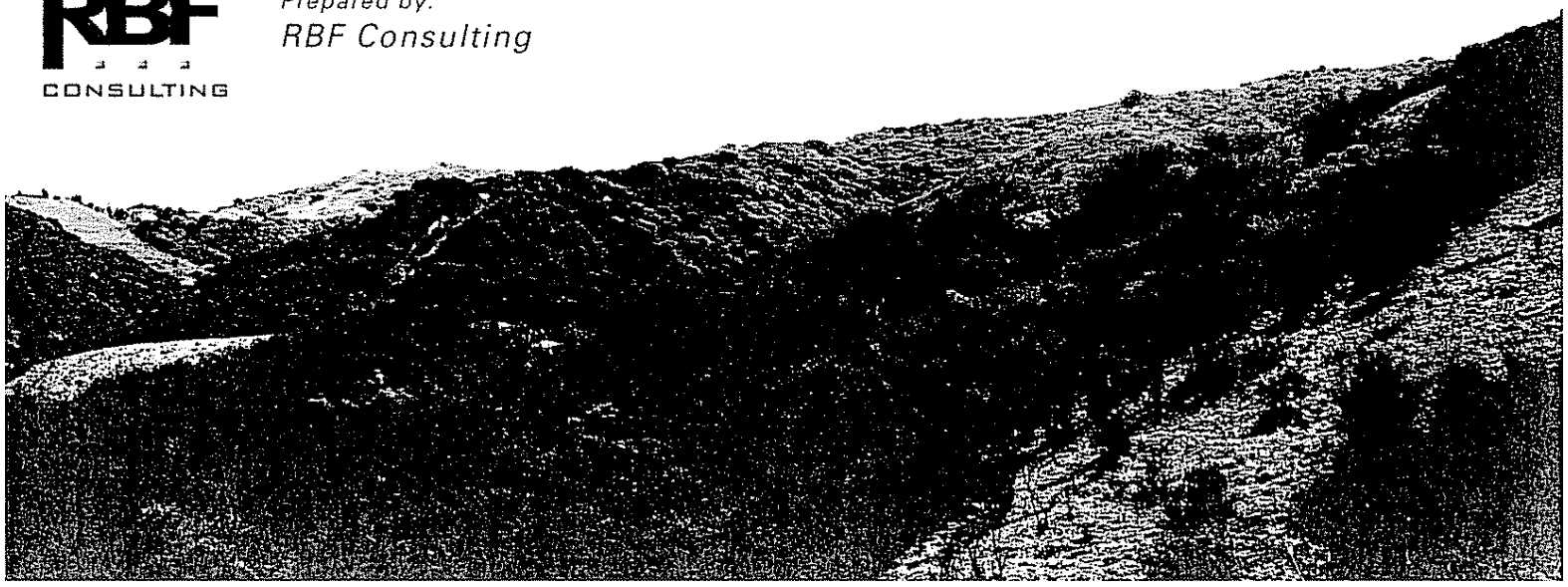
HYDROLOGY STUDY

# Foothill Parkway Westerly Extension

April 2007

*Prepared for:*
*City of Corona*
*Public Works Department*

*Prepared by:*
*RBF Consulting*



RBF CONSULTING

PLANNING | DESIGN | CONSTRUCTION

# FOOTHILL PARKWAY

## HYDROLOGY STUDY

### Riverside County, California

Prepared For:

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JN 10-104629

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# 1 INTRODUCTION

## 1.1 Project Description

The proposed Foothill Parkway Westerly Extension project is located in the southern portion of the City of Corona along the base of the Santa Ana Mountains. The roadway would generally extend westerly from its existing terminus approximately 500 feet west of Skyline Drive to the Green River Road/Paseo Grande intersection for a distance of approximately 2 miles. See Figures 1.1, 1.2, and 1.4 for Regional Vicinity, Site Vicinity, and Site Plan Maps.

The roadway extension is situated along the northeastern base of the Santa Ana Mountains and transects both private and public properties within the City of Corona and County of Riverside. The proposed alignment is located immediately adjacent to the Cleveland National Forest which is under jurisdiction of the United States Forest Service (USFS). The proposed alignment traverses undeveloped terrain generally in an east/west direction and would cross the Mabey Canyon Debris Basin and traverse a 108-inch Metropolitan Water District (MWD) feeder line approximately 1,000 feet southeast of Paseo Grande. Topography through the alignment generally ranges from gently sloping terraces transected by ravines in the eastern and western portions of the alignment, to steep mountainous terrain in the central portion of the alignment. Elevations range from approximately 800 to 1,300 feet above mean sea level (msl).

Land uses surrounding and adjacent to the project alignment include mostly residential uses, vacant properties, limited agricultural uses, and USFS property. The City of Corona Zoning Ordinance designates properties within the project area as Low to High Residential, Estate Residential, and Open Space. The County Zoning Ordinance designates properties within the project area, which are not encompassed by the City as Rural Mountainous, Conservation, and Conservation Habitat. See Figure 1.3 for location of specific land use designations.

Preliminary Existing and Project Condition hydrology studies were prepared for the watershed tributary to Foothill Parkway Extension. Preparation of an Ultimate hydrology study and a more detailed hydrology and hydraulics report, in accordance with City and County criteria, will be prepared during final design.

## 1.2 Project Objectives

The objectives of this study include the following:

1. Prepare a hydrologic analysis of the existing and proposed condition offsite and onsite watershed based on land uses, drainage patterns, ground slopes, and soil types to generate the 10 and 100-year flood storm events. The hydrology computations are based on the Riverside County Flood Control and Water Conservation District Hydrology Manual.

2. Preparation of a Preliminary Hydrology Report.

## 1.3 Existing Facilities

The existing topography demonstrates that the watershed tributary to the project is divided into four major undeveloped drainage areas, all located in the Santa Ana Mountains.

The southern watershed, shown as area E on Exhibit 1, is an undeveloped watershed that slopes in an easterly direction and is tributary to the Riverside County Flood Control and Water Conservation District's (RCFC&WCD) Kroonen Channel. Kroonen Channel is a concrete lined trapezoidal channel that transitions into a 9'X10' RCB culvert in order to convey runoff under Mangular Avenue into Oak Street Debris Basin, which is also a RCFC&WCD facility.

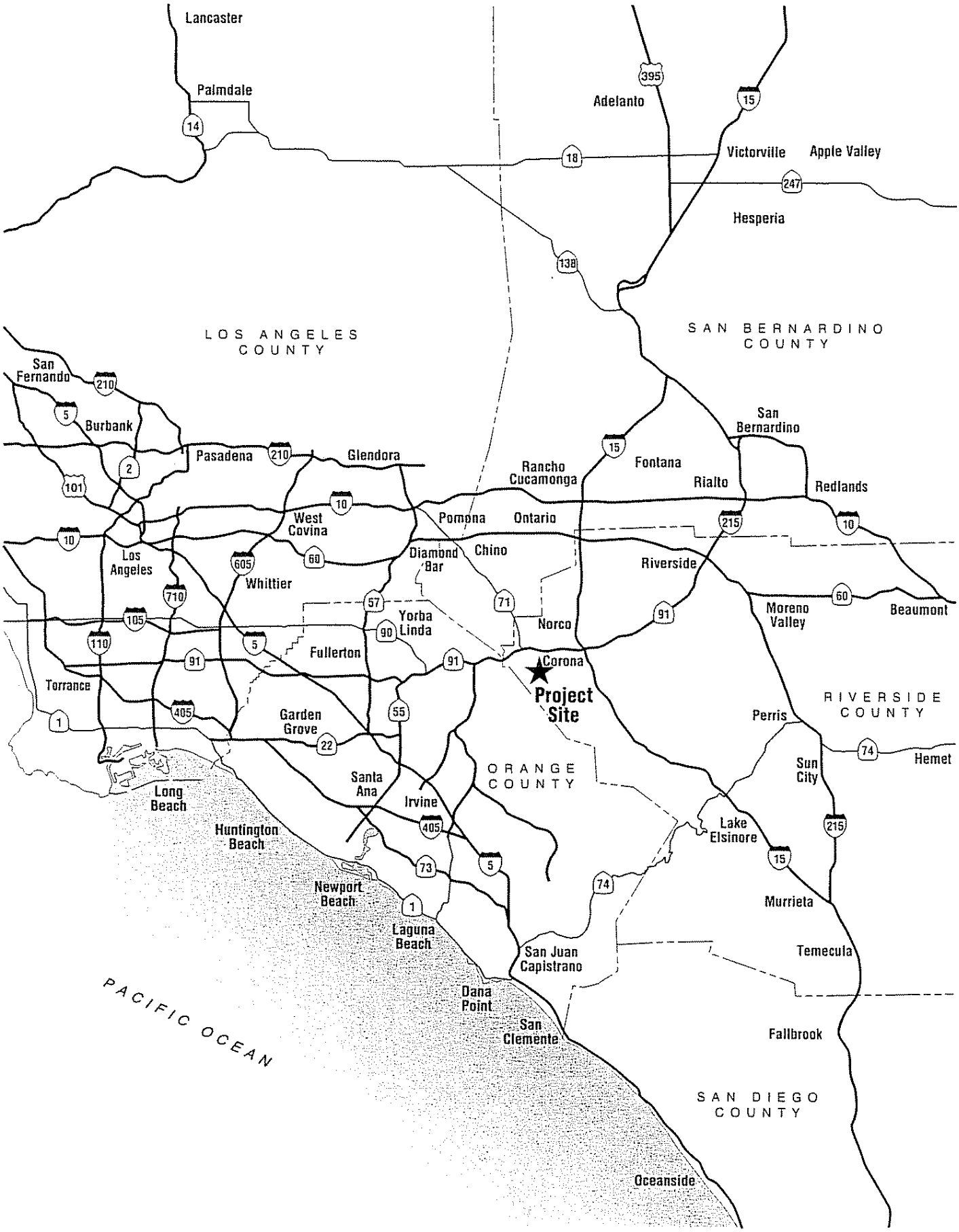
The largest area in the project watershed is shown on Exhibit 1 as area D. Runoff in this area flows in a northeasterly direction into Mabey Canyon Debris Basin (also maintained by RCFC&WCD). Mabey Canyon Debris Basin contains two outlet structures that will have to be improved due to proposed Foothill Parkway's alignment over the existing dam embankment.

Area A, located in between areas E and D, drains in an easterly direction and is conveyed by a natural channel draining northeasterly towards a residential tract.

The fourth watershed, known as Wardlow Canyon Wash, is shown on Exhibit 1 as area F. Watershed F has a downstream concentration point in which runoff is conveyed through an existing 96" RCP culvert under Paseo Grande, an existing residential street.

## 1.4 Flood Hazard Zones

The project is located within the unincorporated areas of Riverside County as outlined in the National Flood Insurance Program (NFIP), which is administered by the Federal Emergency Management Agency (FEMA). Communities in the NFIP must adopt and enforce minimum floodplain management standards, including identification of flood hazards and flood risks. Flood insurance studies previously developed flood hazard designations for this area. The project is located in community numbers 060245 1355 B, 060250 0010 D, and 060250 0005 F. The project site is located on the Flood Insurance Rate Map (FIRM) panel for Riverside County revised March 22, 1983, June 18, 1996, and June 18, 1996, respectively. The flood insurance map indicates that the project has two locations within Zone A caused by Wardlow Canyon Wash and Kroonen channel. Flood zone designation A is defined as a Special Flood Hazard Area subject to inundation by the 100-year flood (1% annual chance flood). Base flood elevations have not been determined for these areas. Firmette maps are included under Exhibit 4.

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FOOTHILL PARKWAY WESTERLY EXTENSION
HYDROLOGY AND HYDRAULICS STUDY

# Regional Vicinity

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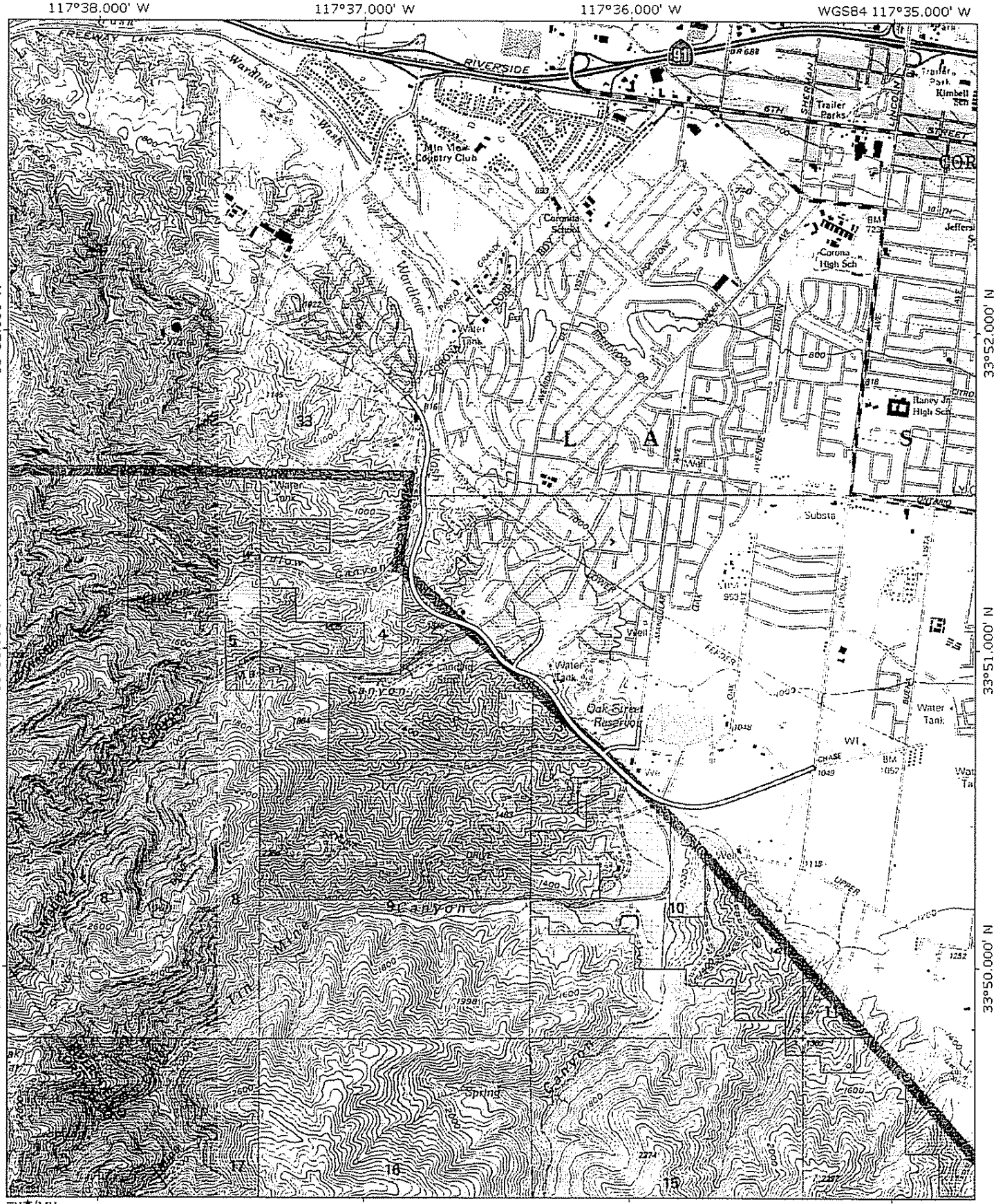
Figure 1.1

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HYDROLOGY AND HYDRAULICS STUDY

# Site Vicinity

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0 2500' APPROXIMATE

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Figure 1.2

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**Legend**

Freeway
City Boundary

**Land Use**

Very Low Density Residential
Low Density Residential
Medium Density Residential
High Density Residential
Very High Density Residential
Rural Residential
Commercial Retail
Commercial Office
Heavy Industrial
Light Industrial
Buisness Park
Public Facilities
Agriculture
Open Space Recreation
Open Space Conservation
Open Space Water
Open Space Conservation Habitat
Low Density Residential - Rural Community
Estate Density Residential - Rural Community
Rural Mountainous

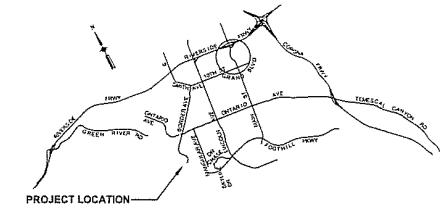
# Riverside County Land Use Plan

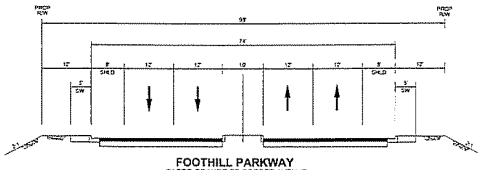
Figure 1.3

Source Information: General Plan Land uses depicted in this map were developed by the county of Riverside Planning Department. The oldest data shown on this map was created in 1990. City Boundary& paecels, County of Riverside.

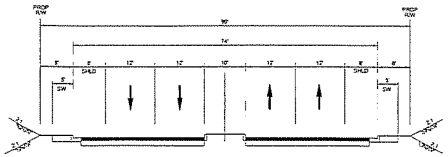
Note: This map may show designations on lands that have been annexed since 1999.

Feet
0 1,000 2,000 4,000

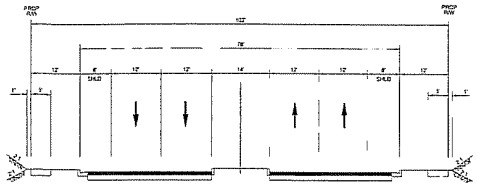


FOOTHILL PARKWAY
PASEO GRANDE TO BORDER AVENUE
(WESTERLY FILL SECTION)



FOOTHILL PARKWAY
PASEO GRANDE TO BORDER AVENUE
(REMAINING SEGMENT)



FOOTHILL PARKWAY
BORDER AVENUE TO SKYLINE DRIVE

GREEN RIVER / PASEO GRANDE

MWD CROSSING

CLEVELAND NATIONAL FOREST

MABEY CANYON DEBRIS BASIN

BORDER CONNECTION

MANGULAR CONNECTION

OAK STREET DEBRIS BASIN

TTM 31955

TTM 34471

LEGEND:

- ROADWAY IMPROVEMENTS
- CUT AREA
- FILL AREA
- MWD LINE
- STORM DRAIN
- PROPOSED DEVELOPMENTS

0 600' APPROXIMATE

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FOOTHILL PARKWAY WESTERLY EXTENSION
HYDROLOGY AND HYDRAULICS STUDY

## Site Plan

Figure 1.4

# 2 HYDROLOGY

## 2.1 Methodology

The tributary drainage area boundaries were delineated utilizing USGS quadrangle maps and current aerial topography for the project site. The proposed street improvements and rough grading plans for the project site were used to determine drainage patterns and boundaries for the on site post-development condition.

Detailed hydrologic parameters used in this analysis can be found in the Riverside County Flood Control and Water Conservation District Hydrology Manual.

### 2.1.1 General Guidelines

The following assumptions/guidelines were applied in the use of the Rational Method, Synthetic Unit Hydrograph, and Link-Node Hydrograph Methods:

- Hydrology studies were prepared using methodology outlined by the RCFC&WCD Hydrology Manual (April 1978). Preliminary onsite hydrology was computed using the Rational Method. The Rational Method is commonly used for determining peak discharge from relatively small drainage areas. For areas in excess of 300 to 500-acres, the Synthetic Unit Hydrograph Method should normally be used.

- All three of these methods include the effects of infiltration caused by land use and soil surface characteristics. The Hydrologic Soils Map from the RCFC&WCD Hydrology Manual, plate C-1.27, indicates that the project study area consists of a combination of soil types A, B, C, and D. Hydrologic soil ratings are based on a scale of A through D, where D is the least pervious, providing the greatest runoff. The type of vegetation, percent ground cover, and percentage of impervious surfaces also affect the infiltration rate. The project cover condition for the on-site area used in the calculation is commercial development, estimated to have a 90% impervious factor.

- The general land use plans for Riverside County and the City of Corona were used to establish the land use assumptions for the existing and project conditions. The land use assumptions for existing and project conditions are identical with the exception of the on-site improvements.

- Per criteria from the RCFC&WCD Hydrology Manual, an Antecedent Moisture Condition (AMC) II was used for the 10-year and 100-year analysis that reflects the degree of ground saturation from previous rainfall events. The AMC value can range from I to III, with condition III being the most severe, allowing for greater runoff and low infiltration.

## 2.2 Rational Method

The Rational Method, an empirical computational procedure for developing peak runoff and discharge for storms of a specified recurrence interval in small watersheds, was

used to compute peak flow rates for watersheds less than 300 acres. The formula is:

$$Q = CIA$$

Where:

Q = Peak discharge, in cubic feet per second.
C = Runoff coefficient representing the ratio of runoff depth to rainfall depth.
I = The time-averaged rainfall intensity for a storm duration equal to the time of concentration, in inches/hour (in./hr.).
A = Drainage area, in acres

### 2.2.1 Rational Method Guidelines

The following assumptions/guidelines were applied in the use of the Rational Method:

- The basic assumption for the Rational Method is that the precipitation rate is constant and uniform over the entire watershed for the time duration such that runoff could travel from the most remote point in the watershed to the concentration point; after which time the rate of runoff does not increase. This is the time defined as the "time of concentration ($T_c$)." The method is based on the assumption that the peak flow rate is directly proportional to drainage area, rainfall intensity, and a runoff coefficient "C," which is related to land use and soil type.

- The runoff coefficient was developed using a runoff index potential number or curve number that ranges from 1 to 98, where 98 is the most impervious and has the highest runoff potential. The runoff coefficients are dependent on the percentage of pervious area.

- Initial subareas were drawn to be less than 10 acres in size and less than 1,000 feet in length per the RCFC&WCD Hydrology Manual guidelines for this procedure.

- Pipe travel times were computed based on preliminary pipe size estimation assuming normal depth for an estimated friction slope. The travel time was calculated assuming full flow and using 90% of the total friction slope, which would result in minor losses. The friction slope was assumed to be approximately equivalent to the storm drain plans or ground slope.

- Standard Intensity Duration Curve values were used for the Rational Method analysis based on RCFC&WCD Hydrology Manual Plate D-4.1. The 10-minute and 60-minute durations were used for both the 10-year and 100-year frequencies in the Corona region.

- The hydrology calculations assumed 100 percent interception of the surface runoff at the local area drain inlets. A future hydraulics analysis of the proposed storm drain systems will estimate the total intercepted flows at each drain.

### 2.2.2 Rational Method Calculation Software

The hydrologic calculations for watershed areas less than 300 acres and the project onsite areas were performed using software developed by Advanced Engineering Software (AES) for the RCFC&WCD Hydrology Manual Rational Method. The 10-year and 100-year storm events design discharge at intermediate points were computed by generating a hydrologic "link-node" model that divides the area into drainage sub-areas, each tributary to a concentration point or hydrologic "node" point determined by the existing and proposed terrain shown on Hydrology Exhibits 1 and 2.

## 2.3 Synthetic Unit Hydrograph Method

The Synthetic Unit Hydrograph, a computational procedure for developing peak runoff and discharge for storms of a specified recurrence interval, was used in watersheds larger than 300 acres. This procedure calculates effective rainfall, which is the portion of the total rainfall that appears as surface runoff, at a specific concentration point. Because no two drainage basins have the same physical characteristics, the appropriate adjustments must be accounted for. Precipitation data for the project location was taken from the Plates E-5.1 thru E-5.4 in the RCFC&WCD Hydrology Manual and are provided in Appendix D of this report.

### 2.3.1 Synthetic Unit Hydrograph Guidelines

The following assumptions/guidelines were applied in the use of the Synthetic Unit Hydrograph Method:

- The 2- and 100-year point rainfall depths at 3- and 6- hour durations were estimated from the Riverside County isohyetals, which represent data from the *NOAA Atlas 2, Volume XI,* California, 1973, found on plates E-5.1 thru E-5.6. The 2- and 100-year event point rainfall depths and Plate E-5.7 (RCFC&WCD, 1978) were used to produce a graphical relationship between the point rainfall depth and the return period relationship for each duration. The 5- and 10-year point rainfall depths were interpolated from the graph. According to the RCFC&WCD manual, a depth-areal adjustment must be applied to the rainfall depths in order to achieve accurate rainfall data. The depth-areal adjustment is based on the size of the drainage area. Due to the relatively small size of the project watershed, this adjustment will be negligible and therefore not applicable.

- Lag times used for the development of the synthetic unit hydrographs were generated based on the shape and size of the sub-basin. The watershed sub area lag times were calculated according to the lag time equation as indicated in the *RCFC&WCD Hydrology Manual.*

- The basin factor (n-value) was estimated based on field investigations and existing and planned development. Composite n-values were developed for each sub-basin based on the mean value of the collection streams and channels within the basin. For typical "mountainous" areas an n-value of 0.050 should be used. For typical "foothill" areas 0.040 should normally be used as the n-value. The project watershed is comprised of mountainous type characteristics in the higher elevations and foothill type characteristics in the lower canyon areas. Taking both of these factors into consideration an n-value of 0.045 was chosen

for this analysis. A weighted n-value based on the entire watershed was calculated and the results are presented in Table 2.1 and 2.2 of this report.

- All natural watershed areas were assumed to be 10% impervious.

- The time-runoff relationship for a particular watershed is controlled by the S-graph or summation hydrograph. In the RCFC&WCD Hydrology Manual there are four s-graphs to choose from: Mountain, Valley, Desert, and Foothill. According to the RCFC&WCD Hydrology Manual, the Mountain curve is suitable for major watersheds within the Santa Ana Mountains. The 3- and 6-hour 5-minute interval Mountain S-graphs were utilized in this study.

- Infiltration:

The watershed was divided into sub-areas and an area averaged infiltration rate was calculated based on hydrologic soil type, vegetative cover, land use and impervious percentage. The "low loss rate" function was then incorporated.

Low loss rate incorporation:

The RCFC&WCD Hydrology Manual's synthetic hydrograph method includes a "low loss rate" function when calculating effective rainfall (i.e. total rain minus infiltration).

From RCFC&WCD Hydrology Manual page E-9:

> *"In the early and late stages of a design storm the adjusted loss rate (constant or variable) will generally exceed the rainfall intensity on a unit time basis, indicating a zero runoff condition which is considered unrealistic. To account for runoff occurring such periods, a low loss rate is used. The low loss rate is usually taken to be 80 to 90-percent of the rainfall for any unit time period where loss would otherwise exceed rainfall. This is equivalent to an effective rain from 10 to 20-percent of the storm rainfall for a particular time period."*

To replicate the RCFC&WCD infiltration function, and low loss rate, using HEC-1 we have done the following using the LU card:

1. In the LU card (field 3) we use an impervious percentage of 10-percent (this forces a minimum of 10-percent effective rainfall to be produced at all times).
2. We then factor-up the area adjusted infiltration rate for each sub-watershed by dividing by 0.9 such that the resultant infiltration rate for the sub-watershed is the desired rate. This value is used in the LU card (field 2). The factor 0.9 shall only be used for undeveloped watersheds or for watersheds were the amount of impervious area is negligible.

Example:

$F(^{in}/_{hr})$ = Area averaged infiltration rate (provided in Tables 2.1 and 2.2)

$F_m(^{in}/_{hr})$ = Desired infiltration rate

$\%A_p$ = Percentage of Pervious Area (0.9)

$\%A_i$ = Percentage of Impervious Area (0.1)

$$F(^{in}/_{hr}) = F_m(^{in}/_{hr}) * (\%A_p) + 0.0(^{in}/_{hr}) * (\%A_i)$$

### 2.3.2 Synthetic Unit Hydrograph Calculation Software

The Synthetic Unit Hydrograph Method outlined in the *RCFC&WCD Hydrology Manual* was used to develop runoff hydrographs using HEC-1 Flood Hydrograph Package (USACE 1998) and LAPRE-1 (USACE 1989).

## 2.4 Link-Node Runoff Hydrograph Method

The Link-Node Runoff Hydrograph, a computational procedure for developing peak runoff and discharge for storms of a specified recurrence interval, was used for watershed F to determine peak flow rates along the proposed Wardlow Canyon storm drain system. This procedure calculates effective rainfall, which is the portion of the total rainfall that appears as surface runoff, at a specific concentration point. The software used for this method enables interactive building of a link-node model of the watershed by adding computed runoff data into temporary computer memory banks called streams. The runoff data in a stream can then be processed by a choice of logic or modeling processes. By sequentially adding to, modifying, processing, or clearing stream data, a complex hydrologic model of the watershed can be created interactively, rather than in a batch data processing mode.

This Method was used to analyze the mainline system that will mitigate runoff for the entire area F, or Wardlow Canyon Wash watershed. By linking hydrographs for each sub watershed within area F, the appropriate peak runoff value was determined and used in order to determine necessary capacities for the proposed main line facility.

### 2.4.1 Link-Node Runoff Hydrograph Guidelines

The following assumptions/guidelines were applied in the use of the Link-Node Runoff Hydrograph Method:

- The 2- and 100-year point rainfall depths at 3- and 6-hour durations were estimated from the Riverside County isohyetals, which represent data from the *NOAA Atlas 2, Volume XI,* California, 1973, found on plates E-5.1 thru E-5.6. The 2- and 100-year event point rainfall depths and Plate E-5.7 (RCFCWCD, 1978) were used to produce a graphical relationship between the point rainfall depth and the return period relationship for each duration. The 5- and 10-year point rainfall depths were interpolated from the graph. According to the RCFC&WCD manual, a depth-areal adjustment must be applied to the rainfall

depths in order to achieve accurate rainfall data. The depth-areal adjustment is based on the size of the drainage area. Due to the relatively small size of the project watershed this adjustment will be negligible and therefore not applicable.

- User-entered Lag Time (Time of Concentration Lag Estimate): Lag was estimated by 0.8 x Tc, where Tc is the time-of-concentration found from the detailed Rational Method analysis (See Riverside County Hydrology Manual).

### 2.4.2 Link-Node Runoff Hydrograph Method Calculation Software

The project condition hydrologic calculations for watershed F were performed using the FloodSCX software developed by Advanced Engineering Software (AES). The 10-year and 100-year storm events design discharge at intermediate points were computed by generating a hydrologic "link-node" model that divides the area into drainage sub-areas, each tributary to a concentration point or hydrologic "node" point determined by the existing and proposed terrain shown on Hydrology Exhibits 1, 2, and 3.

## 2.5 Watershed Characteristics

### 2.5.1 Watershed Overview

The project watershed covers approximately 22,000 acres in the Santa Ana Mountains located in both Orange and Riverside County. It is comprised of four separate major sub-watersheds ranging in size from approximately 40 acres to 1000 acres. Soil types vary from "B" to "D" type with fair cover. The tributary offsite area is predominantly comprised of relatively mild slopes in the Santa Ana Mountains. The Existing Condition Hydrology map is provided in Exhibit 1. Exhibit 2 displays the Project Condition Hydrology map.

Locations of the watershed areas are shown on Exhibits 1 and 2, Existing and Project Condition Hydrology Maps. The watershed characteristics and infiltration rates are presented in the following Tables 2.1 and 2.2. County and City Land use designations are defined on Figure 1.3.

### 2.5.2 Description of Individual Watershed Characteristics

Watershed A is 46.42 acres located southeast of Mabey Canyon Debris Basin. Under the existing conditions the runoff flows from an undeveloped area in an easterly direction and is conveyed by a natural channel. This watershed has fair cover and ranges in elevation from about 1,480 feet to 1,260 feet. Both the existing and project condition hydrology were analyzed using the Rational Method. In the project condition the discharge from watershed A will be passed under the proposed Foothill Parkway through two proposed 36" diameter Reinforced Concrete Pipe (RCP) culverts. The flow from these culverts will outlet into a rip rap energy dissipater and resume its natural drainage course.

Under the existing condition, Watershed B consists of 5.5 undeveloped, fair covered acres located at the base of the Santa Ana Mountains. Runoff currently sheet flows to the existing residential tract along Mangular Road and into Kroonen Channel. This watershed was analyzed using the Rational Method. Under the project condition this area was accounted for within Watershed E.

Watershed D, under existing conditions, encompasses 921.4 acres within the Santa Ana Mountains and drains into the RCFC&WCD Mabey Canyon Debris Basin. The fair covered undeveloped area consists of soil types A, C, and D, and varies in elevation from 2,800 feet to 1,119 feet. This watershed was analyzed using the Synthetic Unit Hydrograph method. The project condition creates an additional 3 acres of tributary area due to the proposed roadway. The increase in impervious area increases a total runoff by only 1 cfs. This additional roadway runoff will be conveyed directly into the spillway causing no affect to the basin. The proposed horizontal alignment for Foothill Parkway runs along the embankment crest of the existing basin. The roadway construction would involve placement of fill on the upstream side of the dam embankment and would completely cover the existing concrete spillway crest located on the easterly abutment. Two alternatives have been developed to accommodate the original storage volume capacity and level of flood protection of the basin, as well as provide a spillway that can adequately pass estimated flow rates. These alternatives will be discussed in a separate Hydraulic Report.

The existing condition of Watershed E is an undeveloped area consisting of 349.2 acres. This watershed has an upstream elevation of approximately 2,700 feet and a down stream elevation of about 1,036 feet where the runoff is conveyed into Oak Street Debris Basin. This watershed was analyzed using the Synthetic Unit Hydrograph method. The proposed roadway intersects the existing natural drainage path creating the need for runoff mitigation improvements. Recommended drainage improvements due to the impacts of Foothill Parkway will be discussed in a separate Hydraulics report. The increase in impervious area in the project condition will create an additional 14 cfs of runoff. On-site hydrology studies for the ultimate condition will be prepared during final design.

Watershed F, also known as Wardlow Canyon Wash, is the northern most area in the project. The fair covered area consists of approximately 838 acres of both undeveloped and developed area ranging in elevation from 3,000 feet to about 783 feet. The existing condition consists of one major drainage course, known as Wardlow Canyon Wash, and several smaller independent natural drainage paths which confluence with Wardlow Canyon at different locations. A residential area located to the northeast of Wardlow Canyon also drains to the Canyon by means of a concrete channel. The tributary runoff from this watershed is conveyed under Paseo Grande at the northeast end of the project. Off-site land use and soil conditions for the project condition hydrology remained unchanged from the existing condition hydrology. Under the project condition an additional 10 acres of roadway surface increased the impervious area creating an additional 21 cfs of runoff from 957 cfs to 978 cfs. The City of Corona provided as-builts, dated 4-12-1990, for the existing facility downstream of Watershed F. According to these plans the facility was designed to convey 900 cfs of runoff underneath Paseo Grande. Since no supporting background study or report on the culvert design was available, RBF will assume the design flow of 978 cfs, calculations provided in Appendix B. Mitigation measures are being considered in order to detain the increase in flow. A detailed analysis of this existing facility will be prepared during final design.

Since the roadway alignment divides the Canyon into several independent drainage paths, three different hydrology methods were implemented. The single area Synthetic Unit Hydrograph was used to analyze runoff for the entire watershed and compare existing to project condition impacts. The Rational Method was used in determining the

time of concentration at specific concentration points within the watershed. Using the time of concentration values found from the Rational Method, the FloodSCX link-node method was implemented to analyze and route individual hydrographs for sub-watersheds within Watershed F. The link-node method provided the most accurate results in order to develop a concept for the mainline system in Wardlow Canyon. A basin analysis was studied through FloodSCX in order to analyze stage storage for the mainline system. Calculations are located in Appendix B.

### 2.5.3 Synthetic Unit Hydrograph Modeling Parameters

The following tables describe Unit Hydrograph modeling parameters for both existing and project conditions. Table 2.1 and 2.2 show three independent concentration points within the project watershed boundary limits. The infiltration rates, Fp, and basin-n values are important variables utilized in the Synthetic Unit Hydrograph Method. It is important to note that the infiltration values used in the HEC-1 program were found by dividing F (from Tables 2.1 and 2.2) by 0.9. The table shows each point with their respective areas. Concentration point 90 is the location of the Existing Oak Street Debris basin. Concentration point 2 represents the runoff conveyed into Mabey Canyon Debris Basin. Concentration point 135 represents the amount of runoff area F will produce and pass through the existing culvert under Paseo Grande. These n-values are based on the most recent aerial photography and field site visits. It is assumed that the only improvement upstream of this project is the existing residential tract on the north-east side of the proposed parkway. All of the developed areas are the on-site areas under the Project condition. The actual n values used in the HEC-1 program are the average n values shown below, divided by 0.9 (low loss factor).

**Table 2.1: Average Basin-n Value and Soil Loss Rates-Existing Condition**

| Conc. Point | Area | Land Use/Soil Type | Cover | Cover Quality | Area (acre) | AMC II R.I. | Fp (Pervious Area Infiltration Rate) | %A (% Area Impervious) | Fp (Adj. infiltration Rate) | %A (Area/ Area of Watershed) | F (Fp x %A) | Basin n | Avg. Basin n |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90 | E | OS_A | Brush | FAIR | 20.20 | 46 | 0.61 | 0 | 0.61 | 0.058 | 0.035 | 0.045 | 0.002 |
| | | OS_C | Brush | FAIR | 180.00 | 77 | 0.28 | 0 | 0.28 | 0.515 | 0.144 | 0.045 | 0.018 |
| | | OS_D | Brush | FAIR | 149.00 | 83 | 0.215 | 0 | 0.215 | 0.427 | 0.092 | 0.045 | 0.015 |
| **Totals** | | | | | **349.20** | | | | | | **0.271** | | **0.0450** |
| 2 | D | OS_A | Brush | FAIR | 43.43 | 46 | 0.61 | 0 | 0.61 | 0.047 | 0.029 | 0.045 | 0.002 |
| | | OS_C | Brush | FAIR | 258.00 | 77 | 0.28 | 0 | 0.28 | 0.280 | 0.078 | 0.045 | 0.010 |
| | | OS_D | Brush | FAIR | 620.00 | 83 | 0.215 | 0 | 0.215 | 0.673 | 0.145 | 0.045 | 0.024 |
| **Totals** | | | | | **921.43** | | | | | | **0.252** | | **0.0450** |
| 135 | F | OS_B | Brush | FAIR | 68.00 | 66 | 0.4 | 0 | 0.4 | 0.081 | 0.032 | 0.045 | 0.003 |
| | | OS_C | Brush | FAIR | 480.47 | 77 | 0.28 | 0 | 0.28 | 0.573 | 0.161 | 0.045 | 0.020 |
| | | OS_D | Brush | FAIR | 250.00 | 83 | 0.215 | 0 | 0.215 | 0.298 | 0.064 | 0.045 | 0.010 |
| | | COM_D | Pavement | FAIR | 0.00 | 75 | 0.3 | 0.9 | 0.057 | 0.000 | 0.000 | 0.015 | 0.000 |
| | | RES_C | Residential | GOOD | 39.60 | 69 | 0.375 | 0.5 | 0.20625 | 0.047 | 0.010 | 0.015 | 0.001 |
| **Totals** | | | | | **838.07** | | | | | | **0.267** | | **0.0436** |

| Table 2.2: Average Basin-n Value and Soil Loss Rates-Project Condition | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conc. Point | Area | Land Use/Soil Type | Cover | Cover Quality | Area (acre) | AMC II R.I. | Fp (Pervious Area Infiltration Rate) | %A (% Area Impervious) | Fp (Adj. infiltration Rate) | %A (Area/Area of Watershed) | F (Fp x %A) | Basin n | Avg. Basin n |
| 90 | E | OS_A | Brush | FAIR | 21 | 46 | 0.61 | 0 | 0.61 | 0.058 | 0.035 | 0.045 | 0.002 |
| | | OS_C | Brush | FAIR | 180 | 77 | 0.28 | 0 | 0.28 | 0.499 | 0.140 | 0.045 | 0.017 |
| | | OS_D | Brush | FAIR | 149 | 83 | 0.215 | 0 | 0.215 | 0.413 | 0.089 | 0.045 | 0.014 |
| | | COM_D | Pavement | FAIR | 10 | 75 | 0.3 | 0.9 | 0.057 | 0.028 | 0.002 | 0.015 | 0.000 |
| | | COM_D | Shrubs | FAIR | 1 | 75 | 0.3 | 0 | 0.3 | 0.003 | 0.001 | 0.035 | 0.000 |
| **Totals** | | | | | **361** | | | | | | **0.266** | | **0.0441** |
| 2 | D | OS_A | Brush | FAIR | 44 | 46 | 0.61 | 0 | 0.61 | 0.047 | 0.029 | 0.045 | 0.002 |
| | | OS_C | Brush | FAIR | 258 | 77 | 0.28 | 0 | 0.28 | 0.279 | 0.078 | 0.045 | 0.010 |
| | | OS_D | Brush | FAIR | 619 | 83 | 0.215 | 0 | 0.215 | 0.669 | 0.144 | 0.045 | 0.023 |
| | | COM_D | Pavement | FAIR | 4 | 75 | 0.3 | 0.9 | 0.057 | 0.004 | 0.000 | 0.015 | 0.000 |
| | | COM_D | Shrubs | FAIR | 1 | 75 | 0.3 | 0 | 0.3 | 0.001 | 0.000 | 0.035 | 0.000 |
| **Totals** | | | | | **925** | | | | | | **0.251** | | **0.045** |
| 135 | F | OS_B | Brush | FAIR | 68 | 66 | 0.4 | 0 | 0.4 | 0.081 | 0.032 | 0.045 | 0.003 |
| | | OS_C | Brush | FAIR | 482 | 77 | 0.28 | 0 | 0.28 | 0.599 | 0.168 | 0.045 | 0.021 |
| | | OS_D | Brush | FAIR | 205 | 83 | 0.215 | 0 | 0.215 | 0.255 | 0.055 | 0.045 | 0.009 |
| | | COM_D | Pavement | FAIR | 10 | 75 | 0.3 | 0.9 | 0.057 | 0.029 | 0.002 | 0.015 | 0.000 |
| | | COM_D | Shrubs | FAIR | 40 | 75 | 0.3 | 0 | 0.3 | 0.037 | 0.011 | 0.015 | 0.001 |
| | | RES_C | Residential | GOOD | 39.60 | 69 | 0.375 | 0.5 | 0.20625 | 0.047 | 0.010 | 0.015 | 0.001 |
| **Totals** | | | | | **845** | | | | | | **0.269** | | **0.042** |

Table 2.3 shows the physical characteristics of each watershed. The values for each watershed area were utilized in the HEC-1 and LAPRE-1 analysis.

| Table 2.3: Physical Data | | | |
|---|---|---|---|
| **Physical Parameters** | **Area E** | **Area D** | **Area F** |
| Area (Sq miles) | 0.56 | 1.44 | 1.31 |
| L (miles) | 1.92 | 2.9 | 2.86 |
| Lca (miles) | 0.91 | 1.6 | 1.35 |
| HW El. (ft) | 2700 | 2800 | 3000 |
| El. Of Conc. Pt. (ft) | 1036 | 1119 | 783 |
| H (feet) | 1664 | 1681 | 2217 |
| Slope (ft/mile) | 867 | 579.7 | 775.2 |
| Sqrt Slope | 29.44 | 24.1 | 27.84 |

## 2.6 Hydrology Summary

A Hydrology Summary for the existing and proposed conditions are provided below on Table 2.4. All of these findings are 100-year high confidence and there calculations are included in Appendix A and B.

**Table 2.4: Hydrology Summary**

| Watershed | Existing Condition (cfs) | Project Condition (cfs) |
|---|---|---|
| A | 100.8 | 91.74 |
| B | 13.78 | Included in E |
| D (3-Hour) | 1076 | 1078 |
| E (3-Hour) | 442 | 456 |
| F (3-Hour) | 957 | 978 |
| F (6-Hour) | 952 | 972 |

# 3 SEDIMENT YIELD

## 3.1 Study Purpose

When designing drainage infrastructure to convey runoff from undeveloped areas sediment yield must be accounted for. Soil erosion caused by runoff in undeveloped areas increases the amount of sediment yield or load in storm water discharge. In order to accommodate for the increase in discharge volume, a Debris Factor must be accounted for when considering design flows.

## 3.2 Sediment Load Calculations

Sediment yield calculations were performed for the undeveloped areas tributary to the project site for each watershed using the Los Angeles District Debris Method (ACOE-TATUM). The calculations were based on Regression Equation 1, which is used for watershed areas between 0.1 and 3.0 square miles. Regression Equation 1 is as follows:

$$LOGD_y = 0.65(LOGP) + 0.62(LOGRR) + 0.18(LOGA) + 0.12(FF) \qquad \text{Eq. 1}$$

where:

$D_y$ = Unit Debris Yield ( $yd^3 + mi^2$ )

P = Maximum 3-Hour Precipitation (inches, taken to two places after the decimal point, times 100)

RR = Relief Ratio (ft/mi)

A = Drainage Area (acre)

FF = Non-Dimensional Fire Factor

Wild Fires play a significant role in the augmentation of soil erosion in Southern California watersheds. Interpolation of the Fire Factor curve in Figure 2 of the Los Angeles District Debris Method manual, and assuming a time period of 2 to 3 years since the last 100% wild fire, a Fire Factor of 4.75 was chosen. Table 3.1 summarizes the debris factors for each particular watershed in the study area. The Debris Factor is calculated by dividing the summation of the runoff volume and the debris load volume by the runoff volume. The Debris Factor is then multiplied by each total runoff value produced by each watershed. This value is the design runoff value that will be used in all of the hydraulic calculations. RBF will use a conservative average Debris Factor of 1.2 for every watershed within the project. Calculations for these findings are supplied in Appendix C.

**Table 3.1: Debris Factor Summary**

| Hydrology Subarea | Area (Sq. Miles) | 100 Yr Frequency 3 Hr. Duration P (Inches)*100 | Flow path Length (Feet) | Relief Ration (RR) (ft./mi.) | Fire Factor (FF) | Debris Load (acre-ft) | Runoff V (acre-ft) 100 YR | Debris Factor |
|---|---|---|---|---|---|---|---|---|
| F | 1.31 | 265 | 15100.8 | 775 | 4.8 | 23.8 | 130 | 1.18 |
| E | 0.55 | 265 | 10137.6 | 865 | 4.8 | 9 | 66 | 1.14 |
| D | 1.439 | 280 | 15312 | 580 | 4.8 | 22.8 | 150 | 1.15 |

RBF CONSULTING

PLANNING | DESIGN | CONSTRUCTION

# HYDROLOGY STUDY

## Technical Appendices

# Appendix A

Existing Condition Hydrology

# Appendix A.1

Area A

10-year and 100-year Storm Event

Rational Method

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                  (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
                  (Rational Tabling Version 6.0D)
             Release Date: 01/01/2004  License ID 1264

                     Analysis prepared by:

                        RBF Consulting
                      14725 Alton Parkway
                     Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
 * Foothill Parkway Existing Condition Hydrology                        *
 * 10 Year Area A                                                       *
 * 10104629                                                             *
 ************************************************************************

  FILE NAME: FHP10A.DAT
  TIME/DATE OF STUDY: 17:31 09/22/2006
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.220
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.940
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.430
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.450
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4796304
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4805313
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.949
  SLOPE OF INTENSITY DURATION CURVE = 0.4796
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== ========
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE      60.00 TO NODE      61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```



```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   839.99
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1260.00
  ELEVATION DIFFERENCE(FEET) =    220.00
  TC = 0.709*[(  839.99**3)/(   220.00)]**.2 =   13.708
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.927
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7314
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      11.53
  TOTAL AREA(ACRES) =       8.18   TOTAL RUNOFF(CFS) =      11.53

****************************************************************************
  FLOW PROCESS FROM NODE      61.00 TO NODE      62.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1260.00  DOWNSTREAM(FEET) =   1110.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1041.23   CHANNEL SLOPE =  0.1441
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      11.53
  FLOW VELOCITY(FEET/SEC) =   8.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =  15.83
  LONGEST FLOWPATH FROM NODE      60.00 TO NODE      62.00 =  1881.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      62.00 TO NODE      62.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.799
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7217
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =     9.83   SUBAREA RUNOFF(CFS) =   12.76
  TOTAL AREA(ACRES) =      18.01   TOTAL RUNOFF(CFS) =   24.29
  TC(MIN.) =  15.83

****************************************************************************
  FLOW PROCESS FROM NODE      62.00 TO NODE      63.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1110.00  DOWNSTREAM(FEET) =   1070.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    91.37   CHANNEL SLOPE =  0.4378
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      24.29
  FLOW VELOCITY(FEET/SEC) =   9.99 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =  15.98
  LONGEST FLOWPATH FROM NODE      60.00 TO NODE      63.00 =  1972.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      63.00 TO NODE      63.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.791
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7211
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    23.28   SUBAREA RUNOFF(CFS) =   30.06
  TOTAL AREA(ACRES) =      41.29   TOTAL RUNOFF(CFS) =   54.36
  TC(MIN.) =  15.98
============================================================================
  END OF STUDY SUMMARY:
```

```
TOTAL AREA(ACRES)      =     41.29  TC(MIN.) =     15.98
PEAK FLOW RATE(CFS)    =     54.36
****************************************************************************
****************************************************************************
END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
                     (Rational Tabling Version 6.0D)
                 Release Date: 01/01/2004  License ID 1264

                         Analysis prepared by:

                            RBF Consulting
                          14725 Alton Parkway
                        Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
* Foothill Parkway Existing Condition Hydrology                          *
* 100 Year Area A                                                        *
* 10104629                                                               *
 ************************************************************************

  FILE NAME: FHP100A.DAT
  TIME/DATE OF STUDY: 11:47 09/25/2006
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.220
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.940
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.430
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.450
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4796304
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4805313
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.450
  SLOPE OF INTENSITY DURATION CURVE = 0.4805
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```



```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   839.99
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1260.00
  ELEVATION DIFFERENCE(FEET) =    220.00
  TC = 0.709*[(  839.99**3)/(   220.00)]**.2 =   13.708
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.948
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7821
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      18.86
  TOTAL AREA(ACRES) =       8.18   TOTAL RUNOFF(CFS) =      18.86

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1260.00  DOWNSTREAM(FEET) =   1110.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1041.23   CHANNEL SLOPE =  0.1441
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      18.86
  FLOW VELOCITY(FEET/SEC) =   9.33 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.86   Tc(MIN.) =  15.57
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =  1881.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.773
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7757
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =     9.83   SUBAREA RUNOFF(CFS) =    21.14
  TOTAL AREA(ACRES) =      18.01   TOTAL RUNOFF(CFS) =    40.00
  TC(MIN.) =  15.57

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     63.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1110.00  DOWNSTREAM(FEET) =   1070.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    91.37   CHANNEL SLOPE =  0.4378
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      40.00
  FLOW VELOCITY(FEET/SEC) =  11.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.13   Tc(MIN.) =  15.70
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     63.00 =  1972.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.761
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7752
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    28.40   SUBAREA RUNOFF(CFS) =    60.80
  TOTAL AREA(ACRES) =      46.41   TOTAL RUNOFF(CFS) =   100.80
  TC(MIN.) =  15.70
============================================================================
  END OF STUDY SUMMARY:
```

```
TOTAL AREA(ACRES)      =     46.41  TC(MIN.) =     15.70
PEAK FLOW RATE(CFS)    =    100.80
****************************************************************************
****************************************************************************
END OF RATIONAL METHOD ANALYSIS
```

# Appendix A.2

Area B

10-year and 100-year Storm Event

Rational Method

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                  (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
                  (Rational Tabling Version 6.0D)
              Release Date: 01/01/2004  License ID 1264

                     Analysis prepared by:

                        RBF Consulting
                      14725 Alton Parkway
                    Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
 * Foothill Parkway Existing Condition Hydrology                        *
 * 10 Year Area B                                                       *
 * 10104629                                                             *
 ************************************************************************

  FILE NAME: FHPE10B.DAT
  TIME/DATE OF STUDY: 10:32 03/05/2007
 ----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.220
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.940
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.430
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.450
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4796304
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4805313
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.949
  SLOPE OF INTENSITY DURATION CURVE = 0.4796
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
 NO.  (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
 ===  =====  =========  ================  ======  =====  ====  ====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

 ****************************************************************************
  FLOW PROCESS FROM NODE      21.00 TO NODE      22.00 IS CODE =  21
 ----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```



```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   666.38
  UPSTREAM ELEVATION(FEET) =   1340.00
  DOWNSTREAM ELEVATION(FEET) =   1125.00
  ELEVATION DIFFERENCE(FEET) =    215.00
  TC = 0.709*[(  666.38**3)/(   215.00)]**.2 =   11.985
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.056
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7400
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =       8.44
  TOTAL AREA(ACRES) =       5.55   TOTAL RUNOFF(CFS) =       8.44
 ============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       5.55  TC(MIN.) =      11.98
  PEAK FLOW RATE(CFS)    =       8.44
 ============================================================================
 ============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                  (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
                  (Rational Tabling Version 6.0D)
             Release Date: 01/01/2004  License ID 1264

                     Analysis prepared by:

                        RBF Consulting
                      14725 Alton Parkway
                    Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
* Foothill Parkway Existing Condition Hydrology                          *
* 100 Year Area B                                                        *
* 10104629                                                               *
 ****************************************************************************

  FILE NAME: FHPE100B.DAT
  TIME/DATE OF STUDY: 10:30 03/05/2007
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.220
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.940
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.430
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.450
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4796304
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4805313
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.450
  SLOPE OF INTENSITY DURATION CURVE = 0.4805
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ==================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```



```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   666.38
  UPSTREAM ELEVATION(FEET) =   1340.00
  DOWNSTREAM ELEVATION(FEET) =   1125.00
  ELEVATION DIFFERENCE(FEET) =    215.00
  TC = 0.709*[(  666.38**3)/(   215.00)]**.2 =   11.985
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.144
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7885
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      13.76
  TOTAL AREA(ACRES) =       5.55   TOTAL RUNOFF(CFS) =      13.76
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       5.55  TC(MIN.) =      11.98
  PEAK FLOW RATE(CFS)    =      13.76
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# Appendix A.3

Area D

100-year Storm Event

3-Hour Synthetic Unit Hydrograph

```
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   04MAY07  TIME  12:38:40   *                                    *           (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   FOOTHILL PARKWAY
         2           ID   Riverside County, California
         3           ID   City of Corona
         4           ID   JN:114629 EXISTING CONDITIONS 100-YEAR 3-HOUR
         5           ID   Watershed D Mountain S graph
         6           IT       5       0       0     288

         7           KK    01.1
         8           KM    01.1 HYDROGRAPH DEVELOPMENT
         9           BA    1.44
        10           PB    2.82
                     *  RCFC&WCD 3-HOUR 5-MINUTE INTERVAL STORM PATTERN
        11           PI     1.3     1.3     1.1     1.5     1.5     1.8     1.5     1.8     1.8     1.5
        12           PI     1.6     1.8     2.2     2.2     2.2     2.0     2.6     2.7     2.4     2.7
        13           PI     3.3     3.1     2.9     3.0     3.1     4.2     5.0     3.5     6.8     7.3
        14           PI     8.2     5.9     2.0     1.8     1.8     0.6
        15           LU            0.28      10
        16           KM   UHG FROM MOUNTAIN S-GRAPH
        17           UI    375.    514.    849.   1254.   1192.    799.    636.    475.    352.    322.
        18           UI    292.    254.    233.    205.    201.    175.    157.    147.    137.    133.
        19           UI    115.    114.    107.    106.     87.     87.     79.     72.     72.     68.
        20           UI    63.2    63.2    63.2    57.4    56.5    56.5    56.5    50.1    49.6    49.6
```

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | UI | 49.6 | 46.2 | 41.9 | 41.9 | 41.9 | 41.9 | 40.8 | 31.9 | 31.9 | 31.9 |
| 22 | UI | 31.9 | 31.9 | 31.9 | 30.8 | 23.2 | 23.2 | 23.2 | 23.2 | 23.2 | 23.2 |
| 23 | UI | 23.2 | 23.2 | 23.2 | 15.6 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 |
| 24 | UI | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 |
| 25 | UI | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 7.6 |
| 26 | ZZ | | | | | | | | | | |

```
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   04MAY07  TIME  12:38:40  *                    *          (916) 756-1104              *
*                                      *                    *                                      *
****************************************                    ****************************************
```

FOOTHILL PARKWAY
Riverside County, California
City of Corona
JN:114629 EXISTING CONDITIONS 100-YEAR 3-HOUR
Watershed D Mountain S graph

```
IT          HYDROGRAPH TIME DATA
                 NMIN          5  MINUTES IN COMPUTATION INTERVAL
                IDATE      1    0  STARTING DATE
                ITIME       0000  STARTING TIME
                   NQ        288  NUMBER OF HYDROGRAPH ORDINATES
              NDDATE      1    0  ENDING DATE
              NDTIME       2355  ENDING TIME
               ICENT         19  CENTURY MARK

          COMPUTATION INTERVAL     .08 HOURS
               TOTAL TIME BASE   23.92 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
```

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

```
          **************
          *            *
   7 KK   *      01.1  *
          *            *
          **************
```

01.1 HYDROGRAPH DEVELOPMENT
UHG FROM MOUNTAIN S-GRAPH

SUBBASIN RUNOFF DATA

9 BA SUBBASIN CHARACTERISTICS

TAREA 1.44 SUBBASIN AREA

PRECIPITATION DATA

10 PB STORM 2.82 BASIN TOTAL PRECIPITATION

11 PI INCREMENTAL PRECIPITATION PATTERN

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.30 | 1.30 | 1.10 | 1.50 | 1.50 | 1.80 | 1.50 | 1.80 | 1.80 | 1.50 |
| 1.60 | 1.80 | 2.20 | 2.20 | 2.20 | 2.00 | 2.60 | 2.70 | 2.40 | 2.70 |
| 3.30 | 3.10 | 2.90 | 3.00 | 3.10 | 4.20 | 5.00 | 3.50 | 6.80 | 7.30 |
| 8.20 | 5.90 | 2.00 | 1.80 | 1.80 | .60 | | | | |

15 LU UNIFORM LOSS RATE

STRTL .00 INITIAL LOSS

CNSTL .28 UNIFORM LOSS RATE

RTIMP 10.00 PERCENT IMPERVIOUS AREA

15 UI INPUT UNITGRAPH, 90 ORDINATES, VOLUME = 1.00

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 375.0 | 514.0 | 849.0 | 1254.0 | 1192.0 | 799.0 | 636.0 | 475.0 | 352.0 | 322.0 |
| 292.0 | 254.0 | 233.0 | 205.0 | 201.0 | 175.0 | 157.0 | 147.0 | 137.0 | 133.0 |
| 115.0 | 114.0 | 107.0 | 106.0 | 87.0 | 87.0 | 79.0 | 72.0 | 72.0 | 68.0 |
| 63.2 | 63.2 | 63.2 | 57.4 | 56.5 | 56.5 | 56.5 | 50.1 | 49.6 | 49.6 |
| 49.6 | 46.2 | 41.9 | 41.9 | 41.9 | 41.9 | 40.8 | 31.9 | 31.9 | 31.9 |
| 31.9 | 31.9 | 31.9 | 30.8 | 23.2 | 23.2 | 23.2 | 23.2 | 23.2 | 23.2 |
| 23.2 | 23.2 | 23.2 | 15.6 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 |
| 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 |
| 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 7.6 |

***

**********

HYDROGRAPH AT STATION 01.1

**********

| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | * | | | | | | | | |
| 1 | | 0000 | 1 | .00 | .00 | .00 | 0. | * | 1 | | 1200 | 145 | .00 | .00 | .00 | 0. |
| 1 | | 0005 | 2 | .04 | .02 | .02 | 6. | * | 1 | | 1205 | 146 | .00 | .00 | .00 | 0. |
| 1 | | 0010 | 3 | .04 | .02 | .02 | 14. | * | 1 | | 1210 | 147 | .00 | .00 | .00 | 0. |
| 1 | | 0015 | 4 | .03 | .02 | .01 | 25. | * | 1 | | 1215 | 148 | .00 | .00 | .00 | 0. |
| 1 | | 0020 | 5 | .04 | .02 | .02 | 46. | * | 1 | | 1220 | 149 | .00 | .00 | .00 | 0. |
| 1 | | 0025 | 6 | .04 | .02 | .02 | 66. | * | 1 | | 1225 | 150 | .00 | .00 | .00 | 0. |
| 1 | | 0030 | 7 | .05 | .02 | .03 | 84. | * | 1 | | 1230 | 151 | .00 | .00 | .00 | 0. |
| 1 | | 0035 | 8 | .04 | .02 | .02 | 102. | * | 1 | | 1235 | 152 | .00 | .00 | .00 | 0. |
| 1 | | 0040 | 9 | .05 | .02 | .03 | 125. | * | 1 | | 1240 | 153 | .00 | .00 | .00 | 0. |
| 1 | | 0045 | 10 | .05 | .02 | .03 | 144. | * | 1 | | 1245 | 154 | .00 | .00 | .00 | 0. |
| 1 | | 0050 | 11 | .04 | .02 | .02 | 157. | * | 1 | | 1250 | 155 | .00 | .00 | .00 | 0. |
| 1 | | 0055 | 12 | .05 | .02 | .02 | 169. | * | 1 | | 1255 | 156 | .00 | .00 | .00 | 0. |
| 1 | | 0100 | 13 | .05 | .02 | .03 | 180. | * | 1 | | 1300 | 157 | .00 | .00 | .00 | 0. |
| 1 | | 0105 | 14 | .06 | .02 | .04 | 190. | * | 1 | | 1305 | 158 | .00 | .00 | .00 | 0. |
| 1 | | 0110 | 15 | .06 | .02 | .04 | 203. | * | 1 | | 1310 | 159 | .00 | .00 | .00 | 0. |
| 1 | | 0115 | 16 | .06 | .02 | .04 | 225. | * | 1 | | 1315 | 160 | .00 | .00 | .00 | 0. |
| 1 | | 0120 | 17 | .06 | .02 | .04 | 247. | * | 1 | | 1320 | 161 | .00 | .00 | .00 | 0. |
| 1 | | 0125 | 18 | .07 | .02 | .05 | 273. | * | 1 | | 1325 | 162 | .00 | .00 | .00 | 0. |
| 1 | | 0130 | 19 | .08 | .02 | .06 | 294. | * | 1 | | 1330 | 163 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0135 | 20 | .07 | .02 | .05 | 313. | * | 1 | 1335 | 164 | .00 | .00 | .00 | 0. |
| 1 | 0140 | 21 | .08 | .02 | .06 | 340. | * | 1 | 1340 | 165 | .00 | .00 | .00 | 0. |
| 1 | 0145 | 22 | .09 | .02 | .07 | 371. | * | 1 | 1345 | 166 | .00 | .00 | .00 | 0. |
| 1 | 0150 | 23 | .09 | .02 | .07 | 396. | * | 1 | 1350 | 167 | .00 | .00 | .00 | 0. |
| 1 | 0155 | 24 | .08 | .02 | .06 | 424. | * | 1 | 1355 | 168 | .00 | .00 | .00 | 0. |
| 1 | 0200 | 25 | .08 | .02 | .06 | 456. | * | 1 | 1400 | 169 | .00 | .00 | .00 | 0. |
| 1 | 0205 | 26 | .09 | .02 | .07 | 480. | * | 1 | 1405 | 170 | .00 | .00 | .00 | 0. |
| 1 | 0210 | 27 | .12 | .02 | .10 | 507. | * | 1 | 1410 | 171 | .00 | .00 | .00 | 0. |
| 1 | 0215 | 28 | .14 | .02 | .12 | 547. | * | 1 | 1415 | 172 | .00 | .00 | .00 | 0. |
| 1 | 0220 | 29 | .10 | .02 | .08 | 585. | * | 1 | 1420 | 173 | .00 | .00 | .00 | 0. |
| 1 | 0225 | 30 | .19 | .02 | .17 | 670. | * | 1 | 1425 | 174 | .00 | .00 | .00 | 0. |
| 1 | 0230 | 31 | .21 | .02 | .18 | 765. | * | 1 | 1430 | 175 | .00 | .00 | .00 | 0. |
| 1 | 0235 | 32 | .23 | .02 | .21 | 870. | * | 1 | 1435 | 176 | .00 | .00 | .00 | 0. |
| 1 | 0240 | 33 | .17 | .02 | .15 | 985. | * | 1 | 1440 | 177 | .00 | .00 | .00 | 0. |
| 1 | 0245 | 34 | .06 | .02 | .04 | 1064. | * | 1 | 1445 | 178 | .00 | .00 | .00 | 0. |
| 1 | 0250 | 35 | .05 | .02 | .03 | 1076. | * | 1 | 1450 | 179 | .00 | .00 | .00 | 0. |
| 1 | 0255 | 36 | .05 | .02 | .03 | 1005. | * | 1 | 1455 | 180 | .00 | .00 | .00 | 0. |
| 1 | 0300 | 37 | .02 | .02 | .00 | 857. | * | 1 | 1500 | 181 | .00 | .00 | .00 | 0. |
| 1 | 0305 | 38 | .00 | .00 | .00 | 714. | * | 1 | 1505 | 182 | .00 | .00 | .00 | 0. |
| 1 | 0310 | 39 | .00 | .00 | .00 | 608. | * | 1 | 1510 | 183 | .00 | .00 | .00 | 0. |
| 1 | 0315 | 40 | .00 | .00 | .00 | 513. | * | 1 | 1515 | 184 | .00 | .00 | .00 | 0. |
| 1 | 0320 | 41 | .00 | .00 | .00 | 441. | * | 1 | 1520 | 185 | .00 | .00 | .00 | 0. |
| 1 | 0325 | 42 | .00 | .00 | .00 | 394. | * | 1 | 1525 | 186 | .00 | .00 | .00 | 0. |
| 1 | 0330 | 43 | .00 | .00 | .00 | 352. | * | 1 | 1530 | 187 | .00 | .00 | .00 | 0. |
| 1 | 0335 | 44 | .00 | .00 | .00 | 320. | * | 1 | 1535 | 188 | .00 | .00 | .00 | 0. |
| 1 | 0340 | 45 | .00 | .00 | .00 | 295. | * | 1 | 1540 | 189 | .00 | .00 | .00 | 0. |
| 1 | 0345 | 46 | .00 | .00 | .00 | 272. | * | 1 | 1545 | 190 | .00 | .00 | .00 | 0. |
| 1 | 0350 | 47 | .00 | .00 | .00 | 251. | * | 1 | 1550 | 191 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48 | .00 | .00 | .00 | 232. | * | 1 | 1555 | 192 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49 | .00 | .00 | .00 | 217. | * | 1 | 1600 | 193 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50 | .00 | .00 | .00 | 204. | * | 1 | 1605 | 194 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51 | .00 | .00 | .00 | 192. | * | 1 | 1610 | 195 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52 | .00 | .00 | .00 | 180. | * | 1 | 1615 | 196 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53 | .00 | .00 | .00 | 170. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54 | .00 | .00 | .00 | 161. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55 | .00 | .00 | .00 | 152. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56 | .00 | .00 | .00 | 143. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57 | .00 | .00 | .00 | 135. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58 | .00 | .00 | .00 | 129. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59 | .00 | .00 | .00 | 123. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60 | .00 | .00 | .00 | 117. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61 | .00 | .00 | .00 | 113. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62 | .00 | .00 | .00 | 109. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63 | .00 | .00 | .00 | 105. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64 | .00 | .00 | .00 | 102. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65 | .00 | .00 | .00 | 98. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66 | .00 | .00 | .00 | 95. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67 | .00 | .00 | .00 | 92. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68 | .00 | .00 | .00 | 88. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69 | .00 | .00 | .00 | 85. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70 | .00 | .00 | .00 | 81. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71 | .00 | .00 | .00 | 79. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72 | .00 | .00 | .00 | 76. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73 | .00 | .00 | .00 | 72. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74 | .00 | .00 | .00 | 69. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75 | .00 | .00 | .00 | 66. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76 | .00 | .00 | .00 | 64. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77 | .00 | .00 | .00 | 61. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78 | .00 | .00 | .00 | 58. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79 | .00 | .00 | .00 | 55. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0635 | 80 | .00 | .00 | .00 | 52. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81 | .00 | .00 | .00 | 50. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82 | .00 | .00 | .00 | 48. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83 | .00 | .00 | .00 | 47. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84 | .00 | .00 | .00 | 44. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85 | .00 | .00 | .00 | 42. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86 | .00 | .00 | .00 | 39. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87 | .00 | .00 | .00 | 37. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88 | .00 | .00 | .00 | 36. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89 | .00 | .00 | .00 | 34. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90 | .00 | .00 | .00 | 33. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91 | .00 | .00 | .00 | 31. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92 | .00 | .00 | .00 | 30. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93 | .00 | .00 | .00 | 28. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94 | .00 | .00 | .00 | 25. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95 | .00 | .00 | .00 | 22. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96 | .00 | .00 | .00 | 19. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97 | .00 | .00 | .00 | 18. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98 | .00 | .00 | .00 | 17. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99 | .00 | .00 | .00 | 16. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .00 | .00 | .00 | 16. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .00 | .00 | .00 | 16. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .00 | .00 | .00 | 15. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .00 | .00 | .00 | 15. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .00 | .00 | .00 | 15. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .00 | .00 | .00 | 14. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .00 | .00 | .00 | 14. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .00 | .00 | .00 | 14. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .00 | .00 | .00 | 13. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .00 | .00 | .00 | 13. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .00 | .00 | .00 | 12. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .00 | .00 | .00 | 12. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .00 | .00 | .00 | 11. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .00 | .00 | .00 | 11. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .00 | .00 | .00 | 10. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .00 | .00 | .00 | 10. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .00 | .00 | .00 | 9. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .00 | .00 | .00 | 8. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .00 | .00 | .00 | 7. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .00 | .00 | .00 | 7. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .00 | .00 | .00 | 5. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .00 | .00 | .00 | 4. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .00 | .00 | .00 | 2. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .00 | .00 | .00 | 1. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .00 | .00 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .00 | .00 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .00 | .00 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .00 | .00 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .00 | .00 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .00 | .00 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .00 | .00 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .00 | .00 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .00 | .00 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .00 | .00 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .00 | .00 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .00 | .00 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .00 | .00 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .00 | .00 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .00 | .00 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .00 | .00 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1135 | 140 | .00 | .00 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .00 | .00 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .00 | .00 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .00 | .00 | .00 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .00 | .00 | .00 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| | | | | | | | * | | | | | | | |

**********

TOTAL RAINFALL = 2.82, TOTAL LOSS = .75, TOTAL EXCESS = 2.07

| PEAK FLOW | TIME | | MAXIMUM AVERAGE FLOW | | | |
|---|---|---|---|---|---|---|
| | | | 6-HR | 24-HR | 72-HR | 23.92-HR |
| + (CFS) | (HR) | | | | | |
| | | (CFS) | | | | |
| + 1076. | 2.83 | | 305. | 80. | 80. | 80. |
| | | (INCHES) | 1.967 | 2.068 | 2.068 | 2.068 |
| | | (AC-FT) | 151. | 159. | 159. | 159. |

CUMULATIVE AREA = 1.44 SQ MI

1

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

| | OPERATION | STATION | PEAK FLOW | TIME OF PEAK | AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR | 24-HOUR | 72-HOUR | BASIN AREA | MAXIMUM STAGE | TIME OF MAX STAGE |
|---|---|---|---|---|---|---|---|---|---|---|
| + | HYDROGRAPH AT | 01.1 | 1076. | 2.83 | 305. | 80. | 80. | 1.44 | | |

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

# Appendix A.4

Area E

100-year Storm Event

3-Hour Synthetic Unit Hydrograph

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   04MAY07  TIME  12:38:56  *
*                                      *
****************************************
```

```
****************************************
*                                      *
*   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   FOOTHILL PARKWAY
  2           ID   Riverside County, California
  3           ID   City of Corona
  4           ID   JN:114629 EXISTING CONDITIONS 100-YEAR 3-HOUR
  5           ID   Watershed E
  6           IT       5       0       0     288

  7           KK    01.1
  8           KM    01.1 HYDROGRAPH DEVELOPMENT
  9           BA     0.55
 10           PB     2.65
              *  RCFC&WCD 3-HOUR 5-MINUTE INTERVAL STORM PATTERN
 11           PI     1.3     1.3     1.1     1.5     1.5     1.8     1.5     1.8     1.8     1.5
 12           PI     1.6     1.8     2.2     2.2     2.2     2.0     2.6     2.7     2.4     2.7
 13           PI     3.3     3.1     2.9     3.0     3.1     4.2     5.0     3.5     6.8     7.3
 14           PI     8.2     5.9     2.0     1.8     1.8     0.6
 15           LU           0.301      10
 16           KM   UHG FROM MOUNTAIN S-GRAPH
 17           UI    247.    456.    748.    499.    335.    212.    183.    149.    127.    117.
 18           UI    93.7    85.1    77.9    68.0    64.1    57.1    51.5    43.4    42.3    38.0
 19           UI    37.3    35.0    33.4    33.2    29.3    29.3    28.7    24.7    24.7    24.7
 20           UI    20.7    18.9    18.9    18.9    17.9    13.7    13.7    13.7    13.7    13.7
```

```
          21          UI    13.7     5.3     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0
          22          UI     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     1.0
          23          ZZ
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   04MAY07  TIME  12:38:56  *                                    *           (916) 756-1104             *
*                                      *                                    *                                      *
****************************************                                    ****************************************
```

FOOTHILL PARKWAY
Riverside County, California
City of Corona
JN:114629 EXISTING CONDITIONS 100-YEAR 3-HOUR
Watershed E

```
     IT          HYDROGRAPH TIME DATA
                       NMIN          5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ        288  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      1    0  ENDING DATE
                     NDTIME       2355  ENDING TIME
                      ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   23.92 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


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


          **************
          *            *
   7 KK   *     01.1   *
          *            *
          **************
                       01.1 HYDROGRAPH DEVELOPMENT
                      UHG FROM MOUNTAIN S-GRAPH

             SUBBASIN RUNOFF DATA

   9 BA         SUBBASIN CHARACTERISTICS
```

```
                TAREA          .50  SUBBASIN AREA
                 SNAP 50000000.00  NORMAL ANNUAL PRECIPITATION
                RATIO          .00  RATIO OF HYDROGRAPH

            PRECIPITATION DATA

10 PB           STORM         2.60  BASIN TOTAL PRECIPITATION

11 PI         INCREMENTAL PRECIPITATION PATTERN
                1.30    1.30    1.10    1.50    1.50    1.80    1.50    1.80    1.80    1.50
                1.60    1.80    2.20    2.20    2.20    2.00    2.60    2.70    2.40    2.70
                3.30    3.10    2.90    3.00    3.10    4.20    5.00    3.50    6.80    7.30
                8.20    5.90    2.00    1.80    1.80     .60

15 LU       UNIFORM LOSS RATE
                STRTL          .00  INITIAL LOSS
                CNSTL          .30  UNIFORM LOSS RATE
                RTIMP        10.00  PERCENT IMPERVIOUS AREA

15 UI       INPUT UNITGRAPH,  59 ORDINATES,  VOLUME = 1.10
              247.0   456.0   748.0   499.0   335.0   212.0   183.0   149.0   127.0   117.0
               93.7    85.1    77.9    68.0    64.1    57.1    51.5    43.4    42.3    38.0
               37.3    35.0    33.4    33.2    29.3    29.3    28.7    24.7    24.7    24.7
               20.7    18.9    18.9    18.9    17.9    13.7    13.7    13.7    13.7    13.7
               13.7     5.3     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0
                5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     1.0

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

                                          HYDROGRAPH AT STATION     01.1

*****************************************************************************************************************************
                                                          *
   DA MON HRMN  ORD    RAIN    LOSS  EXCESS    COMP Q     *    DA MON HRMN  ORD    RAIN    LOSS  EXCESS    COMP Q
                                                          *
    1    0000    1     .00     .00     .00        0.      *     1    1200  145     .00     .00     .00        0.
    1    0005    2     .03     .02     .01        3.      *     1    1205  146     .00     .00     .00        0.
    1    0010    3     .03     .02     .01        8.      *     1    1210  147     .00     .00     .00        0.
    1    0015    4     .03     .02     .01       15.      *     1    1215  148     .00     .00     .00        0.
    1    0020    5     .04     .02     .02       21.      *     1    1220  149     .00     .00     .00        0.
    1    0025    6     .04     .02     .02       25.      *     1    1225  150     .00     .00     .00        0.
    1    0030    7     .05     .02     .02       35.      *     1    1230  151     .00     .00     .00        0.
    1    0035    8     .04     .02     .02       42.      *     1    1235  152     .00     .00     .00        0.
    1    0040    9     .05     .02     .02       50.      *     1    1240  153     .00     .00     .00        0.
    1    0045   10     .05     .02     .02       55.      *     1    1245  154     .00     .00     .00        0.
    1    0050   11     .04     .02     .02       60.      *     1    1250  155     .00     .00     .00        0.
    1    0055   12     .04     .02     .02       62.      *     1    1255  156     .00     .00     .00        0.
    1    0100   13     .05     .02     .02       62.      *     1    1300  157     .00     .00     .00        0.
    1    0105   14     .06     .02     .03       68.      *     1    1305  158     .00     .00     .00        0.
    1    0110   15     .06     .02     .03       78.      *     1    1310  159     .00     .00     .00        0.
    1    0115   16     .06     .02     .03       90.      *     1    1315  160     .00     .00     .00        0.
    1    0120   17     .05     .02     .03       97.      *     1    1320  161     .00     .00     .00        0.
    1    0125   18     .07     .02     .05      104.      *     1    1325  162     .00     .00     .00        0.
    1    0130   19     .07     .02     .05      112.      *     1    1330  163     .00     .00     .00        0.
    1    0135   20     .06     .02     .04      124.      *     1    1335  164     .00     .00     .00        0.
    1    0140   21     .07     .02     .05      133.      *     1    1340  165     .00     .00     .00        0.
    1    0145   22     .09     .02     .06      143.      *     1    1345  166     .00     .00     .00        0.
    1    0150   23     .08     .02     .06      156.      *     1    1350  167     .00     .00     .00        0.
```

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0155 | 24 | .08 | .02 | .05 | 170. | * | 1 | 1355 | 168 | .00 | .00 | .00 | 0. |
| 1 | 0200 | 25 | .08 | .02 | .06 | 177. | * | 1 | 1400 | 169 | .00 | .00 | .00 | 0. |
| 1 | 0205 | 26 | .08 | .02 | .06 | 182. | * | 1 | 1405 | 170 | .00 | .00 | .00 | 0. |
| 1 | 0210 | 27 | .11 | .02 | .09 | 194. | * | 1 | 1410 | 171 | .00 | .00 | .00 | 0. |
| 1 | 0215 | 28 | .13 | .02 | .11 | 219. | * | 1 | 1415 | 172 | .00 | .00 | .00 | 0. |
| 1 | 0220 | 29 | .09 | .02 | .07 | 245. | * | 1 | 1420 | 173 | .00 | .00 | .00 | 0. |
| 1 | 0225 | 30 | .18 | .02 | .15 | 283. | * | 1 | 1425 | 174 | .00 | .00 | .00 | 0. |
| 1 | 0230 | 31 | .19 | .02 | .17 | 319. | * | 1 | 1430 | 175 | .00 | .00 | .00 | 0. |
| 1 | 0235 | 32 | .21 | .02 | .19 | 392. | * | 1 | 1435 | 176 | .00 | .00 | .00 | 0. |
| 1 | 0240 | 33 | .15 | .02 | .13 | 440. | * | 1 | 1440 | 177 | .00 | .00 | .00 | 0. |
| 1 | 0245 | 34 | .05 | .02 | .03 | 442. | * | 1 | 1445 | 178 | .00 | .00 | .00 | 0. |
| 1 | 0250 | 35 | .05 | .02 | .02 | 386. | * | 1 | 1450 | 179 | .00 | .00 | .00 | 0. |
| 1 | 0255 | 36 | .05 | .02 | .02 | 307. | * | 1 | 1455 | 180 | .00 | .00 | .00 | 0. |
| 1 | 0300 | 37 | .02 | .01 | .00 | 249. | * | 1 | 1500 | 181 | .00 | .00 | .00 | 0. |
| 1 | 0305 | 38 | .00 | .00 | .00 | 208. | * | 1 | 1505 | 182 | .00 | .00 | .00 | 0. |
| 1 | 0310 | 39 | .00 | .00 | .00 | 173. | * | 1 | 1510 | 183 | .00 | .00 | .00 | 0. |
| 1 | 0315 | 40 | .00 | .00 | .00 | 147. | * | 1 | 1515 | 184 | .00 | .00 | .00 | 0. |
| 1 | 0320 | 41 | .00 | .00 | .00 | 128. | * | 1 | 1520 | 185 | .00 | .00 | .00 | 0. |
| 1 | 0325 | 42 | .00 | .00 | .00 | 113. | * | 1 | 1525 | 186 | .00 | .00 | .00 | 0. |
| 1 | 0330 | 43 | .00 | .00 | .00 | 101. | * | 1 | 1530 | 187 | .00 | .00 | .00 | 0. |
| 1 | 0335 | 44 | .00 | .00 | .00 | 92. | * | 1 | 1535 | 188 | .00 | .00 | .00 | 0. |
| 1 | 0340 | 45 | .00 | .00 | .00 | 83. | * | 1 | 1540 | 189 | .00 | .00 | .00 | 0. |
| 1 | 0345 | 46 | .00 | .00 | .00 | 76. | * | 1 | 1545 | 190 | .00 | .00 | .00 | 0. |
| 1 | 0350 | 47 | .00 | .00 | .00 | 70. | * | 1 | 1550 | 191 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48 | .00 | .00 | .00 | 64. | * | 1 | 1555 | 192 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49 | .00 | .00 | .00 | 59. | * | 1 | 1600 | 193 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50 | .00 | .00 | .00 | 55. | * | 1 | 1605 | 194 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51 | .00 | .00 | .00 | 51. | * | 1 | 1610 | 195 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52 | .00 | .00 | .00 | 48. | * | 1 | 1615 | 196 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53 | .00 | .00 | .00 | 46. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54 | .00 | .00 | .00 | 43. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55 | .00 | .00 | .00 | 41. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56 | .00 | .00 | .00 | 39. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57 | .00 | .00 | .00 | 36. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58 | .00 | .00 | .00 | 34. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59 | .00 | .00 | .00 | 32. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60 | .00 | .00 | .00 | 30. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61 | .00 | .00 | .00 | 28. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62 | .00 | .00 | .00 | 26. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63 | .00 | .00 | .00 | 24. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64 | .00 | .00 | .00 | 23. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65 | .00 | .00 | .00 | 21. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66 | .00 | .00 | .00 | 20. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67 | .00 | .00 | .00 | 18. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68 | .00 | .00 | .00 | 16. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69 | .00 | .00 | .00 | 15. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70 | .00 | .00 | .00 | 14. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71 | .00 | .00 | .00 | 13. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72 | .00 | .00 | .00 | 11. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73 | .00 | .00 | .00 | 10. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74 | .00 | .00 | .00 | 8. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75 | .00 | .00 | .00 | 8. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76 | .00 | .00 | .00 | 7. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77 | .00 | .00 | .00 | 7. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78 | .00 | .00 | .00 | 7. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79 | .00 | .00 | .00 | 6. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80 | .00 | .00 | .00 | 6. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81 | .00 | .00 | .00 | 6. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82 | .00 | .00 | .00 | 6. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83 | .00 | .00 | .00 | 5. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0655 | 84 | .00 | .00 | .00 | 5. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85 | .00 | .00 | .00 | 5. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86 | .00 | .00 | .00 | 4. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87 | .00 | .00 | .00 | 4. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88 | .00 | .00 | .00 | 3. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89 | .00 | .00 | .00 | 2. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90 | .00 | .00 | .00 | 1. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91 | .00 | .00 | .00 | 1. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92 | .00 | .00 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93 | .00 | .00 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94 | .00 | .00 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95 | .00 | .00 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96 | .00 | .00 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97 | .00 | .00 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98 | .00 | .00 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99 | .00 | .00 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .00 | .00 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .00 | .00 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .00 | .00 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .00 | .00 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .00 | .00 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .00 | .00 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .00 | .00 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .00 | .00 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .00 | .00 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .00 | .00 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .00 | .00 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .00 | .00 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .00 | .00 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .00 | .00 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .00 | .00 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .00 | .00 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .00 | .00 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .00 | .00 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .00 | .00 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .00 | .00 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .00 | .00 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .00 | .00 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .00 | .00 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .00 | .00 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .00 | .00 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .00 | .00 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .00 | .00 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .00 | .00 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .00 | .00 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .00 | .00 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .00 | .00 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .00 | .00 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .00 | .00 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .00 | .00 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .00 | .00 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .00 | .00 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .00 | .00 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .00 | .00 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .00 | .00 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .00 | .00 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .00 | .00 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .00 | .00 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .00 | .00 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .00 | .00 | .00 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |

```
        1     1155  144     .00     .00     .00         0.       *        1     2355  288     .00     .00     .00         0.
                                                                 *
*****************************************************************************************************************************

    TOTAL RAINFALL =    2.60, TOTAL LOSS =     .80, TOTAL EXCESS =    1.80

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     23.92-HR
+  (CFS)       (HR)
                          (CFS)
+     442.      2.75                 105.         27.         27.          27.
                       (INCHES)     1.953       1.975       1.975        1.975
                        (AC-FT)      52.         53.         53.          53.

                        CUMULATIVE AREA =     .50 SQ MI

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

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

         HYDROGRAPH AT
+                          01.1      442.    2.75        105.         27.         27.        .50


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

# Appendix A.5

Area F

100-year Storm Event

3-Hour Synthetic Unit Hydrograph

```
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   04MAY07  TIME  12:39:13   *                                    *           (916) 756-1104             *
 *                                       *                                    *                                      *
 *****************************************                                    ****************************************
```

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

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

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



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

  1           ID   FOOTHILL PARKWAY
  2           ID   Riverside County, California
  3           ID   City of Corona
  4           ID   JN:114629 EXISTING CONDITIONS 100-YEAR 3-HOUR
  5           ID   Watershed F
  6           IT       5       0       0     288

  7           KK    01.1
  8           KM    01.1 HYDROGRAPH DEVELOPMENT
  9           BA    1.31
 10           PB    2.65
              *  RCFC&WCD 3-HOUR 5-MINUTE INTERVAL STORM PATTERN
 11           PI     1.3     1.3     1.1     1.5     1.5     1.8     1.5     1.8     1.8     1.5
 12           PI     1.6     1.8     2.2     2.2     2.2     2.0     2.6     2.7     2.4     2.7
 13           PI     3.3     3.1     2.9     3.0     3.1     4.2     5.0     3.5     6.8     7.3
 14           PI     8.2     5.9     2.0     1.8     1.8     0.6
 15           LU           0.297      10
 16           KM   UHG FROM MOUNTAIN S-GRAPH
 17           UI    398.    637.   1006.   1395.    951.    691.    497.    359.    339.    279.
 18           UI    252.    223.    212.    181.    161.    151.    141.    126.    120.    113.
 19           UI    107.     92.     90.     75.     75.     72.     66.     66.     64.     59.
 20           UI    59.5    59.5    52.7    52.1    52.1    51.8    44.0    44.0    44.0    44.0
```

```
          21          UI    39.5    33.6    33.6    33.6    33.6    33.6    30.0    24.4    24.4    24.4
          22          UI    24.4    24.4    24.4    24.4    23.3     8.9     8.9     8.9     8.9     8.9
          23          UI     8.9     8.9     8.9     8.9     8.9     8.9     8.9     8.9     8.9     8.9
          24          UI     8.9     8.9     8.9     8.9     8.9     8.9     8.9     7.0
          25          ZZ
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   04MAY07  TIME  12:39:13  *                                    *          (916) 756-1104              *
*                                      *                                    *                                      *
****************************************                                    ****************************************


                        FOOTHILL PARKWAY
                        Riverside County, California
                        City of Corona
                        JN:114629 EXISTING CONDITIONS 100-YEAR 3-HOUR
                        Watershed F

     IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         288  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      1    0  ENDING DATE
                     NDTIME        2355  ENDING TIME
                     ICENT           19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   23.92 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


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


          **************
          *            *
   7 KK   *     01.1   *
          *            *
          **************
                        01.1 HYDROGRAPH DEVELOPMENT
                        UHG FROM MOUNTAIN S-GRAPH

               SUBBASIN RUNOFF DATA
```

```
 9 BA          SUBBASIN CHARACTERISTICS
                    TAREA        1.31  SUBBASIN AREA

               PRECIPITATION DATA

10 PB                STORM        2.65  BASIN TOTAL PRECIPITATION

11 PI            INCREMENTAL PRECIPITATION PATTERN
                   1.30      1.30      1.10      1.50      1.50      1.80      1.50      1.80      1.80      1.50
                   1.60      1.80      2.20      2.20      2.20      2.00      2.60      2.70      2.40      2.70
                   3.30      3.10      2.90      3.00      3.10      4.20      5.00      3.50      6.80      7.30
                   8.20      5.90      2.00      1.80      1.80       .60

15 LU          UNIFORM LOSS RATE
                    STRTL         .00  INITIAL LOSS
                    CNSTL         .30  UNIFORM LOSS RATE
                    RTIMP       10.00  PERCENT IMPERVIOUS AREA

15 UI          INPUT UNITGRAPH,  78 ORDINATES,  VOLUME = 1.00
                 398.0     637.0    1006.0    1395.0     951.0     691.0     497.0     359.0     339.0     279.0
                 252.0     223.0     212.0     181.0     161.0     151.0     141.0     126.0     120.0     113.0
                 107.0      92.0      90.0      75.0      75.0      72.0      66.0      66.0      64.0      59.0
                  59.5      59.5      52.7      52.1      52.1      51.8      44.0      44.0      44.0      44.0
                  39.5      33.6      33.6      33.6      33.6      33.6      30.0      24.4      24.4      24.4
                  24.4      24.4      24.4      24.4      23.3       8.9       8.9       8.9       8.9       8.9
                   8.9       8.9       8.9       8.9       8.9       8.9       8.9       8.9       8.9       8.9
                   8.9       8.9       8.9       8.9       8.9       8.9       8.9       7.0

                                                          ***
```

**********

HYDROGRAPH AT STATION 01.1

**********

| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | * | | | | | | | | |
| 1 | | 0000 | 1 | .00 | .00 | .00 | 0. | * | 1 | | 1200 | 145 | .00 | .00 | .00 | 0. |
| 1 | | 0005 | 2 | .03 | .02 | .01 | 5. | * | 1 | | 1205 | 146 | .00 | .00 | .00 | 0. |
| 1 | | 0010 | 3 | .03 | .02 | .01 | 13. | * | 1 | | 1210 | 147 | .00 | .00 | .00 | 0. |
| 1 | | 0015 | 4 | .03 | .02 | .01 | 23. | * | 1 | | 1215 | 148 | .00 | .00 | .00 | 0. |
| 1 | | 0020 | 5 | .04 | .02 | .02 | 41. | * | 1 | | 1220 | 149 | .00 | .00 | .00 | 0. |
| 1 | | 0025 | 6 | .04 | .02 | .02 | 54. | * | 1 | | 1225 | 150 | .00 | .00 | .00 | 0. |
| 1 | | 0030 | 7 | .05 | .02 | .03 | 68. | * | 1 | | 1230 | 151 | .00 | .00 | .00 | 0. |
| 1 | | 0035 | 8 | .04 | .02 | .02 | 86. | * | 1 | | 1235 | 152 | .00 | .00 | .00 | 0. |
| 1 | | 0040 | 9 | .05 | .02 | .03 | 103. | * | 1 | | 1240 | 153 | .00 | .00 | .00 | 0. |
| 1 | | 0045 | 10 | .05 | .02 | .03 | 120. | * | 1 | | 1245 | 154 | .00 | .00 | .00 | 0. |
| 1 | | 0050 | 11 | .04 | .02 | .02 | 128. | * | 1 | | 1250 | 155 | .00 | .00 | .00 | 0. |
| 1 | | 0055 | 12 | .04 | .02 | .02 | 138. | * | 1 | | 1255 | 156 | .00 | .00 | .00 | 0. |
| 1 | | 0100 | 13 | .05 | .02 | .03 | 145. | * | 1 | | 1300 | 157 | .00 | .00 | .00 | 0. |
| 1 | | 0105 | 14 | .06 | .02 | .04 | 153. | * | 1 | | 1305 | 158 | .00 | .00 | .00 | 0. |
| 1 | | 0110 | 15 | .06 | .02 | .04 | 168. | * | 1 | | 1310 | 159 | .00 | .00 | .00 | 0. |
| 1 | | 0115 | 16 | .06 | .02 | .04 | 189. | * | 1 | | 1315 | 160 | .00 | .00 | .00 | 0. |
| 1 | | 0120 | 17 | .05 | .02 | .03 | 210. | * | 1 | | 1320 | 161 | .00 | .00 | .00 | 0. |
| 1 | | 0125 | 18 | .07 | .02 | .05 | 230. | * | 1 | | 1325 | 162 | .00 | .00 | .00 | 0. |
| 1 | | 0130 | 19 | .07 | .02 | .05 | 248. | * | 1 | | 1330 | 163 | .00 | .00 | .00 | 0. |
| 1 | | 0135 | 20 | .06 | .02 | .04 | 265. | * | 1 | | 1335 | 164 | .00 | .00 | .00 | 0. |
| 1 | | 0140 | 21 | .07 | .02 | .05 | 291. | * | 1 | | 1340 | 165 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0145 | 22 | .09 | .02 | .07 | 317. | * | 1 | 1345 | 166 | .00 | .00 | .00 | 0. |
| 1 | 0150 | 23 | .08 | .02 | .06 | 339. | * | 1 | 1350 | 167 | .00 | .00 | .00 | 0. |
| 1 | 0155 | 24 | .08 | .02 | .05 | 367. | * | 1 | 1355 | 168 | .00 | .00 | .00 | 0. |
| 1 | 0200 | 25 | .08 | .02 | .06 | 394. | * | 1 | 1400 | 169 | .00 | .00 | .00 | 0. |
| 1 | 0205 | 26 | .08 | .02 | .06 | 410. | * | 1 | 1405 | 170 | .00 | .00 | .00 | 0. |
| 1 | 0210 | 27 | .11 | .02 | .09 | 434. | * | 1 | 1410 | 171 | .00 | .00 | .00 | 0. |
| 1 | 0215 | 28 | .13 | .02 | .11 | 474. | * | 1 | 1415 | 172 | .00 | .00 | .00 | 0. |
| 1 | 0220 | 29 | .09 | .02 | .07 | 514. | * | 1 | 1420 | 173 | .00 | .00 | .00 | 0. |
| 1 | 0225 | 30 | .18 | .02 | .16 | 598. | * | 1 | 1425 | 174 | .00 | .00 | .00 | 0. |
| 1 | 0230 | 31 | .19 | .02 | .17 | 686. | * | 1 | 1430 | 175 | .00 | .00 | .00 | 0. |
| 1 | 0235 | 32 | .22 | .02 | .20 | 785. | * | 1 | 1435 | 176 | .00 | .00 | .00 | 0. |
| 1 | 0240 | 33 | .16 | .02 | .13 | 910. | * | 1 | 1440 | 177 | .00 | .00 | .00 | 0. |
| 1 | 0245 | 34 | .05 | .02 | .03 | 957. | * | 1 | 1445 | 178 | .00 | .00 | .00 | 0. |
| 1 | 0250 | 35 | .05 | .02 | .03 | 938. | * | 1 | 1450 | 179 | .00 | .00 | .00 | 0. |
| 1 | 0255 | 36 | .05 | .02 | .03 | 828. | * | 1 | 1455 | 180 | .00 | .00 | .00 | 0. |
| 1 | 0300 | 37 | .02 | .01 | .00 | 671. | * | 1 | 1500 | 181 | .00 | .00 | .00 | 0. |
| 1 | 0305 | 38 | .00 | .00 | .00 | 560. | * | 1 | 1505 | 182 | .00 | .00 | .00 | 0. |
| 1 | 0310 | 39 | .00 | .00 | .00 | 471. | * | 1 | 1510 | 183 | .00 | .00 | .00 | 0. |
| 1 | 0315 | 40 | .00 | .00 | .00 | 399. | * | 1 | 1515 | 184 | .00 | .00 | .00 | 0. |
| 1 | 0320 | 41 | .00 | .00 | .00 | 347. | * | 1 | 1520 | 185 | .00 | .00 | .00 | 0. |
| 1 | 0325 | 42 | .00 | .00 | .00 | 308. | * | 1 | 1525 | 186 | .00 | .00 | .00 | 0. |
| 1 | 0330 | 43 | .00 | .00 | .00 | 277. | * | 1 | 1530 | 187 | .00 | .00 | .00 | 0. |
| 1 | 0335 | 44 | .00 | .00 | .00 | 253. | * | 1 | 1535 | 188 | .00 | .00 | .00 | 0. |
| 1 | 0340 | 45 | .00 | .00 | .00 | 230. | * | 1 | 1540 | 189 | .00 | .00 | .00 | 0. |
| 1 | 0345 | 46 | .00 | .00 | .00 | 211. | * | 1 | 1545 | 190 | .00 | .00 | .00 | 0. |
| 1 | 0350 | 47 | .00 | .00 | .00 | 195. | * | 1 | 1550 | 191 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48 | .00 | .00 | .00 | 182. | * | 1 | 1555 | 192 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49 | .00 | .00 | .00 | 169. | * | 1 | 1600 | 193 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50 | .00 | .00 | .00 | 158. | * | 1 | 1605 | 194 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51 | .00 | .00 | .00 | 148. | * | 1 | 1610 | 195 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52 | .00 | .00 | .00 | 139. | * | 1 | 1615 | 196 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53 | .00 | .00 | .00 | 130. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54 | .00 | .00 | .00 | 122. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55 | .00 | .00 | .00 | 115. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56 | .00 | .00 | .00 | 109. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57 | .00 | .00 | .00 | 104. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58 | .00 | .00 | .00 | 100. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59 | .00 | .00 | .00 | 95. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60 | .00 | .00 | .00 | 92. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61 | .00 | .00 | .00 | 88. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62 | .00 | .00 | .00 | 84. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63 | .00 | .00 | .00 | 81. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64 | .00 | .00 | .00 | 77. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65 | .00 | .00 | .00 | 74. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66 | .00 | .00 | .00 | 71. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67 | .00 | .00 | .00 | 68. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68 | .00 | .00 | .00 | 64. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69 | .00 | .00 | .00 | 61. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70 | .00 | .00 | .00 | 59. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71 | .00 | .00 | .00 | 56. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72 | .00 | .00 | .00 | 53. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73 | .00 | .00 | .00 | 50. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74 | .00 | .00 | .00 | 47. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75 | .00 | .00 | .00 | 45. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76 | .00 | .00 | .00 | 43. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77 | .00 | .00 | .00 | 40. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78 | .00 | .00 | .00 | 38. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79 | .00 | .00 | .00 | 35. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80 | .00 | .00 | .00 | 34. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81 | .00 | .00 | .00 | 32. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0645 | 82 | .00 | .00 | .00 | 31. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83 | .00 | .00 | .00 | 29. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84 | .00 | .00 | .00 | 27. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85 | .00 | .00 | .00 | 25. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86 | .00 | .00 | .00 | 22. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87 | .00 | .00 | .00 | 18. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88 | .00 | .00 | .00 | 16. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89 | .00 | .00 | .00 | 16. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90 | .00 | .00 | .00 | 15. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91 | .00 | .00 | .00 | 14. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92 | .00 | .00 | .00 | 14. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93 | .00 | .00 | .00 | 14. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94 | .00 | .00 | .00 | 14. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95 | .00 | .00 | .00 | 13. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96 | .00 | .00 | .00 | 13. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97 | .00 | .00 | .00 | 12. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98 | .00 | .00 | .00 | 12. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99 | .00 | .00 | .00 | 12. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .00 | .00 | .00 | 11. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .00 | .00 | .00 | 10. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .00 | .00 | .00 | 10. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .00 | .00 | .00 | 9. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .00 | .00 | .00 | 9. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .00 | .00 | .00 | 8. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .00 | .00 | .00 | 7. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .00 | .00 | .00 | 6. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .00 | .00 | .00 | 5. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .00 | .00 | .00 | 3. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .00 | .00 | .00 | 2. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .00 | .00 | .00 | 1. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .00 | .00 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .00 | .00 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .00 | .00 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .00 | .00 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .00 | .00 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .00 | .00 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .00 | .00 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .00 | .00 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .00 | .00 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .00 | .00 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .00 | .00 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .00 | .00 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .00 | .00 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .00 | .00 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .00 | .00 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .00 | .00 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .00 | .00 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .00 | .00 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .00 | .00 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .00 | .00 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .00 | .00 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .00 | .00 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .00 | .00 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .00 | .00 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .00 | .00 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .00 | .00 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .00 | .00 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .00 | .00 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .00 | .00 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .00 | .00 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1145 | 142 | .00 | .00 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .00 | .00 | .00 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .00 | .00 | .00 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| | | | | | | | * | | | | | | | |

**********

TOTAL RAINFALL = 2.65, TOTAL LOSS = .79, TOTAL EXCESS = 1.86

| PEAK FLOW | TIME | | MAXIMUM AVERAGE FLOW | | | |
|---|---|---|---|---|---|---|
| | | | 6-HR | 24-HR | 72-HR | 23.92-HR |
| + (CFS) | (HR) | | | | | |
| | | (CFS) | | | | |
| + 957. | 2.75 | | 253. | 66. | 66. | 66. |
| | | (INCHES) | 1.794 | 1.855 | 1.855 | 1.855 |
| | | (AC-FT) | 125. | 130. | 130. | 130. |

CUMULATIVE AREA = 1.31 SQ MI

1

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

| | OPERATION | STATION | PEAK FLOW | TIME OF PEAK | AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR | 24-HOUR | 72-HOUR | BASIN AREA | MAXIMUM STAGE | TIME OF MAX STAGE |
|---|---|---|---|---|---|---|---|---|---|---|
| + | HYDROGRAPH AT | 01.1 | 957. | 2.75 | 253. | 66. | 66. | 1.31 | | |

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

# Appendix A.6

Area F

100-year Storm Event

**6-Hour Synthetic Unit Hydrograph**

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   04MAY07  TIME  12:39:26  *
*                                      *
****************************************
```

```
****************************************
*                                      *
*   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   FOOTHILL PARKWAY
  2           ID   Riverside County, California
  3           ID   City of Corona
  4           ID   JN:114629 Existing CONDITIONS 100-YEAR 6-HOUR
  5           ID   Watershed F
  6           IT       5       0       0     288

  7           KK    01.1
  8           KM    01.1 HYDROGRAPH DEVELOPMENT
  9           BA    1.31
 10           PB    3.85
              * RCFC&WCD 6-HOUR 5-MINUTE INTERVAL STORM PATTERN
 11           PI     0.5     0.6     0.6     0.6     0.6     0.7     0.7     0.7     0.7     0.7
 12           PI     0.7     0.8     0.8     0.8     0.8     0.8     0.8     0.8     0.8     0.8
 13           PI     0.8     0.8     0.8     0.9     0.8     0.9     0.9     0.9     0.9     0.9
 14           PI     0.9     0.9     1.0     1.0     1.0     1.0     1.0     1.1     1.1     1.1
 15           PI     1.2     1.3     1.4     1.4     1.5     1.5     1.6     1.6     1.7     1.8
 16           PI     1.9     2.0     2.1     2.1     2.2     2.3     2.4     2.4     2.5     2.6
 17           PI     3.1     3.6     3.9     4.2     4.7     5.6     1.9     0.9     0.6     0.5
 18           PI     0.3     0.2
 19           LU            0.297      10
 20           KM   UHG FROM MOUNTAIN S-GRAPH
```

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | UI | 398. | 637. | 1006. | 1395. | 951. | 691. | 497. | 359. | 339. | 279. |
| 22 | UI | 252. | 223. | 212. | 181. | 161. | 151. | 141. | 126. | 120. | 113. |
| 23 | UI | 107. | 92. | 90. | 75. | 75. | 72. | 66. | 66. | 64. | 59. |
| 24 | UI | 59.5 | 59.5 | 52.7 | 52.1 | 52.1 | 51.8 | 44.0 | 44.0 | 44.0 | 44.0 |
| 25 | UI | 39.5 | 33.6 | 33.6 | 33.6 | 33.6 | 33.6 | 30.0 | 24.4 | 24.4 | 24.4 |
| 26 | UI | 24.4 | 24.4 | 24.4 | 24.4 | 23.3 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 |
| 27 | UI | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 |
| 28 | UI | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 7.0 | | |
| 29 | ZZ | | | | | | | | | | |

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   04MAY07  TIME  12:39:26   *
*                                       *
*****************************************
```

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

FOOTHILL PARKWAY
Riverside County, California
City of Corona
JN:114629 Existing CONDITIONS 100-YEAR 6-HOUR
Watershed F

```
IT          HYDROGRAPH TIME DATA
                  NMIN          5  MINUTES IN COMPUTATION INTERVAL
                 IDATE      1    0  STARTING DATE
                 ITIME       0000  STARTING TIME
                    NQ        288  NUMBER OF HYDROGRAPH ORDINATES
                NDDATE      1    0  ENDING DATE
                NDTIME       2355  ENDING TIME
                ICENT          19  CENTURY MARK

             COMPUTATION INTERVAL     .08 HOURS
                  TOTAL TIME BASE   23.92 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
```

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

```
          **************
          *            *
   7 KK   *     01.1   *
          *            *
          **************
```

01.1 HYDROGRAPH DEVELOPMENT
UHG FROM MOUNTAIN S-GRAPH

SUBBASIN RUNOFF DATA

9 BA SUBBASIN CHARACTERISTICS
TAREA 1.31 SUBBASIN AREA

PRECIPITATION DATA

10 PB STORM 3.85 BASIN TOTAL PRECIPITATION

11 PI INCREMENTAL PRECIPITATION PATTERN

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| .50 | .60 | .60 | .60 | .60 | .70 | .70 | .70 | .70 | .70 |
| .70 | .80 | .80 | .80 | .80 | .80 | .80 | .80 | .80 | .80 |
| .80 | .80 | .80 | .90 | .80 | .90 | .90 | .90 | .90 | .90 |
| .90 | .90 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.10 | 1.10 | 1.10 |
| 1.20 | 1.30 | 1.40 | 1.40 | 1.50 | 1.50 | 1.60 | 1.60 | 1.70 | 1.80 |
| 1.90 | 2.00 | 2.10 | 2.10 | 2.20 | 2.30 | 2.40 | 2.40 | 2.50 | 2.60 |
| 3.10 | 3.60 | 3.90 | 4.20 | 4.70 | 5.60 | 1.90 | .90 | .60 | .50 |
| .30 | .20 | | | | | | | | |

19 LU UNIFORM LOSS RATE
STRTL .00 INITIAL LOSS
CNSTL .30 UNIFORM LOSS RATE
RTIMP 10.00 PERCENT IMPERVIOUS AREA

19 UI INPUT UNITGRAPH, 78 ORDINATES, VOLUME = 1.00

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 398.0 | 637.0 | 1006.0 | 1395.0 | 951.0 | 691.0 | 497.0 | 359.0 | 339.0 | 279.0 |
| 252.0 | 223.0 | 212.0 | 181.0 | 161.0 | 151.0 | 141.0 | 126.0 | 120.0 | 113.0 |
| 107.0 | 92.0 | 90.0 | 75.0 | 75.0 | 72.0 | 66.0 | 66.0 | 64.0 | 59.0 |
| 59.5 | 59.5 | 52.7 | 52.1 | 52.1 | 51.8 | 44.0 | 44.0 | 44.0 | 44.0 |
| 39.5 | 33.6 | 33.6 | 33.6 | 33.6 | 33.6 | 30.0 | 24.4 | 24.4 | 24.4 |
| 24.4 | 24.4 | 24.4 | 24.4 | 23.3 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 |
| 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 |
| 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 7.0 | | |

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HYDROGRAPH AT STATION 01.1

**********

| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 0000 | 1 | .00 | .00 | .00 | 0. | * | 1 | | 1200 | 145 | .00 | .00 | .00 | 1. |
| 1 | | 0005 | 2 | .02 | .02 | .00 | 1. | * | 1 | | 1205 | 146 | .00 | .00 | .00 | 0. |
| 1 | | 0010 | 3 | .02 | .02 | .00 | 2. | * | 1 | | 1210 | 147 | .00 | .00 | .00 | 0. |
| 1 | | 0015 | 4 | .02 | .02 | .00 | 4. | * | 1 | | 1215 | 148 | .00 | .00 | .00 | 0. |
| 1 | | 0020 | 5 | .02 | .02 | .00 | 7. | * | 1 | | 1220 | 149 | .00 | .00 | .00 | 0. |
| 1 | | 0025 | 6 | .02 | .02 | .00 | 10. | * | 1 | | 1225 | 150 | .00 | .00 | .00 | 0. |
| 1 | | 0030 | 7 | .03 | .02 | .00 | 12. | * | 1 | | 1230 | 151 | .00 | .00 | .00 | 0. |
| 1 | | 0035 | 8 | .03 | .02 | .00 | 15. | * | 1 | | 1235 | 152 | .00 | .00 | .00 | 0. |
| 1 | | 0040 | 9 | .03 | .02 | .00 | 18. | * | 1 | | 1240 | 153 | .00 | .00 | .00 | 0. |
| 1 | | 0045 | 10 | .03 | .02 | .00 | 22. | * | 1 | | 1245 | 154 | .00 | .00 | .00 | 0. |
| 1 | | 0050 | 11 | .03 | .02 | .00 | 25. | * | 1 | | 1250 | 155 | .00 | .00 | .00 | 0. |
| 1 | | 0055 | 12 | .03 | .02 | .00 | 28. | * | 1 | | 1255 | 156 | .00 | .00 | .00 | 0. |
| 1 | | 0100 | 13 | .03 | .02 | .01 | 31. | * | 1 | | 1300 | 157 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0105 | 14 | .03 | .02 | .01 | 35. | * | 1 | 1305 | 158 | .00 | .00 | .00 | 0. |
| 1 | 0110 | 15 | .03 | .02 | .01 | 40. | * | 1 | 1310 | 159 | .00 | .00 | .00 | 0. |
| 1 | 0115 | 16 | .03 | .02 | .01 | 46. | * | 1 | 1315 | 160 | .00 | .00 | .00 | 0. |
| 1 | 0120 | 17 | .03 | .02 | .01 | 51. | * | 1 | 1320 | 161 | .00 | .00 | .00 | 0. |
| 1 | 0125 | 18 | .03 | .02 | .01 | 54. | * | 1 | 1325 | 162 | .00 | .00 | .00 | 0. |
| 1 | 0130 | 19 | .03 | .02 | .01 | 57. | * | 1 | 1330 | 163 | .00 | .00 | .00 | 0. |
| 1 | 0135 | 20 | .03 | .02 | .01 | 59. | * | 1 | 1335 | 164 | .00 | .00 | .00 | 0. |
| 1 | 0140 | 21 | .03 | .02 | .01 | 61. | * | 1 | 1340 | 165 | .00 | .00 | .00 | 0. |
| 1 | 0145 | 22 | .03 | .02 | .01 | 63. | * | 1 | 1345 | 166 | .00 | .00 | .00 | 0. |
| 1 | 0150 | 23 | .03 | .02 | .01 | 64. | * | 1 | 1350 | 167 | .00 | .00 | .00 | 0. |
| 1 | 0155 | 24 | .03 | .02 | .01 | 66. | * | 1 | 1355 | 168 | .00 | .00 | .00 | 0. |
| 1 | 0200 | 25 | .03 | .02 | .01 | 68. | * | 1 | 1400 | 169 | .00 | .00 | .00 | 0. |
| 1 | 0205 | 26 | .03 | .02 | .01 | 70. | * | 1 | 1405 | 170 | .00 | .00 | .00 | 0. |
| 1 | 0210 | 27 | .03 | .02 | .01 | 74. | * | 1 | 1410 | 171 | .00 | .00 | .00 | 0. |
| 1 | 0215 | 28 | .03 | .02 | .01 | 79. | * | 1 | 1415 | 172 | .00 | .00 | .00 | 0. |
| 1 | 0220 | 29 | .03 | .02 | .01 | 82. | * | 1 | 1420 | 173 | .00 | .00 | .00 | 0. |
| 1 | 0225 | 30 | .03 | .02 | .01 | 88. | * | 1 | 1425 | 174 | .00 | .00 | .00 | 0. |
| 1 | 0230 | 31 | .03 | .02 | .01 | 91. | * | 1 | 1430 | 175 | .00 | .00 | .00 | 0. |
| 1 | 0235 | 32 | .03 | .02 | .01 | 94. | * | 1 | 1435 | 176 | .00 | .00 | .00 | 0. |
| 1 | 0240 | 33 | .03 | .02 | .01 | 97. | * | 1 | 1440 | 177 | .00 | .00 | .00 | 0. |
| 1 | 0245 | 34 | .04 | .02 | .02 | 100. | * | 1 | 1445 | 178 | .00 | .00 | .00 | 0. |
| 1 | 0250 | 35 | .04 | .02 | .02 | 104. | * | 1 | 1450 | 179 | .00 | .00 | .00 | 0. |
| 1 | 0255 | 36 | .04 | .02 | .02 | 110. | * | 1 | 1455 | 180 | .00 | .00 | .00 | 0. |
| 1 | 0300 | 37 | .04 | .02 | .02 | 117. | * | 1 | 1500 | 181 | .00 | .00 | .00 | 0. |
| 1 | 0305 | 38 | .04 | .02 | .02 | 121. | * | 1 | 1505 | 182 | .00 | .00 | .00 | 0. |
| 1 | 0310 | 39 | .04 | .02 | .02 | 127. | * | 1 | 1510 | 183 | .00 | .00 | .00 | 0. |
| 1 | 0315 | 40 | .04 | .02 | .02 | 132. | * | 1 | 1515 | 184 | .00 | .00 | .00 | 0. |
| 1 | 0320 | 41 | .04 | .02 | .02 | 139. | * | 1 | 1520 | 185 | .00 | .00 | .00 | 0. |
| 1 | 0325 | 42 | .05 | .02 | .02 | 148. | * | 1 | 1525 | 186 | .00 | .00 | .00 | 0. |
| 1 | 0330 | 43 | .05 | .02 | .03 | 158. | * | 1 | 1530 | 187 | .00 | .00 | .00 | 0. |
| 1 | 0335 | 44 | .05 | .02 | .03 | 170. | * | 1 | 1535 | 188 | .00 | .00 | .00 | 0. |
| 1 | 0340 | 45 | .05 | .02 | .03 | 185. | * | 1 | 1540 | 189 | .00 | .00 | .00 | 0. |
| 1 | 0345 | 46 | .06 | .02 | .04 | 203. | * | 1 | 1545 | 190 | .00 | .00 | .00 | 0. |
| 1 | 0350 | 47 | .06 | .02 | .04 | 220. | * | 1 | 1550 | 191 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48 | .06 | .02 | .04 | 235. | * | 1 | 1555 | 192 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49 | .06 | .02 | .04 | 251. | * | 1 | 1600 | 193 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50 | .07 | .02 | .04 | 267. | * | 1 | 1605 | 194 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51 | .07 | .02 | .05 | 285. | * | 1 | 1610 | 195 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52 | .07 | .02 | .05 | 303. | * | 1 | 1615 | 196 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53 | .08 | .02 | .05 | 325. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54 | .08 | .02 | .06 | 349. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55 | .08 | .02 | .06 | 374. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56 | .08 | .02 | .06 | 398. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57 | .09 | .02 | .07 | 422. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58 | .09 | .02 | .07 | 446. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59 | .09 | .02 | .07 | 470. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60 | .10 | .02 | .07 | 495. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61 | .10 | .02 | .08 | 520. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62 | .12 | .02 | .10 | 550. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63 | .14 | .02 | .12 | 593. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64 | .15 | .02 | .13 | 650. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65 | .16 | .02 | .14 | 724. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66 | .18 | .02 | .16 | 810. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67 | .22 | .02 | .19 | 907. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68 | .07 | .02 | .05 | 952. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69 | .03 | .02 | .01 | 952. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70 | .02 | .02 | .00 | 883. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71 | .02 | .02 | .00 | 714. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72 | .01 | .01 | .00 | 573. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73 | .01 | .01 | .00 | 470. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0605 | 74 | .00 | .00 | .00 | 401. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75 | .00 | .00 | .00 | 358. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76 | .00 | .00 | .00 | 320. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77 | .00 | .00 | .00 | 290. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78 | .00 | .00 | .00 | 265. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79 | .00 | .00 | .00 | 243. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80 | .00 | .00 | .00 | 223. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81 | .00 | .00 | .00 | 206. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82 | .00 | .00 | .00 | 192. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83 | .00 | .00 | .00 | 180. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84 | .00 | .00 | .00 | 168. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85 | .00 | .00 | .00 | 157. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86 | .00 | .00 | .00 | 148. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87 | .00 | .00 | .00 | 139. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88 | .00 | .00 | .00 | 130. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89 | .00 | .00 | .00 | 123. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90 | .00 | .00 | .00 | 116. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91 | .00 | .00 | .00 | 111. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92 | .00 | .00 | .00 | 106. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93 | .00 | .00 | .00 | 102. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94 | .00 | .00 | .00 | 98. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95 | .00 | .00 | .00 | 94. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96 | .00 | .00 | .00 | 90. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97 | .00 | .00 | .00 | 86. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98 | .00 | .00 | .00 | 83. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99 | .00 | .00 | .00 | 79. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .00 | .00 | .00 | 75. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .00 | .00 | .00 | 72. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .00 | .00 | .00 | 69. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .00 | .00 | .00 | 65. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .00 | .00 | .00 | 62. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .00 | .00 | .00 | 59. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .00 | .00 | .00 | 56. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .00 | .00 | .00 | 52. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .00 | .00 | .00 | 49. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .00 | .00 | .00 | 47. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .00 | .00 | .00 | 45. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .00 | .00 | .00 | 42. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .00 | .00 | .00 | 40. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .00 | .00 | .00 | 37. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .00 | .00 | .00 | 34. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .00 | .00 | .00 | 33. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .00 | .00 | .00 | 31. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .00 | .00 | .00 | 30. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .00 | .00 | .00 | 28. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .00 | .00 | .00 | 25. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .00 | .00 | .00 | 23. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .00 | .00 | .00 | 20. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .00 | .00 | .00 | 17. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .00 | .00 | .00 | 16. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .00 | .00 | .00 | 16. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .00 | .00 | .00 | 15. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .00 | .00 | .00 | 15. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .00 | .00 | .00 | 14. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .00 | .00 | .00 | 14. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .00 | .00 | .00 | 14. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .00 | .00 | .00 | 13. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .00 | .00 | .00 | 13. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .00 | .00 | .00 | 12. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .00 | .00 | .00 | 12. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1105 | 134 | .00 | .00 | .00 | 11. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .00 | .00 | .00 | 10. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .00 | .00 | .00 | 10. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .00 | .00 | .00 | 9. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .00 | .00 | .00 | 9. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .00 | .00 | .00 | 8. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .00 | .00 | .00 | 7. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .00 | .00 | .00 | 6. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .00 | .00 | .00 | 5. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .00 | .00 | .00 | 3. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .00 | .00 | .00 | 2. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| | | | | | | | * | | | | | | | |

**********

TOTAL RAINFALL = 3.85, TOTAL LOSS = 1.56, TOTAL EXCESS = 2.29

| PEAK FLOW | TIME | | MAXIMUM AVERAGE FLOW | | | |
|---|---|---|---|---|---|---|
| | | | 6-HR | 24-HR | 72-HR | 23.92-HR |
| + (CFS) | (HR) | | | | | |
| | | (CFS) | | | | |
| + 952. | 5.67 | | 291. | 81. | 81. | 81. |
| | | (INCHES) | 2.069 | 2.289 | 2.289 | 2.289 |
| | | (AC-FT) | 145. | 160. | 160. | 160. |

CUMULATIVE AREA = 1.31 SQ MI

1

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

| | OPERATION | STATION | PEAK FLOW | TIME OF PEAK | AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR | 24-HOUR | 72-HOUR | BASIN AREA | MAXIMUM STAGE | TIME OF MAX STAGE |
|---|---|---|---|---|---|---|---|---|---|---|
| + | HYDROGRAPH AT | 01.1 | 952. | 5.67 | 291. | 81. | 81. | 1.31 | | |

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

# Appendix B

Project Condition Hydrology

# Appendix B.1

Area A

10-year and 100-year Storm Event

Rational Method

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
      RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                (RCFC&WCD)  1978 HYDROLOGY MANUAL
      (c) Copyright 1982-2004 Advanced Engineering Software (aes)
                (Rational Tabling Version 6.0D)
            Release Date: 01/01/2004  License ID 1264

                    Analysis prepared by:

                        RBF Consulting
                     14725 Alton Parkway
                   Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
 * Foothill Parkway Interim Condition Hydrolgy                          *
 * 10 Year Area A1                                                      *
 * 10104629                                                             *
 ************************************************************************

  FILE NAME: FH110A1.DAT
  TIME/DATE OF STUDY: 11:06 10/05/2006
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.220
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.940
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.430
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.450
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4796304
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4805313
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.949
  SLOPE OF INTENSITY DURATION CURVE = 0.4796
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  =====  =====  =====  =======
  1   30.0     20.0   0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE      60.00 TO NODE      61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```



```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   839.99
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1275.00
  ELEVATION DIFFERENCE(FEET) =    205.00
  TC = 0.709*[(  839.99**3)/(   205.00)]**.2 =   13.903
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.914
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7304
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      11.44
  TOTAL AREA(ACRES) =       8.18   TOTAL RUNOFF(CFS) =      11.44

****************************************************************************
  FLOW PROCESS FROM NODE      61.00 TO NODE      62.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1275.00  DOWNSTREAM(FEET) =   1127.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   918.80   CHANNEL SLOPE =  0.1611
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      11.44
  FLOW VELOCITY(FEET/SEC) =   8.18 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =  15.78
  LONGEST FLOWPATH FROM NODE      60.00 TO NODE      62.00 =  1758.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      62.00 TO NODE      62.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.802
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7219
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    11.05   SUBAREA RUNOFF(CFS) =   14.37
  TOTAL AREA(ACRES) =      19.23   TOTAL RUNOFF(CFS) =   25.81
  TC(MIN.) =  15.78
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      19.23  TC(MIN.) =      15.78
  PEAK FLOW RATE(CFS)    =      25.81
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
                (Rational Tabling Version 6.0D)
            Release Date: 01/01/2004  License ID 1264

                    Analysis prepared by:

                        RBF Consulting
                      14725 Alton Parkway
                    Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
 * Foothill Parkway Interim Condition Hydrolgy                          *
 * 100 Year Area A1                                                     *
 * 10104629                                                             *
 ************************************************************************

  FILE NAME: FHI100A1.DAT
  TIME/DATE OF STUDY: 11:16 10/05/2006
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.220
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.940
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.430
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.450
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4796304
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4805313
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.450
  SLOPE OF INTENSITY DURATION CURVE = 0.4805
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ==================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE      60.00 TO NODE      61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```



```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   839.99
  UPSTREAM ELEVATION(FEET) =   1480.00
  DOWNSTREAM ELEVATION(FEET) =   1275.00
  ELEVATION DIFFERENCE(FEET) =    205.00
  TC = 0.709*[(  839.99**3)/(   205.00)]**.2 =   13.903
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.928
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7814
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      18.71
  TOTAL AREA(ACRES) =      8.18   TOTAL RUNOFF(CFS) =      18.71

****************************************************************************
  FLOW PROCESS FROM NODE      61.00 TO NODE      62.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1275.00  DOWNSTREAM(FEET) =   1127.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   918.80   CHANNEL SLOPE =  0.1611
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      18.71
  FLOW VELOCITY(FEET/SEC) =   9.31 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.65   Tc(MIN.) =  15.55
  LONGEST FLOWPATH FROM NODE      60.00 TO NODE      62.00 =  1758.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      62.00 TO NODE      62.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.775
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7757
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   11.05   SUBAREA RUNOFF(CFS) =   23.78
  TOTAL AREA(ACRES) =     19.23   TOTAL RUNOFF(CFS) =   42.50
  TC(MIN.) =  15.55
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      19.23  TC(MIN.) =      15.55
  PEAK FLOW RATE(CFS)    =      42.50
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
      RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
                (Rational Tabling Version 6.0D)
            Release Date: 01/01/2004  License ID 1264

                    Analysis prepared by:

                       RBF Consulting
                    14725 Alton Parkway
                  Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
 * Foothill Parkway Interim Condition Hydrolgy                          *
 * 10 Year Area A2                                                      *
 * 10104629                                                             *
 ************************************************************************

  FILE NAME: FHI10A2.DAT
  TIME/DATE OF STUDY: 11:08 10/05/2006
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.220
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.940
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.430
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.450
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4796304
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4805313
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.949
  SLOPE OF INTENSITY DURATION CURVE = 0.4796
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE      50.00 TO NODE      51.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```



```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   609.92
  UPSTREAM ELEVATION(FEET) =   1400.00
  DOWNSTREAM ELEVATION(FEET) =   1200.00
  ELEVATION DIFFERENCE(FEET) =    200.00
  TC = 0.709*[(  609.92**3)/(   200.00)]**.2 =   11.531
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.094
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7424
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      12.53
  TOTAL AREA(ACRES) =       8.06   TOTAL RUNOFF(CFS) =      12.53

****************************************************************************
  FLOW PROCESS FROM NODE      51.00 TO NODE      52.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =   1125.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   422.36   CHANNEL SLOPE =  0.1776
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      12.53
  FLOW VELOCITY(FEET/SEC) =   8.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.84   Tc(MIN.) =  12.37
  LONGEST FLOWPATH FROM NODE      50.00 TO NODE      52.00 =  1032.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      52.00 TO NODE      52.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.025
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7380
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   11.78   SUBAREA RUNOFF(CFS) =   17.60
  TOTAL AREA(ACRES) =     19.84   TOTAL RUNOFF(CFS) =   30.13
  TC(MIN.) =  12.37
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     19.84  TC(MIN.) =      12.37
  PEAK FLOW RATE(CFS)    =     30.13
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
      RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
                (Rational Tabling Version 6.0D)
            Release Date: 01/01/2004  License ID 1264

                    Analysis prepared by:

                       RBF Consulting
                     14725 Alton Parkway
                   Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
 * Foothill Parkway Interim Condition Hydrolgy                          *
 * 100 Year Area A2                                                     *
 * 10104629                                                             *
 ************************************************************************

  FILE NAME: FHI100A2.DAT
  TIME/DATE OF STUDY: 11:17 10/05/2006
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.220
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.940
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.430
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.450
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4796304
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4805313
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.450
  SLOPE OF INTENSITY DURATION CURVE = 0.4805
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     51.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```



```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   609.92
  UPSTREAM ELEVATION(FEET) =   1400.00
  DOWNSTREAM ELEVATION(FEET) =   1200.00
  ELEVATION DIFFERENCE(FEET) =    200.00
  TC = 0.709*[(  609.92**3)/(   200.00)]**.2 =   11.531
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.203
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7903
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      20.40
  TOTAL AREA(ACRES) =       8.06   TOTAL RUNOFF(CFS) =      20.40

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     52.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =   1125.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   422.36   CHANNEL SLOPE =  0.1776
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      20.40
  FLOW VELOCITY(FEET/SEC) =   9.53 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.74   Tc(MIN.) =  12.27
  LONGEST FLOWPATH FROM NODE     50.00 TO NODE     52.00 =  1032.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     52.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.109
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7874
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   11.78   SUBAREA RUNOFF(CFS) =   28.84
  TOTAL AREA(ACRES) =     19.84   TOTAL RUNOFF(CFS) =   49.24
  TC(MIN.) =  12.27
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     19.84  TC(MIN.) =     12.27
  PEAK FLOW RATE(CFS)    =     49.24
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# Appendix B.2

Area D

100-year Storm Event

3-Hour Synthetic Unit Hydrograph

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   04MAY07  TIME  13:40:37  *
*                                      *
****************************************
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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

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

  1           ID   FOOTHILL PARKWAY
  2           ID   Riverside County, California
  3           ID   City of Corona
  4           ID   JN:114629 Project CONDITIONS 100-YEAR 3-HOUR
  5           ID   Watershed D Mountain S-graph
  6           IT       5       0       0     288

  7           KK    01.1
  8           KM    01.1 HYDROGRAPH DEVELOPMENT
  9           BA    1.44
 10           PB    2.82
              *  RCFC&WCD 3-HOUR 5-MINUTE INTERVAL STORM PATTERN
 11           PI     1.3     1.3     1.1     1.5     1.5     1.8     1.5     1.8     1.8     1.5
 12           PI     1.6     1.8     2.2     2.2     2.2     2.0     2.6     2.7     2.4     2.7
 13           PI     3.3     3.1     2.9     3.0     3.1     4.2     5.0     3.5     6.8     7.3
 14           PI     8.2     5.9     2.0     1.8     1.8     0.6
 15           LU           0.279      10
 16           KM   UHG FROM MOUNTAIN S-GRAPH
 17           UI    376.    515.    854.   1262.   1189.    796.    635.    474.    351.    323.
 18           UI    292.    254.    233.    205.    202.    174.    157.    147.    137.    132.
 19           UI    115.    114.    108.    105.     87.     87.     78.     72.     72.     68.
 20           UI    63.4    63.4    63.4    57.0    56.7    56.7    56.5    49.7    49.7    49.7
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          21          UI    49.7    45.6    42.0    42.0    42.0    42.0    39.7    32.0    32.0    32.0
          22          UI    32.0    32.0    32.0    29.8    23.2    23.2    23.2    23.2    23.2    23.2
          23          UI    23.2    23.2    23.2    13.4     8.5     8.5     8.5     8.5     8.5     8.5
          24          UI     8.5     8.5     8.5     8.5     8.5     8.5     8.5     8.5     8.5     8.5
          25          UI     8.5     8.5     8.5     8.5     8.5     8.5     8.5     8.5     8.5     5.8
          26          ZZ
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   04MAY07  TIME  13:40:37  *                                    *          (916) 756-1104              *
*                                      *                                    *                                      *
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FOOTHILL PARKWAY
Riverside County, California
City of Corona
JN:114629 Project CONDITIONS 100-YEAR 3-HOUR
Watershed D Mountain S-graph

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     IT          HYDROGRAPH TIME DATA
                       NMIN          5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         288  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      1    0  ENDING DATE
                     NDTIME        2355  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   23.92 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


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


          **************
          *            *
   7 KK   *      01.1  *
          *            *
          **************
                        01.1 HYDROGRAPH DEVELOPMENT
                       UHG FROM MOUNTAIN S-GRAPH
```

SUBBASIN RUNOFF DATA

9 BA SUBBASIN CHARACTERISTICS

TAREA 1.44 SUBBASIN AREA

PRECIPITATION DATA

10 PB STORM 2.82 BASIN TOTAL PRECIPITATION

11 PI INCREMENTAL PRECIPITATION PATTERN

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.30 | 1.30 | 1.10 | 1.50 | 1.50 | 1.80 | 1.50 | 1.80 | 1.80 | 1.50 |
| 1.60 | 1.80 | 2.20 | 2.20 | 2.20 | 2.00 | 2.60 | 2.70 | 2.40 | 2.70 |
| 3.30 | 3.10 | 2.90 | 3.00 | 3.10 | 4.20 | 5.00 | 3.50 | 6.80 | 7.30 |
| 8.20 | 5.90 | 2.00 | 1.80 | 1.80 | .60 | | | | |

15 LU UNIFORM LOSS RATE

STRTL .00 INITIAL LOSS

CNSTL .28 UNIFORM LOSS RATE

RTIMP 10.00 PERCENT IMPERVIOUS AREA

15 UI INPUT UNITGRAPH, 90 ORDINATES, VOLUME = 1.00

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 376.0 | 515.0 | 854.0 | 1262.0 | 1189.0 | 796.0 | 635.0 | 474.0 | 351.0 | 323.0 |
| 292.0 | 254.0 | 233.0 | 205.0 | 202.0 | 174.0 | 157.0 | 147.0 | 137.0 | 132.0 |
| 115.0 | 114.0 | 108.0 | 105.0 | 87.0 | 87.0 | 78.0 | 72.0 | 72.0 | 68.0 |
| 63.4 | 63.4 | 63.4 | 57.0 | 56.7 | 56.7 | 56.5 | 49.7 | 49.7 | 49.7 |
| 49.7 | 45.6 | 42.0 | 42.0 | 42.0 | 42.0 | 39.7 | 32.0 | 32.0 | 32.0 |
| 32.0 | 32.0 | 32.0 | 29.8 | 23.2 | 23.2 | 23.2 | 23.2 | 23.2 | 23.2 |
| 23.2 | 23.2 | 23.2 | 13.4 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 |
| 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 |
| 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 5.8 |

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HYDROGRAPH AT STATION 01.1

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| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 0000 | 1 | .00 | .00 | .00 | 0. | * | 1 | | 1200 | 145 | .00 | .00 | .00 | 0. |
| 1 | | 0005 | 2 | .04 | .02 | .02 | 6. | * | 1 | | 1205 | 146 | .00 | .00 | .00 | 0. |
| 1 | | 0010 | 3 | .04 | .02 | .02 | 14. | * | 1 | | 1210 | 147 | .00 | .00 | .00 | 0. |
| 1 | | 0015 | 4 | .03 | .02 | .01 | 25. | * | 1 | | 1215 | 148 | .00 | .00 | .00 | 0. |
| 1 | | 0020 | 5 | .04 | .02 | .02 | 47. | * | 1 | | 1220 | 149 | .00 | .00 | .00 | 0. |
| 1 | | 0025 | 6 | .04 | .02 | .02 | 66. | * | 1 | | 1225 | 150 | .00 | .00 | .00 | 0. |
| 1 | | 0030 | 7 | .05 | .02 | .03 | 84. | * | 1 | | 1230 | 151 | .00 | .00 | .00 | 0. |
| 1 | | 0035 | 8 | .04 | .02 | .02 | 103. | * | 1 | | 1235 | 152 | .00 | .00 | .00 | 0. |
| 1 | | 0040 | 9 | .05 | .02 | .03 | 126. | * | 1 | | 1240 | 153 | .00 | .00 | .00 | 0. |
| 1 | | 0045 | 10 | .05 | .02 | .03 | 144. | * | 1 | | 1245 | 154 | .00 | .00 | .00 | 0. |
| 1 | | 0050 | 11 | .04 | .02 | .02 | 157. | * | 1 | | 1250 | 155 | .00 | .00 | .00 | 0. |
| 1 | | 0055 | 12 | .05 | .02 | .02 | 169. | * | 1 | | 1255 | 156 | .00 | .00 | .00 | 0. |
| 1 | | 0100 | 13 | .05 | .02 | .03 | 181. | * | 1 | | 1300 | 157 | .00 | .00 | .00 | 0. |
| 1 | | 0105 | 14 | .06 | .02 | .04 | 190. | * | 1 | | 1305 | 158 | .00 | .00 | .00 | 0. |
| 1 | | 0110 | 15 | .06 | .02 | .04 | 204. | * | 1 | | 1310 | 159 | .00 | .00 | .00 | 0. |
| 1 | | 0115 | 16 | .06 | .02 | .04 | 226. | * | 1 | | 1315 | 160 | .00 | .00 | .00 | 0. |
| 1 | | 0120 | 17 | .06 | .02 | .04 | 248. | * | 1 | | 1320 | 161 | .00 | .00 | .00 | 0. |
| 1 | | 0125 | 18 | .07 | .02 | .05 | 274. | * | 1 | | 1325 | 162 | .00 | .00 | .00 | 0. |
| 1 | | 0130 | 19 | .08 | .02 | .06 | 295. | * | 1 | | 1330 | 163 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0135 | 20 | .07 | .02 | .05 | 314. | * | 1 | 1335 | 164 | .00 | .00 | .00 | 0. |
| 1 | 0140 | 21 | .08 | .02 | .06 | 341. | * | 1 | 1340 | 165 | .00 | .00 | .00 | 0. |
| 1 | 0145 | 22 | .09 | .02 | .07 | 372. | * | 1 | 1345 | 166 | .00 | .00 | .00 | 0. |
| 1 | 0150 | 23 | .09 | .02 | .07 | 397. | * | 1 | 1350 | 167 | .00 | .00 | .00 | 0. |
| 1 | 0155 | 24 | .08 | .02 | .06 | 425. | * | 1 | 1355 | 168 | .00 | .00 | .00 | 0. |
| 1 | 0200 | 25 | .08 | .02 | .06 | 457. | * | 1 | 1400 | 169 | .00 | .00 | .00 | 0. |
| 1 | 0205 | 26 | .09 | .02 | .07 | 481. | * | 1 | 1405 | 170 | .00 | .00 | .00 | 0. |
| 1 | 0210 | 27 | .12 | .02 | .10 | 508. | * | 1 | 1410 | 171 | .00 | .00 | .00 | 0. |
| 1 | 0215 | 28 | .14 | .02 | .12 | 549. | * | 1 | 1415 | 172 | .00 | .00 | .00 | 0. |
| 1 | 0220 | 29 | .10 | .02 | .08 | 586. | * | 1 | 1420 | 173 | .00 | .00 | .00 | 0. |
| 1 | 0225 | 30 | .19 | .02 | .17 | 672. | * | 1 | 1425 | 174 | .00 | .00 | .00 | 0. |
| 1 | 0230 | 31 | .21 | .02 | .18 | 766. | * | 1 | 1430 | 175 | .00 | .00 | .00 | 0. |
| 1 | 0235 | 32 | .23 | .02 | .21 | 872. | * | 1 | 1435 | 176 | .00 | .00 | .00 | 0. |
| 1 | 0240 | 33 | .17 | .02 | .15 | 987. | * | 1 | 1440 | 177 | .00 | .00 | .00 | 0. |
| 1 | 0245 | 34 | .06 | .02 | .04 | 1067. | * | 1 | 1445 | 178 | .00 | .00 | .00 | 0. |
| 1 | 0250 | 35 | .05 | .02 | .03 | 1078. | * | 1 | 1450 | 179 | .00 | .00 | .00 | 0. |
| 1 | 0255 | 36 | .05 | .02 | .03 | 1006. | * | 1 | 1455 | 180 | .00 | .00 | .00 | 0. |
| 1 | 0300 | 37 | .02 | .02 | .00 | 856. | * | 1 | 1500 | 181 | .00 | .00 | .00 | 0. |
| 1 | 0305 | 38 | .00 | .00 | .00 | 714. | * | 1 | 1505 | 182 | .00 | .00 | .00 | 0. |
| 1 | 0310 | 39 | .00 | .00 | .00 | 608. | * | 1 | 1510 | 183 | .00 | .00 | .00 | 0. |
| 1 | 0315 | 40 | .00 | .00 | .00 | 513. | * | 1 | 1515 | 184 | .00 | .00 | .00 | 0. |
| 1 | 0320 | 41 | .00 | .00 | .00 | 442. | * | 1 | 1520 | 185 | .00 | .00 | .00 | 0. |
| 1 | 0325 | 42 | .00 | .00 | .00 | 394. | * | 1 | 1525 | 186 | .00 | .00 | .00 | 0. |
| 1 | 0330 | 43 | .00 | .00 | .00 | 352. | * | 1 | 1530 | 187 | .00 | .00 | .00 | 0. |
| 1 | 0335 | 44 | .00 | .00 | .00 | 321. | * | 1 | 1535 | 188 | .00 | .00 | .00 | 0. |
| 1 | 0340 | 45 | .00 | .00 | .00 | 295. | * | 1 | 1540 | 189 | .00 | .00 | .00 | 0. |
| 1 | 0345 | 46 | .00 | .00 | .00 | 272. | * | 1 | 1545 | 190 | .00 | .00 | .00 | 0. |
| 1 | 0350 | 47 | .00 | .00 | .00 | 251. | * | 1 | 1550 | 191 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48 | .00 | .00 | .00 | 232. | * | 1 | 1555 | 192 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49 | .00 | .00 | .00 | 217. | * | 1 | 1600 | 193 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50 | .00 | .00 | .00 | 204. | * | 1 | 1605 | 194 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51 | .00 | .00 | .00 | 191. | * | 1 | 1610 | 195 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52 | .00 | .00 | .00 | 180. | * | 1 | 1615 | 196 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53 | .00 | .00 | .00 | 170. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54 | .00 | .00 | .00 | 161. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55 | .00 | .00 | .00 | 152. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56 | .00 | .00 | .00 | 143. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57 | .00 | .00 | .00 | 135. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58 | .00 | .00 | .00 | 128. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59 | .00 | .00 | .00 | 122. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60 | .00 | .00 | .00 | 117. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61 | .00 | .00 | .00 | 113. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62 | .00 | .00 | .00 | 109. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63 | .00 | .00 | .00 | 105. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64 | .00 | .00 | .00 | 102. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65 | .00 | .00 | .00 | 98. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66 | .00 | .00 | .00 | 95. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67 | .00 | .00 | .00 | 92. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68 | .00 | .00 | .00 | 88. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69 | .00 | .00 | .00 | 84. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70 | .00 | .00 | .00 | 81. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71 | .00 | .00 | .00 | 79. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72 | .00 | .00 | .00 | 76. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73 | .00 | .00 | .00 | 72. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74 | .00 | .00 | .00 | 69. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75 | .00 | .00 | .00 | 66. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76 | .00 | .00 | .00 | 64. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77 | .00 | .00 | .00 | 61. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78 | .00 | .00 | .00 | 58. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79 | .00 | .00 | .00 | 55. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0635 | 80 | .00 | .00 | .00 | 52. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81 | .00 | .00 | .00 | 50. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82 | .00 | .00 | .00 | 48. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83 | .00 | .00 | .00 | 46. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84 | .00 | .00 | .00 | 44. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85 | .00 | .00 | .00 | 41. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86 | .00 | .00 | .00 | 39. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87 | .00 | .00 | .00 | 37. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88 | .00 | .00 | .00 | 36. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89 | .00 | .00 | .00 | 34. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90 | .00 | .00 | .00 | 33. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91 | .00 | .00 | .00 | 31. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92 | .00 | .00 | .00 | 30. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93 | .00 | .00 | .00 | 28. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94 | .00 | .00 | .00 | 25. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95 | .00 | .00 | .00 | 22. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96 | .00 | .00 | .00 | 19. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97 | .00 | .00 | .00 | 18. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98 | .00 | .00 | .00 | 17. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99 | .00 | .00 | .00 | 16. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .00 | .00 | .00 | 16. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .00 | .00 | .00 | 16. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .00 | .00 | .00 | 15. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .00 | .00 | .00 | 15. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .00 | .00 | .00 | 15. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .00 | .00 | .00 | 15. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .00 | .00 | .00 | 14. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .00 | .00 | .00 | 14. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .00 | .00 | .00 | 13. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .00 | .00 | .00 | 13. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .00 | .00 | .00 | 13. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .00 | .00 | .00 | 12. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .00 | .00 | .00 | 11. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .00 | .00 | .00 | 11. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .00 | .00 | .00 | 10. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .00 | .00 | .00 | 10. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .00 | .00 | .00 | 9. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .00 | .00 | .00 | 8. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .00 | .00 | .00 | 7. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .00 | .00 | .00 | 6. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .00 | .00 | .00 | 5. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .00 | .00 | .00 | 3. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .00 | .00 | .00 | 2. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .00 | .00 | .00 | 1. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .00 | .00 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .00 | .00 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .00 | .00 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .00 | .00 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .00 | .00 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .00 | .00 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .00 | .00 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .00 | .00 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .00 | .00 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .00 | .00 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .00 | .00 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .00 | .00 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .00 | .00 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .00 | .00 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .00 | .00 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .00 | .00 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1135 | 140 | .00 | .00 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .00 | .00 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .00 | .00 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .00 | .00 | .00 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .00 | .00 | .00 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| | | | | | | | * | | | | | | | |

**********

TOTAL RAINFALL = 2.82, TOTAL LOSS = .75, TOTAL EXCESS = 2.07

| PEAK FLOW | TIME | | MAXIMUM AVERAGE FLOW | | | |
|---|---|---|---|---|---|---|
| | | | 6-HR | 24-HR | 72-HR | 23.92-HR |
| + (CFS) | (HR) | | | | | |
| | | (CFS) | | | | |
| + 1078. | 2.83 | | 305. | 80. | 80. | 80. |
| | | (INCHES) | 1.970 | 2.071 | 2.071 | 2.071 |
| | | (AC-FT) | 151. | 159. | 159. | 159. |

CUMULATIVE AREA = 1.44 SQ MI

1

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

| | OPERATION | STATION | PEAK FLOW | TIME OF PEAK | AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR | 24-HOUR | 72-HOUR | BASIN AREA | MAXIMUM STAGE | TIME OF MAX STAGE |
|---|---|---|---|---|---|---|---|---|---|---|
| + | HYDROGRAPH AT | 01.1 | 1078. | 2.83 | 305. | 80. | 80. | 1.44 | | |

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

# Appendix B.3

Area E

100-year Storm Event

3-Hour Synthetic Unit Hydrograph

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   04MAY07  TIME  13:39:53  *
*                                      *
****************************************
```

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

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

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

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



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

  1           ID   FOOTHILL PARKWAY
  2           ID   Riverside County, California
  3           ID   City of Corona
  4           ID   JN:114629 PROJECT CONDITIONS 100-YEAR 3-HOUR
  5           ID   Watershed E Mountain S graph
  6           IT       5       0       0     288

  7           KK    01.1
  8           KM    01.1 HYDROGRAPH DEVELOPMENT
  9           BA     0.56
 10           PB     2.65
              *  RCFC&WCD 3-HOUR 5-MINUTE INTERVAL STORM PATTERN
 11           PI     1.3     1.3     1.1     1.5     1.5     1.8     1.5     1.8     1.8     1.5
 12           PI     1.6     1.8     2.2     2.2     2.2     2.0     2.6     2.7     2.4     2.7
 13           PI     3.3     3.1     2.9     3.0     3.1     4.2     5.0     3.5     6.8     7.3
 14           PI     8.2     5.9     2.0     1.8     1.8     0.6
 15           LU           0.296      10
 16           KM   UHG FROM MOUNTAIN S-GRAPH
 17           UI    261.    493.    781.    496.    333.    212.    185.    151.    129.    116.
 18           UI    95.4    86.7    77.3    70.0    66.5    54.3    50.4    44.4    42.2    39.1
 19           UI    38.3    35.0    35.0    31.9    30.7    30.7    26.4    25.9    25.9    22.5
 20           UI    19.8    19.8    19.8    18.8    14.4    14.4    14.4    14.4    14.4    13.1
```

```
          21          UI     5.2     5.2     5.2     5.2     5.2     5.2     5.2     5.2     5.2     5.2
          22          UI     5.2     5.2     5.2     5.2     5.2     5.2     2.3
          23          ZZ
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   04MAY07  TIME  13:39:53  *                                    *          (916) 756-1104              *
*                                      *                                    *                                      *
****************************************                                    ****************************************
```

FOOTHILL PARKWAY
Riverside County, California
City of Corona
JN:114629 PROJECT CONDITIONS 100-YEAR 3-HOUR
Watershed E Mountain S graph

```
     IT          HYDROGRAPH TIME DATA
                       NMIN          5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ        288  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      1    0  ENDING DATE
                     NDTIME       2355  ENDING TIME
                      ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   23.92 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


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


          **************
          *            *
   7 KK   *     01.1   *
          *            *
          **************
                       01.1 HYDROGRAPH DEVELOPMENT
                      UHG FROM MOUNTAIN S-GRAPH

               SUBBASIN RUNOFF DATA

   9 BA          SUBBASIN CHARACTERISTICS
```

```
                TAREA          .50  SUBBASIN AREA
                 SNAP 60000000.00  NORMAL ANNUAL PRECIPITATION
                RATIO          .00  RATIO OF HYDROGRAPH

           PRECIPITATION DATA

10 PB           STORM         2.60  BASIN TOTAL PRECIPITATION

11 PI        INCREMENTAL PRECIPITATION PATTERN
                1.30      1.30      1.10      1.50      1.50      1.80      1.50      1.80      1.80      1.50
                1.60      1.80      2.20      2.20      2.20      2.00      2.60      2.70      2.40      2.70
                3.30      3.10      2.90      3.00      3.10      4.20      5.00      3.50      6.80      7.30
                8.20      5.90      2.00      1.80      1.80       .60

15 LU       UNIFORM LOSS RATE
                STRTL          .00  INITIAL LOSS
                CNSTL          .30  UNIFORM LOSS RATE
                RTIMP        10.00  PERCENT IMPERVIOUS AREA

15 UI       INPUT UNITGRAPH,  57 ORDINATES,  VOLUME = 1.12
               261.0     493.0     781.0     496.0     333.0     212.0     185.0     151.0     129.0     116.0
                95.4      86.7      77.3      70.0      66.5      54.3      50.4      44.4      42.2      39.1
                38.3      35.0      35.0      31.9      30.7      30.7      26.4      25.9      25.9      22.5
                19.8      19.8      19.8      18.8      14.4      14.4      14.4      14.4      14.4      13.1
                 5.2       5.2       5.2       5.2       5.2       5.2       5.2       5.2       5.2       5.2
                 5.2       5.2       5.2       5.2       5.2       5.2       2.3

                                                    ***

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

                                          HYDROGRAPH AT STATION     01.1

*****************************************************************************************************************************
                                                                  *
     DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q          *     DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                  *
      1     0000    1     .00     .00     .00         0.          *      1     1200  145     .00     .00     .00         0.
      1     0005    2     .03     .02     .01         3.          *      1     1205  146     .00     .00     .00         0.
      1     0010    3     .03     .02     .01         9.          *      1     1210  147     .00     .00     .00         0.
      1     0015    4     .03     .02     .01        16.          *      1     1215  148     .00     .00     .00         0.
      1     0020    5     .04     .02     .02        22.          *      1     1220  149     .00     .00     .00         0.
      1     0025    6     .04     .02     .02        27.          *      1     1225  150     .00     .00     .00         0.
      1     0030    7     .05     .02     .02        37.          *      1     1230  151     .00     .00     .00         0.
      1     0035    8     .04     .02     .02        45.          *      1     1235  152     .00     .00     .00         0.
      1     0040    9     .05     .02     .02        53.          *      1     1240  153     .00     .00     .00         0.
      1     0045   10     .05     .02     .02        57.          *      1     1245  154     .00     .00     .00         0.
      1     0050   11     .04     .02     .02        63.          *      1     1250  155     .00     .00     .00         0.
      1     0055   12     .04     .02     .02        64.          *      1     1255  156     .00     .00     .00         0.
      1     0100   13     .05     .02     .02        65.          *      1     1300  157     .00     .00     .00         0.
      1     0105   14     .06     .02     .04        72.          *      1     1305  158     .00     .00     .00         0.
      1     0110   15     .06     .02     .04        82.          *      1     1310  159     .00     .00     .00         0.
      1     0115   16     .06     .02     .04        94.          *      1     1315  160     .00     .00     .00         0.
      1     0120   17     .05     .02     .03       101.          *      1     1320  161     .00     .00     .00         0.
      1     0125   18     .07     .02     .05       108.          *      1     1325  162     .00     .00     .00         0.
      1     0130   19     .07     .02     .05       117.          *      1     1330  163     .00     .00     .00         0.
      1     0135   20     .06     .02     .04       129.          *      1     1335  164     .00     .00     .00         0.
      1     0140   21     .07     .02     .05       138.          *      1     1340  165     .00     .00     .00         0.
      1     0145   22     .09     .02     .06       148.          *      1     1345  166     .00     .00     .00         0.
      1     0150   23     .08     .02     .06       162.          *      1     1350  167     .00     .00     .00         0.
```

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0155 | 24 | .08 | .02 | .05 | 177. | * | 1 | 1355 | 168 | .00 | .00 | .00 | 0. |
| 1 | 0200 | 25 | .08 | .02 | .06 | 184. | * | 1 | 1400 | 169 | .00 | .00 | .00 | 0. |
| 1 | 0205 | 26 | .08 | .02 | .06 | 188. | * | 1 | 1405 | 170 | .00 | .00 | .00 | 0. |
| 1 | 0210 | 27 | .11 | .02 | .09 | 201. | * | 1 | 1410 | 171 | .00 | .00 | .00 | 0. |
| 1 | 0215 | 28 | .13 | .02 | .11 | 227. | * | 1 | 1415 | 172 | .00 | .00 | .00 | 0. |
| 1 | 0220 | 29 | .09 | .02 | .07 | 255. | * | 1 | 1420 | 173 | .00 | .00 | .00 | 0. |
| 1 | 0225 | 30 | .18 | .02 | .15 | 292. | * | 1 | 1425 | 174 | .00 | .00 | .00 | 0. |
| 1 | 0230 | 31 | .19 | .02 | .17 | 331. | * | 1 | 1430 | 175 | .00 | .00 | .00 | 0. |
| 1 | 0235 | 32 | .21 | .02 | .19 | 407. | * | 1 | 1435 | 176 | .00 | .00 | .00 | 0. |
| 1 | 0240 | 33 | .15 | .02 | .13 | 456. | * | 1 | 1440 | 177 | .00 | .00 | .00 | 0. |
| 1 | 0245 | 34 | .05 | .02 | .03 | 455. | * | 1 | 1445 | 178 | .00 | .00 | .00 | 0. |
| 1 | 0250 | 35 | .05 | .02 | .02 | 394. | * | 1 | 1450 | 179 | .00 | .00 | .00 | 0. |
| 1 | 0255 | 36 | .05 | .02 | .02 | 311. | * | 1 | 1455 | 180 | .00 | .00 | .00 | 0. |
| 1 | 0300 | 37 | .02 | .01 | .00 | 253. | * | 1 | 1500 | 181 | .00 | .00 | .00 | 0. |
| 1 | 0305 | 38 | .00 | .00 | .00 | 211. | * | 1 | 1505 | 182 | .00 | .00 | .00 | 0. |
| 1 | 0310 | 39 | .00 | .00 | .00 | 175. | * | 1 | 1510 | 183 | .00 | .00 | .00 | 0. |
| 1 | 0315 | 40 | .00 | .00 | .00 | 149. | * | 1 | 1515 | 184 | .00 | .00 | .00 | 0. |
| 1 | 0320 | 41 | .00 | .00 | .00 | 129. | * | 1 | 1520 | 185 | .00 | .00 | .00 | 0. |
| 1 | 0325 | 42 | .00 | .00 | .00 | 115. | * | 1 | 1525 | 186 | .00 | .00 | .00 | 0. |
| 1 | 0330 | 43 | .00 | .00 | .00 | 102. | * | 1 | 1530 | 187 | .00 | .00 | .00 | 0. |
| 1 | 0335 | 44 | .00 | .00 | .00 | 93. | * | 1 | 1535 | 188 | .00 | .00 | .00 | 0. |
| 1 | 0340 | 45 | .00 | .00 | .00 | 84. | * | 1 | 1540 | 189 | .00 | .00 | .00 | 0. |
| 1 | 0345 | 46 | .00 | .00 | .00 | 77. | * | 1 | 1545 | 190 | .00 | .00 | .00 | 0. |
| 1 | 0350 | 47 | .00 | .00 | .00 | 70. | * | 1 | 1550 | 191 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48 | .00 | .00 | .00 | 64. | * | 1 | 1555 | 192 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49 | .00 | .00 | .00 | 59. | * | 1 | 1600 | 193 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50 | .00 | .00 | .00 | 55. | * | 1 | 1605 | 194 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51 | .00 | .00 | .00 | 52. | * | 1 | 1610 | 195 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52 | .00 | .00 | .00 | 49. | * | 1 | 1615 | 196 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53 | .00 | .00 | .00 | 46. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54 | .00 | .00 | .00 | 44. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55 | .00 | .00 | .00 | 41. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56 | .00 | .00 | .00 | 39. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57 | .00 | .00 | .00 | 36. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58 | .00 | .00 | .00 | 34. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59 | .00 | .00 | .00 | 32. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60 | .00 | .00 | .00 | 30. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61 | .00 | .00 | .00 | 28. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62 | .00 | .00 | .00 | 25. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63 | .00 | .00 | .00 | 24. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64 | .00 | .00 | .00 | 22. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65 | .00 | .00 | .00 | 20. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66 | .00 | .00 | .00 | 19. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67 | .00 | .00 | .00 | 17. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68 | .00 | .00 | .00 | 16. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69 | .00 | .00 | .00 | 15. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70 | .00 | .00 | .00 | 13. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71 | .00 | .00 | .00 | 11. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72 | .00 | .00 | .00 | 10. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73 | .00 | .00 | .00 | 8. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74 | .00 | .00 | .00 | 8. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75 | .00 | .00 | .00 | 7. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76 | .00 | .00 | .00 | 7. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77 | .00 | .00 | .00 | 7. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78 | .00 | .00 | .00 | 6. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79 | .00 | .00 | .00 | 6. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80 | .00 | .00 | .00 | 6. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81 | .00 | .00 | .00 | 6. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82 | .00 | .00 | .00 | 5. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83 | .00 | .00 | .00 | 5. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0655 | 84 | .00 | .00 | .00 | 4. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85 | .00 | .00 | .00 | 4. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86 | .00 | .00 | .00 | 3. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87 | .00 | .00 | .00 | 2. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88 | .00 | .00 | .00 | 2. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89 | .00 | .00 | .00 | 1. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90 | .00 | .00 | .00 | 0. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91 | .00 | .00 | .00 | 0. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92 | .00 | .00 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93 | .00 | .00 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94 | .00 | .00 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95 | .00 | .00 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96 | .00 | .00 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97 | .00 | .00 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98 | .00 | .00 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99 | .00 | .00 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .00 | .00 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .00 | .00 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .00 | .00 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .00 | .00 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .00 | .00 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .00 | .00 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .00 | .00 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .00 | .00 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .00 | .00 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .00 | .00 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .00 | .00 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .00 | .00 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .00 | .00 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .00 | .00 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .00 | .00 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .00 | .00 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .00 | .00 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .00 | .00 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .00 | .00 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .00 | .00 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .00 | .00 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .00 | .00 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .00 | .00 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .00 | .00 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .00 | .00 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .00 | .00 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .00 | .00 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .00 | .00 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .00 | .00 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .00 | .00 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .00 | .00 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .00 | .00 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .00 | .00 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .00 | .00 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .00 | .00 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .00 | .00 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .00 | .00 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .00 | .00 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .00 | .00 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .00 | .00 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .00 | .00 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .00 | .00 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .00 | .00 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .00 | .00 | .00 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |

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        1     1155  144     .00     .00     .00         0.       *        1     2355  288     .00     .00     .00         0.
                                                                 *
*****************************************************************************************************************************

    TOTAL RAINFALL =    2.60, TOTAL LOSS =     .79, TOTAL EXCESS =    1.81

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     23.92-HR
+   (CFS)       (HR)
                          (CFS)
+     456.      2.67                 108.         27.         27.          27.
                        (INCHES)    2.005       2.025       2.025        2.025
                         (AC-FT)     53.         54.         54.          54.

                        CUMULATIVE AREA =     .50 SQ MI

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

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

          HYDROGRAPH AT
+                           01.1      456.    2.67        108.         27.         27.        .50


 *** NORMAL END OF HEC-1 ***
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# Appendix B.4

Area F

100-year Storm Event

3-Hour Synthetic Unit Hydrograph

```
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   04MAY07  TIME  13:40:02   *                                    *           (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   FOOTHILL PARKWAY
          2           ID   Riverside County, California
          3           ID   City of Corona
          4           ID   JN:114629 Project CONDITION 100-YEAR 3-HOUR
          5           ID   Watershed F
          6           IT       5       0       0     288

          7           KK    01.1
          8           KM    01.1 HYDROGRAPH DEVELOPMENT
          9           BA    1.31
         10           PB    2.65
                      *  RCFC&WCD 3-HOUR 5-MINUTE INTERVAL STORM PATTERN
         11           PI     1.3     1.3     1.1     1.5     1.5     1.8     1.5     1.8     1.8     1.5
         12           PI     1.6     1.8     2.2     2.2     2.2     2.0     2.6     2.7     2.4     2.7
         13           PI     3.3     3.1     2.9     3.0     3.1     4.2     5.0     3.5     6.8     7.3
         14           PI     8.2     5.9     2.0     1.8     1.8     0.6
         15           LU           0.299      10
         16           KM   UHG FROM MOUNTAIN S-GRAPH
         17           UI    423.    694.   1151.   1387.    912.    676.    469.    355.    333.    280.
         18           UI    250.    222.    208.    175.    161.    149.    136.    127.    119.    113.
         19           UI    96.0    93.7    78.9    78.9    73.7    69.6    69.6    64.9    62.3    62.3
         20           UI    59.3    54.6    54.6    54.6    48.8    46.1    46.1    46.1    43.0    35.2
```

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          21          UI    35.2    35.2    35.2    35.2    30.1    25.6    25.6    25.6    25.6    25.6
          22          UI    25.6    25.6    16.0     9.3     9.3     9.3     9.3     9.3     9.3     9.3
          23          UI     9.3     9.3     9.3     9.3     9.3     9.3     9.3     9.3     9.3     9.3
          24          UI     9.3     9.3     9.3     9.3     2.1
          25          ZZ
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   04MAY07  TIME  13:40:02  *                                    *          (916) 756-1104              *
*                                      *                                    *                                      *
****************************************                                    ****************************************


                        FOOTHILL PARKWAY
                        Riverside County, California
                        City of Corona
                        JN:114629 Project CONDITION 100-YEAR 3-HOUR
                        Watershed F

     IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         288  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      1    0  ENDING DATE
                     NDTIME        2355  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   23.92 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


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


          **************
          *            *
   7 KK   *      01.1  *
          *            *
          **************
                         01.1 HYDROGRAPH DEVELOPMENT
                        UHG FROM MOUNTAIN S-GRAPH

             SUBBASIN RUNOFF DATA
```

```
 9 BA          SUBBASIN CHARACTERISTICS
                    TAREA        1.31  SUBBASIN AREA

               PRECIPITATION DATA

10 PB                STORM        2.65  BASIN TOTAL PRECIPITATION

11 PI            INCREMENTAL PRECIPITATION PATTERN
                   1.30      1.30      1.10      1.50      1.50      1.80      1.50      1.80      1.80      1.50
                   1.60      1.80      2.20      2.20      2.20      2.00      2.60      2.70      2.40      2.70
                   3.30      3.10      2.90      3.00      3.10      4.20      5.00      3.50      6.80      7.30
                   8.20      5.90      2.00      1.80      1.80       .60

15 LU          UNIFORM LOSS RATE
                    STRTL         .00  INITIAL LOSS
                    CNSTL         .30  UNIFORM LOSS RATE
                    RTIMP       10.00  PERCENT IMPERVIOUS AREA

15 UI          INPUT UNITGRAPH,  75 ORDINATES,  VOLUME = 1.00
                 423.0     694.0    1151.0    1387.0     912.0     676.0     469.0     355.0     333.0     280.0
                 250.0     222.0     208.0     175.0     161.0     149.0     136.0     127.0     119.0     113.0
                  96.0      93.7      78.9      78.9      73.7      69.6      69.6      64.9      62.3      62.3
                  59.3      54.6      54.6      54.6      48.8      46.1      46.1      46.1      43.0      35.2
                  35.2      35.2      35.2      35.2      30.1      25.6      25.6      25.6      25.6      25.6
                  25.6      25.6      16.0       9.3       9.3       9.3       9.3       9.3       9.3       9.3
                   9.3       9.3       9.3       9.3       9.3       9.3       9.3       9.3       9.3       9.3
                   9.3       9.3       9.3       9.3       2.1

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

HYDROGRAPH AT STATION 01.1

**********

| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 0000 | 1 | .00 | .00 | .00 | 0. | * | 1 | | 1200 | 145 | .00 | .00 | .00 | 0. |
| 1 | | 0005 | 2 | .03 | .02 | .01 | 5. | * | 1 | | 1205 | 146 | .00 | .00 | .00 | 0. |
| 1 | | 0010 | 3 | .03 | .02 | .01 | 13. | * | 1 | | 1210 | 147 | .00 | .00 | .00 | 0. |
| 1 | | 0015 | 4 | .03 | .02 | .01 | 25. | * | 1 | | 1215 | 148 | .00 | .00 | .00 | 0. |
| 1 | | 0020 | 5 | .04 | .02 | .02 | 43. | * | 1 | | 1220 | 149 | .00 | .00 | .00 | 0. |
| 1 | | 0025 | 6 | .04 | .02 | .02 | 55. | * | 1 | | 1225 | 150 | .00 | .00 | .00 | 0. |
| 1 | | 0030 | 7 | .05 | .02 | .03 | 71. | * | 1 | | 1230 | 151 | .00 | .00 | .00 | 0. |
| 1 | | 0035 | 8 | .04 | .02 | .02 | 89. | * | 1 | | 1235 | 152 | .00 | .00 | .00 | 0. |
| 1 | | 0040 | 9 | .05 | .02 | .03 | 106. | * | 1 | | 1240 | 153 | .00 | .00 | .00 | 0. |
| 1 | | 0045 | 10 | .05 | .02 | .03 | 122. | * | 1 | | 1245 | 154 | .00 | .00 | .00 | 0. |
| 1 | | 0050 | 11 | .04 | .02 | .02 | 131. | * | 1 | | 1250 | 155 | .00 | .00 | .00 | 0. |
| 1 | | 0055 | 12 | .04 | .02 | .02 | 140. | * | 1 | | 1255 | 156 | .00 | .00 | .00 | 0. |
| 1 | | 0100 | 13 | .05 | .02 | .03 | 146. | * | 1 | | 1300 | 157 | .00 | .00 | .00 | 0. |
| 1 | | 0105 | 14 | .06 | .02 | .04 | 154. | * | 1 | | 1305 | 158 | .00 | .00 | .00 | 0. |
| 1 | | 0110 | 15 | .06 | .02 | .04 | 171. | * | 1 | | 1310 | 159 | .00 | .00 | .00 | 0. |
| 1 | | 0115 | 16 | .06 | .02 | .04 | 194. | * | 1 | | 1315 | 160 | .00 | .00 | .00 | 0. |
| 1 | | 0120 | 17 | .05 | .02 | .03 | 214. | * | 1 | | 1320 | 161 | .00 | .00 | .00 | 0. |
| 1 | | 0125 | 18 | .07 | .02 | .05 | 234. | * | 1 | | 1325 | 162 | .00 | .00 | .00 | 0. |
| 1 | | 0130 | 19 | .07 | .02 | .05 | 252. | * | 1 | | 1330 | 163 | .00 | .00 | .00 | 0. |
| 1 | | 0135 | 20 | .06 | .02 | .04 | 271. | * | 1 | | 1335 | 164 | .00 | .00 | .00 | 0. |
| 1 | | 0140 | 21 | .07 | .02 | .05 | 297. | * | 1 | | 1340 | 165 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0145 | 22 | .09 | .02 | .07 | 322. | * | 1 | 1345 | 166 | .00 | .00 | .00 | 0. |
| 1 | 0150 | 23 | .08 | .02 | .06 | 346. | * | 1 | 1350 | 167 | .00 | .00 | .00 | 0. |
| 1 | 0155 | 24 | .08 | .02 | .05 | 375. | * | 1 | 1355 | 168 | .00 | .00 | .00 | 0. |
| 1 | 0200 | 25 | .08 | .02 | .06 | 400. | * | 1 | 1400 | 169 | .00 | .00 | .00 | 0. |
| 1 | 0205 | 26 | .08 | .02 | .06 | 415. | * | 1 | 1405 | 170 | .00 | .00 | .00 | 0. |
| 1 | 0210 | 27 | .11 | .02 | .09 | 440. | * | 1 | 1410 | 171 | .00 | .00 | .00 | 0. |
| 1 | 0215 | 28 | .13 | .02 | .11 | 483. | * | 1 | 1415 | 172 | .00 | .00 | .00 | 0. |
| 1 | 0220 | 29 | .09 | .02 | .07 | 527. | * | 1 | 1420 | 173 | .00 | .00 | .00 | 0. |
| 1 | 0225 | 30 | .18 | .02 | .16 | 613. | * | 1 | 1425 | 174 | .00 | .00 | .00 | 0. |
| 1 | 0230 | 31 | .19 | .02 | .17 | 699. | * | 1 | 1430 | 175 | .00 | .00 | .00 | 0. |
| 1 | 0235 | 32 | .22 | .02 | .19 | 812. | * | 1 | 1435 | 176 | .00 | .00 | .00 | 0. |
| 1 | 0240 | 33 | .16 | .02 | .13 | 938. | * | 1 | 1440 | 177 | .00 | .00 | .00 | 0. |
| 1 | 0245 | 34 | .05 | .02 | .03 | 978. | * | 1 | 1445 | 178 | .00 | .00 | .00 | 0. |
| 1 | 0250 | 35 | .05 | .02 | .03 | 943. | * | 1 | 1450 | 179 | .00 | .00 | .00 | 0. |
| 1 | 0255 | 36 | .05 | .02 | .03 | 815. | * | 1 | 1455 | 180 | .00 | .00 | .00 | 0. |
| 1 | 0300 | 37 | .02 | .01 | .00 | 659. | * | 1 | 1500 | 181 | .00 | .00 | .00 | 0. |
| 1 | 0305 | 38 | .00 | .00 | .00 | 550. | * | 1 | 1505 | 182 | .00 | .00 | .00 | 0. |
| 1 | 0310 | 39 | .00 | .00 | .00 | 461. | * | 1 | 1510 | 183 | .00 | .00 | .00 | 0. |
| 1 | 0315 | 40 | .00 | .00 | .00 | 391. | * | 1 | 1515 | 184 | .00 | .00 | .00 | 0. |
| 1 | 0320 | 41 | .00 | .00 | .00 | 342. | * | 1 | 1520 | 185 | .00 | .00 | .00 | 0. |
| 1 | 0325 | 42 | .00 | .00 | .00 | 303. | * | 1 | 1525 | 186 | .00 | .00 | .00 | 0. |
| 1 | 0330 | 43 | .00 | .00 | .00 | 272. | * | 1 | 1530 | 187 | .00 | .00 | .00 | 0. |
| 1 | 0335 | 44 | .00 | .00 | .00 | 248. | * | 1 | 1535 | 188 | .00 | .00 | .00 | 0. |
| 1 | 0340 | 45 | .00 | .00 | .00 | 226. | * | 1 | 1540 | 189 | .00 | .00 | .00 | 0. |
| 1 | 0345 | 46 | .00 | .00 | .00 | 207. | * | 1 | 1545 | 190 | .00 | .00 | .00 | 0. |
| 1 | 0350 | 47 | .00 | .00 | .00 | 192. | * | 1 | 1550 | 191 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48 | .00 | .00 | .00 | 178. | * | 1 | 1555 | 192 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49 | .00 | .00 | .00 | 166. | * | 1 | 1600 | 193 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50 | .00 | .00 | .00 | 154. | * | 1 | 1605 | 194 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51 | .00 | .00 | .00 | 145. | * | 1 | 1610 | 195 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52 | .00 | .00 | .00 | 134. | * | 1 | 1615 | 196 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53 | .00 | .00 | .00 | 126. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54 | .00 | .00 | .00 | 119. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55 | .00 | .00 | .00 | 112. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56 | .00 | .00 | .00 | 107. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57 | .00 | .00 | .00 | 102. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58 | .00 | .00 | .00 | 98. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59 | .00 | .00 | .00 | 94. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60 | .00 | .00 | .00 | 90. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61 | .00 | .00 | .00 | 86. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62 | .00 | .00 | .00 | 82. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63 | .00 | .00 | .00 | 78. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64 | .00 | .00 | .00 | 75. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65 | .00 | .00 | .00 | 72. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66 | .00 | .00 | .00 | 68. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67 | .00 | .00 | .00 | 64. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68 | .00 | .00 | .00 | 61. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69 | .00 | .00 | .00 | 58. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70 | .00 | .00 | .00 | 55. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71 | .00 | .00 | .00 | 51. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72 | .00 | .00 | .00 | 49. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73 | .00 | .00 | .00 | 47. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74 | .00 | .00 | .00 | 44. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75 | .00 | .00 | .00 | 42. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76 | .00 | .00 | .00 | 39. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77 | .00 | .00 | .00 | 36. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78 | .00 | .00 | .00 | 34. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79 | .00 | .00 | .00 | 33. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80 | .00 | .00 | .00 | 31. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81 | .00 | .00 | .00 | 29. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0645 | 82 | .00 | .00 | .00 | 27. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83 | .00 | .00 | .00 | 24. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84 | .00 | .00 | .00 | 21. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85 | .00 | .00 | .00 | 18. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86 | .00 | .00 | .00 | 16. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87 | .00 | .00 | .00 | 16. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88 | .00 | .00 | .00 | 15. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89 | .00 | .00 | .00 | 15. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90 | .00 | .00 | .00 | 14. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91 | .00 | .00 | .00 | 14. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92 | .00 | .00 | .00 | 14. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93 | .00 | .00 | .00 | 13. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94 | .00 | .00 | .00 | 13. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95 | .00 | .00 | .00 | 12. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96 | .00 | .00 | .00 | 12. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97 | .00 | .00 | .00 | 11. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98 | .00 | .00 | .00 | 11. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99 | .00 | .00 | .00 | 10. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .00 | .00 | .00 | 10. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .00 | .00 | .00 | 9. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .00 | .00 | .00 | 8. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .00 | .00 | .00 | 7. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .00 | .00 | .00 | 6. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .00 | .00 | .00 | 4. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .00 | .00 | .00 | 2. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .00 | .00 | .00 | 1. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .00 | .00 | .00 | 1. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .00 | .00 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .00 | .00 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .00 | .00 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .00 | .00 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .00 | .00 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .00 | .00 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .00 | .00 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .00 | .00 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .00 | .00 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .00 | .00 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .00 | .00 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .00 | .00 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .00 | .00 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .00 | .00 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .00 | .00 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .00 | .00 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .00 | .00 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .00 | .00 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .00 | .00 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .00 | .00 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .00 | .00 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .00 | .00 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .00 | .00 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .00 | .00 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .00 | .00 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .00 | .00 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .00 | .00 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .00 | .00 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .00 | .00 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .00 | .00 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .00 | .00 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .00 | .00 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .00 | .00 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1145 | 142 | .00 | .00 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .00 | .00 | .00 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .00 | .00 | .00 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| | | | | | | | * | | | | | | | |

**********

TOTAL RAINFALL = 2.65, TOTAL LOSS = .80, TOTAL EXCESS = 1.85

| PEAK FLOW | TIME | | MAXIMUM AVERAGE FLOW | | | |
|---|---|---|---|---|---|---|
| | | | 6-HR | 24-HR | 72-HR | 23.92-HR |
| + (CFS) | (HR) | | | | | |
| | | (CFS) | | | | |
| + 978. | 2.75 | | 253. | 65. | 65. | 65. |
| | | (INCHES) | 1.798 | 1.850 | 1.850 | 1.850 |
| | | (AC-FT) | 126. | 129. | 129. | 129. |

CUMULATIVE AREA = 1.31 SQ MI

1

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

| | | PEAK | TIME OF | AVERAGE FLOW FOR MAXIMUM PERIOD | | | BASIN | MAXIMUM | TIME OF |
|---|---|---|---|---|---|---|---|---|---|
| OPERATION | STATION | FLOW | PEAK | | | | AREA | STAGE | MAX STAGE |
| + | | | | 6-HOUR | 24-HOUR | 72-HOUR | | | |
| HYDROGRAPH AT | | | | | | | | | |
| + | 01.1 | 978. | 2.75 | 253. | 65. | 65. | 1.31 | | |

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

# Appendix B.5

Area F

100-year Storm Event

6-Hour Synthetic Unit Hydrograph

```
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   04MAY07  TIME  13:40:23   *                    *           (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   FOOTHILL PARKWAY
  2           ID   Riverside County, California
  3           ID   City of Corona
  4           ID   JN:114629 Project CONDITIONS 100-YEAR 6-HOUR
  5           ID   Watershed F
  6           IT       5       0       0     288

  7           KK    01.1
  8           KM    01.1 HYDROGRAPH DEVELOPMENT
  9           BA    1.31
 10           PB    3.85
              * RCFC&WCD 6-HOUR 5-MINUTE INTERVAL STORM PATTERN
 11           PI     0.5     0.6     0.6     0.6     0.6     0.7     0.7     0.7     0.7     0.7
 12           PI     0.7     0.8     0.8     0.8     0.8     0.8     0.8     0.8     0.8     0.8
 13           PI     0.8     0.8     0.8     0.9     0.8     0.9     0.9     0.9     0.9     0.9
 14           PI     0.9     0.9     1.0     1.0     1.0     1.0     1.0     1.1     1.1     1.1
 15           PI     1.2     1.3     1.4     1.4     1.5     1.5     1.6     1.6     1.7     1.8
 16           PI     1.9     2.0     2.1     2.1     2.2     2.3     2.4     2.4     2.5     2.6
 17           PI     3.1     3.6     3.9     4.2     4.7     5.6     1.9     0.9     0.6     0.5
 18           PI     0.3     0.2
 19           LU           0.299      10
 20           KM   UHG FROM MOUNTAIN S-GRAPH
```

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | UI | 423. | 694. | 1151. | 1387. | 912. | 676. | 469. | 355. | 333. | 280. |
| 22 | UI | 250. | 222. | 208. | 175. | 161. | 149. | 136. | 127. | 119. | 113. |
| 23 | UI | 96.0 | 93.7 | 78.9 | 78.9 | 73.7 | 69.6 | 69.6 | 64.9 | 62.3 | 62.3 |
| 24 | UI | 59.3 | 54.6 | 54.6 | 54.6 | 48.8 | 46.1 | 46.1 | 46.1 | 43.0 | 35.2 |
| 25 | UI | 35.2 | 35.2 | 35.2 | 35.2 | 30.1 | 25.6 | 25.6 | 25.6 | 25.6 | 25.6 |
| 26 | UI | 25.6 | 25.6 | 16.0 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 |
| 27 | UI | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 |
| 28 | UI | 9.3 | 9.3 | 9.3 | 9.3 | 2.1 | | | | | |
| 29 | ZZ | | | | | | | | | | |

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   04MAY07  TIME  13:40:23  *
*                                      *
****************************************
```

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

FOOTHILL PARKWAY
Riverside County, California
City of Corona
JN:114629 Project CONDITIONS 100-YEAR 6-HOUR
Watershed F

```
IT          HYDROGRAPH TIME DATA
                 NMIN          5  MINUTES IN COMPUTATION INTERVAL
                IDATE      1    0  STARTING DATE
                ITIME        0000  STARTING TIME
                   NQ         288  NUMBER OF HYDROGRAPH ORDINATES
               NDDATE      1    0  ENDING DATE
               NDTIME        2355  ENDING TIME
               ICENT          19  CENTURY MARK

            COMPUTATION INTERVAL     .08 HOURS
                 TOTAL TIME BASE   23.92 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
```

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

```
          **************
          *            *
   7 KK   *     01.1   *
          *            *
          **************
```

01.1 HYDROGRAPH DEVELOPMENT
UHG FROM MOUNTAIN S-GRAPH

SUBBASIN RUNOFF DATA

9 BA SUBBASIN CHARACTERISTICS
TAREA 1.31 SUBBASIN AREA

PRECIPITATION DATA

10 PB STORM 3.85 BASIN TOTAL PRECIPITATION

11 PI INCREMENTAL PRECIPITATION PATTERN

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| .50 | .60 | .60 | .60 | .60 | .70 | .70 | .70 | .70 | .70 |
| .70 | .80 | .80 | .80 | .80 | .80 | .80 | .80 | .80 | .80 |
| .80 | .80 | .80 | .90 | .80 | .90 | .90 | .90 | .90 | .90 |
| .90 | .90 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.10 | 1.10 | 1.10 |
| 1.20 | 1.30 | 1.40 | 1.40 | 1.50 | 1.50 | 1.60 | 1.60 | 1.70 | 1.80 |
| 1.90 | 2.00 | 2.10 | 2.10 | 2.20 | 2.30 | 2.40 | 2.40 | 2.50 | 2.60 |
| 3.10 | 3.60 | 3.90 | 4.20 | 4.70 | 5.60 | 1.90 | .90 | .60 | .50 |
| .30 | .20 | | | | | | | | |

19 LU UNIFORM LOSS RATE
STRTL .00 INITIAL LOSS
CNSTL .30 UNIFORM LOSS RATE
RTIMP 10.00 PERCENT IMPERVIOUS AREA

19 UI INPUT UNITGRAPH, 75 ORDINATES, VOLUME = 1.00

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 423.0 | 694.0 | 1151.0 | 1387.0 | 912.0 | 676.0 | 469.0 | 355.0 | 333.0 | 280.0 |
| 250.0 | 222.0 | 208.0 | 175.0 | 161.0 | 149.0 | 136.0 | 127.0 | 119.0 | 113.0 |
| 96.0 | 93.7 | 78.9 | 78.9 | 73.7 | 69.6 | 69.6 | 64.9 | 62.3 | 62.3 |
| 59.3 | 54.6 | 54.6 | 54.6 | 48.8 | 46.1 | 46.1 | 46.1 | 43.0 | 35.2 |
| 35.2 | 35.2 | 35.2 | 35.2 | 30.1 | 25.6 | 25.6 | 25.6 | 25.6 | 25.6 |
| 25.6 | 25.6 | 16.0 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 |
| 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 |
| 9.3 | 9.3 | 9.3 | 9.3 | 2.1 | | | | | |

***

**********

HYDROGRAPH AT STATION 01.1

**********

| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | * | | | | | | | | |
| 1 | | 0000 | 1 | .00 | .00 | .00 | 0. | * | 1 | | 1200 | 145 | .00 | .00 | .00 | 0. |
| 1 | | 0005 | 2 | .02 | .02 | .00 | 1. | * | 1 | | 1205 | 146 | .00 | .00 | .00 | 0. |
| 1 | | 0010 | 3 | .02 | .02 | .00 | 2. | * | 1 | | 1210 | 147 | .00 | .00 | .00 | 0. |
| 1 | | 0015 | 4 | .02 | .02 | .00 | 5. | * | 1 | | 1215 | 148 | .00 | .00 | .00 | 0. |
| 1 | | 0020 | 5 | .02 | .02 | .00 | 8. | * | 1 | | 1220 | 149 | .00 | .00 | .00 | 0. |
| 1 | | 0025 | 6 | .02 | .02 | .00 | 10. | * | 1 | | 1225 | 150 | .00 | .00 | .00 | 0. |
| 1 | | 0030 | 7 | .03 | .02 | .00 | 13. | * | 1 | | 1230 | 151 | .00 | .00 | .00 | 0. |
| 1 | | 0035 | 8 | .03 | .02 | .00 | 15. | * | 1 | | 1235 | 152 | .00 | .00 | .00 | 0. |
| 1 | | 0040 | 9 | .03 | .02 | .00 | 19. | * | 1 | | 1240 | 153 | .00 | .00 | .00 | 0. |
| 1 | | 0045 | 10 | .03 | .02 | .00 | 23. | * | 1 | | 1245 | 154 | .00 | .00 | .00 | 0. |
| 1 | | 0050 | 11 | .03 | .02 | .00 | 25. | * | 1 | | 1250 | 155 | .00 | .00 | .00 | 0. |
| 1 | | 0055 | 12 | .03 | .02 | .00 | 28. | * | 1 | | 1255 | 156 | .00 | .00 | .00 | 0. |
| 1 | | 0100 | 13 | .03 | .02 | .01 | 31. | * | 1 | | 1300 | 157 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0105 | 14 | .03 | .02 | .01 | 35. | * | 1 | 1305 | 158 | .00 | .00 | .00 | 0. |
| 1 | 0110 | 15 | .03 | .02 | .01 | 40. | * | 1 | 1310 | 159 | .00 | .00 | .00 | 0. |
| 1 | 0115 | 16 | .03 | .02 | .01 | 47. | * | 1 | 1315 | 160 | .00 | .00 | .00 | 0. |
| 1 | 0120 | 17 | .03 | .02 | .01 | 51. | * | 1 | 1320 | 161 | .00 | .00 | .00 | 0. |
| 1 | 0125 | 18 | .03 | .02 | .01 | 54. | * | 1 | 1325 | 162 | .00 | .00 | .00 | 0. |
| 1 | 0130 | 19 | .03 | .02 | .01 | 57. | * | 1 | 1330 | 163 | .00 | .00 | .00 | 0. |
| 1 | 0135 | 20 | .03 | .02 | .01 | 59. | * | 1 | 1335 | 164 | .00 | .00 | .00 | 0. |
| 1 | 0140 | 21 | .03 | .02 | .01 | 61. | * | 1 | 1340 | 165 | .00 | .00 | .00 | 0. |
| 1 | 0145 | 22 | .03 | .02 | .01 | 63. | * | 1 | 1345 | 166 | .00 | .00 | .00 | 0. |
| 1 | 0150 | 23 | .03 | .02 | .01 | 64. | * | 1 | 1350 | 167 | .00 | .00 | .00 | 0. |
| 1 | 0155 | 24 | .03 | .02 | .01 | 65. | * | 1 | 1355 | 168 | .00 | .00 | .00 | 0. |
| 1 | 0200 | 25 | .03 | .02 | .01 | 68. | * | 1 | 1400 | 169 | .00 | .00 | .00 | 0. |
| 1 | 0205 | 26 | .03 | .02 | .01 | 70. | * | 1 | 1405 | 170 | .00 | .00 | .00 | 0. |
| 1 | 0210 | 27 | .03 | .02 | .01 | 75. | * | 1 | 1410 | 171 | .00 | .00 | .00 | 0. |
| 1 | 0215 | 28 | .03 | .02 | .01 | 79. | * | 1 | 1415 | 172 | .00 | .00 | .00 | 0. |
| 1 | 0220 | 29 | .03 | .02 | .01 | 83. | * | 1 | 1420 | 173 | .00 | .00 | .00 | 0. |
| 1 | 0225 | 30 | .03 | .02 | .01 | 88. | * | 1 | 1425 | 174 | .00 | .00 | .00 | 0. |
| 1 | 0230 | 31 | .03 | .02 | .01 | 91. | * | 1 | 1430 | 175 | .00 | .00 | .00 | 0. |
| 1 | 0235 | 32 | .03 | .02 | .01 | 94. | * | 1 | 1435 | 176 | .00 | .00 | .00 | 0. |
| 1 | 0240 | 33 | .03 | .02 | .01 | 97. | * | 1 | 1440 | 177 | .00 | .00 | .00 | 0. |
| 1 | 0245 | 34 | .04 | .02 | .02 | 100. | * | 1 | 1445 | 178 | .00 | .00 | .00 | 0. |
| 1 | 0250 | 35 | .04 | .02 | .02 | 105. | * | 1 | 1450 | 179 | .00 | .00 | .00 | 0. |
| 1 | 0255 | 36 | .04 | .02 | .02 | 110. | * | 1 | 1455 | 180 | .00 | .00 | .00 | 0. |
| 1 | 0300 | 37 | .04 | .02 | .02 | 117. | * | 1 | 1500 | 181 | .00 | .00 | .00 | 0. |
| 1 | 0305 | 38 | .04 | .02 | .02 | 122. | * | 1 | 1505 | 182 | .00 | .00 | .00 | 0. |
| 1 | 0310 | 39 | .04 | .02 | .02 | 127. | * | 1 | 1510 | 183 | .00 | .00 | .00 | 0. |
| 1 | 0315 | 40 | .04 | .02 | .02 | 133. | * | 1 | 1515 | 184 | .00 | .00 | .00 | 0. |
| 1 | 0320 | 41 | .04 | .02 | .02 | 140. | * | 1 | 1520 | 185 | .00 | .00 | .00 | 0. |
| 1 | 0325 | 42 | .05 | .02 | .02 | 149. | * | 1 | 1525 | 186 | .00 | .00 | .00 | 0. |
| 1 | 0330 | 43 | .05 | .02 | .03 | 159. | * | 1 | 1530 | 187 | .00 | .00 | .00 | 0. |
| 1 | 0335 | 44 | .05 | .02 | .03 | 172. | * | 1 | 1535 | 188 | .00 | .00 | .00 | 0. |
| 1 | 0340 | 45 | .05 | .02 | .03 | 188. | * | 1 | 1540 | 189 | .00 | .00 | .00 | 0. |
| 1 | 0345 | 46 | .06 | .02 | .04 | 206. | * | 1 | 1545 | 190 | .00 | .00 | .00 | 0. |
| 1 | 0350 | 47 | .06 | .02 | .04 | 222. | * | 1 | 1550 | 191 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48 | .06 | .02 | .04 | 239. | * | 1 | 1555 | 192 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49 | .06 | .02 | .04 | 255. | * | 1 | 1600 | 193 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50 | .07 | .02 | .04 | 271. | * | 1 | 1605 | 194 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51 | .07 | .02 | .05 | 289. | * | 1 | 1610 | 195 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52 | .07 | .02 | .05 | 308. | * | 1 | 1615 | 196 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53 | .08 | .02 | .05 | 330. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54 | .08 | .02 | .06 | 355. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55 | .08 | .02 | .06 | 379. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56 | .08 | .02 | .06 | 404. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57 | .09 | .02 | .07 | 428. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58 | .09 | .02 | .07 | 452. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59 | .09 | .02 | .07 | 477. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60 | .10 | .02 | .07 | 502. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61 | .10 | .02 | .08 | 527. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62 | .12 | .02 | .10 | 558. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63 | .14 | .02 | .12 | 603. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64 | .15 | .02 | .13 | 663. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65 | .16 | .02 | .14 | 741. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66 | .18 | .02 | .16 | 828. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67 | .22 | .02 | .19 | 927. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68 | .07 | .02 | .05 | 972. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69 | .03 | .02 | .01 | 967. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70 | .02 | .02 | .00 | 872. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71 | .02 | .02 | .00 | 697. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72 | .01 | .01 | .00 | 559. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73 | .01 | .01 | .00 | 459. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0605 | 74 | .00 | .00 | .00 | 394. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75 | .00 | .00 | .00 | 352. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76 | .00 | .00 | .00 | 315. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77 | .00 | .00 | .00 | 285. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78 | .00 | .00 | .00 | 259. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79 | .00 | .00 | .00 | 238. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80 | .00 | .00 | .00 | 218. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81 | .00 | .00 | .00 | 202. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82 | .00 | .00 | .00 | 188. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83 | .00 | .00 | .00 | 175. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84 | .00 | .00 | .00 | 164. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85 | .00 | .00 | .00 | 153. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86 | .00 | .00 | .00 | 143. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87 | .00 | .00 | .00 | 134. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88 | .00 | .00 | .00 | 126. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89 | .00 | .00 | .00 | 119. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90 | .00 | .00 | .00 | 114. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91 | .00 | .00 | .00 | 108. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92 | .00 | .00 | .00 | 104. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93 | .00 | .00 | .00 | 100. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94 | .00 | .00 | .00 | 95. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95 | .00 | .00 | .00 | 91. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96 | .00 | .00 | .00 | 87. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97 | .00 | .00 | .00 | 83. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98 | .00 | .00 | .00 | 79. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99 | .00 | .00 | .00 | 75. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .00 | .00 | .00 | 72. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .00 | .00 | .00 | 68. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .00 | .00 | .00 | 64. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .00 | .00 | .00 | 61. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .00 | .00 | .00 | 58. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .00 | .00 | .00 | 54. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .00 | .00 | .00 | 51. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .00 | .00 | .00 | 48. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .00 | .00 | .00 | 46. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .00 | .00 | .00 | 43. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .00 | .00 | .00 | 41. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .00 | .00 | .00 | 38. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .00 | .00 | .00 | 35. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .00 | .00 | .00 | 33. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .00 | .00 | .00 | 32. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .00 | .00 | .00 | 30. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .00 | .00 | .00 | 27. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .00 | .00 | .00 | 25. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .00 | .00 | .00 | 22. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .00 | .00 | .00 | 19. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .00 | .00 | .00 | 17. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .00 | .00 | .00 | 16. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .00 | .00 | .00 | 16. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .00 | .00 | .00 | 15. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .00 | .00 | .00 | 15. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .00 | .00 | .00 | 14. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .00 | .00 | .00 | 14. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .00 | .00 | .00 | 13. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .00 | .00 | .00 | 13. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .00 | .00 | .00 | 12. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .00 | .00 | .00 | 12. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .00 | .00 | .00 | 11. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .00 | .00 | .00 | 11. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .00 | .00 | .00 | 10. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1105 | 134 | .00 | .00 | .00 | 9. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .00 | .00 | .00 | 9. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .00 | .00 | .00 | 8. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .00 | .00 | .00 | 7. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .00 | .00 | .00 | 5. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .00 | .00 | .00 | 4. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .00 | .00 | .00 | 3. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .00 | .00 | .00 | 1. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .00 | .00 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .00 | .00 | .00 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .00 | .00 | .00 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| | | | | | | | * | | | | | | | |

**********

TOTAL RAINFALL = 3.85, TOTAL LOSS = 1.57, TOTAL EXCESS = 2.28

| PEAK FLOW | TIME | | MAXIMUM AVERAGE FLOW | | | |
|---|---|---|---|---|---|---|
| | | | 6-HR | 24-HR | 72-HR | 23.92-HR |
| + (CFS) | (HR) | | | | | |
| | | (CFS) | | | | |
| + 972. | 5.58 | | 292. | 81. | 81. | 81. |
| | | (INCHES) | 2.074 | 2.281 | 2.281 | 2.281 |
| | | (AC-FT) | 145. | 159. | 159. | 159. |

CUMULATIVE AREA = 1.31 SQ MI

1

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

| | OPERATION | STATION | PEAK FLOW | TIME OF PEAK | AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR | 24-HOUR | 72-HOUR | BASIN AREA | MAXIMUM STAGE | TIME OF MAX STAGE |
|---|---|---|---|---|---|---|---|---|---|---|
| + | HYDROGRAPH AT | 01.1 | 972. | 5.58 | 292. | 81. | 81. | 1.31 | | |

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

# Appendix B.6

Area F

10-year and 100-year Storm Event

Rational Method

```
****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     30.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.814
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        7.11     0.7772       85
  SUBAREA AREA(ACRES) =     7.11   SUBAREA RUNOFF(CFS) =   15.55
  TOTAL AREA(ACRES) =      28.16   TOTAL RUNOFF(CFS) =   70.06
  TC(MIN.) =  15.10

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE    134.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    855.00  DOWNSTREAM(FEET) =    815.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   986.02   CHANNEL SLOPE =  0.0406
  CHANNEL FLOW THRU SUBAREA(CFS) =      70.06
  FLOW VELOCITY(FEET/SEC) =   4.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.54   Tc(MIN.) =  18.64
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE    134.00 =  3101.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE    134.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.543
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        4.56     0.7661       85
  SUBAREA AREA(ACRES) =     4.56   SUBAREA RUNOFF(CFS) =    8.88
  TOTAL AREA(ACRES) =      32.72   TOTAL RUNOFF(CFS) =   78.95
  TC(MIN.) =  18.64

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE    134.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.64
  RAINFALL INTENSITY(INCH/HR) =   2.54
  TOTAL STREAM AREA(ACRES) =     32.72
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     78.95

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc      INTENSITY      AREA
  NUMBER       (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       1414.30    24.59        2.226        767.32
     2         78.95    18.64        2.543         32.72

  ****************************WARNING****************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
```



```
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
  ************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM      RUNOFF       Tc      INTENSITY
  NUMBER       (CFS)     (MIN.)   (INCH/HOUR)
     1       1150.83    18.64        2.543
     2       1483.40    24.59        2.226

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   1483.40   Tc(MIN.) =   24.59
  TOTAL AREA(ACRES) =     800.04
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    134.00 = 14313.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    135.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    815.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   750.00   CHANNEL SLOPE =  0.0200
  CHANNEL FLOW THRU SUBAREA(CFS) =   1483.40
  FLOW VELOCITY(FEET/SEC) =   9.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.39   Tc(MIN.) =  25.98
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    135.00 = 15063.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    135.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.168
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        5.12     0.7469       85
  SUBAREA AREA(ACRES) =     5.12   SUBAREA RUNOFF(CFS) =    8.30
  TOTAL AREA(ACRES) =     805.16   TOTAL RUNOFF(CFS) = 1491.70
  TC(MIN.) =  25.98

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    135.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  25.98
  RAINFALL INTENSITY(INCH/HR) =   2.17
  TOTAL STREAM AREA(ACRES) =   805.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   1491.70

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
```

```
FLOW PROCESS FROM NODE     133.00 TO NODE     134.00 IS CODE =   1
----------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
======================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  24.59
RAINFALL INTENSITY(INCH/HR) =   2.23
TOTAL STREAM AREA(ACRES) =    767.32
PEAK FLOW RATE(CFS) AT CONFLUENCE =   1414.30

**********************************************************************
FLOW PROCESS FROM NODE      25.00 TO NODE      26.00 IS CODE =  21
----------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
======================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   562.18
UPSTREAM ELEVATION(FEET) =   1160.00
DOWNSTREAM ELEVATION(FEET) =   1050.00
ELEVATION DIFFERENCE(FEET) =    110.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.553
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
     LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"       D        4.45      0.7999       81    9.29
SUBAREA RUNOFF(CFS) =      12.65
TOTAL AREA(ACRES) =        4.45   TOTAL RUNOFF(CFS) =     12.65

**********************************************************************
FLOW PROCESS FROM NODE      26.00 TO NODE      27.00 IS CODE =  53
----------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1050.00  DOWNSTREAM(FEET) =    940.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   405.42   CHANNEL SLOPE =  0.2713
CHANNEL FLOW THRU SUBAREA(CFS) =      12.65
FLOW VELOCITY(FEET/SEC) =   6.79 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.00   Tc(MIN.) =  10.29
LONGEST FLOWPATH FROM NODE      25.00 TO NODE      27.00 =   967.60 FEET.

**********************************************************************
FLOW PROCESS FROM NODE      26.00 TO NODE      27.00 IS CODE =  81
----------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.384
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                    D        3.41      0.7955       85
SUBAREA AREA(ACRES) =      3.41   SUBAREA RUNOFF(CFS) =     9.18
TOTAL AREA(ACRES) =        7.86   TOTAL RUNOFF(CFS) =    21.83
TC(MIN.) =  10.29

**********************************************************************
FLOW PROCESS FROM NODE      27.00 TO NODE      28.00 IS CODE =  53
----------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
```



```
======================================================================
ELEVATION DATA: UPSTREAM(FEET) =    940.00  DOWNSTREAM(FEET) =    880.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   480.49   CHANNEL SLOPE =  0.1249
CHANNEL FLOW THRU SUBAREA(CFS) =      21.83
FLOW VELOCITY(FEET/SEC) =   5.52 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =  11.74
LONGEST FLOWPATH FROM NODE      25.00 TO NODE      28.00 =  1448.09 FEET.

**********************************************************************
FLOW PROCESS FROM NODE      27.00 TO NODE      28.00 IS CODE =  81
----------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.176
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                    D        5.03      0.7895       85
SUBAREA AREA(ACRES) =      5.03   SUBAREA RUNOFF(CFS) =    12.61
TOTAL AREA(ACRES) =       12.89   TOTAL RUNOFF(CFS) =    34.44
TC(MIN.) =  11.74

**********************************************************************
FLOW PROCESS FROM NODE      28.00 TO NODE      29.00 IS CODE =  53
----------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
ELEVATION DATA: UPSTREAM(FEET) =    880.00  DOWNSTREAM(FEET) =    865.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   149.43   CHANNEL SLOPE =  0.1004
CHANNEL FLOW THRU SUBAREA(CFS) =      34.44
FLOW VELOCITY(FEET/SEC) =   5.77 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   0.43   Tc(MIN.) =  12.17
LONGEST FLOWPATH FROM NODE      25.00 TO NODE      29.00 =  1597.52 FEET.

**********************************************************************
FLOW PROCESS FROM NODE      28.00 TO NODE      29.00 IS CODE =  81
----------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.121
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                    D        8.16      0.7878       85
SUBAREA AREA(ACRES) =      8.16   SUBAREA RUNOFF(CFS) =    20.07
TOTAL AREA(ACRES) =       21.05   TOTAL RUNOFF(CFS) =    54.51
TC(MIN.) =  12.17

**********************************************************************
FLOW PROCESS FROM NODE      29.00 TO NODE      30.00 IS CODE =  53
----------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
ELEVATION DATA: UPSTREAM(FEET) =    865.00  DOWNSTREAM(FEET) =    855.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   517.80   CHANNEL SLOPE =  0.0193
CHANNEL FLOW THRU SUBAREA(CFS) =      54.51
FLOW VELOCITY(FEET/SEC) =   2.95 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.93   Tc(MIN.) =  15.10
LONGEST FLOWPATH FROM NODE      25.00 TO NODE      30.00 =  2115.32 FEET.
```

```
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   879.23
  UPSTREAM ELEVATION(FEET) =   1130.00
  DOWNSTREAM ELEVATION(FEET) =    940.00
  ELEVATION DIFFERENCE(FEET) =    190.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.292
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,BROADLEAF"       D        9.77     0.7929       85   10.89
  SUBAREA RUNOFF(CFS) =      25.50
  TOTAL AREA(ACRES) =       9.77   TOTAL RUNOFF(CFS) =     25.50

**************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    132.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    940.00  DOWNSTREAM(FEET) =    865.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   757.49   CHANNEL SLOPE =  0.0990
  CHANNEL FLOW THRU SUBAREA(CFS) =      25.50
  FLOW VELOCITY(FEET/SEC) =   5.18 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.44   Tc(MIN.) =  13.33
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    132.00 =  1636.72 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    132.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.988
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       15.13     0.7835       85
  SUBAREA AREA(ACRES) =   15.13   SUBAREA RUNOFF(CFS) =   35.41
  TOTAL AREA(ACRES) =     24.90   TOTAL RUNOFF(CFS) =   60.92
  TC(MIN.) =  13.33

**************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    865.00  DOWNSTREAM(FEET) =    820.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   590.16   CHANNEL SLOPE =  0.0763
  CHANNEL FLOW THRU SUBAREA(CFS) =      60.92
  FLOW VELOCITY(FEET/SEC) =   6.08 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.62   Tc(MIN.) =  14.95
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    133.00 =  2226.88 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.828
```



```
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       23.63     0.7777       85
  SUBAREA AREA(ACRES) =   23.63   SUBAREA RUNOFF(CFS) =   51.97
  TOTAL AREA(ACRES) =     48.53   TOTAL RUNOFF(CFS) =  112.88
  TC(MIN.) =  14.95

**************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  14.95
  RAINFALL INTENSITY(INCH/HR) =   2.83
  TOTAL STREAM AREA(ACRES) =    48.53
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    112.88

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1      1325.18    24.44       2.232        718.79
     2       112.88    14.95       2.828         48.53

 ******************************WARNING*******************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **********************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       923.24    14.95       2.828
     2      1414.30    24.44       2.232

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   1414.30   Tc(MIN.) =   24.44
  TOTAL AREA(ACRES) =     767.32
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    133.00 = 14063.17 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    134.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   820.00  DOWNSTREAM(FEET) =   815.00
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 102.0 INCH PIPE IS  82.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  28.90
  ESTIMATED PIPE DIAMETER(INCH) = 102.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   1414.30
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =  24.59
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    134.00 = 14313.17 FEET.

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

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   961.00  DOWNSTREAM(FEET) =   960.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     12.87
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   8.01
  LONGEST FLOWPATH FROM NODE     23.00 TO NODE     37.00 =   575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     37.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   8.01
  RAINFALL INTENSITY(INCH/HR) =   3.82
  TOTAL STREAM AREA(ACRES) =     4.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.87

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1        65.48    10.89       3.292        22.85
     2        12.87     8.01       3.815         4.16

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        61.03     8.01       3.815
     2        76.58    10.89       3.292

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     76.58   Tc(MIN.) =   10.89
  TOTAL AREA(ACRES) =     27.01
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     37.00 =  2644.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE    123.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   960.00  DOWNSTREAM(FEET) =   883.00
  FLOW LENGTH(FEET) =   700.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.14
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     76.58
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =  11.32
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE    123.00 =  3344.41 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    133.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1        76.58    11.32       3.231        27.01
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE    133.00 =  3344.41 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1      1271.63    23.84       2.259       691.78
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    133.00 = 12663.17 FEET.

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       680.51    11.32       3.231
     2      1325.18    23.84       2.259

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   1325.18   Tc(MIN.) =   23.84
  TOTAL AREA(ACRES) =    718.79

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    133.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   883.00  DOWNSTREAM(FEET) =   820.00
  FLOW LENGTH(FEET) =  1400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  87.0 INCH PIPE IS  66.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  38.88
  ESTIMATED PIPE DIAMETER(INCH) =  87.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   1325.18
  PIPE TRAVEL TIME(MIN.) =   0.60    Tc(MIN.) =  24.44
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    133.00 = 14063.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    133.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  24.44
  RAINFALL INTENSITY(INCH/HR) =   2.23
  TOTAL STREAM AREA(ACRES) =   718.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   1325.18

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     50.95

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   485.00
  UPSTREAM ELEVATION(FEET) =   1160.00
  DOWNSTREAM ELEVATION(FEET) =    990.00
  ELEVATION DIFFERENCE(FEET) =    170.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.866
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,BROADLEAF"       D        5.35      0.8072      85    7.79
  SUBAREA RUNOFF(CFS) =      16.70
  TOTAL AREA(ACRES) =       5.35   TOTAL RUNOFF(CFS) =     16.70

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     36.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   990.00  DOWNSTREAM(FEET) =   989.00
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.48
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.70
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =   7.93
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     36.00 =   555.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   7.93
  RAINFALL INTENSITY(INCH/HR) =   3.83
  TOTAL STREAM AREA(ACRES) =      5.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.70

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY      AREA
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1         50.95     10.59        3.336        17.50
     2         16.70      7.93        3.834         5.35

****************************WARNING****************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```



```
  ** PEAK FLOW RATE TABLE **
  STREAM      RUNOFF       Tc       INTENSITY
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)
     1         54.84      7.93        3.834
     2         65.48     10.59        3.336

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     65.48   Tc(MIN.) =   10.59
  TOTAL AREA(ACRES) =     22.85
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     36.00 =  2244.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   989.00  DOWNSTREAM(FEET) =   960.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.24
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      65.48
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =  10.89
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     37.00 =  2644.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.89
  RAINFALL INTENSITY(INCH/HR) =   3.29
  TOTAL STREAM AREA(ACRES) =     22.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     65.48

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     24.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   525.00
  UPSTREAM ELEVATION(FEET) =   1160.00
  DOWNSTREAM ELEVATION(FEET) =    961.00
  ELEVATION DIFFERENCE(FEET) =    199.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.837
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       D        4.16      0.8066      81    7.92
  SUBAREA RUNOFF(CFS) =      12.87
  TOTAL AREA(ACRES) =       4.16   TOTAL RUNOFF(CFS) =     12.87

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     37.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
ELEVATION DATA: UPSTREAM(FEET) =   883.50  DOWNSTREAM(FEET) =   883.00
FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
DEPTH OF FLOW IN 138.0 INCH PIPE IS 109.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  14.42
ESTIMATED PIPE DIAMETER(INCH) = 138.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =   1271.63
PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =  23.84
LONGEST FLOWPATH FROM NODE    100.00 TO NODE    123.00 = 12663.17 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  10
----------------------------------------------------------------------------
>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
FLOW PROCESS FROM NODE     31.00 TO NODE     32.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   957.41
UPSTREAM ELEVATION(FEET) =   1147.50
DOWNSTREAM ELEVATION(FEET) =   1106.00
ELEVATION DIFFERENCE(FEET) =     41.50
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.639
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
     LAND USE             GROUP   (ACRES)   Coefficient   CN  (MIN.)
COMMERCIAL                 D        3.14     0.8902      75    8.84
SUBAREA RUNOFF(CFS) =     10.17
TOTAL AREA(ACRES) =       3.14   TOTAL RUNOFF(CFS) =     10.17

****************************************************************************
FLOW PROCESS FROM NODE     31.00 TO NODE     32.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.639
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient   CN
NATURAL POOR COVER
"BARREN"                   D        5.00     0.8020      85
SUBAREA AREA(ACRES) =     5.00   SUBAREA RUNOFF(CFS) =   14.59
TOTAL AREA(ACRES) =       8.14   TOTAL RUNOFF(CFS) =   24.76
TC(MIN.) =   8.84

****************************************************************************
FLOW PROCESS FROM NODE     32.00 TO NODE     35.00 IS CODE =  61
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) = 1106.00  DOWNSTREAM ELEVATION(FEET) = 1037.00
STREET LENGTH(FEET) =   887.00   CURB HEIGHT(INCHES) =  8.0
STREET HALFWIDTH(FEET) = 37.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.018
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
```



```
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0100
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.62
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.38
  HALFSTREET FLOOD WIDTH(FEET) =   11.93
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   10.04
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.79
STREET FLOW TRAVEL TIME(MIN.) =   1.47   Tc(MIN.) =  10.32
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.379
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient   CN
COMMERCIAL                 D        3.23     0.8895      75
SUBAREA AREA(ACRES) =     3.23      SUBAREA RUNOFF(CFS) =     9.71
TOTAL AREA(ACRES) =      11.37        PEAK FLOW RATE(CFS) =      34.47

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  12.75
FLOW VELOCITY(FEET/SEC.) = 10.40   DEPTH*VELOCITY(FT*FT/SEC.) =   4.08
LONGEST FLOWPATH FROM NODE     31.00 TO NODE     35.00 =  1844.41 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     32.00 TO NODE     35.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.379
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient   CN
NATURAL POOR COVER
"BARREN"                   D        6.13     0.7954      85
SUBAREA AREA(ACRES) =     6.13   SUBAREA RUNOFF(CFS) =   16.48
TOTAL AREA(ACRES) =      17.50   TOTAL RUNOFF(CFS) =   50.95
TC(MIN.) =  10.32

****************************************************************************
FLOW PROCESS FROM NODE     35.00 TO NODE     36.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =  1030.00  DOWNSTREAM(FEET) =   989.00
FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  23.95
ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     50.95
PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =  10.59
LONGEST FLOWPATH FROM NODE     31.00 TO NODE     36.00 =  2244.41 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     35.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  10.59
RAINFALL INTENSITY(INCH/HR) =   3.34
TOTAL STREAM AREA(ACRES) =    17.50
```

```
FLOW PROCESS FROM NODE    121.00 TO NODE    118.00 IS CODE =  81
----------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.700
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                    D       24.44     0.7728      85
SUBAREA AREA(ACRES) =    24.44   SUBAREA RUNOFF(CFS) =   50.99
TOTAL AREA(ACRES) =      47.82   TOTAL RUNOFF(CFS) =  109.62
TC(MIN.) =  16.46

**********************************************************************
FLOW PROCESS FROM NODE    121.00 TO NODE    118.00 IS CODE =  81
----------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.700
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
COMMERCIAL                  D        1.00     0.8873      75
SUBAREA AREA(ACRES) =     1.00   SUBAREA RUNOFF(CFS) =    2.40
TOTAL AREA(ACRES) =      48.82   TOTAL RUNOFF(CFS) =  112.02
TC(MIN.) =  16.46

**********************************************************************
FLOW PROCESS FROM NODE    121.00 TO NODE    118.00 IS CODE =   1
----------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
======================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =  16.46
RAINFALL INTENSITY(INCH/HR) =   2.70
TOTAL STREAM AREA(ACRES) =    48.82
PEAK FLOW RATE(CFS) AT CONFLUENCE =    112.02

** CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1      259.27    29.55       2.038        137.60
    2      112.02    16.46       2.700         48.82

*******************************WARNING*******************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
**********************************************************************

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.

** PEAK FLOW RATE TABLE **
STREAM     RUNOFF      Tc      INTENSITY
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
    1      256.39    16.46       2.700
    2      343.82    29.55       2.038

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    343.82   Tc(MIN.) =   29.55
```



```
TOTAL AREA(ACRES) =    186.42
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    118.00 =  7117.61 FEET.

**********************************************************************
FLOW PROCESS FROM NODE    118.00 TO NODE    122.00 IS CODE =  31
----------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
======================================================================
ELEVATION DATA: UPSTREAM(FEET) =   885.00  DOWNSTREAM(FEET) =   883.50
FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  48.0 INCH PIPE IS  36.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  33.70
ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =    343.82
PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =  29.56
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    122.00 =  7137.61 FEET.

**********************************************************************
FLOW PROCESS FROM NODE    110.00 TO NODE    122.00 IS CODE =  11
----------------------------------------------------------------------
>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
======================================================================

** MAIN STREAM CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1      343.82    29.56       2.037        186.42
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    122.00 =  7137.61 FEET.

** MEMORY BANK #  1 CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1      996.33    23.67       2.267        505.36
LONGEST FLOWPATH FROM NODE    100.00 TO NODE    122.00 = 12513.17 FEET.

*******************************WARNING*******************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
**********************************************************************

** PEAK FLOW RATE TABLE **
STREAM     RUNOFF      Tc      INTENSITY
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
    1     1271.63    23.67       2.267
    2     1239.23    29.56       2.037

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =   1271.63   Tc(MIN.) =   23.67
TOTAL AREA(ACRES) =    691.78

**********************************************************************
FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  12
----------------------------------------------------------------------
>>>>>CLEAR MEMORY BANK # 1 <<<<<
======================================================================

**********************************************************************
FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  31
----------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
======================================================================
```

```
----------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1747.37   CHANNEL SLOPE =  0.0114
  CHANNEL FLOW THRU SUBAREA(CFS) =     162.84
  FLOW VELOCITY(FEET/SEC) =   3.27 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   8.92   Tc(MIN.) =  27.40
  LONGEST FLOWPATH FROM NODE    111.00 TO NODE    117.00 =  5560.56 FEET.

**********************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    117.00 IS CODE =  81
----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.113
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       39.68     0.7436       85
  SUBAREA AREA(ACRES) =   39.68   SUBAREA RUNOFF(CFS) =   62.36
  TOTAL AREA(ACRES) =    114.97   TOTAL RUNOFF(CFS) =  225.19
  TC(MIN.) =  27.40

**********************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    118.00 IS CODE =  53
----------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    885.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1557.05   CHANNEL SLOPE =  0.1252
  CHANNEL FLOW THRU SUBAREA(CFS) =     225.19
  FLOW VELOCITY(FEET/SEC) =  12.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.16   Tc(MIN.) =  29.55
  LONGEST FLOWPATH FROM NODE    111.00 TO NODE    118.00 =  7117.61 FEET.

**********************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    118.00 IS CODE =  81
----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.038
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       22.63     0.7389       85
  SUBAREA AREA(ACRES) =   22.63   SUBAREA RUNOFF(CFS) =   34.07
  TOTAL AREA(ACRES) =    137.60   TOTAL RUNOFF(CFS) =  259.27
  TC(MIN.) =  29.55

**********************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    118.00 IS CODE =   1
----------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
======================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  29.55
  RAINFALL INTENSITY(INCH/HR) =   2.04
  TOTAL STREAM AREA(ACRES) =   137.60
```



```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    259.27

**********************************************************************
  FLOW PROCESS FROM NODE    119.00 TO NODE    120.00 IS CODE =  21
----------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
======================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   811.95
  UPSTREAM ELEVATION(FEET) =   1250.00
  DOWNSTREAM ELEVATION(FEET) =   1060.00
  ELEVATION DIFFERENCE(FEET) =    190.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.368
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       D        9.41     0.7951       81   10.38
  SUBAREA RUNOFF(CFS) =     25.20
  TOTAL AREA(ACRES) =       9.41   TOTAL RUNOFF(CFS) =     25.20

**********************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  53
----------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1060.00  DOWNSTREAM(FEET) =   1000.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   697.00   CHANNEL SLOPE =  0.0861
  CHANNEL FLOW THRU SUBAREA(CFS) =      25.20
  FLOW VELOCITY(FEET/SEC) =   4.81 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.41   Tc(MIN.) =  12.80
  LONGEST FLOWPATH FROM NODE    119.00 TO NODE    121.00 =  1508.95 FEET.

**********************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  81
----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.047
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       13.97     0.7854       85
  SUBAREA AREA(ACRES) =   13.97   SUBAREA RUNOFF(CFS) =   33.43
  TOTAL AREA(ACRES) =     23.38   TOTAL RUNOFF(CFS) =   58.63
  TC(MIN.) =  12.80

**********************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    118.00 IS CODE =  53
----------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1000.00  DOWNSTREAM(FEET) =    885.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1377.65   CHANNEL SLOPE =  0.0835
  CHANNEL FLOW THRU SUBAREA(CFS) =      58.63
  FLOW VELOCITY(FEET/SEC) =   6.28 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.66   Tc(MIN.) =  16.46
  LONGEST FLOWPATH FROM NODE    119.00 TO NODE    118.00 =  2886.60 FEET.

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

```
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   941.76
UPSTREAM ELEVATION(FEET) =   1620.00
DOWNSTREAM ELEVATION(FEET) =   1340.00
ELEVATION DIFFERENCE(FEET) =   280.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.350
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
     LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"       D        7.57     0.7946       81   10.50
SUBAREA RUNOFF(CFS) =     20.15
TOTAL AREA(ACRES) =       7.57   TOTAL RUNOFF(CFS) =     20.15

****************************************************************************
FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1340.00  DOWNSTREAM(FEET) =   1280.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   661.78   CHANNEL SLOPE =  0.0907
CHANNEL FLOW THRU SUBAREA(CFS) =     20.15
FLOW VELOCITY(FEET/SEC) =   4.58 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.41   Tc(MIN.) =  12.91
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    113.00 =  1603.54 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.034
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                    D       10.54     0.7850       85
SUBAREA AREA(ACRES) =   10.54   SUBAREA RUNOFF(CFS) =   25.10
TOTAL AREA(ACRES) =     18.11   TOTAL RUNOFF(CFS) =   45.25
TC(MIN.) =  12.91

****************************************************************************
FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1280.00  DOWNSTREAM(FEET) =   1200.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   764.62   CHANNEL SLOPE =  0.1046
CHANNEL FLOW THRU SUBAREA(CFS) =     45.25
FLOW VELOCITY(FEET/SEC) =   6.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.98   Tc(MIN.) =  14.89
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    114.00 =  2368.16 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.833
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
```



```
NATURAL POOR COVER
"BARREN"                    D       14.20     0.7780       85
SUBAREA AREA(ACRES) =   14.20   SUBAREA RUNOFF(CFS) =   31.30
TOTAL AREA(ACRES) =     32.31   TOTAL RUNOFF(CFS) =   76.55
TC(MIN.) =  14.89

****************************************************************************
FLOW PROCESS FROM NODE    114.00 TO NODE    115.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =   1150.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   703.86   CHANNEL SLOPE =  0.0710
CHANNEL FLOW THRU SUBAREA(CFS) =     76.55
FLOW VELOCITY(FEET/SEC) =   6.33 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.85   Tc(MIN.) =  16.74
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    115.00 =  3072.02 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    114.00 TO NODE    115.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.678
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                    D       19.67     0.7719       85
SUBAREA AREA(ACRES) =   19.67   SUBAREA RUNOFF(CFS) =   40.66
TOTAL AREA(ACRES) =     51.98   TOTAL RUNOFF(CFS) =  117.21
TC(MIN.) =  16.74

****************************************************************************
FLOW PROCESS FROM NODE    115.00 TO NODE    116.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1150.00  DOWNSTREAM(FEET) =   1100.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   741.17   CHANNEL SLOPE =  0.0675
CHANNEL FLOW THRU SUBAREA(CFS) =    117.21
FLOW VELOCITY(FEET/SEC) =   7.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.74   Tc(MIN.) =  18.48
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    116.00 =  3813.19 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    115.00 TO NODE    116.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.554
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                    D       23.31     0.7666       85
SUBAREA AREA(ACRES) =   23.31   SUBAREA RUNOFF(CFS) =   45.63
TOTAL AREA(ACRES) =     75.29   TOTAL RUNOFF(CFS) =  162.84
TC(MIN.) =  18.48

****************************************************************************
FLOW PROCESS FROM NODE    116.00 TO NODE    117.00 IS CODE =  53
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     107.00 TO NODE     108.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1180.00  DOWNSTREAM(FEET) =   1050.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1728.44   CHANNEL SLOPE =  0.0752
  CHANNEL FLOW THRU SUBAREA(CFS) =     631.72
  FLOW VELOCITY(FEET/SEC) =  13.15 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.19   Tc(MIN.) =  20.67
  LONGEST FLOWPATH FROM NODE     100.00 TO NODE     108.00 =  9493.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     108.00 TO NODE     108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.420
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       79.89     0.7603      85
  SUBAREA AREA(ACRES) =   79.89   SUBAREA RUNOFF(CFS) =  146.98
  TOTAL AREA(ACRES) =    380.04   TOTAL RUNOFF(CFS) =  778.70
  TC(MIN.) =  20.67

****************************************************************************
  FLOW PROCESS FROM NODE     108.00 TO NODE     109.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1050.00  DOWNSTREAM(FEET) =    955.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1728.20   CHANNEL SLOPE =  0.0550
  CHANNEL FLOW THRU SUBAREA(CFS) =     778.70
  FLOW VELOCITY(FEET/SEC) =  12.05 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.39   Tc(MIN.) =  23.06
  LONGEST FLOWPATH FROM NODE     100.00 TO NODE     109.00 = 11221.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     108.00 TO NODE     109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.296
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D      115.32     0.7540      85
  SUBAREA AREA(ACRES) =  115.32   SUBAREA RUNOFF(CFS) =  199.63
  TOTAL AREA(ACRES) =    495.36   TOTAL RUNOFF(CFS) =  978.33
  TC(MIN.) =  23.06

****************************************************************************
  FLOW PROCESS FROM NODE     109.00 TO NODE     110.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    955.00  DOWNSTREAM(FEET) =    922.00
```



```
  FLOW LENGTH(FEET) =    989.33   MANNING'S N =  0.013
  DEPTH OF FLOW IN  81.0 INCH PIPE IS  64.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  31.99
  ESTIMATED PIPE DIAMETER(INCH) =  81.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     978.33
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =  23.58
  LONGEST FLOWPATH FROM NODE     100.00 TO NODE     110.00 = 12211.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     109.00 TO NODE     110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.272
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                  D        3.00     0.8853      75
  SUBAREA AREA(ACRES) =    3.00   SUBAREA RUNOFF(CFS) =    6.03
  TOTAL AREA(ACRES) =    498.36   TOTAL RUNOFF(CFS) =  984.36
  TC(MIN.) =  23.58

****************************************************************************
  FLOW PROCESS FROM NODE     109.00 TO NODE     110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.272
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        7.00     0.7527      85
  SUBAREA AREA(ACRES) =    7.00   SUBAREA RUNOFF(CFS) =   11.97
  TOTAL AREA(ACRES) =    505.36   TOTAL RUNOFF(CFS) =  996.33
  TC(MIN.) =  23.58

****************************************************************************
  FLOW PROCESS FROM NODE     110.00 TO NODE     122.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    922.00  DOWNSTREAM(FEET) =    883.50
  FLOW LENGTH(FEET) =    302.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  51.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  52.91
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     996.33
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =  23.67
  LONGEST FLOWPATH FROM NODE     100.00 TO NODE     122.00 = 12513.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     110.00 TO NODE     122.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     111.00 TO NODE     112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
```

```
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =  2436.43 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.104
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
      LAND USE             GROUP   (ACRES)   Coefficient    CN
 NATURAL POOR COVER
 "BARREN"                    D       17.70     0.7873       85
 SUBAREA AREA(ACRES) =   17.70   SUBAREA RUNOFF(CFS) =   43.26
 TOTAL AREA(ACRES) =     39.51   TOTAL RUNOFF(CFS) =  101.68
 TC(MIN.) =  12.31

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2255.00  DOWNSTREAM(FEET) =   1960.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1230.50   CHANNEL SLOPE =  0.2397
 CHANNEL FLOW THRU SUBAREA(CFS) =    101.68
 FLOW VELOCITY(FEET/SEC) =  12.78 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.60   Tc(MIN.) =  13.91
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =  3666.93 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.927
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
      LAND USE             GROUP   (ACRES)   Coefficient    CN
 NATURAL POOR COVER
 "BARREN"                    D       31.55     0.7814       85
 SUBAREA AREA(ACRES) =   31.55   SUBAREA RUNOFF(CFS) =   72.15
 TOTAL AREA(ACRES) =     71.06   TOTAL RUNOFF(CFS) =  173.83
 TC(MIN.) =  13.91

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1960.00  DOWNSTREAM(FEET) =   1600.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1732.80   CHANNEL SLOPE =  0.2078
 CHANNEL FLOW THRU SUBAREA(CFS) =    173.83
 FLOW VELOCITY(FEET/SEC) =  14.22 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.03   Tc(MIN.) =  15.94
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =  5399.73 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.741
```



```
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
      LAND USE             GROUP   (ACRES)   Coefficient    CN
 NATURAL POOR COVER
 "BARREN"                    D       46.73     0.7744       85
 SUBAREA AREA(ACRES) =   46.73   SUBAREA RUNOFF(CFS) =   99.21
 TOTAL AREA(ACRES) =    117.79   TOTAL RUNOFF(CFS) =  273.04
 TC(MIN.) =  15.94

****************************************************************************
 FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1600.00  DOWNSTREAM(FEET) =   1230.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1976.72   CHANNEL SLOPE =  0.1872
 CHANNEL FLOW THRU SUBAREA(CFS) =    273.04
 FLOW VELOCITY(FEET/SEC) =  15.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.10   Tc(MIN.) =  18.04
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =  7376.45 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.583
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
      LAND USE             GROUP   (ACRES)   Coefficient    CN
 NATURAL POOR COVER
 "BARREN"                    D       65.75     0.7679       85
 SUBAREA AREA(ACRES) =   65.75   SUBAREA RUNOFF(CFS) =  130.42
 TOTAL AREA(ACRES) =    183.54   TOTAL RUNOFF(CFS) =  403.46
 TC(MIN.) =  18.04

****************************************************************************
 FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1230.00  DOWNSTREAM(FEET) =   1180.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   388.75   CHANNEL SLOPE =  0.1286
 CHANNEL FLOW THRU SUBAREA(CFS) =    403.46
 FLOW VELOCITY(FEET/SEC) =  14.81 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.44   Tc(MIN.) =  18.48
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =  7765.20 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.554
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
      LAND USE             GROUP   (ACRES)   Coefficient    CN
 NATURAL POOR COVER
 "BARREN"                    D      116.61     0.7666       85
 SUBAREA AREA(ACRES) =  116.61   SUBAREA RUNOFF(CFS) =  228.26
 TOTAL AREA(ACRES) =    300.15   TOTAL RUNOFF(CFS) =  631.72
 TC(MIN.) =  18.48
```

```
****************************************************************************
  INTEGRATED RATIONAL METHOD/UH METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
                    (Rational Tabling Version 6.0D)
                Release Date: 01/01/2004  License ID 1264

                        Analysis prepared by:

                            RBF Consulting
                          14725 Alton Parkway
                        Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
* FHP Area F 100 year combined Rational Method                          *
*                                                                       *
*                                                                       *
 ************************************************************************

  FILE NAME: 100FDES.DAT
  TIME/DATE OF STUDY: 10:30 05/04/2007
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.220
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.940
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.430
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.450
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4796304
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4805313
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.450
  SLOPE OF INTENSITY DURATION CURVE = 0.4805
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

  UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
    WATERSHED LAG = 0.80 * Tc
    MOUNTAIN S-GRAPH USED.
    RIVERSIDE COUNTY DEPTH-AREA FACTORS USED (See Page B-3.)
    * 3-HOUR ( 5-MINUTE PERIOD) DESIGN STORM USED.
    UNADJUSTED  3-HOUR RAINFALL DEPTH (INCHES) =   2.65
    * 6-HOUR ( 5-MINUTE PERIOD) DESIGN STORM USED.
    UNADJUSTED  6-HOUR RAINFALL DEPTH (INCHES) =   3.85
```



```
    LOW LOSS RATE PERCENTAGE =  0.90
  *PRECIPITATION ZONE NUMBER (PZN) = 2.0
  *ANTECEDENT MOISTURE CONDITION (AMC) =  0.00 ASSUMED FOR UNIT HYDROGRAPH METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   861.38
  UPSTREAM ELEVATION(FEET) =   3000.00
  DOWNSTREAM ELEVATION(FEET) =   2660.00
  ELEVATION DIFFERENCE(FEET) =   340.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.502
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       D        9.81     0.7986       81    9.58
  SUBAREA RUNOFF(CFS) =      27.44
  TOTAL AREA(ACRES) =       9.81   TOTAL RUNOFF(CFS) =      27.44

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2660.00  DOWNSTREAM(FEET) =   2460.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   787.24   CHANNEL SLOPE =  0.2541
  CHANNEL FLOW THRU SUBAREA(CFS) =      27.44
  FLOW VELOCITY(FEET/SEC) =   8.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.54   Tc(MIN.) =  11.12
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =  1648.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.259
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       12.00     0.7920       85
  SUBAREA AREA(ACRES) =   12.00   SUBAREA RUNOFF(CFS) =   30.98
  TOTAL AREA(ACRES) =     21.81   TOTAL RUNOFF(CFS) =   58.42
  TC(MIN.) =  11.12

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2460.00  DOWNSTREAM(FEET) =   2255.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   787.81   CHANNEL SLOPE =  0.2602
  CHANNEL FLOW THRU SUBAREA(CFS) =      58.42
  FLOW VELOCITY(FEET/SEC) =  11.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.19   Tc(MIN.) =  12.31
```

```
*****************************WARNING*********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFCWCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
*********************************************************************

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.

** PEAK FLOW RATE TABLE **
STREAM     RUNOFF      Tc      INTENSITY
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
    1      500.53    14.64       1.868
    2      911.61    28.99       1.346

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    911.61   Tc(MIN.) =   28.99
TOTAL AREA(ACRES) =    844.79
LONGEST FLOWPATH FROM NODE    100.00 TO NODE    135.00 = 15063.17 FEET.
=====================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)      =    844.79  TC(MIN.) =     28.99
PEAK FLOW RATE(CFS)    =    911.61
=====================================================================
=====================================================================
END OF RATIONAL METHOD ANALYSIS
```

```
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   863.10
  UPSTREAM ELEVATION(FEET) =   1000.00
  DOWNSTREAM ELEVATION(FEET) =    950.00
  ELEVATION DIFFERENCE(FEET) =     50.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.203
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"         C        8.58     0.8038       69   10.37
  SUBAREA RUNOFF(CFS) =      15.20
  TOTAL AREA(ACRES) =       8.58   TOTAL RUNOFF(CFS) =     15.20

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  950.00  DOWNSTREAM ELEVATION(FEET) =  885.00
  STREET LENGTH(FEET) =   873.80   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.69
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   14.02
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.93
  STREET FLOW TRAVEL TIME(MIN.) =   2.05   Tc(MIN.) =  12.42
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.021
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"         C       15.50     0.7971       69
  SUBAREA AREA(ACRES) =   15.50      SUBAREA RUNOFF(CFS) =   24.97
  TOTAL AREA(ACRES) =     24.08        PEAK FLOW RATE(CFS) =      40.16

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.37
  FLOW VELOCITY(FEET/SEC.) =  7.77   DEPTH*VELOCITY(FT*FT/SEC.) =   3.53
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =  1736.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  885.00  DOWNSTREAM ELEVATION(FEET) =  850.00
  STREET LENGTH(FEET) =   815.30   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00
```



```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.73
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.52
    HALFSTREET FLOOD WIDTH(FEET) =   20.27
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.51
  STREET FLOW TRAVEL TIME(MIN.) =   2.03   Tc(MIN.) =  14.45
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.879
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"         C       15.55     0.7912       69
  SUBAREA AREA(ACRES) =   15.55      SUBAREA RUNOFF(CFS) =   23.12
  TOTAL AREA(ACRES) =     39.63        PEAK FLOW RATE(CFS) =      63.28

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  21.99
  FLOW VELOCITY(FEET/SEC.) =  7.01   DEPTH*VELOCITY(FT*FT/SEC.) =   3.89
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      4.00 =  2552.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE    135.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    850.00  DOWNSTREAM(FEET) =    783.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   286.20   CHANNEL SLOPE =  0.2341
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =  10.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     63.28
  FLOW VELOCITY(FEET/SEC.) =  25.62   FLOW DEPTH(FEET) =   0.45
  TRAVEL TIME(MIN.) =   0.19   Tc(MIN.) =  14.64
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    135.00 =  2838.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE    135.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  14.64
  RAINFALL INTENSITY(INCH/HR) =   1.87
  TOTAL STREAM AREA(ACRES) =    39.63
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     63.28

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       866.01    28.99       1.346       805.16
     2        63.28    14.64       1.868        39.63
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     30.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.783
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        7.11     0.7204       85
  SUBAREA AREA(ACRES) =     7.11   SUBAREA RUNOFF(CFS) =     9.13
  TOTAL AREA(ACRES) =      28.16   TOTAL RUNOFF(CFS) =    42.15
  TC(MIN.) =  16.13

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE    134.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    855.00  DOWNSTREAM(FEET) =    815.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   986.02   CHANNEL SLOPE =  0.0406
  CHANNEL FLOW THRU SUBAREA(CFS) =     42.15
  FLOW VELOCITY(FEET/SEC) =   3.92 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.19   Tc(MIN.) =  20.33
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE    134.00 =  3101.34 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE    134.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.596
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        4.56     0.7039       85
  SUBAREA AREA(ACRES) =     4.56   SUBAREA RUNOFF(CFS) =     5.12
  TOTAL AREA(ACRES) =      32.72   TOTAL RUNOFF(CFS) =    47.28
  TC(MIN.) =  20.33

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE    134.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  20.33
  RAINFALL INTENSITY(INCH/HR) =   1.60
  TOTAL STREAM AREA(ACRES) =     32.72
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     47.28

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       820.33    27.33       1.384        767.32
     2        47.28    20.33       1.596         32.72

 ******************************WARNING*****************************
```



```
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ***************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       657.39    20.33       1.596
     2       861.35    27.33       1.384

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    861.35   Tc(MIN.) =   27.33
  TOTAL AREA(ACRES) =    800.04
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    134.00 = 14313.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    135.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    815.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   750.00   CHANNEL SLOPE =  0.0200
  CHANNEL FLOW THRU SUBAREA(CFS) =    861.35
  FLOW VELOCITY(FEET/SEC) =   7.52 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.66   Tc(MIN.) =  28.99
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    135.00 = 15063.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    135.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.346
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        5.12     0.6766       85
  SUBAREA AREA(ACRES) =     5.12   SUBAREA RUNOFF(CFS) =     4.66
  TOTAL AREA(ACRES) =    805.16   TOTAL RUNOFF(CFS) =   866.01
  TC(MIN.) =  28.99

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    135.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  28.99
  RAINFALL INTENSITY(INCH/HR) =   1.35
  TOTAL STREAM AREA(ACRES) =   805.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    866.01

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    134.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  27.33
  RAINFALL INTENSITY(INCH/HR) =   1.38
  TOTAL STREAM AREA(ACRES) =   767.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    820.33

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     26.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   562.18
  UPSTREAM ELEVATION(FEET) =   1160.00
  DOWNSTREAM ELEVATION(FEET) =   1050.00
  ELEVATION DIFFERENCE(FEET) =    110.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.323
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       D        4.45     0.7554       81    9.29
  SUBAREA RUNOFF(CFS) =       7.81
  TOTAL AREA(ACRES) =       4.45   TOTAL RUNOFF(CFS) =       7.81

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     27.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1050.00  DOWNSTREAM(FEET) =    940.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   405.42   CHANNEL SLOPE =  0.2713
  CHANNEL FLOW THRU SUBAREA(CFS) =       7.81
  FLOW VELOCITY(FEET/SEC) =   5.78 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.17   Tc(MIN.) =  10.46
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE     27.00 =   967.60 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     27.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.194
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        3.41     0.7484       85
  SUBAREA AREA(ACRES) =     3.41   SUBAREA RUNOFF(CFS) =     5.60
  TOTAL AREA(ACRES) =       7.86   TOTAL RUNOFF(CFS) =    13.41
  TC(MIN.) =  10.46

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     28.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    940.00  DOWNSTREAM(FEET) =    880.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   480.49   CHANNEL SLOPE =  0.1249
  CHANNEL FLOW THRU SUBAREA(CFS) =      13.41
  FLOW VELOCITY(FEET/SEC) =   4.70 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.70   Tc(MIN.) =  12.16
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE     28.00 =  1448.09 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     28.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.041
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        5.03     0.7391       85
  SUBAREA AREA(ACRES) =     5.03   SUBAREA RUNOFF(CFS) =     7.59
  TOTAL AREA(ACRES) =      12.89   TOTAL RUNOFF(CFS) =    21.00
  TC(MIN.) =  12.16

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     29.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    880.00  DOWNSTREAM(FEET) =    865.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   149.43   CHANNEL SLOPE =  0.1004
  CHANNEL FLOW THRU SUBAREA(CFS) =      21.00
  FLOW VELOCITY(FEET/SEC) =   4.89 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.51   Tc(MIN.) =  12.67
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE     29.00 =  1597.52 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     29.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.001
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        8.16     0.7365       85
  SUBAREA AREA(ACRES) =     8.16   SUBAREA RUNOFF(CFS) =    12.03
  TOTAL AREA(ACRES) =      21.05   TOTAL RUNOFF(CFS) =    33.02
  TC(MIN.) =  12.67

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     30.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    865.00  DOWNSTREAM(FEET) =    855.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   517.80   CHANNEL SLOPE =  0.0193
  CHANNEL FLOW THRU SUBAREA(CFS) =      33.02
  FLOW VELOCITY(FEET/SEC) =   2.49 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.46   Tc(MIN.) =  16.13
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE     30.00 =  2115.32 FEET.
```

```
----------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
======================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   879.23
  UPSTREAM ELEVATION(FEET) =   1130.00
  DOWNSTREAM ELEVATION(FEET) =    940.00
  ELEVATION DIFFERENCE(FEET) =    190.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.152
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  NATURAL POOR COVER
  "CHAPARRAL,BROADLEAF"       D        9.77      0.7460       85   10.89
  SUBAREA RUNOFF(CFS) =      15.68
  TOTAL AREA(ACRES) =        9.77   TOTAL RUNOFF(CFS) =     15.68

**********************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    132.00 IS CODE =  53
----------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    940.00  DOWNSTREAM(FEET) =    865.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   757.49   CHANNEL SLOPE =  0.0990
  CHANNEL FLOW THRU SUBAREA(CFS) =      15.68
  FLOW VELOCITY(FEET/SEC) =   4.41 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.86   Tc(MIN.) =  13.76
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    132.00 =  1636.72 FEET.

**********************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    132.00 IS CODE =  81
----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.924
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       15.13      0.7311       85
  SUBAREA AREA(ACRES) =    15.13   SUBAREA RUNOFF(CFS) =   21.28
  TOTAL AREA(ACRES) =      24.90   TOTAL RUNOFF(CFS) =   36.97
  TC(MIN.) =  13.76

**********************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  53
----------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    865.00  DOWNSTREAM(FEET) =    820.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   590.16   CHANNEL SLOPE =  0.0763
  CHANNEL FLOW THRU SUBAREA(CFS) =      36.97
  FLOW VELOCITY(FEET/SEC) =   5.15 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.91   Tc(MIN.) =  15.67
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    133.00 =  2226.88 FEET.

**********************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  81
----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
```



```
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.808
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       23.63      0.7224       85
  SUBAREA AREA(ACRES) =    23.63   SUBAREA RUNOFF(CFS) =   30.86
  TOTAL AREA(ACRES) =      48.53   TOTAL RUNOFF(CFS) =   67.83
  TC(MIN.) =  15.67

**********************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =   1
----------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
======================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  15.67
  RAINFALL INTENSITY(INCH/HR) =   1.81
  TOTAL STREAM AREA(ACRES) =    48.53
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     67.83

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       768.24    27.16       1.388        718.79
     2        67.83    15.67       1.808         48.53

  ******************************WARNING*******************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
  **********************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       510.95    15.67       1.808
     2       820.33    27.16       1.388

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    820.33   Tc(MIN.) =   27.16
  TOTAL AREA(ACRES) =    767.32
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    133.00 = 14063.17 FEET.

**********************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    134.00 IS CODE =  31
----------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   820.00  DOWNSTREAM(FEET) =   815.00
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  84.0 INCH PIPE IS  65.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  25.36
  ESTIMATED PIPE DIAMETER(INCH) =  84.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    820.33
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =  27.33
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    134.00 = 14313.17 FEET.
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   961.00  DOWNSTREAM(FEET) =   960.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.22
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      7.97
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   8.02
  LONGEST FLOWPATH FROM NODE     23.00 TO NODE     37.00 =   575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     37.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   8.02
  RAINFALL INTENSITY(INCH/HR) =   2.49
  TOTAL STREAM AREA(ACRES) =     4.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.97

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       40.18    11.75        2.075        22.85
     2        7.97     8.02        2.492         4.16

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       35.40     8.02        2.492
     2       46.82    11.75        2.075

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     46.82   Tc(MIN.) =   11.75
  TOTAL AREA(ACRES) =     27.01
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     37.00 =  2644.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE    123.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   960.00  DOWNSTREAM(FEET) =   883.00
  FLOW LENGTH(FEET) =   700.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.56
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     46.82
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =  12.25
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE    123.00 =  3344.41 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    133.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       46.82    12.25        2.035        27.01
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE    133.00 =  3344.41 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1      735.89    26.48        1.405       691.78
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    133.00 = 12663.17 FEET.

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      387.13    12.25        2.035
     2      768.24    26.48        1.405

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    768.24   Tc(MIN.) =   26.48
  TOTAL AREA(ACRES) =    718.79

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    133.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   883.00  DOWNSTREAM(FEET) =   820.00
  FLOW LENGTH(FEET) =  1400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  72.0 INCH PIPE IS  53.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  34.12
  ESTIMATED PIPE DIAMETER(INCH) =  72.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    768.24
  PIPE TRAVEL TIME(MIN.) =   0.68    Tc(MIN.) =  27.16
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    133.00 = 14063.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    133.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  27.16
  RAINFALL INTENSITY(INCH/HR) =   1.39
  TOTAL STREAM AREA(ACRES) =   718.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    768.24

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
```

```
PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.48

****************************************************************************
FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   485.00
UPSTREAM ELEVATION(FEET) =   1160.00
DOWNSTREAM ELEVATION(FEET) =    990.00
ELEVATION DIFFERENCE(FEET) =    170.00
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.527
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
     LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
NATURAL POOR COVER
*CHAPARRAL,BROADLEAF*       D        5.35     0.7654       85    7.79
SUBAREA RUNOFF(CFS) =     10.35
TOTAL AREA(ACRES) =       5.35   TOTAL RUNOFF(CFS) =     10.35

****************************************************************************
FLOW PROCESS FROM NODE     22.00 TO NODE     36.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   990.00  DOWNSTREAM(FEET) =   989.00
FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   7.59
ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     10.35
PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   7.95
LONGEST FLOWPATH FROM NODE     21.00 TO NODE     36.00 =   555.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     22.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   7.95
RAINFALL INTENSITY(INCH/HR) =   2.50
TOTAL STREAM AREA(ACRES) =      5.35
PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.35

** CONFLUENCE DATA **
STREAM      RUNOFF       Tc       INTENSITY      AREA
NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
    1        31.48     11.40        2.105        17.50
    2        10.35      7.95        2.503         5.35

*******************************WARNING*******************************
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ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
*********************************************************************

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.
```



```
** PEAK FLOW RATE TABLE **
STREAM      RUNOFF       Tc       INTENSITY
NUMBER       (CFS)     (MIN.)    (INCH/HOUR)
    1        32.29      7.95        2.503
    2        40.18     11.40        2.105

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =     40.18   Tc(MIN.) =   11.40
TOTAL AREA(ACRES) =      22.85
LONGEST FLOWPATH FROM NODE     31.00 TO NODE     36.00 =  2244.41 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   989.00  DOWNSTREAM(FEET) =   960.00
FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  21.0 INCH PIPE IS  17.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  19.19
ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     40.18
PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  11.75
LONGEST FLOWPATH FROM NODE     31.00 TO NODE     37.00 =  2644.41 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  11.75
RAINFALL INTENSITY(INCH/HR) =   2.08
TOTAL STREAM AREA(ACRES) =     22.85
PEAK FLOW RATE(CFS) AT CONFLUENCE =     40.18

****************************************************************************
FLOW PROCESS FROM NODE     23.00 TO NODE     24.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   525.00
UPSTREAM ELEVATION(FEET) =   1160.00
DOWNSTREAM ELEVATION(FEET) =    961.00
ELEVATION DIFFERENCE(FEET) =    199.00
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.508
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
     LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
NATURAL FAIR COVER
*CHAPARRAL,BROADLEAF*       D        4.16     0.7645       81    7.92
SUBAREA RUNOFF(CFS) =      7.97
TOTAL AREA(ACRES) =       4.16   TOTAL RUNOFF(CFS) =      7.97

****************************************************************************
FLOW PROCESS FROM NODE     24.00 TO NODE     37.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
ELEVATION DATA: UPSTREAM(FEET) =   883.50  DOWNSTREAM(FEET) =   883.00
FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
DEPTH OF FLOW IN 114.0 INCH PIPE IS  87.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  12.66
ESTIMATED PIPE DIAMETER(INCH) = 114.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =    735.89
PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =  26.48
LONGEST FLOWPATH FROM NODE    100.00 TO NODE    123.00 = 12663.17 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  10
----------------------------------------------------------------------------
>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
FLOW PROCESS FROM NODE     31.00 TO NODE     32.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   957.41
UPSTREAM ELEVATION(FEET) =   1147.50
DOWNSTREAM ELEVATION(FEET) =   1106.00
ELEVATION DIFFERENCE(FEET) =     41.50
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.378
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
     LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
COMMERCIAL                 D        3.14     0.8858       75    8.84
SUBAREA RUNOFF(CFS) =      6.62
TOTAL AREA(ACRES) =       3.14   TOTAL RUNOFF(CFS) =      6.62

****************************************************************************
FLOW PROCESS FROM NODE     31.00 TO NODE     32.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.378
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                   D        5.00     0.7583       85
SUBAREA AREA(ACRES) =     5.00   SUBAREA RUNOFF(CFS) =     9.02
TOTAL AREA(ACRES) =       8.14   TOTAL RUNOFF(CFS) =    15.63
TC(MIN.) =   8.84

****************************************************************************
FLOW PROCESS FROM NODE     32.00 TO NODE     35.00 IS CODE =  61
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) = 1106.00  DOWNSTREAM ELEVATION(FEET) = 1037.00
STREET LENGTH(FEET) =   887.00   CURB HEIGHT(INCHES) =  8.0
STREET HALFWIDTH(FEET) = 37.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.018
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
```



```
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.68
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.37
  HALFSTREET FLOOD WIDTH(FEET) =   11.64
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.61
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.46
STREET FLOW TRAVEL TIME(MIN.) =   2.24   Tc(MIN.) =  11.08
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.135
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
COMMERCIAL                 D        3.23     0.8845       75
SUBAREA AREA(ACRES) =     3.23   SUBAREA RUNOFF(CFS) =     6.10
TOTAL AREA(ACRES) =      11.37     PEAK FLOW RATE(CFS) =      21.73

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  12.46
FLOW VELOCITY(FEET/SEC.) =  6.83   DEPTH*VELOCITY(FT*FT/SEC.) =   2.64
LONGEST FLOWPATH FROM NODE     31.00 TO NODE     35.00 =  1844.41 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     32.00 TO NODE     35.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.135
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                   D        6.13     0.7449       85
SUBAREA AREA(ACRES) =     6.13   SUBAREA RUNOFF(CFS) =     9.75
TOTAL AREA(ACRES) =      17.50   TOTAL RUNOFF(CFS) =    31.48
TC(MIN.) =  11.08

****************************************************************************
FLOW PROCESS FROM NODE     35.00 TO NODE     36.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) = 1030.00  DOWNSTREAM(FEET) =   989.00
FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  20.58
ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     31.48
PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =  11.40
LONGEST FLOWPATH FROM NODE     31.00 TO NODE     36.00 =  2244.41 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     35.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  11.40
RAINFALL INTENSITY(INCH/HR) =   2.11
TOTAL STREAM AREA(ACRES) =    17.50
```

```
  FLOW PROCESS FROM NODE    121.00 TO NODE    118.00 IS CODE =  81
-----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=======================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.713
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       24.44     0.7146       85
  SUBAREA AREA(ACRES) =   24.44   SUBAREA RUNOFF(CFS) =   29.91
  TOTAL AREA(ACRES) =     47.82   TOTAL RUNOFF(CFS) =   65.53
  TC(MIN.) =  17.54

*********************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    118.00 IS CODE =  81
-----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=======================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.713
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                  D        1.00     0.8815       75
  SUBAREA AREA(ACRES) =    1.00   SUBAREA RUNOFF(CFS) =    1.51
  TOTAL AREA(ACRES) =     48.82   TOTAL RUNOFF(CFS) =   67.04
  TC(MIN.) =  17.54

*********************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    118.00 IS CODE =   1
-----------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=======================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  17.54
  RAINFALL INTENSITY(INCH/HR) =   1.71
  TOTAL STREAM AREA(ACRES) =    48.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     67.04

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       150.38    33.13       1.262        137.60
     2        67.04    17.54       1.713         48.82

 ******************************WARNING*****************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 *******************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       146.66    17.54       1.713
     2       199.79    33.13       1.262

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    199.79   Tc(MIN.) =   33.13
```



```
  TOTAL AREA(ACRES) =    186.42
  LONGEST FLOWPATH FROM NODE    111.00 TO NODE    118.00 =  7117.61 FEET.

*********************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    122.00 IS CODE =  31
-----------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   885.00  DOWNSTREAM(FEET) =   883.50
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  29.38
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    199.79
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =  33.14
  LONGEST FLOWPATH FROM NODE    111.00 TO NODE    122.00 =  7137.61 FEET.

*********************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    122.00 IS CODE =  11
-----------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
=======================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       199.79    33.14       1.262        186.42
  LONGEST FLOWPATH FROM NODE    111.00 TO NODE    122.00 =  7137.61 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       577.42    26.28       1.411        505.36
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    122.00 = 12513.17 FEET.

 ******************************WARNING*****************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 *******************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       735.89    26.28       1.411
     2       716.48    33.14       1.262

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    735.89   Tc(MIN.) =   26.28
  TOTAL AREA(ACRES) =    691.78

*********************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  12
-----------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
=======================================================================

*********************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  31
-----------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=======================================================================
```

```
----------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1747.37   CHANNEL SLOPE =  0.0114
  CHANNEL FLOW THRU SUBAREA(CFS) =      96.35
  FLOW VELOCITY(FEET/SEC) =   2.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  10.62   Tc(MIN.) =  30.55
  LONGEST FLOWPATH FROM NODE    111.00 TO NODE    117.00 =  5560.56 FEET.

**********************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    117.00 IS CODE =  81
----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.312
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       39.68     0.6723       85
  SUBAREA AREA(ACRES) =   39.68   SUBAREA RUNOFF(CFS) =   35.01
  TOTAL AREA(ACRES) =    114.97   TOTAL RUNOFF(CFS) =  131.36
  TC(MIN.) =  30.55

**********************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    118.00 IS CODE =  53
----------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    885.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1557.05   CHANNEL SLOPE =  0.1252
  CHANNEL FLOW THRU SUBAREA(CFS) =    131.36
  FLOW VELOCITY(FEET/SEC) =  10.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.58   Tc(MIN.) =  33.13
  LONGEST FLOWPATH FROM NODE    111.00 TO NODE    118.00 =  7117.61 FEET.

**********************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    118.00 IS CODE =  81
----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.262
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       22.63     0.6656       85
  SUBAREA AREA(ACRES) =   22.63   SUBAREA RUNOFF(CFS) =   19.02
  TOTAL AREA(ACRES) =    137.60   TOTAL RUNOFF(CFS) =  150.38
  TC(MIN.) =  33.13

**********************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    118.00 IS CODE =   1
----------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
======================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  33.13
  RAINFALL INTENSITY(INCH/HR) =   1.26
  TOTAL STREAM AREA(ACRES) =   137.60
```



```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    150.38

**********************************************************************
  FLOW PROCESS FROM NODE    119.00 TO NODE    120.00 IS CODE =  21
----------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
======================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   811.95
  UPSTREAM ELEVATION(FEET) =   1250.00
  DOWNSTREAM ELEVATION(FEET) =   1060.00
  ELEVATION DIFFERENCE(FEET) =    190.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.202
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       D        9.41     0.7489       81   10.38
  SUBAREA RUNOFF(CFS) =      15.52
  TOTAL AREA(ACRES) =       9.41   TOTAL RUNOFF(CFS) =     15.52

**********************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  53
----------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1060.00  DOWNSTREAM(FEET) =   1000.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   697.00   CHANNEL SLOPE =  0.0861
  CHANNEL FLOW THRU SUBAREA(CFS) =     15.52
  FLOW VELOCITY(FEET/SEC) =   4.09 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.84   Tc(MIN.) =  13.22
  LONGEST FLOWPATH FROM NODE    119.00 TO NODE    121.00 =  1508.95 FEET.

**********************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  81
----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.961
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       13.97     0.7337       85
  SUBAREA AREA(ACRES) =   13.97   SUBAREA RUNOFF(CFS) =   20.10
  TOTAL AREA(ACRES) =     23.38   TOTAL RUNOFF(CFS) =   35.62
  TC(MIN.) =  13.22

**********************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    118.00 IS CODE =  53
----------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1000.00  DOWNSTREAM(FEET) =    885.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1377.65   CHANNEL SLOPE =  0.0835
  CHANNEL FLOW THRU SUBAREA(CFS) =     35.62
  FLOW VELOCITY(FEET/SEC) =   5.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.32   Tc(MIN.) =  17.54
  LONGEST FLOWPATH FROM NODE    119.00 TO NODE    118.00 =  2886.60 FEET.

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

```
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   941.76
UPSTREAM ELEVATION(FEET) =   1620.00
DOWNSTREAM ELEVATION(FEET) =   1340.00
ELEVATION DIFFERENCE(FEET) =    280.00
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.190
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
     LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"       D        7.57     0.7482       81   10.50
SUBAREA RUNOFF(CFS) =      12.40
TOTAL AREA(ACRES) =        7.57   TOTAL RUNOFF(CFS) =     12.40

****************************************************************************
FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1340.00  DOWNSTREAM(FEET) =   1280.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   661.78   CHANNEL SLOPE =  0.0907
CHANNEL FLOW THRU SUBAREA(CFS) =      12.40
FLOW VELOCITY(FEET/SEC) =   3.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.83   Tc(MIN.) =  13.33
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    113.00 =  1603.54 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.953
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                    D       10.54     0.7332       85
SUBAREA AREA(ACRES) =    10.54   SUBAREA RUNOFF(CFS) =   15.09
TOTAL AREA(ACRES) =      18.11   TOTAL RUNOFF(CFS) =   27.50
TC(MIN.) =  13.33

****************************************************************************
FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1280.00  DOWNSTREAM(FEET) =   1200.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   764.62   CHANNEL SLOPE =  0.1046
CHANNEL FLOW THRU SUBAREA(CFS) =      27.50
FLOW VELOCITY(FEET/SEC) =   5.46 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.33   Tc(MIN.) =  15.67
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    114.00 =  2368.16 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.808
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
```



```
NATURAL POOR COVER
"BARREN"                    D       14.20     0.7224       85
SUBAREA AREA(ACRES) =    14.20   SUBAREA RUNOFF(CFS) =   18.55
TOTAL AREA(ACRES) =      32.31   TOTAL RUNOFF(CFS) =   46.04
TC(MIN.) =  15.67

****************************************************************************
FLOW PROCESS FROM NODE    114.00 TO NODE    115.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =   1150.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   703.86   CHANNEL SLOPE =  0.0710
CHANNEL FLOW THRU SUBAREA(CFS) =      46.04
FLOW VELOCITY(FEET/SEC) =   5.34 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.20   Tc(MIN.) =  17.86
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    115.00 =  3072.02 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    114.00 TO NODE    115.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.698
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                    D       19.67     0.7133       85
SUBAREA AREA(ACRES) =    19.67   SUBAREA RUNOFF(CFS) =   23.82
TOTAL AREA(ACRES) =      51.98   TOTAL RUNOFF(CFS) =   69.86
TC(MIN.) =  17.86

****************************************************************************
FLOW PROCESS FROM NODE    115.00 TO NODE    116.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1150.00  DOWNSTREAM(FEET) =   1100.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   741.17   CHANNEL SLOPE =  0.0675
CHANNEL FLOW THRU SUBAREA(CFS) =      69.86
FLOW VELOCITY(FEET/SEC) =   5.98 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.06   Tc(MIN.) =  19.93
LONGEST FLOWPATH FROM NODE    111.00 TO NODE    116.00 =  3813.19 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    115.00 TO NODE    116.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.611
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient    CN
NATURAL POOR COVER
"BARREN"                    D       23.31     0.7054       85
SUBAREA AREA(ACRES) =    23.31   SUBAREA RUNOFF(CFS) =   26.49
TOTAL AREA(ACRES) =      75.29   TOTAL RUNOFF(CFS) =   96.35
TC(MIN.) =  19.93

****************************************************************************
FLOW PROCESS FROM NODE    116.00 TO NODE    117.00 IS CODE =  53
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     107.00 TO NODE     108.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1180.00  DOWNSTREAM(FEET) =   1050.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1728.44   CHANNEL SLOPE =  0.0752
  CHANNEL FLOW THRU SUBAREA(CFS) =     369.76
  FLOW VELOCITY(FEET/SEC) =  11.00 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.62   Tc(MIN.) =  22.72
  LONGEST FLOWPATH FROM NODE     100.00 TO NODE     108.00 =  9493.64 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     108.00 TO NODE     108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.512
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       79.89     0.6956      85
  SUBAREA AREA(ACRES) =   79.89   SUBAREA RUNOFF(CFS) =   84.05
  TOTAL AREA(ACRES) =    380.04   TOTAL RUNOFF(CFS) =  453.81
  TC(MIN.) =  22.72

****************************************************************************
  FLOW PROCESS FROM NODE     108.00 TO NODE     109.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1050.00  DOWNSTREAM(FEET) =    955.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1728.20   CHANNEL SLOPE =  0.0550
  CHANNEL FLOW THRU SUBAREA(CFS) =     453.81
  FLOW VELOCITY(FEET/SEC) =  10.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.86   Tc(MIN.) =  25.59
  LONGEST FLOWPATH FROM NODE     100.00 TO NODE     109.00 = 11221.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     108.00 TO NODE     109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.429
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D      115.32     0.6865      85
  SUBAREA AREA(ACRES) =  115.32   SUBAREA RUNOFF(CFS) =  113.11
  TOTAL AREA(ACRES) =    495.36   TOTAL RUNOFF(CFS) =  566.92
  TC(MIN.) =  25.59

****************************************************************************
  FLOW PROCESS FROM NODE     109.00 TO NODE     110.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    955.00  DOWNSTREAM(FEET) =    932.00
```



```
  FLOW LENGTH(FEET) =    989.33   MANNING'S N =  0.013
  DEPTH OF FLOW IN  66.0 INCH PIPE IS  52.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.91
  ESTIMATED PIPE DIAMETER(INCH) =  66.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     566.92
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =  26.18
  LONGEST FLOWPATH FROM NODE     100.00 TO NODE     110.00 = 12211.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     109.00 TO NODE     110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.413
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                  D        3.00     0.8785      75
  SUBAREA AREA(ACRES) =    3.00   SUBAREA RUNOFF(CFS) =    3.72
  TOTAL AREA(ACRES) =    498.36   TOTAL RUNOFF(CFS) =  570.65
  TC(MIN.) =  26.18

****************************************************************************
  FLOW PROCESS FROM NODE     109.00 TO NODE     110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.413
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D        7.00     0.6847      85
  SUBAREA AREA(ACRES) =    7.00   SUBAREA RUNOFF(CFS) =    6.77
  TOTAL AREA(ACRES) =    505.36   TOTAL RUNOFF(CFS) =  577.42
  TC(MIN.) =  26.18

****************************************************************************
  FLOW PROCESS FROM NODE     110.00 TO NODE     122.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    922.00  DOWNSTREAM(FEET) =    883.50
  FLOW LENGTH(FEET) =    302.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  38.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  47.15
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     577.42
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =  26.28
  LONGEST FLOWPATH FROM NODE     100.00 TO NODE     122.00 = 12513.17 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     110.00 TO NODE     122.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     111.00 TO NODE     112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
```

```
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =  2436.43 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.993
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       17.70     0.7359       85
  SUBAREA AREA(ACRES) =    17.70   SUBAREA RUNOFF(CFS) =   25.96
  TOTAL AREA(ACRES) =      39.51   TOTAL RUNOFF(CFS) =   61.67
  TC(MIN.) =  12.79

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2255.00  DOWNSTREAM(FEET) =   1960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1230.50   CHANNEL SLOPE =  0.2397
  CHANNEL FLOW THRU SUBAREA(CFS) =      61.67
  FLOW VELOCITY(FEET/SEC) =  10.82 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =  14.68
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =  3666.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.865
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       31.55     0.7268       85
  SUBAREA AREA(ACRES) =    31.55   SUBAREA RUNOFF(CFS) =   42.77
  TOTAL AREA(ACRES) =      71.06   TOTAL RUNOFF(CFS) =  104.43
  TC(MIN.) =  14.68

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1960.00  DOWNSTREAM(FEET) =   1600.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1732.80   CHANNEL SLOPE =  0.2078
  CHANNEL FLOW THRU SUBAREA(CFS) =     104.43
  FLOW VELOCITY(FEET/SEC) =  12.00 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.41   Tc(MIN.) =  17.09
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =  5399.73 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.734
```



```
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       46.73     0.7164       85
  SUBAREA AREA(ACRES) =    46.73   SUBAREA RUNOFF(CFS) =   58.05
  TOTAL AREA(ACRES) =     117.79   TOTAL RUNOFF(CFS) =  162.49
  TC(MIN.) =  17.09

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1600.00  DOWNSTREAM(FEET) =   1230.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1976.72   CHANNEL SLOPE =  0.1872
  CHANNEL FLOW THRU SUBAREA(CFS) =     162.49
  FLOW VELOCITY(FEET/SEC) =  13.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.50   Tc(MIN.) =  19.58
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =  7376.45 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.624
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       65.75     0.7066       85
  SUBAREA AREA(ACRES) =    65.75   SUBAREA RUNOFF(CFS) =   75.47
  TOTAL AREA(ACRES) =     183.54   TOTAL RUNOFF(CFS) =  237.95
  TC(MIN.) =  19.58

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1230.00  DOWNSTREAM(FEET) =   1180.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   388.75   CHANNEL SLOPE =  0.1286
  CHANNEL FLOW THRU SUBAREA(CFS) =     237.95
  FLOW VELOCITY(FEET/SEC) =  12.42 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.52   Tc(MIN.) =  20.11
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =  7765.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.604
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D      116.61     0.7047       85
  SUBAREA AREA(ACRES) =   116.61   SUBAREA RUNOFF(CFS) =  131.81
  TOTAL AREA(ACRES) =     300.15   TOTAL RUNOFF(CFS) =  369.76
  TC(MIN.) =  20.11
```

```
****************************************************************************
  INTEGRATED RATIONAL METHOD/UH METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
                    (Rational Tabling Version 6.0D)
               Release Date: 01/01/2004  License ID 1264

                        Analysis prepared by:

                          RBF Consulting
                        14725 Alton Parkway
                      Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
* FHP Area F 10 Year combined Rational Method                            *
*                                                                        *
*                                                                        *
 ************************************************************************

  FILE NAME: 10FDES.DAT
  TIME/DATE OF STUDY: 11:08 05/04/2007
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.220
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.940
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.430
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.450
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4796304
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4805313
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.949
  SLOPE OF INTENSITY DURATION CURVE = 0.4796
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

  UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
    WATERSHED LAG = 0.80 * Tc
    MOUNTAIN S-GRAPH USED.
    RIVERSIDE COUNTY DEPTH-AREA FACTORS USED (See Page B-3.)
    * 3-HOUR ( 5-MINUTE PERIOD) DESIGN STORM USED.
    UNADJUSTED  3-HOUR RAINFALL DEPTH (INCHES) =   1.74
    * 6-HOUR ( 5-MINUTE PERIOD) DESIGN STORM USED.
    UNADJUSTED  6-HOUR RAINFALL DEPTH (INCHES) =   2.50
```



```
    LOW LOSS RATE PERCENTAGE =  0.90
  *PRECIPITATION ZONE NUMBER (PZN) = 2.0
  *ANTECEDENT MOISTURE CONDITION (AMC) =  0.00 ASSUMED FOR UNIT HYDROGRAPH METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   861.38
  UPSTREAM ELEVATION(FEET) =   3000.00
  DOWNSTREAM ELEVATION(FEET) =   2660.00
  ELEVATION DIFFERENCE(FEET) =    340.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.289
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       D        9.81     0.7537       81    9.58
  SUBAREA RUNOFF(CFS) =      16.93
  TOTAL AREA(ACRES) =       9.81   TOTAL RUNOFF(CFS) =     16.93

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2660.00  DOWNSTREAM(FEET) =   2460.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   787.24   CHANNEL SLOPE =  0.2541
  CHANNEL FLOW THRU SUBAREA(CFS) =      16.93
  FLOW VELOCITY(FEET/SEC) =   7.24 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.81   Tc(MIN.) =  11.39
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =  1648.62 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.107
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    D       12.00     0.7432       85
  SUBAREA AREA(ACRES) =   12.00   SUBAREA RUNOFF(CFS) =   18.79
  TOTAL AREA(ACRES) =     21.81   TOTAL RUNOFF(CFS) =   35.71
  TC(MIN.) =  11.39

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2460.00  DOWNSTREAM(FEET) =   2255.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   787.81   CHANNEL SLOPE =  0.2602
  CHANNEL FLOW THRU SUBAREA(CFS) =      35.71
  FLOW VELOCITY(FEET/SEC) =   9.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.40   Tc(MIN.) =  12.79
```

```
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   863.10
UPSTREAM ELEVATION(FEET) =   1000.00
DOWNSTREAM ELEVATION(FEET) =    950.00
ELEVATION DIFFERENCE(FEET) =     50.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.371
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS   Tc
     LAND USE             GROUP   (ACRES)   Coefficient   CN  (MIN.)
RESIDENTIAL
"S.F. 1/4 ACRE LOT"         C        8.58     0.8321      69   10.37
SUBAREA RUNOFF(CFS) =      24.06
TOTAL AREA(ACRES) =       8.58   TOTAL RUNOFF(CFS) =     24.06

****************************************************************************
FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  62
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) =  950.00  DOWNSTREAM ELEVATION(FEET) =  885.00
STREET LENGTH(FEET) =   873.80   CURB HEIGHT(INCHES) =  8.0
STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.018
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.06
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.47
  HALFSTREET FLOOD WIDTH(FEET) =   16.99
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.95
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.70
STREET FLOW TRAVEL TIME(MIN.) =   1.83   Tc(MIN.) =  12.20
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.117
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient   CN
RESIDENTIAL
"S.F. 1/4 ACRE LOT"         C       15.50     0.8275      69
SUBAREA AREA(ACRES) =   15.50      SUBAREA RUNOFF(CFS) =   39.98
TOTAL AREA(ACRES) =     24.08        PEAK FLOW RATE(CFS) =      64.04

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  19.80
FLOW VELOCITY(FEET/SEC.) =  8.66   DEPTH*VELOCITY(FT*FT/SEC.) =   4.47
LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =  1736.90 FEET.

****************************************************************************
FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  62
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) =  885.00  DOWNSTREAM ELEVATION(FEET) =  850.00
STREET LENGTH(FEET) =   815.30   CURB HEIGHT(INCHES) =  8.0
STREET HALFWIDTH(FEET) = 30.00
```



```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.018
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      82.72
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.60
  HALFSTREET FLOOD WIDTH(FEET) =   24.41
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.50
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.49
STREET FLOW TRAVEL TIME(MIN.) =   1.81   Tc(MIN.) =  14.02
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.916
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Runoff      SCS
     LAND USE             GROUP   (ACRES)   Coefficient   CN
RESIDENTIAL
"S.F. 1/4 ACRE LOT"         C       15.55     0.8233      69
SUBAREA AREA(ACRES) =   15.55      SUBAREA RUNOFF(CFS) =   37.34
TOTAL AREA(ACRES) =     39.63        PEAK FLOW RATE(CFS) =     101.38

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  26.45
FLOW VELOCITY(FEET/SEC.) =  7.87   DEPTH*VELOCITY(FT*FT/SEC.) =   5.00
LONGEST FLOWPATH FROM NODE      1.00 TO NODE      4.00 =  2552.20 FEET.

****************************************************************************
FLOW PROCESS FROM NODE      4.00 TO NODE    135.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    850.00  DOWNSTREAM(FEET) =    783.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   286.20   CHANNEL SLOPE =  0.2341
CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   1.000
MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =  10.00
CHANNEL FLOW THRU SUBAREA(CFS) =    101.38
FLOW VELOCITY(FEET/SEC.) =  30.18   FLOW DEPTH(FEET) =   0.60
TRAVEL TIME(MIN.) =   0.16   Tc(MIN.) =  14.17
LONGEST FLOWPATH FROM NODE      1.00 TO NODE    135.00 =  2838.40 FEET.

****************************************************************************
FLOW PROCESS FROM NODE      4.00 TO NODE    135.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =  14.17
RAINFALL INTENSITY(INCH/HR) =   2.90
TOTAL STREAM AREA(ACRES) =    39.63
PEAK FLOW RATE(CFS) AT CONFLUENCE =    101.38

** CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
   1      1491.70    25.98       2.168        805.16
   2       101.38    14.17       2.901         39.63
```

```
*****************************WARNING*****************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
*******************************************************************

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
    1       915.32    14.17       2.901
    2      1567.47    25.98       2.160

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =   1567.47   Tc(MIN.) =   25.98
 TOTAL AREA(ACRES) =    844.79
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    135.00 = 15063.17 FEET.
****************************************************************************
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =    844.79  TC(MIN.) =     25.98
 PEAK FLOW RATE(CFS)    =   1567.47
****************************************************************************
****************************************************************************
 END OF RATIONAL METHOD ANALYSIS
```

# Appendix B.7

Area F

10 & 100-year Storm Event

3-Hour FloodSCX Hydrograph Method

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

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                  (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2004 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 2.0A)
             Release Date: 01/01/2003  License ID 1264

                      Analysis prepared by:

                         RBF Consulting
                       14725 Alton Parkway
                     Irvine, California  92618


 ************************* DESCRIPTION OF STUDY *************************
* Flood X UH Area F 10 Year High Confidence                              *
*                                                                        *
*                                                                        *
 ************************************************************************

  FILE NAME: UHF10.DAT
  TIME/DATE OF STUDY: 10:51 06/07/2007


****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    109.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      495.360 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.340 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         MOUNTAIN S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.269
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         USER-ENTERED RAINFALL =  1.74 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9980


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  24.510


         RUNOFF HYDROGRAPH LISTING LIMITS:
         MODEL TIME(HOURS) FOR BEGINNING OF RESULTS =    1.00
         MODEL TIME(HOURS) FOR END OF RESULTS =    4.00


============================================================================
                     UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
```



| NUMBER | MEAN VALUES | ORDINATES(CFS) |
|---|---|---|
| 1 | 2.924 | 175.148 |
| 2 | 12.146 | 552.486 |
| 3 | 29.454 | 1036.871 |
| 4 | 44.100 | 877.392 |
| 5 | 53.041 | 535.663 |
| 6 | 58.742 | 341.507 |
| 7 | 63.350 | 276.086 |
| 8 | 67.093 | 224.245 |
| 9 | 70.292 | 191.604 |
| 10 | 73.081 | 167.134 |
| 11 | 75.391 | 138.349 |
| 12 | 77.479 | 125.121 |
| 13 | 79.312 | 109.764 |
| 14 | 80.992 | 100.669 |
| 15 | 82.506 | 90.670 |
| 16 | 83.816 | 78.511 |
| 17 | 84.952 | 68.023 |
| 18 | 86.022 | 64.151 |
| 19 | 86.997 | 58.399 |
| 20 | 87.948 | 56.948 |
| 21 | 88.823 | 52.422 |
| 22 | 89.682 | 51.472 |
| 23 | 90.480 | 47.796 |
| 24 | 91.240 | 45.524 |
| 25 | 91.984 | 44.569 |
| 26 | 92.632 | 38.860 |
| 27 | 93.265 | 37.886 |
| 28 | 93.889 | 37.399 |
| 29 | 94.407 | 31.011 |
| 30 | 94.892 | 29.063 |
| 31 | 95.377 | 29.083 |
| 32 | 95.860 | 28.892 |
| 33 | 96.253 | 23.564 |
| 34 | 96.605 | 21.120 |
| 35 | 96.958 | 21.139 |
| 36 | 97.311 | 21.120 |
| 37 | 97.663 | 21.120 |
| 38 | 97.978 | 18.847 |
| 39 | 98.101 | 7.352 |
| 40 | 98.197 | 5.767 |
| 41 | 98.293 | 5.767 |
| 42 | 98.389 | 5.748 |
| 43 | 98.485 | 5.767 |
| 44 | 98.582 | 5.767 |
| 45 | 98.678 | 5.748 |
| 46 | 98.774 | 5.786 |
| 47 | 98.870 | 5.748 |
| 48 | 98.967 | 5.786 |
| 49 | 99.063 | 5.748 |
| 50 | 99.159 | 5.748 |
| 51 | 99.255 | 5.748 |
| 52 | 99.351 | 5.748 |
| 53 | 99.447 | 5.748 |
| 54 | 99.542 | 5.748 |
| 55 | 99.638 | 5.748 |
| 56 | 99.734 | 5.748 |
| 57 | 99.830 | 5.748 |
| 58 | 99.926 | 5.748 |
| 59 | 100.000 | 4.418 |

TOTAL STORM RAINFALL(INCHES) = 1.74
TOTAL SOIL-LOSS(INCHES) = 0.78
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.95

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 32.3858
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 39.2810

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3 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 100.0 200.0 300.0 400.0 |
|---|---|---|---|
| 1.000 | 1.1611 | 26.88 | .VQ |
| 1.083 | 1.3625 | 29.24 | .VQ |
| 1.167 | 1.6181 | 37.11 | .V Q |
| 1.250 | 1.9482 | 47.93 | .V Q |
| 1.333 | 2.3312 | 55.61 | . V Q |
| 1.417 | 2.7502 | 60.83 | . V Q |
| 1.500 | 3.2111 | 66.93 | . V Q |
| 1.583 | 3.7465 | 77.74 | . V Q |
| 1.667 | 4.3484 | 87.39 | . V Q . |
| 1.750 | 5.0011 | 94.78 | . V Q. |
| 1.833 | 5.7325 | 106.19 | . V Q |
| 1.917 | 6.5629 | 120.58 | . V . Q |
| 2.000 | 7.4522 | 129.12 | . V . Q |
| 2.083 | 8.3669 | 132.82 | . V . Q |
| 2.167 | 9.3357 | 140.67 | . V. Q |
| 2.250 | 10.4336 | 159.41 | . V Q |
| 2.333 | 11.7232 | 187.25 | . .V Q . |
| 2.417 | 13.2238 | 217.89 | . . V .Q |
| 2.500 | 14.9434 | 249.68 | . . V . Q |
| 2.583 | 17.0818 | 310.49 | . . V . .Q |
| 2.667 | 19.6299 | 369.99 | . . V. . Q . |
| 2.750 | 22.3298 | 392.01 | . . . V . Q. |
| 2.833 | 24.7548 | 352.12 | . . . V . Q . |
| 2.917 | 26.6419 | 273.99 | . . . Q . . |
| 3.000 | 28.0912 | 210.44 | . . .Q V . . |
| 3.083 | 29.2738 | 171.71 | . . Q . V. . |
| 3.167 | 30.2619 | 143.47 | . . Q . V . |
| 3.250 | 31.0928 | 120.64 | . . Q . .V . |
| 3.333 | 31.8109 | 104.27 | . Q . . V . |
| 3.417 | 32.4408 | 91.46 | . Q. . . V . |
| 3.500 | 33.0003 | 81.24 | . Q . . . V . |
| 3.583 | 33.5044 | 73.20 | . Q . . . V . |
| 3.667 | 33.9604 | 66.20 | . Q . . . V . |
| 3.750 | 34.3730 | 59.92 | . Q . . . V . |
| 3.833 | 34.7473 | 54.34 | . Q . . . V . |
| 3.917 | 35.0886 | 49.55 | . Q . . . V . |
| 4.000 | 35.4059 | 46.08 | . Q . . . V . |

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FLOW PROCESS FROM NODE 109.00 TO NODE 122.00 IS CODE = 4

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>>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<

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MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO

(0.938)(DIAMETER):

PIPELENGTH(FT) = 1300.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 955.00
DOWNSTREAM ELEVATION(FT) = 883.50
PIPE DIAMETER(FT) = 11.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

| TIME (HRS) | INFLOW (CFS) | VELOCITY (FPS) | OUTFLOW (CFS) | UPSTREAM PONDING(AF) |
|---|---|---|---|---|
| 1.000 | 26.88 | 2.94 | 31.94 | 0.000 |
| 1.083 | 29.24 | 3.20 | 26.05 | 0.000 |
| 1.167 | 37.11 | 4.06 | 31.61 | 0.000 |
| 1.250 | 47.93 | 5.25 | 53.30 | 0.000 |
| 1.333 | 55.61 | 6.09 | 58.10 | 0.000 |
| 1.417 | 60.83 | 6.66 | 60.83 | 0.000 |
| 1.500 | 66.93 | 7.32 | 66.93 | 0.000 |
| 1.583 | 77.74 | 8.51 | 77.74 | 0.000 |
| 1.667 | 87.39 | 9.56 | 87.39 | 0.000 |
| 1.750 | 94.78 | 10.37 | 94.78 | 0.000 |
| 1.833 | 106.19 | 11.62 | 106.19 | 0.000 |
| 1.917 | 120.58 | 13.20 | 120.58 | 0.000 |
| 2.000 | 129.12 | 14.13 | 129.12 | 0.000 |
| 2.083 | 132.82 | 14.54 | 132.82 | 0.000 |
| 2.167 | 140.67 | 15.39 | 140.67 | 0.000 |
| 2.250 | 159.41 | 17.44 | 159.41 | 0.000 |
| 2.333 | 187.25 | 20.49 | 187.25 | 0.000 |
| 2.417 | 217.89 | 23.84 | 217.89 | 0.000 |
| 2.500 | 249.68 | 27.32 | 249.68 | 0.000 |
| 2.583 | 310.49 | 28.76 | 303.31 | 0.000 |
| 2.667 | 369.99 | 30.14 | 363.57 | 0.000 |
| 2.750 | 392.01 | 30.65 | 389.78 | 0.000 |
| 2.833 | 352.12 | 29.73 | 356.22 | 0.000 |
| 2.917 | 273.99 | 27.92 | 282.80 | 0.000 |
| 3.000 | 210.44 | 23.03 | 213.38 | 0.000 |
| 3.083 | 171.71 | 18.79 | 171.71 | 0.000 |
| 3.167 | 143.47 | 15.70 | 143.47 | 0.000 |
| 3.250 | 120.64 | 13.20 | 120.64 | 0.000 |
| 3.333 | 104.27 | 11.41 | 104.27 | 0.000 |
| 3.417 | 91.46 | 10.01 | 91.46 | 0.000 |
| 3.500 | 81.24 | 8.89 | 81.24 | 0.000 |
| 3.583 | 73.20 | 8.01 | 73.20 | 0.000 |
| 3.667 | 66.20 | 7.24 | 66.20 | 0.000 |
| 3.750 | 59.92 | 6.56 | 59.92 | 0.000 |
| 3.833 | 54.34 | 5.95 | 54.34 | 0.000 |
| 3.917 | 49.55 | 5.42 | 49.55 | 0.000 |
| 4.000 | 46.08 | 5.04 | 46.08 | 0.000 |

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FLOW PROCESS FROM NODE 111.00 TO NODE 118.00 IS CODE = 1
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>>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
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(UNIT-HYDROGRAPH ADDED TO STREAM #2)

WATERSHED AREA = 186.420 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
*USER ENTERED "LAG" TIME = 0.442 HOURS



CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
MOUNTAIN S-GRAPH SELECTED
UNIFORM MEAN SOIL-LOSS(INCH/HOUR) = 0.216
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
USER-ENTERED RAINFALL = 1.74 INCHES
RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9993

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 18.854

RUNOFF HYDROGRAPH LISTING LIMITS:
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 1.00
MODEL TIME(HOURS) FOR END OF RESULTS = 4.00

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UNIT HYDROGRAPH DETERMINATION

| INTERVAL NUMBER | "S" GRAPH MEAN VALUES | UNIT HYDROGRAPH ORDINATES(CFS) |
|---|---|---|
| 1 | 2.132 | 48.056 |
| 2 | 8.058 | 133.607 |
| 3 | 18.412 | 233.433 |
| 4 | 33.174 | 332.811 |
| 5 | 43.742 | 238.273 |
| 6 | 51.110 | 166.105 |
| 7 | 56.137 | 113.344 |
| 8 | 60.081 | 88.899 |
| 9 | 63.523 | 77.610 |
| 10 | 66.421 | 65.344 |
| 11 | 68.994 | 58.012 |
| 12 | 71.340 | 52.885 |
| 13 | 73.365 | 45.645 |
| 14 | 75.139 | 39.989 |
| 15 | 76.782 | 37.042 |
| 16 | 78.294 | 34.094 |
| 17 | 79.646 | 30.495 |
| 18 | 80.929 | 28.922 |
| 19 | 82.136 | 27.211 |
| 20 | 83.170 | 23.309 |
| 21 | 84.147 | 22.015 |
| 22 | 84.993 | 19.093 |
| 23 | 85.827 | 18.794 |
| 24 | 86.591 | 17.215 |
| 25 | 87.330 | 16.669 |
| 26 | 88.056 | 16.358 |
| 27 | 88.724 | 15.060 |
| 28 | 89.385 | 14.912 |
| 29 | 90.034 | 14.634 |
| 30 | 90.626 | 13.341 |
| 31 | 91.211 | 13.182 |
| 32 | 91.794 | 13.154 |
| 33 | 92.316 | 11.767 |
| 34 | 92.803 | 10.972 |
| 35 | 93.289 | 10.968 |
| 36 | 93.776 | 10.968 |
| 37 | 94.201 | 9.594 |

| | | |
|---|---|---|
| 38 | 94.574 | 8.417 |
| 39 | 94.948 | 8.422 |
| 40 | 95.321 | 8.412 |
| 41 | 95.695 | 8.417 |
| 42 | 96.044 | 7.880 |
| 43 | 96.321 | 6.236 |
| 44 | 96.592 | 6.114 |
| 45 | 96.863 | 6.119 |
| 46 | 97.134 | 6.114 |
| 47 | 97.405 | 6.110 |
| 48 | 97.677 | 6.128 |
| 49 | 97.939 | 5.895 |
| 50 | 98.060 | 2.728 |
| 51 | 98.134 | 1.672 |
| 52 | 98.208 | 1.672 |
| 53 | 98.282 | 1.663 |
| 54 | 98.356 | 1.672 |
| 55 | 98.430 | 1.672 |
| 56 | 98.504 | 1.663 |
| 57 | 98.578 | 1.663 |
| 58 | 98.652 | 1.672 |
| 59 | 98.726 | 1.672 |
| 60 | 98.800 | 1.672 |
| 61 | 98.874 | 1.653 |
| 62 | 98.948 | 1.682 |
| 63 | 99.022 | 1.663 |
| 64 | 99.096 | 1.663 |
| 65 | 99.169 | 1.663 |
| 66 | 99.243 | 1.663 |
| 67 | 99.317 | 1.663 |
| 68 | 99.391 | 1.663 |
| 69 | 99.464 | 1.663 |
| 70 | 99.538 | 1.663 |
| 71 | 99.612 | 1.663 |
| 72 | 99.686 | 1.663 |
| 73 | 99.759 | 1.663 |
| 74 | 99.833 | 1.663 |
| 75 | 99.907 | 1.663 |
| 76 | 99.981 | 1.663 |
| 77 | 100.000 | 0.434 |

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TOTAL STORM RAINFALL(INCHES) = 1.74
TOTAL SOIL-LOSS(INCHES) = 0.64
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.10

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 9.9207
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 17.0815

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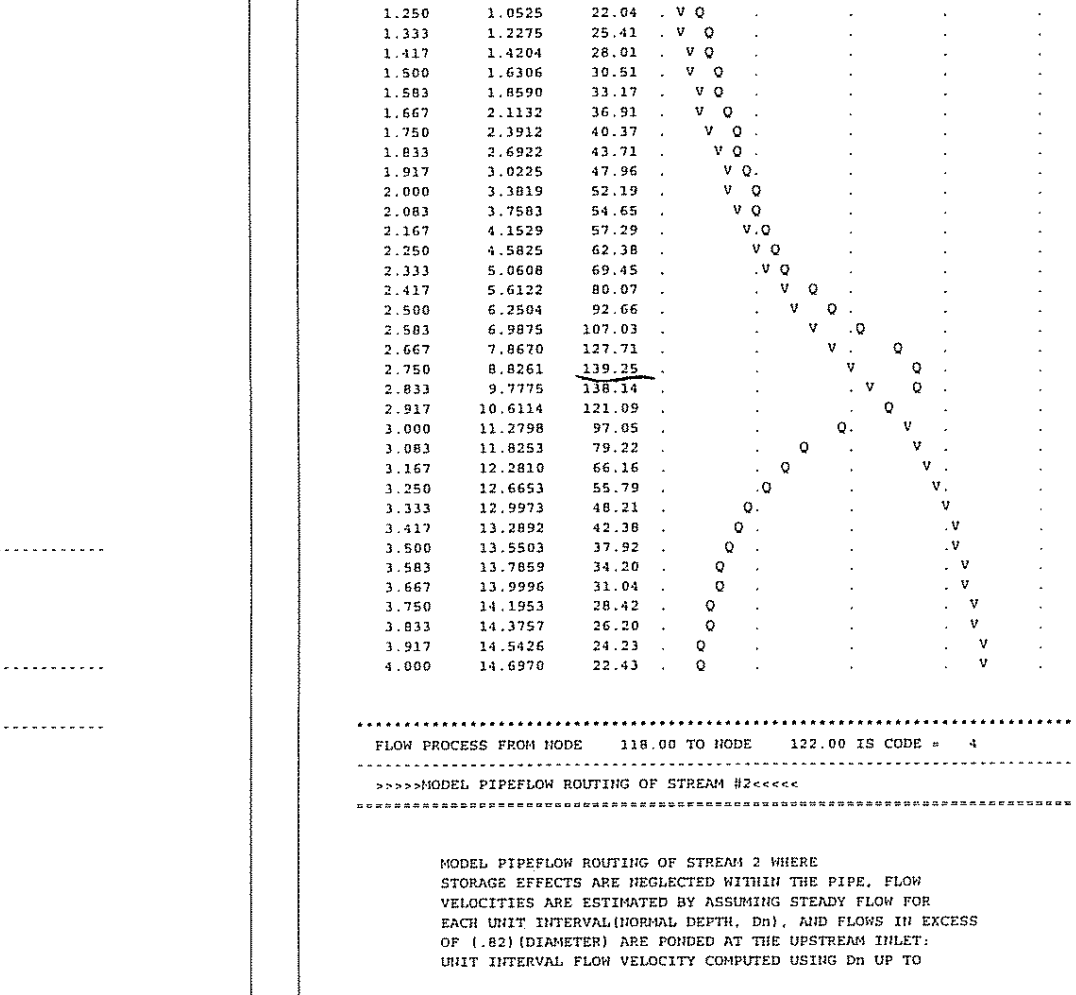
3 - H O U R  S T O R M
R U N O F F  H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) |
|---|---|---|
| 1.000 | 0.6537 | 16.26 |
| 1.083 | 0.7703 | 16.93 |
| 1.167 | 0.9007 | 18.93 |
| 1.250 | 1.0525 | 22.04 |
| 1.333 | 1.2275 | 25.41 |
| 1.417 | 1.4204 | 28.01 |
| 1.500 | 1.6306 | 30.51 |
| 1.583 | 1.8590 | 33.17 |
| 1.667 | 2.1132 | 36.91 |
| 1.750 | 2.3912 | 40.37 |
| 1.833 | 2.6922 | 43.71 |
| 1.917 | 3.0225 | 47.96 |
| 2.000 | 3.3819 | 52.19 |
| 2.083 | 3.7583 | 54.65 |
| 2.167 | 4.1529 | 57.29 |
| 2.250 | 4.5825 | 62.38 |
| 2.333 | 5.0608 | 69.45 |
| 2.417 | 5.6122 | 80.07 |
| 2.500 | 6.2504 | 92.66 |
| 2.583 | 6.9875 | 107.03 |
| 2.667 | 7.8670 | 127.71 |
| 2.750 | 8.8261 | 139.25 |
| 2.833 | 9.7775 | 138.14 |
| 2.917 | 10.6114 | 121.09 |
| 3.000 | 11.2798 | 97.05 |
| 3.083 | 11.8253 | 79.22 |
| 3.167 | 12.2810 | 66.16 |
| 3.250 | 12.6653 | 55.79 |
| 3.333 | 12.9973 | 48.21 |
| 3.417 | 13.2892 | 42.38 |
| 3.500 | 13.5503 | 37.92 |
| 3.583 | 13.7859 | 34.20 |
| 3.667 | 13.9996 | 31.04 |
| 3.750 | 14.1953 | 28.42 |
| 3.833 | 14.3757 | 26.20 |
| 3.917 | 14.5426 | 24.23 |
| 4.000 | 14.6970 | 22.43 |

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FLOW PROCESS FROM NODE 118.00 TO NODE 122.00 IS CODE = 4

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>>>>>MODEL PIPEFLOW ROUTING OF STREAM #2<<<<<

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MODEL PIPEFLOW ROUTING OF STREAM 2 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE. FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO

(0.938)(DIAMETER):

PIPELENGTH(FT) = 20.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 885.00
DOWNSTREAM ELEVATION(FT) = 883.50
PIPE DIAMETER(FT) = 5.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

| TIME (HRS) | INFLOW (CFS) | VELOCITY (FPS) | OUTFLOW (CFS) | UPSTREAM PONDING(AF) |
|---|---|---|---|---|
| 1.000 | 16.26 | 8.61 | 16.26 | 0.000 |
| 1.083 | 16.93 | 8.97 | 16.93 | 0.000 |
| 1.167 | 18.93 | 10.03 | 18.93 | 0.000 |
| 1.250 | 22.04 | 11.67 | 22.04 | 0.000 |
| 1.333 | 25.41 | 13.46 | 25.41 | 0.000 |
| 1.417 | 28.01 | 14.84 | 28.01 | 0.000 |
| 1.500 | 30.51 | 16.16 | 30.51 | 0.000 |
| 1.583 | 33.17 | 17.57 | 33.17 | 0.000 |
| 1.667 | 36.91 | 19.03 | 36.90 | 0.000 |
| 1.750 | 40.37 | 19.42 | 40.36 | 0.000 |
| 1.833 | 43.71 | 19.79 | 43.70 | 0.000 |
| 1.917 | 47.96 | 20.27 | 47.95 | 0.000 |
| 2.000 | 52.19 | 20.74 | 52.18 | 0.000 |
| 2.083 | 54.65 | 21.02 | 54.65 | 0.000 |
| 2.167 | 57.29 | 21.31 | 57.28 | 0.000 |
| 2.250 | 62.38 | 21.88 | 62.37 | 0.000 |
| 2.333 | 69.45 | 22.68 | 69.43 | 0.000 |
| 2.417 | 80.07 | 23.64 | 80.05 | 0.000 |
| 2.500 | 92.66 | 24.73 | 92.64 | 0.000 |
| 2.583 | 107.03 | 25.98 | 107.00 | 0.000 |
| 2.667 | 127.71 | 27.35 | 127.67 | 0.000 |
| 2.750 | 139.25 | 28.11 | 139.23 | 0.000 |
| 2.833 | 138.14 | 28.04 | 138.14 | 0.000 |
| 2.917 | 121.09 | 26.91 | 121.11 | 0.000 |
| 3.000 | 97.05 | 25.11 | 97.09 | 0.000 |
| 3.083 | 79.22 | 23.57 | 79.25 | 0.000 |
| 3.167 | 66.16 | 22.31 | 66.19 | 0.000 |
| 3.250 | 55.79 | 21.15 | 55.81 | 0.000 |
| 3.333 | 48.21 | 20.30 | 48.23 | 0.000 |
| 3.417 | 42.38 | 19.64 | 42.40 | 0.000 |
| 3.500 | 37.92 | 19.14 | 37.93 | 0.000 |
| 3.583 | 34.20 | 18.11 | 34.21 | 0.000 |
| 3.667 | 31.04 | 16.44 | 31.04 | 0.000 |
| 3.750 | 28.42 | 15.05 | 28.42 | 0.000 |
| 3.833 | 26.20 | 13.88 | 26.20 | 0.000 |
| 3.917 | 24.23 | 12.83 | 24.23 | 0.000 |
| 4.000 | 22.43 | 11.88 | 22.43 | 0.000 |
| 4.083 | 20.90 | 11.07 | 20.90 | 0.000 |
| 4.167 | 19.28 | 10.21 | 19.28 | 0.000 |
| 4.250 | 17.95 | 9.51 | 17.95 | 0.000 |
| 4.333 | 16.85 | 8.93 | 16.85 | 0.000 |
| 4.417 | 15.88 | 8.41 | 15.88 | 0.000 |
| 4.500 | 15.09 | 7.99 | 15.09 | 0.000 |
| 4.583 | 14.32 | 7.59 | 14.32 | 0.000 |
| 4.667 | 13.67 | 7.24 | 13.67 | 0.000 |
| 4.750 | 13.07 | 6.92 | 13.07 | 0.000 |
| 4.833 | 12.43 | 6.59 | 12.43 | 0.000 |
| 4.917 | 11.86 | 6.28 | 11.86 | 0.000 |
| 5.000 | 11.33 | 6.00 | 11.33 | 0.000 |



FLOW PROCESS FROM NODE 122.00 TO NODE 122.00 IS CODE = 7

>>>>>STREAM NUMBER 2 ADDED TO STREAM NUMBER 1<<<<<

FLOW PROCESS FROM NODE 122.00 TO NODE 122.00 IS CODE = 6

>>>>>STREAM NUMBER 2 CLEARED AND SET TO ZERO<<<<<

FLOW PROCESS FROM NODE 122.00 TO NODE 122.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 150.0 300.0 450.0 600.0 |
|---|---|---|---|
| 0.083 | 0.0013 | 0.19 | Q . . . . |
| 0.167 | 0.0065 | 0.75 | Q . . . . |
| 0.250 | 0.0187 | 1.77 | Q . . . . |
| 0.333 | 0.0411 | 3.25 | Q . . . . |
| 0.417 | 0.0724 | 4.54 | Q . . . . |
| 0.500 | 0.1144 | 6.10 | Q . . . . |
| 0.583 | 0.1728 | 8.48 | Q . . . . |
| 0.667 | 0.2464 | 10.69 | Q . . . . |
| 0.750 | 0.4014 | 22.51 | VQ . . . . |
| 0.833 | 0.8575 | 66.22 | V Q . . . . |
| 0.917 | 1.2150 | 51.91 | V Q . . . . |
| 1.000 | 1.5470 | 48.21 | .V Q . . . . |
| 1.083 | 1.8430 | 42.98 | .VQ . . . . |
| 1.167 | 2.1911 | 50.54 | .V Q . . . . |
| 1.250 | 2.7100 | 75.34 | .V Q . . . . |
| 1.333 | 3.2851 | 83.51 | . V Q . . . . |
| 1.417 | 3.8970 | 88.85 | . V Q . . . . |
| 1.500 | 4.5681 | 97.44 | . V Q . . . . |
| 1.583 | 5.3319 | 110.90 | . V Q . . . . |
| 1.667 | 6.1879 | 124.30 | . V Q . . . . |
| 1.750 | 7.1186 | 135.14 | . V Q. . . . |
| 1.833 | 8.1509 | 149.89 | . V Q. . . . |
| 1.917 | 9.3116 | 168.53 | . V .Q . . . |
| 2.000 | 10.5602 | 181.30 | . V . Q . . . |
| 2.083 | 11.8513 | 187.47 | . V . Q . . . |
| 2.167 | 13.2147 | 197.95 | . V. Q . . . |
| 2.250 | 14.7421 | 221.78 | . V Q . . . |
| 2.333 | 16.5099 | 256.69 | . .V Q . . . |
| 2.417 | 18.5618 | 297.94 | . . V Q. . . |
| 2.500 | 20.9194 | 342.32 | . . V . Q . . |
| 2.583 | 23.7453 | 410.32 | . . V . Q . . |
| 2.667 | 27.1285 | 491.25 | . . V. . Q . |
| 2.750 | 30.7719 | 529.02 | . . .V . Q . |
| 2.833 | 34.1765 | 494.36 | . . . V . Q . |
| 2.917 | 36.9583 | 403.91 | . . . Q . . |
| 3.000 | 39.0965 | 310.46 | . . Q V . . |
| 3.083 | 40.8249 | 250.97 | . . Q . V . . |
| 3.167 | 42.2688 | 209.66 | . . Q . V. . |

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3.250   43.4841   176.45 .        .Q      .       V       .
3.333   44.5343   152.49 .        Q       .       .V      .
3.417   45.4562   133.86 .       Q .      .       . V     .
3.500   46.2770   119.18 .      Q  .      .       . V     .
3.583   47.0167   107.40 .      Q  .      .       .  V    .
3.667   47.6864    97.24 .     Q   .      .       .  V    .
3.750   48.2948    88.34 .    Q    .      .       .   V   .
3.833   48.8495    80.54 .    Q    .      .       .   V   .
3.917   49.3576    73.78 .   Q     .      .       .    V  .
4.000   49.8294    68.50 .   Q     .      .       .    V  .
4.083   50.2696    63.91 .   Q     .      .       .    V  .
4.167   50.6806    59.68 .  Q      .      .       .    V  .
4.250   51.0769    57.55 .  Q      .      .       .     V .
4.333   51.4431    53.17 .  Q      .      .       .     V .
4.417   51.7818    49.18 .  Q      .      .       .     V .
4.500   52.1033    46.68 .  Q      .      .       .     V .
4.583   52.4029    43.51 . Q       .      .       .      V .
4.667   52.6833    40.71 . Q       .      .       .      V .
4.750   52.9477    38.39 . Q       .      .       .      V .
4.833   53.1945    35.83 . Q       .      .       .      V .
4.917   53.4253    33.51 . Q       .      .       .      V .
5.000   53.6366    30.68 . Q       .      .       .       V .
5.083   53.8361    28.97 .Q        .      .       .       V .
5.167   54.0419    29.80 .Q        .      .       .       V .
5.250   54.2167    25.39 .Q        .      .       .       V .
5.333   54.3778    23.39 .Q        .      .       .       V .
5.417   54.5231    21.10 .Q        .      .       .       V .
5.500   54.6541    19.02 .Q        .      .       .       V .
5.583   54.7867    19.25 .Q        .      .       .       V .
5.667   54.9141    18.50 .Q        .      .       .       V .
5.750   55.0241    15.97 .Q        .      .       .        V.
5.833   55.1078    12.16 Q         .      .       .        V.
5.917   55.2072    14.42 Q         .      .       .        V.
6.000   55.2710     9.26 Q         .      .       .        V.
6.083   55.3398    10.00 Q         .      .       .        V.
6.167   55.3859     6.68 Q         .      .       .        V.
6.250   55.4512     9.49 Q         .      .       .        V.
6.333   55.4841     4.78 Q         .      .       .        V.
6.417   55.5465     9.05 Q         .      .       .        V.
6.500   55.5952     7.07 Q         .      .       .        V.
6.583   55.6404     6.57 Q         .      .       .        V.
6.667   55.6816     5.97 Q         .      .       .        V.
6.750   55.7299     7.02 Q         .      .       .        V.
6.833   55.7704     5.88 Q         .      .       .        V.
6.917   55.8108     5.87 Q         .      .       .        V.
7.000   55.8475     5.32 Q         .      .       .        V.
7.083   55.8877     5.85 Q         .      .       .        V.
7.167   55.9300     6.14 Q         .      .       .        V.
7.250   55.9713     6.00 Q         .      .       .        V.
7.333   56.0113     5.81 Q         .      .       .        V.
7.417   56.0498     5.58 Q         .      .       .        V.
7.500   56.0868     5.38 Q         .      .       .        V.
7.583   56.1224     5.18 Q         .      .       .        V.
7.667   56.1566     4.96 Q         .      .       .        V.
7.750   56.1888     4.68 Q         .      .       .        V.
7.833   56.2185     4.31 Q         .      .       .        V.
7.917   56.2457     3.95 Q         .      .       .        V.
8.000   56.2700     3.52 Q         .      .       .        V.
8.083   56.2898     2.88 Q         .      .       .        V.
8.167   56.3049     2.19 Q         .      .       .        V.
8.250   56.3158     1.59 Q         .      .       .        V.
8.333   56.3245     1.26 Q         .      .       .        V.
8.417   56.3323     1.14 Q         .      .       .        V.
8.500   56.3393     1.01 Q         .      .       .        V.
```



```
8.583   56.3454   0.88 Q         .      .      .        V.
8.667   56.3509   0.80 Q         .      .      .        V.
8.750   56.3555   0.67 Q         .      .      .        V.
8.833   56.3589   0.49 Q         .      .      .        V.
8.917   56.3609   0.30 Q         .      .      .        V.
9.000   56.3618   0.13 Q         .      .      .        V.
9.083   56.3622   0.06 Q         .      .      .        V.
9.167   56.3624   0.03 Q         .      .      .        V.
9.250   56.3625   0.01 Q         .      .      .        V.
9.333   56.3625   0.00 Q         .      .      .         V
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     122.00 TO NODE     123.00 IS CODE =   4
----------------------------------------------------------------------------
  >>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<
============================================================================
```

MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
(0.938)(DIAMETER):

PIPELENGTH(FT) = 150.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 883.50
DOWNSTREAM ELEVATION(FT) = 883.00
PIPE DIAMETER(FT) = 12.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

| TIME (HRS) | INFLOW (CFS) | VELOCITY (FPS) | OUTFLOW (CFS) | UPSTREAM PONDING(AF) |
|---|---|---|---|---|
| 1.000 | 48.21 | 4.43 | 48.21 | 0.000 |
| 1.083 | 42.98 | 3.95 | 42.98 | 0.000 |
| 1.167 | 50.54 | 4.65 | 50.54 | 0.000 |
| 1.250 | 75.34 | 6.93 | 75.34 | 0.000 |
| 1.333 | 83.51 | 7.25 | 83.19 | 0.000 |
| 1.417 | 88.85 | 7.36 | 88.57 | 0.000 |
| 1.500 | 97.44 | 7.52 | 97.01 | 0.000 |
| 1.583 | 110.90 | 7.79 | 110.26 | 0.000 |
| 1.667 | 124.30 | 8.05 | 123.69 | 0.000 |
| 1.750 | 135.14 | 8.26 | 134.68 | 0.000 |
| 1.833 | 149.89 | 8.54 | 149.30 | 0.000 |
| 1.917 | 168.53 | 8.85 | 167.78 | 0.000 |
| 2.000 | 181.30 | 9.04 | 180.80 | 0.000 |
| 2.083 | 187.47 | 9.13 | 187.23 | 0.000 |
| 2.167 | 197.95 | 9.29 | 197.56 | 0.000 |
| 2.250 | 221.78 | 9.65 | 220.94 | 0.000 |
| 2.333 | 256.69 | 10.09 | 255.46 | 0.000 |
| 2.417 | 297.94 | 10.56 | 296.55 | 0.000 |
| 2.500 | 342.32 | 11.00 | 340.87 | 0.000 |
| 2.583 | 410.32 | 11.61 | 408.21 | 0.000 |
| 2.667 | 491.25 | 12.23 | 488.83 | 0.000 |
| 2.750 | 529.02 | 12.44 | 527.84 | 0.000 |
| 2.833 | 494.36 | 12.24 | 495.44 | 0.000 |
| 2.917 | 403.91 | 11.56 | 406.62 | 0.000 |
| 3.000 | 310.46 | 10.71 | 313.44 | 0.000 |

| | | | | |
|---|---|---|---|---|
| 3.083 | 250.97 | 10.02 | 252.95 | 0.000 |
| 3.167 | 209.66 | 9.47 | 211.11 | 0.000 |
| 3.250 | 176.45 | 8.97 | 177.69 | 0.000 |
| 3.333 | 152.49 | 8.60 | 153.46 | 0.000 |
| 3.417 | 133.86 | 8.23 | 134.60 | 0.000 |
| 3.500 | 119.18 | 7.95 | 119.81 | 0.000 |
| 3.583 | 107.40 | 7.72 | 107.94 | 0.000 |
| 3.667 | 97.24 | 7.52 | 97.73 | 0.000 |
| 3.750 | 88.34 | 7.35 | 88.79 | 0.000 |
| 3.833 | 80.54 | 7.20 | 80.95 | 0.000 |
| 3.917 | 73.78 | 6.78 | 73.94 | 0.000 |
| 4.000 | 68.50 | 6.30 | 68.50 | 0.000 |
| 4.083 | 63.91 | 5.88 | 63.91 | 0.000 |
| 4.167 | 59.68 | 5.49 | 59.68 | 0.000 |
| 4.250 | 57.55 | 5.29 | 57.55 | 0.000 |
| 4.333 | 53.17 | 4.89 | 53.17 | 0.000 |
| 4.417 | 49.18 | 4.52 | 49.18 | 0.000 |
| 4.500 | 46.68 | 4.29 | 46.68 | 0.000 |
| 4.583 | 43.51 | 4.00 | 43.51 | 0.000 |
| 4.667 | 40.71 | 3.74 | 40.71 | 0.000 |
| 4.750 | 38.39 | 3.53 | 38.39 | 0.000 |
| 4.833 | 35.83 | 3.29 | 35.83 | 0.000 |
| 4.917 | 33.51 | 3.08 | 33.51 | 0.000 |
| 5.000 | 30.68 | 2.82 | 30.68 | 0.000 |

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**********************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE    123.00 IS CODE =   1
----------------------------------------------------------------------
 >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
======================================================================

     (UNIT-HYDROGRAPH ADDED TO STREAM #3)

        WATERSHED AREA =       27.000 ACRES
        BASEFLOW =    0.000 CFS/SQUARE-MILE
        *USER ENTERED "LAG" TIME =     0.150 HOURS
         CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
         THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
         MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
        MOUNTAIN S-GRAPH SELECTED
        UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.273
        LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
        USER-ENTERED RAINFALL =  1.74 INCHES
        RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
        RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999


        UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
        UNIT INTERVAL PERCENTAGE OF LAG-TIME =  55.556


======================================================================
                    UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------
        1                9.253                30.213
        2               41.956               106.786
        3               59.426                57.047
        4               68.455                29.480
```



| | | |
|---|---|---|
| 5 | 74.682 | 20.336 |
| 6 | 79.230 | 14.849 |
| 7 | 82.796 | 11.643 |
| 8 | 85.484 | 8.777 |
| 9 | 87.718 | 7.296 |
| 10 | 89.697 | 6.464 |
| 11 | 91.462 | 5.763 |
| 12 | 92.991 | 4.990 |
| 13 | 94.319 | 4.336 |
| 14 | 95.426 | 3.615 |
| 15 | 96.382 | 3.123 |
| 16 | 97.182 | 2.611 |
| 17 | 97.915 | 2.395 |
| 18 | 98.233 | 0.973 |
| 19 | 98.433 | 0.713 |
| 20 | 98.649 | 0.712 |
| 21 | 98.867 | 0.712 |
| 22 | 99.086 | 0.713 |
| 23 | 99.303 | 0.712 |
| 24 | 99.521 | 0.712 |
| 25 | 99.739 | 0.712 |
| 26 | 99.957 | 0.712 |
| 27 | 100.000 | 0.139 |

| UNIT PERIOD (NUMBER) | UNIT RAINFALL (INCHES) | UNIT SOIL-LOSS (INCHES) | EFFECTIVE RAINFALL (INCHES) |
|---|---|---|---|
| 1 | 0.0226 | 0.0204 | 0.0023 |
| 2 | 0.0226 | 0.0204 | 0.0023 |
| 3 | 0.0191 | 0.0172 | 0.0019 |
| 4 | 0.0261 | 0.0227 | 0.0033 |
| 5 | 0.0261 | 0.0227 | 0.0033 |
| 6 | 0.0313 | 0.0227 | 0.0086 |
| 7 | 0.0261 | 0.0227 | 0.0033 |
| 8 | 0.0313 | 0.0227 | 0.0086 |
| 9 | 0.0313 | 0.0227 | 0.0086 |
| 10 | 0.0261 | 0.0227 | 0.0033 |
| 11 | 0.0278 | 0.0227 | 0.0051 |
| 12 | 0.0313 | 0.0227 | 0.0086 |
| 13 | 0.0383 | 0.0227 | 0.0155 |
| 14 | 0.0383 | 0.0227 | 0.0155 |
| 15 | 0.0383 | 0.0227 | 0.0155 |
| 16 | 0.0348 | 0.0227 | 0.0120 |
| 17 | 0.0452 | 0.0227 | 0.0225 |
| 18 | 0.0470 | 0.0227 | 0.0242 |
| 19 | 0.0418 | 0.0227 | 0.0190 |
| 20 | 0.0470 | 0.0227 | 0.0242 |
| 21 | 0.0574 | 0.0227 | 0.0347 |
| 22 | 0.0539 | 0.0227 | 0.0312 |
| 23 | 0.0505 | 0.0227 | 0.0277 |
| 24 | 0.0522 | 0.0227 | 0.0294 |
| 25 | 0.0539 | 0.0227 | 0.0312 |
| 26 | 0.0731 | 0.0227 | 0.0503 |
| 27 | 0.0870 | 0.0227 | 0.0642 |
| 28 | 0.0609 | 0.0227 | 0.0381 |
| 29 | 0.1183 | 0.0227 | 0.0956 |
| 30 | 0.1270 | 0.0227 | 0.1043 |
| 31 | 0.1427 | 0.0227 | 0.1199 |
| 32 | 0.1026 | 0.0227 | 0.0799 |
| 33 | 0.0348 | 0.0227 | 0.0120 |
| 34 | 0.0313 | 0.0227 | 0.0086 |
| 35 | 0.0313 | 0.0227 | 0.0086 |
| 36 | 0.0104 | 0.0094 | 0.0010 |

TOTAL STORM RAINFALL(INCHES) = 1.74
TOTAL SOIL-LOSS(INCHES) = 0.80
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.94

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.7895
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.1240



3 - H O U R  S T O R M
R U N O F F  H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 7.5 15.0 22.5 30.0 |
|---|---|---|---|
| 0.083 | 0.0005 | 0.07 | Q |
| 0.167 | 0.0026 | 0.31 | Q |
| 0.250 | 0.0056 | 0.43 | Q |
| 0.333 | 0.0090 | 0.50 | Q |
| 0.417 | 0.0137 | 0.68 | Q |
| 0.500 | 0.0202 | 0.94 | VQ |
| 0.583 | 0.0299 | 1.40 | VQ |
| 0.667 | 0.0391 | 1.35 | VQ |
| 0.750 | 0.0515 | 1.79 | V Q |
| 0.833 | 0.0647 | 1.91 | .VQ |
| 0.917 | 0.0754 | 1.56 | .VQ |
| 1.000 | 0.0868 | 1.66 | .VQ |
| 1.083 | 0.1024 | 2.27 | .V Q |
| 1.167 | 0.1246 | 3.22 | . V Q |
| 1.250 | 0.1503 | 3.73 | . V Q |
| 1.333 | 0.1773 | 3.91 | . V Q |
| 1.417 | 0.2053 | 4.06 | . V Q |
| 1.500 | 0.2410 | 5.19 | . V Q |
| 1.583 | 0.2811 | 5.83 | . V Q |
| 1.667 | 0.3214 | 5.85 | . VQ |
| 1.750 | 0.3677 | 6.72 | . V Q |
| 1.833 | 0.4234 | 8.09 | . V Q |
| 1.917 | 0.4814 | 8.43 | . V.Q |
| 2.000 | 0.5392 | 8.39 | . VQ |
| 2.083 | 0.5989 | 8.66 | .Q |
| 2.167 | 0.6651 | 9.62 | . Q |
| 2.250 | 0.7500 | 12.33 | . V Q |
| 2.333 | 0.8484 | 14.28 | . V Q. |
| 2.417 | 0.9498 | 14.72 | . V Q. |
| 2.500 | 1.0912 | 20.53 | . V Q |
| 2.583 | 1.2641 | 25.10 | . V Q |
| 2.667 | 1.4550 | 27.72 | . V . Q |
| 2.750 | 1.6184 | 23.73 | . VQ |
| 2.833 | 1.7257 | 15.59 | . Q . V |
| 2.917 | 1.8037 | 11.32 | . Q . V |
| 3.000 | 1.8654 | 8.96 | .Q . V |
| 3.083 | 1.9121 | 6.77 | . Q. . V |
| 3.167 | 1.9484 | 5.28 | . Q . . V |
| 3.250 | 1.9781 | 4.32 | . Q . . V |
| 3.333 | 2.0033 | 3.66 | . Q . . V |
| 3.417 | 2.0249 | 3.14 | . Q . . V |
| 3.500 | 2.0433 | 2.68 | . Q . . V |
| 3.583 | 2.0588 | 2.25 | . Q . . V |
| 3.667 | 2.0717 | 1.86 | . Q . . V. |
| 3.750 | 2.0824 | 1.56 | . Q . . V. |
| 3.833 | 2.0911 | 1.26 | .Q . . V. |
| 3.917 | 2.0978 | 0.97 | .Q . . V. |
| 4.000 | 2.1028 | 0.72 | Q . . V. |
| 4.083 | 2.1065 | 0.54 | Q . . V. |
| 4.167 | 2.1098 | 0.48 | Q . . V. |
| 4.250 | 2.1128 | 0.44 | Q . . V. |
| 4.333 | 2.1155 | 0.39 | Q . . V. |

| | | | |
|---|---|---|---|
| 4.417 | 2.1178 | 0.34 | Q |
| 4.500 | 2.1200 | 0.31 | Q |
| 4.583 | 2.1217 | 0.25 | Q |
| 4.667 | 2.1229 | 0.18 | Q |
| 4.750 | 2.1236 | 0.10 | Q |
| 4.833 | 2.1238 | 0.03 | Q |
| 4.917 | 2.1239 | 0.01 | Q |
| 5.000 | 2.1240 | 0.01 | Q |

FLOW PROCESS FROM NODE 123.00 TO NODE 123.00 IS CODE = 7

>>>>>STREAM NUMBER 3 ADDED TO STREAM NUMBER 1<<<<<

FLOW PROCESS FROM NODE 123.00 TO NODE 123.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) |
|---|---|---|
| 1.000 | 1.5964 | 49.87 |
| 1.083 | 1.9080 | 45.25 |
| 1.167 | 2.2783 | 53.76 |
| 1.250 | 2.8228 | 79.07 |
| 1.333 | 3.4227 | 87.11 |
| 1.417 | 4.0607 | 92.63 |
| 1.500 | 4.7645 | 102.19 |
| 1.583 | 5.5640 | 116.08 |
| 1.667 | 6.4562 | 129.55 |
| 1.750 | 7.4300 | 141.40 |
| 1.833 | 8.5139 | 157.39 |
| 1.917 | 9.7275 | 176.21 |
| 2.000 | 11.0304 | 189.18 |
| 2.083 | 12.3795 | 195.90 |
| 2.167 | 13.8064 | 207.18 |
| 2.250 | 15.4129 | 233.27 |
| 2.333 | 17.2706 | 269.74 |
| 2.417 | 19.4144 | 311.28 |
| 2.500 | 21.9034 | 361.40 |
| 2.583 | 24.8876 | 433.31 |
| 2.667 | 28.4451 | 516.55 |
| 2.750 | 32.2438 | 551.57 |
| 2.833 | 35.7632 | 511.02 |
| 2.917 | 38.6416 | 417.94 |
| 3.000 | 40.8620 | 322.41 |
| 3.083 | 42.6507 | 259.72 |
| 3.167 | 44.1410 | 216.38 |
| 3.250 | 45.3945 | 182.01 |
| 3.333 | 46.4765 | 157.12 |
| 3.417 | 47.4251 | 137.74 |
| 3.500 | 48.2687 | 122.48 |
| 3.583 | 49.0276 | 110.20 |
| 3.667 | 49.7135 | 99.59 |
| 3.750 | 50.3358 | 90.36 |
| 3.833 | 50.9020 | 82.21 |
| 3.917 | 51.4179 | 74.91 |



| | | | |
|---|---|---|---|
| 4.000 | 51.8947 | 69.22 | Q |
| 4.083 | 52.3386 | 64.46 | Q |
| 4.167 | 52.7529 | 60.16 | Q |
| 4.250 | 53.1522 | 57.98 | Q |
| 4.333 | 53.5211 | 53.56 | Q |
| 4.417 | 53.8622 | 49.52 | Q |
| 4.500 | 54.1858 | 46.99 | Q |
| 4.583 | 54.4872 | 43.76 | Q |
| 4.667 | 54.7688 | 40.89 | Q |
| 4.750 | 55.0339 | 38.49 | Q |
| 4.833 | 55.2808 | 35.86 | Q |
| 4.917 | 55.5118 | 33.53 | Q |
| 5.000 | 55.7231 | 30.69 | Q |

FLOW PROCESS FROM NODE 123.00 TO NODE 133.00 IS CODE = 4

>>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<

MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
(0.938)(DIAMETER):

PIPELENGTH(FT) = 1400.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 883.00
DOWNSTREAM ELEVATION(FT) = 820.00
PIPE DIAMETER(FT) = 12.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

| TIME (HRS) | INFLOW (CFS) | VELOCITY (FPS) | OUTFLOW (CFS) | UPSTREAM PONDING(AF) |
|---|---|---|---|---|
| 1.000 | 49.87 | 4.59 | 71.84 | 0.000 |
| 1.083 | 45.25 | 4.16 | 54.82 | 0.000 |
| 1.167 | 53.76 | 4.94 | 51.64 | 0.000 |
| 1.250 | 79.07 | 7.27 | 87.42 | 0.000 |
| 1.333 | 87.11 | 8.01 | 87.11 | 0.000 |
| 1.417 | 92.63 | 8.52 | 92.63 | 0.000 |
| 1.500 | 102.19 | 9.40 | 102.19 | 0.000 |
| 1.583 | 116.08 | 10.67 | 116.08 | 0.000 |
| 1.667 | 129.55 | 11.91 | 129.55 | 0.000 |
| 1.750 | 141.40 | 13.00 | 141.40 | 0.000 |
| 1.833 | 157.39 | 14.47 | 157.39 | 0.000 |
| 1.917 | 176.21 | 16.20 | 176.21 | 0.000 |
| 2.000 | 189.18 | 17.40 | 189.18 | 0.000 |
| 2.083 | 195.90 | 18.01 | 195.90 | 0.000 |
| 2.167 | 207.18 | 19.05 | 207.18 | 0.000 |
| 2.250 | 233.27 | 21.45 | 233.27 | 0.000 |
| 2.333 | 269.74 | 24.80 | 269.74 | 0.000 |
| 2.417 | 311.28 | 26.74 | 307.70 | 0.000 |
| 2.500 | 361.40 | 27.71 | 354.87 | 0.000 |
| 2.583 | 433.31 | 29.11 | 424.70 | 0.000 |
| 2.667 | 516.55 | 30.73 | 507.57 | 0.000 |
| 2.750 | 551.57 | 31.41 | 548.07 | 0.000 |

| | | | | |
|---|---|---|---|---|
| 2.833 | 511.02 | 30.62 | 515.09 | 0.000 |
| 2.917 | 417.94 | 28.81 | 428.12 | 0.000 |
| 3.000 | 322.41 | 26.95 | 334.28 | 0.000 |
| 3.083 | 259.72 | 23.88 | 264.79 | 0.000 |
| 3.167 | 216.38 | 19.90 | 216.38 | 0.000 |
| 3.250 | 182.01 | 16.74 | 182.01 | 0.000 |
| 3.333 | 157.12 | 14.45 | 157.12 | 0.000 |
| 3.417 | 137.74 | 12.67 | 137.74 | 0.000 |
| 3.500 | 122.48 | 11.26 | 122.48 | 0.000 |
| 3.583 | 110.20 | 10.13 | 110.20 | 0.000 |
| 3.667 | 99.59 | 9.16 | 99.59 | 0.000 |
| 3.750 | 90.36 | 8.31 | 90.36 | 0.000 |
| 3.833 | 82.21 | 7.56 | 82.21 | 0.000 |
| 3.917 | 74.91 | 6.89 | 74.91 | 0.000 |
| 4.000 | 69.22 | 6.37 | 69.22 | 0.000 |
| 4.083 | 64.46 | 5.93 | 64.46 | 0.000 |
| 4.167 | 60.16 | 5.53 | 60.16 | 0.000 |
| 4.250 | 57.98 | 5.33 | 57.98 | 0.000 |
| 4.333 | 53.56 | 4.93 | 53.56 | 0.000 |
| 4.417 | 49.52 | 4.55 | 50.75 | 0.000 |
| 4.500 | 46.99 | 4.32 | 48.30 | 0.000 |
| 4.583 | 43.76 | 4.02 | 44.46 | 0.000 |
| 4.667 | 40.89 | 3.76 | 40.52 | 0.000 |
| 4.750 | 38.49 | 3.54 | 38.02 | 0.000 |
| 4.833 | 35.86 | 3.30 | 36.09 | 0.000 |
| 4.917 | 33.53 | 3.08 | 33.23 | 0.000 |
| 5.000 | 30.69 | 2.82 | 31.20 | 0.000 |

```
****************************************************************************
 FLOW PROCESS FROM NODE    130.00 TO NODE    133.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

     (UNIT-HYDROGRAPH ADDED TO STREAM #4)

        WATERSHED AREA =       48.530 ACRES
        BASEFLOW =    0.000 CFS/SQUARE-MILE
        *USER ENTERED "LAG" TIME =     0.210 HOURS
         CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
         THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
         MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
        MOUNTAIN S-GRAPH SELECTED
        UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.207
        LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
        USER-ENTERED RAINFALL =  1.74 INCHES
        RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
        RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9998


        UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
        UNIT INTERVAL PERCENTAGE OF LAG-TIME =  39.683


        RUNOFF HYDROGRAPH LISTING LIMITS:
        MODEL TIME(HOURS) FOR BEGINNING OF RESULTS =   1.00
        MODEL TIME(HOURS) FOR END OF RESULTS =   4.00


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
```



| INTERVAL NUMBER | "S" GRAPH MEAN VALUES | UNIT HYDROGRAPH ORDINATES(CFS) |
|---|---|---|
| 1 | 5.478 | 32.149 |
| 2 | 27.878 | 131.471 |
| 3 | 49.210 | 125.199 |
| 4 | 59.535 | 60.599 |
| 5 | 66.300 | 39.701 |
| 6 | 71.450 | 30.229 |
| 7 | 75.429 | 23.352 |
| 8 | 78.671 | 19.030 |
| 9 | 81.400 | 16.018 |
| 10 | 83.652 | 13.213 |
| 11 | 85.492 | 10.798 |
| 12 | 87.112 | 9.509 |
| 13 | 88.597 | 8.718 |
| 14 | 89.970 | 8.059 |
| 15 | 91.222 | 7.344 |
| 16 | 92.375 | 6.766 |
| 17 | 93.400 | 6.021 |
| 18 | 94.325 | 5.426 |
| 19 | 95.111 | 4.617 |
| 20 | 95.883 | 4.525 |
| 21 | 96.496 | 3.602 |
| 22 | 97.067 | 3.351 |
| 23 | 97.638 | 3.351 |
| 24 | 98.053 | 2.437 |
| 25 | 98.213 | 0.936 |
| 26 | 98.369 | 0.914 |
| 27 | 98.524 | 0.914 |
| 28 | 98.680 | 0.915 |
| 29 | 98.836 | 0.915 |
| 30 | 98.992 | 0.914 |
| 31 | 99.148 | 0.914 |
| 32 | 99.303 | 0.914 |
| 33 | 99.459 | 0.914 |
| 34 | 99.615 | 0.914 |
| 35 | 99.771 | 0.914 |
| 36 | 99.926 | 0.914 |
| 37 | 100.000 | 0.433 |

```
----------------------------------------------------------------------------

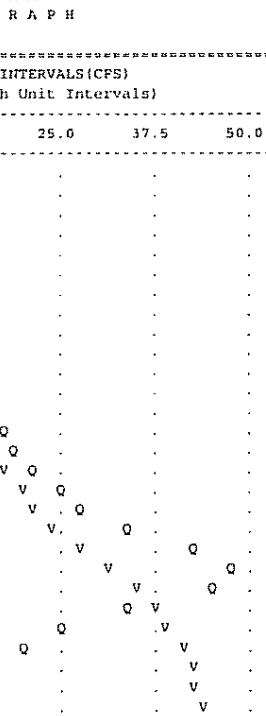
        TOTAL STORM RAINFALL(INCHES) =  1.74
        TOTAL SOIL-LOSS(INCHES) =  0.61
        TOTAL EFFECTIVE RAINFALL(INCHES) =  1.13

----------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =        2.4795
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =        4.5536
----------------------------------------------------------------------------
```

3 - H O U R  S T O R M
R U N O F F  H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) |
|---|---|---|
| 1.000 | 0.2737 | 5.40 |
| 1.083 | 0.3166 | 6.22 |
| 1.167 | 0.3693 | 7.66 |
| 1.250 | 0.4300 | 8.81 |
| 1.333 | 0.4943 | 9.33 |
| 1.417 | 0.5608 | 9.66 |
| 1.500 | 0.6366 | 11.00 |
| 1.583 | 0.7223 | 12.44 |
| 1.667 | 0.8110 | 12.88 |
| 1.750 | 0.9065 | 13.87 |
| 1.833 | 1.0163 | 15.94 |
| 1.917 | 1.1345 | 17.17 |
| 2.000 | 1.2538 | 17.32 |
| 2.083 | 1.3756 | 17.68 |
| 2.167 | 1.5061 | 18.96 |
| 2.250 | 1.6608 | 22.46 |
| 2.333 | 1.8413 | 26.21 |
| 2.417 | 2.0330 | 27.83 |
| 2.500 | 2.2688 | 34.24 |
| 2.583 | 2.5639 | 42.84 |
| 2.667 | 2.8959 | 48.20 |
| 2.750 | 3.2899 | 45.60 |
| 2.833 | 3.4490 | 34.71 |
| 2.917 | 3.6259 | 25.68 |
| 3.000 | 3.7705 | 20.99 |
| 3.083 | 3.8853 | 16.67 |
| 3.167 | 3.9753 | 13.08 |
| 3.250 | 4.0498 | 10.81 |
| 3.333 | 4.1129 | 9.16 |
| 3.417 | 4.1670 | 7.87 |
| 3.500 | 4.2145 | 6.90 |
| 3.583 | 4.2569 | 6.16 |
| 3.667 | 4.2949 | 5.51 |
| 3.750 | 4.3288 | 4.92 |
| 3.833 | 4.3592 | 4.41 |
| 3.917 | 4.3861 | 3.91 |
| 4.000 | 4.4101 | 3.49 |




FLOW PROCESS FROM NODE 133.00 TO NODE 133.00 IS CODE = 7

>>>>>STREAM NUMBER 4 ADDED TO STREAM NUMBER 1<<<<<

FLOW PROCESS FROM NODE 133.00 TO NODE 133.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<



STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) |
|---|---|---|
| 1.000 | 1.4118 | 77.24 |
| 1.083 | 1.8322 | 61.04 |
| 1.167 | 2.2406 | 59.30 |
| 1.250 | 2.9034 | 96.23 |
| 1.333 | 3.5675 | 96.44 |
| 1.417 | 4.2720 | 102.29 |
| 1.500 | 5.0516 | 113.19 |
| 1.583 | 5.9367 | 128.53 |
| 1.667 | 6.9177 | 142.43 |
| 1.750 | 7.9870 | 155.27 |
| 1.833 | 9.1807 | 173.33 |
| 1.917 | 10.5125 | 193.37 |
| 2.000 | 11.9347 | 206.50 |
| 2.083 | 13.4056 | 213.57 |
| 2.167 | 14.9630 | 226.14 |
| 2.250 | 16.7242 | 255.72 |
| 2.333 | 18.7625 | 295.96 |
| 2.417 | 21.0732 | 335.53 |
| 2.500 | 23.7531 | 389.12 |
| 2.583 | 26.9731 | 467.54 |
| 2.667 | 30.8007 | 555.77 |
| 2.750 | 34.8893 | 593.67 |
| 2.833 | 38.6759 | 549.81 |
| 2.917 | 41.8013 | 453.80 |
| 3.000 | 44.2481 | 355.27 |
| 3.083 | 46.1865 | 281.46 |
| 3.167 | 47.7668 | 229.46 |
| 3.250 | 49.0947 | 192.81 |
| 3.333 | 50.2399 | 166.28 |
| 3.417 | 51.2426 | 145.60 |
| 3.500 | 52.1337 | 129.38 |
| 3.583 | 52.9350 | 116.35 |
| 3.667 | 53.6589 | 105.11 |
| 3.750 | 54.3151 | 95.28 |
| 3.833 | 54.9117 | 86.62 |
| 3.917 | 55.4545 | 78.82 |
| 4.000 | 55.9553 | 72.71 |
| 4.083 | 56.4203 | 67.52 |
| 4.167 | 56.8529 | 62.82 |
| 4.250 | 57.2682 | 60.29 |
| 4.333 | 57.6508 | 55.56 |
| 4.417 | 58.0119 | 52.42 |
| 4.500 | 58.3538 | 49.65 |
| 4.583 | 58.6672 | 45.50 |
| 4.667 | 58.9522 | 41.38 |
| 4.750 | 59.2195 | 38.81 |
| 4.833 | 59.4729 | 36.81 |
| 4.917 | 59.7064 | 33.89 |
| 5.000 | 59.9256 | 31.83 |




FLOW PROCESS FROM NODE 133.00 TO NODE 134.00 IS CODE = 4

>>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<

MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE

STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET: UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO (0.938)(DIAMETER):

PIPELENGTH(FT) = 250.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 820.00
DOWNSTREAM ELEVATION(FT) = 815.00
PIPE DIAMETER(FT) = 12.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

| TIME (HRS) | INFLOW (CFS) | VELOCITY (FPS) | OUTFLOW (CFS) | UPSTREAM PONDING(AF) |
|---|---|---|---|---|
| 1.000 | 77.24 | 7.10 | 77.24 | 0.000 |
| 1.083 | 61.04 | 5.61 | 61.04 | 0.000 |
| 1.167 | 59.30 | 5.45 | 59.30 | 0.000 |
| 1.250 | 96.23 | 8.85 | 96.23 | 0.000 |
| 1.333 | 96.44 | 8.87 | 96.44 | 0.000 |
| 1.417 | 102.29 | 9.41 | 102.29 | 0.000 |
| 1.500 | 113.19 | 10.41 | 113.19 | 0.000 |
| 1.583 | 128.53 | 11.82 | 128.53 | 0.000 |
| 1.667 | 142.43 | 13.10 | 142.43 | 0.000 |
| 1.750 | 155.27 | 14.28 | 155.27 | 0.000 |
| 1.833 | 173.33 | 15.94 | 173.33 | 0.000 |
| 1.917 | 193.37 | 17.55 | 193.25 | 0.000 |
| 2.000 | 206.50 | 17.80 | 206.02 | 0.000 |
| 2.083 | 213.57 | 17.94 | 213.32 | 0.000 |
| 2.167 | 226.14 | 18.19 | 225.69 | 0.000 |
| 2.250 | 255.72 | 18.76 | 254.73 | 0.000 |
| 2.333 | 295.96 | 19.54 | 294.70 | 0.000 |
| 2.417 | 335.53 | 20.31 | 334.38 | 0.000 |
| 2.500 | 389.12 | 21.32 | 387.67 | 0.000 |
| 2.583 | 467.54 | 22.50 | 465.44 | 0.000 |
| 2.667 | 555.77 | 23.82 | 553.65 | 0.000 |
| 2.750 | 593.67 | 24.31 | 592.76 | 0.000 |
| 2.833 | 549.81 | 23.73 | 550.85 | 0.000 |
| 2.917 | 453.80 | 22.29 | 456.14 | 0.000 |
| 3.000 | 355.27 | 20.70 | 357.94 | 0.000 |
| 3.083 | 281.46 | 19.26 | 283.59 | 0.000 |
| 3.167 | 229.46 | 18.25 | 231.16 | 0.000 |
| 3.250 | 192.81 | 17.54 | 194.13 | 0.000 |
| 3.333 | 166.28 | 15.29 | 166.38 | 0.000 |
| 3.417 | 145.60 | 13.39 | 145.60 | 0.000 |
| 3.500 | 129.38 | 11.90 | 129.38 | 0.000 |
| 3.583 | 116.35 | 10.70 | 116.35 | 0.000 |
| 3.667 | 105.11 | 9.67 | 105.11 | 0.000 |
| 3.750 | 95.28 | 8.76 | 95.28 | 0.000 |
| 3.833 | 86.62 | 7.96 | 86.62 | 0.000 |
| 3.917 | 78.82 | 7.25 | 78.82 | 0.000 |
| 4.000 | 72.71 | 6.69 | 72.71 | 0.000 |
| 4.083 | 67.52 | 6.21 | 67.52 | 0.000 |
| 4.167 | 62.82 | 5.78 | 62.82 | 0.000 |
| 4.250 | 60.29 | 5.54 | 60.29 | 0.000 |
| 4.333 | 55.56 | 5.11 | 55.56 | 0.000 |
| 4.417 | 52.42 | 4.82 | 52.42 | 0.000 |
| 4.500 | 49.65 | 4.57 | 49.65 | 0.000 |
| 4.583 | 45.50 | 4.18 | 45.50 | 0.000 |
| 4.667 | 41.38 | 3.81 | 41.38 | 0.000 |



| | | | | |
|---|---|---|---|---|
| 4.750 | 38.81 | 3.57 | 38.81 | 0.000 |
| 4.833 | 36.81 | 3.38 | 36.81 | 0.000 |
| 4.917 | 33.89 | 3.12 | 33.89 | 0.000 |
| 5.000 | 31.83 | 2.93 | 31.83 | 0.000 |

FLOW PROCESS FROM NODE 25.00 TO NODE 134.00 IS CODE = 1

>>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

(UNIT-HYDROGRAPH ADDED TO STREAM #5)

WATERSHED AREA = 33.000 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
*USER ENTERED "LAG" TIME = 0.271 HOURS
CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
MOUNTAIN S-GRAPH SELECTED
UNIFORM MEAN SOIL-LOSS(INCH/HOUR) = 0.223
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
USER-ENTERED RAINFALL = 1.74 INCHES
RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 30.750

RUNOFF HYDROGRAPH LISTING LIMITS:
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 1.00
MODEL TIME(HOURS) FOR END OF RESULTS = 4.00

UNIT HYDROGRAPH DETERMINATION

| INTERVAL NUMBER | "S" GRAPH MEAN VALUES | UNIT HYDROGRAPH ORDINATES(CFS) |
|---|---|---|
| 1 | 3.872 | 15.453 |
| 2 | 18.165 | 57.043 |
| 3 | 39.551 | 85.348 |
| 4 | 52.155 | 50.303 |
| 5 | 59.457 | 29.141 |
| 6 | 64.902 | 21.733 |
| 7 | 69.226 | 17.256 |
| 8 | 72.842 | 14.431 |
| 9 | 75.742 | 11.573 |
| 10 | 78.270 | 10.092 |
| 11 | 80.453 | 8.710 |
| 12 | 82.400 | 7.771 |
| 13 | 84.031 | 6.508 |
| 14 | 85.427 | 5.574 |
| 15 | 86.701 | 5.084 |
| 16 | 87.896 | 4.767 |
| 17 | 88.996 | 4.391 |
| 18 | 90.054 | 4.224 |
| 19 | 91.020 | 3.852 |
| 20 | 91.955 | 3.734 |

| | | |
|---|---|---|
| 21 | 92.771 | 3.256 |
| 22 | 93.565 | 3.167 |
| 23 | 94.275 | 2.834 |
| 24 | 94.884 | 2.431 |
| 25 | 95.493 | 2.430 |
| 26 | 96.065 | 2.282 |
| 27 | 96.516 | 1.803 |
| 28 | 96.959 | 1.766 |
| 29 | 97.401 | 1.766 |
| 30 | 97.840 | 1.752 |
| 31 | 98.078 | 0.949 |
| 32 | 98.199 | 0.482 |
| 33 | 98.320 | 0.483 |
| 34 | 98.441 | 0.483 |
| 35 | 98.561 | 0.482 |
| 36 | 98.682 | 0.482 |
| 37 | 98.803 | 0.482 |
| 38 | 98.924 | 0.483 |
| 39 | 99.044 | 0.482 |
| 40 | 99.165 | 0.482 |
| 41 | 99.286 | 0.482 |
| 42 | 99.406 | 0.482 |
| 43 | 99.527 | 0.482 |
| 44 | 99.648 | 0.482 |
| 45 | 99.768 | 0.482 |
| 46 | 99.889 | 0.482 |
| 47 | 100.000 | 0.443 |

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TOTAL STORM RAINFALL(INCHES) = 1.74
TOTAL SOIL-LOSS(INCHES) = 0.66
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.08

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.8107
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.9721

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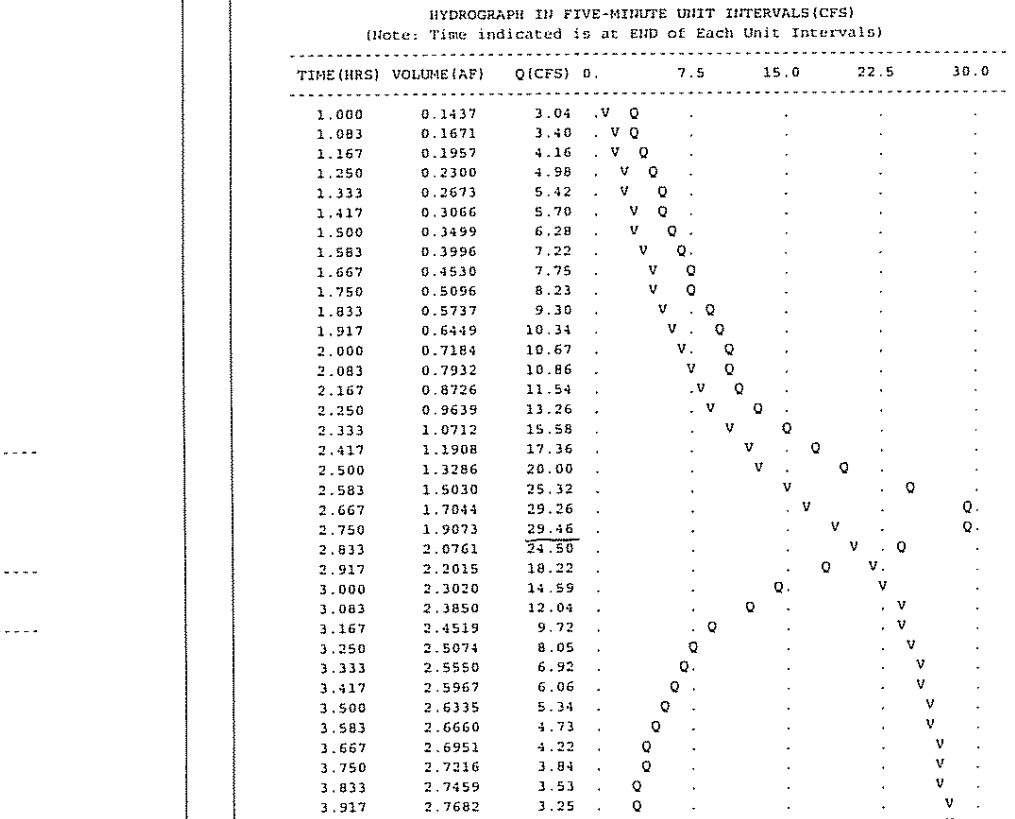
3 - H O U R  S T O R M
R U N O F F  H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) |
|---|---|---|
| 1.000 | 0.1437 | 3.04 |
| 1.083 | 0.1671 | 3.40 |
| 1.167 | 0.1957 | 4.16 |
| 1.250 | 0.2300 | 4.98 |
| 1.333 | 0.2673 | 5.42 |
| 1.417 | 0.3066 | 5.70 |
| 1.500 | 0.3499 | 6.28 |
| 1.583 | 0.3996 | 7.22 |
| 1.667 | 0.4530 | 7.75 |
| 1.750 | 0.5096 | 8.23 |
| 1.833 | 0.5737 | 9.30 |
| 1.917 | 0.6449 | 10.34 |
| 2.000 | 0.7184 | 10.67 |
| 2.083 | 0.7932 | 10.86 |
| 2.167 | 0.8726 | 11.54 |
| 2.250 | 0.9639 | 13.26 |
| 2.333 | 1.0712 | 15.58 |
| 2.417 | 1.1908 | 17.36 |
| 2.500 | 1.3286 | 20.00 |
| 2.583 | 1.5030 | 25.32 |
| 2.667 | 1.7044 | 29.26 |
| 2.750 | 1.9073 | 29.46 |
| 2.833 | 2.0761 | 24.50 |
| 2.917 | 2.2015 | 18.22 |
| 3.000 | 2.3020 | 14.59 |
| 3.083 | 2.3850 | 12.04 |
| 3.167 | 2.4519 | 9.72 |
| 3.250 | 2.5074 | 8.05 |
| 3.333 | 2.5550 | 6.92 |
| 3.417 | 2.5967 | 6.06 |
| 3.500 | 2.6335 | 5.34 |
| 3.583 | 2.6660 | 4.73 |
| 3.667 | 2.6951 | 4.22 |
| 3.750 | 2.7216 | 3.84 |
| 3.833 | 2.7459 | 3.53 |
| 3.917 | 2.7682 | 3.25 |
| 4.000 | 2.7889 | 3.00 |




**********

FLOW PROCESS FROM NODE 134.00 TO NODE 134.00 IS CODE = 7

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>>>>>STREAM NUMBER 5 ADDED TO STREAM NUMBER 1<<<<<

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**********

FLOW PROCESS FROM NODE 134.00 TO NODE 134.00 IS CODE = 11

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>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

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STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 175.0 350.0 525.0 700.0 |
|---|---|---|---|
| 1.000 | 1.4931 | 80.29 | V Q . . . . |
| 1.083 | 1.9369 | 64.44 | .V Q . . . . |
| 1.167 | 2.3739 | 63.45 | .V Q . . . . |
| 1.250 | 3.0709 | 101.21 | .V Q . . . . |
| 1.333 | 3.7725 | 101.86 | . V Q . . . . |
| 1.417 | 4.5162 | 107.99 | . V Q . . . . |
| 1.500 | 5.3390 | 119.47 | . V Q . . . . |
| 1.583 | 6.2739 | 135.75 | . V Q . . . . |
| 1.667 | 7.3082 | 150.18 | . V Q . . . . |
| 1.750 | 8.4342 | 163.49 | . V Q. . . . |
| 1.833 | 9.6920 | 182.63 | . V Q . . . |
| 1.917 | 11.0941 | 203.59 | . V .Q . . . |
| 2.000 | 12.5865 | 216.69 | . V . Q . . . |
| 2.083 | 14.1304 | 224.17 | . V . Q . . . |
| 2.167 | 15.7643 | 237.23 | . V. Q . . . |
| 2.250 | 17.6099 | 267.98 | . V Q . . . |
| 2.333 | 19.7468 | 310.28 | . .V Q . . . |
| 2.417 | 22.1693 | 351.74 | . . V Q . . . |
| 2.500 | 24.9769 | 407.67 | . . V . Q . . . |
| 2.583 | 28.3568 | 490.76 | . . V . Q . . . |
| 2.667 | 32.3713 | 582.90 | . . V. . Q . . |
| 2.750 | 36.6565 | 622.22 | . . . V . Q . . |
| 2.833 | 40.6190 | 575.35 | . . . V . Q . . |
| 2.917 | 43.8860 | 474.36 | . . . VQ . . . |
| 3.000 | 46.4516 | 372.53 | . . .Q V . . . |
| 3.083 | 48.4876 | 295.63 | . . Q . V. . . |
| 3.167 | 50.1465 | 240.88 | . . Q . V . . |
| 3.250 | 51.5390 | 202.18 | . .Q . .V . . |
| 3.333 | 52.7325 | 173.29 | . Q. . .V . . |
| 3.417 | 53.7770 | 151.66 | . Q . . . V . . |
| 3.500 | 54.7048 | 134.72 | . Q . . . V . . |
| 3.583 | 55.5387 | 121.08 | . Q . . . V . . |
| 3.667 | 56.2917 | 109.33 | . Q . . . V . . |
| 3.750 | 56.9743 | 99.12 | . Q . . . V . . |
| 3.833 | 57.5952 | 90.15 | . Q . . . V . . |
| 3.917 | 58.1604 | 82.07 | . Q . . . V . . |
| 4.000 | 58.6818 | 75.71 | . Q . . . V . . |
| 4.083 | 59.1658 | 70.28 | . Q . . . V . . |
| 4.167 | 59.6158 | 65.35 | . Q . . . V . . |
| 4.250 | 60.0471 | 62.61 | . Q . . . V . . |
| 4.333 | 60.4442 | 57.66 | . Q . . . V . . |
| 4.417 | 60.8183 | 54.32 | . Q . . . V . . |
| 4.500 | 61.1721 | 51.37 | . Q . . . V . . |
| 4.583 | 61.4962 | 47.07 | . Q . . . V . . |
| 4.667 | 61.7909 | 42.79 | . Q . . . V . . |
| 4.750 | 62.0668 | 40.05 | . Q . . . V . . |
| 4.833 | 62.3280 | 37.92 | . Q . . . V . . |
| 4.917 | 62.5682 | 34.89 | .Q . . . V . . |
| 5.000 | 62.7932 | 32.67 | .Q . . . V . |

**********
FLOW PROCESS FROM NODE 134.00 TO NODE 135.00 IS CODE = 5.2

>>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<

THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE



INTERVALS(Reference: the National Engineering Handbook,
Hydrology, Chapter 17, page 17-52, August,1972,
U.S. Department of Commerce).

ASSUMED REGULAR CHANNEL INFORMATION:
BASEWIDTH(FT) = 4.00 CHANNEL Z = 6.00
UPSTREAM ELEVATION(FT) = 815.00
DOWNSTREAM ELEVATION(FT) = 800.00
CHANNEL LENGTH(FT) = 750.00 MANNING'S FACTOR = 0.035
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 622.22
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 484.69
CHANNEL NORMAL VELOCITY FOR Q = 484.69 CFS = 8.08 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.826

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 0.994

CONVEX METHOD CHANNEL ROUTING RESULTS:

| MODEL TIME (HRS) | INFLOW (STREAM 1) (CFS) | ROUTED FLOW (CFS) | OUTFLOW LESS LOSS (STREAM 1) (CFS) |
|---|---|---|---|
| 1.000 | 80.29 | 82.18 | 82.18 |
| 1.083 | 64.44 | 68.57 | 68.57 |
| 1.167 | 63.45 | 63.73 | 63.73 |
| 1.250 | 101.21 | 91.40 | 91.40 |
| 1.333 | 101.86 | 101.63 | 101.63 |
| 1.417 | 107.99 | 106.40 | 106.40 |
| 1.500 | 119.47 | 116.48 | 116.48 |
| 1.583 | 135.75 | 131.50 | 131.50 |
| 1.667 | 150.18 | 146.40 | 146.40 |
| 1.750 | 163.49 | 160.01 | 160.01 |
| 1.833 | 182.63 | 177.64 | 177.64 |
| 1.917 | 203.59 | 198.11 | 198.11 |
| 2.000 | 216.69 | 213.26 | 213.26 |
| 2.083 | 224.17 | 222.21 | 222.21 |
| 2.167 | 237.23 | 233.83 | 233.83 |
| 2.250 | 267.98 | 259.97 | 259.97 |
| 2.333 | 310.28 | 299.24 | 299.24 |
| 2.417 | 351.74 | 340.90 | 340.90 |
| 2.500 | 407.67 | 393.07 | 393.07 |
| 2.583 | 490.76 | 469.08 | 469.08 |
| 2.667 | 582.90 | 558.83 | 558.83 |
| 2.750 | 622.22 | 611.86 | 611.86 |
| 2.833 | 575.35 | 587.47 | 587.47 |
| 2.917 | 474.36 | 500.68 | 500.68 |
| 3.000 | 372.53 | 399.15 | 399.15 |
| 3.083 | 295.63 | 315.77 | 315.77 |
| 3.167 | 240.88 | 255.23 | 255.23 |
| 3.250 | 202.18 | 212.32 | 212.32 |
| 3.333 | 173.29 | 180.86 | 180.86 |
| 3.417 | 151.66 | 157.33 | 157.33 |
| 3.500 | 134.72 | 139.16 | 139.16 |
| 3.583 | 121.08 | 124.65 | 124.65 |
| 3.667 | 109.33 | 112.41 | 112.41 |
| 3.750 | 99.12 | 101.79 | 101.79 |
| 3.833 | 90.15 | 92.50 | 92.50 |
| 3.917 | 82.07 | 84.18 | 84.18 |

| | | | |
|---|---|---|---|
| 4.000 | 75.71 | 77.37 | 77.37 |
| 4.083 | 70.28 | 71.70 | 71.70 |
| 4.167 | 65.35 | 66.64 | 66.64 |
| 4.250 | 62.61 | 63.33 | 63.33 |
| 4.333 | 57.66 | 58.95 | 58.95 |
| 4.417 | 54.32 | 55.20 | 55.20 |
| 4.500 | 51.37 | 52.15 | 52.15 |
| 4.583 | 47.07 | 48.19 | 48.19 |
| 4.667 | 42.79 | 43.91 | 43.91 |
| 4.750 | 40.05 | 40.77 | 40.77 |
| 4.833 | 37.92 | 38.48 | 38.48 |
| 4.917 | 34.89 | 35.68 | 35.68 |
| 5.000 | 32.67 | 33.25 | 33.25 |
| 5.083 | 29.13 | 30.05 | 30.05 |
| 5.167 | 28.34 | 28.55 | 28.55 |
| 5.250 | 31.76 | 30.87 | 30.87 |
| 5.333 | 21.79 | 24.38 | 24.38 |
| 5.417 | 26.16 | 25.04 | 25.04 |
| 5.500 | 20.09 | 21.66 | 21.66 |
| 5.583 | 17.09 | 17.88 | 17.88 |
| 5.667 | 15.28 | 15.76 | 15.76 |
| 5.750 | 20.11 | 18.86 | 18.86 |
| 5.833 | 17.35 | 18.06 | 18.06 |
| 5.917 | 14.07 | 14.93 | 14.93 |
| 6.000 | 13.42 | 13.60 | 13.60 |
| 6.083 | 9.33 | 10.40 | 10.40 |
| 6.167 | 9.13 | 9.19 | 9.19 |
| 6.250 | 11.69 | 11.03 | 11.03 |
| 6.333 | 9.23 | 9.87 | 9.87 |
| 6.417 | 0.12 | 2.49 | 2.49 |
| 6.500 | 6.29 | 4.70 | 4.70 |
| 6.583 | 12.31 | 10.73 | 10.73 |
| 6.667 | 0.26 | 3.38 | 3.38 |
| 6.750 | 3.87 | 2.95 | 2.95 |
| 6.833 | 5.74 | 5.25 | 5.25 |
| 6.917 | 4.41 | 4.75 | 4.75 |
| 7.000 | 9.62 | 8.27 | 8.27 |
| 7.083 | 1.54 | 3.63 | 3.63 |
| 7.167 | 9.31 | 7.31 | 7.31 |
| 7.250 | 1.62 | 3.61 | 3.61 |
| 7.333 | 4.84 | 4.01 | 4.01 |
| 7.417 | 10.90 | 9.32 | 9.32 |
| 7.500 | 2.20 | 4.46 | 4.46 |
| 7.583 | 3.80 | 3.40 | 3.40 |
| 7.667 | 3.93 | 3.90 | 3.90 |
| 7.750 | 4.56 | 4.40 | 4.40 |
| 7.833 | 6.28 | 5.77 | 5.77 |
| 7.917 | 12.03 | 10.51 | 10.51 |
| 8.000 | 1.60 | 4.30 | 4.30 |
| 8.083 | 4.64 | 3.87 | 3.87 |
| 8.167 | 4.29 | 4.38 | 4.38 |
| 8.250 | 4.56 | 4.49 | 4.49 |
| 8.333 | 4.76 | 4.71 | 4.71 |
| 8.417 | 4.56 | 4.61 | 4.61 |
| 8.500 | 5.35 | 5.14 | 5.14 |
| 8.583 | 5.17 | 5.22 | 5.22 |
| 8.667 | 4.95 | 5.01 | 5.01 |
| 8.750 | 4.66 | 4.74 | 4.74 |
| 8.833 | 4.31 | 4.41 | 4.41 |
| 8.917 | 3.93 | 4.03 | 4.03 |
| 9.000 | 3.47 | 3.59 | 3.59 |
| 9.083 | 2.87 | 3.02 | 3.02 |
| 9.167 | 2.21 | 2.38 | 2.38 |
| 9.250 | 1.65 | 1.79 | 1.79 |



| | | | |
|---|---|---|---|
| 9.333 | 1.31 | 1.40 | 1.40 |
| 9.417 | 1.14 | 1.18 | 1.18 |
| 9.500 | 1.01 | 1.04 | 1.04 |
| 9.583 | 0.89 | 0.92 | 0.92 |
| 9.667 | 0.79 | 0.82 | 0.82 |
| 9.750 | 0.66 | 0.69 | 0.69 |
| 9.833 | 0.49 | 0.53 | 0.53 |
| 9.917 | 0.30 | 0.35 | 0.35 |
| 10.000 | 0.15 | 0.19 | 0.19 |
| 10.083 | 0.07 | 0.09 | 0.09 |
| 10.167 | 0.03 | 0.04 | 0.04 |
| 10.250 | 0.01 | 0.02 | 0.02 |
| 10.333 | 0.00 | 0.01 | 0.01 |

```
================================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =     66.012 AF
    OUTFLOW VOLUME =     66.012 AF
    LOSS    VOLUME =      0.000 AF


********************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE    135.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
################################################################################

      (UNIT-HYDROGRAPH ADDED TO STREAM #2)

         WATERSHED AREA =       44.720 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.195 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         MOUNTAIN S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.269
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         USER-ENTERED RAINFALL =  1.74 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9998


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  42.691


         RUNOFF HYDROGRAPH LISTING LIMITS:
         MODEL TIME(HOURS) FOR BEGINNING OF RESULTS =    2.00
         MODEL TIME(HOURS) FOR END OF RESULTS =    4.00


================================================================================
                      UNIT HYDROGRAPH DETERMINATION

--------------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
--------------------------------------------------------------------------------
        1                6.089                32.929
        2               30.933               134.368
        3               51.659               112.092
        4               61.518                53.319
        5               68.179                36.023
        6               73.238                27.360
```

| | | |
|---|---|---|
| 7 | 77.103 | 20.904 |
| 8 | 80.263 | 17.090 |
| 9 | 82.909 | 14.313 |
| 10 | 85.003 | 11.325 |
| 11 | 86.794 | 9.688 |
| 12 | 88.415 | 8.765 |
| 13 | 89.900 | 8.031 |
| 14 | 91.251 | 7.305 |
| 15 | 92.478 | 6.636 |
| 16 | 93.578 | 5.951 |
| 17 | 94.523 | 5.110 |
| 18 | 95.368 | 4.573 |
| 19 | 96.148 | 4.217 |
| 20 | 96.770 | 3.361 |
| 21 | 97.384 | 3.322 |
| 22 | 97.943 | 3.025 |
| 23 | 98.167 | 1.211 |
| 24 | 98.335 | 0.907 |
| 25 | 98.502 | 0.908 |
| 26 | 98.670 | 0.906 |
| 27 | 98.838 | 0.908 |
| 28 | 99.005 | 0.907 |
| 29 | 99.173 | 0.907 |
| 30 | 99.341 | 0.907 |
| 31 | 99.508 | 0.907 |
| 32 | 99.676 | 0.907 |
| 33 | 99.844 | 0.907 |
| 34 | 100.000 | 0.846 |

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TOTAL STORM RAINFALL(INCHES) = 1.74
TOTAL SOIL-LOSS(INCHES) = 0.78
TOTAL EFFECTIVE RAINFALL(INCHES) = 0.96

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 2.9242
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 3.5573

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3 - H O U R  S T O R M
R U N O F F  H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 12.5 25.0 37.5 50.0 |
|---|---|---|---|
| 2.000 | 0.8439 | 13.44 | . VQ . . . |
| 2.083 | 0.9389 | 13.79 | . VQ . . . |
| 2.167 | 1.0424 | 15.03 | . VQ . . . |
| 2.250 | 1.1700 | 18.53 | . VQ . . . |
| 2.333 | 1.3215 | 22.00 | . V Q . . . |
| 2.417 | 1.4815 | 23.23 | . V Q . . . |
| 2.500 | 1.6878 | 29.95 | . V . Q . . |
| 2.583 | 1.9487 | 37.88 | . .V Q . |
| 2.667 | 2.2429 | 42.72 | . V . Q . |
| 2.750 | 2.5147 | 39.46 | . V .Q . |
| 2.833 | 2.7113 | 28.56 | . . Q V . |
| 2.917 | 2.8520 | 20.43 | . Q . . V . |
| 3.000 | 2.9648 | 16.37 | . Q . . V . |
| 3.083 | 3.0539 | 12.94 | . Q . . V . |
| 3.167 | 3.1245 | 10.25 | . Q . . . V . |
| 3.250 | 3.1829 | 8.48 | . Q . . . V . |
| 3.333 | 3.2322 | 7.16 | . Q . . . V . |
| 3.417 | 3.2747 | 6.18 | . Q . . . V . |
| 3.500 | 3.3123 | 5.45 | . Q . . . V . |
| 3.583 | 3.3456 | 4.84 | . Q . . . V . |
| 3.667 | 3.3753 | 4.31 | . Q . . . V . |
| 3.750 | 3.4017 | 3.82 | . Q . . . V . |
| 3.833 | 3.4249 | 3.37 | . Q . . . V . |
| 3.917 | 3.4454 | 2.97 | . Q . . . V . |
| 4.000 | 3.4630 | 2.56 | . Q . . . V . |

**********

FLOW PROCESS FROM NODE 135.00 TO NODE 135.00 IS CODE = 7

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>>>>>STREAM NUMBER 2 ADDED TO STREAM NUMBER 1<<<<<

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**********

FLOW PROCESS FROM NODE 135.00 TO NODE 135.00 IS CODE = 11

---

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

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STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 175.0 350.0 525.0 700.0 |
|---|---|---|---|
| 1.000 | 1.4856 | 84.87 | V Q . . . . |
| 1.083 | 1.9817 | 72.03 | .V Q . . . . |
| 1.167 | 2.4538 | 68.55 | .V Q . . . . |
| 1.250 | 3.1233 | 97.21 | .V Q . . . . |
| 1.333 | 3.8660 | 107.85 | . V Q . . . . |
| 1.417 | 4.6433 | 112.86 | . V Q . . . . |
| 1.500 | 5.4994 | 124.30 | . V Q . . . . |

| | | | |
|---|---|---|---|
| 1.583 | 6.4677 | 140.60 | . V Q . . . . |
| 1.667 | 7.5406 | 155.79 | . V Q . . . . |
| 1.750 | 8.7141 | 170.39 | . V Q. . . . |
| 1.833 | 10.0227 | 190.01 | . V Q . . . |
| 1.917 | 11.4792 | 211.48 | . V . Q . . . |
| 2.000 | 13.0404 | 226.69 | . V . Q . . . |
| 2.083 | 14.6658 | 236.00 | . V . Q . . . |
| 2.167 | 16.3797 | 248.86 | . V. Q . . . |
| 2.250 | 18.2977 | 278.50 | . V Q . . . |
| 2.333 | 20.5101 | 321.24 | . .V Q . . . |
| 2.417 | 23.0179 | 364.13 | . . V Q . . |
| 2.500 | 25.9313 | 423.02 | . . V . Q . . |
| 2.583 | 29.4228 | 506.96 | . . V . Q . . |
| 2.667 | 33.5657 | 601.55 | . . V. . Q . |
| 2.750 | 38.0513 | 651.32 | . . .V . Q |
| 2.833 | 42.2939 | 616.05 | . . . V . Q |
| 2.917 | 45.8829 | 521.11 | . . . V Q. |
| 3.000 | 48.7445 | 415.52 | . . . Q V . |
| 3.083 | 51.0084 | 328.71 | . . Q . V. |
| 3.167 | 52.8368 | 265.48 | . . Q . V |
| 3.250 | 54.3574 | 220.80 | . . Q . .V |
| 3.333 | 55.6523 | 188.02 | . Q . .V |
| 3.417 | 56.7784 | 163.51 | . Q. . . V |
| 3.500 | 57.7743 | 144.61 | . Q . . . V |
| 3.583 | 58.6662 | 129.50 | . Q . . . V |
| 3.667 | 59.4700 | 116.72 | . Q . . . V |
| 3.750 | 60.1974 | 105.61 | . Q . . . V |
| 3.833 | 60.8576 | 95.87 | . Q . . . V |
| 3.917 | 61.4579 | 87.15 | . Q . . . V |
| 4.000 | 62.0084 | 79.93 | . Q . . . V |
| 4.083 | 62.5173 | 73.90 | . Q . . . V |
| 4.167 | 62.9895 | 68.56 | . Q . . . V |
| 4.250 | 63.4366 | 64.92 | . Q . . . V |
| 4.333 | 63.8515 | 60.24 | . Q . . . V |
| 4.417 | 64.2384 | 56.18 | . Q . . . V |
| 4.500 | 64.6028 | 52.91 | . Q . . . V |
| 4.583 | 64.9394 | 48.87 | . Q . . . V |
| 4.667 | 65.2462 | 44.54 | . Q . . . V |
| 4.750 | 65.5310 | 41.36 | . Q . . . V |
| 4.833 | 65.7999 | 39.04 | . Q . . . V |
| 4.917 | 66.0493 | 36.21 | . Q . . . V |
| 5.000 | 66.2816 | 33.73 | .Q . . . V |
| 5.083 | 66.4915 | 30.48 | .Q . . . V |
| 5.167 | 66.6907 | 28.93 | .Q . . . V |
| 5.250 | 66.9054 | 31.17 | .Q . . . V |
| 5.333 | 67.0747 | 24.58 | .Q . . . V |
| 5.417 | 67.2478 | 25.13 | .Q . . . V |
| 5.500 | 67.3972 | 21.69 | .Q . . . V |
| 5.583 | 67.5204 | 17.90 | .Q . . . V |
| 5.667 | 67.6290 | 15.77 | Q . . . V |
| 5.750 | 67.7589 | 18.86 | .Q . . . V |
| 5.833 | 67.8833 | 18.06 | .Q . . . V. |
| 5.917 | 67.9861 | 14.93 | Q . . . V. |
| 6.000 | 68.0798 | 13.60 | Q . . . V. |

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END OF FLOODSCx ROUTING ANALYSIS

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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2004 Advanced Engineering Software (aes)
              (Synthetic Unit Hydrograph Version 2.0A)
             Release Date: 01/01/2003  License ID 1264

                        Analysis prepared by:

                           RBF Consulting
                         14725 Alton Parkway
                       Irvine, California  92618


 ************************ DESCRIPTION OF STUDY ************************
* Flood X UH Area F 100 Year High Confidence                          *
*                                                                     *
*                                                                     *
 **********************************************************************

  FILE NAME: UHF.DAT
  TIME/DATE OF STUDY: 14:15 06/07/2007


****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    109.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      495.360 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.310 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         MOUNTAIN S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.268
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         USER-ENTERED RAINFALL =  2.65 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9980


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  26.882


         RUNOFF HYDROGRAPH LISTING LIMITS:
         MODEL TIME(HOURS) FOR BEGINNING OF RESULTS =    0.00
         MODEL TIME(HOURS) FOR END OF RESULTS =  15.00


============================================================================
                      UNIT HYDROGRAPH DETERMINATION
----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
```



| NUMBER | MEAN VALUES | ORDINATES(CFS) |
|---|---|---|
| 1 | 3.277 | 196.298 |
| 2 | 14.259 | 657.908 |
| 3 | 33.681 | 1163.525 |
| 4 | 47.555 | 831.157 |
| 5 | 55.742 | 490.456 |
| 6 | 61.304 | 333.243 |
| 7 | 65.763 | 267.092 |
| 8 | 69.450 | 220.931 |
| 9 | 72.627 | 190.297 |
| 10 | 75.213 | 154.907 |
| 11 | 77.508 | 137.527 |
| 12 | 79.506 | 119.677 |
| 13 | 81.332 | 109.385 |
| 14 | 82.914 | 94.753 |
| 15 | 84.294 | 82.670 |
| 16 | 85.496 | 72.024 |
| 17 | 86.610 | 66.731 |
| 18 | 87.662 | 63.044 |
| 19 | 88.643 | 58.743 |
| 20 | 89.586 | 56.489 |
| 21 | 90.467 | 52.824 |
| 22 | 91.301 | 49.942 |
| 23 | 92.104 | 48.097 |
| 24 | 92.806 | 42.047 |
| 25 | 93.499 | 41.559 |
| 26 | 94.144 | 38.626 |
| 27 | 94.680 | 32.123 |
| 28 | 95.213 | 31.896 |
| 29 | 95.745 | 31.888 |
| 30 | 96.202 | 27.344 |
| 31 | 96.588 | 23.182 |
| 32 | 96.975 | 23.165 |
| 33 | 97.362 | 23.156 |
| 34 | 97.749 | 23.191 |
| 35 | 98.034 | 17.080 |
| 36 | 98.142 | 6.494 |
| 37 | 98.248 | 6.338 |
| 38 | 98.354 | 6.338 |
| 39 | 98.460 | 6.338 |
| 40 | 98.565 | 6.302 |
| 41 | 98.670 | 6.320 |
| 42 | 98.776 | 6.303 |
| 43 | 98.881 | 6.320 |
| 44 | 98.987 | 6.338 |
| 45 | 99.093 | 6.338 |
| 46 | 99.198 | 6.338 |
| 47 | 99.304 | 6.338 |
| 48 | 99.410 | 6.338 |
| 49 | 99.516 | 6.338 |
| 50 | 99.622 | 6.338 |
| 51 | 99.727 | 6.338 |
| 52 | 99.833 | 6.338 |
| 53 | 99.939 | 6.338 |
| 54 | 100.000 | 3.656 |

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----------------------------------------------------------------------------

        TOTAL STORM RAINFALL(INCHES) =  2.64
        TOTAL SOIL-LOSS(INCHES) =  0.80
        TOTAL EFFECTIVE RAINFALL(INCHES) =  1.85
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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 32.8568
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 76.2825

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==========

3 - H O U R  S T O R M
R U N O F F  H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 175.0 350.0 525.0 700.0 |
|---|---|---|---|
| 0.083 | 0.0163 | 2.37 | Q |
| 0.167 | 0.0872 | 10.29 | Q |
| 0.250 | 0.2475 | 23.27 | VQ |
| 0.333 | 0.4671 | 31.89 | VQ |
| 0.417 | 0.7329 | 38.60 | V Q |
| 0.500 | 1.0916 | 52.09 | V Q |
| 0.583 | 1.5404 | 65.17 | V Q |
| 0.667 | 2.0695 | 76.82 | .V Q |
| 0.750 | 2.6468 | 83.81 | .V Q |
| 0.833 | 3.2825 | 92.31 | .V Q |
| 0.917 | 3.9432 | 95.94 | . V Q |
| 1.000 | 4.6009 | 95.49 | . V Q |
| 1.083 | 5.3036 | 102.04 | . V Q |
| 1.167 | 6.1115 | 117.30 | . V Q |
| 1.250 | 7.0468 | 135.81 | . V Q |
| 1.333 | 8.0649 | 147.82 | . V Q |
| 1.417 | 9.1380 | 155.82 | . V Q |
| 1.500 | 10.2874 | 166.90 | . V Q. |
| 1.583 | 11.5709 | 186.37 | . V Q |
| 1.667 | 12.9543 | 200.86 | . V .Q |
| 1.750 | 14.4150 | 212.09 | . V . Q |
| 1.833 | 16.0173 | 232.66 | . V . Q |
| 1.917 | 17.7826 | 256.32 | . V. Q |
| 2.000 | 19.6255 | 267.59 | . V Q |
| 2.083 | 21.5053 | 272.95 | . .V Q |
| 2.167 | 23.4796 | 286.66 | . . V Q |
| 2.250 | 25.6785 | 319.29 | . . V Q . |
| 2.333 | 28.2054 | 366.90 | . . V Q |
| 2.417 | 31.0480 | 412.76 | . . V . Q |
| 2.500 | 34.2397 | 463.42 | . . V . Q |
| 2.583 | 38.1638 | 569.78 | . . V . Q |
| 2.667 | 42.7143 | 660.73 | . . . V . Q . |
| 2.750 | 47.4284 | 684.48 | . . . V . Q. |
| 2.833 | 51.5813 | 603.01 | . . . V . Q . |
| 2.917 | 54.8248 | 470.95 | . . . Q V . . |
| 3.000 | 57.4254 | 377.60 | . . .Q V . |
| 3.083 | 59.5951 | 315.05 | . . Q .V . |
| 3.167 | 61.3653 | 257.03 | . . Q . . V . |
| 3.250 | 62.8369 | 213.67 | . . Q . . V . |
| 3.333 | 64.0961 | 182.84 | . Q . . V . |
| 3.417 | 65.1991 | 160.16 | . Q. . . V . |
| 3.500 | 66.1796 | 142.37 | . Q . . . V . |
| 3.583 | 67.0561 | 127.27 | . Q . . . V . |
| 3.667 | 67.8416 | 114.05 | . Q . . . V . |
| 3.750 | 68.5510 | 103.00 | . Q . . . V . |
| 3.833 | 69.1978 | 93.91 | . Q . . . V . |
| 3.917 | 69.7922 | 86.31 | . Q . . . V . |
| 4.000 | 70.3438 | 80.10 | . Q . . . V . |
| 4.083 | 70.8572 | 74.54 | . Q . . . V . |
| 4.167 | 71.3354 | 69.44 | . Q . . . V . |
| 4.250 | 71.7829 | 64.98 | . Q . . . V . |
| 4.333 | 72.1971 | 60.14 | . Q . . . V . |

```
4.417    72.5814    55.80  .  Q      .        .        .        V .
4.500    72.9383    51.82  . Q       .        .        .        V .
4.583    73.2654    47.50  . Q       .        .        .        V .
4.667    73.5644    43.41  . Q       .        .        .        V .
4.750    73.8376    39.67  . Q       .        .        .        V .
4.833    74.0886    36.45  . Q       .        .        .        V .
4.917    74.3199    33.58  .Q        .        .        .        V .
5.000    74.5294    30.42  .Q        .        .        .         V.
5.083    74.7159    27.07  .Q        .        .        .         V.
5.167    74.8853    24.60  .Q        .        .        .         V.
5.250    75.0402    22.49  .Q        .        .        .         V.
5.333    75.1741    19.44  .Q        .        .        .         V.
5.417    75.2854    16.17  Q         .        .        .         V.
5.500    75.3755    13.07  Q         .        .        .         V.
5.583    75.4527    11.21  Q         .        .        .         V.
5.667    75.5248    10.48  Q         .        .        .         V.
5.750    75.5926     9.84  Q         .        .        .         V.
5.833    75.6568     9.32  Q         .        .        .         V.
5.917    75.7188     9.00  Q         .        .        .         V.
6.000    75.7788     8.71  Q         .        .        .         V.
6.083    75.8368     8.43  Q         .        .        .         V.
6.167    75.8925     8.08  Q         .        .        .         V.
6.250    75.9455     7.69  Q         .        .        .         V.
6.333    75.9959     7.33  Q         .        .        .         V.
6.417    76.0439     6.97  Q         .        .        .         V.
6.500    76.0894     6.61  Q         .        .        .         V.
6.583    76.1318     6.15  Q         .        .        .         V.
6.667    76.1699     5.53  Q         .        .        .         V.
6.750    76.2039     4.94  Q         .        .        .         V.
6.833    76.2333     4.26  Q         .        .        .         V.
6.917    76.2555     3.23  Q         .        .        .         V.
7.000    76.2699     2.08  Q         .        .        .         V.
7.083    76.2768     1.01  Q         .        .        .         V.
7.167    76.2799     0.44  Q         .        .        .         V.
7.250    76.2817     0.26  Q         .        .        .         V.
7.333    76.2824     0.10  Q         .        .        .         V.
7.417    76.2824     0.01  Q         .        .        .         V.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    122.00 IS CODE =   4
----------------------------------------------------------------------------
  >>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<
============================================================================

        MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
        STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
        VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
        EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
        OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
        UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
        (0.938)(DIAMETER):

        PIPELENGTH(FT) =    1300.00     MANNINGS FACTOR = 0.013
        UPSTREAM ELEVATION(FT) =     955.00
        DOWNSTREAM ELEVATION(FT) =     883.50
        PIPE DIAMETER(FT) =  11.00

        NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:
```



| TIME (HRS) | INFLOW (CFS) | VELOCITY (FPS) | OUTFLOW (CFS) | UPSTREAM PONDING(AF) |
|---|---|---|---|---|
| 1.000 | 95.49 | 10.45 | 95.49 | 0.000 |
| 1.083 | 102.04 | 11.17 | 102.04 | 0.000 |
| 1.167 | 117.30 | 12.84 | 117.30 | 0.000 |
| 1.250 | 135.81 | 14.86 | 135.81 | 0.000 |
| 1.333 | 147.82 | 16.18 | 147.82 | 0.000 |
| 1.417 | 155.82 | 17.05 | 155.82 | 0.000 |
| 1.500 | 166.90 | 18.26 | 166.90 | 0.000 |
| 1.583 | 186.37 | 20.39 | 186.37 | 0.000 |
| 1.667 | 200.86 | 21.98 | 200.86 | 0.000 |
| 1.750 | 212.09 | 23.21 | 212.09 | 0.000 |
| 1.833 | 232.66 | 25.46 | 232.66 | 0.000 |
| 1.917 | 256.32 | 27.51 | 255.54 | 0.000 |
| 2.000 | 267.59 | 27.77 | 266.21 | 0.000 |
| 2.083 | 272.95 | 27.89 | 272.30 | 0.000 |
| 2.167 | 286.66 | 28.21 | 285.04 | 0.000 |
| 2.250 | 319.29 | 28.97 | 315.55 | 0.000 |
| 2.333 | 366.90 | 30.07 | 361.79 | 0.000 |
| 2.417 | 412.76 | 31.13 | 408.18 | 0.000 |
| 2.500 | 463.42 | 32.30 | 458.71 | 0.000 |
| 2.583 | 569.78 | 34.40 | 560.17 | 0.000 |
| 2.667 | 660.73 | 36.03 | 653.04 | 0.000 |
| 2.750 | 684.48 | 36.45 | 682.59 | 0.000 |
| 2.833 | 603.01 | 34.99 | 609.71 | 0.000 |
| 2.917 | 470.95 | 32.48 | 482.79 | 0.000 |
| 3.000 | 377.60 | 30.32 | 386.47 | 0.000 |
| 3.083 | 315.05 | 28.87 | 321.73 | 0.000 |
| 3.167 | 257.03 | 27.53 | 263.85 | 0.000 |
| 3.250 | 213.67 | 23.38 | 214.54 | 0.000 |
| 3.333 | 182.84 | 20.01 | 182.84 | 0.000 |
| 3.417 | 160.16 | 17.53 | 160.16 | 0.000 |
| 3.500 | 142.37 | 15.58 | 142.37 | 0.000 |
| 3.583 | 127.27 | 13.93 | 127.27 | 0.000 |
| 3.667 | 114.05 | 12.48 | 114.05 | 0.000 |
| 3.750 | 103.00 | 11.27 | 103.00 | 0.000 |
| 3.833 | 93.91 | 10.28 | 93.91 | 0.000 |
| 3.917 | 86.31 | 9.45 | 86.31 | 0.000 |
| 4.000 | 80.10 | 8.77 | 80.10 | 0.000 |
| 4.083 | 74.54 | 8.16 | 74.54 | 0.000 |
| 4.167 | 69.44 | 7.60 | 69.44 | 0.000 |
| 4.250 | 64.98 | 7.11 | 64.98 | 0.000 |
| 4.333 | 60.14 | 6.58 | 60.14 | 0.000 |
| 4.417 | 55.80 | 6.11 | 55.80 | 0.000 |
| 4.500 | 51.82 | 5.67 | 51.82 | 0.000 |
| 4.583 | 47.50 | 5.20 | 47.50 | 0.000 |
| 4.667 | 43.41 | 4.75 | 43.41 | 0.000 |
| 4.750 | 39.67 | 4.34 | 39.67 | 0.000 |
| 4.833 | 36.45 | 3.99 | 39.60 | 0.000 |
| 4.917 | 33.58 | 3.68 | 33.30 | 0.000 |
| 5.000 | 30.42 | 3.33 | 30.72 | 0.000 |

```
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  FLOW PROCESS FROM NODE    111.00 TO NODE    118.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #2)

        WATERSHED AREA =      186.420 ACRES
        BASEFLOW =    0.000 CFS/SQUARE-MILE
        *USER ENTERED "LAG" TIME =     0.400 HOURS
```

CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
MOUNTAIN S-GRAPH SELECTED
UNIFORM MEAN SOIL-LOSS(INCH/HOUR) = 0.216
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
USER-ENTERED RAINFALL = 2.65 INCHES
RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9993

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 20.833

RUNOFF HYDROGRAPH LISTING LIMITS:
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 0.00
MODEL TIME(HOURS) FOR END OF RESULTS = 15.00

UNIT HYDROGRAPH DETERMINATION

| INTERVAL NUMBER | "S" GRAPH MEAN VALUES | UNIT HYDROGRAPH ORDINATES(CFS) |
|---|---|---|
| 1 | 2.399 | 54.089 |
| 2 | 9.350 | 156.716 |
| 3 | 22.249 | 290.800 |
| 4 | 37.570 | 345.420 |
| 5 | 47.502 | 223.905 |
| 6 | 54.239 | 151.890 |
| 7 | 58.869 | 104.389 |
| 8 | 62.848 | 89.714 |
| 9 | 66.119 | 73.731 |
| 10 | 68.987 | 64.666 |
| 11 | 71.563 | 58.077 |
| 12 | 73.744 | 49.180 |
| 13 | 75.666 | 43.317 |
| 14 | 77.434 | 39.859 |
| 15 | 79.006 | 35.447 |
| 16 | 80.460 | 32.775 |
| 17 | 81.830 | 30.890 |
| 18 | 83.005 | 26.484 |
| 19 | 84.093 | 24.533 |
| 20 | 85.033 | 21.206 |
| 21 | 85.948 | 20.622 |
| 22 | 86.781 | 18.782 |
| 23 | 87.598 | 18.416 |
| 24 | 88.371 | 17.437 |
| 25 | 89.102 | 16.480 |
| 26 | 89.830 | 16.408 |
| 27 | 90.499 | 15.074 |
| 28 | 91.145 | 14.559 |
| 29 | 91.789 | 14.529 |
| 30 | 92.363 | 12.952 |
| 31 | 92.901 | 12.120 |
| 32 | 93.439 | 12.119 |
| 33 | 93.963 | 11.828 |
| 34 | 94.394 | 9.722 |
| 35 | 94.807 | 9.296 |
| 36 | 95.219 | 9.304 |
| 37 | 95.632 | 9.300 |



| | | |
|---|---|---|
| 38 | 96.024 | 8.831 |
| 39 | 96.332 | 6.958 |
| 40 | 96.632 | 6.755 |
| 41 | 96.931 | 6.755 |
| 42 | 97.231 | 6.764 |
| 43 | 97.531 | 6.755 |
| 44 | 97.831 | 6.755 |
| 45 | 98.035 | 4.608 |
| 46 | 98.117 | 1.851 |
| 47 | 98.199 | 1.843 |
| 48 | 98.281 | 1.843 |
| 49 | 98.363 | 1.851 |
| 50 | 98.445 | 1.843 |
| 51 | 98.527 | 1.852 |
| 52 | 98.608 | 1.843 |
| 53 | 98.690 | 1.843 |
| 54 | 98.772 | 1.843 |
| 55 | 98.854 | 1.851 |
| 56 | 98.935 | 1.835 |
| 57 | 99.018 | 1.852 |
| 58 | 99.099 | 1.835 |
| 59 | 99.180 | 1.835 |
| 60 | 99.262 | 1.835 |
| 61 | 99.343 | 1.835 |
| 62 | 99.424 | 1.835 |
| 63 | 99.506 | 1.835 |
| 64 | 99.587 | 1.835 |
| 65 | 99.669 | 1.835 |
| 66 | 99.750 | 1.835 |
| 67 | 99.831 | 1.835 |
| 68 | 99.913 | 1.835 |
| 69 | 99.994 | 1.835 |
| 70 | 100.000 | 0.132 |

TOTAL STORM RAINFALL(INCHES) = 2.65
TOTAL SOIL-LOSS(INCHES) = 0.64
TOTAL EFFECTIVE RAINFALL(INCHES) = 2.00

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 10.0092
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 31.1123

3 - H O U R  S T O R M
R U N O F F  H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 75.0 150.0 225.0 300.0 |
|---|---|---|---|
| 0.083 | 0.0061 | 0.89 | Q |
| 0.167 | 0.0300 | 3.46 | Q |
| 0.250 | 0.0847 | 7.95 | VQ |
| 0.333 | 0.1768 | 13.37 | VQ |
| 0.417 | 0.2950 | 17.17 | V Q |
| 0.500 | 0.4420 | 21.34 | V Q |
| 0.583 | 0.6234 | 26.34 | V Q |
| 0.667 | 0.8361 | 30.88 | .V Q |
| 0.750 | 1.0760 | 34.83 | .V Q |
| 0.833 | 1.3338 | 37.43 | .V Q |
| 0.917 | 1.6094 | 40.02 | . V Q |
| 1.000 | 1.8921 | 41.06 | . V Q |
| 1.083 | 2.1868 | 42.66 | . V Q |
| 1.167 | 2.5077 | 46.71 | . V Q |
| 1.250 | 2.8694 | 52.52 | . V Q |
| 1.333 | 3.2686 | 57.97 | . V Q |
| 1.417 | 3.6951 | 61.93 | . V Q |
| 1.500 | 4.1489 | 65.89 | . V Q |
| 1.583 | 4.6370 | 70.87 | . V Q. |
| 1.667 | 5.1675 | 77.03 | . V Q |
| 1.750 | 5.7333 | 82.16 | . V Q |
| 1.833 | 6.3386 | 87.88 | . V .Q |
| 1.917 | 6.9946 | 95.25 | . V . Q |
| 2.000 | 7.6944 | 101.61 | . V. Q |
| 2.083 | 8.4165 | 104.86 | . V Q |
| 2.167 | 9.1677 | 109.06 | . .V Q |
| 2.250 | 9.9804 | 118.01 | . . V Q |
| 2.333 | 10.8817 | 130.88 | . . V Q . |
| 2.417 | 11.9026 | 148.24 | . . V Q. |
| 2.500 | 13.0538 | 167.14 | . . V . Q |
| 2.583 | 14.3850 | 193.30 | . . V . Q |
| 2.667 | 15.9472 | 226.83 | . . V Q |
| 2.750 | 17.6218 | 243.14 | . . . V . Q |
| 2.833 | 19.2385 | 234.75 | . . . V .Q |
| 2.917 | 20.6193 | 200.49 | . . . Q |
| 3.000 | 21.7372 | 162.32 | . . .Q V . |
| 3.083 | 22.6669 | 134.99 | . . Q . V. |
| 3.167 | 23.4460 | 113.14 | . . Q . V |
| 3.250 | 24.0981 | 94.68 | . . Q . V |
| 3.333 | 24.6574 | 81.21 | . Q . .V |
| 3.417 | 25.1489 | 71.37 | . Q. . . V |
| 3.500 | 25.5884 | 63.81 | . Q . . . V |
| 3.583 | 25.9834 | 57.36 | . Q . . . V |
| 3.667 | 26.3428 | 52.18 | . Q . . . V |
| 3.750 | 26.6724 | 47.85 | . Q . . . V |
| 3.833 | 26.9739 | 43.78 | . Q . . . V |
| 3.917 | 27.2519 | 40.37 | . Q . . . V |
| 4.000 | 27.5075 | 37.11 | . Q . . . V |
| 4.083 | 27.7437 | 34.31 | . Q . . . V |
| 4.167 | 27.9630 | 31.83 | . Q . . . V |
| 4.250 | 28.1680 | 29.77 | . Q . . . V |
| 4.333 | 28.3612 | 28.05 | . Q . . . V |



| | | | |
|---|---|---|---|
| 4.417 | 28.5435 | 26.46 | . Q . . . V . |
| 4.500 | 28.7165 | 25.13 | . Q . . . V . |
| 4.583 | 28.8806 | 23.82 | . Q . . . V . |
| 4.667 | 29.0359 | 22.56 | . Q . . . V . |
| 4.750 | 29.1836 | 21.44 | . Q . . . V . |
| 4.833 | 29.3230 | 20.24 | . Q . . . V . |
| 4.917 | 29.4542 | 19.05 | . Q . . . V . |
| 5.000 | 29.5773 | 17.87 | . Q . . . V . |
| 5.083 | 29.6931 | 16.82 | . Q . . . V . |
| 5.167 | 29.8019 | 15.80 | . Q . . . V . |
| 5.250 | 29.9039 | 14.80 | .Q . . . V . |
| 5.333 | 29.9983 | 13.71 | .Q . . . V . |
| 5.417 | 30.0860 | 12.74 | .Q . . . V . |
| 5.500 | 30.1689 | 12.03 | .Q . . . V . |
| 5.583 | 30.2463 | 11.24 | .Q . . . V . |
| 5.667 | 30.3180 | 10.41 | .Q . . . V . |
| 5.750 | 30.3842 | 9.61 | .Q . . . V. |
| 5.833 | 30.4454 | 8.89 | .Q . . . V. |
| 5.917 | 30.5023 | 8.25 | .Q . . . V. |
| 6.000 | 30.5551 | 7.68 | .Q . . . V. |
| 6.083 | 30.6035 | 7.02 | Q . . . V. |
| 6.167 | 30.6458 | 6.15 | Q . . . V. |
| 6.250 | 30.6815 | 5.18 | Q . . . V. |
| 6.333 | 30.7111 | 4.29 | Q . . . V. |
| 6.417 | 30.7371 | 3.78 | Q . . . V. |
| 6.500 | 30.7617 | 3.57 | Q . . . V. |
| 6.583 | 30.7850 | 3.38 | Q . . . V. |
| 6.667 | 30.8074 | 3.25 | Q . . . V. |
| 6.750 | 30.8293 | 3.19 | Q . . . V. |
| 6.833 | 30.8508 | 3.12 | Q . . . V. |
| 6.917 | 30.8717 | 3.04 | Q . . . V. |
| 7.000 | 30.8922 | 2.97 | Q . . . V. |
| 7.083 | 30.9121 | 2.90 | Q . . . V. |
| 7.167 | 30.9315 | 2.81 | Q . . . V. |
| 7.250 | 30.9501 | 2.71 | Q . . . V. |
| 7.333 | 30.9682 | 2.62 | Q . . . V. |
| 7.417 | 30.9856 | 2.52 | Q . . . V. |
| 7.500 | 31.0021 | 2.40 | Q . . . V. |
| 7.583 | 31.0178 | 2.28 | Q . . . V. |
| 7.667 | 31.0327 | 2.17 | Q . . . V. |
| 7.750 | 31.0469 | 2.06 | Q . . . V. |
| 7.833 | 31.0602 | 1.94 | Q . . . V. |
| 7.917 | 31.0725 | 1.77 | Q . . . V. |
| 8.000 | 31.0832 | 1.57 | Q . . . V. |
| 8.083 | 31.0930 | 1.42 | Q . . . V. |
| 8.167 | 31.1009 | 1.14 | Q . . . V. |
| 8.250 | 31.1065 | 0.82 | Q . . . V. |
| 8.333 | 31.1097 | 0.46 | Q . . . V. |
| 8.417 | 31.1110 | 0.19 | Q . . . V. |
| 8.500 | 31.1118 | 0.12 | Q . . . V. |
| 8.583 | 31.1122 | 0.06 | Q . . . V. |
| 8.667 | 31.1123 | 0.01 | Q . . . V. |

FLOW PROCESS FROM NODE 118.00 TO NODE 122.00 IS CODE = 4

>>>>>MODEL PIPEFLOW ROUTING OF STREAM #2<<<<<

MODEL PIPEFLOW ROUTING OF STREAM 2 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR

EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
(0.938)(DIAMETER):

PIPELENGTH(FT) = 20.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 885.00
DOWNSTREAM ELEVATION(FT) = 883.50
PIPE DIAMETER(FT) = 5.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

| TIME (HRS) | INFLOW (CFS) | VELOCITY (FPS) | OUTFLOW (CFS) | UPSTREAM PONDING(AF) |
|---|---|---|---|---|
| 1.000 | 41.06 | 19.49 | 41.05 | 0.000 |
| 1.083 | 42.66 | 19.67 | 42.66 | 0.000 |
| 1.167 | 46.71 | 20.13 | 46.70 | 0.000 |
| 1.250 | 52.52 | 20.78 | 52.51 | 0.000 |
| 1.333 | 57.97 | 21.39 | 57.96 | 0.000 |
| 1.417 | 61.93 | 21.83 | 61.92 | 0.000 |
| 1.500 | 65.89 | 22.28 | 65.88 | 0.000 |
| 1.583 | 70.87 | 22.84 | 70.86 | 0.000 |
| 1.667 | 77.03 | 23.38 | 77.01 | 0.000 |
| 1.750 | 82.16 | 23.82 | 82.15 | 0.000 |
| 1.833 | 87.88 | 24.32 | 87.87 | 0.000 |
| 1.917 | 95.25 | 24.96 | 95.24 | 0.000 |
| 2.000 | 101.61 | 25.51 | 101.60 | 0.000 |
| 2.083 | 104.86 | 25.79 | 104.85 | 0.000 |
| 2.167 | 109.06 | 26.11 | 109.06 | 0.000 |
| 2.250 | 118.01 | 26.70 | 117.99 | 0.000 |
| 2.333 | 130.88 | 27.56 | 130.85 | 0.000 |
| 2.417 | 148.24 | 28.63 | 148.21 | 0.000 |
| 2.500 | 167.14 | 29.63 | 167.11 | 0.000 |
| 2.583 | 193.30 | 30.96 | 193.26 | 0.000 |
| 2.667 | 226.83 | 32.39 | 226.78 | 0.000 |
| 2.750 | 243.14 | 32.92 | 243.11 | 0.000 |
| 2.833 | 234.75 | 32.64 | 234.76 | 0.000 |
| 2.917 | 200.49 | 31.31 | 200.54 | 0.000 |
| 3.000 | 162.32 | 29.38 | 162.38 | 0.000 |
| 3.083 | 134.99 | 27.83 | 135.03 | 0.000 |
| 3.167 | 113.14 | 26.38 | 113.18 | 0.000 |
| 3.250 | 94.68 | 24.91 | 94.71 | 0.000 |
| 3.333 | 81.21 | 23.74 | 81.24 | 0.000 |
| 3.417 | 71.37 | 22.89 | 71.39 | 0.000 |
| 3.500 | 63.81 | 22.04 | 63.83 | 0.000 |
| 3.583 | 57.36 | 21.32 | 57.37 | 0.000 |
| 3.667 | 52.18 | 20.74 | 52.20 | 0.000 |
| 3.750 | 47.85 | 20.26 | 47.86 | 0.000 |
| 3.833 | 43.78 | 19.80 | 43.79 | 0.000 |
| 3.917 | 40.37 | 19.42 | 40.38 | 0.000 |
| 4.000 | 37.11 | 19.05 | 37.12 | 0.000 |
| 4.083 | 34.31 | 18.17 | 34.31 | 0.000 |
| 4.167 | 31.83 | 16.86 | 31.83 | 0.000 |
| 4.250 | 29.77 | 15.77 | 29.77 | 0.000 |
| 4.333 | 28.05 | 14.86 | 28.05 | 0.000 |
| 4.417 | 26.46 | 14.02 | 26.46 | 0.000 |
| 4.500 | 25.13 | 13.31 | 25.13 | 0.000 |
| 4.583 | 23.82 | 12.62 | 23.82 | 0.000 |
| 4.667 | 22.56 | 11.95 | 22.56 | 0.000 |
| 4.750 | 21.44 | 11.36 | 21.44 | 0.000 |
| 4.833 | 20.24 | 10.72 | 20.24 | 0.000 |



| | | | | |
|---|---|---|---|---|
| 4.917 | 19.05 | 10.09 | 19.05 | 0.000 |
| 5.000 | 17.87 | 9.47 | 17.87 | 0.000 |

**********
FLOW PROCESS FROM NODE 122.00 TO NODE 122.00 IS CODE = 7
---
>>>>>STREAM NUMBER 2 ADDED TO STREAM NUMBER 1<<<<<
==========

**********
FLOW PROCESS FROM NODE 122.00 TO NODE 122.00 IS CODE = 6
---
>>>>>STREAM NUMBER 2 CLEARED AND SET TO ZERO<<<<<
==========

**********
FLOW PROCESS FROM NODE 122.00 TO NODE 122.00 IS CODE = 11
---
>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
==========

STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 250.0 500.0 750.0 1000.0 |
|---|---|---|---|
| 0.083 | 0.0053 | 0.77 | Q |
| 0.167 | 0.0291 | 3.46 | Q |
| 0.250 | 0.0839 | 7.95 | Q |
| 0.333 | 0.2238 | 20.32 | Q |
| 0.417 | 0.6318 | 59.24 | V Q |
| 0.500 | 1.2369 | 87.87 | V Q |
| 0.583 | 1.8740 | 92.51 | V Q |
| 0.667 | 2.6158 | 107.70 | V Q |
| 0.750 | 3.4383 | 119.43 | .V Q |
| 0.833 | 4.3426 | 131.31 | .V Q |
| 0.917 | 5.2789 | 135.95 | .V Q |
| 1.000 | 6.2193 | 136.54 | . V Q |
| 1.083 | 7.2159 | 144.70 | . V Q |
| 1.167 | 8.3453 | 164.00 | . V Q |
| 1.250 | 9.6423 | 188.32 | . V Q |
| 1.333 | 11.0595 | 205.78 | . V Q |
| 1.417 | 12.5591 | 217.74 | . V Q |
| 1.500 | 14.1622 | 232.77 | . V Q. |
| 1.583 | 15.9338 | 257.23 | . V Q |
| 1.667 | 17.8475 | 277.88 | . V .Q |
| 1.750 | 19.8740 | 294.24 | . V .Q |
| 1.833 | 22.0815 | 320.53 | . V . Q |
| 1.917 | 24.4973 | 350.78 | . V. Q |
| 2.000 | 27.0304 | 367.81 | . V Q |
| 2.083 | 29.6279 | 377.15 | . .V Q |
| 2.167 | 32.3420 | 394.09 | . . V Q |
| 2.250 | 35.3279 | 433.54 | . . V Q |
| 2.333 | 38.7208 | 492.64 | . . V Q. |
| 2.417 | 42.5526 | 556.38 | . . V . Q |
| 2.500 | 46.8627 | 625.83 | . . V . Q |
| 2.583 | 52.0516 | 753.43 | . . V. Q |
| 2.667 | 58.1110 | 879.81 | . . .V . Q |
| 2.750 | 64.4863 | 925.70 | . . . V . Q |
| 2.833 | 70.3022 | 844.47 | . . . V . Q |
| 2.917 | 75.0084 | 683.33 | . . . Q . |

| | | | |
|---|---|---|---|
| 3.000 | 78.7883 | 548.85 | .Q V. |
| 3.083 | 81.9341 | 456.76 | .Q V |
| 3.167 | 84.5307 | 377.03 | .Q .V |
| 3.250 | 86.6605 | 309.25 | .Q .V |
| 3.333 | 88.4792 | 264.07 | .Q .V |
| 3.417 | 90.0739 | 231.55 | .Q. .V |
| 3.500 | 91.4940 | 206.20 | .Q . .V |
| 3.583 | 92.7656 | 184.64 | .Q . .V |
| 3.667 | 93.9106 | 166.25 | .Q . .V |
| 3.750 | 94.9496 | 150.86 | .Q . .V |
| 3.833 | 95.8979 | 137.70 | .Q . .V |
| 3.917 | 96.7704 | 126.68 | .Q . .V |
| 4.000 | 97.5777 | 117.21 | .Q . .V |
| 4.083 | 98.3273 | 108.85 | .Q . .V |
| 4.167 | 99.0248 | 101.28 | .Q . .V |
| 4.250 | 99.6774 | 94.75 | .Q . .V |
| 4.333 | 100.2848 | 88.19 | .Q . .V |
| 4.417 | 100.8513 | 82.26 | .Q . .V |
| 4.500 | 101.3812 | 76.94 | .Q . .V |
| 4.583 | 101.8723 | 71.31 | .Q . .V |
| 4.667 | 102.3267 | 65.97 | .Q . .V |
| 4.750 | 102.7476 | 61.11 | .Q . .V |
| 4.833 | 103.1597 | 59.84 | .Q . .V |
| 4.917 | 103.5202 | 52.35 | .Q . .V |
| 5.000 | 103.8549 | 48.59 | .Q . .V |
| 5.083 | 104.1585 | 44.08 | .Q . .V |
| 5.167 | 104.4307 | 39.53 | .Q . .V |
| 5.250 | 104.6850 | 36.92 | .Q . .V |
| 5.333 | 104.9199 | 34.11 | .Q . .V. |
| 5.417 | 105.1254 | 29.84 | .Q . .V. |
| 5.500 | 105.3371 | 30.75 | .Q . .V. |
| 5.583 | 105.4808 | 20.86 | Q . .V. |
| 5.667 | 105.6025 | 17.67 | Q . .V. |
| 5.750 | 105.7561 | 22.29 | Q . .V. |
| 5.833 | 105.8561 | 14.53 | Q . .V. |
| 5.917 | 105.9701 | 16.55 | Q . .V. |
| 6.000 | 106.0791 | 15.83 | Q . .V. |
| 6.083 | 106.1936 | 16.63 | Q . .V. |
| 6.167 | 106.2858 | 13.38 | Q . .V. |
| 6.250 | 106.3745 | 12.89 | Q . .V. |
| 6.333 | 106.4562 | 11.86 | Q . .V. |
| 6.417 | 106.5327 | 11.10 | Q . .V. |
| 6.500 | 106.6033 | 10.25 | Q . .V. |
| 6.583 | 106.6766 | 10.64 | Q . .V. |
| 6.667 | 106.7440 | 9.79 | Q . .V. |
| 6.750 | 106.8039 | 8.70 | Q . .V. |
| 6.833 | 106.8613 | 8.34 | Q . .V. |
| 6.917 | 106.9151 | 7.81 | Q . .V. |
| 7.000 | 106.9807 | 9.53 | Q . .V. |
| 7.083 | 107.0245 | 6.36 | Q . .V. |
| 7.167 | 107.0624 | 5.50 | Q . .V. |
| 7.250 | 107.1131 | 7.36 | Q . .V. |
| 7.333 | 107.1372 | 3.50 | Q . .V. |
| 7.417 | 107.1882 | 7.40 | Q . .V. |
| 7.500 | 107.2149 | 3.88 | Q . .V. |
| 7.583 | 107.2576 | 6.20 | Q . .V. |
| 7.667 | 107.2921 | 5.02 | Q . .V. |
| 7.750 | 107.3182 | 3.78 | Q . .V. |
| 7.833 | 107.3372 | 2.76 | Q . .V. |
| 7.917 | 107.3521 | 2.16 | Q . .V. |
| 8.000 | 107.3643 | 1.78 | Q . .V. |
| 8.083 | 107.3746 | 1.49 | Q . .V. |
| 8.167 | 107.3824 | 1.14 | Q . .V. |
| 8.250 | 107.3882 | 0.83 | Q . .V. |



| | | | |
|---|---|---|---|
| 8.333 | 107.3917 | 0.50 | Q . . . V. |
| 8.417 | 107.3932 | 0.23 | Q . . . V. |
| 8.500 | 107.3941 | 0.13 | Q . . . V. |
| 8.583 | 107.3946 | 0.07 | Q . . . V. |
| 8.667 | 107.3947 | 0.01 | Q . . . V. |
| 8.750 | 107.3947 | 0.00 | Q . . . V. |

```
*******************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =   4
-------------------------------------------------------------------
  >>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<
===================================================================
```

MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
(0.938)(DIAMETER):

PIPELENGTH(FT) = 150.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 883.50
DOWNSTREAM ELEVATION(FT) = 883.00
PIPE DIAMETER(FT) = 12.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

| TIME (HRS) | INFLOW (CFS) | VELOCITY (FPS) | OUTFLOW (CFS) | UPSTREAM PONDING(AF) |
|---|---|---|---|---|
| 1.000 | 136.54 | 8.28 | 136.52 | 0.000 |
| 1.083 | 144.70 | 8.44 | 144.37 | 0.000 |
| 1.167 | 164.00 | 8.78 | 163.23 | 0.000 |
| 1.250 | 188.32 | 9.15 | 187.37 | 0.000 |
| 1.333 | 205.78 | 9.41 | 205.14 | 0.000 |
| 1.417 | 217.74 | 9.59 | 217.32 | 0.000 |
| 1.500 | 232.77 | 9.81 | 232.27 | 0.000 |
| 1.583 | 257.23 | 10.10 | 256.35 | 0.000 |
| 1.667 | 277.88 | 10.33 | 277.17 | 0.000 |
| 1.750 | 294.24 | 10.52 | 293.70 | 0.000 |
| 1.833 | 320.53 | 10.80 | 319.67 | 0.000 |
| 1.917 | 350.78 | 11.08 | 349.79 | 0.000 |
| 2.000 | 367.81 | 11.24 | 367.27 | 0.000 |
| 2.083 | 377.15 | 11.32 | 376.87 | 0.000 |
| 2.167 | 394.09 | 11.47 | 393.57 | 0.000 |
| 2.250 | 433.54 | 11.81 | 432.36 | 0.000 |
| 2.333 | 492.64 | 12.23 | 490.87 | 0.000 |
| 2.417 | 556.38 | 12.60 | 554.43 | 0.000 |
| 2.500 | 625.83 | 12.99 | 623.83 | 0.000 |
| 2.583 | 753.43 | 13.61 | 749.83 | 0.000 |
| 2.667 | 879.81 | 14.16 | 876.44 | 0.000 |
| 2.750 | 925.70 | 14.33 | 924.45 | 0.000 |
| 2.833 | 844.47 | 14.03 | 846.69 | 0.000 |
| 2.917 | 683.33 | 13.25 | 687.64 | 0.000 |
| 3.000 | 548.85 | 12.55 | 552.77 | 0.000 |
| 3.083 | 456.76 | 12.00 | 459.60 | 0.000 |
| 3.167 | 377.03 | 11.32 | 379.40 | 0.000 |
| 3.250 | 309.25 | 10.69 | 311.45 | 0.000 |
| 3.333 | 264.07 | 10.17 | 265.56 | 0.000 |

| | | | | |
|---|---|---|---|---|
| 3.417 | 231.55 | 9.80 | 232.71 | 0.000 |
| 3.500 | 206.20 | 9.41 | 207.07 | 0.000 |
| 3.583 | 184.64 | 9.09 | 185.43 | 0.000 |
| 3.667 | 166.25 | 8.81 | 166.97 | 0.000 |
| 3.750 | 150.86 | 8.56 | 151.49 | 0.000 |
| 3.833 | 137.70 | 8.31 | 138.22 | 0.000 |
| 3.917 | 126.68 | 8.09 | 127.15 | 0.000 |
| 4.000 | 117.21 | 7.91 | 117.63 | 0.000 |
| 4.083 | 108.85 | 7.75 | 109.23 | 0.000 |
| 4.167 | 101.28 | 7.60 | 101.64 | 0.000 |
| 4.250 | 94.75 | 7.47 | 95.08 | 0.000 |
| 4.333 | 88.19 | 7.34 | 88.53 | 0.000 |
| 4.417 | 82.26 | 7.23 | 82.57 | 0.000 |
| 4.500 | 76.94 | 7.08 | 77.20 | 0.000 |
| 4.583 | 71.31 | 6.56 | 71.31 | 0.000 |
| 4.667 | 65.97 | 6.07 | 65.97 | 0.000 |
| 4.750 | 61.11 | 5.62 | 61.11 | 0.000 |
| 4.833 | 59.84 | 5.50 | 59.84 | 0.000 |
| 4.917 | 52.35 | 4.81 | 52.35 | 0.000 |
| 5.000 | 48.59 | 4.47 | 48.59 | 0.000 |

```
****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE    123.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #3)

         WATERSHED AREA =       27.000 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.150 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         MOUNTAIN S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.273
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         USER-ENTERED RAINFALL =  2.65 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.0) = 0.9999


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  55.556


============================================================================
                      UNIT HYDROGRAPH DETERMINATION
----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                9.253                30.213
        2               41.956               106.786
        3               59.426                57.047
        4               68.455                29.480
        5               74.682                20.336
        6               79.230                14.849
        7               82.796                11.643
        8               85.484                 8.777
```



| | | |
|---|---|---|
| 9 | 87.718 | 7.296 |
| 10 | 89.697 | 6.464 |
| 11 | 91.462 | 5.763 |
| 12 | 92.991 | 4.990 |
| 13 | 94.319 | 4.336 |
| 14 | 95.426 | 3.615 |
| 15 | 96.382 | 3.123 |
| 16 | 97.182 | 2.611 |
| 17 | 97.915 | 2.395 |
| 18 | 98.213 | 0.973 |
| 19 | 98.431 | 0.713 |
| 20 | 98.649 | 0.712 |
| 21 | 98.867 | 0.712 |
| 22 | 99.086 | 0.713 |
| 23 | 99.303 | 0.712 |
| 24 | 99.521 | 0.712 |
| 25 | 99.739 | 0.712 |
| 26 | 99.957 | 0.712 |
| 27 | 100.000 | 0.139 |

| UNIT PERIOD (NUMBER) | UNIT RAINFALL (INCHES) | UNIT SOIL-LOSS (INCHES) | EFFECTIVE RAINFALL (INCHES) |
|---|---|---|---|
| 1 | 0.0344 | 0.0227 | 0.0117 |
| 2 | 0.0344 | 0.0227 | 0.0117 |
| 3 | 0.0291 | 0.0227 | 0.0064 |
| 4 | 0.0397 | 0.0227 | 0.0170 |
| 5 | 0.0397 | 0.0227 | 0.0170 |
| 6 | 0.0477 | 0.0227 | 0.0249 |
| 7 | 0.0397 | 0.0227 | 0.0170 |
| 8 | 0.0477 | 0.0227 | 0.0249 |
| 9 | 0.0477 | 0.0227 | 0.0249 |
| 10 | 0.0397 | 0.0227 | 0.0170 |
| 11 | 0.0424 | 0.0227 | 0.0196 |
| 12 | 0.0477 | 0.0227 | 0.0249 |
| 13 | 0.0583 | 0.0227 | 0.0355 |
| 14 | 0.0583 | 0.0227 | 0.0355 |
| 15 | 0.0583 | 0.0227 | 0.0355 |
| 16 | 0.0530 | 0.0227 | 0.0302 |
| 17 | 0.0689 | 0.0227 | 0.0461 |
| 18 | 0.0715 | 0.0227 | 0.0488 |
| 19 | 0.0636 | 0.0227 | 0.0408 |
| 20 | 0.0715 | 0.0227 | 0.0488 |
| 21 | 0.0874 | 0.0227 | 0.0647 |
| 22 | 0.0821 | 0.0227 | 0.0594 |
| 23 | 0.0768 | 0.0227 | 0.0541 |
| 24 | 0.0795 | 0.0227 | 0.0567 |
| 25 | 0.0821 | 0.0227 | 0.0594 |
| 26 | 0.1113 | 0.0227 | 0.0885 |
| 27 | 0.1325 | 0.0227 | 0.1097 |
| 28 | 0.0927 | 0.0227 | 0.0700 |
| 29 | 0.1802 | 0.0227 | 0.1574 |
| 30 | 0.1934 | 0.0227 | 0.1707 |
| 31 | 0.2173 | 0.0227 | 0.1945 |
| 32 | 0.1563 | 0.0227 | 0.1336 |
| 33 | 0.0530 | 0.0227 | 0.0302 |
| 34 | 0.0477 | 0.0227 | 0.0249 |
| 35 | 0.0477 | 0.0227 | 0.0249 |
| 36 | 0.0159 | 0.0143 | 0.0016 |

TOTAL STORM RAINFALL(INCHES) = 2.65
TOTAL SOIL-LOSS(INCHES) = 0.81
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.84

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.8238
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 4.1360



3 - H O U R  S T O R M
R U N O F F  H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Interval)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 12.5 25.0 37.5 50.0 |
|---|---|---|---|
| 0.083 | 0.0024 | 0.35 | Q |
| 0.167 | 0.0135 | 1.60 | VQ |
| 0.250 | 0.0280 | 2.11 | VQ |
| 0.333 | 0.0432 | 2.21 | VQ |
| 0.417 | 0.0658 | 3.28 | V Q |
| 0.500 | 0.0943 | 4.14 | V Q |
| 0.583 | 0.1293 | 5.09 | .V Q |
| 0.667 | 0.1649 | 5.17 | .V Q |
| 0.750 | 0.2061 | 5.98 | .V Q |
| 0.833 | 0.2494 | 6.28 | . V Q |
| 0.917 | 0.2894 | 5.82 | . V Q |
| 1.000 | 0.3311 | 6.05 | . VQ |
| 1.083 | 0.3795 | 7.03 | . V Q |
| 1.167 | 0.4384 | 8.54 | . V Q |
| 1.250 | 0.5029 | 9.37 | . V Q |
| 1.333 | 0.5696 | 9.68 | . V Q |
| 1.417 | 0.6381 | 9.95 | . VQ |
| 1.500 | 0.7185 | 11.68 | . V Q. |
| 1.583 | 0.8058 | 12.67 | . V Q |
| 1.667 | 0.8935 | 12.73 | . V Q |
| 1.750 | 0.9903 | 14.06 | . V.Q |
| 1.833 | 1.1016 | 16.16 | . V Q |
| 1.917 | 1.2165 | 16.68 | . .V Q |
| 2.000 | 1.3310 | 16.63 | . . VQ |
| 2.083 | 1.4485 | 17.06 | . . QV |
| 2.167 | 1.5760 | 18.52 | . . QV |
| 2.250 | 1.7320 | 22.65 | . . V Q . |
| 2.333 | 1.9086 | 25.63 | . . V Q |
| 2.417 | 2.0897 | 26.31 | . . VQ |
| 2.500 | 2.3319 | 35.16 | . . . V Q . |
| 2.583 | 2.6219 | 42.11 | . . . V . Q |
| 2.667 | 2.9394 | 46.10 | . . . V . Q |
| 2.750 | 3.2151 | 40.02 | . . . .VQ |
| 2.833 | 3.4053 | 27.63 | . . . Q . V |
| 2.917 | 3.5508 | 21.12 | . . Q . . V |
| 3.000 | 3.6691 | 17.18 | . . Q . . V |
| 3.083 | 3.7556 | 12.57 | . Q . . V |
| 3.167 | 3.8219 | 9.61 | . Q . . . V |
| 3.250 | 3.8756 | 7.80 | . Q . . . V |
| 3.333 | 3.9207 | 6.55 | . Q . . . V |
| 3.417 | 3.9591 | 5.58 | . Q . . . V |
| 3.500 | 3.9918 | 4.74 | . Q . . . V |
| 3.583 | 4.0193 | 4.00 | . Q . . . V |
| 3.667 | 4.0421 | 3.31 | . Q . . . V. |
| 3.750 | 4.0613 | 2.78 | . Q . . . V. |
| 3.833 | 4.0767 | 2.25 | .Q . . . V. |
| 3.917 | 4.0888 | 1.76 | .Q . . . V. |
| 4.000 | 4.0979 | 1.32 | .Q . . . V. |
| 4.083 | 4.1048 | 1.00 | Q . . . V. |
| 4.167 | 4.1108 | 0.87 | Q . . . V. |
| 4.250 | 4.1162 | 0.78 | Q . . . V. |
| 4.333 | 4.1208 | 0.67 | Q . . . V. |

```
  4.417     4.1249     0.59  Q          .          .          .          V.
  4.500     4.1286     0.54  Q          .          .          .          V.
  4.583     4.1316     0.44  Q          .          .          .          V.
  4.667     4.1337     0.32  Q          .          .          .          V.
  4.750     4.1350     0.18  Q          .          .          .          V.
  4.833     4.1355     0.08  Q          .          .          .          V.
  4.917     4.1358     0.04  Q          .          .          .          V.
  5.000     4.1359     0.02  Q          .          .          .          V.
  5.083     4.1360     0.00  Q          .          .          .          V.

**********************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =   7
----------------------------------------------------------------------
  >>>>>STREAM NUMBER 3 ADDED TO STREAM NUMBER 1<<<<<
======================================================================

**********************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =  11
----------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
======================================================================

          STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      250.0     500.0     750.0    1000.0
----------------------------------------------------------------------
   1.000      6.4937    142.57  . V  Q    .         .         .         .
   1.083      7.5364    151.40  . V   Q   .         .         .         .
   1.167      8.7194    171.77  .  V  Q   .         .         .         .
   1.250     10.0743    196.73  .  V   Q  .         .         .         .
   1.333     11.5538    214.82  .   V   Q .         .         .         .
   1.417     13.1190    227.27  .   V    Q.         .         .         .
   1.500     14.7991    243.95  .    V   Q.         .         .         .
   1.583     16.6518    269.02  .    V    Q         .         .         .
   1.667     18.6484    289.90  .     V   .Q        .         .         .
   1.750     20.7680    307.76  .      V  . Q       .         .         .
   1.833     23.0809    335.83  .       V .  Q      .         .         .
   1.917     25.6048    366.47  .        V.   Q     .         .         .
   2.000     28.2487    383.90  .         V    Q    .         .         .
   2.083     30.9617    393.92  .         .V   Q    .         .         .
   2.167     33.7998    412.09  .         . V   Q   .         .         .
   2.250     36.9335    455.01  .         .  V    Q .         .         .
   2.333     40.4907    516.50  .         .   V     Q         .         .
   2.417     44.4902    580.74  .         .    V     .  Q     .         .
   2.500     49.0287    658.99  .         .      V  .    Q    .         .
   2.583     54.4829    791.94  .         .        V.         .Q        .
   2.667     60.8365    922.54  .         .          .V        .    Q   .
   2.750     67.4789    964.47  .         .           .   V    .      Q .
   2.833     73.5003    874.31  .         .            .     V .   Q    .
   2.917     78.3816    708.76  .         .             .      Q .      .
   3.000     82.3068    569.95  .         .              . Q    V.       .
   3.083     85.5587    472.17  .         .            Q .       V       .
   3.167     88.2378    389.01  .         .    Q       .        .V       .
   3.250     90.4365    319.25  .         . Q          .         . V     .
   3.333     92.3105    272.11  .         Q            .         .  V    .
   3.417     93.9516    238.29  .        Q.            .         .  V    .
   3.500     95.4104    211.81  .       Q .            .         .   V   .
   3.583     96.7150    189.43  .      Q  .            .         .   V   .
   3.667     97.8878    170.28  .     Q   .            .         .    V  .
   3.750     98.9502    154.27  .     Q   .            .         .    V  .
   3.833     99.9176    140.47  .    Q    .            .         .    V  .
```



```
  3.917    100.8054    128.90  .    Q    .         .         .         V  .
  4.000    101.6246    118.95  .   Q     .         .         .         V  .
  4.083    102.3838    110.24  .   Q     .         .         .         V  .
  4.167    103.0898    102.51  .   Q     .         .         .         V  .
  4.250    103.7499     95.85  .  Q      .         .         .          V .
  4.333    104.3642     89.20  .  Q      .         .         .          V .
  4.417    104.9370     83.16  .  Q      .         .         .          V .
  4.500    105.4723     77.73  .  Q      .         .         .          V .
  4.583    105.9665     71.75  . Q       .         .         .           V .
  4.667    106.4230     66.29  . Q       .         .         .           V .
  4.750    106.8451     61.29  . Q       .         .         .           V .
  4.833    107.2578     59.92  . Q       .         .         .           V .
  4.917    107.6186     52.39  . Q       .         .         .           V .
  5.000    107.9534     48.61  .Q        .         .         .           V .

**********************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    133.00 IS CODE =   4
----------------------------------------------------------------------
  >>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<
======================================================================

      MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
      STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
      VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
      EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
      OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
      UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
      (0.938)(DIAMETER):

      PIPELENGTH(FT) =    1400.00     MANNINGS FACTOR = 0.013
      UPSTREAM ELEVATION(FT) =     883.00
      DOWNSTREAM ELEVATION(FT) =     820.00
      PIPE DIAMETER(FT) =  12.00

      NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

       TIME      INFLOW   VELOCITY   OUTFLOW    UPSTREAM
      (HRS)      (CFS)     (FPS)     (CFS)     PONDING(AF)
       1.000    142.57     13.11    143.36       0.000
       1.083    151.40     13.92    151.40       0.000
       1.167    171.77     15.80    171.77       0.000
       1.250    196.73     18.09    196.73       0.000
       1.333    214.82     19.75    214.82       0.000
       1.417    227.27     20.90    227.27       0.000
       1.500    243.95     22.43    243.95       0.000
       1.583    269.02     24.74    269.02       0.000
       1.667    289.90     26.32    289.25       0.000
       1.750    307.76     26.67    305.31       0.000
       1.833    335.83     27.21    332.10       0.000
       1.917    366.47     27.81    362.57       0.000
       2.000    383.90     28.15    381.75       0.000
       2.083    393.92     28.34    392.71       0.000
       2.167    412.09     28.70    409.94       0.000
       2.250    455.01     29.53    450.12       0.000
       2.333    516.50     30.73    509.96       0.000
       2.417    580.74     31.93    574.31       0.000
       2.500    658.99     33.11    650.98       0.000
       2.583    791.94     35.11    779.55       0.000
       2.667    922.54     36.83    910.93       0.000
```

| | | | | |
|---|---|---|---|---|
| 2.750 | 964.47 | 37.32 | 960.74 | 0.000 |
| 2.833 | 874.31 | 36.28 | 882.47 | 0.000 |
| 2.917 | 708.76 | 33.86 | 723.53 | 0.000 |
| 3.000 | 569.95 | 31.77 | 583.92 | 0.000 |
| 3.083 | 472.17 | 29.87 | 482.12 | 0.000 |
| 3.167 | 389.01 | 28.25 | 398.53 | 0.000 |
| 3.250 | 319.25 | 26.89 | 328.11 | 0.000 |
| 3.333 | 272.11 | 25.02 | 276.76 | 0.000 |
| 3.417 | 238.29 | 21.91 | 238.29 | 0.000 |
| 3.500 | 211.81 | 19.48 | 211.81 | 0.000 |
| 3.583 | 189.43 | 17.42 | 189.43 | 0.000 |
| 3.667 | 170.28 | 15.66 | 170.28 | 0.000 |
| 3.750 | 154.27 | 14.19 | 154.27 | 0.000 |
| 3.833 | 140.47 | 12.92 | 140.47 | 0.000 |
| 3.917 | 128.90 | 11.85 | 128.90 | 0.000 |
| 4.000 | 118.95 | 10.94 | 118.95 | 0.000 |
| 4.083 | 110.24 | 10.14 | 110.24 | 0.000 |
| 4.167 | 102.51 | 9.43 | 102.51 | 0.000 |
| 4.250 | 95.85 | 8.81 | 95.85 | 0.000 |
| 4.333 | 89.20 | 8.20 | 89.20 | 0.000 |
| 4.417 | 83.16 | 7.65 | 83.16 | 0.000 |
| 4.500 | 77.73 | 7.15 | 77.73 | 0.000 |
| 4.583 | 71.75 | 6.60 | 71.75 | 0.000 |
| 4.667 | 66.29 | 6.10 | 66.29 | 0.000 |
| 4.750 | 61.29 | 5.64 | 61.29 | 0.000 |
| 4.833 | 59.92 | 5.51 | 59.92 | 0.000 |
| 4.917 | 52.39 | 4.82 | 52.39 | 0.000 |
| 5.000 | 48.61 | 4.47 | 50.75 | 0.000 |

```
****************************************************************************
 FLOW PROCESS FROM NODE     130.00 TO NODE     133.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

     (UNIT-HYDROGRAPH ADDED TO STREAM #4)

       WATERSHED AREA =       48.530 ACRES
       BASEFLOW =    0.000 CFS/SQUARE-MILE
       *USER ENTERED "LAG" TIME =     0.200 HOURS
        CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
        THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
        MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
       MOUNTAIN S-GRAPH SELECTED
       UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.207
       LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
       USER-ENTERED RAINFALL =  2.65 INCHES
       RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
       RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9998


       UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
       UNIT INTERVAL PERCENTAGE OF LAG-TIME =  41.667


============================================================================
                     UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
```



| | | |
|---|---|---|
| 1 | 5.875 | 34.480 |
| 2 | 29.910 | 141.062 |
| 3 | 50.870 | 123.020 |
| 4 | 60.859 | 58.623 |
| 5 | 67.553 | 39.289 |
| 6 | 72.654 | 29.938 |
| 7 | 76.550 | 22.866 |
| 8 | 79.733 | 18.682 |
| 9 | 82.417 | 15.755 |
| 10 | 84.563 | 12.594 |
| 11 | 86.364 | 10.573 |
| 12 | 87.985 | 9.509 |
| 13 | 89.466 | 8.695 |
| 14 | 90.822 | 7.956 |
| 15 | 92.076 | 7.363 |
| 16 | 93.170 | 6.418 |
| 17 | 94.179 | 5.923 |
| 18 | 95.013 | 4.896 |
| 19 | 95.828 | 4.781 |
| 20 | 96.482 | 3.839 |
| 21 | 97.081 | 3.518 |
| 22 | 97.681 | 3.519 |
| 23 | 98.076 | 2.320 |
| 24 | 98.240 | 0.962 |
| 25 | 98.404 | 0.961 |
| 26 | 98.567 | 0.958 |
| 27 | 98.731 | 0.961 |
| 28 | 98.894 | 0.960 |
| 29 | 99.058 | 0.962 |
| 30 | 99.222 | 0.960 |
| 31 | 99.385 | 0.960 |
| 32 | 99.549 | 0.960 |
| 33 | 99.712 | 0.960 |
| 34 | 99.876 | 0.960 |
| 35 | 100.000 | 0.729 |

| UNIT PERIOD (NUMBER) | UNIT RAINFALL (INCHES) | UNIT SOIL-LOSS (INCHES) | EFFECTIVE RAINFALL (INCHES) |
|---|---|---|---|
| 1 | 0.0344 | 0.0172 | 0.0172 |
| 2 | 0.0344 | 0.0172 | 0.0172 |
| 3 | 0.0291 | 0.0172 | 0.0119 |
| 4 | 0.0397 | 0.0172 | 0.0225 |
| 5 | 0.0397 | 0.0172 | 0.0225 |
| 6 | 0.0477 | 0.0172 | 0.0304 |
| 7 | 0.0397 | 0.0172 | 0.0225 |
| 8 | 0.0477 | 0.0172 | 0.0304 |
| 9 | 0.0477 | 0.0172 | 0.0304 |
| 10 | 0.0397 | 0.0172 | 0.0225 |
| 11 | 0.0424 | 0.0172 | 0.0251 |
| 12 | 0.0477 | 0.0172 | 0.0304 |
| 13 | 0.0583 | 0.0172 | 0.0410 |
| 14 | 0.0583 | 0.0172 | 0.0410 |
| 15 | 0.0583 | 0.0172 | 0.0410 |
| 16 | 0.0530 | 0.0172 | 0.0357 |
| 17 | 0.0689 | 0.0172 | 0.0516 |
| 18 | 0.0715 | 0.0172 | 0.0543 |
| 19 | 0.0636 | 0.0172 | 0.0463 |
| 20 | 0.0715 | 0.0172 | 0.0543 |
| 21 | 0.0874 | 0.0172 | 0.0702 |
| 22 | 0.0821 | 0.0172 | 0.0649 |
| 23 | 0.0768 | 0.0172 | 0.0596 |
| 24 | 0.0795 | 0.0172 | 0.0622 |
| 25 | 0.0821 | 0.0172 | 0.0649 |
| 26 | 0.1113 | 0.0172 | 0.0940 |
| 27 | 0.1325 | 0.0172 | 0.1152 |
| 28 | 0.0927 | 0.0172 | 0.0755 |
| 29 | 0.1802 | 0.0172 | 0.1629 |
| 30 | 0.1934 | 0.0172 | 0.1762 |
| 31 | 0.2173 | 0.0172 | 0.2000 |
| 32 | 0.1563 | 0.0172 | 0.1391 |
| 33 | 0.0530 | 0.0172 | 0.0357 |
| 34 | 0.0477 | 0.0172 | 0.0304 |
| 35 | 0.0477 | 0.0172 | 0.0304 |
| 36 | 0.0159 | 0.0143 | 0.0016 |

TOTAL STORM RAINFALL(INCHES) = 2.65
TOTAL SOIL-LOSS(INCHES) = 0.62
TOTAL EFFECTIVE RAINFALL(INCHES) = 2.03

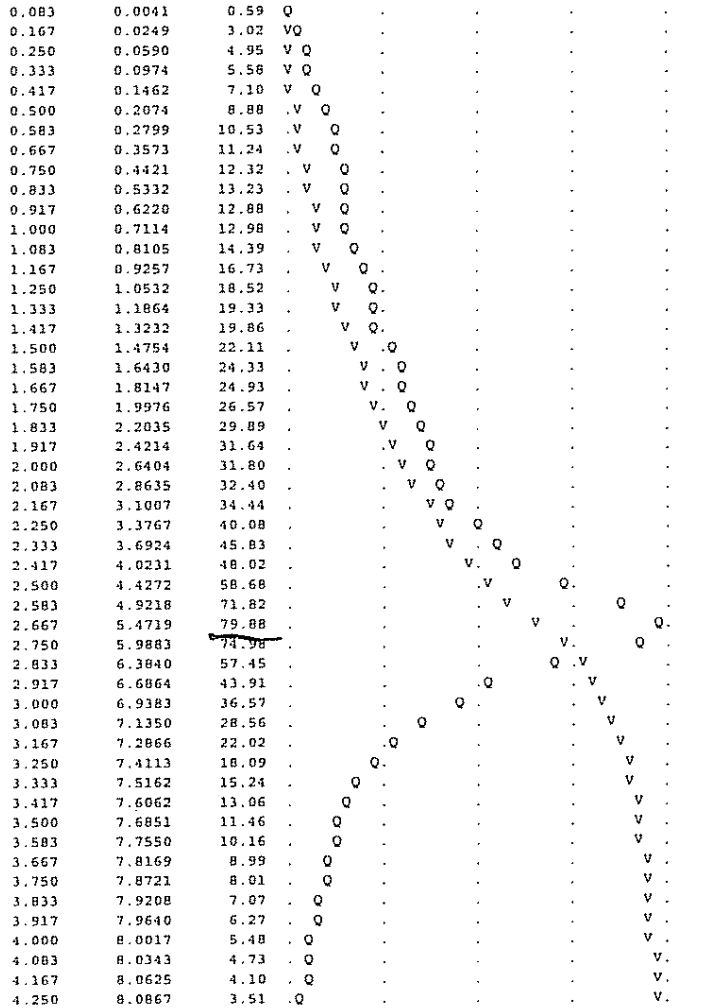
TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 2.4995
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 8.2112



3 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) |
|---|---|---|
| 0.083 | 0.0041 | 0.59 |
| 0.167 | 0.0249 | 3.02 |
| 0.250 | 0.0590 | 4.95 |
| 0.333 | 0.0974 | 5.58 |
| 0.417 | 0.1462 | 7.10 |
| 0.500 | 0.2074 | 8.88 |
| 0.583 | 0.2799 | 10.53 |
| 0.667 | 0.3573 | 11.24 |
| 0.750 | 0.4421 | 12.32 |
| 0.833 | 0.5332 | 13.23 |
| 0.917 | 0.6220 | 12.88 |
| 1.000 | 0.7114 | 12.98 |
| 1.083 | 0.8105 | 14.39 |
| 1.167 | 0.9257 | 16.73 |
| 1.250 | 1.0532 | 18.52 |
| 1.333 | 1.1864 | 19.33 |
| 1.417 | 1.3232 | 19.86 |
| 1.500 | 1.4754 | 22.11 |
| 1.583 | 1.6430 | 24.33 |
| 1.667 | 1.8147 | 24.93 |
| 1.750 | 1.9976 | 26.57 |
| 1.833 | 2.2035 | 29.89 |
| 1.917 | 2.4214 | 31.64 |
| 2.000 | 2.6404 | 31.80 |
| 2.083 | 2.8635 | 32.40 |
| 2.167 | 3.1007 | 34.44 |
| 2.250 | 3.3767 | 40.08 |
| 2.333 | 3.6924 | 45.83 |
| 2.417 | 4.0231 | 48.02 |
| 2.500 | 4.4272 | 58.68 |
| 2.583 | 4.9218 | 71.82 |
| 2.667 | 5.4719 | 79.88 |
| 2.750 | 5.9883 | 74.98 |
| 2.833 | 6.3840 | 57.45 |
| 2.917 | 6.6864 | 43.91 |
| 3.000 | 6.9383 | 36.57 |
| 3.083 | 7.1350 | 28.56 |
| 3.167 | 7.2866 | 22.02 |
| 3.250 | 7.4113 | 18.09 |
| 3.333 | 7.5162 | 15.24 |
| 3.417 | 7.6062 | 13.06 |
| 3.500 | 7.6851 | 11.46 |
| 3.583 | 7.7550 | 10.16 |
| 3.667 | 7.8169 | 8.99 |
| 3.750 | 7.8721 | 8.01 |
| 3.833 | 7.9208 | 7.07 |
| 3.917 | 7.9640 | 6.27 |
| 4.000 | 8.0017 | 5.48 |
| 4.083 | 8.0343 | 4.73 |
| 4.167 | 8.0625 | 4.10 |
| 4.250 | 8.0867 | 3.51 |
| 4.333 | 8.1068 | 2.92 |



| | | | |
|---|---|---|---|
| 4.417 | 8.1229 | 2.34 | .Q . . . V. |
| 4.500 | 8.1355 | 1.82 | Q . . . V. |
| 4.583 | 8.1459 | 1.52 | Q . . . V. |
| 4.667 | 8.1554 | 1.37 | Q . . . V. |
| 4.750 | 8.1638 | 1.23 | Q . . . V. |
| 4.833 | 8.1716 | 1.13 | Q . . . V. |
| 4.917 | 8.1789 | 1.07 | Q . . . V. |
| 5.000 | 8.1858 | 1.00 | Q . . . V. |
| 5.083 | 8.1920 | 0.90 | Q . . . V. |
| 5.167 | 8.1975 | 0.80 | Q . . . V. |
| 5.250 | 8.2024 | 0.71 | Q . . . V. |
| 5.333 | 8.2062 | 0.55 | Q . . . V. |
| 5.417 | 8.2087 | 0.37 | Q . . . V. |
| 5.500 | 8.2101 | 0.20 | Q . . . V. |
| 5.583 | 8.2107 | 0.09 | Q . . . V. |
| 5.667 | 8.2111 | 0.05 | Q . . . V. |
| 5.750 | 8.2112 | 0.02 | Q . . . V. |
| 5.833 | 8.2112 | 0.00 | Q . . . V |

FLOW PROCESS FROM NODE 133.00 TO NODE 133.00 IS CODE = 7

>>>>>STREAM NUMBER 4 ADDED TO STREAM NUMBER 1<<<<<

FLOW PROCESS FROM NODE 133.00 TO NODE 133.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Interval)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 275.0 550.0 825.0 1100.0 |
|---|---|---|---|
| 1.000 | 6.8555 | 156.34 | . V Q . . . . |
| 1.083 | 7.9973 | 165.79 | . V Q . . . . |
| 1.167 | 9.2956 | 188.51 | . V Q . . . . |
| 1.250 | 10.7780 | 215.25 | . V Q . . . . |
| 1.333 | 12.3907 | 234.16 | . V Q . . . . |
| 1.417 | 14.0927 | 247.13 | . V Q . . . . |
| 1.500 | 15.9250 | 266.06 | . V Q. . . . |
| 1.583 | 17.9453 | 293.34 | . V Q . . . . |
| 1.667 | 20.1091 | 314.18 | . V .Q . . . . |
| 1.750 | 22.3947 | 331.88 | . V . Q . . . . |
| 1.833 | 24.8878 | 361.99 | . V . Q . . . . |
| 1.917 | 27.6027 | 394.21 | . V. Q . . . . |
| 2.000 | 30.4508 | 413.55 | . V Q . . . . |
| 2.083 | 33.3786 | 425.11 | . .V Q . . . . |
| 2.167 | 36.4390 | 444.38 | . . V Q . . . . |
| 2.250 | 39.8150 | 490.20 | . . V Q . . . . |
| 2.333 | 43.6428 | 555.79 | . . V Q . . . . |
| 2.417 | 47.9288 | 622.33 | . . V . Q . . . . |
| 2.500 | 52.8162 | 709.66 | . . V . Q . . . . |
| 2.583 | 58.6797 | 851.38 | . . V. Q . . . . |
| 2.667 | 65.5035 | 990.81 | . . .V . Q . . . . |
| 2.750 | 72.6365 | 1035.72 | . . . V . Q . . . . |
| 2.833 | 79.1098 | 939.91 | . . . V . Q . . . . |
| 2.917 | 84.3952 | 767.44 | . . . QV . . . . |
| 3.000 | 88.6685 | 620.49 | . . . Q V. . . . |
| 3.083 | 92.1856 | 510.67 | . . Q . V . . . . |



| | | | |
|---|---|---|---|
| 3.167 | 95.0819 | 420.55 | . . Q . .V . . . . |
| 3.250 | 97.4662 | 346.20 | . . Q . . V . . . . |
| 3.333 | 99.4772 | 292.00 | . Q . . . V . . . . |
| 3.417 | 101.2083 | 251.35 | . Q. . . . V . . . . |
| 3.500 | 102.7459 | 223.27 | . Q . . . . V . . . . |
| 3.583 | 104.1205 | 199.59 | . Q . . . . V . . . . |
| 3.667 | 105.3552 | 179.28 | . Q . . . . V . . . . |
| 3.750 | 106.4728 | 162.28 | . Q . . . . V . . . . |
| 3.833 | 107.4889 | 147.54 | . Q . . . . V . . . . |
| 3.917 | 108.4198 | 135.17 | . Q . . . . V . . . . |
| 4.000 | 109.2768 | 124.43 | . Q . . . . V . . . . |
| 4.083 | 110.0685 | 114.96 | . Q . . . . V . . . . |
| 4.167 | 110.8027 | 106.61 | . Q . . . . V . . . . |
| 4.250 | 111.4871 | 99.37 | . Q . . . . V . . . . |
| 4.333 | 112.1215 | 92.12 | . Q . . . . V . . . . |
| 4.417 | 112.7104 | 85.51 | . Q . . . . V . . . . |
| 4.500 | 113.2583 | 79.55 | . Q . . . . V . . . . |
| 4.583 | 113.7629 | 73.27 | . Q . . . . V . . . . |
| 4.667 | 114.2289 | 67.66 | . Q . . . . V . . . . |
| 4.750 | 114.6595 | 62.52 | . Q . . . . V . . . . |
| 4.833 | 115.0799 | 61.04 | . Q . . . . V . . . . |
| 4.917 | 115.4480 | 53.46 | .Q . . . . V . . . . |
| 5.000 | 115.8044 | 51.75 | .Q . . . . V . . . . |

FLOW PROCESS FROM NODE 133.00 TO NODE 133.00 IS CODE = 3.1

>>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<

```
 INFLOW
(STREAM 1)
     |
     |
     V                 __effective depth
 -----------           |   (and volume)
|           |    |    |
|           |    |....V........
| detention |<-->|           outflow
|   basin   |    |........._______
 -----------     |     ^    | \
     |           |  dead    |  basin outlet
     V           | storage  |
  OUTFLOW         ---------
(STREAM 1)
```

ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
THROUGH A FLOW-THROUGH DETENTION BASIN
SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
DEAD STORAGE(AF) = 0.000
SPECIFIED DEAD STORAGE(AF) FILLED = 0.000
SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET = 0.000
DETENTION BASIN CONSTANT LOSS RATE(CFS) = 0.00

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

| INTERVAL NUMBER | DEPTH (FT) | OUTFLOW (CFS) | STORAGE (AF) |
|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.000 |
| 2 | 5.00 | 80.00 | 0.850 |

| | | | |
|---|---|---|---|
| 3 | 8.00 | 646.00 | 2.500 |
| 4 | 12.00 | 965.00 | 6.800 |
| 5 | 13.00 | 1030.00 | 8.300 |
| 6 | 14.00 | 1090.00 | 10.000 |
| 7 | 20.00 | 1400.00 | 24.000 |

==========

MODIFIED-PULS BASIN ROUTING MODEL RESULTS(5-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

| CLOCK TIME (HRS) | DEAD-STORAGE FILLED(AF) | INFLOW (CFS) | LOSS (CFS) | EFFECTIVE DEPTH(FT) | MEAN OUTFLOW (CFS) | EFFECTIVE VOLUME(AF) |
|---|---|---|---|---|---|---|
| 0.083 | 0.000 | 0.59 | 0.00 | 0.02 | 0.1 | 0.003 |
| 0.167 | 0.000 | 3.02 | 0.00 | 0.10 | 1.0 | 0.017 |
| 0.250 | 0.000 | 4.95 | 0.00 | 0.20 | 2.4 | 0.035 |
| 0.333 | 0.000 | 5.58 | 0.00 | 0.27 | 3.8 | 0.047 |
| 0.417 | 0.000 | 18.86 | 0.00 | 0.72 | 7.9 | 0.122 |
| 0.500 | 0.000 | 117.17 | 0.00 | 3.95 | 37.3 | 0.672 |
| 0.583 | 0.000 | 113.58 | 0.00 | 5.09 | 80.3 | 0.901 |
| 0.667 | 0.000 | 123.37 | 0.00 | 5.24 | 111.5 | 0.983 |
| 0.750 | 0.000 | 143.00 | 0.00 | 5.34 | 135.0 | 1.038 |
| 0.833 | 0.000 | 152.81 | 0.00 | 5.39 | 149.0 | 1.064 |
| 0.917 | 0.000 | 156.16 | 0.00 | 5.40 | 154.9 | 1.073 |
| 1.000 | 0.000 | 156.34 | 0.00 | 5.40 | 156.4 | 1.073 |
| 1.083 | 0.000 | 165.79 | 0.00 | 5.46 | 161.5 | 1.102 |
| 1.167 | 0.000 | 188.51 | 0.00 | 5.58 | 178.5 | 1.172 |
| 1.250 | 0.000 | 215.25 | 0.00 | 5.73 | 203.8 | 1.250 |
| 1.333 | 0.000 | 234.16 | 0.00 | 5.82 | 226.4 | 1.303 |
| 1.417 | 0.000 | 247.13 | 0.00 | 5.89 | 241.8 | 1.340 |
| 1.500 | 0.000 | 266.06 | 0.00 | 5.99 | 257.8 | 1.397 |
| 1.583 | 0.000 | 293.34 | 0.00 | 6.14 | 281.5 | 1.478 |
| 1.667 | 0.000 | 314.18 | 0.00 | 6.25 | 305.6 | 1.537 |
| 1.750 | 0.000 | 331.88 | 0.00 | 6.34 | 324.5 | 1.588 |
| 1.833 | 0.000 | 361.99 | 0.00 | 6.51 | 348.8 | 1.679 |
| 1.917 | 0.000 | 394.21 | 0.00 | 6.68 | 380.5 | 1.773 |
| 2.000 | 0.000 | 413.55 | 0.00 | 6.78 | 405.8 | 1.826 |
| 2.083 | 0.000 | 425.11 | 0.00 | 6.83 | 420.5 | 1.859 |
| 2.167 | 0.000 | 444.38 | 0.00 | 6.94 | 435.9 | 1.917 |
| 2.250 | 0.000 | 490.20 | 0.00 | 7.19 | 469.9 | 2.057 |
| 2.333 | 0.000 | 555.79 | 0.00 | 7.55 | 527.4 | 2.252 |
| 2.417 | 0.000 | 622.33 | 0.00 | 7.90 | 594.2 | 2.446 |
| 2.500 | 0.000 | 709.66 | 0.00 | 8.33 | 650.0 | 2.857 |
| 2.583 | 0.000 | 851.38 | 0.00 | 9.24 | 708.9 | 3.838 |
| 2.667 | 0.000 | 990.81 | 0.00 | 10.50 | 795.2 | 5.185 |
| 2.750 | 0.000 | 1035.72 | 0.00 | 11.47 | 884.0 | 6.230 |
| 2.833 | 0.000 | 939.91 | 0.00 | 11.56 | 926.2 | 6.325 |
| 2.917 | 0.000 | 767.44 | 0.00 | 10.73 | 896.7 | 5.434 |
| 3.000 | 0.000 | 620.49 | 0.00 | 9.49 | 814.2 | 4.100 |
| 3.083 | 0.000 | 510.67 | 0.00 | 8.19 | 713.0 | 2.707 |
| 3.167 | 0.000 | 420.55 | 0.00 | 6.83 | 543.7 | 1.859 |
| 3.250 | 0.000 | 346.20 | 0.00 | 6.38 | 382.8 | 1.607 |
| 3.333 | 0.000 | 292.00 | 0.00 | 6.10 | 313.8 | 1.457 |
| 3.417 | 0.000 | 251.35 | 0.00 | 5.89 | 268.2 | 1.341 |
| 3.500 | 0.000 | 223.27 | 0.00 | 5.75 | 234.7 | 1.262 |
| 3.583 | 0.000 | 199.59 | 0.00 | 5.62 | 209.5 | 1.193 |
| 3.667 | 0.000 | 179.28 | 0.00 | 5.52 | 187.8 | 1.135 |
| 3.750 | 0.000 | 162.28 | 0.00 | 5.43 | 169.4 | 1.086 |
| 3.833 | 0.000 | 147.54 | 0.00 | 5.35 | 153.7 | 1.044 |
| 3.917 | 0.000 | 135.17 | 0.00 | 5.29 | 140.3 | 1.008 |
| 4.000 | 0.000 | 124.43 | 0.00 | 5.23 | 128.9 | 0.977 |



| | | | | | | |
|---|---|---|---|---|---|---|
| 4.083 | 0.000 | 114.96 | 0.00 | 5.18 | 118.9 | 0.950 |
| 4.167 | 0.000 | 106.61 | 0.00 | 5.14 | 110.1 | 0.926 |
| 4.250 | 0.000 | 99.37 | 0.00 | 5.10 | 102.4 | 0.905 |
| 4.333 | 0.000 | 92.12 | 0.00 | 5.06 | 95.2 | 0.884 |
| 4.417 | 0.000 | 85.51 | 0.00 | 5.03 | 88.3 | 0.865 |
| 4.500 | 0.000 | 79.55 | 0.00 | 4.97 | 82.3 | 0.846 |
| 4.583 | 0.000 | 73.27 | 0.00 | 4.78 | 78.0 | 0.813 |
| 4.667 | 0.000 | 67.66 | 0.00 | 4.51 | 74.3 | 0.767 |
| 4.750 | 0.000 | 62.52 | 0.00 | 4.22 | 69.8 | 0.717 |
| 4.833 | 0.000 | 61.04 | 0.00 | 4.02 | 65.9 | 0.683 |
| 4.917 | 0.000 | 53.46 | 0.00 | 3.69 | 61.7 | 0.627 |
| 5.000 | 0.000 | 51.75 | 0.00 | 3.47 | 57.2 | 0.589 |

---

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 119.742 AF
BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
OUTFLOW VOLUME = 119.742 AF
LOSS VOLUME = 0.000 AF

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FLOW PROCESS FROM NODE 133.00 TO NODE 134.00 IS CODE = 4

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>>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<

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MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
(0.938)(DIAMETER):

PIPELENGTH(FT) = 250.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 820.00
DOWNSTREAM ELEVATION(FT) = 815.00
PIPE DIAMETER(FT) = 12.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

| TIME (HRS) | INFLOW (CFS) | VELOCITY (FPS) | OUTFLOW (CFS) | UPSTREAM PONDING(AF) |
|---|---|---|---|---|
| 1.000 | 156.36 | 14.38 | 156.36 | 0.000 |
| 1.083 | 161.46 | 14.85 | 161.46 | 0.000 |
| 1.167 | 178.45 | 16.41 | 178.45 | 0.000 |
| 1.250 | 203.83 | 17.75 | 203.32 | 0.000 |
| 1.333 | 226.44 | 18.19 | 225.64 | 0.000 |
| 1.417 | 241.82 | 18.49 | 241.38 | 0.000 |
| 1.500 | 257.82 | 18.80 | 257.29 | 0.000 |
| 1.583 | 281.52 | 19.26 | 280.77 | 0.000 |
| 1.667 | 305.61 | 19.73 | 304.88 | 0.000 |
| 1.750 | 324.48 | 20.10 | 323.93 | 0.000 |
| 1.833 | 348.80 | 20.57 | 348.12 | 0.000 |
| 1.917 | 380.53 | 21.19 | 379.69 | 0.000 |
| 2.000 | 405.82 | 21.57 | 405.10 | 0.000 |
| 2.083 | 420.45 | 21.79 | 420.05 | 0.000 |
| 2.167 | 435.93 | 22.02 | 435.51 | 0.000 |
| 2.250 | 469.89 | 22.53 | 469.01 | 0.000 |
| 2.333 | 527.41 | 23.40 | 526.00 | 0.000 |

| | | | | |
|---|---|---|---|---|
| 2.417 | 594.18 | 24.32 | 592.60 | 0.000 |
| 2.500 | 649.96 | 24.96 | 648.62 | 0.000 |
| 2.583 | 708.89 | 25.64 | 707.54 | 0.000 |
| 2.667 | 795.25 | 26.55 | 793.33 | 0.000 |
| 2.750 | 883.97 | 27.36 | 882.01 | 0.000 |
| 2.833 | 926.23 | 27.75 | 925.34 | 0.000 |
| 2.917 | 896.71 | 27.48 | 897.33 | 0.000 |
| 3.000 | 814.20 | 26.72 | 816.00 | 0.000 |
| 3.083 | 713.02 | 25.68 | 715.28 | 0.000 |
| 3.167 | 543.67 | 23.64 | 547.64 | 0.000 |
| 3.250 | 382.79 | 21.22 | 386.92 | 0.000 |
| 3.333 | 313.81 | 19.89 | 315.70 | 0.000 |
| 3.417 | 268.17 | 19.00 | 269.56 | 0.000 |
| 3.500 | 234.74 | 18.35 | 235.84 | 0.000 |
| 3.583 | 209.49 | 17.86 | 210.38 | 0.000 |
| 3.667 | 187.77 | 17.27 | 188.48 | 0.000 |
| 3.750 | 169.37 | 15.57 | 169.37 | 0.000 |
| 3.833 | 153.71 | 14.13 | 153.71 | 0.000 |
| 3.917 | 140.33 | 12.90 | 140.33 | 0.000 |
| 4.000 | 128.93 | 11.86 | 128.93 | 0.000 |
| 4.083 | 118.93 | 10.94 | 118.93 | 0.000 |
| 4.167 | 110.11 | 10.13 | 110.11 | 0.000 |
| 4.250 | 102.39 | 9.42 | 102.39 | 0.000 |
| 4.333 | 95.19 | 8.75 | 95.19 | 0.000 |
| 4.417 | 88.28 | 8.12 | 88.28 | 0.000 |
| 4.500 | 82.30 | 7.57 | 82.30 | 0.000 |
| 4.583 | 78.04 | 7.18 | 78.04 | 0.000 |
| 4.667 | 74.33 | 6.84 | 74.33 | 0.000 |
| 4.750 | 69.81 | 6.42 | 69.81 | 0.000 |
| 4.833 | 65.88 | 6.06 | 65.88 | 0.000 |
| 4.917 | 61.66 | 5.67 | 61.66 | 0.000 |
| 5.000 | 57.22 | 5.26 | 57.22 | 0.000 |

```
****************************************************************************
  FLOW PROCESS FROM NODE      25.00 TO NODE     134.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #5)

         WATERSHED AREA =       33.000 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.200 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         MOUNTAIN S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.223
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         USER-ENTERED RAINFALL =  2.65 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999


         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  41.667


============================================================================
                    UNIT HYDROGRAPH DETERMINATION
```



| INTERVAL NUMBER | "S" GRAPH MEAN VALUES | UNIT HYDROGRAPH ORDINATES(CFS) |
|---|---|---|
| 1 | 5.875 | 23.446 |
| 2 | 29.910 | 95.921 |
| 3 | 50.870 | 83.652 |
| 4 | 60.859 | 39.863 |
| 5 | 67.553 | 26.716 |
| 6 | 72.654 | 20.357 |
| 7 | 76.550 | 15.549 |
| 8 | 79.733 | 12.704 |
| 9 | 82.417 | 10.713 |
| 10 | 84.563 | 8.564 |
| 11 | 86.364 | 7.190 |
| 12 | 87.985 | 6.466 |
| 13 | 89.466 | 5.913 |
| 14 | 90.822 | 5.410 |
| 15 | 92.076 | 5.007 |
| 16 | 93.170 | 4.364 |
| 17 | 94.179 | 4.027 |
| 18 | 95.013 | 3.330 |
| 19 | 95.828 | 3.251 |
| 20 | 96.482 | 2.610 |
| 21 | 97.081 | 2.392 |
| 22 | 97.681 | 2.393 |
| 23 | 98.076 | 1.577 |
| 24 | 98.240 | 0.654 |
| 25 | 98.404 | 0.653 |
| 26 | 98.567 | 0.652 |
| 27 | 98.731 | 0.653 |
| 28 | 98.894 | 0.653 |
| 29 | 99.058 | 0.654 |
| 30 | 99.222 | 0.653 |
| 31 | 99.385 | 0.653 |
| 32 | 99.549 | 0.653 |
| 33 | 99.712 | 0.653 |
| 34 | 99.876 | 0.653 |
| 35 | 100.000 | 0.496 |

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----------------------------------------------------------------------------

         TOTAL STORM RAINFALL(INCHES) =  2.65
         TOTAL SOIL-LOSS(INCHES) =  0.66
         TOTAL EFFECTIVE RAINFALL(INCHES) =  1.98

----------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =        1.8280
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =        5.4557
----------------------------------------------------------------------------
```

3 - H O U R  S T O R M
R U N O F F  H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 15.0 30.0 45.0 60.0 |
|---|---|---|---|
| 0.083 | 0.0026 | 0.37 | Q |
| 0.167 | 0.0156 | 1.89 | VQ |
| 0.250 | 0.0369 | 3.10 | V Q |
| 0.333 | 0.0608 | 3.47 | V Q |
| 0.417 | 0.0916 | 4.47 | V Q |
| 0.500 | 0.1305 | 5.65 | V Q |
| 0.583 | 0.1770 | 6.75 | .V Q |
| 0.667 | 0.2267 | 7.22 | .V Q |
| 0.750 | 0.2814 | 7.94 | . V Q |
| 0.833 | 0.3402 | 8.54 | . V Q |
| 0.917 | 0.3974 | 8.30 | . V Q |
| 1.000 | 0.4550 | 8.36 | . V Q |
| 1.083 | 0.5191 | 9.31 | . V Q |
| 1.167 | 0.5941 | 10.90 | . V Q |
| 1.250 | 0.6775 | 12.10 | . V Q |
| 1.333 | 0.7646 | 12.65 | . V Q |
| 1.417 | 0.8542 | 13.00 | . V Q |
| 1.500 | 0.9543 | 14.53 | . V Q. |
| 1.583 | 1.0647 | 16.03 | . V Q |
| 1.667 | 1.1779 | 16.44 | . V Q |
| 1.750 | 1.2988 | 17.55 | . V.Q |
| 1.833 | 1.4352 | 19.81 | . V Q |
| 1.917 | 1.5798 | 20.99 | . .V Q |
| 2.000 | 1.7251 | 21.10 | . . V Q |
| 2.083 | 1.8733 | 21.51 | . . VQ |
| 2.167 | 2.0309 | 22.90 | . . VQ |
| 2.250 | 2.2150 | 26.73 | . . VQ |
| 2.333 | 2.4260 | 30.64 | . . V Q |
| 2.417 | 2.6473 | 32.13 | . . V.Q |
| 2.500 | 2.9185 | 39.38 | . . .V Q |
| 2.583 | 3.2512 | 48.31 | . . . V . Q |
| 2.667 | 3.6217 | 53.79 | . . . V . Q |
| 2.750 | 3.9692 | 50.46 | . . . V. Q |
| 2.833 | 4.2346 | 38.54 | . . . Q .V |
| 2.917 | 4.4366 | 29.33 | . . Q. . V |
| 3.000 | 4.6044 | 24.37 | . Q . . V |
| 3.083 | 4.7356 | 19.05 | . . Q . . V |
| 3.167 | 4.8369 | 14.71 | . . Q. . . V |
| 3.250 | 4.9203 | 12.10 | . . Q . . . V |
| 3.333 | 4.9904 | 10.19 | . Q . . . V |
| 3.417 | 5.0506 | 8.73 | . Q . . . V |
| 3.500 | 5.1034 | 7.67 | . Q . . . V |
| 3.583 | 5.1502 | 6.80 | . Q . . . V |
| 3.667 | 5.1917 | 6.02 | . Q . . . V |
| 3.750 | 5.2287 | 5.37 | . Q . . . V |
| 3.833 | 5.2613 | 4.74 | . Q . . . V |
| 3.917 | 5.2902 | 4.20 | . Q . . . V |
| 4.000 | 5.3155 | 3.67 | . Q . . . V |
| 4.083 | 5.3373 | 3.16 | . Q . . . V. |
| 4.167 | 5.3562 | 2.74 | .Q . . . V. |
| 4.250 | 5.3724 | 2.35 | .Q . . . V. |
| 4.333 | 5.3858 | 1.95 | .Q . . . V. |



| | | | |
|---|---|---|---|
| 4.417 | 5.3966 | 1.57 | .Q . . . V. |
| 4.500 | 5.4050 | 1.22 | Q . . . V. |
| 4.583 | 5.4120 | 1.02 | Q . . . V. |
| 4.667 | 5.4183 | 0.92 | Q . . . V. |
| 4.750 | 5.4240 | 0.82 | Q . . . V. |
| 4.833 | 5.4292 | 0.76 | Q . . . V. |
| 4.917 | 5.4341 | 0.72 | Q . . . V. |
| 5.000 | 5.4387 | 0.67 | Q . . . V. |
| 5.083 | 5.4429 | 0.61 | Q . . . V. |
| 5.167 | 5.4466 | 0.54 | Q . . . V. |
| 5.250 | 5.4499 | 0.48 | Q . . . V. |
| 5.333 | 5.4524 | 0.37 | Q . . . V. |
| 5.417 | 5.4541 | 0.25 | Q . . . V. |
| 5.500 | 5.4550 | 0.13 | Q . . . V. |
| 5.583 | 5.4554 | 0.06 | Q . . . V. |
| 5.667 | 5.4556 | 0.03 | Q . . . V. |
| 5.750 | 5.4557 | 0.02 | Q . . . V. |
| 5.833 | 5.4557 | 0.00 | Q . . . V. |

FLOW PROCESS FROM NODE 134.00 TO NODE 134.00 IS CODE = 7

>>>>>STREAM NUMBER 5 ADDED TO STREAM NUMBER 1<<<<<

FLOW PROCESS FROM NODE 134.00 TO NODE 134.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) | 0. 250.0 500.0 750.0 1000.0 |
|---|---|---|---|
| 1.000 | 6.1756 | 164.72 | .V Q . . . . |
| 1.083 | 7.3516 | 170.76 | . V Q . . . . |
| 1.167 | 8.6557 | 189.35 | . V Q . . . . |
| 1.250 | 10.1393 | 215.42 | . V Q . . . . |
| 1.333 | 11.7804 | 238.29 | . V Q. . . . |
| 1.417 | 13.5318 | 254.30 | . V Q . . . |
| 1.500 | 15.4039 | 271.82 | . V Q . . . |
| 1.583 | 17.4479 | 296.80 | . V .Q . . . |
| 1.667 | 19.6609 | 321.32 | . V . Q . . . |
| 1.750 | 22.0127 | 341.48 | . V . Q . . . |
| 1.833 | 24.5466 | 367.93 | . V . Q . . . |
| 1.917 | 27.3062 | 400.69 | . V . Q . . . |
| 2.000 | 30.2415 | 426.21 | . V. Q . . . |
| 2.083 | 33.2826 | 441.56 | . V Q . . . |
| 2.167 | 36.4396 | 458.41 | . .V Q . . . |
| 2.250 | 39.8538 | 495.74 | . . V Q. . . |
| 2.333 | 43.6875 | 556.64 | . . V . Q . . |
| 2.417 | 47.9900 | 624.73 | . . V . Q . . |
| 2.500 | 52.7283 | 687.99 | . . V . Q . . |
| 2.583 | 57.9339 | 755.86 | . . V . Q . |
| 2.667 | 63.7680 | 847.12 | . . V . Q . |
| 2.750 | 70.1900 | 932.47 | . . . V . Q . |
| 2.833 | 76.8283 | 963.88 | . . . V . Q . |
| 2.917 | 83.2102 | 926.66 | . . . V . Q . |
| 3.000 | 88.9979 | 840.37 | . . . V . Q . |
| 3.083 | 94.0552 | 734.32 | . . . QV . |

```
3.167    97.9281    562.35  .          .          . Q       .V         .
3.250   100.6762    399.02  .          .    Q     .         . V        .
3.333   102.9206    325.89  .          .  Q       .         . V        .
3.417   104.8372    278.29  .          .Q         .         .  V       .
3.500   106.5143    243.51  .        Q.           .         .   V      .
3.583   108.0100    217.18  .       Q .           .         .   V      .
3.667   109.3495    194.50  .      Q  .           .         .   V      .
3.750   110.5529    174.73  .     Q   .           .         .    V     .
3.833   111.6441    158.44  .     Q   .           .         .    V     .
3.917   112.6395    144.53  .    Q    .           .         .    V     .
4.000   113.5527    132.60  .    Q    .           .         .     V    .
4.083   114.3935    122.09  .   Q     .           .         .     V    .
4.167   115.1708    112.85  .   Q     .           .         .     V    .
4.250   115.8922    104.75  .   Q     .           .         .      V   .
4.333   116.5612     97.14  . Q       .           .         .      V   .
4.417   117.1800     89.85  . Q       .           .         .      V   .
4.500   117.7552     83.51  . Q       .           .         .      V   .
4.583   118.2997     79.06  . Q       .           .         .      V   .
4.667   118.8179     75.25  . Q       .           .         .      V   .
4.750   119.3044     70.63  . Q       .           .         .       V  .
4.833   119.7633     66.64  . Q       .           .         .       V  .
4.917   120.1929     62.37  . Q       .           .         .       V  .
5.000   120.5916     57.89  . Q       .           .         .       V  .
```

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*******************************************************************
 FLOW PROCESS FROM NODE    134.00 TO NODE    135.00 IS CODE = 5.2
-------------------------------------------------------------------
 >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
*******************************************************************

      THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
      TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
      INTERVALS(Reference: the National Engineering Handbook,
      Hydrology, Chapter 17, page 17-52, August,1972,
      U.S. Department of Commerce).

      ASSUMED REGULAR CHANNEL INFORMATION:
        BASEWIDTH(FT) =     4.00     CHANNEL Z =  6.00
        UPSTREAM ELEVATION(FT) =     815.00
        DOWNSTREAM ELEVATION(FT) =     800.00
        CHANNEL LENGTH(FT) =     750.00     MANNING'S FACTOR = 0.035
        CONSTANT LOSS RATE(CFS) =    0.00

      CHANNEL ROUTING COEFFICIENT ESTIMATED:
        MAXIMUM INFLOW(CFS) =   963.88
        AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW =   744.01
        CHANNEL NORMAL VELOCITY FOR Q =   744.01 CFS =   8.99 FPS
        ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.841

      MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
      UNIT INTERVALS IS CSTAR = 0.997

      CONVEX METHOD CHANNEL ROUTING RESULTS:
                                          OUTFLOW LESS
       MODEL        INFLOW      ROUTED       LOSS
        TIME      (STREAM 1)    FLOW      (STREAM 1)
       (HRS)        (CFS)       (CFS)       (CFS)
        1.000       164.72      164.37      164.37
        1.083       170.76      169.34      169.34
        1.167       189.35      184.96      184.96
```



```
        1.250       215.42      209.26      209.26
        1.333       238.29      232.87      232.87
        1.417       254.30      250.51      250.51
        1.500       271.82      267.68      267.68
        1.583       296.80      290.89      290.89
        1.667       321.32      315.52      315.52
        1.750       341.48      336.71      336.71
        1.833       367.93      361.67      361.67
        1.917       400.69      392.94      392.94
        2.000       426.21      420.16      420.16
        2.083       441.56      437.92      437.92
        2.167       458.41      454.42      454.42
        2.250       495.74      486.92      486.92
        2.333       556.64      542.24      542.24
        2.417       624.73      608.62      608.62
        2.500       687.99      673.02      673.02
        2.583       755.86      739.80      739.80
        2.667       847.12      825.53      825.53
        2.750       932.47      912.27      912.27
        2.833       963.88      956.41      956.41
        2.917       926.66      935.42      935.42
        3.000       840.37      860.76      860.76
        3.083       734.32      759.41      759.41
        3.167       562.35      603.01      603.01
        3.250       399.02      437.69      437.69
        3.333       325.89      343.26      343.26
        3.417       278.29      289.58      289.58
        3.500       243.51      251.75      251.75
        3.583       217.18      223.42      223.42
        3.667       194.50      199.87      199.87
        3.750       174.73      179.41      179.41
        3.833       158.44      162.30      162.30
        3.917       144.53      147.82      147.82
        4.000       132.60      135.42      135.42
        4.083       122.09      124.58      124.58
        4.167       112.85      115.04      115.04
        4.250       104.75      106.67      106.67
        4.333        97.14       98.94       98.94
        4.417        89.85       91.58       91.58
        4.500        83.51       85.01       85.01
        4.583        79.06       80.12       80.12
        4.667        75.25       76.15       76.15
        4.750        70.63       71.73       71.73
        4.833        66.64       67.58       67.58
        4.917        62.37       63.38       63.38
        5.000        57.89       58.95       58.95
===================================================================
 PROCESS SUMMARY OF STORAGE:
   INFLOW  VOLUME =     125.198 AF
   OUTFLOW VOLUME =     125.198 AF
   LOSS    VOLUME =       0.000 AF

*******************************************************************
 FLOW PROCESS FROM NODE      1.00 TO NODE    135.00 IS CODE =   1
-------------------------------------------------------------------
 >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
*******************************************************************

      (UNIT-HYDROGRAPH ADDED TO STREAM #2)

        WATERSHED AREA =       44.720 ACRES
        BASEFLOW =    0.000 CFS/SQUARE-MILE
        *USER ENTERED "LAG" TIME =     0.189 HOURS
```

CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
MOUNTAIN S-GRAPH SELECTED
UNIFORM MEAN SOIL-LOSS(INCH/HOUR) = 0.269
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
USER-ENTERED RAINFALL = 2.65 INCHES
RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9998

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 44.092

RUNOFF HYDROGRAPH LISTING LIMITS:
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 1.00
MODEL TIME(HOURS) FOR END OF RESULTS = 4.00

UNIT HYDROGRAPH DETERMINATION

| INTERVAL NUMBER | "S" GRAPH MEAN VALUES | UNIT HYDROGRAPH ORDINATES(CFS) |
|---|---|---|
| 1 | 6.391 | 34.562 |
| 2 | 32.299 | 140.123 |
| 3 | 52.684 | 110.247 |
| 4 | 62.388 | 52.484 |
| 5 | 69.014 | 35.835 |
| 6 | 73.997 | 26.952 |
| 7 | 77.825 | 20.704 |
| 8 | 80.970 | 17.005 |
| 9 | 83.535 | 13.873 |
| 10 | 85.584 | 11.085 |
| 11 | 87.369 | 9.654 |
| 12 | 88.984 | 8.735 |
| 13 | 90.468 | 8.021 |
| 14 | 91.820 | 7.316 |
| 15 | 93.002 | 6.392 |
| 16 | 94.089 | 5.876 |
| 17 | 94.981 | 4.824 |
| 18 | 95.041 | 4.651 |
| 19 | 96.528 | 3.718 |
| 20 | 97.162 | 3.431 |
| 21 | 97.790 | 3.392 |
| 22 | 98.118 | 1.775 |
| 23 | 98.291 | 0.936 |
| 24 | 98.464 | 0.936 |
| 25 | 98.637 | 0.935 |
| 26 | 98.810 | 0.937 |
| 27 | 98.983 | 0.936 |
| 28 | 99.156 | 0.936 |
| 29 | 99.330 | 0.936 |
| 30 | 99.503 | 0.936 |
| 31 | 99.676 | 0.936 |
| 32 | 99.849 | 0.936 |
| 33 | 100.000 | 0.817 |



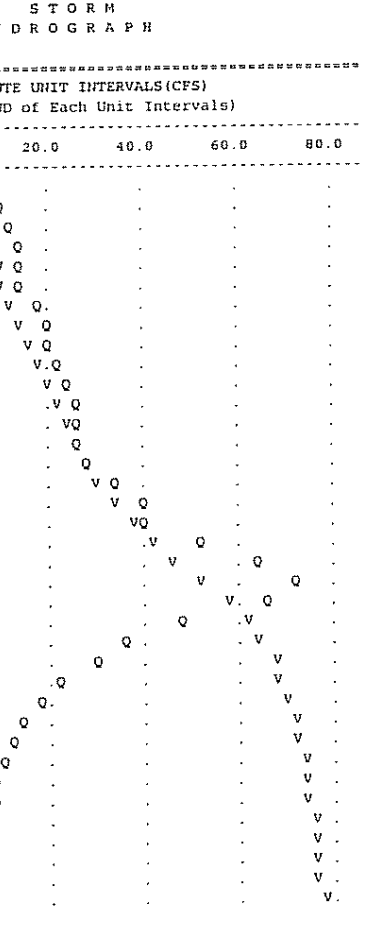
TOTAL STORM RAINFALL(INCHES) = 2.65
TOTAL SOIL-LOSS(INCHES) = 0.80
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.85

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 2.9772
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 6.8932

3 - H O U R  S T O R M
R U N O F F  H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) |
|---|---|---|
| 1.000 | 0.5154 | 9.64 |
| 1.083 | 0.5909 | 10.97 |
| 1.167 | 0.6817 | 13.17 |
| 1.250 | 0.7832 | 14.74 |
| 1.333 | 0.8894 | 15.43 |
| 1.417 | 0.9987 | 15.86 |
| 1.500 | 1.1232 | 18.09 |
| 1.583 | 1.2614 | 20.06 |
| 1.667 | 1.4025 | 20.49 |
| 1.750 | 1.5549 | 22.13 |
| 1.833 | 1.7289 | 25.26 |
| 1.917 | 1.9129 | 26.72 |
| 2.000 | 2.0975 | 26.81 |
| 2.083 | 2.2862 | 27.39 |
| 2.167 | 2.4883 | 29.35 |
| 2.250 | 2.7283 | 34.86 |
| 2.333 | 3.0050 | 40.17 |
| 2.417 | 3.2935 | 41.89 |
| 2.500 | 3.6564 | 52.70 |
| 2.583 | 4.1025 | 64.77 |
| 2.667 | 4.5989 | 72.08 |
| 2.750 | 5.0571 | 66.53 |
| 2.833 | 5.3970 | 49.35 |
| 2.917 | 5.6528 | 37.14 |
| 3.000 | 5.8638 | 30.64 |
| 3.083 | 6.0271 | 23.72 |
| 3.167 | 6.1535 | 18.35 |
| 3.250 | 6.2571 | 15.04 |
| 3.333 | 6.3442 | 12.65 |
| 3.417 | 6.4192 | 10.89 |
| 3.500 | 6.4850 | 9.55 |
| 3.583 | 6.5429 | 8.42 |
| 3.667 | 6.5942 | 7.45 |
| 3.750 | 6.6392 | 6.53 |
| 3.833 | 6.6788 | 5.76 |
| 3.917 | 6.7132 | 4.99 |
| 4.000 | 6.7425 | 4.26 |




FLOW PROCESS FROM NODE 135.00 TO NODE 135.00 IS CODE = 7

>>>>>STREAM NUMBER 2 ADDED TO STREAM NUMBER 1<<<<<

FLOW PROCESS FROM NODE 135.00 TO NODE 135.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<



STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

| TIME(HRS) | VOLUME(AF) | Q(CFS) |
|---|---|---|
| 1.000 | 6.4225 | 174.01 |
| 1.083 | 7.6642 | 180.30 |
| 1.167 | 9.0288 | 198.13 |
| 1.250 | 10.5715 | 224.00 |
| 1.333 | 12.2815 | 248.30 |
| 1.417 | 14.1160 | 266.37 |
| 1.500 | 16.0841 | 285.76 |
| 1.583 | 18.2257 | 310.96 |
| 1.667 | 20.5398 | 336.01 |
| 1.750 | 23.0111 | 358.84 |
| 1.833 | 25.6759 | 386.93 |
| 1.917 | 28.5661 | 419.66 |
| 2.000 | 31.6444 | 446.97 |
| 2.083 | 34.8490 | 465.31 |
| 2.167 | 38.1808 | 483.77 |
| 2.250 | 41.7743 | 521.78 |
| 2.333 | 45.7854 | 582.41 |
| 2.417 | 50.2655 | 650.51 |
| 2.500 | 55.2635 | 725.72 |
| 2.583 | 60.8046 | 804.57 |
| 2.667 | 66.9865 | 897.61 |
| 2.750 | 73.7275 | 978.79 |
| 2.833 | 80.6542 | 1005.76 |
| 2.917 | 87.3523 | 972.56 |
| 3.000 | 93.4914 | 891.39 |
| 3.083 | 98.8848 | 783.13 |
| 3.167 | 103.1642 | 621.36 |
| 3.250 | 106.2821 | 452.72 |
| 3.333 | 108.7333 | 355.91 |
| 3.417 | 110.8026 | 300.47 |
| 3.500 | 112.6022 | 261.30 |
| 3.583 | 114.1988 | 231.83 |
| 3.667 | 115.6266 | 207.32 |
| 3.750 | 116.9072 | 185.94 |
| 3.833 | 118.0646 | 168.06 |
| 3.917 | 119.1170 | 152.81 |
| 4.000 | 120.0790 | 139.68 |
| 4.083 | 120.9625 | 128.28 |
| 4.167 | 121.7761 | 118.14 |
| 4.250 | 122.5283 | 109.21 |
| 4.333 | 123.2235 | 100.95 |
| 4.417 | 123.8648 | 93.12 |
| 4.500 | 124.4593 | 86.32 |
| 4.583 | 125.0192 | 81.30 |
| 4.667 | 125.5511 | 77.22 |
| 4.750 | 126.0519 | 72.72 |
| 4.833 | 126.5238 | 68.52 |
| 4.917 | 126.9661 | 64.23 |
| 5.000 | 127.3773 | 59.70 |




END OF FLOODSCx ROUTING ANALYSIS

# Appendix C.1

Debris Load Calculations

Army Corp of Engineers- Los Angeles District Method for Prediction of Debris Yield

Equation 1 - "LOG Dy = 0.65(LOG P) + 0.62(LOG RR) + 0.18(LOG A) + 0.12(FF)"
Where Dy = Unit Debris Yield (yd3 / mi2)

*Debris Calculation Summary*

| Hydrology Node / Subarea | Area (A) (Acres) | Area (A) (Sq. Miles) | 100 Yr Frequency 3 Hr. Intensity P (Inches)*100 | Upstream Elevation (Feet) | Downstream Elevation (Feet) | Flow path Length (Feet) | Relief Ration (RR) (ft./mi.) | Fire Factor (FF) | Equation 1 Log10(Dy) | Debris Load (Dy) (CY/Sq.Mi.) | Debris Load (CY) | Debris Load (acre-ft) | Runoff V (acre-ft) 100 YR | Debris Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 845 | 1.320 | 265 | 3000.0 | 783 | 15100.8 | 775 | 4.8 | 4.463 | 29,065 | 38,375 | 23.8 | 130 | 1.18 |
| E | 349.2 | 0.546 | 265 | 2700.0 | 1040 | 10137.6 | 865 | 4.8 | 4.424 | 26,527 | 14,474 | 9.0 | 66 | 1.14 |
| D | 921.1 | 1.439 | 280 | 2800.0 | 1119 | 15312 | 580 | 4.8 | 4.407 | 25,550 | 36,772 | 22.8 | 150 | 1.15 |

* A-T Factor considered 1.0
** Area assumed to have burned within 2-3 years.

$$\text{Debris Factor} = \frac{(\text{Debris Load (acre-ft)} + \text{Runoff (acre-ft)})}{\text{Runoff (acre-ft)}}$$

Ex: $\frac{23.8 + 130}{130} = 1.18$

$$\text{Average Debris Factor} = \frac{(1.18 + 1.14 + 1.15)}{3} = 1.16$$

use 1.2 as Factor

# Appendix D

Precipitation Data

RBF

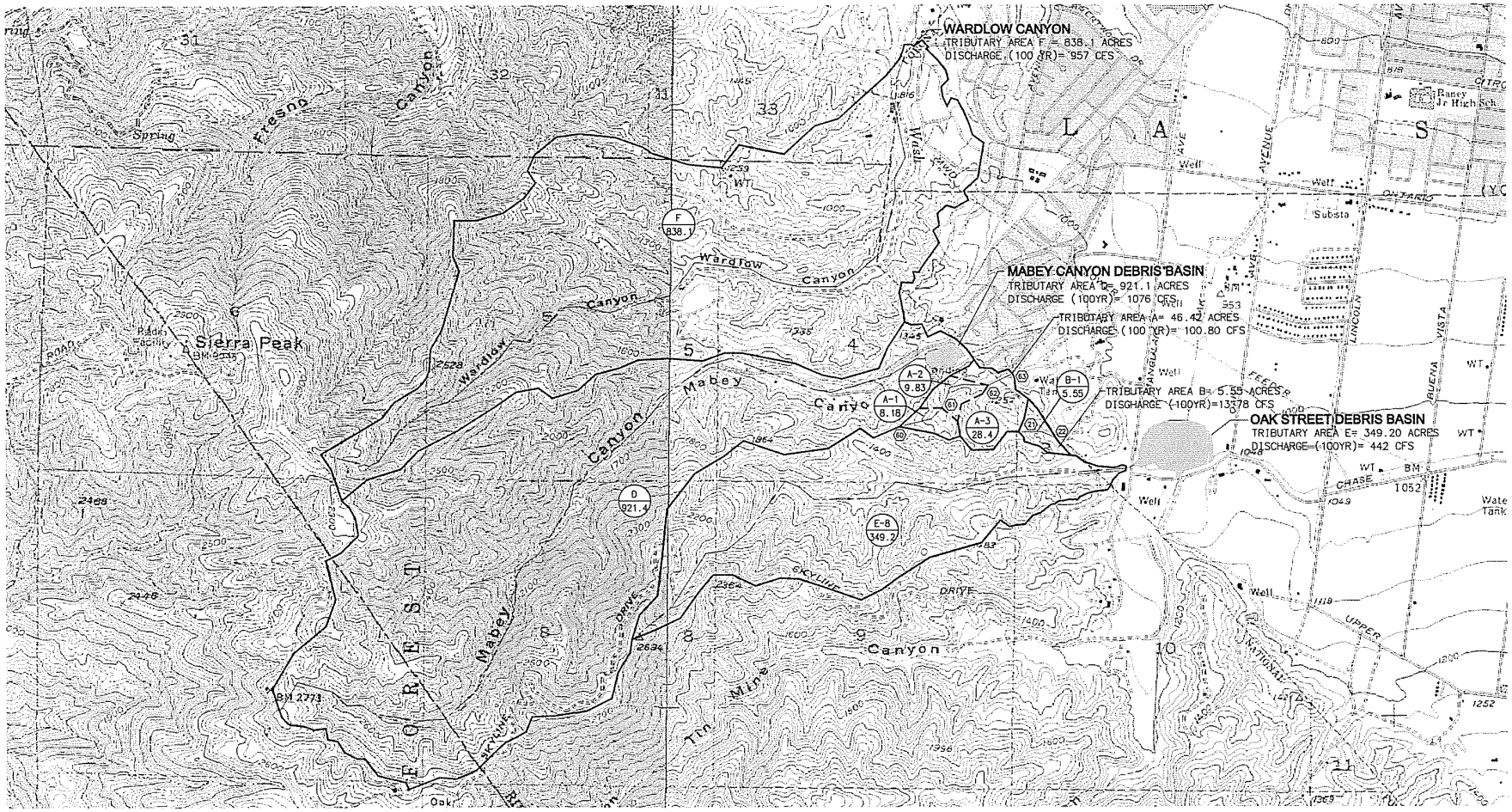
PLANNING | DESIGN | CONSTRUCTION
CONSULTING

# HYDROLOGY STUDY

## Exhibits

# Exhibit 1

Hydrology Map – Existing Condition




LEGEND

- DRAINAGE BOUNDARY
- SUBAREA BOUNDARY
- FLOW PATH
- A-1 / 1.0 — SUBAREA DESIGNATION / SUBAREA (ACRES)
- 1 — HYDROLOGY NODE

SCALE: 1"=800'

800 0 800 1600 2400
GRAPHIC SCALE

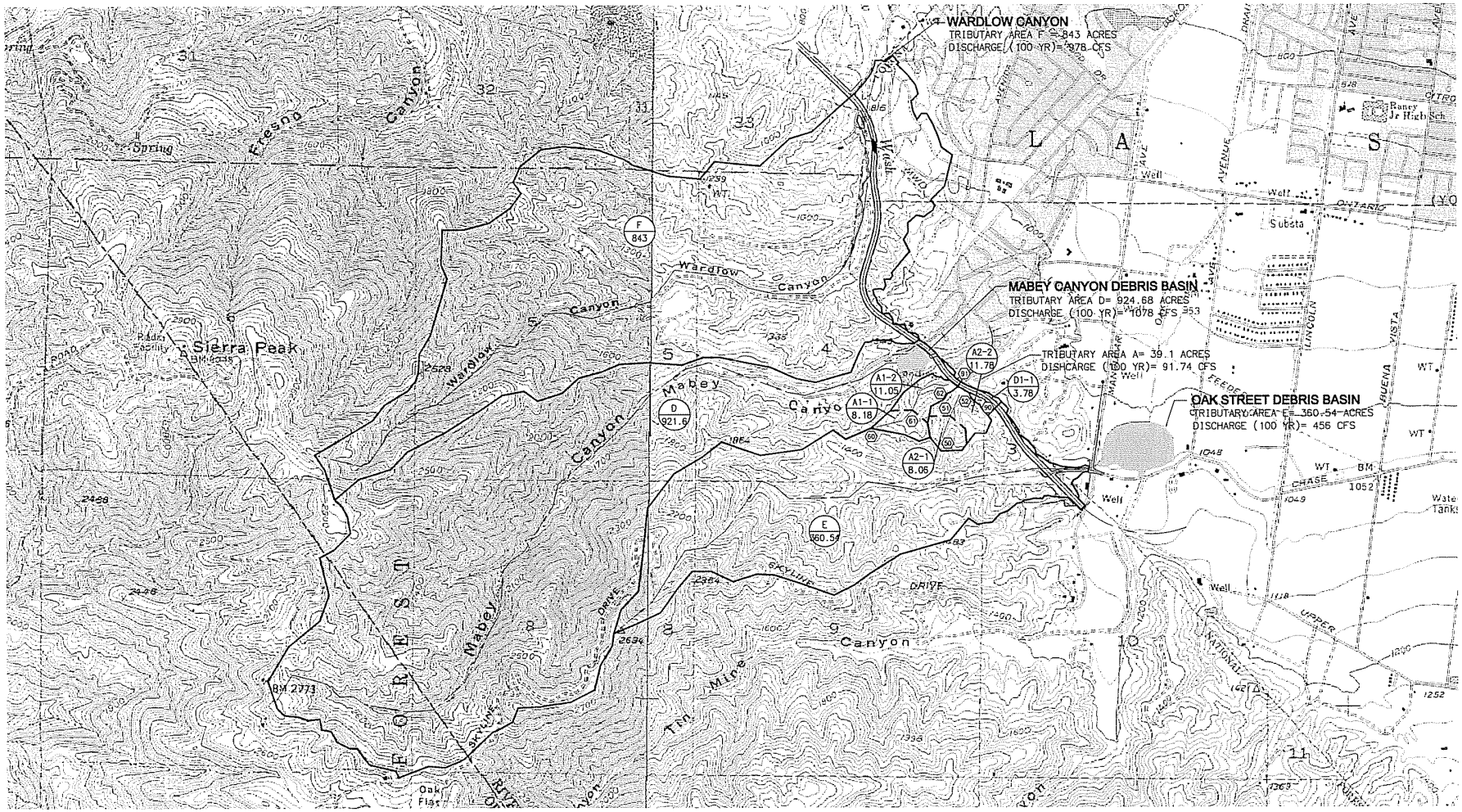
RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION

14725 ALTON PARKWAY
IRVINE, CALIFORNIA 92618-2027
949.472.3505 • FAX 949.472.8373 • www.RBF.com

# EXHIBIT 1
# CORONA/FOOTHILL PKWY
# EXISTING CONDITION HYDROLOGY MAP

# Exhibit 2

Hydrology Map – Project Condition




**LEGEND**

- DRAINAGE BOUNDARY
- SUBAREA BOUNDARY
- FLOW PATH
- A-1 / 1.0 — SUBAREA DESIGNATION / SUBAREA (ACRES)
- 1 — HYDROLOGY NODE

SCALE 1"=800'

GRAPHIC SCALE: 800 0 800 1600 2400

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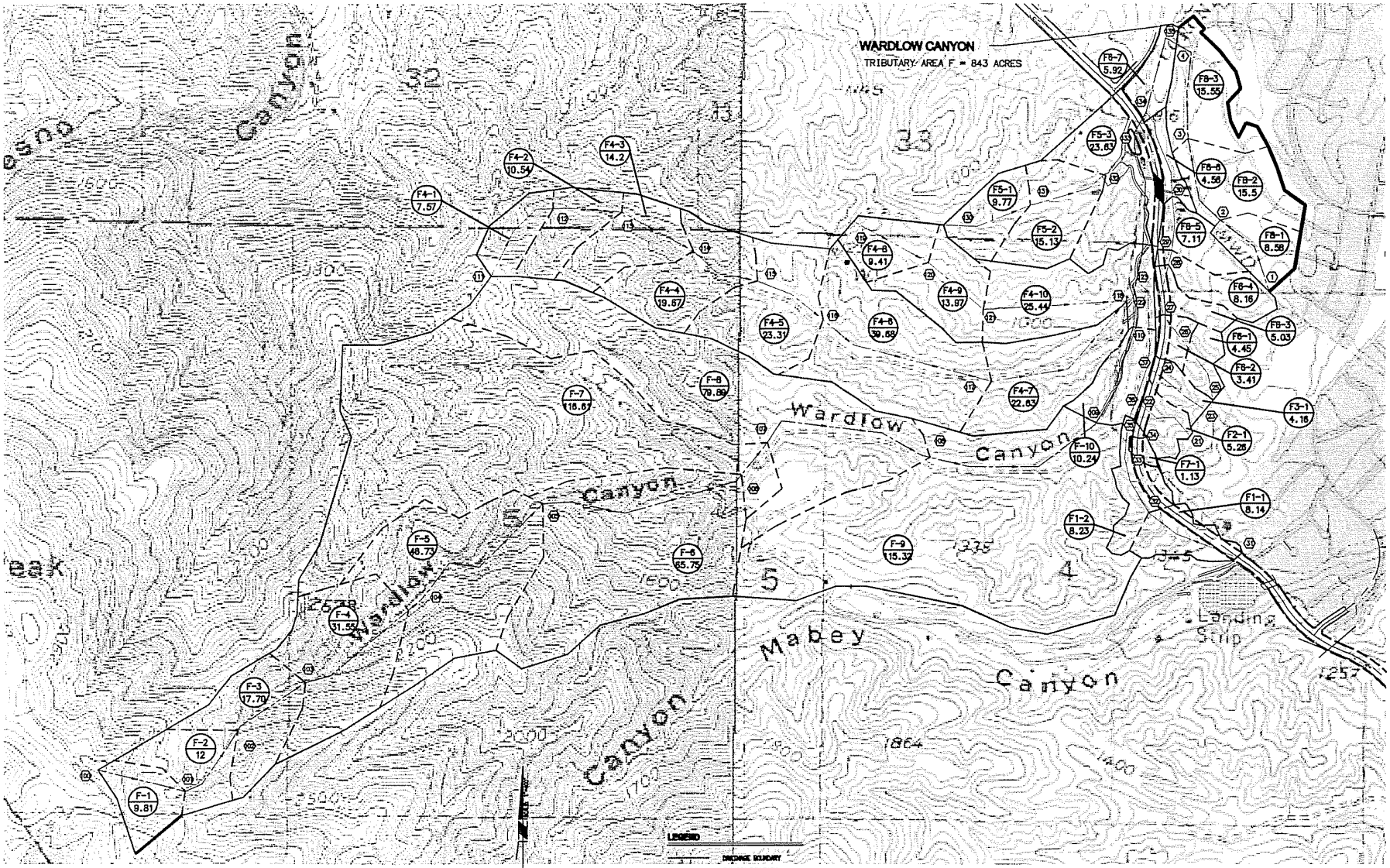
# EXHIBIT 2
# CORONA/FOOTHILL PKWY
# PROJECT CONDITION HYDROLOGY MAP

# Exhibit 3

Hydrology Map – Project Condition Area F

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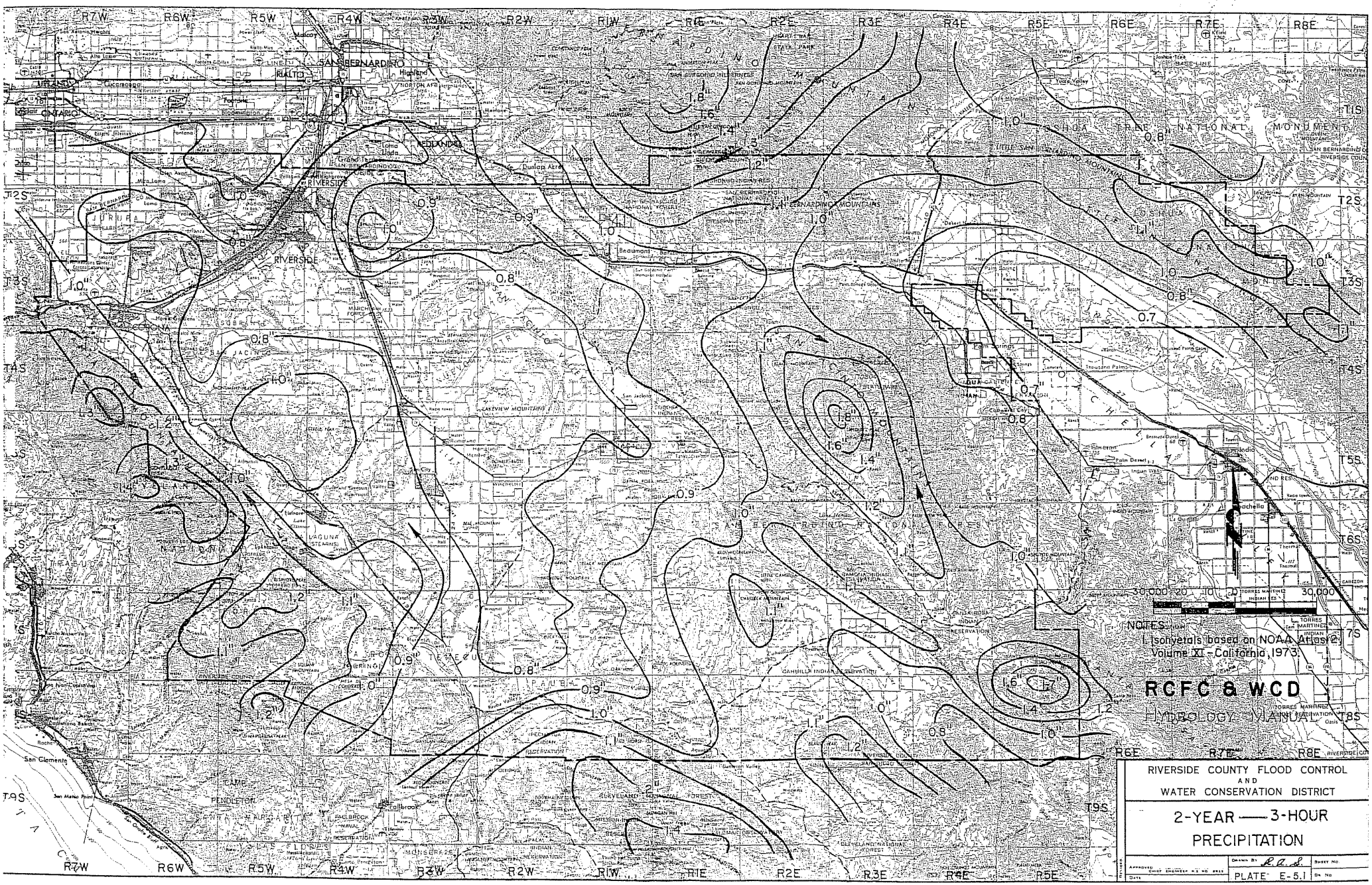
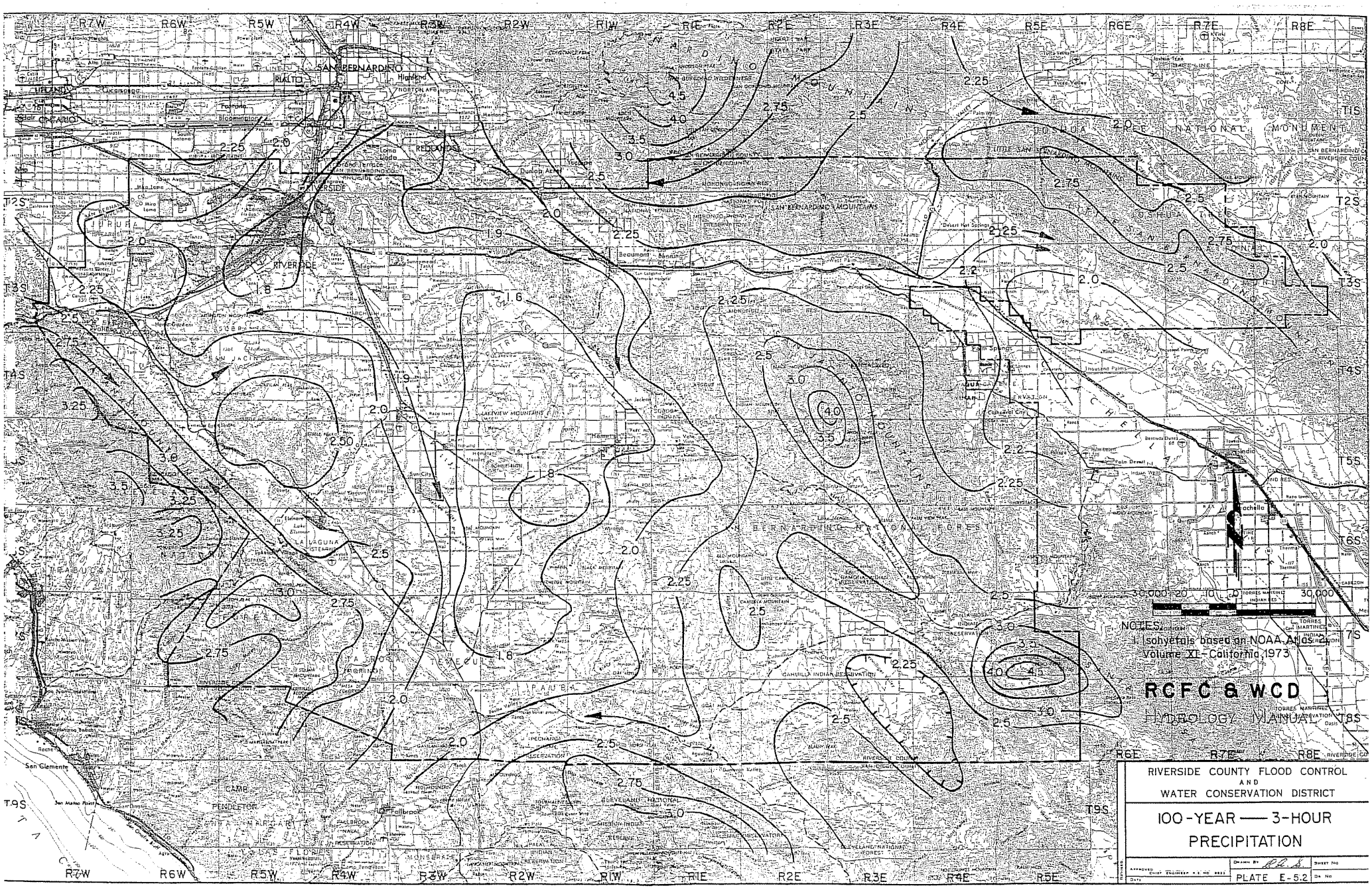
# EXHIBIT 3
# CORONA/FOOTHILL PKWY
# PROJECT CONDITION HYDROLOGY MAP

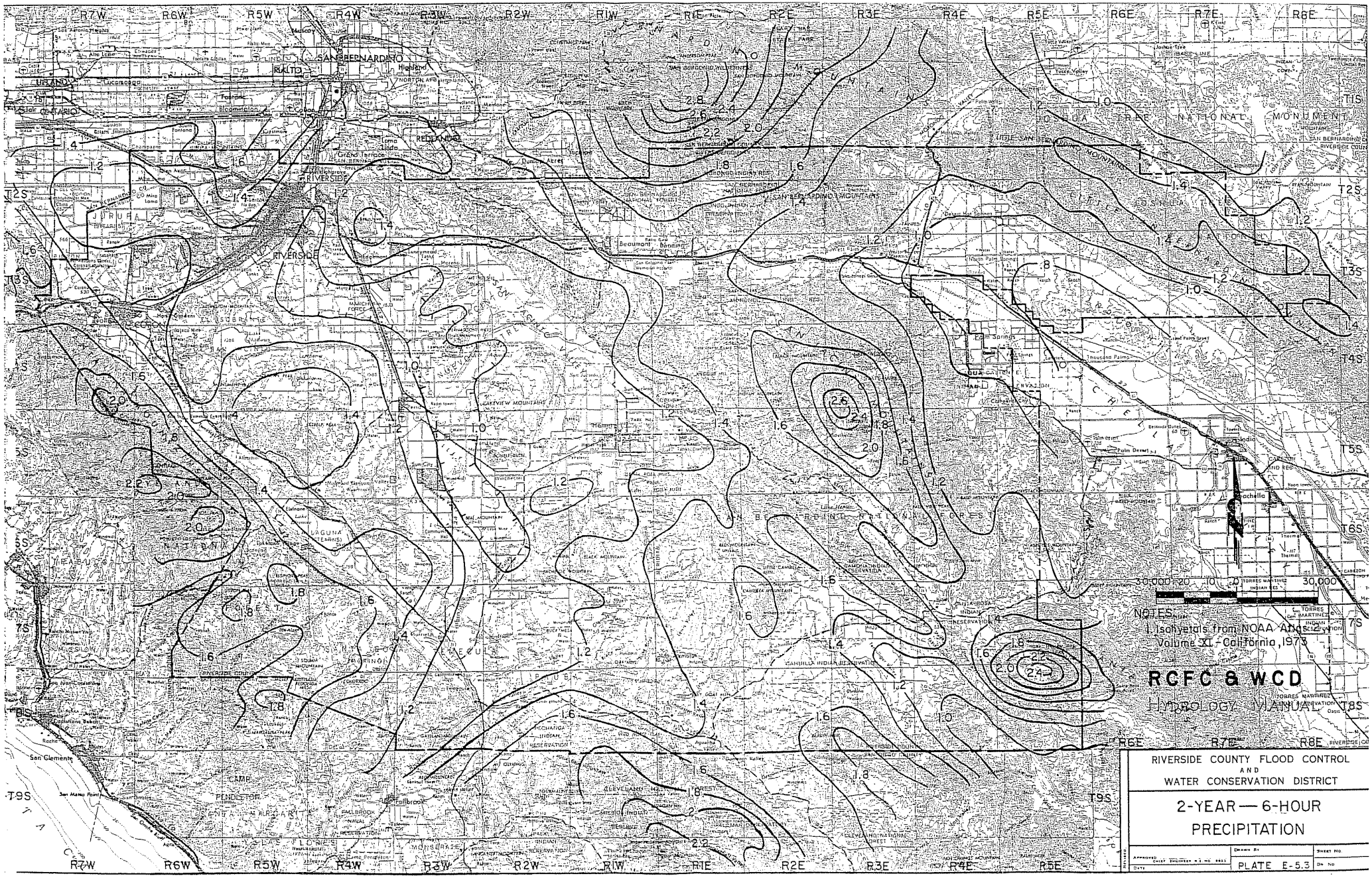
H:\PDATA\10104629\CADD\STRMWATER\EXHIBITS\HYDROLOGY\4629-EX_HYD-00F.DWG JHOHNBAUM 10/4/07 11:16 am

# Exhibit 4

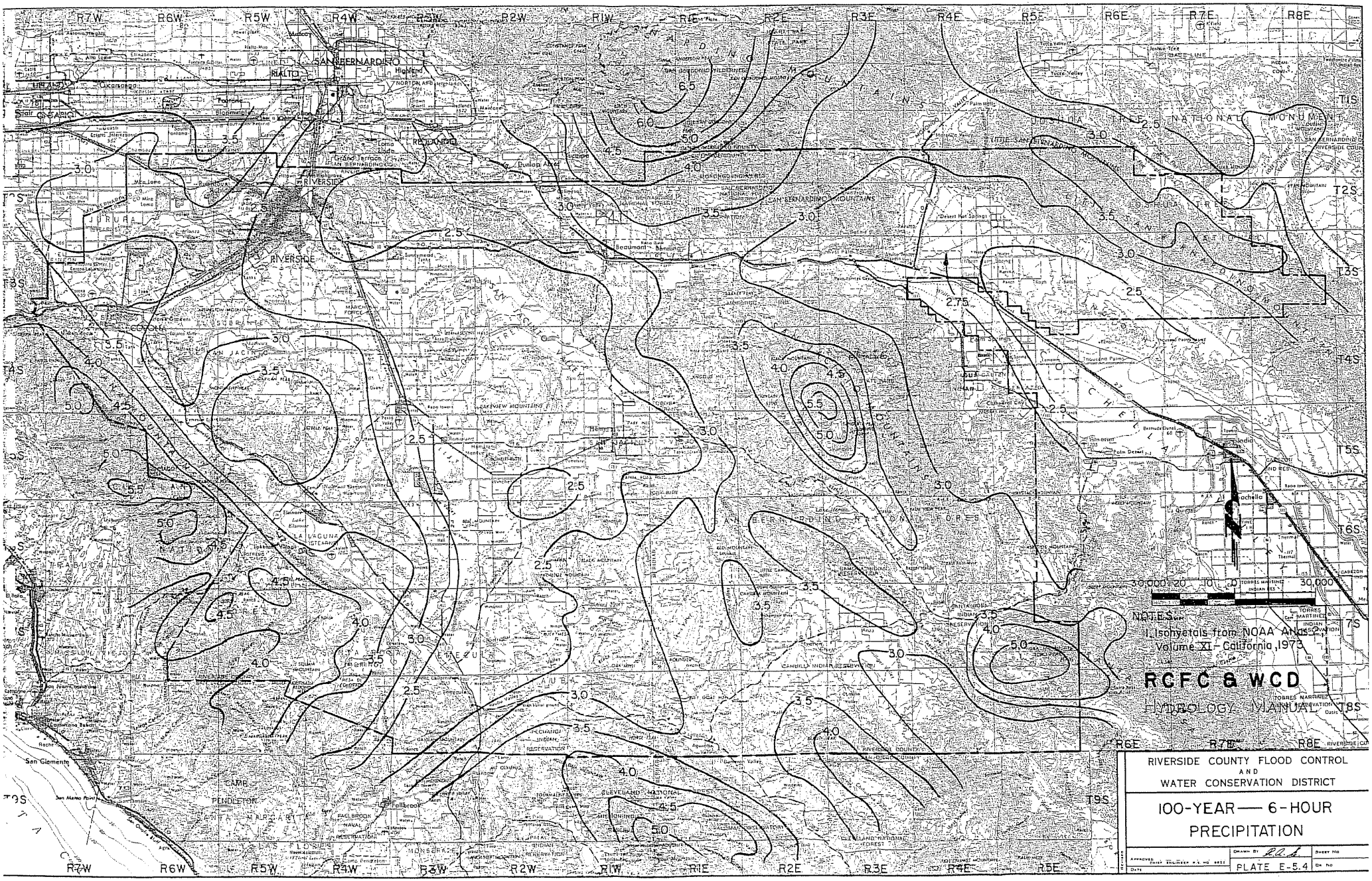
FEMA Firmettes


NOTES:
1. Isohyetals based on NOAA Atlas 2, Volume XI - California, 1973.
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 3-HOUR
PRECIPITATION
PLATE E-5.1
SAN BERNARDINO
RIVERSIDE
RIALTO
ONTARIO
CORONA
JURUPA
LAKEVIEW MOUNTAINS
SAN JACINTO MOUNTAINS
SAN BERNARDINO MOUNTAINS
LITTLE SAN BERNARDINO MOUNTAINS
JOSHUA TREE NATIONAL MONUMENT
CLEVELAND NATIONAL FOREST
CAMP PENDLETON
San Clemente
Palm Springs
Indio
Coachella
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
R6E
R7E
R8E
T1S
T2S
T3S
T4S
T5S
T6S
T7S
T8S
T9S


NOTES:
1. Isohyetals based on NOAA Atlas 2, Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 3-HOUR
PRECIPITATION
PLATE E-5.2
SAN BERNARDINO
RIVERSIDE
SAN BERNARDINO MOUNTAINS
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO NATIONAL FOREST
LA LAGUNA
CAMP PENDLETON
Fallbrook
San Clemente
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
R6E
R7E
R8E
T1S
T2S
T3S
T4S
T5S
T6S
T7S
T8S
T9S



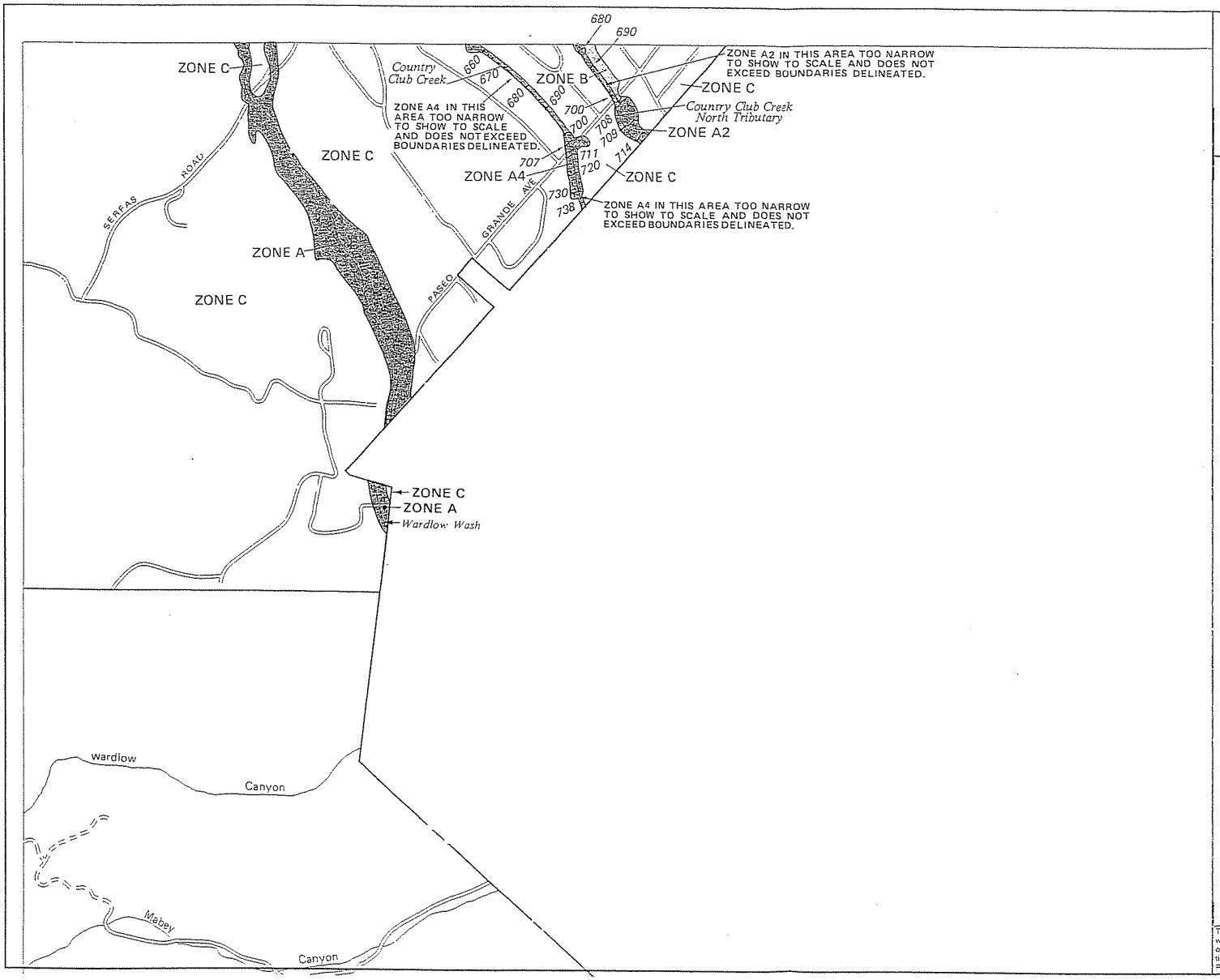
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
R6E
R7E
R8E
T1S
T2S
T3S
T4S
T5S
T6S
T7S
T8S
T9S
SAN BERNARDINO
RIVERSIDE
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO MOUNTAINS
LAKEVIEW MOUNTAINS
CAMP PENDLETON
Fallbrook
Beaumont
Palm Springs
Indio
Coachella
30,000 20 10 0 30,000
NOTES
1. Isohyetals from NOAA Atlas 2 Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 6-HOUR
PRECIPITATION
PLATE E-5.3




RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

100-YEAR — 6-HOUR
PRECIPITATION

PLATE E-5.4




APPROXIMATE SCALE

1000 0 1000 FEE

NATIONAL FLOOD INSURANCE PROGRAM

# FIRM

## FLOOD INSURANCE RATE MAP

# RIVERSIDE COUNTY, CALIFORNIA

UNINCORPORATED AREA

PANEL 1355 OF 3600

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
060245 1355 B

MAP REVISED:
MARCH 22, 1983

Federal Emergency Management Agency

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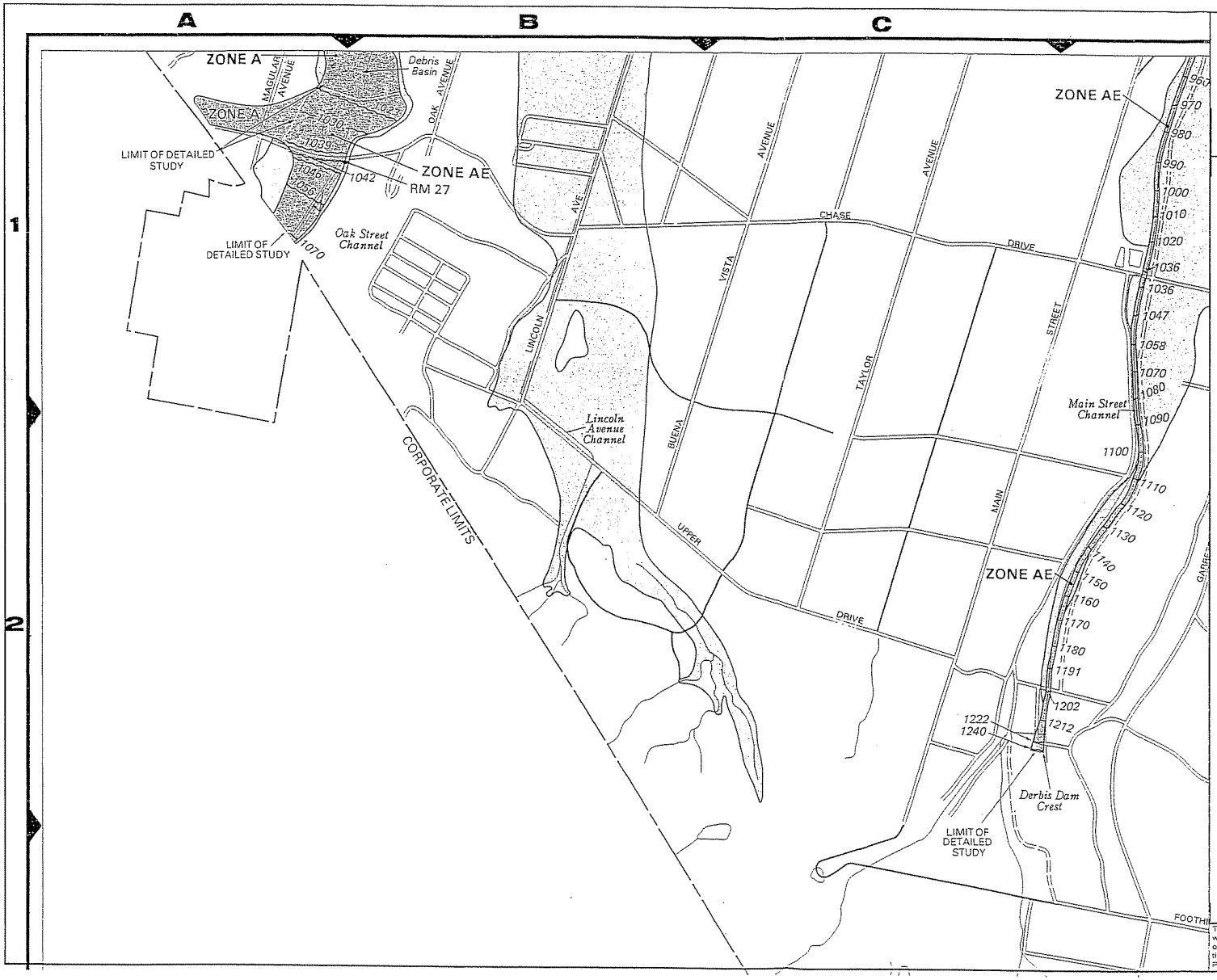


APPROXIMATE SCALE IN FEET

1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

# FIRM

## FLOOD INSURANCE RATE MAP

CITY OF
CORONA,
CALIFORNIA
RIVERSIDE COUNTY

(SEE MAP INDEX FOR PANELS NOT PRINTED)

**COMMUNITY-PANEL NUMBER**
060250 0010 D

**MAP REVISED:**
JUNE 18, 1996

Federal Emergency Management Agency

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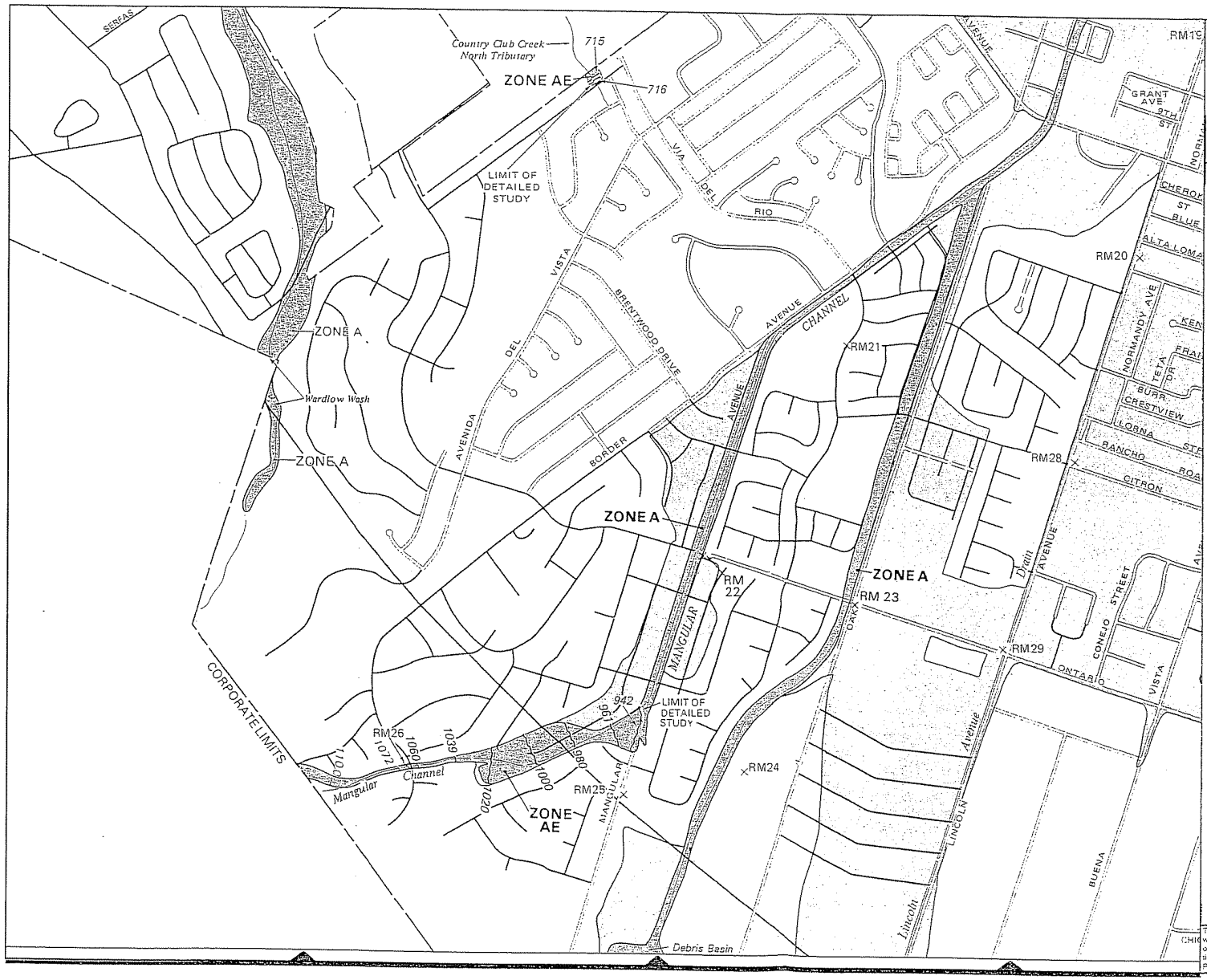


APPROXIMATE SCALE IN FEET

1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

# FIRM

## FLOOD INSURANCE RATE MAP

CITY OF
CORONA,
CALIFORNIA
RIVERSIDE COUNTY

(SEE MAP INDEX FOR PANELS NOT PRINTED)

**COMMUNITY-PANEL NUMBER**
060250 0005 F

**MAP REVISED:**
JUNE 18, 1996

Federal Emergency Management Agency

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