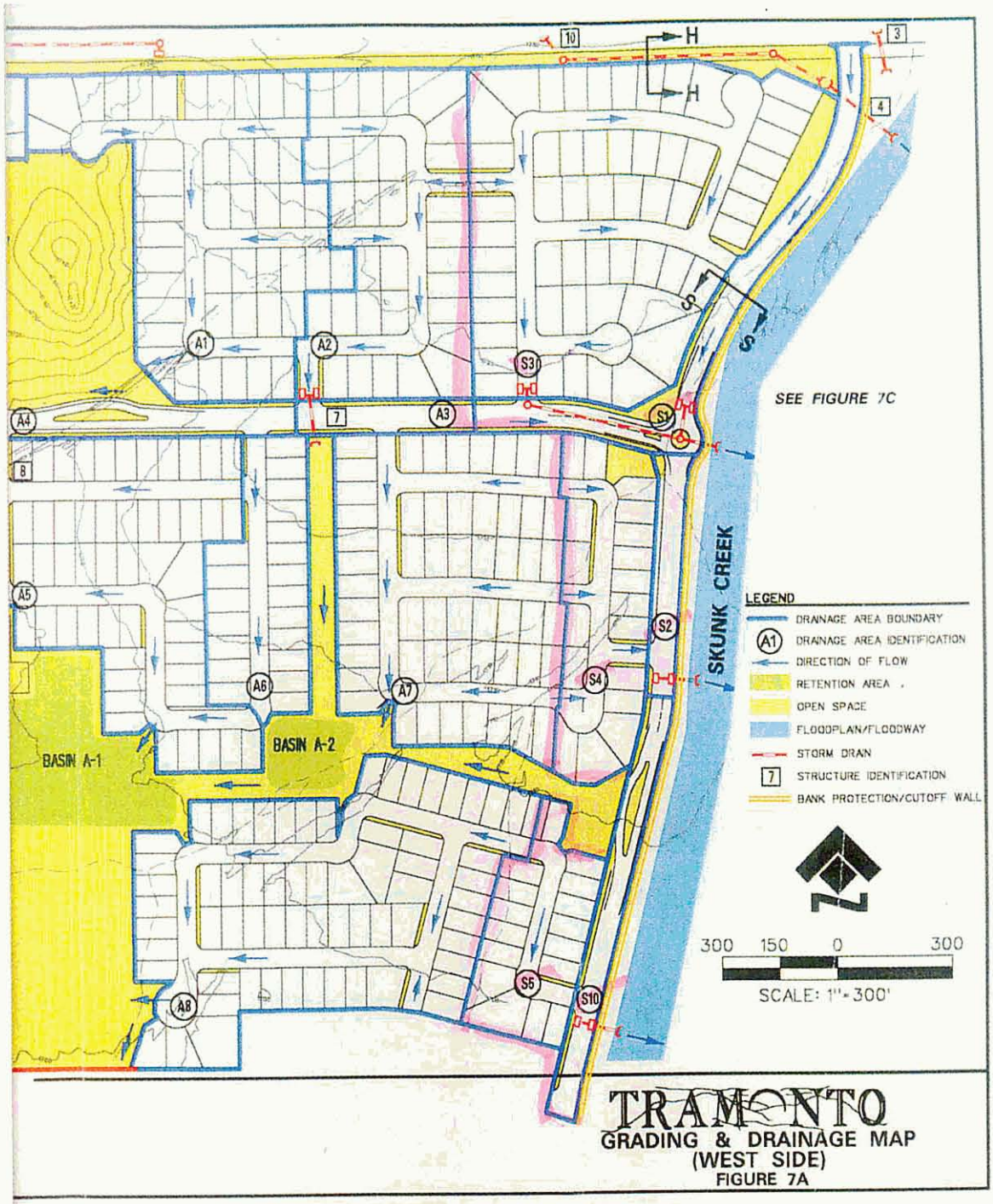
Hoslan Engineering Consultants

980034StrHyd_rev2.xls

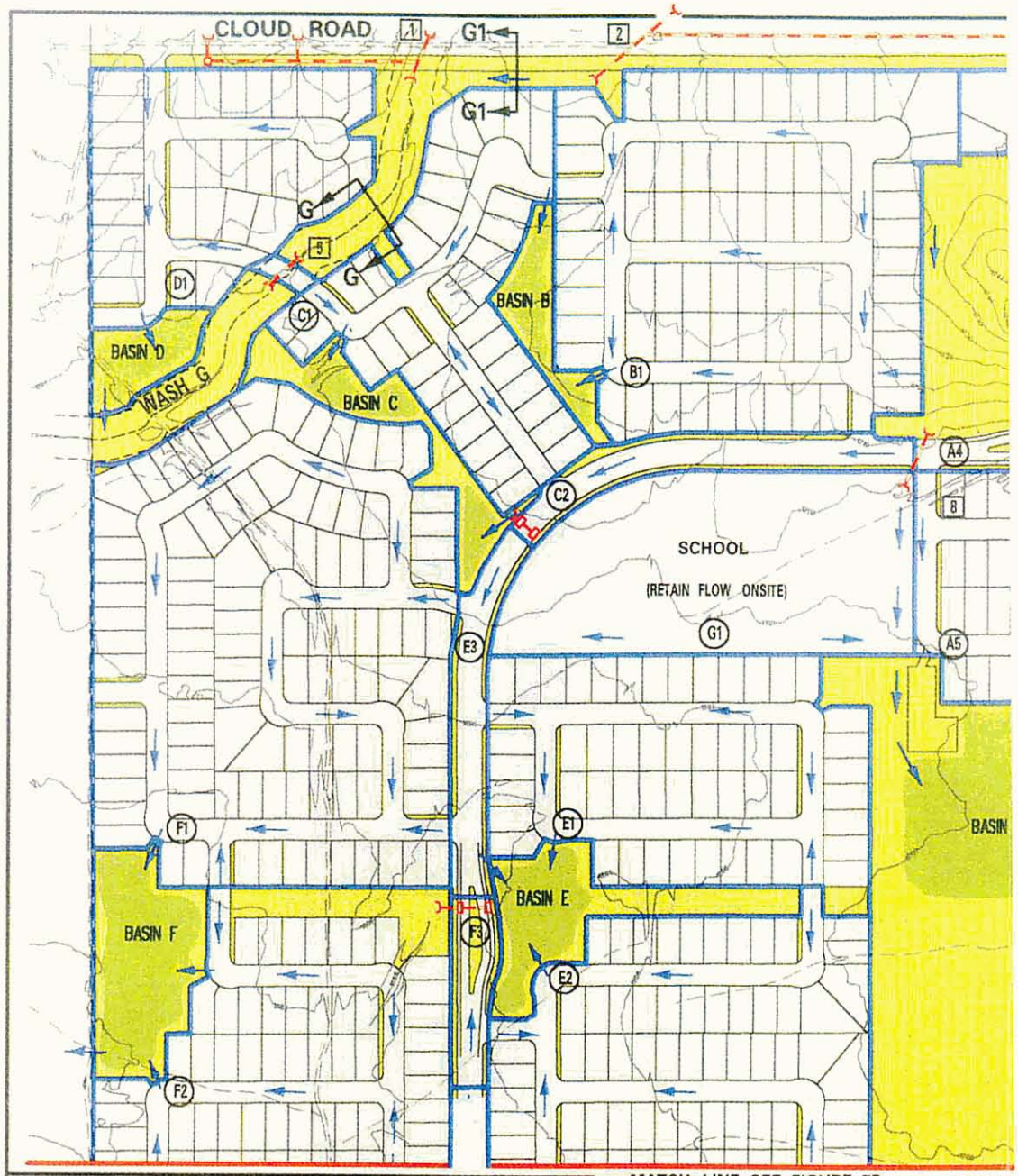
TRAMONTO
Retention Computations

100-Year, 2-hour Precip. = 2.72 inches

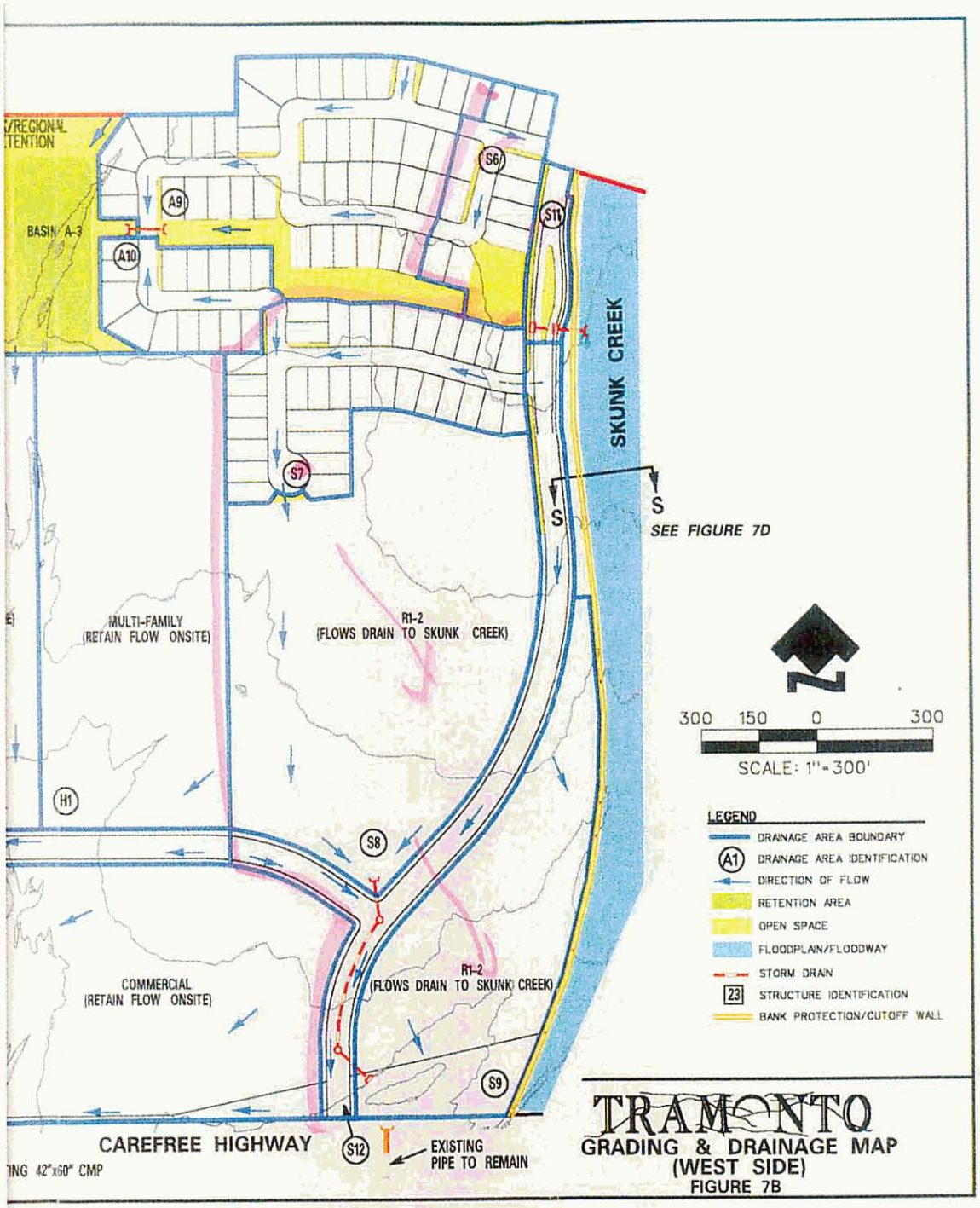
Sub-Basin I.D.	Drainage Area (Ac)	Runoff Coefficient C	100-year 2-hr Runoff Volume (AF)	Volume Required (AF)	Excess Volume (1) (AF)	Comment
EAST OF SKUNK CREEK						
Basin						
F1	12.29	0.50	1.39	1.39	0.00	
F2	22.79	0.35	1.81	1.81	0.00	
Basin Area	1.25	0.25	0.07	0.07	0.00	
EAST TOTALS	36.33		3.27	3.27	0.00	

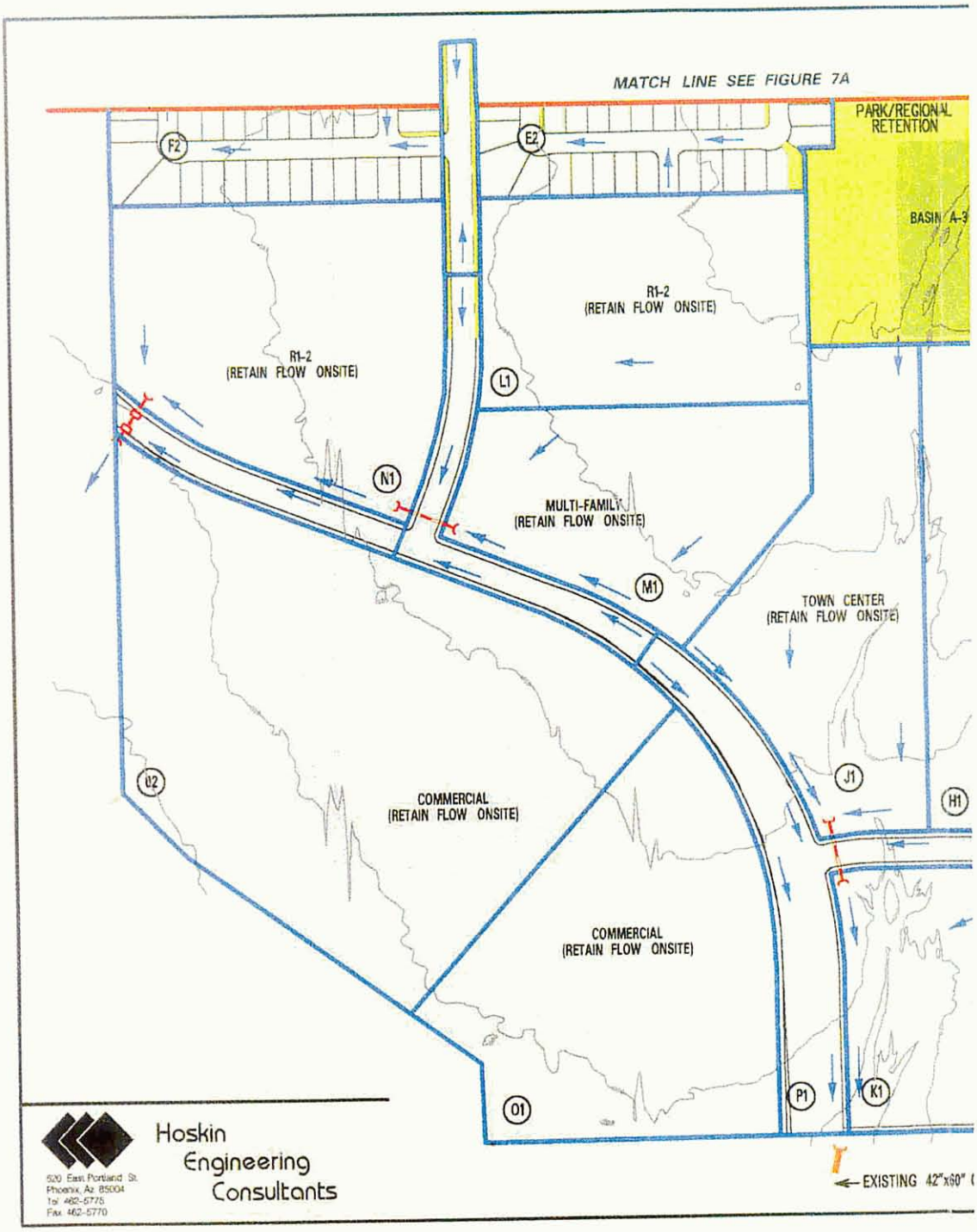


TRAMONTO
GRADING & DRAINAGE MAP
(WEST SIDE)
FIGURE 7A



Hoskin Engineering Consultants
520 East Portland St
Phoenix, Az 85004
Tel 462-5775
Fax 462-5770


REGIONAL
TENTION
BASIN A-3
A9
A10
S6
S11
SKUNK CREEK
S7
S
S
SEE FIGURE 7D
MULTI-FAMILY
(RETAIN FLOW ONSITE)
R1-2
(FLOWS DRAIN TO SKUNK CREEK)
H1
S8
COMMERCIAL
(RETAIN FLOW ONSITE)
R1-2
(FLOWS DRAIN TO SKUNK CREEK)
S9
CAREFREE HIGHWAY
S12
EXISTING
PIPE TO REMAIN
NG 42"x60" CMP
300 150 0 300
SCALE: 1"=300'
LEGEND
DRAINAGE AREA BOUNDARY
A1 DRAINAGE AREA IDENTIFICATION
DIRECTION OF FLOW
RETENTION AREA
OPEN SPACE
FLOODPLAIN/FLOODWAY
STORM DRAIN
23 STRUCTURE IDENTIFICATION
BANK PROTECTION/CUTOFF WALL
TRAMONTO
GRADING & DRAINAGE MAP
(WEST SIDE)
FIGURE 7B


MATCH LINE SEE FIGURE 7A
PARK/REGIONAL RETENTION
BASIN A-3
F2
E2
R1-2
(RETAIN FLOW ONSITE)
R1-2
(RETAIN FLOW ONSITE)
L1
N1
MULTI-FAMILY
(RETAIN FLOW ONSITE)
M1
TOWN CENTER
(RETAIN FLOW ONSITE)
J1
H1
O2
COMMERCIAL
(RETAIN FLOW ONSITE)
COMMERCIAL
(RETAIN FLOW ONSITE)
O1
P1
K1
EXISTING 42"x60"
Hoskin
Engineering
Consultants
520 East Portland St.
Phoenix, Az 85004
Tel 462-5775
Fax 462-5770

CURRENT DATE: 09-30-2003 FILE DATE: 09-30-2003
CURRENT TIME: 16:01:49 FILE NAME: C17O

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.1

CULVERT NO.	INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	1678.00	1674.00	227.04	1 CSP	3.00	3.00	.020	CONVENTIONAL
2								
3								
4								
5								
6								

SITE DATA — CULVERT SHAPE, MATERIAL, INLET

SUMMARY OF CULVERT FLOWS (cfs) FILE: C17O DATE: 09-30-2003

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1678.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1680.40	150.0	26.0	0.0	0.0	0.0	0.0	0.0	122.51	10
1680.60	300.0	29.3	0.0	0.0	0.0	0.0	0.0	267.88	7
1680.74	450.0	31.8	0.0	0.0	0.0	0.0	0.0	414.17	6
1680.86	600.0	33.8	0.0	0.0	0.0	0.0	0.0	563.02	6
1680.97	750.0	35.4	0.0	0.0	0.0	0.0	0.0	708.43	5
1681.05	900.0	36.8	0.0	0.0	0.0	0.0	0.0	855.15	4
1681.12	1050.0	37.9	0.0	0.0	0.0	0.0	0.0	1004.87	4
1681.19	1200.0	39.0	0.0	0.0	0.0	0.0	0.0	1154.23	4
1681.21	1232.0	39.3	0.0	0.0	0.0	0.0	0.0	1186.43	3
1681.32	1500.0	40.9	0.0	0.0	0.0	0.0	0.0	1449.65	4
1680.00	19.4	19.4	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C17O DATE: 09-30-2003

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
1678.00	0.000	0.00	0.00	0.00
1680.40	-0.003	150.00	1.50	1.00
1680.60	-0.003	300.00	2.79	0.93
1680.74	-0.004	450.00	4.06	0.90
1680.86	-0.003	600.00	3.20	0.53
1680.97	-0.005	750.00	6.17	0.82
1681.05	-0.008	900.00	8.09	0.90
1681.12	-0.007	1050.00	7.19	0.68
1681.19	-0.006	1200.00	6.74	0.56
1681.21	-0.005	1232.00	6.32	0.51
1681.32	-0.008	1500.00	9.40	0.63

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 09-30-2003 FILE DATE: 09-30-2003
CURRENT TIME: 16:01:49 FILE NAME: C17O

PERFORMANCE CURVE FOR CULVERT 1 - 1(3.00 (ft) BY 3.00 (ft)) CSP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	1678.00	0.00	0.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
25.99	1680.39	2.39	2.39	1-S2n	1.41	1.64	1.34	1.56	8.50	4.88
29.33	1680.59	2.59	2.59	1-S2n	1.52	1.75	1.45	2.54	8.66	4.30
31.77	1680.74	2.74	2.74	1-S2n	1.59	1.83	1.53	2.92	8.80	4.41
33.77	1680.86	2.86	2.86	1-S1f	1.65	1.88	2.00	3.18	6.76	4.60
35.40	1680.96	2.96	2.96	1-S1f	1.70	1.93	2.10	3.39	6.70	4.78
36.77	1681.04	3.04	3.04	1-S1f	1.74	1.97	2.10	3.56	6.96	4.95
37.94	1681.12	3.12	3.12	1-S1f	1.78	2.00	2.10	3.71	7.18	5.11
39.02	1681.18	3.18	3.18	1-S1f	1.81	2.03	2.20	3.85	7.04	5.26
39.25	1681.20	3.20	3.20	1-S1f	1.82	2.03	2.20	3.88	7.08	5.29
40.94	1681.31	3.31	3.31	1-S1f	1.87	2.08	2.20	4.00	7.39	5.42

El. inlet face invert 1678.00 ft El. outlet invert 1674.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	1678.00 ft
OUTLET STATION	227.00 ft
OUTLET ELEVATION	1674.00 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0176
CULVERT LENGTH ALONG SLOPE	227.04 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	3.00 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.020
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

CURRENT DATE: 09-30-2003 FILE DATE: 09-30-2003
CURRENT TIME: 16:01:49 FILE NAME: C170

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ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ TAILWATER ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
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***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: C170
MAIN CHANNEL ONLY FILE DATE: 06-11-2003

LEFT CHANNEL BOUNDARY	0
RIGHT CHANNEL BOUNDARY	0
MANNING n LEFT OVER BANK	0.000
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.000
SLOPE OF CHANNEL	0.0105 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	1678.00
2	63.00	1676.00
3	70.00	1674.00
4	84.00	1674.00
5	92.00	1676.00
6	183.00	1678.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	1674.00	0.000	0.00	0.00	0.00
150.00	1675.56	0.783	1.56	4.88	0.78
300.00	1676.54	0.762	2.54	4.30	0.64
450.00	1676.92	0.767	2.92	4.41	0.67
600.00	1677.18	0.776	3.18	4.60	0.71
750.00	1677.39	0.783	3.39	4.78	0.75
900.00	1677.56	0.791	3.56	4.95	0.80
1050.00	1677.71	0.797	3.71	5.11	0.83
1200.00	1677.85	0.803	3.85	5.26	0.87
1232.00	1677.88	0.804	3.88	5.29	0.88
1500.00	1678.00	0.809	4.00	5.42	0.91

Note: Shear stress was calculated using R.

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ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ROADWAY OVERTOPPING DATA ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
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ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	100.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	1682.00
2	215.00	1681.00
3	430.00	1680.00
4	530.00	1680.00
5	745.00	1681.00
6	960.00	1682.00

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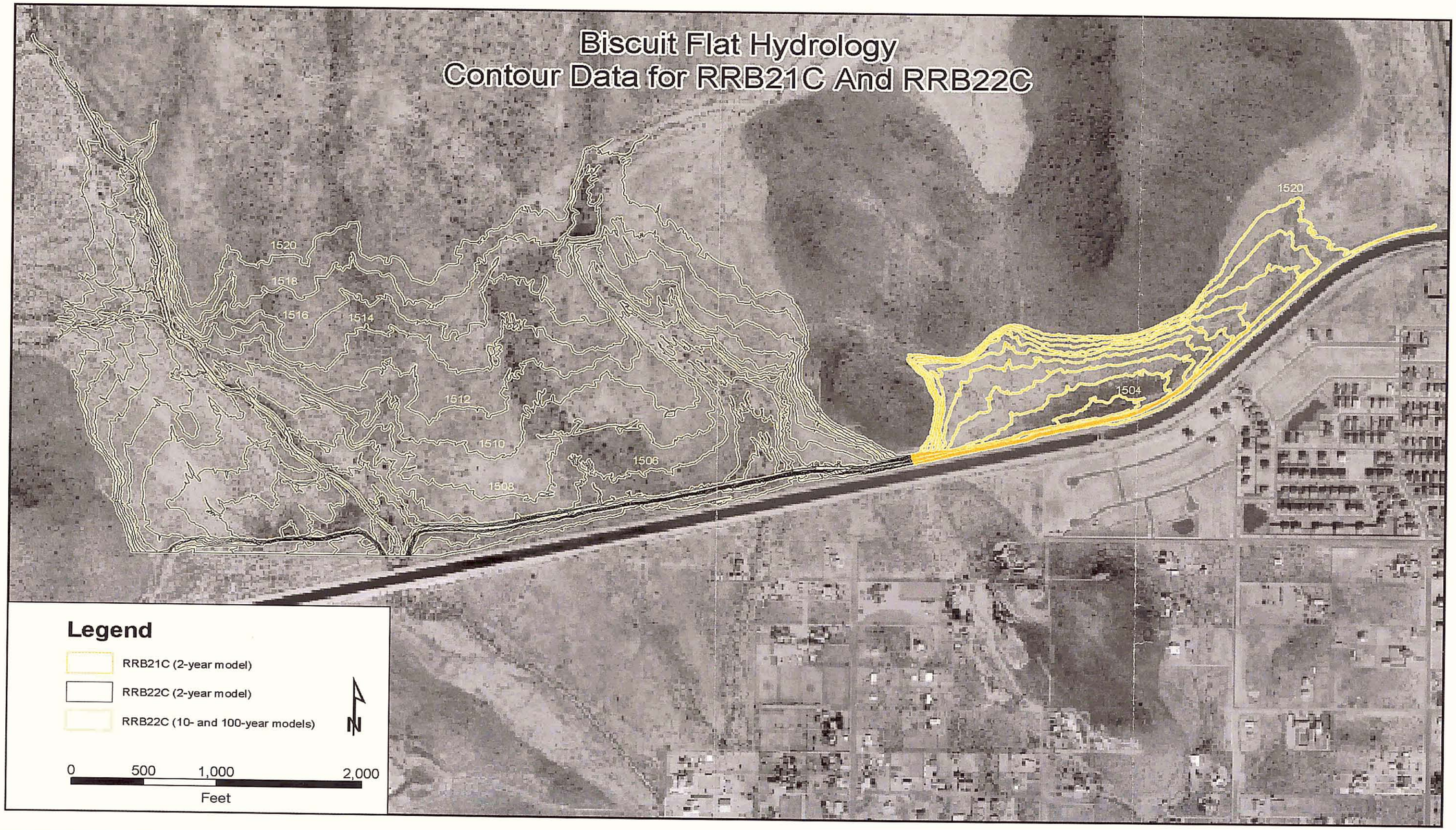
RRB21C and RRB22C


Biscuit Flat Hydrology
Contour Data for RRB21C And RRB22C
1520
1518
1516
1514
1512
1510
1508
1506
1520
1504
Legend
RRB21C (2-year model)
RRB22C (2-year model)
RRB22C (10- and 100-year models)
N
0
500
1,000
2,000
Feet

RRB21C: Spillway Discharge Computations

Project Description	
Worksheet	RRB21C OUTFLOW
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

Input Data	
Mannings Coefficient	0.040
Slope	0.001 ft/ft 000
Left Side Slope	1.00 H : V
Right Side Slope	1.00 H : V
Bottom Width	4.00 ft

Attribute	Minimum	Maximum	Increment
Depth (ft)	0.00	15.00	1.00

Depth (ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.00	N/A	N/A	N/A	N/A	N/A
1.00	4.77	0.95	5.0	6.83	6.00
2.00	16.29	1.36	12.0	9.66	8.00
3.00	34.89	1.66	21.0	12.49	10.00
4.00	61.44	1.92	32.0	15.31	12.00
5.00	96.86	2.15	45.0	18.14	14.00
6.00	142.05	2.37	60.0	20.97	16.00
7.00	197.87	2.57	77.0	23.80	18.00
8.00	265.16	2.76	96.0	26.63	20.00
9.00	344.72	2.95	117.0	29.46	22.00
10.00	437.34	3.12	140.0	32.28	24.00

Depth (ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
11.00	543.79	3.30	165.0	35.11	26.00
12.00	664.81	3.46	192.0	37.94	28.00
13.00	801.12	3.62	221.0	40.77	30.00
14.00	953.44	3.78	252.0	43.60	32.00
15.00	1,122.45	3.94	285.0	46.43	34.00

RRB22C: Spillway Discharge Computations

CURRENT DATE: 03-04-2003 FILE DATE: 03-04-2003
CURRENT TIME: 08:27:21 FILE NAME: RRB22C

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULVERT NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS	SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	1496.00	1492.00	200.04	3	RCP	5.50	5.50	.012	CONVENTIONAL
2									
3									
4									
5									
6									

SUMMARY OF CULVERT FLOWS (cfs) FILE: RRB22C DATE: 03-04-2003

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1496.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1499.13	200.0	200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1500.82	400.0	400.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1501.61	500.0	500.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1504.60	800.0	800.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1507.40	1000.0	1000.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1510.88	1200.0	1200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1514.97	1400.0	1400.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1519.64	1600.0	1600.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1520.16	1800.0	1620.9	0.0	0.0	0.0	0.0	0.0	170.22	8
1520.26	2000.0	1624.8	0.0	0.0	0.0	0.0	0.0	355.47	4
1520.00	1614.4	1614.4	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: RRB22C DATE: 03-04-2003

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
1496.00	0.000	0.00	0.00	0.00
1499.13	0.000	200.00	0.00	0.00
1500.82	0.000	400.00	0.00	0.00
1501.61	0.000	500.00	0.00	0.00
1504.60	0.000	800.00	0.00	0.00
1507.40	0.000	1000.00	0.00	0.00
1510.88	0.000	1200.00	0.00	0.00
1514.97	0.000	1400.00	0.00	0.00
1519.64	0.000	1600.00	0.00	0.00
1520.16	-0.009	1800.00	8.91	0.50
1520.26	-0.005	2000.00	19.69	0.98

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 03-04-2003 FILE DATE: 03-04-2003
CURRENT TIME: 08:27:21 FILE NAME: RRB22C

PERFORMANCE CURVE FOR CULVERT 1 - 3(5.50 (ft) BY 5.50 (ft)) RCP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	1496.00	0.00	-4.00	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
200.00	1499.12	3.12	0.12	1-S2n	1.31	2.23	1.37	1.42	14.25	4.27
400.00	1500.82	4.82	1.35	1-S2n	1.89	3.21	2.05	2.09	16.52	5.33
500.00	1501.61	5.61	2.11	1-S2n	2.15	3.60	2.34	2.36	17.33	5.72
800.00	1504.60	8.60	5.01	1-S2n	2.81	4.52	3.12	3.05	19.22	6.63
1000.00	1507.40	11.40	7.48	5-S2n	3.22	4.95	3.61	3.43	20.22	7.08
1200.00	1510.88	14.88	10.45	5-S2n	3.65	5.38	4.05	3.77	21.39	7.47
1400.00	1514.97	18.97	13.76	6-FFc	4.12	5.50	5.50	4.09	19.64	7.82
1600.00	1519.64	23.64	17.51	6-FFc	4.76	5.50	5.50	4.38	22.45	8.14
1620.88	1520.16	24.16	17.93	6-FFc	4.84	5.50	5.50	4.65	22.74	8.42
1624.84	1520.26	24.26	18.01	6-FFc	4.86	5.50	5.50	4.91	22.80	8.69

El. inlet face invert 1496.00 ft El. outlet invert 1492.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	100.00 ft
INLET ELEVATION	1496.00 ft
OUTLET STATION	300.00 ft
OUTLET ELEVATION	1492.00 ft
NUMBER OF BARRELS	3
SLOPE (V/H)	0.0200
CULVERT LENGTH ALONG SLOPE	200.04 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	5.50 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

CURRENT DATE: 03-04-2003
CURRENT TIME: 08:27:21

FILE DATE: 03-04-2003
FILE NAME: RRB22C

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***** USER DEFINED CHANNEL CROSS-SECTION

FILE NAME: RRB22C
FILE DATE: 02-04-2003

MAIN CHANNEL ONLY

LEFT CHANNEL BOUNDARY	0
RIGHT CHANNEL BOUNDARY	0
MANNING n LEFT OVER BANK	0.000
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.000
SLOPE OF CHANNEL	0.0080 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	1504.00
2	7.00	1502.00
3	14.00	1500.00
4	19.00	1498.00
5	26.00	1496.00
6	34.00	1494.00
7	44.00	1492.00
8	71.00	1492.00
9	78.00	1494.00
10	85.00	1496.00
11	92.00	1498.00
12	100.00	1500.00
13	105.00	1502.00
14	113.00	1504.00

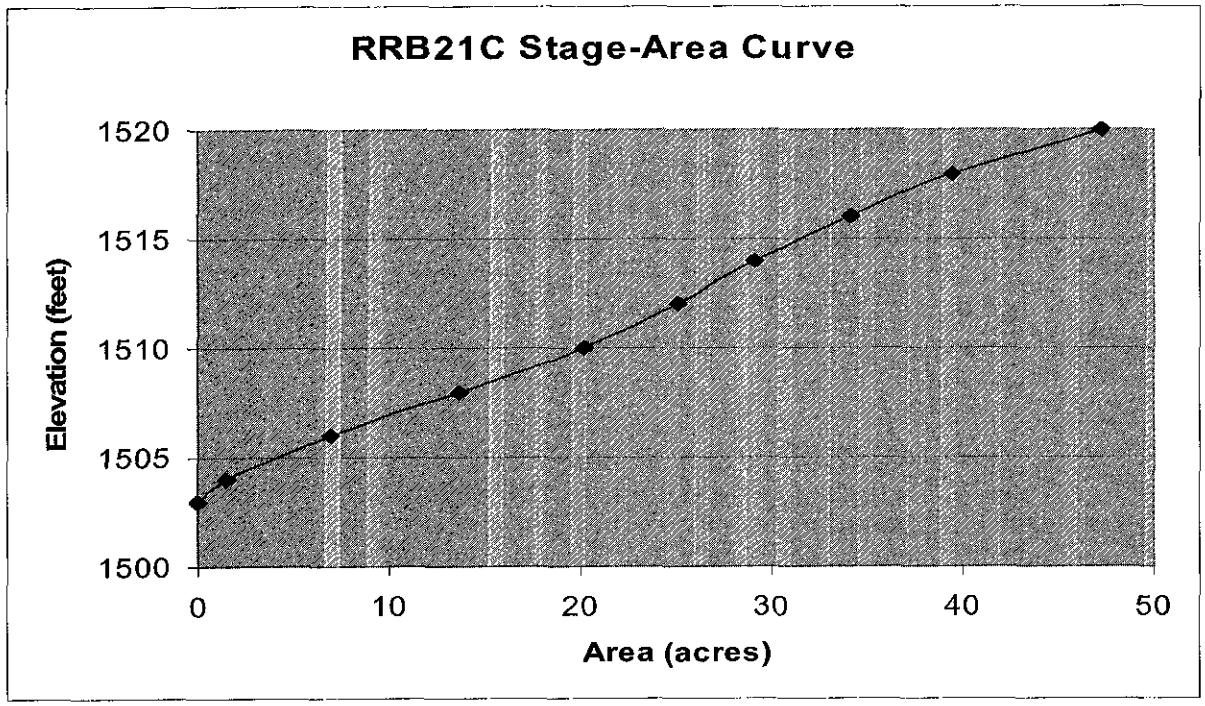
******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

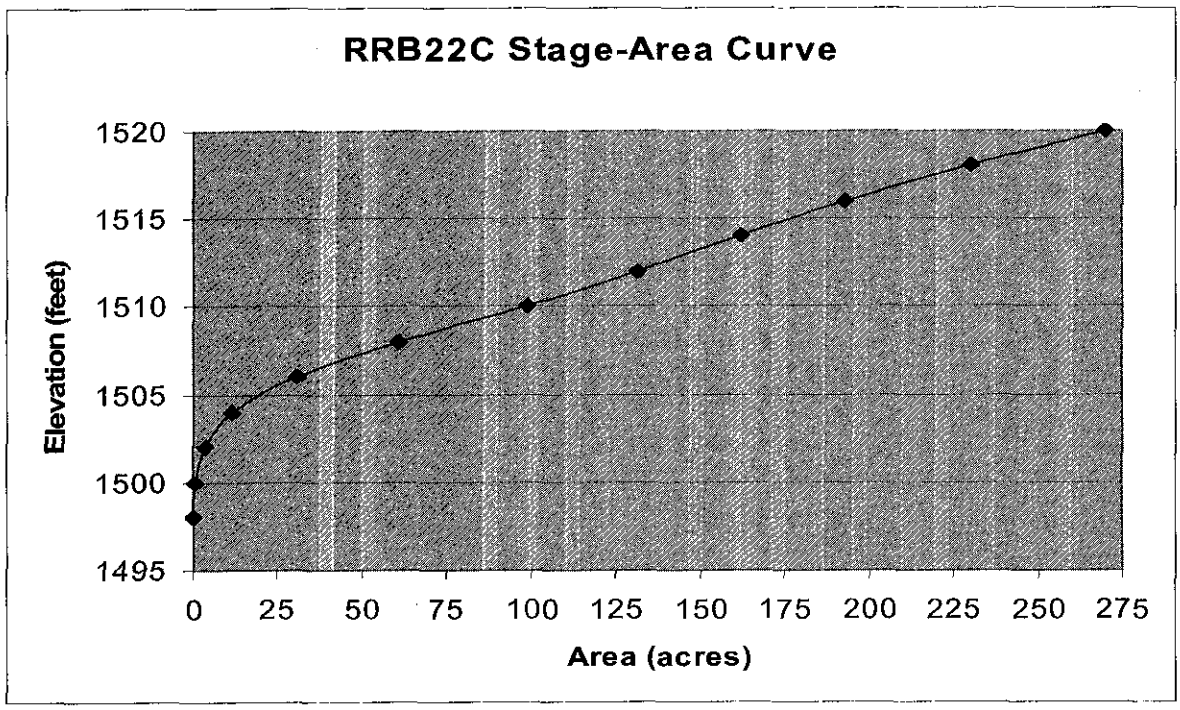
FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	1492.00	0.000	0.00	0.00	0.00
200.00	1493.42	0.686	1.42	4.27	0.60
400.00	1494.09	0.724	2.09	5.33	0.83
500.00	1494.36	0.737	2.36	5.72	0.92
800.00	1495.05	0.764	3.05	6.63	1.15
1000.00	1495.43	0.776	3.43	7.08	1.27
1200.00	1495.77	0.786	3.77	7.47	1.38
1400.00	1496.09	0.795	4.09	7.82	1.48
1600.00	1496.38	0.802	4.38	8.14	1.57
1800.00	1496.65	0.809	4.65	8.42	1.65
2000.00	1496.91	0.815	4.91	8.69	1.73

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	GRAVEL
EMBANKMENT TOP WIDTH	135.00 ft
CREST LENGTH	1000.00 ft
OVERTOPPING CREST ELEVATION	1520.00 ft

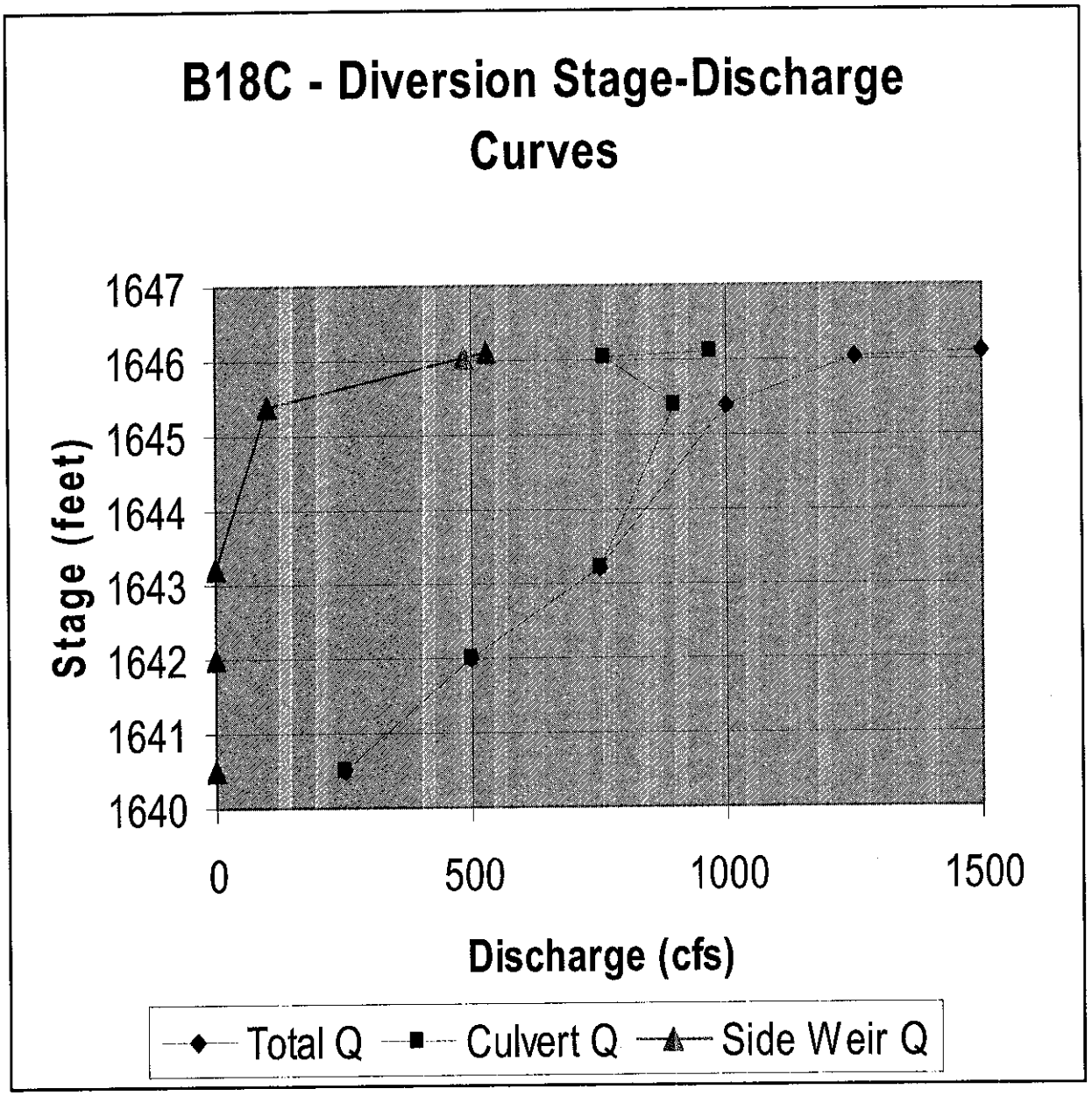

RRB21C Stage-Area Curve
Elevation (feet)
1520
1515
1510
1505
1500
0
10
20
30
40
50
Area (acres)

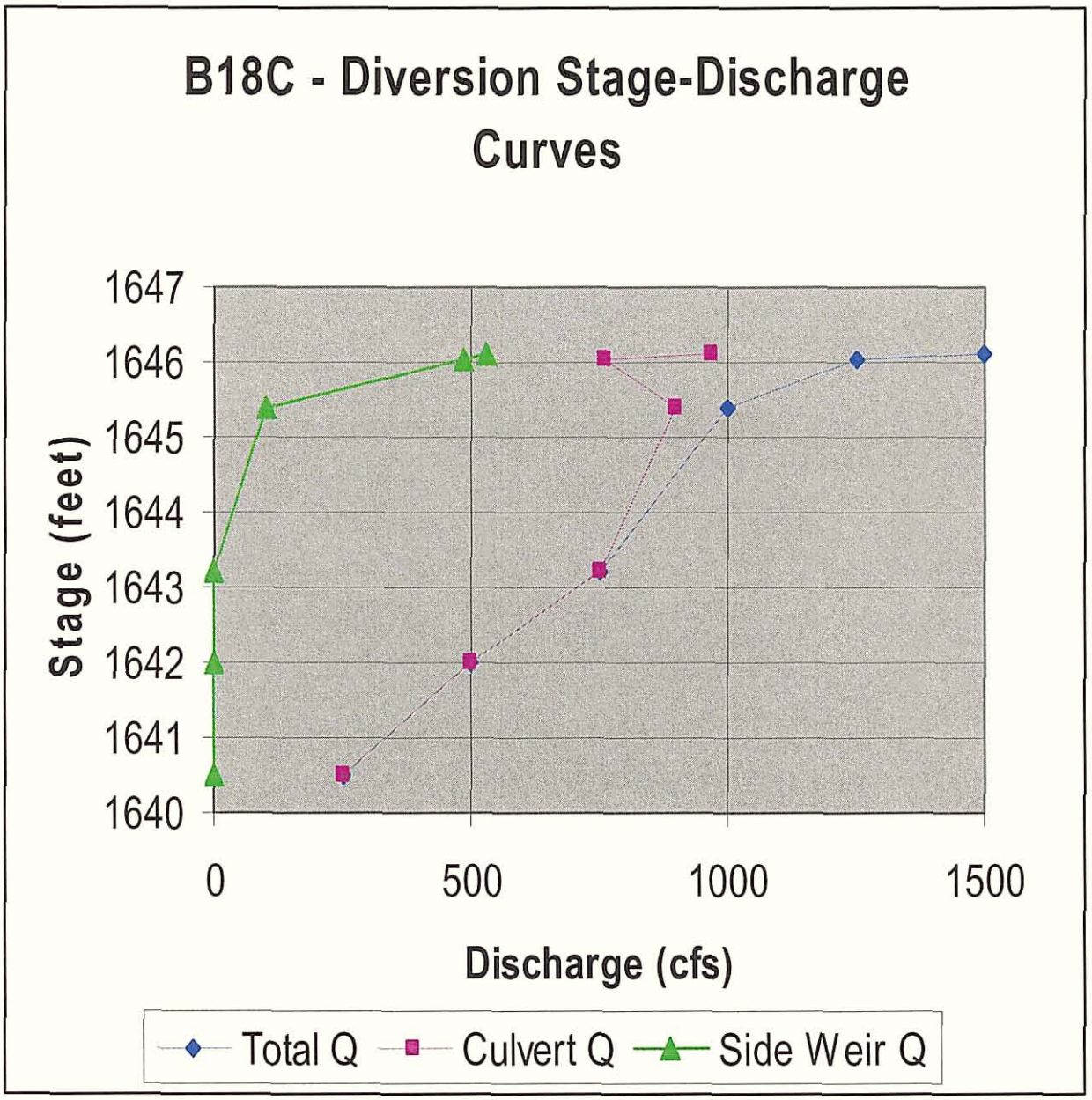

RRB22C Stage-Area Curve
Elevation (feet)
1520
1515
1510
1505
1500
1495
0
25
50
75
100
125
150
175
200
225
250
275
Area (acres)

Appendix D.6

Diversion Calculations

B18C


B18C - Diversion Stage-Discharge Curves
1647
1646
1645
1644
1643
1642
1641
1640
Stage (feet)
0
500
1000
1500
Discharge (cfs)
Total Q
Culvert Q
Side Weir Q


B18C - Diversion Stage-Discharge Curves
Stage (feet)
1647
1646
1645
1644
1643
1642
1641
1640
0
500
1000
1500
Discharge (cfs)
Total Q
Culvert Q
Side Weir Q

River: CAP_East Profile: PF 3 Culvert ID Culvert #1

Reach Reach-1 Riv Sta: 1160

Plan: biscuit_flat CAP_East Reach-1 RS: 1160 Profile: PF 3 Culvert ID: Culvert #1

Culv Q (cfs)	250.00	Culv Ful Lngh (ft)	
# Barrels	2	Culv Vel US (ft/s)	7.38
Q Barrel (cfs)	125.00	Culv Vel DS (ft/s)	5.05
E.G. US. (ft)	1640.88	Culv Inv El Up (ft)	1638.00
W.S. US. (ft)	1640.51	Culv Inv El Dn (ft)	1637.00
E.G. DS (ft)	1639.87	Culv Frctn Ls (ft)	0.67
W.S. DS (ft)	1639.48	Culv Ext Lss (ft)	0.00
Delta EG (ft)	1.01	Culv Ent Lss (ft)	0.34
Delta WS (ft)	1.03	Q Weir (cfs)	
E.G. IC (ft)	1640.67	Weir Sta Lft (ft)	
E.G. OC (ft)	1640.88	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	1639.69	Weir Max Depth (ft)	
Culv WS Outlet (ft)	1639.48	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.50	Wr Flw Area (sq ft)	
Culv Crt Depth (ft)	1.69	Min El Weir Flow (ft)	1644.55

Errors, Warnings and Notes

Select Profile

River: CAP_East Profile: PF 4 Culvert ID Culvert #1

Reach Reach-1 Riv Sta: 1160

Plan: biscuit_flat CAP_East Reach-1 RS: 1160 Profile: PF 4 Culvert ID: Culvert #1

Culv Q (cfs)	500.00	Culv Ful Lngh (ft)	
# Barrels	2	Culv Vel US (ft/s)	9.30
Q Barrel (cfs)	250.00	Culv Vel DS (ft/s)	7.46
E.G. US. (ft)	1642.57	Culv Inv El Up (ft)	1638.00
W.S. US. (ft)	1641.99	Culv Inv El Dn (ft)	1637.00
E.G. DS (ft)	1641.19	Culv Frctn Ls (ft)	0.82
W.S. DS (ft)	1640.35	Culv Ext Lss (ft)	0.02
Delta EG (ft)	1.37	Culv Ent Lss (ft)	0.54
Delta WS (ft)	1.64	Q Weir (cfs)	
E.G. IC (ft)	1642.31	Weir Sta Lft (ft)	
E.G. OC (ft)	1642.57	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	1640.69	Weir Max Depth (ft)	
Culv WS Outlet (ft)	1640.35	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	2.38	Wr Flw Area (sq ft)	
Culv Crt Depth (ft)	2.69	Min El Weir Flow (ft)	1644.55

Errors, Warnings and Notes

Select Profile

River: CAP_East Profile: PF 5 Culvert ID Culvert #1

Reach Reach-1 Riv Sta: 1160

Plan: biscuit_flat CAP_East Reach-1 RS: 1160 Profile: PF 5 Culvert ID: Culvert #1

Culv Q (cfs)	750.00	Culv Ful Lngh (ft)	
# Barrels	2	Culv Vel US (ft/s)	10.65
Q Barrel (cfs)	375.00	Culv Vel DS (ft/s)	11.86
E.G. US. (ft)	1643.99	Culv Inv El Up (ft)	1638.00
W.S. US. (ft)	1643.23	Culv Inv El Dn (ft)	1637.00
E.G. DS (ft)	1642.29	Culv Frctn Ls (ft)	0.94
W.S. DS (ft)	1640.89	Culv Ext Lss (ft)	0.06
Delta EG (ft)	1.70	Culv Ent Lss (ft)	0.70
Delta WS (ft)	2.34	Q Weir (cfs)	
E.G. IC (ft)	1643.71	Weir Sta Lft (ft)	
E.G. OC (ft)	1643.99	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	1641.52	Weir Max Depth (ft)	
Culv WS Outlet (ft)	1640.16	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	3.16	Wr Flw Area (sq ft)	
Culv Crt Depth (ft)	3.52	Min El Weir Flow (ft)	1644.55

Errors, Warnings and Notes

Select Profile

River: CAP_East Profile: PF 6 Culvert ID Culvert #1

Reach Reach-1 Riv Sta: 1160

Plan: biscuit_flat CAP_East Reach-1 RS: 1160 Profile: PF 6 Culvert ID: Culvert #1

Culv Q (cfs)	897.14	Culv Ful Lngh (ft)	224.00
# Barrels	2	Culv Vel US (ft/s)	8.97
Q Barrel (cfs)	448.57	Culv Vel DS (ft/s)	8.97
E.G. US. (ft)	1644.53	Culv Inv El Up (ft)	1638.00
W.S. US. (ft)	1643.12	Culv Inv El Dn (ft)	1637.00
E.G. DS (ft)	1643.33	Culv Frctn Ls (ft)	0.92
W.S. DS (ft)	1641.26	Culv Ext Lss (ft)	0.00
Delta EG (ft)	1.20	Culv Ent Lss (ft)	0.50
Delta WS (ft)	1.87	Q Weir (cfs)	102.86
E.G. IC (ft)	1644.66	Weir Sta Lft (ft)	0.00
E.G. OC (ft)	1644.53	Weir Sta Rgt (ft)	147.79
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1643.00	Weir Max Depth (ft)	0.85
Culv WS Outlet (ft)	1642.08	Weir Avg Depth (ft)	0.38
Culv Nml Depth (ft)	3.59	Wr Flw Area (sq ft)	56.15
Culv Crt Depth (ft)	3.97	Min El Weir Flow (ft)	1644.55

Errors, Warnings and Notes

Select Profile

River: CAP_East Profile: PF 7 Culvert ID Culvert #1

Reach Reach-1 Riv Sta: 1160

Plan: biscuit_flat CAP_East Reach-1 RS: 1160 Profile: PF 7 Culvert ID: Culvert #1

Culv Q (cfs)	762.53	Culv Ful Lngh (ft)	224.00
# Barrels	2	Culv Vel US (ft/s)	7.63
Q Barrel (cfs)	381.27	Culv Vel DS (ft/s)	7.63
E.G. US. (ft)	1645.20	Culv Inv El Up (ft)	1638.00
W.S. US. (ft)	1645.19	Culv Inv El Dn (ft)	1637.00
E.G. DS (ft)	1644.33	Culv Frctn Ls (ft)	0.50
W.S. DS (ft)	1641.93	Culv Ext Lss (ft)	0.00
Delta EG (ft)	0.87	Culv Ent Lss (ft)	0.36
Delta WS (ft)	3.26	Q Weir (cfs)	487.47
E.G. IC (ft)	1645.04	Weir Sta Lft (ft)	0.00
E.G. OC (ft)	1645.20	Weir Sta Rgt (ft)	286.26
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1643.00	Weir Max Depth (ft)	1.50
Culv WS Outlet (ft)	1643.43	Weir Avg Depth (ft)	0.70
Culv Nml Depth (ft)		Wr Flw Area (sq ft)	200.22
Culv Crt Depth (ft)	3.56	Min El Weir Flow (ft)	1644.55

Errors, Warnings and Notes

Warning: During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.

Select Profile

River: CAP_East Profile: PF 8 Culvert ID Culvert #1

Reach Reach-1 Riv Sta: 1160

Plan: biscuit_flat CAP_East Reach-1 RS: 1160 Profile: PF 8 Culvert ID: Culvert #1

Culv Q (cfs)	969.58	Culv Ful Lngh (ft)	224.00
# Barrels	2	Culv Vel US (ft/s)	9.70
Q Barrel (cfs)	484.79	Culv Vel DS (ft/s)	9.70
E.G. US. (ft)	1645.26	Culv Inv El Up (ft)	1638.00
W.S. US. (ft)	1645.24	Culv Inv El Dn (ft)	1637.00
E.G. DS (ft)	1642.42	Culv Frctn Ls (ft)	0.82
W.S. DS (ft)	1642.40	Culv Ext Lss (ft)	1.44
Delta EG (ft)	2.84	Culv Ent Lss (ft)	0.58
Delta WS (ft)	2.85	Q Weir (cfs)	530.42
E.G. IC (ft)	1645.29	Weir Sta Lft (ft)	0.00
E.G. OC (ft)	1645.26	Weir Sta Rgt (ft)	295.06
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1643.00	Weir Max Depth (ft)	1.55
Culv WS Outlet (ft)	1642.00	Weir Avg Depth (ft)	0.73
Culv Nml Depth (ft)	3.80	Wr Flw Area (sq ft)	214.20
Culv Crt Depth (ft)	4.18	Min El Weir Flow (ft)	1644.55

Errors, Warnings and Notes

Flow through all barrels in a culvert.

Subbasin ID	Area (sq. ft.)	Area (Ac)	Rainfall (in)	Rainfall (ft)	Volume (Ac-ft)	Weighted C-Value	Retention Volume (Ac-ft)
B1	20669913.68	474.515925	2.76	0.23	109.14	0.79	86.23
B2	25462874.38	584.547162	2.76	0.23	134.45	0.79	106.61
B3	28174547.22	646.798605	2.76	0.23	148.76	0.80	118.72
B4	16274950.52	373.621454	2.76	0.23	85.93	0.75	64.50
B5	1921144.71	44.1034139	2.76	0.23	10.14	0.71	7.20
B6	15124639.18	347.213939	2.76	0.23	79.86	0.72	57.22
B7	2228305.048	51.154845	2.76	0.23	11.77	0.71	8.35
B8	11283593.79	259.03567	2.76	0.23	59.58	0.71	42.52
B9	10739130.01	246.536502	2.76	0.23	56.70	0.71	40.26
B10	1947223.935	44.7021105	2.76	0.23	10.28	0.71	7.30
B11	11417221.13	262.103332	2.76	0.23	60.28	0.71	42.80
B12	5103475.129	117.159668	2.76	0.23	26.95	0.71	19.13
B13	13489197.49	309.669364	2.76	0.23	71.22	0.71	50.69
B14	12015867.95	275.846372	2.76	0.23	63.44	0.76	48.43
B15	3211288.577	73.7210417	2.76	0.23	16.96	0.71	12.04
B16	751851.3715	17.2601325	2.76	0.23	3.97	0.71	2.82
B18	6262694.087	143.771673	2.76	0.23	33.07	0.84	27.63
B19	15997255.1	367.246444	2.76	0.23	84.47	0.83	70.13
B20	21781370.05	500.031452	2.76	0.23	115.01	0.72	82.84
B21	15044334.54	345.370398	2.76	0.23	79.44	0.75	59.31
B22	7685577.325	176.436578	2.76	0.23	40.58	0.71	28.81

Appendix D.7

HEC-1 Output

Existing Condition
2-Year

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   15JUL03  TIME  13:09:27  *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    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

  1           ID   BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP
  2           ID
  3           ID    JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
  4           ID    ADOBE DAM / DESERT HILLS ADMP
  5           ID    FEBRUARY 2003
  6           ID
  7           ID    THIS IS THE 2-YEAR 24-HOUR MODEL FOR EXISTING CONDITIONS
  8           ID
  9           ID
 10           ID    MODEL BASIS:
 11           ID      * DDMSW PROJECT NAME: BF_EX24
 12           ID      * PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
 13           ID      * MULTIPLE STORM OPTION (JD)
 14           ID      * GREEN & AMPT LOSS METHOD
 15           ID      * CLARK UNIT HYDROGRAPH METHOD
 16           ID      * TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
 17           ID        EXCEPT FOR BASIN B17 DUE TO INCORRECT CALCULATION OF Kb FOR
 18           ID        MULTIPLE LAND USES
 19           ID      * MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
 20           ID      * 2-YEAR VALUES COMPUTED BY 0.10 RATIO OF 100-YEAR RESULTS
 21           ID        PER DRAFT HYDROLOGY MANUAL (2003)
 22           ID      * RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI
 23           ID
 24           ID
              *DIAGRAM
 25           IT       5 01FEB03    0005     600
 26           IO       5
 27           IN      15
              *
              *  THESE RAINFALL RECORDS ARE FOR THE 100-YR 24-HR STORM.
              *  THE 2-HR HYDROGRAPHS ARE COMPUTED BY USE OF RATIOS
              *  ON FIELD 3 OF THE BA RECORD.
              *
 28           JD   4.15    0.01
 29           PC  0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 30           PC  0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 31           PC  0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 32           PC  0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 33           PC  0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 34           PC  0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 35           PC  0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 36           PC  0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 37           PC  0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 38           PC  0.983   0.986   0.989   0.992   0.995   0.998   1.000
 39           JD  3.901      10
 40           JD  3.735      30
 41           JD  3.569      60
 42           JD  3.511      90
              *
```

1 HEC-1 INPUT PAGE 2

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

```
43          KK      B1   BASIN
44          BA   0.741            0.10
45          LG    0.35    0.13   10.10    0.03       1
46          UC   0.771   0.577
47          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
48          UA     100
            *

49          KK      B2   BASIN
50          BA   0.913            0.10
51          LG    0.35    0.05   12.40    0.01       0
52          UC   0.900   0.828
53          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
54          UA     100
            *

55          KK      B3   BASIN
56          BA   1.011            0.10
57          LG    0.35    0.05   12.40    0.01       0
58          UC   0.929   0.862
59          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
60          UA     100
            *

61          KK     B3C
62          KM      COMBINE B1 + B2 + B3
63          HC       3
            *

64          KK    B3B4ROUTE    REACH
65          KM    ROUTE COMBINED FLOWS FROM B3C TO B4C
66          KM     SLOPE = (1538-1535)/1401 = 0.002
67          RS       3    FLOW      -1
68          RC   0.080   0.050   0.080    1401  0.0020    0.00
69          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
70          RY   110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
            *

71          KK      B4   BASIN
72          BA   0.584            0.10
73          LG    0.35    0.15    9.70    0.04       0
74          UC   0.429   0.286
75          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
76          UA     100
            *

77          KK     B4C
78          KM     COMBINE RUNOFF FROM B4 WITH ROUTED FLOWS FROM B3C
79          HC       2
            *
```



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

80          KK   RRB4CROUTE    STORAGE
81          KM    STORAGE ROUTING THRU FIRST OF TWO STOCK TANKS ON BUCHANAN WASH
82          KM    THIS TANK IS MOSTLY HYDROLOGICALLY EFFECTIVE ONLY FOR THE MOST
83          KM    FREQUENT EVENTS SUCH AS THE 2-YEAR EVENT.
84          KM    AREA-ELEVATION DATA FROM 2 FT CONTOUR DATA FOR ADMP
85          KM    STAGE-DISCHARGE CURVE COMPUTED FROM COE UNEVEN WEIR PROGRAM (FILE: RRB4C.IN)
86          RS       1    STOR      -1
87          SA       0    0.09    0.55    6.05   17.79   33.44
88          SE    1533    1534    1536    1538    1540    1542
89          SQ       0      33     162     429     868    1512    2364    3361    4547
90          SE    1536  1536.5  1537.0  1537.5  1538.0  1538.5  1539.0  1539.5  1540.0
            *
            *   THIS CHANNEL ROUTING REMOVED FROM 2-YEAR MODEL DUE TO BACKUP BETWEEN
            *   STOCK PONDS AT B4C AND B5C.
            *
            * KK  B4B5ROUTE    REACH
            * KM   ROUTE COMBINED FLOWS FROM B4C TO B5C
            * KM   SLOPE = (1535-1534)/1014 = 0.001
            * RS      2    FLOW      -1
            * RC 0.080   0.050   0.080    1014  0.0010    0.00
            * RX   0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
            * RY 110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
            *

91          KK      B5   BASIN
92          BA   0.069            0.10
93          LG    0.35    0.15    9.70    0.04       0
94          UC   0.321   0.324
95          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
96          UA     100
            *

97          KK     B5C
98          KM     COMBINE RUNOFF FROM B5 WITH ROUTED FLOWS FROM B4C
99          HC       2
```

```
                *
100             KK   RRB5CROUTE   STORAGE
101             KM     ROUTE HYDROGRAPH THROUGH STOCK POND
102             KM     ASSUMPTION OF SEPARATE STORAGE AREAS FOR 2-YR EVENT
103             KM     AREA-ELEVATION DATA FROM 2 FT CONTOURS FOR ADMP
104             KM     DISCHARGE CURVE COMPUTED WITH COE UNEVEN WEIR PROGRAM (FILE: RR5BC.IN)
105             RS       1     STOR      -1
106             SA       0     0.24    1.41     8.30    12.87
107             SE    1533     1534    1536     1538     1540
108             SQ       0      103     357      780     1400     2224     3274     4498     5940
109             SE  1536.0   1536.5  1537.0   1537.5   1538.0   1538.5   1539.0   1539.5   1540.0
                *
                *   NO CHANNEL ROUTING FROM B5C TO B6C DUE TO SHORT REACH LENGTH (752')
                *
1                                          HEC-1 INPUT                                          PAGE  4

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

110             KK      B6   BASIN
111             BA   0.543             0.10
112             LG    0.35     0.25    4.25     0.39       4
113             UC   0.350    0.280
114             UA       0      3.0     5.0      8.0    12.0     20.0     43.0     75.0     90.0     96.0
115             UA     100
                *

116             KK     B6C
117             KM     COMBINE RUNOFF FROM B6 WITH ROUTED FLOWS FROM B5C
118             HC       2
                *

119             KK    B6B8ROUTE   REACH
120             KM     ROUTE COMBINED FLOWS FROM B6C TO B8C
121             KM     SLOPE = (1531-1522)/1909 = 0.0047
122             RS       2    FLOW      -1
123             RC   0.080    0.050   0.080     1909   0.0047     0.00
124             RX     0.0    250.0   275.0    280.0    290.0    295.0    320.0    570.0
125             RY   112.0    101.0   100.0     95.0     95.0    100.0    101.0    112.0
                *

126             KK      B7   BASIN
127             BA   0.080             0.10
128             LG    0.35     0.25    5.10     0.24      10
129             UC   0.192    0.166
130             UA       0      3.0     5.0      8.0    12.0     20.0     43.0     75.0     90.0     96.0
131             UA     100
                *

132             KK    B8CR
133             KM     COMBINE RUNOFF FROM B7 WITH ROUTED FLOWS FROM B6C
134             HC       2
                *

135             KK      B8   BASIN
136             BA   0.405             0.10
137             LG    0.35     0.05   12.40     0.01       0
138             UC   0.783    0.878
139             UA       0      4.5    12.6     23.2    35.8     50.0     64.2     76.8     87.4     95.5
140             UA     100       .
                *

141             KK     B8C
142             KM     COMBINE RUNOFF FROM B8 WITH COMBINED FLOWS AT B8CL
143             KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B8C
144             HC       2
                *
1                                          HEC-1 INPUT                                          PAGE  5

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

145             KK   B8B10ROUTE   REACH
146             KM     ROUTE COMBINED FLOWS FROM B8C TO B10C
147             KM     SLOPE = (1522-1514)/1700 = 0.0047
148             RS       2    FLOW      -1
149             RC   0.080    0.050   0.080     1700   0.0047     0.00
150             RX     0.0    250.0   275.0    280.0    290.0    295.0    320.0    570.0
151             RY   112.0    101.0   100.0     95.0     95.0    100.0    101.0    112.0
                *

152             KK      B9   BASIN
153             BA   0.385             0.10
154             LG    0.35     0.25    4.60     0.31       4
155             UC   0.325    0.292
156             UA       0      4.5    12.6     23.2    35.8     50.0     64.2     76.8     87.4     95.5
157             UA     100
                *

158             KK   B10CL
```

```
159          KM     COMBINE RUNOFF FROM B9 WITH ROUTED FLOWS FROM B8C
160          HC       2
             *

161          KK     B10   BASIN
162          BA   0.070            0.10
163          LG    0.35    0.05   12.40    0.01       0
164          UC   0.513   0.828
165          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
166          UA     100
             *

167          KK    B10C
168          KM     COMBINE RUNOFF FROM B10 WITH COMBINED FLOWS AT B10CL
169          KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B10C
170          HC       2
             *

171          KK  B10B11ROUTE   REACH
172          KM     ROUTE COMBINED FLOWS FROM B10C TO B11C
173          KM     SLOPE = (1514-1509)/1236 = 0.0040
174          RS       1    FLOW      -1
175          RC   0.080   0.050   0.080    1236  0.0040    0.00
176          RX     0.0    25.0    50.0    55.0    70.0    75.0   100.0   515.0
177          RY   106.0   101.0   100.0    95.0    95.0   100.0   101.0   106.0
             *

178          KK     B11   BASIN
179          BA   0.410            0.10
180          LG    0.35    0.25    4.45    0.34       4
181          UC   0.321   0.271
182          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
183          UA     100
             *
```



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

184          KK    B11C
185          KM     COMBINE RUNOFF FROM B11 WITH ROUTED FLOWS FROM B10C
186          HC       2
             *

187          KK  B11B22ROUTE   REACH
188          KM     ROUTE COMBINED FLOWS FROM B11C TO B22C THRU B12
189          KM     SLOPE = (1509-1498)/2644 = 0.0042
190          RS       2    FLOW      -1
191          RC   0.080   0.050   0.080    2644  0.0042    0.00
192          RX     0.0    25.0   200.0   206.0   230.0   236.0   336.0   536.0
193          RY   106.0   102.0   100.0    97.0    95.0   100.0   102.0   106.0
             *

194          KK     B12   BASIN
195          BA   0.206            0.10
196          LG    0.35    0.15    7.60    0.09       4
197          UC   0.488   0.384
198          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
199          UA     100
             *

200          KK   B22CR
201          KM     COMBINE RUNOFF FROM B12 WITH ROUTED FLOWS FROM B11C
202          HC       2
             *

203          KK     B13   BASIN
204          BA   0.502            0.10
205          LG    0.35    0.05   12.40    0.01       0
206          UC   0.942   1.182
207          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
208          UA     100
             *

209          KK   B22CC
210          KM     COMBINE RUNOFF FROM B13 WITH COMBINED FLOWS AT B22CR
211          HC       2
             *

212          KK     B14   BASIN
213          BA   0.431            0.10
214          LG    0.35    0.05   12.40    0.01       0
215          UC   0.879   1.137
216          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
217          UA     100
             *

218          KK     B15   BASIN
219          BA   0.115            0.10
220          LG    0.35    0.05   12.40    0.01       0
221          UC   0.433   0.469
```

```
222          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
223          UA     100
             *
1                                          HEC-1 INPUT                                          PAGE  7

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

224          KK    B15C
225          KM     COMBINE RUNOFF FROM B14 WITH RUNOFF FROM B15
226          HC       2
             *

227          KK  B15B16ROUTE   REACH
228          KM     ROUTE COMBINED FLOWS FROM B15C TO B16C
229          KM     SLOPE = (1530-1516)/1669 = 0.0084
230          RS       1    FLOW      -1
231          RC   0.080   0.050   0.080    1669  0.0084    0.00
232          RX     0.0    20.0    40.0    65.0    85.0   110.0   130.0   150.0
233          RY   100.0    98.0    96.0    96.0    96.0    96.0    98.0   100.0
             *

234          KK     B16   BASIN
235          BA   0.027            0.10
236          LG    0.35    0.05   12.40    0.01       0
237          UC   0.254   0.286
238          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
239          UA     100
             *

240          KK   B20CR
241          KM     COMBINE RUNOFF FROM B16 WITH ROUTED FLOWS FROM B15C
242          HC       2
             *

243          KK     B17   BASIN
244          BA   0.643            0.10
245          LG    0.29    0.10   11.20    0.03      17
246          UC   0.525   0.327
247          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
248          UA     100
             *

249          KK   RRB17ROUTE   STORAGE
250          KM   STORAGE ROUTE ADDED TO ACCOUNT FOR THE TRAMONTO DEVELOPMENT
251          RS       1    ELEV    1676
252          SV     0.0   27.39   34.24   41.09   47.94   54.78
253          SE    1676    1678    1679    1680    1681    1682
254          SQ     0.0     0.0    67.0   134.0   817.0  1500.0
             *

255          KK  B17B18ROUTE   REACH
256          KM     ROUTE RUNOFF FROM B17 TO B18C
257          KM     SLOPE = (1680-1640)/4738 = 0.0084
258          RS       5    FLOW      -1
259          RC   0.080   0.050   0.080    4738  0.0084    0.00
260          RX     0.0    40.0   110.0   115.0   130.0   135.0   205.0   240.0
261          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *
1                                          HEC-1 INPUT                                          PAGE  8

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

262          KK     B18   BASIN
263          BA   0.225            0.10
264          LG    0.35    0.10   11.20    0.02       0
265          UC   0.421   0.299
266          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
267          UA     100
             *

268          KK    B18C
269          KM     COMBINE RUNOFF FROM B18 WITH ROUTED FLOWS FROM B17
270          KM     THIS IS THE TOTAL FLOW AT I-17.
271          HC       2
             *

272          KK    B18D
273          KM     DIVERSION OF FLOW TO SOUTH ALONG EAST SIDE OF I-17
274          KM     THIS FLOW EVENTUALLY RE-JOINS SKUNK CREEK
275          DT   DIV18
276          DI     250     500     750    1000    1250    1500
277          DQ       0      66     212     405     601     822
             *

278          KK  B18B19ROUTE   REACH
279          KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
280          KM     SLOPE = (1640-1561)/10091 = 0.0078
281          RS       9    FLOW      -1
282          RC   0.080   0.050   0.080   10091  0.0078    0.00
```

```
RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
*

KK     B19   BASIN
BA   0.574            0.10
LG    0.35    0.10   11.20    0.02       0
UC   0.763   0.734
UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
UA     100
*

KK    B19C
KM     COMBINE RUNOFF FROM B19 WITH ROUTED FLOWS FROM B18C
HC       2
*

KK  B19B20ROUTE   REACH
KM     ROUTE COMBINED FLOWS FROM B19C TO B20C
KM     SLOPE = (1561-1516)/6629 = 0.0068
RS       6    FLOW      -1
RC   0.080   0.050   0.080    6629  0.0068    0.00
RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
*
```

1 HEC-1 INPUT PAGE 9

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

KK     B20   BASIN
BA   0.781            0.10
LG    0.35    0.10   11.20    0.02       3
UC   0.708   0.522
UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
UA     100
*

KK   B20CL
KM     COMBINE RUNOFF FROM B20 WITH ROUTED FLOWS FROM B19C
HC       2
*

KK    B20C
KM     COMBINE FLOWS FROM B20CR AND B20CL
KM     THIS IS THE TOTAL FLOW AT B20C
HC       2
*

KK  B20B22ROUTE   REACH
KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
KM     SLOPE = (1516-1498)/4576 = 0.0039
RS       8    FLOW      -1
RC   0.080   0.070   0.080    4576  0.0039    0.00
RX     0.0   200.0   250.0   275.0   325.0   400.0   450.0   500.0
RY   104.0    99.0    98.0    98.0    98.0    98.0    99.0   104.0
*

KK     B22   BASIN
BA   0.361            0.10
LG    0.35    0.10   11.20    0.02       1
UC   0.579   0.437
UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
UA     100
*

KK   B22CC
KM     COMBINE RUNOFF FROM B22 WITH ROUTED FLOWS FROM B20C
HC       2
*

KK     B21   BASIN
BA   0.544            0.10
LG    0.35    0.15    8.40    0.07       5
UC   0.888   0.994
UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
UA     100
*
```

1 HEC-1 INPUT PAGE 10

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

KK  RRB21CROUTE   STORAGE
KM     ROUTE FLOW THROUGH PONDING AREA BEHIND CAP CANAL
KM     OUTFLOW IN SMALL CHANNEL ALONG CAP TO WEST TO RRB22C
RS       1    STOR      -1
SA       0    1.47    6.93   13.75   20.26   25.16   29.12   34.14   39.42   47.31
SE    1503    1504    1506    1508    1510    1512    1514    1516    1518    1520
SQ       0       5      35      97     198     345     544     801    1122
SE    1503    1504    1506    1508    1510    1512    1514    1516    1518
```

```
                    *
                    *  KKB21B22
                    *  KM   ROUTE ROUTED OUTFLOW FROM B21 TO B22C
                    *  KM   SLOPE = (1504-1498)/3868 = 0.0016
                    *  RS      8    FLOW      -1
                    *  RC  0.08    0.05    0.08    3868  0.0016
                    *  RX      0      30      50      60      70      80     200     500
                    *  RY    100      92      90      85      85      90      92      94
                    *

344                 KK   B22CL
345                 KM    COMBINE B22C WITH ROUTED FLOWS FROM B21
346                 HC       2
                    *

347                 KK    B22C
348                 KM     COMBINE ALL FLOWS IN BUCHANAN WASH UPSTREAM OF CAP
349                 HC       2
350                 ZW      A=BW@CAP   C=FLOW   F=EX24
                    *

351                 KK  RRB22CROUTE   STORAGE
352                 KM     ROUTE FLOWS THROUGH LARGE PONDING AREA UPSTREAM OF CAP
353                 KM     OUTLET IS 3 - 66" RCPS
354                 KM     THESE STAGE-AREA DATA DO NOT INCLUDE THE AREA IN RRB21C STORAGE AREA
355                 RS       1    STOR      -1
356                 SA       0    0.35    3.60   11.40   30.98   61.00   99.01  131.40  162.24  193.24
357                 SA  230.10  269.99
358                 SE    1498    1500    1502    1504    1506    1508    1510    1512    1514    1516
359                 SE    1518    1520
360                 SQ       0     200     400     500     800    1000    1200    1400    1600    2000
361                 SE    1496 1499.12 1500.82 1501.61  1504.6  1507.4 1510.88 1514.97 1519.64 1520.26
                    *
362                 ZZ
1
          SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE     (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

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

  43        B1
            .
            .
  49        .          B2
            .           .
            .           .
  55        .           .          B3
            .           .           .
            .           .           .
  61      B3C.......................
            V
            V
  64     B3B4
            .
            .
  71        .          B4
            .           .
            .           .
  77      B4C............
            V
            V
  80     RRB4C
            .
            .
  91        .          B5
            .           .
            .           .
  97      B5C............
            V
            V
 100     RRB5C
            .
            .
 110        .          B6
            .           .
            .           .
 116      B6C............
            V
            V
 119     B6B8
            .
            .
 126        .          B7
            .           .
            .           .
 132     B8CR............
            .
            .
 135        .          B8
            .           .
```

```
141          B8C............
              V
              V
145        B8B10
              .
              .
152           .          B9
              .           .
              .           .
158        B10CL...........
              .
              .
161           .         B10
              .           .
              .           .
167         B10C...........
              V
              V
171       B10B11
              .
              .
178           .         B11
              .           .
              .           .
184         B11C...........
              V
              V
187       B11B22
              .
              .
194           .         B12
              .           .
              .           .
200        B22CR...........
              .
              .
203           .         B13
              .           .
              .           .
209        B22CC...........
              .
              .
212           .         B14
              .           .
              .           .
218           .           .        B15
              .           .          .
              .           .          .
224           .       B15C...........
              .         V
              .         V
227           .     B15B16
              .           .
              .           .
234           .           .        B16
              .           .          .
              .           .          .
240           .      B20CR...........
              .           .
              .           .
243           .           .        B17
              .           .          V
              .           .          V
249           .           .      RRB17
              .           .          V
              .           .          V
255           .           .     B17B18
              .           .          .
              .           .          .
262           .           .          .         B18
              .           .          .           .
              .           .          .           .
268           .           .       B18C...........
              .           .          .
              .           .          .
275           .           .          .-------->   DIV18
272           .           .       B18D
              .           .          V
              .           .          V
278           .           .     B18B19
              .           .          .
              .           .          .
285           .           .          .         B19
              .           .          .           .
              .           .          .           .
291           .           .       B19C...........
              .           .          V
              .           .          V
294           .           .     B19B20
              .           .          .
```

```
  301          .          .          .          B20
               .          .          .            .
               .          .          .            .
  307          .          .       B20CL............
               .          .          .
               .          .          .
  310          .       B20C...........
               .          V
               .          V
  314          .     B20B22
               .          .
               .          .
  321          .          .        B22
               .          .          .
               .          .          .
  327          .      B22CC...........
               .          .
               .          .
  330          .          .        B21
               .          .          V
               .          .          V
  336          .          .      RRB21C
               .          .          .
               .          .          .
  344          .      B22CL...........
               .          .
               .          .
  347       B22C...........
               V
               V
  351     RRB22C
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   15JUL03  TIME  13:09:27  *
*                                      *
****************************************
```

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

BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP

JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
ADOBE DAM / DESERT HILLS ADMP
FEBRUARY 2003

THIS IS THE 2-YEAR 24-HOUR MODEL FOR EXISTING CONDITIONS

MODEL BASIS:
* DDMSW PROJECT NAME: BF_EX24
* PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
* MULTIPLE STORM OPTION (JD)
* GREEN & AMPT LOSS METHOD
* CLARK UNIT HYDROGRAPH METHOD
* TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
  EXCEPT FOR BASIN B17 DUE TO INCORRECT CALCULATION OF Kb FOR
  MULTIPLE LAND USES
* MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
* 2-YEAR VALUES COMPUTED BY 0.10 RATIO OF 100-YEAR RESULTS
  PER DRAFT HYDROLOGY MANUAL (2003)
* RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI

```
 26 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     1FEB 3  STARTING DATE
                      ITIME       0005  STARTING TIME
                         NQ        600  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     3FEB 3  ENDING DATE
                     NDTIME       0200  ENDING TIME
                      ICENT         19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                       TOTAL TIME BASE   49.92 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

28 JD INDEX STORM NO. 1

STRM 4.15 PRECIPITATION DEPTH
TRDA .01 TRANSPOSITION DRAINAGE AREA

29 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
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39 JD INDEX STORM NO. 2

STRM 3.90 PRECIPITATION DEPTH
TRDA 10.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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40 JD INDEX STORM NO. 3

STRM 3.73 PRECIPITATION DEPTH
TRDA 30.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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41 JD INDEX STORM NO. 4
STRM 3.57 PRECIPITATION DEPTH
TRDA 60.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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42 JD INDEX STORM NO. 5
STRM 3.51 PRECIPITATION DEPTH
TRDA 90.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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    -----DSS---ZOPEN:  Existing File Opened,  File: BF224E.DSS
                       Unit:  71;  DSS Version: 6-JG
 -----DSS---ZWRITE Unit  71; Vers.    7:  /BW@CAP/B22C/FLOW/01FEB1903/5MIN/EX24/
 -----DSS---ZWRITE Unit  71; Vers.    7:  /BW@CAP/B22C/FLOW/02FEB1903/5MIN/EX24/
 -----DSS---ZWRITE Unit  71; Vers.    3:  /BW@CAP/B22C/FLOW/03FEB1903/5MIN/EX24/
1
                                        RUNOFF SUMMARY
                                   FLOW IN CUBIC FEET PER SECOND
                              TIME IN HOURS,  AREA IN SQUARE MILES

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

          HYDROGRAPH AT
+                          B1      78.   12.50         18.         5.         2.       .74
          HYDROGRAPH AT
+                          B2      76.   12.67         25.         7.         4.       .91
          HYDROGRAPH AT
+                          B3      82.   12.67         28.         8.         4.      1.01
          3 COMBINED AT
+                          B3C    231.   12.58         71.        20.        10.      2.66
          ROUTED TO
+                         B3B4    223.   12.83         70.        20.        10.      2.66
          HYDROGRAPH AT
+                          B4      88.   12.25         13.         3.         2.       .58
          2 COMBINED AT
+                          B4C    249.   12.75         83.        23.        11.      3.25
          ROUTED TO
+                        RRB4C    247.   12.83         83.        23.        11.      3.25
          HYDROGRAPH AT
+                          B5      11.   12.17          2.         0.         0.       .07
          2 COMBINED AT
+                          B5C    250.   12.83         84.        24.        11.      3.32
          ROUTED TO
+                        RRB5C    248.   12.92         84.        24.        11.      3.32
          HYDROGRAPH AT
+                          B6      70.   12.17          7.         2.         1.       .54
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+	2 COMBINED AT	B6C	255.	12.83	91.	25.	12.	3.86
+	ROUTED TO	B6B8	254.	12.92	91.	25.	12.	3.86
+	HYDROGRAPH AT	B7	16.	12.08	1.	0.	0.	.08
+	2 COMBINED AT	B8CR	254.	12.92	92.	26.	12.	3.94
+	HYDROGRAPH AT	B8	34.	12.58	11.	3.	2.	.41
+	2 COMBINED AT	B8C	282.	12.92	103.	29.	14.	4.35
+	ROUTED TO	B8B10	281.	13.00	103.	29.	14.	4.35
+	HYDROGRAPH AT	B9	50.	12.17	5.	1.	1.	.38
+	2 COMBINED AT	B10CL	285.	12.92	108.	30.	14.	4.73
+	HYDROGRAPH AT	B10	7.	12.33	2.	1.	0.	.07
+	2 COMBINED AT	B10C	290.	12.92	110.	31.	15.	4.80
+	ROUTED TO	B10B11	289.	12.92	110.	31.	15.	4.80
+	HYDROGRAPH AT	B11	55.	12.08	5.	1.	1.	.41
+	2 COMBINED AT	B11C	294.	12.75	115.	32.	15.	5.21
+	ROUTED TO	B11B22	293.	13.00	114.	32.	15.	5.21
+	HYDROGRAPH AT	B12	28.	12.33	4.	1.	0.	.21
+	2 COMBINED AT	B22CR	302.	12.92	118.	33.	16.	5.42
+	HYDROGRAPH AT	B13	34.	12.75	14.	4.	2.	.50
+	2 COMBINED AT	B22CC	334.	12.83	131.	37.	18.	5.92
+	HYDROGRAPH AT	B14	31.	12.67	12.	4.	2.	.43
+	HYDROGRAPH AT	B15	15.	12.25	3.	1.	0.	.12
+	2 COMBINED AT	B15C	40.	12.58	15.	4.	2.	.55
+	ROUTED TO	B15B16	37.	12.83	15.	4.	2.	.55
+	HYDROGRAPH AT	B16	5.	12.08	1.	0.	0.	.03
+	2 COMBINED AT	B20CR	38.	12.75	16.	5.	2.	.57
+	HYDROGRAPH AT	B17	93.	12.17	16.	5.	2.	.64
+	ROUTED TO	RRB17	0.	.00	0.	0.	0.	.64
+	ROUTED TO	B17B18	0.	.00	0.	0.	0.	.64
+	HYDROGRAPH AT	B18	37.	12.25	6.	2.	1.	.22
+	2 COMBINED AT	B18C	37.	12.25	6.	2.	1.	.87

DIVERSION TO

+		DIV18	0.	.00	0.	0.	0.	.87
+	HYDROGRAPH AT	B18D	37.	12.25	6.	2.	1.	.87
+	ROUTED TO	B18B19	18.	13.67	6.	2.	1.	.87
+	HYDROGRAPH AT	B19	51.	12.50	15.	4.	2.	.57
+	2 COMBINED AT	B19C	51.	12.58	20.	5.	3.	1.44
+	ROUTED TO	B19B20	45.	13.25	20.	5.	3.	1.44
+	HYDROGRAPH AT	B20	91.	12.50	20.	5.	3.	.78
+	2 COMBINED AT	B20CL	94.	12.50	39.	11.	5.	2.22
+	2 COMBINED AT	B20C	128.	12.58	54.	15.	7.	2.80
+	ROUTED TO	B20B22	115.	13.83	53.	15.	7.	2.80
+	HYDROGRAPH AT	B22	47.	12.42	9.	3.	1.	.36
+	2 COMBINED AT	B22CC	121.	13.83	59.	18.	9.	3.16
+	HYDROGRAPH AT	B21	36.	12.50	11.	3.	1.	.54
+	ROUTED TO	RRB21C	14.	13.92	10.	3.	1.	.54
+	2 COMBINED AT	B22CL	135.	13.83	68.	21.	10.	3.70
+	2 COMBINED AT	B22C	399.	13.42	198.	57.	27.	9.62
+	ROUTED TO	RRB22C	398.	13.50	198.	57.	27.	9.62

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

```
-----DSS---ZCLOSE Unit:  71,   File: BF224E.DSS
           Pointer Utilization:    .25
           Number of Records:       3
           File Size:      15.3  Kbytes
           Percent Inactive:     .0
```

Existing Condition
10-Year

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *             JUN  1998                *
 *           VERSION 4.1                *
 *                                      *
 *  RUN DATE   15JUL03  TIME  13:10:43  *
 *                                      *
 ****************************************
```

```
****************************************
*                                      *
*    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

  1           ID   BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP
  2           ID
  3           ID    JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
  4           ID    ADOBE DAM / DESERT HILLS ADMP
  5           ID    FEBRUARY 2003
  6           ID
  7           ID    THIS IS THE 10-YEAR 24-HOUR MODEL FOR EXISTING CONDITIONS
  8           ID
  9           ID
 10           ID    MODEL BASIS:
 11           ID      * DDMSW PROJECT NAME: BF_EX24
 12           ID      * PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
 13           ID      * MULTIPLE STORM OPTION (JD)
 14           ID      * GREEN & AMPT LOSS METHOD
 15           ID      * CLARK UNIT HYDROGRAPH METHOD
 16           ID      * TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
 17           ID        EXCEPT BASIN B17 DUE TO INCORRECT CALCULATION OF Kb FOR
 18           ID        MULTIPLE LAND USES
 19           ID      * MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
 20           ID      * 10-YR COMPUTED BASED ON 0.35 RATIO OF 100-YEAR PER
 21           ID        DRAFT HYDROLOGY MANUAL (2003)
 22           ID      * RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI
 23           ID
 24           ID
              *DIAGRAM
 25           IT       5 01FEB03     0005      600
 26           IO       5
 27           IN      15
              *
              *  THESE RAINFALL RECORDS ARE FOR THE 100-YEAR 24-HOUR STORM.
              *  THE 10-YR HYDROGRAPHS ARE COMPUTED BY USE OF RATIOS
              *  ON FIELD 3 OF THE BA RECORD.
              *
 28           JD    4.15    0.01
 29           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 30           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 31           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 32           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 33           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 34           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 35           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 36           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 37           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 38           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000
 39           JD   3.901      10
 40           JD   3.735      30
 41           JD   3.569      60
 42           JD   3.511      90
              *
1                                   HEC-1 INPUT                                                    PAGE  2

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

```
43          KK      B1   BASIN
44          BA   0.741            0.35
45          LG    0.35    0.13   10.10    0.03       1
46          UC   0.771   0.577
47          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
48          UA     100
            *

49          KK      B2   BASIN
50          BA   0.913            0.35
51          LG    0.35    0.05   12.40    0.01       0
52          UC   0.900   0.828
53          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
54          UA     100
            *

55          KK      B3   BASIN
56          BA   1.011            0.35
57          LG    0.35    0.05   12.40    0.01       0
58          UC   0.929   0.862
59          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
60          UA     100
            *

61          KK     B3C
62          KM      COMBINE B1 + B2 + B3
63          HC       3
            *

64          KK    B3B4ROUTE   REACH
65          KM    ROUTE COMBINED FLOWS FROM B3C TO B4C
66          KM     SLOPE = (1538-1535)/1401 = 0.002
67          RS       3    FLOW      -1
68          RC   0.080   0.050   0.080    1401  0.0020    0.00
69          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
70          RY   110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
            *

71          KK      B4   BASIN
72          BA   0.584            0.35
73          LG    0.35    0.15    9.70    0.04       0
74          UC   0.429   0.286
75          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
76          UA     100
            *

77          KK     B4C
78          KM     COMBINE RUNOFF FROM B4 WITH ROUTED FLOWS FROM B3C
79          HC       2
            *
            *   THIS CHANNEL ROUTING REMOVED FROM 10- & 100-YR MODELS DUE TO BACKUP BETWEEN
            *   STOCK PONDS AT B4C AND B5C.
            *
            * KK  B4B5ROUTE   REACH
            * KM   ROUTE COMBINED FLOWS FROM B4C TO B5C
            * KM   SLOPE = (1535-1534)/1014 = 0.001
            * RS     2    FLOW      -1
            * RC 0.080   0.050   0.080    1014  0.0010    0.00
            * RX   0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
            * RY 110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
            *
```



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

80          KK      B5   BASIN
81          BA   0.069            0.35
82          LG    0.35    0.15    9.70    0.04       0
83          UC   0.321   0.324
84          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
85          UA     100
            *

86          KK     B5C
87          KM     COMBINE RUNOFF FROM B5 WITH ROUTED FLOWS FROM B4C
88          HC       2
            *

89          KK   RRB5CROUTE   STORAGE
90          KM     ROUTE HYDROGRAPH THROUGH COMBINED STORAGE AREA ASSOCIATED WITH TWO
91          KM     STOCK PONDS (ONE AT B4CA AND THE OTHER AT B5C).
92          KM     ASSUMPTION OF COMBINED STORAGE AREAS FOR 10-YR & 100-YR EVENTS.
93          KM     DISCHARGE CURVE COMPUTED WITH COE UNEVEN WEIR PROGRAM (FILE: RR5BC.IN)
94          RS       1    STOR      -1
95          SA       0    0.33    1.96   14.34   30.65
96          SE    1533    1534    1536    1538    1540
97          SQ       0     103     357     780    1400    2224    3274    4498    5940
98          SE  1536.0  1536.5  1537.0  1537.5  1538.0  1538.5  1539.0  1539.5  1540.0
            *
```

```
                 *   NO CHANNEL ROUTING FROM B5C TO B6C DUE TO SHORT REACH LENGTH (752')
                 *

  99             KK      B6   BASIN
 100             BA   0.543            0.35
 101             LG    0.35    0.25    4.25    0.39       4
 102             UC   0.350   0.280
 103             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 104             UA     100
                 *

 105             KK     B6C
 106             KM     COMBINE RUNOFF FROM B6 WITH ROUTED FLOWS FROM B5C
 107             HC       2
                 *

 108             KK    B6B8ROUTE   REACH
 109             KM     ROUTE COMBINED FLOWS FROM B6C TO B8C
 110             KM     SLOPE = (1531-1522)/1909 = 0.0047
 111             RS       2    FLOW      -1
 112             RC   0.080   0.050   0.080    1909  0.0047    0.00
 113             RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
 114             RY   112.0   101.0   100.0    95.0    95.0   100.0   101.0   112.0
                 *
1                                                HEC-1 INPUT                                                PAGE  4

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

 115             KK      B7   BASIN
 116             BA   0.080            0.35
 117             LG    0.35    0.25    5.10    0.24      10
 118             UC   0.192   0.166
 119             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 120             UA     100
                 *

 121             KK    B8CR
 122             KM     COMBINE RUNOFF FROM B7 WITH ROUTED FLOWS FROM B6C
 123             HC       2
                 *

 124             KK      B8   BASIN
 125             BA   0.405            0.35
 126             LG    0.35    0.05   12.40    0.01       0
 127             UC   0.783   0.878
 128             UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 129             UA     100
                 *

 130             KK     B8C
 131             KM     COMBINE RUNOFF FROM B8 WITH COMBINED FLOWS AT B8CL
 132             KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B8C
 133             HC       2
                 *

 134             KK   B8B10ROUTE   REACH
 135             KM     ROUTE COMBINED FLOWS FROM B8C TO B10C
 136             KM     SLOPE = (1522-1514)/1700 = 0.0047
 137             RS       2    FLOW      -1
 138             RC   0.080   0.050   0.080    1700  0.0047    0.00
 139             RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
 140             RY   112.0   101.0   100.0    95.0    95.0   100.0   101.0   112.0
                 *

 141             KK      B9   BASIN
 142             BA   0.385            0.35
 143             LG    0.35    0.25    4.60    0.31       4
 144             UC   0.325   0.292
 145             UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 146             UA     100
                 *

 147             KK   B10CL
 148             KM     COMBINE RUNOFF FROM B9 WITH ROUTED FLOWS FROM B8C
 149             HC       2
                 *
1                                                HEC-1 INPUT                                                PAGE  5

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

 150             KK     B10   BASIN
 151             BA   0.070            0.35
 152             LG    0.35    0.05   12.40    0.01       0
 153             UC   0.513   0.828
 154             UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 155             UA     100
                 *

 156             KK    B10C
```

```
157          KM     COMBINE RUNOFF FROM B10 WITH COMBINED FLOWS AT B10CL
158          KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B10C
159          HC       2
             *

160          KK  B10B11ROUTE   REACH
161          KM     ROUTE COMBINED FLOWS FROM B10C TO B11C
162          KM     SLOPE = (1514-1509)/1236 = 0.0040
163          RS       1    FLOW      -1
164          RC   0.080   0.050   0.080    1236  0.0040    0.00
165          RX     0.0    25.0    50.0    55.0    70.0    75.0   100.0   515.0
166          RY   106.0   101.0   100.0    95.0    95.0   100.0   101.0   106.0
             *

167          KK     B11   BASIN
168          BA   0.410            0.35
169          LG    0.35    0.25    4.45    0.34       4
170          UC   0.321   0.271
171          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
172          UA     100
             *

173          KK    B11C
174          KM     COMBINE RUNOFF FROM B11 WITH ROUTED FLOWS FROM B10C
175          HC       2
             *

176          KK  B11B22ROUTE   REACH
177          KM     ROUTE COMBINED FLOWS FROM B11C TO B22C THRU B12
178          KM     SLOPE = (1509-1498)/2644 = 0.0042
179          RS       2    FLOW      -1
180          RC   0.080   0.050   0.080    2644  0.0042    0.00
181          RX     0.0    25.0   200.0   206.0   230.0   236.0   336.0   536.0
182          RY   106.0   102.0   100.0    97.0    95.0   100.0   102.0   106.0
             *

183          KK     B12   BASIN
184          BA   0.206            0.35
185          LG    0.35    0.15    7.60    0.09       4
186          UC   0.488   0.384
187          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
188          UA     100
             *
```



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

189          KK   B22CR
190          KM     COMBINE RUNOFF FROM B12 WITH ROUTED FLOWS FROM B11C
191          HC       2
             *

192          KK     B13   BASIN
193          BA   0.502            0.35
194          LG    0.35    0.05   12.40    0.01       0
195          UC   0.942   1.182
196          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
197          UA     100
             *

198          KK   B22CC
199          KM     COMBINE RUNOFF FROM B13 WITH COMBINED FLOWS AT B22CR
200          HC       2
             *

201          KK     B14   BASIN
202          BA   0.431            0.35
203          LG    0.35    0.05   12.40    0.01       0
204          UC   0.879   1.137
205          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
206          UA     100
             *

207          KK     B15   BASIN
208          BA   0.115            0.35
209          LG    0.35    0.05   12.40    0.01       0
210          UC   0.433   0.469
211          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
212          UA     100
             *

213          KK    B15C
214          KM     COMBINE RUNOFF FROM B14 WITH RUNOFF FROM B15
215          HC       2
             *

216          KK  B15B16ROUTE   REACH
217          KM     ROUTE COMBINED FLOWS FROM B15C TO B16C
218          KM     SLOPE = (1530-1516)/1669 = 0.0084
219          RS       1    FLOW      -1
```

```
220          RC   0.080   0.050   0.080    1669  0.0084    0.00
221          RX     0.0    20.0    40.0    65.0    85.0   110.0   130.0   150.0
222          RY   100.0    98.0    96.0    96.0    96.0    96.0    98.0   100.0
             *

223          KK     B16   BASIN
224          BA   0.027            0.35
225          LG    0.35    0.05   12.40    0.01       0
226          UC   0.254   0.286
227          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5

228          UA     100
             *
1                                          HEC-1 INPUT                                                    PAGE  7

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

229          KK   B20CR
230          KM     COMBINE RUNOFF FROM B16 WITH ROUTED FLOWS FROM B15C
231          HC       2
             *

232          KK     B17   BASIN
233          BA   0.643            0.35
234          LG    0.29    0.10   11.20    0.03      17
235          UC   0.525   0.327
236          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
237          UA     100
             *

238          KK   RRB17ROUTE   STORAGE
239          KM   STORAGE ROUTE ADDED TO ACCOUNT FOR THE TRAMONTO DEVELOPMENT
240          RS       1    ELEV    1676
241          SV     0.0   27.39   34.24   41.09   47.94   54.78
242          SE    1676    1678    1679    1680    1681    1682
243          SQ     0.0     0.0    67.0   134.0   817.0  1500.0
             *

244          KK  B17B18ROUTE   REACH
245          KM     ROUTE RUNOFF FROM B17 TO B18C
246          KM     SLOPE = (1680-1640)/4738 = 0.0084
247          RS       5    FLOW      -1
248          RC   0.080   0.050   0.080    4738  0.0084    0.00
249          RX     0.0    40.0   110.0   115.0   130.0   135.0   205.0   240.0
250          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *

251          KK     B18   BASIN
252          BA   0.225            0.35
253          LG    0.35    0.10   11.20    0.02       0
254          UC   0.421   0.299
255          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
256          UA     100
             *

257          KK    B18C
258          KM     COMBINE RUNOFF FROM B18 WITH ROUTED FLOWS FROM B17
259          KM     THIS IS THE TOTAL FLOW AT I-17.
260          HC       2
             *

261          KK    B18D
262          KM     DIVERSION OF FLOW TO SOUTH ALONG EAST SIDE OF I-17
263          KM     THIS FLOW EVENTUALLY RE-JOINS SKUNK CREEK
264          DT   DIV18
265          DI     250     500     750    1000    1250    1500
266          DQ       0      66     212     405     601     822
             *
1                                          HEC-1 INPUT                                                    PAGE  8

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

267          KK  B18B19ROUTE   REACH
268          KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
269          KM     SLOPE = (1640-1561)/10091 = 0.0078
270          RS       9    FLOW      -1
271          RC   0.080   0.050   0.080   10091  0.0078    0.00
272          RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
273          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *

274          KK     B19   BASIN
275          BA   0.574            0.35
276          LG    0.35    0.10   11.20    0.02       0
277          UC   0.763   0.734
278          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
279          UA     100
             *
```

```
280          KK    B19C
281          KM     COMBINE RUNOFF FROM B19 WITH ROUTED FLOWS FROM B18C
282          HC       2
             *

283          KK  B19B20ROUTE   REACH
284          KM     ROUTE COMBINED FLOWS FROM B19C TO B20C
285          KM     SLOPE = (1561-1516)/6629 = 0.0068
286          RS       6    FLOW      -1
287          RC   0.080   0.050   0.080    6629  0.0068    0.00
288          RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
289          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *

290          KK     B20   BASIN
291          BA   0.781            0.35
292          LG    0.35    0.10   11.20    0.02       3
293          UC   0.708   0.522
294          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
295          UA     100
             *

296          KK   B20CL
297          KM     COMBINE RUNOFF FROM B20 WITH ROUTED FLOWS FROM B19C
298          HC       2
             *

299          KK    B20C
300          KM     COMBINE FLOWS FROM B20CR AND B20CL
301          KM     THIS IS THE TOTAL FLOW AT B20C
302          HC       2
             *
```



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

303          KK  B20B22ROUTE   REACH
304          KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
305          KM     SLOPE = (1516-1498)/4576 = 0.0039
306          RS       8    FLOW      -1
307          RC   0.080   0.070   0.080    4576  0.0039    0.00
308          RX     0.0   200.0   250.0   275.0   325.0   400.0   450.0   500.0
309          RY   104.0    99.0    98.0    98.0    98.0    98.0    99.0   104.0
             *

310          KK     B22   BASIN
311          BA   0.361            0.35
312          LG    0.35    0.10   11.20    0.02       1
313          UC   0.579   0.437
314          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
315          UA     100
             *

316          KK   B22CC
317          KM    COMBINE RUNOFF FROM B22 WITH ROUTED FLOWS FROM B20C
318          HC       2
             *

319          KK     B21   BASIN
320          BA   0.544            0.35
321          LG    0.35    0.15    8.40    0.07       5
322          UC   0.888   0.994
323          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
324          UA     100
             *
             *  KKB21B22
             *  KM   ROUTE ROUTED OUTFLOW FROM B21 TO B22C
             *  KM   SLOPE = (1504-1498)/3868 = 0.0016
             *  RS     8    FLOW      -1
             *  RC  0.08    0.05    0.08    3868  0.0016
             *  RX     0      30      50      60      70      80     200     500
             *  RY   100      92      90      85      85      90      92      94
             *

325          KK   B22CC
326          KM    COMBINE B22C WITH ROUTED FLOWS FROM B21
327          HC       2
             *

328          KK    B22C
329          KM     COMBINE ALL FLOWS IN BUCHANAN WASH UPSTREAM OF CAP
330          HC       2
331          ZW      A=BW@CAP   C=FLOW   F=EX24
             *
```



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

332          KK  RRB22CROUTE   STORAGE
```

```
333          KM     ROUTE FLOWS THROUGH LARGE PONDING AREA UPSTREAM OF CAP
334          KM     OUTLET IS 3 - 66" RCPS
335          KM     THIS STORAGE ROUTING INCLUDES AREA IN RRB21C FOR THE 10-YR AND 100-YR
336          KM     MODELS AS THE MAXIMUM PONDING ELEVATION BACKS UP FROM RRB22C EAST INTO
337          KM     RRB21C AREA ABOVE ABOUT 1504.0 FT.
338          RS       1    STOR      -1
339          SA       0    0.35    3.60   12.87   37.91   74.76  119.27  156.56  191.36  227.38
340          SA  269.52  317.29
341          SE    1498    1500    1502    1504    1506    1508    1510    1512    1514    1516
342          SE    1518    1520
343          SQ       0     200     400     500     800    1000    1200    1400    1600    2000
344          SE    1496 1499.12 1500.82 1501.61  1504.6  1507.4 1510.88 1514.97 1519.64 1520.26
             *
345          ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

  43          B1
               .
               .
  49           .          B2
               .           .
               .           .
  55           .           .          B3
               .           .           .
               .           .           .
  61        B3C.......................
             V
             V
  64       B3B4
               .
               .
  71           .          B4
               .           .
               .           .
  77        B4C............
               .
               .
  80           .          B5
               .           .
               .           .
  86        B5C............
             V
             V
  89      RRB5C
               .
               .
  99           .          B6
               .           .
               .           .
 105        B6C............
             V
             V
 108       B6B8
               .
               .
 115           .          B7
               .           .
               .           .
 121       B8CR............
               .
               .
 124           .          B8
               .           .
               .           .
 130        B8C............
             V
             V
 134      B8B10
               .
               .
 141           .          B9
               .           .
               .           .
 147      B10CL............
               .
               .
 150           .          B10
               .           .
               .           .
 156       B10C............
             V
             V
 160     B10B11
               .
               .
 167           .          B11
```

```
173     B11C............
          V
          V
176     B11B22
183             B12
189     B22CR...........
192             B13
198     B22CC...........
201             B14
207                     B15
213             B15C............
                  V
                  V
216           B15B16
223                     B16
229           B20CR...........
232                     B17
                          V
                          V
238                   RRB17
                          V
                          V
244                 B17B18
251                                 B18
257                     B18C............
264                                 .-------->   DIV18
261                     B18D
                          V
                          V
267                 B18B19
274                                 B19
280                     B19C............
                          V
                          V
283                 B19B20
290                                 B20
296                     B20CL...........
299             B20C............
                  V
                  V
303           B20B22
310                     B22
316           B22CC...........
319                     B21
325             B22CL...........
```

```
                .          .
                .          .
  328        B22C............
               V
               V
  332      RRB22C

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998              *
 *           VERSION 4.1                *
 *                                      *
 *  RUN DATE   15JUL03  TIME  13:10:43  *
 *                                      *
 ****************************************
```

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

BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP

JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
ADOBE DAM / DESERT HILLS ADMP
FEBRUARY 2003

THIS IS THE 10-YEAR 24-HOUR MODEL FOR EXISTING CONDITIONS

MODEL BASIS:
* DDMSW PROJECT NAME: BF_EX24
* PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
* MULTIPLE STORM OPTION (JD)
* GREEN & AMPT LOSS METHOD
* CLARK UNIT HYDROGRAPH METHOD
* TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
  EXCEPT BASIN B17 DUE TO INCORRECT CALCULATION OF Kb FOR
  MULTIPLE LAND USES
* MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
* 10-YR COMPUTED BASED ON 0.35 RATIO OF 100-YEAR PER
  DRAFT HYDROLOGY MANUAL (2003)
* RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI

```
 26 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     1FEB 3  STARTING DATE
                      ITIME       0005  STARTING TIME
                         NQ        600  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     3FEB 3  ENDING DATE
                     NDTIME       0200  ENDING TIME
                      ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   49.92 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

 28 JD           INDEX STORM NO. 1
                       STRM       4.15  PRECIPITATION DEPTH
                       TRDA        .01  TRANSPOSITION DRAINAGE AREA

 29 PI             PRECIPITATION PATTERN
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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39 JD INDEX STORM NO. 2

STRM 3.90 PRECIPITATION DEPTH
TRDA 10.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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40 JD INDEX STORM NO. 3

STRM 3.73 PRECIPITATION DEPTH
TRDA 30.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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41 JD INDEX STORM NO. 4

STRM 3.57 PRECIPITATION DEPTH
TRDA 60.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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42 JD INDEX STORM NO. 5

STRM 3.51 PRECIPITATION DEPTH

TRDA 90.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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HYDROGRAPH MULTIPLIED BY .35

HYDROGRAPH MULTIPLIED BY .35

HYDROGRAPH MULTIPLIED BY .35

HYDROGRAPH MULTIPLIED BY .35

HYDROGRAPH MULTIPLIED BY .35

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                                        HYDROGRAPH MULTIPLIED BY   .35
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WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO
                                        HYDROGRAPH MULTIPLIED BY   .35
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WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO
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    -----DSS---ZOPEN:  Existing File Opened,  File: BF1024E.DSS
                       Unit:  71;  DSS Version: 6-JG
 -----DSS---ZWRITE Unit  71; Vers.    6:  /BW@CAP/B22C/FLOW/01FEB1903/5MIN/EX24/
 -----DSS---ZWRITE Unit  71; Vers.    6:  /BW@CAP/B22C/FLOW/02FEB1903/5MIN/EX24/
 -----DSS---ZWRITE Unit  71; Vers.    6:  /BW@CAP/B22C/FLOW/03FEB1903/5MIN/EX24/
1
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	B1	275.	12.50	62.	16.	8.	.74		
+	HYDROGRAPH AT	B2	266.	12.67	89.	26.	13.	.91		
+	HYDROGRAPH AT	B3	287.	12.67	98.	29.	14.	1.01		
+	3 COMBINED AT	B3C	810.	12.58	247.	70.	34.	2.66		
+	ROUTED TO	B3B4	787.	12.83	247.	70.	34.	2.66		
+	HYDROGRAPH AT	B4	308.	12.25	45.	11.	5.	.58		
+	2 COMBINED AT	B4C	885.	12.75	291.	81.	39.	3.25		
+	HYDROGRAPH AT	B5	37.	12.17	6.	1.	1.	.07		
+	2 COMBINED AT	B5C	897.	12.75	296.	82.	40.	3.32		
+	ROUTED TO	RRB5C	875.	12.83	296.	82.	40.	3.32		
+	HYDROGRAPH AT	B6	243.	12.17	24.	6.	3.	.54		
+	2 COMBINED AT	B6C	907.	12.83	318.	88.	42.	3.86		
+	ROUTED TO	B6B8	892.	13.00	318.	88.	42.	3.86		
+	HYDROGRAPH AT	B7	55.	12.08	4.	1.	1.	.08		
+	2 COMBINED AT	B8CR	892.	12.92	323.	89.	43.	3.94		
+	HYDROGRAPH AT	B8	118.	12.58	40.	12.	6.	.41		
+	2 COMBINED AT	B8C	989.	12.92	361.	101.	48.	4.35		
+	ROUTED TO	B8B10	979.	13.08	361.	101.	48.	4.35		
+	HYDROGRAPH AT	B9	174.	12.17	18.	5.	2.	.38		
+	2 COMBINED AT	B10CL	990.	13.00	378.	105.	51.	4.73		
+	HYDROGRAPH AT	B10	23.	12.33	7.	2.	1.	.07		

+	2 COMBINED AT	B10C	1004.	13.00	385.	107.	51.	4.80
+	ROUTED TO	B10B11	994.	13.17	385.	107.	51.	4.80
+	HYDROGRAPH AT	B11	193.	12.08	19.	5.	2.	.41
+	2 COMBINED AT	B11C	1001.	13.08	403.	112.	54.	5.21
+	ROUTED TO	B11B22	979.	13.33	402.	112.	54.	5.21
+	HYDROGRAPH AT	B12	97.	12.33	14.	4.	2.	.21
+	2 COMBINED AT	B22CR	993.	13.33	416.	115.	55.	5.42
+	HYDROGRAPH AT	B13	120.	12.75	48.	14.	7.	.50
+	2 COMBINED AT	B22CC	1082.	13.33	462.	129.	62.	5.92
+	HYDROGRAPH AT	B14	107.	12.67	42.	12.	6.	.43
+	HYDROGRAPH AT	B15	52.	12.25	12.	3.	2.	.12
+	2 COMBINED AT	B15C	141.	12.58	53.	16.	8.	.55
+	ROUTED TO	B15B16	137.	12.67	53.	16.	8.	.55
+	HYDROGRAPH AT	B16	16.	12.08	3.	1.	0.	.03
+	2 COMBINED AT	B20CR	142.	12.67	55.	16.	8.	.57
+	HYDROGRAPH AT	B17	326.	12.17	58.	16.	8.	.64
+	ROUTED TO	RRB17	10.	14.92	7.	2.	1.	.64
+	ROUTED TO	B17B18	9.	15.92	6.	2.	1.	.64
+	HYDROGRAPH AT	B18	130.	12.25	21.	6.	3.	.22
+	2 COMBINED AT	B18C	128.	12.25	23.	7.	4.	.87
+	DIVERSION TO	DIV18	0.	.00	0.	0.	0.	.87
+	HYDROGRAPH AT	B18D	128.	12.25	23.	7.	4.	.87
+	ROUTED TO	B18B19	85.	13.08	23.	7.	4.	.87
+	HYDROGRAPH AT	B19	179.	12.50	52.	14.	7.	.57
+	2 COMBINED AT	B19C	211.	12.92	71.	21.	10.	1.44
+	ROUTED TO	B19B20	198.	13.50	71.	21.	10.	1.44
+	HYDROGRAPH AT	B20	319.	12.50	71.	19.	9.	.78
+	2 COMBINED AT	B20CL	380.	12.58	138.	40.	19.	2.22
+	2 COMBINED AT	B20C	517.	12.58	192.	56.	27.	2.80
+	ROUTED TO	B20B22	481.	13.33	190.	56.	27.	2.80

```
          HYDROGRAPH AT
+                          B22       166.   12.42        33.        9.        4.      .36

          2 COMBINED AT
+                        B22CC       526.   13.25       218.       64.       31.     3.16

          HYDROGRAPH AT
+                          B21       128.   12.50        38.       10.        5.      .54

          2 COMBINED AT
+                        B22CL       606.   13.25       254.       73.       35.     3.70

          2 COMBINED AT
+                         B22C      1676.   13.25       710.      200.       97.     9.62

          ROUTED TO
+                       RRB22C       946.   14.33       710.      200.       97.     9.62


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


     -----DSS---ZCLOSE Unit:  71,   File: BF1024E.DSS
              Pointer Utilization:    .25
              Number of Records:       3
              File Size:     15.3  Kbytes
              Percent Inactive:     .0
```

Existing Condition
100-Year

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998              *
 *            VERSION 4.1               *
 *                                      *
 *  RUN DATE   15JUL03  TIME  13:10:53  *
 *                                      *
 ****************************************
```

```
****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*   HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET            *
*      DAVIS, CALIFORNIA 95616         *
*          (916) 756-1104              *
*                                      *
****************************************
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X     X  XXXXXXX   XXXXX            X
X     X  X        X     X          XX
X     X  X        X                 X
XXXXXXX  XXXX     X         XXXXX   X
X     X  X        X                 X
X     X  X        X     X           X
X     X  XXXXXXX   XXXXX           XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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

1 HEC-1 INPUT PAGE 1

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

  1           ID   BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP
  2           ID
  3           ID    JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
  4           ID    ADOBE DAM / DESERT HILLS ADMP
  5           ID    FEBRUARY 2003
  6           ID
  7           ID    THIS IS THE 100-YEAR 24-HOUR MODEL FOR EXISTING CONDITIONS
  8           ID
  9           ID
 10           ID    MODEL BASIS:
 11           ID      * DDMSW PROJECT NAME: BF_EX24
 12           ID      * PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
 13           ID      * MULTIPLE STORM OPTION (JD)
 14           ID      * GREEN & AMPT LOSS METHOD
 15           ID      * CLARK UNIT HYDROGRAPH METHOD
 16           ID      * TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
 17           ID        EXCEPT BASIN B17 DUE TO INCORRECT CALCULATION OF Kb FOR
 18           ID        MULTIPLE LAND USES
 19           ID      * MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
 20           ID      * RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI
 21           ID
 22           ID
              *DIAGRAM
 23           IT       5 01FEB03    0005     600
 24           IO       5
 25           IN      15
 26           JD    4.15    0.01
 27           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 28           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 29           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 30           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 31           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 32           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 33           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 34           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 35           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 36           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000
 37           JD   3.901      10

 38           JD   3.735      30
 39           JD   3.569      60
 40           JD   3.511      90
              *

 41           KK      B1   BASIN
 42           BA   0.741
 43           LG    0.35    0.13   10.10    0.03       1
 44           UC   0.771   0.577
 45           UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 46           UA     100
              *
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1 HEC-1 INPUT PAGE 2

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

 47           KK      B2   BASIN
 48           BA   0.913
 49           LG    0.35    0.05   12.40    0.01       0
 50           UC   0.900   0.828
 51           UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 52           UA     100
              *

 53           KK      B3   BASIN
 54           BA   1.011
 55           LG    0.35    0.05   12.40    0.01       0
 56           UC   0.929   0.862
 57           UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 58           UA     100
              *

 59           KK     B3C
 60           KM      COMBINE B1 + B2 + B3
 61           HC       3
              *

 62           KK    B3B4ROUTE   REACH
 63           KM    ROUTE COMBINED FLOWS FROM B3C TO B4C
 64           KM     SLOPE = (1538-1535)/1401 = 0.002
 65           RS       3    FLOW      -1
 66           RC   0.080   0.050   0.080    1401  0.0020    0.00
 67           RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
 68           RY   110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
              *

 69           KK      B4   BASIN
 70           BA   0.584
 71           LG    0.35    0.15    9.70    0.04       0
 72           UC   0.429   0.286
 73           UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 74           UA     100
              *

 75           KK     B4C
 76           KM     COMBINE RUNOFF FROM B4 WITH ROUTED FLOWS FROM B3C
 77           HC       2
              *
              *   THIS CHANNEL ROUTING REMOVED FROM 10- & 100-YR MODELS DUE TO BACKUP BETWEEN
              *   STOCK PONDS AT B4C AND B5C.
              *
              * KK  B4B5ROUTE   REACH
              * KM   ROUTE COMBINED FLOWS FROM B4C TO B5C
              * KM   SLOPE = (1535-1534)/1014 = 0.001
              * RS      2    FLOW      -1
              * RC 0.080   0.050   0.080    1014  0.0010    0.00
              * RX   0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
              * RY 110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 78           KK      B5   BASIN
 79           BA   0.069
 80           LG    0.35    0.15    9.70    0.04       0
 81           UC   0.321   0.324
 82           UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 83           UA     100
              *

 84           KK     B5C
 85           KM     COMBINE RUNOFF FROM B5 WITH ROUTED FLOWS FROM B4C
 86           HC       2
              *

 87           KK   RRB5CROUTE   STORAGE
 88           KM     ROUTE HYDROGRAPH THROUGH COMBINED STORAGE AREA ASSOCIATED WITH TWO
 89           KM     STOCK PONDS (ONE AT B4CA AND THE OTHER AT B5C).
 90           KM     ASSUMPTION OF COMBINED STORAGE AREAS FOR 10-YR & 100-YR EVENTS.
 91           KM     DISCHARGE CURVE COMPUTED WITH COE UNEVEN WEIR PROGRAM (FILE: RR5BC.IN)
 92           RS       1    STOR      -1
 93           SA       0    0.33    1.96   14.34   30.65
 94           SE    1533    1534    1536    1538    1540
 95           SQ       0     103     357     780    1400    2224    3274    4498    5940
 96           SE  1536.0  1536.5  1537.0  1537.5  1538.0  1538.5  1539.0  1539.5  1540.0
              *
              *   NO CHANNEL ROUTING FROM B5C TO B6C DUE TO SHORT REACH LENGTH (752')
              *

 97           KK      B6   BASIN
 98           BA   0.543
 99           LG    0.35    0.25    4.25    0.39       4
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100          UC   0.350   0.280
101          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
102          UA     100
             *

103          KK     B6C
104          KM     COMBINE RUNOFF FROM B6 WITH ROUTED FLOWS FROM B5C
105          HC       2
             *

106          KK    B6B8ROUTE   REACH
107          KM     ROUTE COMBINED FLOWS FROM B6C TO B8C
108          KM     SLOPE = (1531-1522)/1909 = 0.0047
109          RS       2    FLOW      -1
110          RC   0.080   0.050   0.080    1909  0.0047    0.00
111          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
112          RY   112.0   101.0   100.0    95.0    95.0   100.0   101.0   112.0
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

113          KK      B7   BASIN
114          BA   0.080
115          LG    0.35    0.25    5.10    0.24      10
116          UC   0.192   0.166
117          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
118          UA     100
             *

119          KK    B8CR
120          KM     COMBINE RUNOFF FROM B7 WITH ROUTED FLOWS FROM B6C
121          HC       2
             *

122          KK      B8   BASIN
123          BA   0.405
124          LG    0.35    0.05   12.40    0.01       0
125          UC   0.783   0.878
126          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
127          UA     100
             *

128          KK     B8C
129          KM     COMBINE RUNOFF FROM B8 WITH COMBINED FLOWS AT B8CL
130          KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B8C
131          HC       2

             *

132          KK   B8B10ROUTE   REACH
133          KM     ROUTE COMBINED FLOWS FROM B8C TO B10C
134          KM     SLOPE = (1522-1514)/1700 = 0.0047
135          RS       2    FLOW      -1
136          RC   0.080   0.050   0.080    1700  0.0047    0.00
137          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
138          RY   112.0   101.0   100.0    95.0    95.0   100.0   101.0   112.0
             *

139          KK      B9   BASIN
140          BA   0.385
141          LG    0.35    0.25    4.60    0.31       4
142          UC   0.325   0.292
143          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
144          UA     100
             *

145          KK   B10CL
146          KM     COMBINE RUNOFF FROM B9 WITH ROUTED FLOWS FROM B8C
147          HC       2
             *
```



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

148          KK     B10   BASIN
149          BA   0.070
150          LG    0.35    0.05   12.40    0.01       0
151          UC   0.513   0.828
152          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
153          UA     100
             *

154          KK    B10C
155          KM     COMBINE RUNOFF FROM B10 WITH COMBINED FLOWS AT B10CL
156          KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B10C
157          HC       2
             *
```

```
158          KK  B10B11ROUTE   REACH
159          KM     ROUTE COMBINED FLOWS FROM B10C TO B11C
160          KM     SLOPE = (1514-1509)/1236 = 0.0040
161          RS       1    FLOW      -1
162          RC   0.080   0.050   0.080    1236  0.0040    0.00
163          RX     0.0    25.0    50.0    55.0    70.0    75.0   100.0   515.0
164          RY   106.0   101.0   100.0    95.0    95.0   100.0   101.0   106.0
             *

165          KK     B11   BASIN
166          BA   0.410
167          LG    0.35    0.25    4.45    0.34       4
168          UC   0.321   0.271
169          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
170          UA     100
             *

171          KK    B11C
172          KM     COMBINE RUNOFF FROM B11 WITH ROUTED FLOWS FROM B10C
173          HC       2
             *

174          KK  B11B22ROUTE   REACH
175          KM     ROUTE COMBINED FLOWS FROM B11C TO B22C THRU B12
176          KM     SLOPE = (1509-1498)/2644 = 0.0042
177          RS       2    FLOW      -1
178          RC   0.080   0.050   0.080    2644  0.0042    0.00
179          RX     0.0    25.0   200.0   206.0   230.0   236.0   336.0   536.0
180          RY   106.0   102.0   100.0    97.0    95.0   100.0   102.0   106.0
             *

181          KK     B12   BASIN
182          BA   0.206
183          LG    0.35    0.15    7.60    0.09       4
184          UC   0.488   0.384
185          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
186          UA     100
             *
```



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

187          KK   B22CR
188          KM     COMBINE RUNOFF FROM B12 WITH ROUTED FLOWS FROM B11C
189          HC       2
             *

190          KK     B13   BASIN
191          BA   0.502
192          LG    0.35    0.05   12.40    0.01       0
193          UC   0.942   1.182
194          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
195          UA     100
             *

196          KK   B22CC
197          KM     COMBINE RUNOFF FROM B13 WITH COMBINED FLOWS AT B22CR
198          HC       2
             *

199          KK     B14   BASIN
200          BA   0.431
201          LG    0.35    0.05   12.40    0.01       0
202          UC   0.879   1.137
203          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
204          UA     100
             *

205          KK     B15   BASIN
206          BA   0.115
207          LG    0.35    0.05   12.40    0.01       0
208          UC   0.433   0.469
209          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
210          UA     100
             *

211          KK    B15C
212          KM     COMBINE RUNOFF FROM B14 WITH RUNOFF FROM B15
213          HC       2
             *

214          KK  B15B16ROUTE   REACH
215          KM     ROUTE COMBINED FLOWS FROM B15C TO B16C
216          KM     SLOPE = (1530-1516)/1669 = 0.0084
217          RS       1    FLOW      -1
218          RC   0.080   0.050   0.080    1669  0.0084    0.00
219          RX     0.0    20.0    40.0    65.0    85.0   110.0   130.0   150.0
220          RY   100.0    98.0    96.0    96.0    96.0    96.0    98.0   100.0
             *
```

```
221          KK     B16   BASIN
222          BA   0.027
223          LG    0.35    0.05   12.40    0.01       0
224          UC   0.254   0.286
225          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
226          UA     100
             *
1                                          HEC-1 INPUT                                          PAGE  7

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

227          KK   B20CR
228          KM     COMBINE RUNOFF FROM B16 WITH ROUTED FLOWS FROM B15C
229          HC       2
             *

230          KK     B17   BASIN
231          BA   0.643
232          LG    0.29    0.10   11.20    0.03      17
233          UC   0.525   0.327
234          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
235          UA     100
             *

236          KK   RRB17ROUTE   STORAGE
237          KM   STORAGE ROUTE ADDED TO ACCOUNT FOR THE TRAMONTO DEVELOPMENT
238          RS       1    ELEV    1676
239          SV     0.0   27.39   34.24   41.09   47.94   54.78
240          SE    1676    1678    1679    1680    1681    1682
241          SQ     0.0     0.0    67.0   134.0   817.0  1500.0
             *

242          KK  B17B18ROUTE   REACH
243          KM     ROUTE RUNOFF FROM B17 TO B18C
244          KM     SLOPE = (1680-1640)/4738 = 0.0084
245          RS       5    FLOW      -1
246          RC   0.080   0.050   0.080    4738  0.0084    0.00
247          RX     0.0    40.0   110.0   115.0   130.0   135.0   205.0   240.0
248          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *

249          KK     B18   BASIN
250          BA   0.225
251          LG    0.35    0.10   11.20    0.02       0
252          UC   0.421   0.299
253          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
254          UA     100
             *

255          KK    B18C
256          KM     COMBINE RUNOFF FROM B18 WITH ROUTED FLOWS FROM B17
257          KM     THIS IS THE TOTAL FLOW AT I-17.
258          HC       2
             *

259          KK    B18D
260          KM     DIVERSION OF FLOW TO SOUTH ALONG EAST SIDE OF I-17
261          KM     THIS FLOW EVENTUALLY RE-JOINS SKUNK CREEK
262          DT   DIV18
263          DI     250     500     750    1000    1250    1500
264          DQ       0      66     212     405     601     822
             *
1                                          HEC-1 INPUT                                          PAGE  8

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

265          KK  B18B19ROUTE   REACH
266          KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
267          KM     SLOPE = (1640-1561)/10091 = 0.0078
268          RS       9    FLOW      -1
269          RC   0.080   0.050   0.080   10091  0.0078    0.00
270          RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
271          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *

272          KK     B19   BASIN
273          BA   0.574
274          LG    0.35    0.10   11.20    0.02       0
275          UC   0.763   0.734
276          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
277          UA     100
             *

278          KK    B19C
279          KM     COMBINE RUNOFF FROM B19 WITH ROUTED FLOWS FROM B18C
280          HC       2
             *
```

```
281          KK  B19B20ROUTE   REACH
282          KM     ROUTE COMBINED FLOWS FROM B19C TO B20C
283          KM     SLOPE = (1561-1516)/6629 = 0.0068
284          RS       6    FLOW      -1
285          RC   0.080   0.050   0.080    6629  0.0068    0.00
286          RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
287          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *

288          KK     B20   BASIN
289          BA   0.781
290          LG    0.35    0.10   11.20    0.02       3

291          UC   0.708   0.522
292          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
293          UA     100
             *

294          KK   B20CL
295          KM     COMBINE RUNOFF FROM B20 WITH ROUTED FLOWS FROM B19C
296          HC       2
             *

297          KK    B20C
298          KM     COMBINE FLOWS FROM B20CR AND B20CL
299          KM     THIS IS THE TOTAL FLOW AT B20C
300          HC       2
             *
```



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

301          KK  B20B22ROUTE   REACH
302          KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
303          KM     SLOPE = (1516-1498)/4576 = 0.0039
304          RS       8    FLOW      -1
305          RC   0.080   0.070   0.080    4576  0.0039    0.00
306          RX     0.0   200.0   250.0   275.0   325.0   400.0   450.0   500.0
307          RY   104.0    99.0    98.0    98.0    98.0    98.0    99.0   104.0
             *

308          KK     B22   BASIN
309          BA   0.361
310          LG    0.35    0.10   11.20    0.02       1
311          UC   0.579   0.437
312          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
313          UA     100
             *

314          KK   B22CC
315          KM    COMBINE RUNOFF FROM B22 WITH ROUTED FLOWS FROM B20C
316          HC       2
             *

317          KK     B21   BASIN
318          BA   0.544
319          LG    0.35    0.15    8.40    0.07       5
320          UC   0.888   0.994
321          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
322          UA     100
             *
             *  KKB21B22
             *  KM    ROUTE ROUTED OUTFLOW FROM B21 TO B22C
             *  KM    SLOPE = (1504-1498)/3868 = 0.0016
             *  RS      8    FLOW      -1
             *  RC  0.08    0.05    0.08    3868  0.0016
             *  RX     0      30      50      60      70      80     200     500
             *  RY   100      92      90      85      85      90      92      94
             *

323          KK   B22CL
324          KM    COMBINE B22C WITH ROUTED FLOWS FROM B21
325          HC       2
             *

326          KK    B22C
327          KM     COMBINE ALL FLOWS IN BUCHANAN WASH UPSTREAM OF CAP
328          HC       2
329          ZW      A=BW@CAP   C=FLOW   F=EX24
             *
```



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

330          KK  RRB22CROUTE   STORAGE
331          KM     ROUTE FLOWS THROUGH LARGE PONDING AREA UPSTREAM OF CAP
332          KM     OUTLET IS 3 - 66" RCPS
333          KM     THIS STORAGE ROUTING INCLUDES AREA IN RRB21C FOR THE 10-YR AND 100-YR
```

```
334          KM     MODELS AS THE MAXIMUM PONDING ELEVATION BACKS UP FROM RRB22C EAST INTO
335          KM     RRB21C AREA ABOVE ABOUT 1504.0 FT.
336          RS       1     STOR      -1
337          SA       0     0.35    3.60    12.87    37.91    74.76   119.27   156.56   191.36   227.38
338          SA  269.52   317.29
339          SE    1498     1500    1502     1504     1506     1508     1510     1512     1514     1516
340          SE    1518     1520
341          SQ       0      200     400      500      800     1000     1200     1400     1600     2000
342          SE    1496  1499.12 1500.82  1501.61   1504.6   1507.4  1510.88  1514.97  1519.64  1520.26
             *
343          ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

  41          B1
               .
               .
  47           .          B2
               .           .
               .           .
  53           .           .          B3
               .           .           .
               .           .           .
  59        B3C.......................
              V
              V
  62       B3B4
               .
               .
  69           .          B4
               .           .
               .           .
  75        B4C............
               .
               .
  78           .          B5
               .           .
               .           .
  84        B5C............
              V
              V
  87      RRB5C
               .
               .
  97           .          B6
               .           .
               .           .
 103        B6C............
              V
              V
 106       B6B8
               .
               .
 113           .          B7
               .           .
               .           .
 119       B8CR............
               .
               .
 122           .          B8
               .           .
               .           .
 128        B8C............
              V
              V
 132      B8B10
               .
               .
 139           .          B9
               .           .
               .           .
 145      B10CL............
               .
               .
 148           .          B10
               .           .
               .           .
 154       B10C............
              V
              V
 158     B10B11
               .
               .
 165           .          B11
               .           .
               .           .
 171       B11C............
```

```
                V
                V
174        B11B22
                .
                .
181             .          B12
                .            .
                .            .
187        B22CR............
                .
                .
190             .          B13
                .            .
                .            .
196        B22CC............
                .
                .
199             .          B14
                .            .
                .            .
205             .            .          B15
                .            .            .
                .            .            .
211             .        B15C............
                .            V
                .            V
214             .      B15B16
                .            .
                .            .
221             .            .          B16
                .            .            .
                .            .            .
227             .       B20CR............
                .            .
                .            .
230             .            .          B17
                .            .            V
                .            .            V
236             .            .        RRD17
                .            .            V
                .            .            V
242             .            .      B17B18
                .            .            .
                .            .            .
249             .            .            .          B18
                .            .            .            .
                .            .            .            .
255             .            .       B18C............
                .            .            .
                .            .            .
262             .            .            .-------> DIV18
259             .            .       B18D
                .            .            V
                .            .            V
265             .            .      B18B19
                .            .            .
                .            .            .
272             .            .            .          B19
                .            .            .            .
                .            .            .            .
278             .            .       B19C............
                .            .            V
                .            .            V
281             .            .      B19B20
                .            .            .
                .            .            .
288             .            .            .          B20
                .            .            .            .
                .            .            .            .
294             .            .       B20CL............
                .            .            .
                .            .            .
297             .        B20C............
                .            V
                .            V
301             .       B20B22
                .            .
                .            .
308             .            .          B22
                .            .            .
                .            .            .
314             .       B22CC............
                .            .
                .            .
317             .            .          B21
                .            .            .
                .            .            .
323             .        B22CL............
                .            .
                .            .
326        B22C............
```

```
                V
                V
  330       RRB22C

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998              *
 *           VERSION 4.1                *
 *                                      *
 *  RUN DATE   15JUL03  TIME  13:10:53  *
 *                                      *
 ****************************************
```

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

BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP

JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
ADOBE DAM / DESERT HILLS ADMP
FEBRUARY 2003

THIS IS THE 100-YEAR 24-HOUR MODEL FOR EXISTING CONDITIONS

MODEL BASIS:
* DDMSW PROJECT NAME: BF_EX24
* PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
* MULTIPLE STORM OPTION (JD)
* GREEN & AMPT LOSS METHOD
* CLARK UNIT HYDROGRAPH METHOD
* TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
  EXCEPT BASIN B17 DUE TO INCORRECT CALCULATION OF Kb FOR
  MULTIPLE LAND USES
* MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
* RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI

```
 24 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     1FEB 3  STARTING DATE
                      ITIME       0005  STARTING TIME
                         NQ        600  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     3FEB 3  ENDING DATE
                     NDTIME       0200  ENDING TIME
                      ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   49.92 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

 26 JD           INDEX STORM NO. 1
                       STRM       4.15  PRECIPITATION DEPTH
                       TRDA        .01  TRANSPOSITION DRAINAGE AREA

 27 PI            PRECIPITATION PATTERN
                    .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                    .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                    .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
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                    .00      .00      .00      .00      .00      .00      .00      .01      .00      .01
                    .01      .01      .01      .01      .01      .01      .01      .01      .03      .03
                    .03      .09      .09      .09      .01      .01      .01      .01      .01      .01
                    .01      .01      .01      .01      .01      .01      .00      .00      .00      .00
                    .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                    .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
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      .00    .00    .00    .00    .00    .00    .00    .00
37 JD   INDEX STORM NO. 2
          STRM      3.90  PRECIPITATION DEPTH
          TRDA     10.00  TRANSPOSITION DRAINAGE AREA

0 PI    PRECIPITATION PATTERN
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
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      .00    .00    .00    .00    .00    .00    .00    .01    .00    .01
      .01    .01    .01    .01    .01    .01    .01    .01    .03    .03
      .03    .09    .09    .09    .01    .01    .01    .01    .01    .01
      .01    .01    .01    .01    .01    .01    .00    .00    .00    .00
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      .00    .00    .00    .00    .00    .00    .00    .00
38 JD   INDEX STORM NO. 3
          STRM      3.73  PRECIPITATION DEPTH
          TRDA     30.00  TRANSPOSITION DRAINAGE AREA

0 PI    PRECIPITATION PATTERN
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
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      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .01    .00    .01
      .01    .01    .01    .01    .01    .01    .01    .01    .03    .03
      .03    .09    .09    .09    .01    .01    .01    .01    .01    .01
      .01    .01    .01    .01    .01    .01    .00    .00    .00    .00
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      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00
39 JD   INDEX STORM NO. 4
          STRM      3.57  PRECIPITATION DEPTH
          TRDA     60.00  TRANSPOSITION DRAINAGE AREA

0 PI    PRECIPITATION PATTERN
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
      .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
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                .01      .01      .01      .01      .01      .01      .01      .01      .03      .03
                .03      .09      .09      .09      .01      .01      .01      .01      .01      .01
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40 JD          INDEX STORM NO. 5
                STRM        3.51  PRECIPITATION DEPTH
                TRDA       90.00  TRANSPOSITION DRAINAGE AREA

 0 PI           PRECIPITATION PATTERN
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
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                .01      .01      .01      .01      .01      .01      .01      .01      .03      .03
                .03      .09      .09      .09      .01      .01      .01      .01      .01      .01
                .01      .01      .01      .01      .01      .01      .00      .00      .00      .00
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                .00      .00      .00      .00      .00      .00      .00      .00
        WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO
        WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO
   -----DSS---ZOPEN:  Existing File Opened,  File: BF10024E.DSS
                      Unit:  71;  DSS Version: 6-JG
 -----DSS---ZWRITE Unit  71; Vers.   10:  /BW@CAP/B22C/FLOW/01FEB1903/5MIN/EX24/
 -----DSS---ZWRITE Unit  71; Vers.   10:  /BW@CAP/B22C/FLOW/02FEB1903/5MIN/EX24/
 -----DSS---ZWRITE Unit  71; Vers.    9:  /BW@CAP/B22C/FLOW/03FEB1903/5MIN/EX24/
1
                                   RUNOFF SUMMARY
                              FLOW IN CUBIC FEET PER SECOND
                           TIME IN HOURS,  AREA IN SQUARE MILES

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

        HYDROGRAPH AT
+                          B1       784.   12.50        178.       45.        22.       .74

        HYDROGRAPH AT
+                          B2       759.   12.67        254.       75.        36.       .91

        HYDROGRAPH AT
+                          B3       819.   12.67        281.       83.        40.      1.01

        3 COMBINED AT
+                          B3C     2314.   12.58        705.      200.        96.      2.66

        ROUTED TO
+                          B3B4    2278.   12.75        705.      200.        96.      2.66
```

+	HYDROGRAPH AT	B4	879.	12.25	130.	33.	16.	.58
+	2 COMBINED AT	B4C	2581.	12.67	830.	231.	111.	3.25
+	HYDROGRAPH AT	B5	107.	12.17	16.	4.	2.	.07
+	2 COMBINED AT	B5C	2620.	12.67	845.	235.	113.	3.32
+	ROUTED TO	RRB5C	2554.	12.83	845.	235.	113.	3.32
+	HYDROGRAPH AT	B6	695.	12.17	69.	18.	9.	.54
+	2 COMBINED AT	B6C	2671.	12.75	910.	252.	121.	3.86
+	ROUTED TO	B6B8	2635.	12.92	910.	252.	121.	3.86
+	HYDROGRAPH AT	B7	157.	12.08	13.	3.	2.	.08
+	2 COMBINED AT	B8CR	2637.	12.92	922.	255.	123.	3.94
+	HYDROGRAPH AT	B8	338.	12.58	114.	33.	16.	.41
+	2 COMBINED AT	B8C	2926.	12.83	1031.	287.	138.	4.35
+	ROUTED TO	B8B10	2901.	13.00	1031.	287.	138.	4.35
+	HYDROGRAPH AT	B9	499.	12.17	53.	14.	7.	.38
+	2 COMBINED AT	B10CL	2950.	12.92	1081.	300.	144.	4.73
+	HYDROGRAPH AT	B10	65.	12.33	20.	6.	3.	.07
+	2 COMBINED AT	B10C	2993.	12.92	1100.	306.	147.	4.80
+	ROUTED TO	B10B11	2964.	13.00	1100.	306.	147.	4.80
+	HYDROGRAPH AT	B11	552.	12.08	54.	14.	7.	.41
+	2 COMBINED AT	B11C	2992.	13.00	1151.	319.	153.	5.21
+	ROUTED TO	B11B22	2941.	13.17	1151.	319.	153.	5.21
+	HYDROGRAPH AT	B12	278.	12.33	40.	10.	5.	.21
+	2 COMBINED AT	B22CR	2996.	13.17	1188.	329.	158.	5.42
+	HYDROGRAPH AT	B13	344.	12.75	138.	41.	20.	.50
+	2 COMBINED AT	B22CC	3276.	13.17	1322.	368.	177.	5.92
+	HYDROGRAPH AT	B14	305.	12.67	119.	36.	17.	.43
+	HYDROGRAPH AT	B15	148.	12.25	33.	10.	5.	.12
+	2 COMBINED AT	B15C	402.	12.58	151.	45.	22.	.55
+	ROUTED TO	B15B16	397.	12.67	151.	45.	22.	.55
+	HYDROGRAPH AT	B16	47.	12.08	8.	2.	1.	.03
	2 COMBINED AT							

+		B20CR	412.	12.58	158.	47.	23.	.57
+	HYDROGRAPH AT	B17	931.	12.17	165.	45.	22.	.64
+	ROUTED TO	RRB17	602.	12.50	118.	32.	15.	.64
+	ROUTED TO	B17B18	464.	13.00	117.	32.	15.	.64
+	HYDROGRAPH AT	B18	371.	12.25	59.	16.	8.	.22
+	2 COMBINED AT	B18C	544.	13.00	169.	47.	23.	.87
+	DIVERSION TO	DIV18	92.	13.00	10.	2.	1.	.87
+	HYDROGRAPH AT	B18D	452.	13.00	159.	45.	21.	.87
+	ROUTED TO	B18B19	396.	13.83	158.	45.	21.	.87
+	HYDROGRAPH AT	B19	512.	12.50	148.	40.	19.	.57
+	2 COMBINED AT	B19C	617.	12.75	297.	83.	40.	1.44
+	ROUTED TO	B19B20	598.	13.42	297.	83.	40.	1.44
+	HYDROGRAPH AT	B20	911.	12.50	203.	55.	26.	.78
+	2 COMBINED AT	B20CL	1096.	12.58	488.	136.	66.	2.22
+	2 COMBINED AT	B20C	1499.	12.58	642.	182.	88.	2.80
+	ROUTED TO	B20B22	1457.	13.08	640.	182.	88.	2.80
+	HYDROGRAPH AT	B22	474.	12.42	94.	25.	12.	.36
+	2 COMBINED AT	B22CC	1637.	13.00	722.	206.	99.	3.16
+	HYDROGRAPH AT	B21	365.	12.50	110.	28.	14.	.54
+	2 COMBINED AT	B22CL	1916.	13.00	826.	233.	113.	3.70
+	2 COMBINED AT	B22C	5120.	13.08	2127.	596.	287.	9.62
+	ROUTED TO	RRB22C	1243.	15.50	1209.	597.	287.	9.62

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

```
-----DSS---ZCLOSE Unit:  71,   File: BF10024E.DSS
          Pointer Utilization:    .25
          Number of Records:      14
          File Size:      30.7  Kbytes
          Percent Inactive:     .0
```

Future Condition
2-Year

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   15JUL03  TIME  16:23:14  *
*                                      *
****************************************
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****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*   HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET            *
*      DAVIS, CALIFORNIA 95616         *
*          (916) 756-1104              *
*                                      *
****************************************
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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

```
1                                   HEC-1 INPUT                                                    PAGE  1

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

    1           ID   BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP
    2           ID
    3           ID    JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
    4           ID    ADOBE DAM / DESERT HILLS ADMP
    5           ID    FEBRUARY 2003
    6           ID
    7           ID    THIS IS THE 2-YEAR 24-HOUR MODEL FOR FUTURE CONDITIONS
    8           ID
    9           ID
   10           ID    MODEL BASIS:
   11           ID      * DDMSW PROJECT NAME: BF_FU24
   12           ID      * PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
   13           ID      * MULTIPLE STORM OPTION (JD)
   14           ID      * GREEN & AMPT LOSS METHOD
   15           ID      * CLARK UNIT HYDROGRAPH METHOD
   16           ID      * TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
   17           ID        EXCEPT BASIN B17 DUE TO INCORRECT CALCULATION OF Kb FOR
   18           ID        MULTIPLE LAND USES
   19           ID      * MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
   20           ID      * 2-YEAR VALUES COMPUTED BY 0.10 RATIO OF 100-YEAR RESULT
   21           ID        PER DRAFT HYDROLOGY MANUAL (2003)
   22           ID      * RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI
   23           ID
   24           ID
                *DIAGRAM
   25           IT       5 01FEB03    0005     600
   26           IO       5
   27           IN      15
                *
                *  THESE RAINFALL RECORDS ARE FOR THE 100-YR 24-HR STORM.
                *  THE 2-YR HYDROGRAPHS ARE COMPUTED BY USE OF RATIOS
                *  ON FIELD 3 OF THE BA RECORD.
                *
   28           JD    4.15    0.01
   29           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
   30           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
   31           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
   32           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
   33           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
   34           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
   35           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
   36           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
   37           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
   38           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000
   39           JD   3.901      10
   40           JD   3.735      30
   41           JD   3.569      60
   42           JD   3.511      90
                *
1                                   HEC-1 INPUT                                                    PAGE  2

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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```
43          KK      B1   BASIN
44          BA   0.741            0.10
45          LG    0.25    0.13   10.10    0.04      38
46          UC   0.729   0.543
47          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
48          UA     100
            *

49          KK   RETB1
50          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
51          KM    - 474.52 AC DEVELOPMENT WITH RETENTION
52          KM    - C FACTOR = 0.79
53          KM    - 100-YR 2-HR RAIN = 2.76"
54          DT   R1OUT   86.23
55          DI       0    1500
56          DQ       0    1500
            *

57          KK      B2   BASIN
58          BA   0.913            0.10
59          LG    0.22    0.05   12.40    0.01      46
60          UC   0.788   0.714
61          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
62          UA     100
            *

63          KK   RETB2
64          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
65          KM    - 584.55 AC DEVELOPMENT WITH RETENTION
66          KM    - C FACTOR = 0.79
67          KM    - 100-YR 2-HR RAIN = 2.76"
68          DT   R2OUT  106.61
69          DI       0    1500
70          DQ       0    1500
            *

71          KK      B3   BASIN
72          BA   1.011            0.10
73          LG    0.19    0.05   12.40    0.02      52
74          UC   0.763   0.692
75          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
76          UA     100
            *

77          KK   RETB3
78          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
79          KM    - 646.80 AC DEVELOPMENT WITH RETENTION
80          KM    - C FACTOR = 0.80
81          KM    - 100-YR 2-HR RAIN = 2.76"
82          DT   R3OUT  118.72
83          DI       0    1500
84          DQ       0    1500
            *
```



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

85          KK     B3C
86          KM      COMBINE B1 + B2 + B3
87          HC       3
            *

88          KK    B3B4ROUTE    REACH
89          KM    ROUTE COMBINED FLOWS FROM B3C TO B4C
90          KM     SLOPE = (1538-1535)/1401 = 0.002
91          RS       3    FLOW      -1
92          RC   0.080   0.050   0.080    1401  0.0020    0.00
93          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
94          RY   110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
            *

95          KK      B4   BASIN
96          BA   0.584            0.10
97          LG    0.25    0.15    9.70    0.06      34
98          UC   0.417   0.277
99          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
100         UA     100
            *

101         KK   RETB4
102         KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
103         KM    - 373.62 AC DEVELOPMENT WITH RETENTION
104         KM    - C FACTOR = 0.75
105         KM    - 100-YR 2-HR RAIN = 2.76"
106         DT   R4OUT   64.50
107         DI       0    1500
108         DQ       0    1500
            *
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109          KK     B4C
110          KM     COMBINE RUNOFF FROM B4 WITH ROUTED FLOWS FROM B3C
111          HC       2
             *

112          KK   RRB4CROUTE    STORAGE
113          KM    STORAGE ROUTING THRU FIRST OF TWO STOCK TANKS ON BUCHANAN WASH
114          KM    THIS TANK IS MOSTLY HYDROLOGICALLY EFFECTIVE ONLY FOR THE MOST
115          KM    FREQUENT EVENTS SUCH AS THE 2-YEAR EVENT.
116          KM    AREA-ELEVATION DATA FROM 2 FT CONTOUR DATA FOR ADMP
117          KM    STAGE-DISCHARGE CURVE COMPUTED FROM COE UNEVEN WEIR PROGRAM (FILE: RRB4C.IN)
118          RS       1     STOR      -1
119          SA       0     0.09     0.55     6.05    17.79    33.44
120          SE    1533     1534     1536     1538     1540     1542
121          SQ       0       33      162      429      868     1512     2364     3361     4547
122          SE    1536   1536.5   1537.0   1537.5   1538.0   1538.5   1539.0   1539.5   1540.0
             *
             *   THIS CHANNEL ROUTING REMOVED FROM 2-YEAR MODEL DUE TO BACKUP BETWEEN
             *   STOCK PONDS AT B4C AND B5C.
             *
             * KK  B4B5ROUTE    REACH
             * KM   ROUTE COMBINED FLOWS FROM B4C TO B5C
             * KM   SLOPE = (1535-1534)/1014 = 0.001
             * RS     2     FLOW      -1
             * RC 0.080   0.050   0.080    1014  0.0010    0.00
             * RX   0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
             * RY 110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
             *
```



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

123          KK      B5    BASIN
124          BA   0.069             0.10
125          LG    0.25     0.15    9.70     0.06       30
126          UC   0.317    0.319
127          UA       0      4.5    12.6     23.2     35.8     50.0     64.2     76.8     87.4     95.5
128          UA     100
             *

129          KK   RETB5
130          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
131          KM    - 44.10 AC DEVELOPMENT WITH RETENTION
132          KM    - C FACTOR = 0.71
133          KM    - 100-YR 2-HR RAIN = 2.76"
134          DT   R5OUT    7.20
135          DI       0     500
136          DQ       0     500
             *

137          KK     B5C
138          KM     COMBINE RUNOFF FROM B5 WITH ROUTED FLOWS FROM B4C
139          HC       2
             *

140          KK   RRB5CROUTE    STORAGE
141          KM     ROUTE HYDROGRAPH THROUGH COMBINED STORAGE AREA ASSOCIATED WITH TWO
142          KM     STOCK PONDS (ONE AT B4CA AND THE OTHER AT B5C).
143          KM     ASSUMPTION OF COMBINED STORAGE AREAS FOR 10-YR & 100-YR EVENTS.
144          KM     DISCHARGE CURVE COMPUTED WITH COE UNEVEN WEIR PROGRAM (FILE: RR5BC.IN)
145          RS       1     STOR      -1
146          SA       0     0.33     1.96    14.34    30.65
147          SE    1533     1534     1536     1538     1540
148          SQ       0      103      357      780     1400     2224     3274     4498     5940
149          SE  1536.0   1536.5   1537.0   1537.5   1538.0   1538.5   1539.0   1539.5   1540.0
             *
             *   NO CHANNEL ROUTING FROM B5C TO B6C DUE TO SHORT REACH LENGTH (752')
             *

150          KK      B6    BASIN
151          BA   0.543             0.10
152          LG    0.25     0.25    4.25     0.49       34
153          UC   0.325    0.258
154          UA       0      3.0     5.0      8.0     12.0     20.0     43.0     75.0     90.0     96.0
155          UA     100
             *

156          KK   RETB6
157          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
158          KM    - 347.21 AC DEVELOPMENT WITH RETENTION
159          KM    - C FACTOR = 0.72
160          KM    - 100-YR 2-HR RAIN = 2.76"
161          DT   R6OUT   57.22
162          DI       0    1000
163          DQ       0    1000
             *
```



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

```
164          KK     B6C
165          KM     COMBINE RUNOFF FROM B6 WITH ROUTED FLOWS FROM B5C
166          HC       2
             *

167          KK    B6B8ROUTE    REACH
168          KM     ROUTE COMBINED FLOWS FROM B6C TO B8C
169          KM     SLOPE = (1531-1522)/1909 = 0.0047
170          RS       2    FLOW      -1
171          RC   0.080   0.050   0.080    1909  0.0047    0.00
172          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
173          RY   112.0   101.0   100.0    95.0    95.0   100.0   101.0   112.0
             *

174          KK      B7   BASIN
175          BA   0.080            0.10
176          LG    0.25    0.25    5.10    0.31      40
177          UC   0.188   0.162
178          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
179          UA     100
             *

180          KK   RETB7
181          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
182          KM    - 51.15 AC DEVELOPMENT WITH RETENTION
183          KM    - C FACTOR = 0.71
184          KM    - 100-YR 2-HR RAIN = 2.76"
185          DT   R7OUT     8.35
186          DI       0      500
187          DQ       0      500
             *

188          KK    B8CR
189          KM     COMBINE RUNOFF FROM B7 WITH ROUTED FLOWS FROM B6C
190          HC       2
             *

191          KK      B8   BASIN
192          BA   0.405            0.10
193          LG    0.25    0.05   12.40    0.01      30
194          UC   0.750   0.836
195          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
196          UA     100
             *

197          KK   RETB8
198          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
199          KM    - 259.04 AC DEVELOPMENT WITH RETENTION
200          KM    - C FACTOR = 0.71
201          KM    - 100-YR 2-HR RAIN = 2.76"
202          DT   R8OUT    42.52
203          DI       0      500
204          DQ       0      500
             *
```



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

205          KK     B8C
206          KM     COMBINE RUNOFF FROM B8 WITH COMBINED FLOWS AT B8CL
207          KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B8C
208          HC       2
             *

209          KK   B8B10ROUTE    REACH
210          KM     ROUTE COMBINED FLOWS FROM B8C TO B10C
211          KM     SLOPE = (1522-1514)/1700 = 0.0047
212          RS       2    FLOW      -1
213          RC   0.080   0.050   0.080    1700  0.0047    0.00
214          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
215          RY   112.0   101.0   100.0    95.0    95.0   100.0   101.0   112.0
             *

216          KK      B9   BASIN
217          BA   0.385            0.10
218          LG    0.25    0.25    4.60    0.39      34
219          UC   0.308   0.275
220          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
221          UA     100
             *

222          KK   RETB9
223          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
224          KM    - 246.54 AC DEVELOPMENT WITH RETENTION
225          KM    - C FACTOR = 0.71
226          KM    - 100-YR 2-HR RAIN = 2.76"
227          DT   R9OUT    40.26
228          DI       0     1000
229          DQ       0     1000
```

```
                *

230             KK   B10CL
231             KM     COMBINE RUNOFF FROM B9 WITH ROUTED FLOWS FROM B8C
232             HC       2
                *

233             KK     B10   BASIN
234             BA   0.070             0.10
235             LG    0.25     0.05   12.40    0.01      30
236             UC   0.504    0.813
237             UA       0      4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
238             UA     100
                *

239             KK  RETB10
240             KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
241             KM    - 44.70 AC DEVELOPMENT WITH RETENTION
242             KM    - C FACTOR = 0.71
243             KM    - 100-YR 2-HR RAIN = 2.76"
244             DT  R10OUT     7.30
245             DI       0      500
246             DQ       0      500
                *
1                                          HEC-1 INPUT                                                PAGE  7

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

247             KK    B10C
248             KM     COMBINE RUNOFF FROM B10 WITH COMBINED FLOWS AT B10CL
249             KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B10C
250             HC       2
                *

251             KK  B10B11ROUTE   REACH
252             KM     ROUTE COMBINED FLOWS FROM B10C TO B11C
253             KM     SLOPE = (1514-1509)/1236 = 0.0040
254             RS       1    FLOW      -1
255             RC   0.080   0.050   0.080    1236  0.0040    0.00
256             RX     0.0    25.0    50.0    55.0    70.0    75.0   100.0   515.0
257             RY   106.0   101.0   100.0    95.0    95.0   100.0   101.0   106.0
                *

258             KK     B11   BASIN
259             BA   0.410             0.10
260             LG    0.25     0.25    4.45    0.43      34
261             UC   0.304    0.256
262             UA       0      5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
263             UA     100
                *

264             KK  RETB11
265             KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
266             KM    - 262.10 AC DEVELOPMENT WITH RETENTION
267             KM    - C FACTOR = 0.71
268             KM    - 100-YR 2-HR RAIN = 2.76"
269             DT  R11OUT    42.80
270             DI       0     1000
271             DQ       0     1000
                *

272             KK    B11C
273             KM     COMBINE RUNOFF FROM B11 WITH ROUTED FLOWS FROM B10C
274             HC       2
                *

275             KK  B11B22ROUTE   REACH
276             KM     ROUTE COMBINED FLOWS FROM B11C TO B22C THRU B12
277             KM     SLOPE = (1509-1498)/2644 = 0.0042
278             RS       2    FLOW      -1
279             RC   0.080   0.050   0.080    2644  0.0042    0.00
280             RX     0.0    25.0   200.0   206.0   230.0   236.0   336.0   536.0
281             RY   106.0   102.0   100.0    97.0    95.0   100.0   102.0   106.0
                *

282             KK     B12   BASIN
283             BA   0.206             0.10
284             LG    0.22     0.15    7.60    0.11      42
285             UC   0.521    0.413
286             UA       0      3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
287             UA     100
                *
1                                          HEC-1 INPUT                                                PAGE  8

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

288             KK  RETB12
289             KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
290             KM    - 117.16 AC DEVELOPMENT WITH RETENTION
```

```
291          KM    - C FACTOR = 0.71
292          KM    - 100-YR 2-HR RAIN = 2.76"
293          DT  R12OUT   19.13
294          DI       0     500
295          DQ       0     500
             *

296          KK   B22CR
297          KM     COMBINE RUNOFF FROM B12 WITH ROUTED FLOWS FROM B11C
298          HC       2
             *

299          KK     B13   BASIN
300          BA   0.502            0.10
301          LG    0.24    0.05   12.40    0.01      33
302          UC   0.925   1.158
303          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
304          UA     100
             *

305          KK  RETB13
306          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
307          KM    - 309.67 AC DEVELOPMENT WITH RETENTION
308          KM    - C FACTOR = 0.71
309          KM    - 100-YR 2-HR RAIN = 2.76"
310          DT  R13OUT   50.69
311          DI       0     500
312          DQ       0     500
             *

313          KK   B22CC
314          KM     COMBINE RUNOFF FROM B13 WITH COMBINED FLOWS AT B22CR
315          HC       2
             *

316          KK     B14   BASIN
317          BA   0.431            0.10
318          LG    0.20    0.05   12.40    0.02      48
319          UC   0.733   0.929
320          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
321          UA     100
             *

322          KK  RETB14
323          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
324          KM    - 275.85 AC DEVELOPMENT WITH RETENTION
325          KM    - C FACTOR = 0.76
326          KM    - 100-YR 2-HR RAIN = 2.76"
327          DT  R14OUT   48.43
328          DI       0     500
329          DQ       0     500
             *
```



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

330          KK     B15   BASIN
331          BA   0.115            0.10
332          LG    0.25    0.05   12.40    0.01      30
333          UC   0.425   0.459
334          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
335          UA     100
             *

336          KK  RETB15
337          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
338          KM    - 73.72 AC DEVELOPMENT WITH RETENTION
339          KM    - C FACTOR = 0.71
340          KM    - 100-YR 2-HR RAIN = 2.76"
341          DT  R15OUT   12.04
342          DI       0     500
343          DQ       0     500
             *

344          KK    B15C
345          KM     COMBINE RUNOFF FROM B14 WITH RUNOFF FROM B15
346          HC       2
             *

347          KK  B15B16ROUTE   REACH
348          KM     ROUTE COMBINED FLOWS FROM B15C TO B16C
349          KM     SLOPE = (1530-1516)/1669 = 0.0084
350          RS       1    FLOW      -1
351          RC   0.080   0.050   0.080    1669  0.0084    0.00
352          RX     0.0    20.0    40.0    65.0    85.0   110.0   130.0   150.0
353          RY   100.0    98.0    96.0    96.0    96.0    96.0    98.0   100.0
             *

354          KK     B16   BASIN
355          BA   0.027            0.10
```

```
356          LG    0.25    0.05   12.40    0.01      30
357          UC   0.254   0.286
358          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
359          UA     100
             *

360          KK  RETB16
361          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
362          KM    - 17.26 AC DEVELOPMENT WITH RETENTION
363          KM    - C FACTOR = 0.71
364          KM    - 100-YR 2-HR RAIN = 2.76"
365          DT  R16OUT    2.82
366          DI       0     500
367          DQ       0     500
             *
1                                        HEC-1 INPUT                                          PAGE 10

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


368          KK   B20CR
369          KM     COMBINE RUNOFF FROM B16 WITH ROUTED FLOWS FROM B15C
370          HC       2
             *

371          KK     B17   BASIN
372          BA   0.643            0.10
373          LG    0.22    0.10   11.20    0.03      41
374          UC   0.479   0.296
375          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
376          UA     100
             *

377          KK   RRB17ROUTE   STORAGE
378          KM   STORAGE ROUTE ADDED TO ACCOUNT FOR THE TRAMONTO DEVELOPMENT
379          KM    - 27.39 AC-FT OF VOLUME IS RETAINED PRIOR TO OUTLET DOWNSTREAM
380          KM    - ADDITIONAL VOLUME ABOVE 27.39 IS IN A VERTICAL PATTERN ASSUMING
381          KM    - A 4' DEEP RETENTION BASIN TO REACH THE 27.39 AC-FT.
382          RS       1    ELEV    1676
383          SV     0.0   27.39   34.24   41.09   47.94   54.78
384          SE    1676    1678    1679    1680    1681    1682
385          SQ     0.0     0.0    67.0   134.0   817.0  1500.0
             *

386          KK  B17B18ROUTE   REACH
387          KM     ROUTE RUNOFF FROM B17 TO B18C
388          KM     SLOPE = (1680-1640)/4738 = 0.0084
389          RS       5    FLOW      -1
390          RC   0.080   0.050   0.080    4738  0.0084    0.00
391          RX     0.0    40.0   110.0   115.0   130.0   135.0   205.0   240.0
392          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *

393          KK     B18   BASIN
394          BA   0.225            0.10
395          LG    0.12    0.10   11.20    0.03      75
396          UC   0.292   0.199
397          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
398          UA     100
             *

399          KK  RETB18
400          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
401          KM    - 143.77 AC DEVELOPMENT WITH RETENTION
402          KM    - C FACTOR = 0.84
403          KM    - 100-YR 2-HR RAIN = 2.76"
404          DT  R18OUT   27.63
405          DI       0    1000
406          DQ       0    1000
             *
1                                        HEC-1 INPUT                                          PAGE 11

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


407          KK    B18C
408          KM     COMBINE RUNOFF FROM B18 WITH ROUTED FLOWS FROM B17
409          KM     THIS IS THE TOTAL FLOW AT I-17.
410          HC       2
             *

411          KK    B18D
412          KM     DIVERSION OF FLOW TO SOUTH ALONG EAST SIDE OF I-17
413          KM     THIS FLOW EVENTUALLY RE-JOINS SKUNK CREEK
414          DT   DIV18
415          DI     250     500     750    1000    1250    1500
416          DQ       0      66     212     405     601     822
             *

417          KK  B18B19ROUTE   REACH
418          KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
```

```
419          KM     SLOPE = (1640-1561)/10091 = 0.0078
420          RS       9    FLOW      -1
421          RC   0.080   0.050   0.080   10091  0.0078    0.00
422          RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
423          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *

424          KK     B19   BASIN
425          BA   0.574            0.10
426          LG    0.12    0.10   11.20    0.03      73
427          UC   0.508   0.468
428          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
429          UA     100
             *

430          KK  RETB19
431          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
432          KM    - 367.25 AC DEVELOPMENT WITH RETENTION
433          KM    - C FACTOR = 0.83
434          KM    - 100-YR 2-HR RAIN = 2.76"
435          DT  R19OUT   70.13
436          DI       0    1000
437          DQ       0    1000
             *

438          KK    B19C
439          KM     COMBINE RUNOFF FROM B19 WITH ROUTED FLOWS FROM B18C
440          HC       2
             *

441          KK  B19B20ROUTE   REACH
442          KM     ROUTE COMBINED FLOWS FROM B19C TO B20C
443          KM     SLOPE = (1561-1516)/6629 = 0.0068
444          RS       6    FLOW      -1
445          RC   0.080   0.050   0.080    6629  0.0068    0.00
446          RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
447          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

448          KK     B20   BASIN
449          BA   0.781            0.10
450          LG    0.24    0.10   11.20    0.03      36
451          UC   0.654   0.478
452          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
453          UA     100
             *

454          KK  RETB20
455          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
456          KM    - 500.03 AC DEVELOPMENT WITH RETENTION
457          KM    - C FACTOR = 0.72
458          KM    - 100-YR 2-HR RAIN = 2.76"
459          DT  R20OUT   82.84
460          DI       0    1500
461          DQ       0    1500
             *

462          KK   B20CL
463          KM     COMBINE RUNOFF FROM B20 WITH ROUTED FLOWS FROM B19C
464          HC       2
             *

465          KK    B20C
466          KM     COMBINE FLOWS FROM B20CR AND B20CL
467          KM     THIS IS THE TOTAL FLOW AT B20C
468          HC       2
             *

469          KK  B20B22ROUTE   REACH
470          KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
471          KM     SLOPE = (1516-1498)/4576 = 0.0039
472          RS       8    FLOW      -1
473          RC   0.080   0.070   0.080    4576  0.0039    0.00
474          RX     0.0   200.0   250.0   275.0   325.0   400.0   450.0   500.0
475          RY   104.0    99.0    98.0    98.0    98.0    98.0    99.0   104.0
             *

476          KK     B22   BASIN
477          BA   0.361            0.10
478          LG    0.19    0.10   11.20    0.03      48
479          UC   0.708   0.546
480          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
481          UA     100
             *

482          KK  RETB22
483          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
```

```
484          KM    - 176.44 AC DEVELOPMENT WITH RETENTION
485          KM    - C FACTOR = 0.71
486          KM    - 100-YR 2-HR RAIN = 2.76"
487          DT  R22OUT   28.81
488          DI       0    1000
489          DQ       0    1000
             *
1                                          HEC-1 INPUT                                                    PAGE 13

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


490          KK   B22CC
491          KM    COMBINE RUNOFF FROM B22 WITH ROUTED FLOWS FROM B20C
492          HC       2
             *

493          KK     B21   BASIN
494          BA   0.544            0.10
495          LG    0.21    0.15    8.40    0.09      49
496          UC   0.758   0.835
497          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
498          UA     100
             *

499          KK  RETB21
500          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
501          KM    - 345.37 AC DEVELOPMENT WITH RETENTION
502          KM    - C FACTOR = 0.75
503          KM    - 100-YR 2-HR RAIN = 2.76"
504          DT  R21OUT   59.31
505          DI       0    1000
506          DQ       0    1000
             *

507          KK  RRB21CROUTE   STORAGE
508          KM     ROUTE FLOW THROUGH PONDING AREA BEHIND CAP CANAL
509          KM     OUTFLOW IN SMALL CHANNEL ALONG CAP TO WEST TO RRB22C
510          RS       1    STOR      -1
511          SA       0    1.47    6.93   13.75   20.26   25.16   29.12   34.14   39.42   47.31
512          SE    1503    1504    1506    1508    1510    1512    1514    1516    1518    1520
513          SQ       0       5      35      97     198     345     544     801    1122
514          SE    1503    1504    1506    1508    1510    1512    1514    1516    1518
             *
             *  KKB21B22
             *  KM   ROUTE ROUTED OUTFLOW FROM B21 TO B22C
             *  KM   SLOPE = (1504-1498)/3868 = 0.0016
             *  RS     8    FLOW      -1
             *  RC  0.08    0.05    0.08    3868  0.0016
             *  RX     0      30      50      60      70      80     200     500
             *  RY   100      92      90      85      85      90      92      94
             *

515          KK   B22CL
516          KM    COMBINE B22C WITH ROUTED FLOWS FROM B21
517          HC       2
             *

518          KK    B22C
519          KM     COMBINE ALL FLOWS IN BUCHANAN WASH UPSTREAM OF CAP
520          HC       2
521          ZW      A=BW@CAP   C=FLOW   F=EX24
             *
1                                          HEC-1 INPUT                                                    PAGE 14

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


522          KK  RRB22CROUTE   STORAGE
523          KM     ROUTE FLOWS THROUGH LARGE PONDING AREA UPSTREAM OF CAP
524          KM     OUTLET IS 3 - 66" RCPS
525          KM     THESE STAGE-AREA DATA DO NOT INCLUDE THE AREA IN RRB21C STORAGE AREA
526          RS       1    STOR      -1
527          SA       0    0.35    3.60   11.40   30.98   61.00   99.01  131.40  162.24  193.24
528          SA  230.10  269.99
529          SE    1498    1500    1502    1504    1506    1508    1510    1512    1514    1516
530          SE    1518    1520
531          SQ       0     200     400     500     800    1000    1200    1400    1600    2000
532          SE    1496 1499.12 1500.82 1501.61  1504.6  1507.4 1510.88 1514.97 1519.64 1520.26
             *
533          ZZ
1
          SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

  43        B1
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54          ,-------> R1OUT
49     RETB1
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            .
57          .          B2
            .           .
            .           .
68          .           .-------> R2OUT
63          .      RETB2
            .           .
            .           .
71          .           .          B3
            .           .           .
            .           .           .
82          .           .           .-------> R3OUT
77          .           .      RETB3
            .           .           .
            .           .           .
85        B3C.......................
           V
           V
88       B3B4
            .
            .
95          .          B4
            .           .
            .           .
106         .           .-------> R4OUT
101         .      RETB4
            .           .
            .           .
109       B4C............
           V
           V
112      RRB4C
            .
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123         .          B5
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            .           .
134         .           .-------> R5OUT
129         .      RETB5
            .           .
            .           .
137       B5C............
           V
           V
140      RRB5C
            .
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150         .          B6
            .           .
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161         .           .-------> R6OUT
156         .      RETB6
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            .           .
164       B6C............
           V
           V
167       B6B8
            .
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174         .          B7
            .           .
            .           .
185         .           .-------> R7OUT
180         .      RETB7
            .           .
            .           .
188       B8CR...........
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191         .          B8
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202         .           .-------> R8OUT
197         .      RETB8
            .           .
            .           .
205       B8C............
           V
           V
209      B8B10
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216         .          B9
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227         .           .-------> R9OUT
222         .      RETB9
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230        B10CL............
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233             .        B10
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244             .           .-------> R10OUT
239             .     RETB10
                .           .
                .           .
247         B10C............
               V
               V
251       B10B11
                .
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258             .        B11
                .           .
                .           .
269             .           .-------> R11OUT
264             .     RETB11
                .           .
                .           .
272         B11C............
               V
               V
275       B11B22
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282             .        B12
                .           .
                .           .
293             .           .-------> R12OUT
288             .     RETB12
                .           .
                .           .
296       B22CR............
                .
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299             .        B13
                .           .
                .           .
310             .           .-------> R13OUT
305             .     RETB13
                .           .
                .           .
313       B22CC............
                .
                .
316             .        B14
                .           .
                .           .
327             .           .-------> R14OUT
322             .     RETB14
                .           .
                .           .
330             .           .        B15
                .           .           .
                .           .           .
341             .           .           .-------> R15OUT
336             .           .     RETB15
                .           .           .
                .           .           .
344             .      B15C............
                .         V
                .         V
347             .     B15B16
                .           .
                .           .
354             .           .        B16
                .           .           .
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365             .           .           .-------> R16OUT
360             .           .     RETB16
                .           .           .
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368             .     B20CR............
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371             .           .        B17
                .           .          V
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377             .           .      RRB17
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386             .           .     B17B18
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393                                  B18
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404                                   .-------> R18OUT
399                             RETB18
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407                          B18C............
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414                                   .-------> DIV18
411                          B18D
                                     V
                                     V
417                         B18B19
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424                                  B19
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435                                   .-------> R19OUT
430                             RETB19
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438                          B19C............
                                     V
                                     V
441                         B19B20
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448                                  B20
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459                                   .-------> R20OUT
454                             RETB20
                                      .
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462                          B20CL...........
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465                     B20C............
                           V
                           V
469                  B20B22
                           .
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476                            B22
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487                                   .-------> R22OUT
482                          RETB22
                                      .
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490                     B22CC...........
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493                            B21
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504                                   .-------> R21OUT
499                          RETB21
                                     V
                                     V
507                          RRB21C
                                      .
                                      .
515                     B22CL...........
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                           .
518                 B22C............
                       V
                       V
522               RRB22C
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```
(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998              *
 *           VERSION 4.1                *
 *                                      *
 *  RUN DATE   15JUL03  TIME  16:23:14  *
 *                                      *
 ****************************************
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****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP

```
                    JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
                    ADOBE DAM / DESERT HILLS ADMP
                    FEBRUARY 2003

                    THIS IS THE 2-YEAR 24-HOUR MODEL FOR FUTURE CONDITIONS


                    MODEL BASIS:
                      * DDMSW PROJECT NAME: BF_FU24
                      * PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
                      * MULTIPLE STORM OPTION (JD)
                      * GREEN & AMPT LOSS METHOD
                      * CLARK UNIT HYDROGRAPH METHOD
                      * TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
                        EXCEPT BASIN B17 DUE TO INCORRECT CALCULATION OF Kb FOR
                        MULTIPLE LAND USES
                      * MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
                      * 2-YEAR VALUES COMPUTED BY 0.10 RATIO OF 100-YEAR RESULT
                        PER DRAFT HYDROLOGY MANUAL (2003)
                      * RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI


26 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     1FEB 3  STARTING DATE
                     ITIME       0005  STARTING TIME
                        NQ        600  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE     3FEB 3  ENDING DATE
                    NDTIME       0200  ENDING TIME
                     ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL      .08 HOURS
                      TOTAL TIME BASE   49.92 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

28 JD          INDEX STORM NO. 1
                     STRM        4.15  PRECIPITATION DEPTH
                     TRDA         .01  TRANSPOSITION DRAINAGE AREA

29 PI            PRECIPITATION PATTERN
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39 JD          INDEX STORM NO. 2
                     STRM        3.90  PRECIPITATION DEPTH
                     TRDA       10.00  TRANSPOSITION DRAINAGE AREA

 0 PI            PRECIPITATION PATTERN
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40 JD INDEX STORM NO. 3
STRM 3.73 PRECIPITATION DEPTH
TRDA 30.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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41 JD INDEX STORM NO. 4
STRM 3.57 PRECIPITATION DEPTH
TRDA 60.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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42 JD INDEX STORM NO. 5

STRM 3.51 PRECIPITATION DEPTH

TRDA 90.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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-----DSS---ZOPEN:  Existing File Opened,  File: BF224F.DSS
                   Unit:  71;  DSS Version: 6-JG
-----DSS---ZWRITE Unit  71; Vers.    6:  /BW@CAP/B22C/FLOW/01FEB1903/5MIN/EX24/
-----DSS---ZWRITE Unit  71; Vers.    6:  /BW@CAP/B22C/FLOW/02FEB1903/5MIN/EX24/
-----DSS---ZWRITE Unit  71; Vers.    6:  /BW@CAP/B22C/FLOW/03FEB1903/5MIN/EX24/
1
                                   RUNOFF SUMMARY
                            FLOW IN CUBIC FEET PER SECOND
                      TIME IN HOURS,  AREA IN SQUARE MILES
```

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	B1	84.	12.50	19.	6.	3.	.74		
+	DIVERSION TO	R1OUT	84.	12.50	19.	6.	3.	.74		
+	HYDROGRAPH AT	RETB1	0.	.00	0.	0.	0.	.74		
+	HYDROGRAPH AT	B2	85.	12.58	27.	9.	4.	.91		
+	DIVERSION TO	R2OUT	85.	12.58	27.	9.	4.	.91		
+	HYDROGRAPH AT	RETB2	0.	.00	0.	0.	0.	.91		
+	HYDROGRAPH AT	B3	96.	12.50	29.	9.	4.	1.01		
+	DIVERSION TO	R3OUT	96.	12.50	29.	9.	4.	1.01		
+	HYDROGRAPH AT	RETB3	0.	.00	0.	0.	0.	1.01		
+	3 COMBINED AT	B3C	0.	.00	0.	0.	0.	2.66		
+	ROUTED TO	B3B4	0.	.00	0.	0.	0.	2.66		
+	HYDROGRAPH AT	B4	90.	12.25	14.	4.	2.	.58		
+	DIVERSION TO	R4OUT	90.	12.25	14.	4.	2.	.58		
+	HYDROGRAPH AT	RETB4	0.	.00	0.	0.	0.	.58		
+	2 COMBINED AT	B4C	0.	.00	0.	0.	0.	3.25		
+	ROUTED TO	RRB4C	0.	.00	0.	0.	0.	3.25		
+	HYDROGRAPH AT	B5	11.	12.17	2.	0.	0.	.07		
+	DIVERSION TO	R5OUT	11.	12.17	2.	0.	0.	.07		
+	HYDROGRAPH AT	RETB5	0.	.00	0.	0.	0.	.07		
+	2 COMBINED AT	B5C	0.	.00	0.	0.	0.	3.32		
+	ROUTED TO	RRB5C	0.	.00	0.	0.	0.	3.32		
+	HYDROGRAPH AT	B6	79.	12.17	10.	3.	1.	.54		
+	DIVERSION TO	R6OUT	79.	12.17	10.	3.	1.	.54		
+	HYDROGRAPH AT	RETB6	0.	.00	0.	0.	0.	.54		
+	2 COMBINED AT	B6C	0.	.00	0.	0.	0.	3.86		
+	ROUTED TO	B6B8	0.	.00	0.	0.	0.	3.86		
+	HYDROGRAPH AT	B7	16.	12.08	2.	1.	0.	.08		
+	DIVERSION TO	R7OUT	16.	12.08	2.	1.	0.	.08		
+	HYDROGRAPH AT	RETB7	0.	.00	0.	0.	0.	.08		

+	2 COMBINED AT	B8CR	0.	.00	0.	0.	0.	3.94
+	HYDROGRAPH AT	B8	35.	12.58	12.	4.	2.	.41
+	DIVERSION TO	R8OUT	35.	12.58	12.	4.	2.	.41
+	HYDROGRAPH AT	RETB8	0.	.00	0.	0.	0.	.41
+	2 COMBINED AT	B8C	0.	.00	0.	0.	0.	4.35
+	ROUTED TO	B8B10	0.	.00	0.	0.	0.	4.35
+	HYDROGRAPH AT	B9	55.	12.17	7.	2.	1.	.38
+	DIVERSION TO	R9OUT	55.	12.17	7.	2.	1.	.38
+	HYDROGRAPH AT	RETB9	0.	.00	0.	0.	0.	.38
+	2 COMBINED AT	B10CL	0.	.00	0.	0.	0.	4.73
+	HYDROGRAPH AT	B10	7.	12.33	2.	1.	0.	.07
+	DIVERSION TO	R10OUT	7.	12.33	2.	1.	0.	.07
+	HYDROGRAPH AT	RETB10	0.	.00	0.	0.	0.	.07
+	2 COMBINED AT	B10C	0.	.00	0.	0.	0.	4.80
+	ROUTED TO	B10B11	0.	.00	0.	0.	0.	4.80
+	HYDROGRAPH AT	B11	61.	12.08	7.	2.	1.	.41
+	DIVERSION TO	R11OUT	61.	12.08	7.	2.	1.	.41
+	HYDROGRAPH AT	RETB11	0.	.00	0.	0.	0.	.41
+	2 COMBINED AT	B11C	0.	.00	0.	0.	0.	5.21
+	ROUTED TO	B11B22	0.	.00	0.	0.	0.	5.21
+	HYDROGRAPH AT	B12	28.	12.33	5.	1.	1.	.21
+	DIVERSION TO	R12OUT	28.	12.33	5.	1.	1.	.21
+	HYDROGRAPH AT	RETB12	0.	.00	0.	0.	0.	.21
+	2 COMBINED AT	B22CR	0.	.00	0.	0.	0.	5.42
+	HYDROGRAPH AT	B13	35.	12.75	14.	5.	2.	.50
+	DIVERSION TO	R13OUT	35.	12.75	14.	5.	2.	.50
+	HYDROGRAPH AT	RETB13	0.	.00	0.	0.	0.	.50
+	2 COMBINED AT	B22CC	0.	.00	0.	0.	0.	5.92
+	HYDROGRAPH AT	B14	35.	12.58	12.	4.	2.	.43
+	DIVERSION TO	R14OUT	35.	12.58	12.	4.	2.	.43
	HYDROGRAPH AT							

+		RETB14	0.	.00	0.	0.	0.	.43
+	HYDROGRAPH AT	B15	15.	12.25	3.	1.	1.	.12
+	DIVERSION TO	R15OUT	15.	12.25	3.	1.	1.	.12
+	HYDROGRAPH AT	RETB15	0.	.00	0.	0.	0.	.12
+	2 COMBINED AT	B15C	0.	.00	0.	0.	0.	.55
+	ROUTED TO	B15B16	0.	.00	0.	0.	0.	.55
+	HYDROGRAPH AT	B16	5.	12.08	1.	0.	0.	.03
+	DIVERSION TO	R16OUT	5.	12.08	1.	0.	0.	.03
+	HYDROGRAPH AT	RETB16	0.	.00	0.	0.	0.	.03
+	2 COMBINED AT	B20CR	0.	.00	0.	0.	0.	.57
+	HYDROGRAPH AT	B17	101.	12.17	17.	5.	3.	.64
+	ROUTED TO	RRB17	0.	.00	0.	0.	0.	.64
+	ROUTED TO	B17B18	0.	.00	0.	0.	0.	.64
+	HYDROGRAPH AT	B18	45.	12.17	7.	2.	1.	.22
+	DIVERSION TO	R18OUT	45.	12.17	7.	2.	1.	.22
+	HYDROGRAPH AT	RETB18	0.	.00	0.	0.	0.	.22
+	2 COMBINED AT	B18C	0.	.00	0.	0.	0.	.87
+	DIVERSION TO	DIV18	0.	.00	0.	0.	0.	.87
+	HYDROGRAPH AT	B18D	0.	.00	0.	0.	0.	.87
+	ROUTED TO	B18B19	0.	.00	0.	0.	0.	.87
+	HYDROGRAPH AT	B19	71.	12.33	17.	5.	3.	.57
+	DIVERSION TO	R19OUT	71.	12.33	17.	5.	3.	.57
+	HYDROGRAPH AT	RETB19	0.	.00	0.	0.	0.	.57
+	2 COMBINED AT	B19C	0.	.00	0.	0.	0.	1.44
+	ROUTED TO	B19B20	0.	.00	0.	0.	0.	1.44
+	HYDROGRAPH AT	B20	97.	12.42	21.	6.	3.	.78
+	DIVERSION TO	R20OUT	97.	12.42	21.	6.	3.	.78
+	HYDROGRAPH AT	RETB20	0.	.00	0.	0.	0.	.78
+	2 COMBINED AT	B20CL	0.	.00	0.	0.	0.	2.22
+	2 COMBINED AT	B20C	0.	.00	0.	0.	0.	2.80
+	ROUTED TO	B20B22	0.	.00	0.	0.	0.	2.80

	HYDROGRAPH AT							
+		B22	42.	12.50	10.	3.	1.	.36
	DIVERSION TO							
+		R22OUT	42.	12.50	10.	3.	1.	.36
	HYDROGRAPH AT							
+		RETB22	0.	.00	0.	0.	0.	.36
	2 COMBINED AT							
+		B22CC	0.	.00	0.	0.	0.	3.16
	HYDROGRAPH AT							
+		B21	45.	12.42	13.	4.	2.	.54
	DIVERSION TO							
+		R21OUT	45.	12.42	13.	4.	2.	.54
	HYDROGRAPH AT							
+		RETB21	0.	.00	0.	0.	0.	.54
	ROUTED TO							
+		RRB21C	0.	.00	0.	0.	0.	.54
	2 COMBINED AT							
+		B22CL	0.	.00	0.	0.	0.	3.70
	2 COMBINED AT							
+		B22C	0.	.00	0.	0.	0.	9.62
	ROUTED TO							
+		RRB22C	0.	.00	0.	0.	0.	9.62

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

```
-----DSS---ZCLOSE Unit:  71,   File: BF224F.DSS
          Pointer Utilization:    .25
          Number of Records:       3
          File Size:     15.3  Kbytes
          Percent Inactive:     .0
```

Future Condition
10-Year

```
1****************************************                    ****************************************
 *                                      *                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *   U.S. ARMY CORPS OF ENGINEERS       *
 *              JUN   1998              *                    *   HYDROLOGIC ENGINEERING CENTER      *
 *            VERSION 4.1               *                    *         609 SECOND STREET            *
 *                                      *                    *      DAVIS, CALIFORNIA 95616         *
 *  RUN DATE   15JUL03  TIME  16:23:27  *                    *          (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

    1           ID   BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP
    2           ID
    3           ID    JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
    4           ID    ADOBE DAM / DESERT HILLS ADMP
    5           ID    FEBRUARY 2003
    6           ID
    7           ID    THIS IS THE 10-YEAR 24-HOUR MODEL FOR FUTURE CONDITIONS
    8           ID
    9           ID
   10           ID    MODEL BASIS:
   11           ID      * DDMSW PROJECT NAME: BF_FU24
   12           ID      * PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
   13           ID      * MULTIPLE STORM OPTION (JD)
   14           ID      * GREEN & AMPT LOSS METHOD
   15           ID      * CLARK UNIT HYDROGRAPH METHOD
   16           ID      * TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
   17           ID        EXCEPT B17 DUE TO INCORRECT Kb CALCULATION FOR MULTIPLE
   18           ID        LAND USES
   19           ID      * MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
   20           ID      * 10-YR COMPUTED BASED ON 0.35 RATIO OF 100-YEAR PER
   21           ID        DRAFT HYDROLOGY MANUAL (2003)
   22           ID      * RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI
   23           ID
   24           ID
                *DIAGRAM
   25           IT       5 01FEB03     0005      600
   26           IO       5
   27           IN      15
                *
                *  THESE RAINFALL RECORDS ARE FOR THE 100-YEAR 24-HOUR STORM.
                *  THE 10-YR HYDROGRAPHS ARE COMPUTED BY USE OF RATIOS
                *  ON FIELD 3 OF THE BA RECORD.
                *
   28           JD    4.15     0.01
   29           PC   0.000    0.002    0.005    0.008    0.011    0.014    0.017    0.020    0.023    0.026
   30           PC   0.029    0.032    0.035    0.038    0.041    0.044    0.048    0.052    0.056    0.060
   31           PC   0.064    0.068    0.072    0.076    0.080    0.085    0.090    0.095    0.100    0.105
   32           PC   0.110    0.115    0.120    0.126    0.133    0.140    0.147    0.155    0.163    0.172
   33           PC   0.181    0.191    0.203    0.218    0.236    0.257    0.283    0.387    0.663    0.707
   34           PC   0.735    0.758    0.776    0.791    0.804    0.815    0.825    0.834    0.842    0.849
   35           PC   0.856    0.863    0.869    0.875    0.881    0.887    0.893    0.898    0.903    0.908
   36           PC   0.913    0.918    0.922    0.926    0.930    0.934    0.938    0.942    0.946    0.950
   37           PC   0.953    0.956    0.959    0.962    0.965    0.968    0.971    0.974    0.977    0.980
   38           PC   0.983    0.986    0.989    0.992    0.995    0.998    1.000
   39           JD   3.901       10
   40           JD   3.735       30
   41           JD   3.569       60
   42           JD   3.511       90
                *
1                                                HEC-1 INPUT                                                PAGE  2

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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 43          KK      B1   BASIN
 44          BA   0.741            0.35
 45          LG    0.25    0.13   10.10    0.04      38
 46          UC   0.729   0.543
 47          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 48          UA     100
             *

 49          KK   RETB1
 50          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
 51          KM    - 474.52 AC DEVELOPMENT WITH RETENTION
 52          KM    - C FACTOR = 0.79
 53          KM    - 100-YR 2-HR RAIN = 2.76"
 54          DT   R1OUT   86.23
 55          DI       0    1500
 56          DQ       0    1500
             *

 57          KK      B2   BASIN
 58          BA   0.913            0.35
 59          LG    0.22    0.05   12.40    0.01      46
 60          UC   0.788   0.714
 61          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 62          UA     100
             *

 63          KK   RETB2
 64          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
 65          KM    - 584.55 AC DEVELOPMENT WITH RETENTION
 66          KM    - C FACTOR = 0.79
 67          KM    - 100-YR 2-HR RAIN = 2.76"
 68          DT   R2OUT  106.61
 69          DI       0    1500
 70          DQ       0    1500
             *

 71          KK      B3   BASIN
 72          BA   1.011            0.35
 73          LG    0.19    0.05   12.40    0.02      52
 74          UC   0.763   0.692
 75          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 76          UA     100
             *

 77          KK   RETB3
 78          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
 79          KM    - 646.80 AC DEVELOPMENT WITH RETENTION
 80          KM    - C FACTOR = 0.80
 81          KM    - 100-YR 2-HR RAIN = 2.76"
 82          DT   R3OUT  118.72
 83          DI       0    1500
 84          DQ       0    1500
             *
1                                    HEC-1 INPUT                                          PAGE  3

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

 85          KK     B3C
 86          KM      COMBINE B1 + B2 + B3
 87          HC       3
             *

 88          KK    B3B4ROUTE    REACH
 89          KM    ROUTE COMBINED FLOWS FROM B3C TO B4C
 90          KM     SLOPE = (1538-1535)/1401 = 0.002
 91          RS       3    FLOW      -1
 92          RC   0.080   0.050   0.080    1401  0.0020    0.00
 93          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
 94          RY   110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
             *

 95          KK      B4   BASIN
 96          BA   0.584            0.35
 97          LG    0.25    0.15    9.70    0.06      34
 98          UC   0.417   0.277
 99          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
100          UA     100
             *

101          KK   RETB4
102          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
103          KM    - 373.62 AC DEVELOPMENT WITH RETENTION
104          KM    - C FACTOR = 0.75
105          KM    - 100-YR 2-HR RAIN = 2.76"
106          DT   R4OUT   64.50
107          DI       0    1500
108          DQ       0    1500
             *
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109          KK     B4C
110          KM     COMBINE RUNOFF FROM B4 WITH ROUTED FLOWS FROM B3C
111          HC       2
             *
             *   THIS CHANNEL ROUTING REMOVED FROM 10- & 100-YR MODELS DUE TO BACKUP BETWEEN
             *   STOCK PONDS AT B4C AND B5C.
             *
             * KK  B4B5ROUTE   REACH
             * KM   ROUTE COMBINED FLOWS FROM B4C TO B5C
             * KM   SLOPE = (1535-1534)/1014 = 0.001
             * RS     2    FLOW      -1
             * RC 0.080   0.050   0.080    1014  0.0010    0.00
             * RX   0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
             * RY 110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
             *

112          KK      B5   BASIN
113          BA   0.069            0.35
114          LG    0.25    0.15    9.70    0.06      30
115          UC   0.317   0.319
116          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
117          UA     100
             *
```

1 HEC-1 INPUT PAGE 4

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

118          KK   RETB5
119          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
120          KM    - 44.10 AC DEVELOPMENT WITH RETENTION
121          KM    - C FACTOR = 0.71
122          KM    - 100-YR 2-HR RAIN = 2.76"
123          DT   R5OUT    7.20
124          DI       0     500
125          DQ       0     500
             *

126          KK     B5C
127          KM     COMBINE RUNOFF FROM B5 WITH ROUTED FLOWS FROM B4C
128          HC       2
             *

129          KK   RRB5CROUTE   STORAGE
130          KM     ROUTE HYDROGRAPH THROUGH COMBINED STORAGE AREA ASSOCIATED WITH TWO
131          KM     STOCK PONDS (ONE AT B4CA AND THE OTHER AT B5C).
132          KM     ASSUMPTION OF COMBINED STORAGE AREAS FOR 10-YR & 100-YR EVENTS.
133          KM     DISCHARGE CURVE COMPUTED WITH COE UNEVEN WEIR PROGRAM (FILE: RR5BC.IN)
134          RS       1    STOR      -1
135          SA       0    0.33    1.96   14.34   30.65
136          SE    1533    1534    1536    1538    1540
137          SQ       0     103     357     780    1400    2224    3274    4498    5940
138          SE  1536.0  1536.5  1537.0  1537.5  1538.0  1538.5  1539.0  1539.5  1540.0
             *
             *   NO CHANNEL ROUTING FROM B5C TO B6C DUE TO SHORT REACH LENGTH (752')
             *

139          KK      B6   BASIN
140          BA   0.543            0.35
141          LG    0.25    0.25    4.25    0.49      34
142          UC   0.325   0.258
143          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
144          UA     100
             *

145          KK   RETB6
146          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
147          KM    - 347.21 AC DEVELOPMENT WITH RETENTION
148          KM    - C FACTOR = 0.72
149          KM    - 100-YR 2-HR RAIN = 2.76"
150          DT   R6OUT   57.22
151          DI       0    1000
152          DQ       0    1000
             *

153          KK     B6C
154          KM     COMBINE RUNOFF FROM B6 WITH ROUTED FLOWS FROM B5C
155          HC       2
             *
```

1 HEC-1 INPUT PAGE 5

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

156          KK    B6B8ROUTE   REACH
157          KM     ROUTE COMBINED FLOWS FROM B6C TO B8C
158          KM     SLOPE = (1531-1522)/1909 = 0.0047
159          RS       2    FLOW      -1
160          RC   0.080   0.050   0.080    1909  0.0047    0.00
161          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
162          RY   112.0   101.0   100.0    95.0    95.0   100.0   101.0   112.0
```

```
*

KK      B7   BASIN
BA   0.080            0.35
LG    0.25    0.25    5.10    0.31      40
UC   0.188   0.162
UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
UA     100
*

KK   RETB7
KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
KM    - 51.15 AC DEVELOPMENT WITH RETENTION
KM    - C FACTOR = 0.71
KM    - 100-YR 2-HR RAIN = 2.76"
DT   R7OUT    8.35
DI       0     500
DQ       0     500
*

KK    B8CR
KM     COMBINE RUNOFF FROM B7 WITH ROUTED FLOWS FROM B6C
HC       2
*

KK      B8   BASIN
BA   0.405            0.35
LG    0.25    0.05   12.40    0.01      30
UC   0.750   0.836
UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
UA     100
*

KK   RETB8
KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
KM    - 259.04 AC DEVELOPMENT WITH RETENTION
KM    - C FACTOR = 0.71
KM    - 100-YR 2-HR RAIN = 2.76"
DT   R8OUT   42.52
DI       0     500
DQ       0     500
*
```



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

KK     B8C
KM     COMBINE RUNOFF FROM B8 WITH COMBINED FLOWS AT B8CL
KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B8C
HC       2
*

KK   B8B10ROUTE   REACH
KM     ROUTE COMBINED FLOWS FROM B8C TO B10C
KM     SLOPE = (1522-1514)/1700 = 0.0047
RS       2    FLOW      -1
RC   0.080   0.050   0.080    1700  0.0047    0.00
RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
RY   112.0   101.0   100.0    95.0    95.0   100.0   101.0   112.0
*

KK      B9   BASIN
BA   0.385            0.35
LG    0.25    0.25    4.60    0.39      34
UC   0.308   0.275
UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
UA     100
*

KK   RETB9
KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
KM    - 246.54 AC DEVELOPMENT WITH RETENTION
KM    - C FACTOR = 0.71
KM    - 100-YR 2-HR RAIN = 2.76"
DT   R9OUT   40.26
DI       0    1000
DQ       0    1000
*

KK   B10CL
KM     COMBINE RUNOFF FROM B9 WITH ROUTED FLOWS FROM B8C
HC       2
*

KK     B10   BASIN
BA   0.070            0.35
LG    0.25    0.05   12.40    0.01      30
UC   0.504   0.813
UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
UA     100
```

```
                 *
 228             KK  RETB10
 229             KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
 230             KM    - 44.70 AC DEVELOPMENT WITH RETENTION
 231             KM    - C FACTOR = 0.71
 232             KM    - 100-YR 2-HR RAIN = 2.76"
 233             DT  R10OUT    7.30
 234             DI       0     500
 235             DQ       0     500
                 *
1                                          HEC-1 INPUT                                                PAGE  7

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

 236             KK    B10C
 237             KM     COMBINE RUNOFF FROM B10 WITH COMBINED FLOWS AT B10CL
 238             KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B10C
 239             HC       2
                 *
 240             KK  B10B11ROUTE   REACH
 241             KM     ROUTE COMBINED FLOWS FROM B10C TO B11C
 242             KM     SLOPE = (1514-1509)/1236 = 0.0040
 243             RS       1    FLOW      -1
 244             RC   0.080   0.050   0.080    1236  0.0040    0.00
 245             RX     0.0    25.0    50.0    55.0    70.0    75.0   100.0   515.0
 246             RY   106.0   101.0   100.0    95.0    95.0   100.0   101.0   106.0
                 *
 247             KK     B11   BASIN
 248             BA   0.410            0.35
 249             LG    0.25    0.25    4.45    0.43      34
 250             UC   0.304   0.256
 251             UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 252             UA     100
                 *
 253             KK  RETB11
 254             KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
 255             KM    - 262.10 AC DEVELOPMENT WITH RETENTION
 256             KM    - C FACTOR = 0.71
 257             KM    - 100-YR 2-HR RAIN = 2.76"
 258             DT  R11OUT   42.80
 259             DI       0    1000
 260             DQ       0    1000
                 *
 261             KK    B11C
 262             KM     COMBINE RUNOFF FROM B11 WITH ROUTED FLOWS FROM B10C
 263             HC       2
                 *
 264             KK  B11B22ROUTE   REACH
 265             KM     ROUTE COMBINED FLOWS FROM B11C TO B22C THRU B12
 266             KM     SLOPE = (1509-1498)/2644 = 0.0042
 267             RS       2    FLOW      -1
 268             RC   0.080   0.050   0.080    2644  0.0042    0.00
 269             RX     0.0    25.0   200.0   206.0   230.0   236.0   336.0   536.0
 270             RY   106.0   102.0   100.0    97.0    95.0   100.0   102.0   106.0
                 *
 271             KK     B12   BASIN
 272             BA   0.206            0.35
 273             LG    0.22    0.15    7.60    0.11      42
 274             UC   0.521   0.413
 275             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 276             UA     100
                 *
1                                          HEC-1 INPUT                                                PAGE  8

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

 277             KK  RETB12
 278             KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
 279             KM    - 117.16 AC DEVELOPMENT WITH RETENTION
 280             KM    - C FACTOR = 0.71
 281             KM    - 100-YR 2-HR RAIN = 2.76"
 282             DT  R12OUT   19.13
 283             DI       0     500
 284             DQ       0     500
                 *
 285             KK   B22CR
 286             KM     COMBINE RUNOFF FROM B12 WITH ROUTED FLOWS FROM B11C
 287             HC       2
                 *
 288             KK     B13   BASIN
```

```
289          BA   0.502            0.35
290          LG    0.24    0.05   12.40    0.01      33
291          UC   0.925   1.158
292          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
293          UA     100
             *

294          KK  RETB13
295          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
296          KM    - 309.67 AC DEVELOPMENT WITH RETENTION
297          KM    - C FACTOR = 0.71
298          KM    - 100-YR 2-HR RAIN = 2.76"
299          DT  R13OUT   50.69
300          DI       0     500
301          DQ       0     500
             *

302          KK   B22CC
303          KM     COMBINE RUNOFF FROM B13 WITH COMBINED FLOWS AT B22CR
304          HC       2
             *

305          KK     B14   BASIN
306          BA   0.431            0.35
307          LG    0.20    0.05   12.40    0.02      48
308          UC   0.733   0.929
309          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
310          UA     100
             *

311          KK  RETB14
312          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
313          KM    - 275.85 AC DEVELOPMENT WITH RETENTION
314          KM    - C FACTOR = 0.76
315          KM    - 100-YR 2-HR RAIN = 2.76"
316          DT  R14OUT   48.43
317          DI       0     500
318          DQ       0     500
             *
```



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

319          KK     B15   BASIN
320          BA   0.115            0.35
321          LG    0.25    0.05   12.40    0.01      30
322          UC   0.425   0.459
323          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
324          UA     100
             *

325          KK  RETB15
326          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
327          KM    - 73.72 AC DEVELOPMENT WITH RETENTION
328          KM    - C FACTOR = 0.71
329          KM    - 100-YR 2-HR RAIN = 2.76"
330          DT  R15OUT   12.04
331          DI       0     500
332          DQ       0     500
             *

333          KK    B15C
334          KM     COMBINE RUNOFF FROM B14 WITH RUNOFF FROM B15
335          HC       2
             *

336          KK  B15B16ROUTE   REACH
337          KM     ROUTE COMBINED FLOWS FROM B15C TO B16C
338          KM     SLOPE = (1530-1516)/1669 = 0.0084
339          RS       1    FLOW      -1
340          RC   0.080   0.050   0.080    1669  0.0084    0.00
341          RX     0.0    20.0    40.0    65.0    85.0   110.0   130.0   150.0
342          RY   100.0    98.0    96.0    96.0    96.0    96.0    98.0   100.0
             *

343          KK     B16   BASIN
344          BA   0.027            0.35
345          LG    0.25    0.05   12.40    0.01      30
346          UC   0.254   0.286
347          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
348          UA     100
             *

349          KK  RETB16
350          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
351          KM    - 17.26 AC DEVELOPMENT WITH RETENTION
352          KM    - C FACTOR = 0.71
353          KM    - 100-YR 2-HR RAIN = 2.76"
354          DT  R16OUT    2.82
355          DI       0     500
```

```
356          DQ       0     500
             *
1                                          HEC-1 INPUT                                                    PAGE 10

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


357          KK   B20CR
358          KM     COMBINE RUNOFF FROM B16 WITH ROUTED FLOWS FROM B15C
359          HC       2
             *

360          KK     B17   BASIN
361          BA   0.643             0.35
362          LG    0.22    0.10    11.20    0.03      41
363          UC   0.479   0.296
364          UA       0     5.0     16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
365          UA     100
             *

366          KK   RRB17ROUTE   STORAGE
367          KM   STORAGE ROUTE ADDED TO ACCOUNT FOR THE TRAMONTO DEVELOPMENT
368          KM    - 27.39 AC-FT OF VOLUME IS RETAINED PRIOR TO OUTLET DOWNSTREAM
369          KM    - ADDITIONAL VOLUME ABOVE 27.39 IS IN A VERTICAL PATTERN ASSUMING
370          KM    - A 4' DEEP RETENTION BASIN TO REACH THE 27.39 AC-FT.
371          RS       1    ELEV    1676
372          SV     0.0   27.39   34.24   41.09   47.94   54.78
373          SE    1676    1678    1679    1680    1681    1682
374          SQ     0.0     0.0    67.0   134.0   817.0  1500.0
             *

375          KK  B17B18ROUTE   REACH
376          KM     ROUTE RUNOFF FROM B17 TO B18C
377          KM     SLOPE = (1680-1640)/4738 = 0.0084
378          RS       5    FLOW      -1
379          RC   0.080   0.050   0.080    4738  0.0084    0.00
380          RX     0.0    40.0   110.0   115.0   130.0   135.0   205.0   240.0
381          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *

382          KK     B18   BASIN
383          BA   0.225             0.35
384          LG    0.12    0.10    11.20    0.03      75
385          UC   0.292   0.199
386          UA       0     3.0      5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
387          UA     100
             *

388          KK  RETB18
389          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
390          KM    - 143.77 AC DEVELOPMENT WITH RETENTION
391          KM    - C FACTOR = 0.84
392          KM    - 100-YR 2-HR RAIN = 2.76"
393          DT  R18OUT   27.63
394          DI       0    1000
395          DQ       0    1000
             *
1                                          HEC-1 INPUT                                                    PAGE 11

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


396          KK    B18C
397          KM     COMBINE RUNOFF FROM B18 WITH ROUTED FLOWS FROM B17
398          KM     THIS IS THE TOTAL FLOW AT I-17.
399          HC       2
             *

400          KK    B18D
401          KM     DIVERSION OF FLOW TO SOUTH ALONG EAST SIDE OF I-17
402          KM     THIS FLOW EVENTUALLY RE-JOINS SKUNK CREEK
403          DT   DIV18
404          DI     250     500     750    1000    1250    1500
405          DQ       0      66     212     405     601     822
             *

406          KK  B18B19ROUTE   REACH
407          KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
408          KM     SLOPE = (1640-1561)/10091 = 0.0078
409          RS       9    FLOW      -1
410          RC   0.080   0.050   0.080   10091  0.0078    0.00
411          RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
412          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
             *

413          KK     B19   BASIN
414          BA   0.574             0.35
415          LG    0.12    0.10    11.20    0.03      73
416          UC   0.508   0.468
417          UA       0     4.5     12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
418          UA     100
```

```
                *

419             KK  RETB19
420             KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
421             KM    - 367.25 AC DEVELOPMENT WITH RETENTION
422             KM    - C FACTOR = 0.83
423             KM    - 100-YR 2-HR RAIN = 2.76"
424             DT  R19OUT   70.13
425             DI       0    1000
426             DQ       0    1000
                *

427             KK    B19C
428             KM     COMBINE RUNOFF FROM B19 WITH ROUTED FLOWS FROM B18C
429             HC       2
                *

430             KK  B19B20ROUTE   REACH
431             KM     ROUTE COMBINED FLOWS FROM B19C TO B20C
432             KM     SLOPE = (1561-1516)/6629 = 0.0068
433             RS       6    FLOW      -1
434             RC   0.080   0.050   0.080    6629  0.0068    0.00
435             RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
436             RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
                *
1                                          HEC-1 INPUT                                                    PAGE 12

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

437             KK     B20   BASIN
438             BA   0.781            0.35
439             LG    0.24    0.10   11.20    0.03      36
440             UC   0.654   0.478
441             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
442             UA     100
                *

443             KK  RETB20
444             KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
445             KM    - 500.03 AC DEVELOPMENT WITH RETENTION
446             KM    - C FACTOR = 0.72
447             KM    - 100-YR 2-HR RAIN = 2.76"
448             DT  R20OUT   82.84
449             DI       0    1500
450             DQ       0    1500
                *

451             KK   B20CL
452             KM     COMBINE RUNOFF FROM B20 WITH ROUTED FLOWS FROM B19C
453             HC       2
                *

454             KK    B20C
455             KM     COMBINE FLOWS FROM B20CR AND B20CL
456             KM     THIS IS THE TOTAL FLOW AT B20C
457             HC       2
                *

458             KK  B20B22ROUTE   REACH
459             KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
460             KM     SLOPE = (1516-1498)/4576 = 0.0039
461             RS       8    FLOW      -1
462             RC   0.080   0.070   0.080    4576  0.0039    0.00
463             RX     0.0   200.0   250.0   275.0   325.0   400.0   450.0   500.0
464             RY   104.0    99.0    98.0    98.0    98.0    98.0    99.0   104.0
                *

465             KK     B22   BASIN
466             BA   0.361            0.35
467             LG    0.19    0.10   11.20    0.03      48
468             UC   0.708   0.546
469             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
470             UA     100
                *

471             KK  RETB22
472             KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
473             KM    - 176.44 AC DEVELOPMENT WITH RETENTION
474             KM    - C FACTOR = 0.71
475             KM    - 100-YR 2-HR RAIN = 2.76"
476             DT  R22OUT   28.81
477             DI       0    1000
478             DQ       0    1000
                *
1                                          HEC-1 INPUT                                                    PAGE 13

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

479             KK   B22CC
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480          KM    COMBINE RUNOFF FROM B22 WITH ROUTED FLOWS FROM B20C
481          HC       2
             *

482          KK     B21   BASIN
483          BA   0.544            0.35
484          LG    0.21    0.15    8.40    0.09      49
485          UC   0.758   0.835
486          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
487          UA     100
             *

488          KK  RETB21
489          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
490          KM    - 345.37 AC DEVELOPMENT WITH RETENTION
491          KM    - C FACTOR = 0.75
492          KM    - 100-YR 2-HR RAIN = 2.76"
493          DT  R21OUT   59.31
494          DI       0    1000
495          DQ       0    1000
             *
             *  KKB21B22
             *  KM   ROUTE ROUTED OUTFLOW FROM B21 TO B22C
             *  KM   SLOPE = (1504-1498)/3868 = 0.0016
             *  RS     8    FLOW      -1
             *  RC  0.08    0.05    0.08    3868  0.0016
             *  RX     0      30      50      60      70      80     200     500
             *  RY   100      92      90      85      85      90      92      94
             *

496          KK   B22CL
497          KM    COMBINE B22C WITH ROUTED FLOWS FROM B21
498          HC       2
             *

499          KK    B22C
500          KM     COMBINE ALL FLOWS IN BUCHANAN WASH UPSTREAM OF CAP
501          HC       2
502          ZW      A=BW@CAP   C=FLOW   F=EX24
             *

503          KK  RRB22CROUTE   STORAGE
504          KM     ROUTE FLOWS THROUGH LARGE PONDING AREA UPSTREAM OF CAP
505          KM     OUTLET IS 3 - 66" RCPS
506          KM     THIS STORAGE ROUTING INCLUDES AREA IN RRB21C FOR THE 10-YR AND 100-YR
507          KM     MODELS AS THE MAXIMUM PONDING ELEVATION BACKS UP FROM RRB22C EAST INTO
508          KM     RRB21C AREA ABOVE ABOUT 1504.0 FT.
509          RS       1    STOR      -1
510          SA       0    0.35    3.60   12.87   37.91   74.76  119.27  156.56  191.36  227.38
511          SA  269.52  317.29
512          SE    1498    1500    1502    1504    1506    1508    1510    1512    1514    1516
513          SE    1518    1520
514          SQ       0     200     400     500     800    1000    1200    1400    1600    2000
1                                                HEC-1 INPUT                                          PAGE 14

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

515          SE    1496 1499.12 1500.82 1501.61  1504.6  1507.4 1510.88 1514.97 1519.64 1520.26
             *
516          ZZ
1
             SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

   43          B1
                .
                .
   54           .------->   R1OUT
   49       RETB1
                .
                .
   57           .          B2
                .           .
                .           .
   68           .           .------->   R2OUT
   63           .       RETB2
                .           .
                .           .
   71           .           .          B3
                .           .           .
                .           .           .
   82           .           .           .------->   R3OUT
   77           .           .       RETB3
                .           .           .
                .           .           .
   85         B3C.......................
                V
                V
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 88        B3B4
              .
              .
 95           .          B4
              .           .
              .           .
106           .           .-------->   R4OUT
101           .       RETB4
              .           .
              .           .
109        B4C............
              .
              .
112           .          B5
              .           .
              .           .
123           .           .-------->   R5OUT
118           .       RETB5
              .           .
              .           .
126        B5C............

             V
             V
129       RRB5C
              .
              .
139           .          B6
              .           .
              .           .
150           .           .-------->   R6OUT
145           .       RETB6
              .           .
              .           .
153        B6C............
             V
             V
156        B6B8        .
              .
              .
163           .          B7
              .           .
              .           .
174           .           .-------->   R7OUT
169           .       RETB7
              .           .
              .           .
177       B8CR............
              .
              .
180           .          B8
              .           .
              .           .
191           .           .-------->   R8OUT
186           .       RETB8
              .           .
              .           .

194        B8C............
             V
             V
198       B8B10
              .
              .
205           .          B9
              .           .
              .           .
216           .           .-------->   R9OUT
211           .       RETB9
              .           .
              .           .
219      B10CL............
              .
              .
222           .         B10
              .           .
              .           .
233           .           .-------->  R10OUT
228           .      RETB10
              .           .
              .           .
236       B10C............
             V
             V
240      B10B11
              .
              .
247           .         B11
              .           .
              .           .
258           .           .-------->  R11OUT
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253          .      RETB11
             .          .

             .          .
261       B11C............
             V
             V
264     B11B22
             .
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271          .        B12
             .          .
             .          .
282          .          .-------> R12OUT
277          .      RETB12
             .          .
             .          .
285      B22CR............
             .
             .
288          .        B13
             .          .
             .          .
299          .          .-------> R13OUT
294          .      RETB13
             .          .
             .          .
302      B22CC............
             .

             .
305          .        B14
             .          .
             .          .
316          .          .-------> R14OUT
311          .      RETB14
             .          .
             .          .
319          .          .        B15
             .          .          .
             .          .          .
330          .          .          .-------> R15OUT
325          .          .     RETB15
             .          .          .
             .          .          .
333          .       B15C............
             .          V
             .          V
336          .     B15B16
             .          .
             .          .
343          .          .        B16
             .          .          .
             .          .          .
354          .          .          .-------> R16OUT
349          .          .     RETB16

             .          .          .
             .          .          .
357          .      B20CR............
             .          .
             .          .
360          .          .        B17
             .          .          V
             .          .          V
366          .          .      RRB17
             .          .          V
             .          .          V
375          .          .     B17B18
             .          .          .
             .          .          .
382          .          .          .        B18
             .          .          .          .
             .          .          .          .
393          .          .          .          .-------> R18OUT
388          .          .          .     RETB18
             .          .          .          .
             .          .          .          .
396          .          .       B18C............
             .          .          .
             .          .          .
403          .          .          .-------> DIV18
400          .          .       B18D
             .          .          V
             .          .          V
406          .          .     B18B19
             .          .          .
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413          .          .          .        B19
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424          .          .          .          .-------> R19OUT
419          .          .          .     RETB19
             .          .          .          .
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427          .          .      B19C............
             .          .         V
             .          .         V
430          .          .     B19B20
             .          .          .
             .          .          .
437          .          .          .        B20
             .          .          .          .
             .          .          .          .
448          .          .          .          .-------> R20OUT
443          .          .          .     RETB20
             .          .          .          .
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451          .          .      B20CL............
             .          .          .
             .          .          .
454          .       B20C............
             .          V
             .          V
458          .     B20B22
             .          .
             .          .
465          .          .        B22
             .          .          .
             .          .          .
476          .          .          .-------> R22OUT
471          .          .     RETB22
             .          .          .
             .          .          .
479          .      B22CC............
             .          .
             .          .
482          .          .        B21
             .          .          .
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493          .          .          .-------> R21OUT
488          .          .     RETB21
             .          .          .
             .          .          .
496          .      B22CL............
             .          .
             .          .
499       B22C............
             V
             V
503     RRB22C
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*             JUN   1998               *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   15JUL03  TIME  16:23:27  *
*                                      *
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****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP

JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
ADOBE DAM / DESERT HILLS ADMP
FEBRUARY 2003

THIS IS THE 10-YEAR 24-HOUR MODEL FOR FUTURE CONDITIONS

MODEL BASIS:
* DDMSW PROJECT NAME: BF_FU24
* PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
* MULTIPLE STORM OPTION (JD)
* GREEN & AMPT LOSS METHOD
* CLARK UNIT HYDROGRAPH METHOD
* TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
  EXCEPT B17 DUE TO INCORRECT Kb CALCULATION FOR MULTIPLE
  LAND USES
* MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
* 10-YR COMPUTED BASED ON 0.35 RATIO OF 100-YEAR PER
  DRAFT HYDROLOGY MANUAL (2003)
* RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI

```
26 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     1FEB 3  STARTING DATE
                  ITIME       0005  STARTING TIME
                     NQ        600  NUMBER OF HYDROGRAPH ORDINATES
                 NDDATE     3FEB 3  ENDING DATE
                 NDTIME       0200  ENDING TIME
                  ICENT         19  CENTURY MARK

             COMPUTATION INTERVAL     .08 HOURS
                  TOTAL TIME BASE   49.92 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

28 JD        INDEX STORM NO. 1
                  STRM        4.15  PRECIPITATION DEPTH
                  TRDA         .01  TRANSPOSITION DRAINAGE AREA

29 PI          PRECIPITATION PATTERN
                 .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
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                 .03     .09     .09     .09     .01     .01     .01     .01     .01     .01
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39 JD        INDEX STORM NO. 2
                  STRM        3.90  PRECIPITATION DEPTH
                  TRDA       10.00  TRANSPOSITION DRAINAGE AREA

 0 PI          PRECIPITATION PATTERN
                 .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
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                 .01     .01     .01     .01     .01     .01     .01     .01     .03     .03
                 .03     .09     .09     .09     .01     .01     .01     .01     .01     .01
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40 JD     INDEX STORM NO. 3
            STRM        3.73  PRECIPITATION DEPTH
            TRDA       30.00  TRANSPOSITION DRAINAGE AREA

 0 PI       PRECIPITATION PATTERN
            .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
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41 JD     INDEX STORM NO. 4
            STRM        3.57  PRECIPITATION DEPTH
            TRDA       60.00  TRANSPOSITION DRAINAGE AREA

 0 PI       PRECIPITATION PATTERN
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            .03      .09      .09      .09      .01      .01      .01      .01      .01      .01
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42 JD     INDEX STORM NO. 5
            STRM        3.51  PRECIPITATION DEPTH
            TRDA       90.00  TRANSPOSITION DRAINAGE AREA

 0 PI       PRECIPITATION PATTERN
            .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
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.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
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  -----DSS---ZOPEN:  Existing File Opened,  File: BF1024F.DSS
                     Unit:  71;  DSS Version: 6-JG
 -----DSS---ZWRITE Unit  71; Vers.    5:  /BW@CAP/B22C/FLOW/01FEB1903/5MIN/EX24/
 -----DSS---ZWRITE Unit  71; Vers.    5:  /BW@CAP/B22C/FLOW/02FEB1903/5MIN/EX24/
 -----DSS---ZWRITE Unit  71; Vers.    5:  /BW@CAP/B22C/FLOW/03FEB1903/5MIN/EX24/
1
                                        RUNOFF SUMMARY
                                   FLOW IN CUBIC FEET PER SECOND
                                TIME IN HOURS,  AREA IN SQUARE MILES

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

        HYDROGRAPH AT
+                            B1    295.   12.50          67.         20.         10.       .74
        DIVERSION TO
+                         R1OUT    295.   12.50          67.         20.         10.       .74
        HYDROGRAPH AT
+                         RETB1      0.     .00           0.          0.          0.       .74
        HYDROGRAPH AT
+                            B2    297.   12.58          93.         30.         15.       .91
        DIVERSION TO
+                         R2OUT    297.   12.58          93.         30.         15.       .91
        HYDROGRAPH AT
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+		RETB2	0.	.00	0.	0.	0.	.91
+	HYDROGRAPH AT	B3	335.	12.50	101.	32.	16.	1.01
+	DIVERSION TO	R3OUT	335.	12.50	101.	32.	16.	1.01
+	HYDROGRAPH AT	RETB3	0.	.00	0.	0.	0.	1.01
+	3 COMBINED AT	B3C	0.	.00	0.	0.	0.	2.66
+	ROUTED TO	B3B4	0.	.00	0.	0.	0.	2.66
+	HYDROGRAPH AT	B4	315.	12.25	49.	14.	7.	.58
+	DIVERSION TO	R4OUT	315.	12.25	49.	14.	7.	.58
+	HYDROGRAPH AT	RETB4	0.	.00	0.	0.	0.	.58
+	2 COMBINED AT	B4C	0.	.00	0.	0.	0.	3.25
+	HYDROGRAPH AT	B5	38.	12.17	6.	2.	1.	.07
+	DIVERSION TO	R5OUT	38.	12.17	6.	2.	1.	.07
+	HYDROGRAPH AT	RETB5	0.	.00	0.	0.	0.	.07
+	2 COMBINED AT	B5C	0.	.00	0.	0.	0.	3.32
+	ROUTED TO	RRB5C	0.	.00	0.	0.	0.	3.32
+	HYDROGRAPH AT	B6	278.	12.17	34.	10.	5.	.54
+	DIVERSION TO	R6OUT	278.	12.17	34.	10.	5.	.54
+	HYDROGRAPH AT	RETB6	0.	.00	0.	0.	0.	.54
+	2 COMBINED AT	B6C	0.	.00	0.	0.	0.	3.86
+	ROUTED TO	B6B8	0.	.00	0.	0.	0.	3.86
+	HYDROGRAPH AT	B7	57.	12.08	6.	2.	1.	.08
+	DIVERSION TO	R7OUT	57.	12.08	6.	2.	1.	.08
+	HYDROGRAPH AT	RETB7	0.	.00	0.	0.	0.	.08
+	2 COMBINED AT	B8CR	0.	.00	0.	0.	0.	3.94
+	HYDROGRAPH AT	B8	124.	12.58	41.	13.	6.	.41
+	DIVERSION TO	R8OUT	124.	12.58	41.	13.	6.	.41
+	HYDROGRAPH AT	RETB8	0.	.00	0.	0.	0.	.41
+	2 COMBINED AT	B8C	0.	.00	0.	0.	0.	4.35
+	ROUTED TO	B8B10	0.	.00	0.	0.	0.	4.35
+	HYDROGRAPH AT	B9	191.	12.17	25.	8.	4.	.38
+	DIVERSION TO	R9OUT	191.	12.17	25.	8.	4.	.38

+	HYDROGRAPH AT	RETB9	0.	.00	0.	0.	0.	.38
+	2 COMBINED AT	B10CL	0.	.00	0.	0.	0.	4.73
+	HYDROGRAPH AT	B10	23.	12.33	7.	2.	1.	.07
+	DIVERSION TO	R10OUT	23.	12.33	7.	2.	1.	.07
+	HYDROGRAPH AT	RETB10	0.	.00	0.	0.	0.	.07
+	2 COMBINED AT	B10C	0.	.00	0.	0.	0.	4.80
+	ROUTED TO	B10B11	0.	.00	0.	0.	0.	4.80
+	HYDROGRAPH AT	B11	213.	12.08	26.	8.	4.	.41
+	DIVERSION TO	R11OUT	213.	12.08	26.	8.	4.	.41
+	HYDROGRAPH AT	RETB11	0.	.00	0.	0.	0.	.41
+	2 COMBINED AT	B11C	0.	.00	0.	0.	0.	5.21
+	ROUTED TO	B11B22	0.	.00	0.	0.	0.	5.21
+	HYDROGRAPH AT	B12	96.	12.33	17.	5.	2.	.21
+	DIVERSION TO	R12OUT	96.	12.33	17.	5.	2.	.21
+	HYDROGRAPH AT	RETB12	0.	.00	0.	0.	0.	.21
+	2 COMBINED AT	B22CR	0.	.00	0.	0.	0.	5.42
+	HYDROGRAPH AT	B13	124.	12.75	50.	16.	8.	.50
+	DIVERSION TO	R13OUT	124.	12.75	50.	16.	8.	.50
+	HYDROGRAPH AT	RETB13	0.	.00	0.	0.	0.	.50
+	2 COMBINED AT	B22CC	0.	.00	0.	0.	0.	5.92
+	HYDROGRAPH AT	B14	124.	12.58	43.	14.	7.	.43
+	DIVERSION TO	R14OUT	124.	12.58	43.	14.	7.	.43
+	HYDROGRAPH AT	RETB14	0.	.00	0.	0.	0.	.43
+	HYDROGRAPH AT	B15	53.	12.25	12.	4.	2.	.12
+	DIVERSION TO	R15OUT	53.	12.25	12.	4.	2.	.12
+	HYDROGRAPH AT	RETB15	0.	.00	0.	0.	0.	.12
+	2 COMBINED AT	B15C	0.	.00	0.	0.	0.	.55
+	ROUTED TO	B15B16	0.	.00	0.	0.	0.	.55
+	HYDROGRAPH AT	B16	16.	12.08	3.	1.	0.	.03
+	DIVERSION TO	R16OUT	16.	12.08	3.	1.	0.	.03

+	HYDROGRAPH AT	RETB16	0.	.00	0.	0.	0.	.03
+	2 COMBINED AT	B20CR	0.	.00	0.	0.	0.	.57
+	HYDROGRAPH AT	B17	352.	12.17	61.	18.	9.	.64
+	ROUTED TO	RRB17	23.	13.92	14.	5.	2.	.64
+	ROUTED TO	B17B18	23.	14.50	14.	5.	2.	.64
+	HYDROGRAPH AT	B18	159.	12.17	23.	8.	4.	.22
+	DIVERSION TO	R18OUT	159.	12.17	23.	8.	4.	.22
+	HYDROGRAPH AT	RETB18	0.	.00	0.	0.	0.	.22
+	2 COMBINED AT	B18C	23.	14.50	14.	5.	2.	.87
+	DIVERSION TO	DIV18	0.	.00	0.	0.	0.	.87
+	HYDROGRAPH AT	B18D	22.	14.58	14.	5.	2.	.87
+	ROUTED TO	B18B19	19.	16.25	12.	5.	2.	.87
+	HYDROGRAPH AT	B19	250.	12.33	58.	19.	9.	.57
+	DIVERSION TO	R19OUT	250.	12.33	58.	19.	9.	.57
+	HYDROGRAPH AT	RETB19	0.	.00	0.	0.	0.	.57
+	2 COMBINED AT	B19C	19.	16.25	12.	5.	2.	1.44
+	ROUTED TO	B19B20	17.	17.58	11.	4.	2.	1.44
+	HYDROGRAPH AT	B20	338.	12.42	73.	22.	10.	.78
+	DIVERSION TO	R20OUT	338.	12.42	73.	22.	10.	.78
+	HYDROGRAPH AT	RETB20	0.	.00	0.	0.	0.	.78
+	2 COMBINED AT	B20CL	17.	17.58	11.	4.	2.	2.22
+	2 COMBINED AT	B20C	17.	17.58	11.	4.	2.	2.80
+	ROUTED TO	B20B22	14.	20.25	10.	4.	2.	2.80
+	HYDROGRAPH AT	B22	147.	12.50	35.	11.	5.	.36
+	DIVERSION TO	R22OUT	147.	12.50	35.	11.	5.	.36
+	HYDROGRAPH AT	RETB22	0.	.00	0.	0.	0.	.36
+	2 COMBINED AT	B22CC	14.	20.25	10.	4.	2.	3.16
+	HYDROGRAPH AT	B21	156.	12.42	46.	15.	7.	.54
+	DIVERSION TO	R21OUT	156.	12.42	46.	15.	7.	.54
+	HYDROGRAPH AT	RETB21	0.	.00	0.	0.	0.	.54
	2 COMBINED AT							

```
+                        B22CL        14.   20.25        10.        4.        2.      3.70

        2 COMBINED AT
+                         B22C        13.   20.33        10.        4.        2.      9.62

        ROUTED TO
+                       RRB22C        13.   20.33        10.        4.        2.      9.62


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


    -----DSS---ZCLOSE Unit:  71,   File: BF1024F.DSS
              Pointer Utilization:    .25
              Number of Records:       3
              File Size:      15.3  Kbytes
              Percent Inactive:     .0
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Future Condition
100-Year

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1****************************************                    ****************************************
 *                                      *                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *   U.S. ARMY CORPS OF ENGINEERS       *
 *             JUN   1998               *                    *   HYDROLOGIC ENGINEERING CENTER      *
 *           VERSION 4.1                *                    *         609 SECOND STREET            *
 *                                      *                    *      DAVIS, CALIFORNIA 95616         *
 *  RUN DATE   15JUL03  TIME  16:23:36  *                    *          (916) 756-1104            *
 *                                      *                    *                                      *
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                                        X     X  X        X     X         XX
                                        X     X  X        X               X
                                        XXXXXXX  XXXX     X        XXXXX  X
                                        X     X  X        X               X
                                        X     X  X        X     X         X
                                        X     X  XXXXXXX   XXXXX         XXX

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

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

1                                          HEC-1 INPUT                                                    PAGE  1

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

    1           ID   BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP
    2           ID
    3           ID    JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
    4           ID    ADOBE DAM / DESERT HILLS ADMP
    5           ID    FEBRUARY 2003
    6           ID
    7           ID    THIS IS THE 100-YEAR 24-HOUR MODEL FOR FUTURE CONDITIONS
    8           ID
    9           ID
   10           ID    MODEL BASIS:
   11           ID      * DDMSW PROJECT NAME: BF_FU24
   12           ID      * PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
   13           ID      * MULTIPLE STORM OPTION (JD)
   14           ID      * GREEN & AMPT LOSS METHOD
   15           ID      * CLARK UNIT HYDROGRAPH METHOD
   16           ID      * TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
   17           ID        EXCEPT BASIN B17 DUE TO INCORRECT CALCULATION OF Kb FOR
   18           ID        MULTIPLE LAND USES
   19           ID      * MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
   20           ID      * RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI
   21           ID
   22           ID
                *DIAGRAM
   23           IT       5 01FEB03    0005     600
   24           IO       5
   25           IN      15
   26           JD    4.15    0.01
   27           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
   28           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
   29           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
   30           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
   31           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
   32           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
   33           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
   34           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
   35           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
   36           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000
   37           JD   3.901      10

   38           JD   3.735      30
   39           JD   3.569      60
   40           JD   3.511      90
                *

   41           KK      B1   BASIN
   42           BA   0.741
   43           LG    0.25    0.13   10.10    0.04      38
   44           UC   0.729   0.543
   45           UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   46           UA     100
                *
1                                          HEC-1 INPUT                                                    PAGE  2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  47          KK   RETB1
  48          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
  49          KM    - 474.52 AC DEVELOPMENT WITH RETENTION
  50          KM    - C FACTOR = 0.79
  51          KM    - 100-YR 2-HR RAIN = 2.76"
  52          DT   R1OUT   86.23
  53          DI       0    1500
  54          DQ       0    1500
              *

  55          KK      B2   BASIN
  56          BA   0.913
  57          LG    0.22    0.05   12.40    0.01      46
  58          UC   0.788   0.714
  59          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  60          UA     100
              *

  61          KK   RETB2
  62          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
  63          KM    - 584.55 AC DEVELOPMENT WITH RETENTION
  64          KM    - C FACTOR = 0.79
  65          KM    - 100-YR 2-HR RAIN = 2.76"
  66          DT   R2OUT  106.61
  67          DI       0    1500
  68          DQ       0    1500
              *

  69          KK      B3   BASIN
  70          BA   1.011
  71          LG    0.19    0.05   12.40    0.02      52
  72          UC   0.763   0.692
  73          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  74          UA     100
              *

  75          KK   RETB3
  76          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
  77          KM    - 646.80 AC DEVELOPMENT WITH RETENTION
  78          KM    - C FACTOR = 0.80
  79          KM    - 100-YR 2-HR RAIN = 2.76"
  80          DT   R3OUT  118.72
  81          DI       0    1500
  82          DQ       0    1500
              *

  83          KK     B3C
  84          KM      COMBINE B1 + B2 + B3
  85          HC       3
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  86          KK    B3B4ROUTE   REACH
  87          KM    ROUTE COMBINED FLOWS FROM B3C TO B4C
  88          KM     SLOPE = (1538-1535)/1401 = 0.002
  89          RS       3    FLOW      -1
  90          RC   0.080   0.050   0.080    1401  0.0020    0.00
  91          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
  92          RY   110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
              *

  93          KK      B4   BASIN
  94          BA   0.584
  95          LG    0.25    0.15    9.70    0.06      34
  96          UC   0.417   0.277
  97          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  98          UA     100
              *

  99          KK   RETB4
 100          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
 101          KM    - 373.62 AC DEVELOPMENT WITH RETENTION
 102          KM    - C FACTOR = 0.75
 103          KM    - 100-YR 2-HR RAIN = 2.76"
 104          DT   R4OUT   64.50
 105          DI       0    1500
 106          DQ       0    1500
              *

 107          KK     B4C
 108          KM     COMBINE RUNOFF FROM B4 WITH ROUTED FLOWS FROM B3C
 109          HC       2
              *
              *   THIS CHANNEL ROUTING REMOVED FROM 10- & 100-YR MODELS DUE TO BACKUP BETWEEN
```

```
*   STOCK PONDS AT B4C AND B5C.
*
* KK  B4B5ROUTE   REACH
* KM   ROUTE COMBINED FLOWS FROM B4C TO B5C
* KM   SLOPE = (1535-1534)/1014 = 0.001
* RS     2    FLOW      -1
* RC 0.080   0.050   0.080    1014  0.0010    0.00
* RX   0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
* RY 110.0    99.0    98.0    95.0    95.0    98.0    99.0   110.0
*

KK      B5   BASIN
BA   0.069
LG    0.25    0.15    9.70    0.06      30
UC   0.317   0.319
UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
UA     100
*
```

1 HEC-1 INPUT PAGE 4

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

KK   RETB5
KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
KM    - 44.10 AC DEVELOPMENT WITH RETENTION
KM    - C FACTOR = 0.71
KM    - 100-YR 2-HR RAIN = 2.76"
DT   R5OUT    7.20
DI       0     500
DQ       0     500
*

KK     B5C
KM     COMBINE RUNOFF FROM B5 WITH ROUTED FLOWS FROM B4C
HC       2
*

KK   RRB5CROUTE   STORAGE
KM     ROUTE HYDROGRAPH THROUGH COMBINED STORAGE AREA ASSOCIATED WITH TWO

KM     STOCK PONDS (ONE AT B4CA AND THE OTHER AT B5C).
KM     ASSUMPTION OF COMBINED STORAGE AREAS FOR 10-YR & 100-YR EVENTS.
KM     DISCHARGE CURVE COMPUTED WITH COE UNEVEN WEIR PROGRAM (FILE: RR5BC.IN)
RS       1    STOR      -1
SA       0    0.33    1.96   14.34   30.65
SE    1533    1534    1536    1538    1540
SQ       0     103     357     780    1400    2224    3274    4498    5940
SE  1536.0  1536.5  1537.0  1537.5  1538.0  1538.5  1539.0  1539.5  1540.0
*
*   NO CHANNEL ROUTING FROM B5C TO B6C DUE TO SHORT REACH LENGTH (752')
*

KK      B6   BASIN
BA   0.543
LG    0.25    0.25    4.25    0.49      34
UC   0.325   0.258
UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
UA     100
*

KK   RETB6
KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
KM    - 347.21 AC DEVELOPMENT WITH RETENTION
KM    - C FACTOR = 0.72
KM    - 100-YR 2-HR RAIN = 2.76"
DT   R6OUT   57.22
DI       0    1000
DQ       0    1000
*

KK     B6C
KM     COMBINE RUNOFF FROM B6 WITH ROUTED FLOWS FROM B5C
HC       2
*
```

1 HEC-1 INPUT PAGE 5

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

KK    B6B8ROUTE   REACH
KM     ROUTE COMBINED FLOWS FROM B6C TO B8C
KM     SLOPE = (1531-1522)/1909 = 0.0047
RS       2    FLOW      -1
RC   0.080   0.050   0.080    1909  0.0047    0.00
RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
RY   112.0   101.0   100.0    95.0    95.0   100.0   101.0   112.0
*

KK      B7   BASIN
BA   0.080
```

```
163          LG    0.25    0.25    5.10    0.31      40
164          UC   0.188   0.162
165          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
166          UA     100
             *

167          KK   RETB7
168          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
169          KM    - 51.15 AC DEVELOPMENT WITH RETENTION
170          KM    - C FACTOR = 0.71
171          KM    - 100-YR 2-HR RAIN = 2.76"
172          DT   R7OUT    8.35
173          DI       0     500
174          DQ       0     500
             *

175          KK    B8CR
176          KM     COMBINE RUNOFF FROM B7 WITH ROUTED FLOWS FROM B6C
177          HC       2
             *

178          KK      B8   BASIN
179          BA   0.405
180          LG    0.25    0.05   12.40    0.01      30
181          UC   0.750   0.836
182          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
183          UA     100
             *

184          KK   RETB8
185          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
186          KM    - 259.04 AC DEVELOPMENT WITH RETENTION
187          KM    - C FACTOR = 0.71
188          KM    - 100-YR 2-HR RAIN = 2.76"
189          DT   R8OUT   42.52
190          DI       0     500
191          DQ       0     500
             *
```



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

192          KK     B8C
193          KM     COMBINE RUNOFF FROM B8 WITH COMBINED FLOWS AT B8CL
194          KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B8C
195          HC       2
             *

196          KK   B8B10ROUTE   REACH
197          KM     ROUTE COMBINED FLOWS FROM B8C TO B10C
198          KM     SLOPE = (1522-1514)/1700 = 0.0047
199          RS       2    FLOW      -1
200          RC   0.080   0.050   0.080    1700  0.0047    0.00
201          RX     0.0   250.0   275.0   280.0   290.0   295.0   320.0   570.0
202          RY   112.0   101.0   100.0    95.0    95.0   100.0   101.0   112.0
             *

203          KK      B9   BASIN
204          BA   0.385
205          LG    0.25    0.25    4.60    0.39      34
206          UC   0.308   0.275
207          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
208          UA     100
             *

209          KK   RETB9
210          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
211          KM    - 246.54 AC DEVELOPMENT WITH RETENTION
212          KM    - C FACTOR = 0.71
213          KM    - 100-YR 2-HR RAIN = 2.76"
214          DT   R9OUT   40.26
215          DI       0    1000
216          DQ       0    1000
             *

217          KK   B10CL
218          KM     COMBINE RUNOFF FROM B9 WITH ROUTED FLOWS FROM B8C
219          HC       2
             *

220          KK     B10   BASIN
221          BA   0.070
222          LG    0.25    0.05   12.40    0.01      30
223          UC   0.504   0.813
224          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
225          UA     100
             *

226          KK  RETB10
227          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
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228          KM    - 44.70 AC DEVELOPMENT WITH RETENTION
229          KM    - C FACTOR = 0.71
230          KM    - 100-YR 2-HR RAIN = 2.76"
231          DT  R10OUT    7.30
232          DI       0     500
233          DQ       0     500
             *
1                                        HEC-1 INPUT                                                    PAGE  7

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


234          KK    B10C
235          KM     COMBINE RUNOFF FROM B10 WITH COMBINED FLOWS AT B10CL
236          KM     THIS IS THE TOTAL FLOW IN BUCHANAN WASH AT B10C
237          HC       2
             *

238          KK  B10B11ROUTE   REACH
239          KM     ROUTE COMBINED FLOWS FROM B10C TO B11C
240          KM     SLOPE = (1514-1509)/1236 = 0.0040
241          RS       1    FLOW      -1
242          RC   0.080   0.050   0.080    1236  0.0040    0.00
243          RX     0.0    25.0    50.0    55.0    70.0    75.0   100.0   515.0
244          RY   106.0   101.0   100.0    95.0    95.0   100.0   101.0   106.0
             *

245          KK     B11   BASIN
246          BA   0.410
247          LG    0.25    0.25    4.45    0.43      34
248          UC   0.304   0.256
249          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
250          UA     100
             *

251          KK  RETB11
252          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
253          KM    - 262.10 AC DEVELOPMENT WITH RETENTION
254          KM    - C FACTOR = 0.71
255          KM    - 100-YR 2-HR RAIN = 2.76"
256          DT  R11OUT   42.80
257          DI       0    1000
258          DQ       0    1000
             *

259          KK    B11C
260          KM     COMBINE RUNOFF FROM B11 WITH ROUTED FLOWS FROM B10C
261          HC       2
             *

262          KK  B11B22ROUTE   REACH
263          KM     ROUTE COMBINED FLOWS FROM B11C TO B22C THRU B12
264          KM     SLOPE = (1509-1498)/2644 = 0.0042
265          RS       2    FLOW      -1
266          RC   0.080   0.050   0.080    2644  0.0042    0.00
267          RX     0.0    25.0   200.0   206.0   230.0   236.0   336.0   536.0
268          RY   106.0   102.0   100.0    97.0    95.0   100.0   102.0   106.0
             *

269          KK     B12   BASIN
270          BA   0.206
271          LG    0.22    0.15    7.60    0.11      42
272          UC   0.521   0.413
273          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
274          UA     100
             *
1                                        HEC-1 INPUT                                                    PAGE  8

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


275          KK  RETB12
276          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
277          KM    - 117.16 AC DEVELOPMENT WITH RETENTION
278          KM    - C FACTOR = 0.71
279          KM    - 100-YR 2-HR RAIN = 2.76"
280          DT  R12OUT   19.13
281          DI       0     500
282          DQ       0     500
             *

283          KK   B22CR
284          KM     COMBINE RUNOFF FROM B12 WITH ROUTED FLOWS FROM B11C
285          HC       2
             *

286          KK     B13   BASIN
287          BA   0.502
288          LG    0.24    0.05   12.40    0.01      33
289          UC   0.925   1.158
290          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
```

```
291          UA     100
             *

292          KK  RETB13
293          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
294          KM    - 309.67 AC DEVELOPMENT WITH RETENTION
295          KM    - C FACTOR = 0.71
296          KM    - 100-YR 2-HR RAIN = 2.76"
297          DT  R13OUT   50.69
298          DI       0     500
299          DQ       0     500
             *

300          KK   B22CC
301          KM     COMBINE RUNOFF FROM B13 WITH COMBINED FLOWS AT B22CR
302          HC       2
             *

303          KK     B14   BASIN
304          BA   0.431
305          LG    0.20    0.05   12.40    0.02      48
306          UC   0.733   0.929
307          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
308          UA     100
             *

309          KK  RETB14
310          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
311          KM    - 275.85 AC DEVELOPMENT WITH RETENTION
312          KM    - C FACTOR = 0.76
313          KM    - 100-YR 2-HR RAIN = 2.76"
314          DT  R14OUT   48.43
315          DI       0     500
316          DQ       0     500
             *
```



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

317          KK     B15   BASIN
318          BA   0.115
319          LG    0.25    0.05   12.40    0.01      30
320          UC   0.425   0.459
321          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
322          UA     100
             *

323          KK  RETB15
324          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
325          KM    - 73.72 AC DEVELOPMENT WITH RETENTION
326          KM    - C FACTOR = 0.71
327          KM    - 100-YR 2-HR RAIN = 2.76"
328          DT  R15OUT   12.04
329          DI       0     500
330          DQ       0     500
             *

331          KK    B15C
332          KM     COMBINE RUNOFF FROM B14 WITH RUNOFF FROM B15
333          HC       2
             *

334          KK  B15B16ROUTE   REACH
335          KM     ROUTE COMBINED FLOWS FROM B15C TO B16C
336          KM     SLOPE = (1530-1516)/1669 = 0.0084
337          RS       1    FLOW      -1
338          RC   0.080   0.050   0.080    1669  0.0084    0.00
339          RX     0.0    20.0    40.0    65.0    85.0   110.0   130.0   150.0
340          RY   100.0    98.0    96.0    96.0    96.0    96.0    98.0   100.0
             *

341          KK     B16   BASIN
342          BA   0.027
343          LG    0.25    0.05   12.40    0.01      30
344          UC   0.254   0.286
345          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
346          UA     100
             *

347          KK  RETB16
348          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
349          KM    - 17.26 AC DEVELOPMENT WITH RETENTION
350          KM    - C FACTOR = 0.71
351          KM    - 100-YR 2-HR RAIN = 2.76"
352          DT  R16OUT    2.82
353          DI       0     500
354          DQ       0     500
             *
```

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

 355          KK   B20CR
 356          KM     COMBINE RUNOFF FROM B16 WITH ROUTED FLOWS FROM B15C
 357          HC       2
              *

 358          KK     B17   BASIN
 359          BA   0.643
 360          LG    0.22    0.10   11.20    0.03      41
 361          UC   0.479   0.296
 362          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 363          UA     100
              *

 364          KK   RRB17ROUTE   STORAGE
 365          KM   STORAGE ROUTE ADDED TO ACCOUNT FOR THE TRAMONTO DEVELOPMENT
 366          KM    - 27.39 AC-FT OF VOLUME IS RETAINED PRIOR TO OUTLET DOWNSTREAM
 367          KM    - ADDITIONAL VOLUME ABOVE 27.39 IS IN A VERTICAL PATTERN ASSUMING
 368          KM    - A 4' DEEP RETENTION BASIN TO REACH THE 27.39 AC-FT.
 369          RS       1    ELEV    1676
 370          SV     0.0   27.39   34.24   41.09   47.94   54.78
 371          SE    1676    1678    1679    1680    1681    1682
 372          SQ     0.0     0.0    67.0   134.0   817.0  1500.0
              *

 373          KK  B17B18ROUTE   REACH
 374          KM     ROUTE RUNOFF FROM B17 TO B18C
 375          KM     SLOPE = (1680-1640)/4738 = 0.0084
 376          RS       5    FLOW      -1
 377          RC   0.080   0.050   0.080    4738  0.0084    0.00
 378          RX     0.0    40.0   110.0   115.0   130.0   135.0   205.0   240.0
 379          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
              *

 380          KK     B18   BASIN
 381          BA   0.225
 382          LG    0.12    0.10   11.20    0.03      75
 383          UC   0.292   0.199
 384          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 385          UA     100
              *

 386          KK  RETB18
 387          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
 388          KM    - 143.77 AC DEVELOPMENT WITH RETENTION
 389          KM    - C FACTOR = 0.84
 390          KM    - 100-YR 2-HR RAIN = 2.76"
 391          DT  R18OUT   27.63
 392          DI       0    1000

 393          DQ       0    1000
              *
1                                          HEC-1 INPUT                                          PAGE 11

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

 394          KK    B18C
 395          KM     COMBINE RUNOFF FROM B18 WITH ROUTED FLOWS FROM B17
 396          KM     THIS IS THE TOTAL FLOW AT I-17.
 397          HC       2
              *

 398          KK    B18D
 399          KM     DIVERSION OF FLOW TO SOUTH ALONG EAST SIDE OF I-17
 400          KM     THIS FLOW EVENTUALLY RE-JOINS SKUNK CREEK
 401          DT   DIV18
 402          DI     250     500     750    1000    1250    1500
 403          DQ       0      66     212     405     601     822
              *

 404          KK  B18B19ROUTE   REACH
 405          KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
 406          KM     SLOPE = (1640-1561)/10091 = 0.0078
 407          RS       9    FLOW      -1
 408          RC   0.080   0.050   0.080   10091  0.0078    0.00
 409          RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
 410          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0
              *

 411          KK     B19   BASIN
 412          BA   0.574
 413          LG    0.12    0.10   11.20    0.03      73
 414          UC   0.508   0.468
 415          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 416          UA     100
              *

 417          KK  RETB19
```

```
418          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
419          KM    - 367.25 AC DEVELOPMENT WITH RETENTION
420          KM    - C FACTOR = 0.83
421          KM    - 100-YR 2-HR RAIN = 2.76"
422          DT  R19OUT   70.13
423          DI       0    1000
424          DQ       0    1000
             *

425          KK    B19C
426          KM     COMBINE RUNOFF FROM B19 WITH ROUTED FLOWS FROM B18C
427          HC       2
             *

428          KK  B19B20ROUTE   REACH
429          KM     ROUTE COMBINED FLOWS FROM B19C TO B20C
430          KM     SLOPE = (1561-1516)/6629 = 0.0068
431          RS       6    FLOW      -1
432          RC   0.080   0.050   0.080    6629  0.0068    0.00
433          RX     0.0    70.0   120.0   125.0   145.0   150.0   200.0   270.0
434          RY   100.0    98.0    96.0    95.0    95.0    96.0    98.0   100.0

             *
1                                          HEC-1 INPUT                                                PAGE 12

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

435          KK     B20   BASIN
436          BA   0.781
437          LG    0.24    0.10   11.20    0.03      36
438          UC   0.654   0.478
439          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
440          UA     100
             *

441          KK  RETB20
442          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
443          KM    - 500.03 AC DEVELOPMENT WITH RETENTION
444          KM    - C FACTOR = 0.72
445          KM    - 100-YR 2-HR RAIN = 2.76"
446          DT  R20OUT   82.84
447          DI       0    1500
448          DQ       0    1500
             *

449          KK   B20CL
450          KM     COMBINE RUNOFF FROM B20 WITH ROUTED FLOWS FROM B19C
451          HC       2
             *

452          KK    B20C
453          KM     COMBINE FLOWS FROM B20CR AND B20CL
454          KM     THIS IS THE TOTAL FLOW AT B20C
455          HC       2
             *

456          KK  B20B22ROUTE   REACH
457          KM     ROUTE COMBINED FLOWS FROM B18C TO B19C
458          KM     SLOPE = (1516-1498)/4576 = 0.0039
459          RS       8    FLOW      -1
460          RC   0.080   0.070   0.080    4576  0.0039    0.00
461          RX     0.0   200.0   250.0   275.0   325.0   400.0   450.0   500.0
462          RY   104.0    99.0    98.0    98.0    98.0    98.0    99.0   104.0
             *

463          KK     B22   BASIN
464          BA   0.361
465          LG    0.19    0.10   11.20    0.03      48
466          UC   0.708   0.546
467          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
468          UA     100
             *

469          KK  RETB22
470          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
471          KM    - 176.44 AC DEVELOPMENT WITH RETENTION
472          KM    - C FACTOR = 0.71
473          KM    - 100-YR 2-HR RAIN = 2.76"
474          DT  R22OUT   28.81
475          DI       0    1000
476          DQ       0    1000

             *
1                                          HEC-1 INPUT                                                PAGE 13

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

477          KK   B22CC
478          KM    COMBINE RUNOFF FROM B22 WITH ROUTED FLOWS FROM B20C
```

```
479          HC       2
             *

480          KK     B21   BASIN
481          BA   0.544
482          LG    0.21    0.15    8.40    0.09      49
483          UC   0.758   0.835
484          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
485          UA     100
             *

486          KK  RETB21
487          KM   DIVERT VOLUME FOR RETENTION ESTIMATED BASED ON:
488          KM    - 345.37 AC DEVELOPMENT WITH RETENTION
489          KM    - C FACTOR = 0.75
490          KM    - 100-YR 2-HR RAIN = 2.76"
491          DT  R21OUT   59.31
492          DI       0    1000
493          DQ       0    1000
             *
             *  KKB21B22
             *  KM   ROUTE ROUTED OUTFLOW FROM B21 TO B22C
             *  KM   SLOPE = (1504-1498)/3868 = 0.0016
             *  RS     8    FLOW      -1
             *  RC  0.08    0.05    0.08    3868  0.0016
             *  RX     0      30      50      60      70      80     200     500
             *  RY   100      92      90      85      85      90      92      94
             *

494          KK   B22CL
495          KM    COMBINE B22C WITH ROUTED FLOWS FROM B21
496          HC       2
             *

497          KK    B22C
498          KM     COMBINE ALL FLOWS IN BUCHANAN WASH UPSTREAM OF CAP
499          HC       2
500          ZW      A=BW@CAP   C=FLOW   F=EX24
             *

501          KK  RRB22CROUTE   STORAGE
502          KM     ROUTE FLOWS THROUGH LARGE PONDING AREA UPSTREAM OF CAP
503          KM     OUTLET IS 3 - 66" RCPS
504          KM     THIS STORAGE ROUTING INCLUDES AREA IN RRB21C FOR THE 10-YR AND 100-YR
505          KM     MODELS AS THE MAXIMUM PONDING ELEVATION BACKS UP FROM RRB22C EAST INTO
506          KM     RRB21C AREA ABOVE ABOUT 1504.0 FT.
507          RS       1    STOR      -1
508          SA       0    0.35    3.60   12.87   37.91   74.76  119.27  156.56  191.36  227.38
509          SA  269.52  317.29
510          SE    1498    1500    1502    1504    1506    1508    1510    1512    1514    1516
511          SE    1518    1520
512          SQ       0     200     400     500     800    1000    1200    1400    1600    2000
```



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

513          SE    1496 1499.12 1500.82 1501.61  1504.6  1507.4 1510.88 1514.97 1519.64 1520.26
             *
514          ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   41          B1
                .
                .
   52           .-------->   R1OUT
   47       RETB1
                .
                .
   55           .          B2
                .           .
                .           .
   66           .           .-------->   R2OUT
   61           .       RETB2
                .           .
                .           .
   69           .           .          B3
                .           .           .
                .           .           .
   80           .           .           .-------->   R3OUT
   75           .           .       RETB3
                .           .           .
                .           .           .
   83         B3C.......................
                V
                V
   86        B3B4
```

```
                .
                .
 93             .          B4
                .           .

                .           .
104             .           .-------> R4OUT
 99             .       RETB4
                .           .
                .           .
107          B4C............
                .
                .
110             .          B5
                .           .
                .           .
121             .           .-------> R5OUT
116             .       RETB5
                .           .
                .           .
124          B5C............
                V
                V
127        RRB5C
                .
                .
137             .          B6
                .           .
                .           .
148             .           .-------> R6OUT
143             .       RETB6
                .           .
                .           .
151          B6C............
                V
                V
154         B6B8
                .
                .
161             .          B7

                .           .
                .           .
172             .           .-------> R7OUT
167             .       RETB7
                .           .
                .           .
175         B8CR............
                .
                .
178             .          B8
                .           .
                .           .
189             .           .-------> R8OUT
184             .       RETB8
                .           .
                .           .
192          B8C............
                V
                V
196        B8B10
                .
                .
203             .          B9
                .           .
                .           .
214             .           .-------> R9OUT
209             .       RETB9
                .           .
                .           .
217       B10CL............
                .
                .
220             .         B10
                .           .
                .           .
231             .           .-------> R10OUT
226             .      RETB10
                .           .
                .           .
234         B10C............
                V
                V
238       B10B11
                .
                .
245             .         B11
                .           .
                .           .
256             .           .-------> R11OUT
251             .      RETB11
```

```
                .          .
                .          .
259         B11C............
                V
                V
262       B11B22
                .
                .
269             .        B12
                .          .
                .          .
280             .          .-------> R12OUT
275             .     RETB12
                .          .
                .          .
283       B22CR............
                .
                .
286             .        B13
                .          .
                .          .
297             .          .-------> R13OUT
292             .     RETB13
                .          .
                .          .
300       B22CC............
                .
                .
303             .        B14
                .          .
                .          .
314             .          .-------> R14OUT
309             .     RETB14
                .          .
                .          .
317             .          .       B15
                .          .         .
                .          .         .
328             .          .         .-------> R15OUT
323             .          .     RETB15
                .          .         .
                .          .         .
331             .      B15C............
                .        V
                .        V
334             .     B15B16
                .          .
                .          .
341             .          .       B16
                .          .         .
                .          .         .
352             .          .         .-------> R16OUT
347             .          .     RETB16
                .          .         .
                .          .         .
355             .     B20CR............
                .          .
                .          .
358             .          .       B17
                .          .         V
                .          .         V
364             .          .      RRB17
                .          .         V
                .          .         V
373             .          .     B17B18

                .          .         .
                .          .         .
380             .          .         .       B18
                .          .         .         .
                .          .         .         .

391             .          .         .         .-------> R18OUT
386             .          .         .     RETB18
                .          .         .         .
                .          .         .         .
394             .          .       B18C............
                .          .         .
                .          .         .
401             .          .         .-------> DIV18
398             .          .       B18D
                .          .         V
                .          .         V
404             .          .     B18B19
                .          .         .
                .          .         .
411             .          .         .       B19
                .          .         .         .
                .          .         .         .
422             .          .         .         .-------> R19OUT
417             .          .         .     RETB19
```

```
                .          .          .          .
                .          .          .          .
  425           .          .       B19C...........
                .          .          V
                .          .          V
  428           .          .      B19B20
                .          .          .
                .          .          .
  435           .          .          .        B20
                .          .          .          .
                .          .          .          .
  446           .          .          .          .-------> R20OUT
  441           .          .          .      RETB20
                .          .          .          .
                .          .          .          .
  449           .          .       B20CL...........
                .          .          .
                .          .          .
  452           .        B20C...........
                .          V
                .          V
  456           .      B20B22
                .          .
                .          .
  463           .          .         B22
                .          .          .
                .          .          .
  474           .          .          .-------> R22OUT
  469           .          .      RETB22
                .          .          .
                .          .          .
  477           .       B22CC...........
                .          .
                .          .
  480           .          .         B21
                .          .          .
                .          .          .
  491           .          .          .-------> R21OUT
  486           .          .      RETB21

                .          .          .
                .          .          .
  494           .       B22CL...........
                .          .
                .          .
  497        B22C...........
                V
                V
  501      RRB22C
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998              *
 *            VERSION 4.1               *
 *                                      *
 *  RUN DATE   15JUL03  TIME  16:23:36  *
 *                                      *
 ****************************************
```

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

BUCHANAN WASH AND TRIBUTARIES UPSTREAM OF CAP

JE FULLER / HYDROLOGY & GEOMORPHOLOGY, INC.
ADOBE DAM / DESERT HILLS ADMP
FEBRUARY 2003

THIS IS THE 100-YEAR 24-HOUR MODEL FOR FUTURE CONDITIONS

MODEL BASIS:
* DDMSW PROJECT NAME: BF_FU24
* PREFRE RAINFALL STATISTICS FROM NOAA ATLAS II
* MULTIPLE STORM OPTION (JD)
* GREEN & AMPT LOSS METHOD
* CLARK UNIT HYDROGRAPH METHOD
* TC & R COMPUTED WITH MCHUP1 THRU DDMSW 2.1
  EXCEPT BASIN B17 DUE TO INCORRECT CALCULATION OF Kb FOR
  MULTIPLE LAND USES
* MODIFIED PULS NORMAL DEPTH CHANNEL ROUTING
* RRB17 WAS INSERTED TO ACCOUNT FOR TRAMONTO MASTER PLAN COMMUNITY RETENTI

```
  24 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       1FEB 3  STARTING DATE
               ITIME         0005  STARTING TIME
                  NQ          600  NUMBER OF HYDROGRAPH ORDINATES
              NDDATE       3FEB 3  ENDING DATE
              NDTIME         0200  ENDING TIME
               ICENT           19  CENTURY MARK

          COMPUTATION INTERVAL      .08 HOURS
               TOTAL TIME BASE    49.92 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

26 JD       INDEX STORM NO. 1
                STRM        4.15  PRECIPITATION DEPTH
                TRDA         .01  TRANSPOSITION DRAINAGE AREA

27 PI         PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00

37 JD       INDEX STORM NO. 2
                STRM        3.90  PRECIPITATION DEPTH
                TRDA       10.00  TRANSPOSITION DRAINAGE AREA

 0 PI         PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
```

```
                .00       .00       .00       .00       .00       .00       .00       .00

38 JD        INDEX STORM NO. 3
                STRM        3.73  PRECIPITATION DEPTH
                TRDA       30.00  TRANSPOSITION DRAINAGE AREA

 0 PI         PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00

39 JD        INDEX STORM NO. 4
                STRM        3.57  PRECIPITATION DEPTH
                TRDA       60.00  TRANSPOSITION DRAINAGE AREA

 0 PI         PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00

40 JD        INDEX STORM NO. 5
                STRM        3.51  PRECIPITATION DEPTH
                TRDA       90.00  TRANSPOSITION DRAINAGE AREA

 0 PI         PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
```

```
                    .01    .01    .01    .01    .01    .01    .01    .01    .03    .03
                    .03    .09    .09    .09    .01    .01    .01    .01    .01    .01
                    .01    .01    .01    .01    .01    .01    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .00    .00
   -----DSS---ZOPEN:  Existing File Opened,  File: BF10024F.DSS
                     Unit:  71;  DSS Version: 6-JG
 -----DSS---ZWRITE Unit  71; Vers.    7:  /BW@CAP/B22C/FLOW/01FEB1903/5MIN/EX24/
 -----DSS---ZWRITE Unit  71; Vers.    7:  /BW@CAP/B22C/FLOW/02FEB1903/5MIN/EX24/
 -----DSS---ZWRITE Unit  71; Vers.    7:  /BW@CAP/B22C/FLOW/03FEB1903/5MIN/EX24/
1
                                   RUNOFF SUMMARY
                          FLOW IN CUBIC FEET PER SECOND
                       TIME IN HOURS,  AREA IN SQUARE MILES

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

        HYDROGRAPH AT
+                          B1     842.   12.50      190.       56.        27.      .74

        DIVERSION TO
+                        R1OUT    842.   12.50      162.       43.        21.      .74

        HYDROGRAPH AT
+                        RETB1    179.   13.83       44.       13.         6.      .74

        HYDROGRAPH AT
+                          B2     849.   12.58      265.       86.        42.      .91

        DIVERSION TO
+                        R2OUT    849.   12.58      199.       54.        26.      .91

        HYDROGRAPH AT
+                        RETB2    394.   13.50      107.       33.        16.      .91

        HYDROGRAPH AT
+                          B3     956.   12.50      290.       93.        45.     1.01

        DIVERSION TO
+                        R3OUT    956.   12.50      219.       60.        29.     1.01

        HYDROGRAPH AT
+                        RETB3    421.   13.50      110.       33.        16.     1.01

        3 COMBINED AT
+                          B3C    861.   13.50      251.       76.        37.     2.66

        ROUTED TO
+                         B3B4    772.   13.92      250.       76.        37.     2.66

        HYDROGRAPH AT
+                          B4     900.   12.25      140.       41.        20.      .58

        DIVERSION TO
+                        R4OUT    900.   12.25      122.       33.        16.      .58

        HYDROGRAPH AT
+                        RETB4    141.   13.08       28.        9.         4.      .58

        2 COMBINED AT
+                          B4C    808.   13.92      269.       84.        40.     3.25

        HYDROGRAPH AT
+                          B5     108.   12.17       17.        5.         2.      .07

        DIVERSION TO
+                        R5OUT    108.   12.17       14.        4.         2.      .07

        HYDROGRAPH AT
+                        RETB5     24.   12.75        4.        1.         1.      .07

        2 COMBINED AT
+                          B5C    812.   13.92      271.       85.        41.     3.32

        ROUTED TO
+                        RRB5C    787.   14.00      270.       85.        41.     3.32

        HYDROGRAPH AT
```

+		B6	795.	12.17	96.	30.	14.	.54
+	DIVERSION TO	R6OUT	795.	12.17	96.	29.	14.	.54
+	HYDROGRAPH AT	RETB6	5.	16.92	3.	1.	0.	.54
+	2 COMBINED AT	B6C	784.	14.00	270.	85.	41.	3.86
+	ROUTED TO	B6B8	756.	14.17	269.	84.	41.	3.86
+	HYDROGRAPH AT	B7	163.	12.08	16.	5.	2.	.08
+	DIVERSION TO	R7OUT	163.	12.08	15.	4.	2.	.08
+	HYDROGRAPH AT	RETB7	7.	12.83	2.	1.	0.	.08
+	2 COMBINED AT	B8CR	759.	14.17	271.	85.	41.	3.94
+	HYDROGRAPH AT	B8	353.	12.58	117.	37.	18.	.41
+	DIVERSION TO	R8OUT	353.	12.58	81.	21.	10.	.41
+	HYDROGRAPH AT	RETB8	192.	13.42	52.	16.	7.	.41
+	2 COMBINED AT	B8C	860.	14.17	318.	99.	48.	4.35
+	ROUTED TO	B8B10	842.	14.33	317.	99.	48.	4.35
+	HYDROGRAPH AT	B9	546.	12.17	71.	22.	10.	.38
+	DIVERSION TO	R9OUT	546.	12.17	71.	20.	10.	.38
+	HYDROGRAPH AT	RETB9	5.	15.00	4.	1.	1.	.38
+	2 COMBINED AT	B10CL	839.	14.33	317.	100.	48.	4.73
+	HYDROGRAPH AT	B10	67.	12.33	21.	6.	3.	.07
+	DIVERSION TO	R10OUT	67.	12.33	14.	4.	2.	.07
+	HYDROGRAPH AT	RETB10	35.	13.25	10.	3.	1.	.07
+	2 COMBINED AT	B10C	853.	14.33	325.	102.	49.	4.80
+	ROUTED TO	B10B11	834.	14.50	324.	102.	49.	4.80
+	HYDROGRAPH AT	B11	608.	12.08	74.	23.	11.	.41
+	DIVERSION TO	R11OUT	608.	12.08	74.	22.	10.	.41
+	HYDROGRAPH AT	RETB11	5.	15.42	3.	1.	1.	.41
+	2 COMBINED AT	B11C	832.	14.50	324.	103.	49.	5.21
+	ROUTED TO	B11B22	798.	14.75	322.	103.	49.	5.21
+	HYDROGRAPH AT,	B12	276.	12.33	48.	15.	7.	.21
+	DIVERSION TO	R12OUT	276.	12.33	35.	10.	5.	.21
+	HYDROGRAPH AT	RETB12	113.	12.92	18.	5.	2.	.21

+	2 COMBINED AT	B22CR	806.	14.75	329.	107.	52.	5.42
+	HYDROGRAPH AT	B13	354.	12.75	143.	46.	22.	.50
+	DIVERSION TO	R13OUT	354.	12.75	96.	26.	12.	.50
+	HYDROGRAPH AT	RETB13	210.	13.75	70.	21.	10.	.50
+	2 COMBINED AT	B22CC	918.	14.67	393.	126.	61.	5.92
+	HYDROGRAPH AT	B14	355.	12.58	123.	39.	19.	.43
+	DIVERSION TO	R14OUT	355.	12.58	90.	24.	12.	.43
+	HYDROGRAPH AT	RETB14	171.	13.67	51.	15.	7.	.43
+	HYDROGRAPH AT	B15	151.	12.25	34.	11.	5.	.12
+	DIVERSION TO	R15OUT	151.	12.25	23.	6.	3.	.12
+	HYDROGRAPH AT	RETB15	73.	12.83	15.	5.	2.	.12
+	2 COMBINED AT	B15C	196.	13.67	63.	19.	9.	.55
+	ROUTED TO	B15B16	167.	13.83	62.	19.	9.	.55
+	HYDROGRAPH AT	B16	47.	12.08	8.	3.	1.	.03
+	DIVERSION TO	R16OUT	47.	12.08	5.	1.	1.	.03
+	HYDROGRAPH AT	RETB16	25.	12.42	4.	1.	1.	.03
+	2 COMBINED AT	B20CR	170.	13.83	65.	20.	10.	.57
+	HYDROGRAPH AT	B17	1006.	12.17	175.	53.	25.	.64
+	ROUTED TO	RRB17	752.	12.42	140.	39.	19.	.64
+	ROUTED TO	B17B18	584.	12.92	138.	39.	19.	.64
+	HYDROGRAPH AT	B18	455.	12.17	66.	22.	11.	.22
+	DIVERSION TO	R18OUT	455.	12.17	50.	14.	7.	.22
+	HYDROGRAPH AT	RETB18	165.	12.50	26.	8.	4.	.22
+	2 COMBINED AT	B18C	651.	12.83	163.	46.	22.	.87
+	DIVERSION TO	DIV18	154.	12.83	14.	4.	2.	.87
+	HYDROGRAPH AT	B18D	497.	12.83	149.	43.	21.	.87
+	ROUTED TO	B18B19	422.	13.75	144.	43.	21.	.87
+	HYDROGRAPH AT	B19	714.	12.33	166.	55.	26.	.57
+	DIVERSION TO	R19OUT	714.	12.33	126.	35.	17.	.57
+	HYDROGRAPH AT	RETB19	307.	13.00	65.	20.	9.	.57

+	2 COMBINED AT	B19C	544.	13.67	205.	62.	30.	1.44
+	ROUTED TO	B19B20	509.	14.25	201.	62.	30.	1.44
+	HYDROGRAPH AT	B20	965.	12.42	209.	62.	30.	.78
+	DIVERSION TO	R20OUT	965.	12.42	156.	42.	20.	.78
+	HYDROGRAPH AT	RETB20	347.	13.25	71.	20.	10.	.78
+	2 COMBINED AT	B20CL	615.	14.17	265.	81.	39.	2.22
+	2 COMBINED AT	B20C	761.	14.08	325.	100.	48.	2.80
+	ROUTED TO	B20B22	738.	14.67	316.	100.	48.	2.80
+	HYDROGRAPH AT	B22	420.	12.50	100.	31.	15.	.36
+	DIVERSION TO	R22OUT	420.	12.50	52.	15.	7.	.36
+	HYDROGRAPH AT	RETB22	336.	12.75	59.	16.	8.	.36
+	2 COMBINED AT	B22CC	778.	14.58	351.	115.	55.	3.16
+	HYDROGRAPH AT	B21	445.	12.42	133.	42.	20.	.54
+	DIVERSION TO	R21OUT	445.	12.42	109.	30.	14.	.54
+	HYDROGRAPH AT	RETB21	146.	13.83	39.	12.	6.	.54
+	2 COMBINED AT	B22CL	849.	14.58	383.	126.	61.	3.70
+	2 COMBINED AT	B22C	1732.	14.67	749.	247.	119.	9.62
+	ROUTED TO	RRB22C	934.	15.67	748.	247.	119.	9.62

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

```
-----DSS---ZCLOSE Unit:  71,   File: BF10024F.DSS
          Pointer Utilization:   .25
          Number of Records:      3
          File Size:     15.3  Kbytes
          Percent Inactive:    .0
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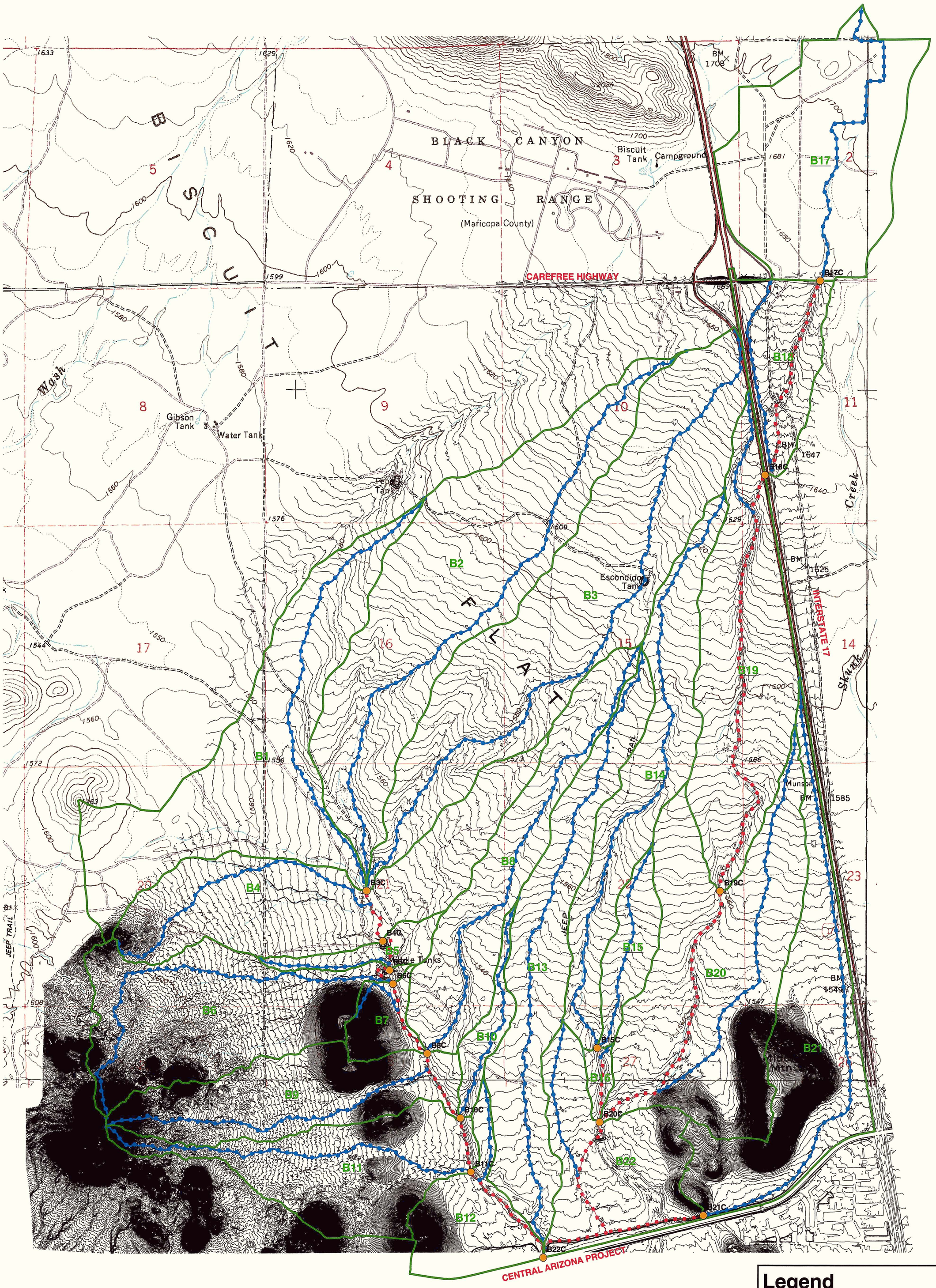
EXHIBIT A

Watershed Exhibit



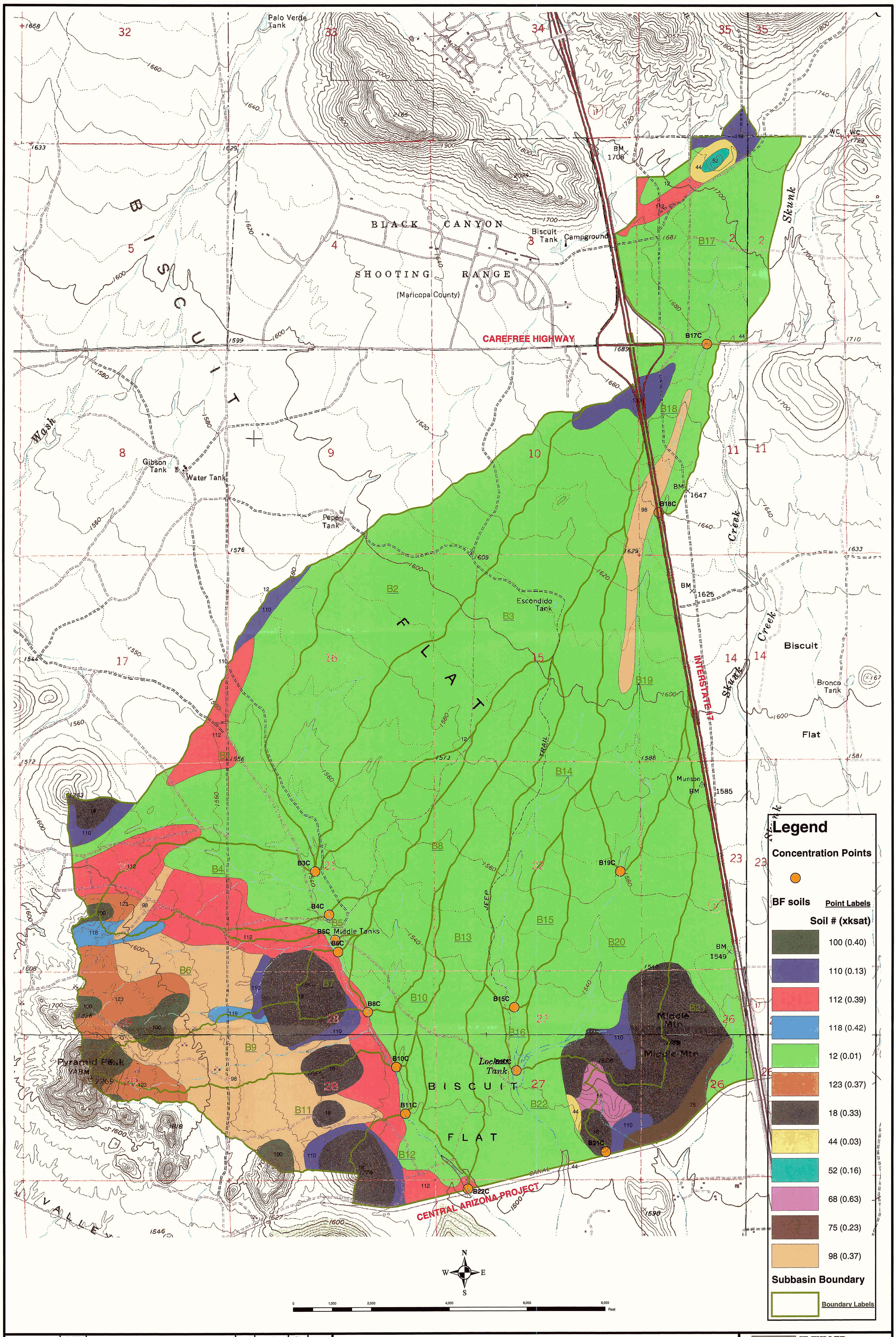
JOB NO.	24-2003	REVISIONS	NO.	DATE	BY	CHKD
DESIGNED BY	JAD					
DRAWN BY	NAH					
CHECKED BY	JAD					
APPROVED BY	JAD					
DATE	5-22-03					

ADOBE DAM/DESERT HILLS AREA DRAINAGE MASTER PLAN - FCD 2002C001
EXHIBIT A
BUCHANAN WASH

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.
6101 S. Rural Rd., Ste. 110
Tempe, Arizona 85283
Phone (480) 752-2124
Fax (480) 839-2193
www.jefuller.com
2881 N. Silver Spur Dr.
Tucson, Arizona 85745
Phone (520) 623-3112
Fax (520) 623-3130

EXHIBIT B

Soils Exhibit



JOB NO.	24-2003	REVISIONS	NO.	DATE	BY	CHKD
DESIGNED BY	JAD					
DRAWN BY	NAH					
CHECKED BY	JAD					
APPROVED BY	JAD					
DATE	9-24-03					

ADOBE DAM/DESERT HILLS AREA DRAINAGE MASTER PLAN - FCD 2002C001
EXHIBIT B
BUCHANAN WASH

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.
6101 S. Rural Rd., Ste. 110
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Phone (480) 752-2124
Fax (480) 839-2193
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2881 N. Silver Spur Dr.
Tucson, Arizona 85745
Phone (520) 623-3112
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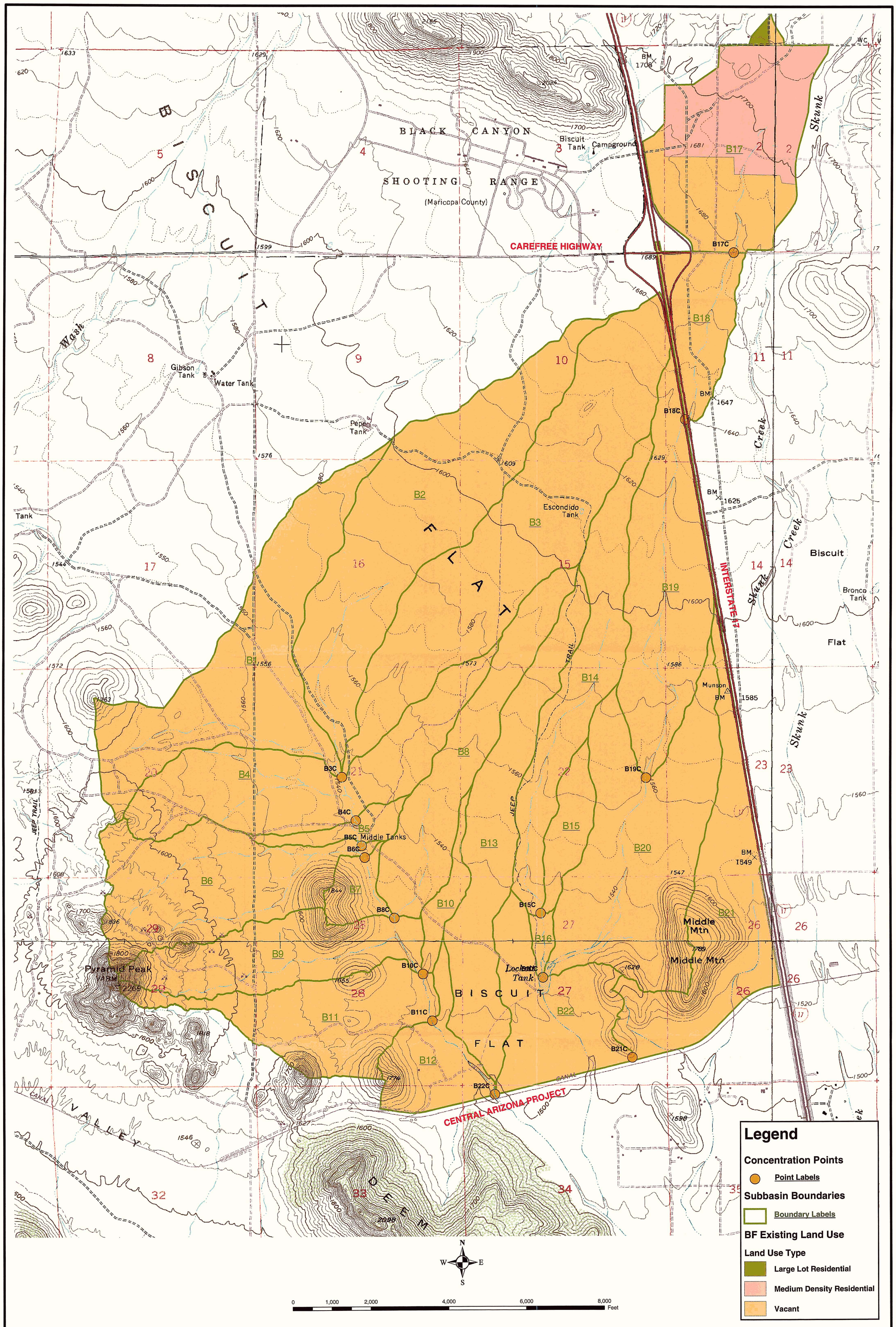
EXHIBIT C

Existing Condition Land Use Exhibit



JOB NO.	24-2003
DESIGNED BY	JAD
DRAWN BY	NAH
CHECKED BY	JAD
APPROVED BY	JAD
DATE	9-25-03

REVISIONS	NO.	DATE	BY	CHKD

ADOBE DAM/DESERT HILLS AREA DRAINAGE MASTER PLAN - FCD 2002C001
EXHIBIT C
BUCHANAN WASH

JE FULLER
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EXHIBIT D

Future Condition Land Use Exhibit

DATA CD:

- Digital Copy of Report in PDF Format
- Digital Copies of DDMSW and HEC-1 files
- GIS Shapefile Coverages of Project Elements