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The WLB Group Inc.

OFFISITE DRAINAGE CONCEPT STUDY

Part A - Offsite Hydrology
(Appendix 2 - Appendix 5)

OUTER LOOP HIGHWAY
(Buckeye Road to Northern Avenue)
Revised December 10, 1987

Property of
Library

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OFFISITE DRAINAGE CONCEPT STUDY

Part A - Offsite Hydrology
(Appendix 2 - Appendix 5)

OUTER LOOP HIGHWAY
(Buckeye Road to Northern Avenue)
Revised December 10, 1987

Registered Professional Engineer
CERTIFICATE NO.
15594
MARK G.
GAVAN
Date Signed 1-27-88
ARIZONA, U.S.A.

FLOOD CONTROL DISTRICT
RECEIVED
FEB 05 '88

	CH ENG		P & PM
	DEP		HYDRO
	ADMIN		LAND
	FINANCE		FILE
	C & O		
	CONSN		

REMARKS

APPENDIX 2

HEC-1 OUTPUT

Buckeye Road to Papago Freeway

BUCKEYE ROAD TO PAPGO FREEWAY

50-Year Case

```
*************************************
*                                   *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*          FEBRUARY 1981            *
*        REVISED 14 JUN 85          *
*                                   *
*     RUN DATE: Thu 10-JUL-1986     *
*        TIME: 11:53:29.69          *
*                                   *
*************************************
```

```
*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
* THE HYDROLOGIC ENGINEERING CENTER *
*        609 SECOND STREET          *
*      DAVIS, CALIFORNIA 95616      *
*                                   *
* (916) 756-1104 OR (FTS) 448-3285  *
*                                   *
*************************************
```

```
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. THE VERSION RELEASED 31JAN85 CONTAINS NEW OPTIONS ON RL AND BA RECORDS, AND ADDS THE HL RECORD. SEE JANUARY 1985 INPUT DESCRIPTION FOR NEW DEFINITIONS.

```
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION  :::
:::          By: John R. Haestad        :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```


==========

H A E S T A D M E T H O D S

==========

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 753-9800

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

  1           ID        BUCPAP50                 50-YEAR STORM
  2           ID        DRAINAGE AREA FOR THE OUTER LOOP DRAINAGE STUDY FOR THE STRETCH OF
  3           ID        HIGHWAY BETWEEN BUCKEYE ROAD AND INTERSTATE 10 (PAPAGO FREEWAY).
              *DIAGRAM
  4           IT       610JULY85    1200     240
  5           IO       5
  6           JD             .5
  7           JH                    .63    1.23    2.16    2.35    2.50    2.76    3.02    3.29
  8           JD            1.0
  9           JD            2.0
 10           JD            3.0
 11           JD            4.0

 12           KK     SB1
 13           KM        SUBWATERSHED 1 (SB1) IN THE BUCKEYE ROAD TO PAPAGO FREEWAY SECTION.
 14           KM        THE HYPOTHECTICAL DATA CARD IS USED TO INPUT STORM RAINFALL DATA
 15           KM        COMPUTED FROM THE ADDENDUM TO ADOT'S "HYDROLOGIC DESIGN FOR HIGHWAY
 16           KM        DRAINAGE IN ARIZONA" APRIL 1975.
 17           BA     .81
 18           LS             81
 19           UD    1.37

 20           KK     CP2
 21           KM        ROUTE FLOW FROM SB1 TO CONCENTRATION POINT 2 (CP2).
 22           RK    2640    .022     .05                     1.0     4.0

 23           KK     SB2
 24           KM        RUNOFF FROM SUBWATERSHED 2.
 25           BA    2.40
 26           LS             82
 27           UD    2.81

 28           KK     CP2
 29           KM        COMBINE HYDROGRAPHS AT CP2.
 30           HC       2

 31           KK     CP3
 32           KM        ROUTE COMBINED FLOW AT CP2 TO CP3.
 33           RK    2640   .0023    .050                     1.0     4.0

 34           KK     SB3
 35           KM        RUNOFF FROM SUBWATERSHED 3.
 36           BA     .60
 37           LS             83
 38           UD    1.59

 39           KK     CP3
 40           KM        COMBINE TOTAL DRAINAGE AREA AT CP3.
 41           HC       2
 42           ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

  12         SB1
              V
              V
  20         CP2
              .
              .
  23          .          SB2
              .            .
              .            .
  28         CP2............
              V
              V
  31         CP3
              .
              .
  34          .          SB3
              .            .
              .            .
  39         CP3............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          FEBRUARY 1981               *
*        REVISED 14 JUN 85             *
*                                      *
*     RUN DATE: Thu 10-JUL-1986        *
*        TIME: 11:53:42.11             *
*                                      *
****************************************
```

```
****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
* THE HYDROLOGIC ENGINEERING CENTER    *
*        609 SECOND STREET             *
*      DAVIS, CALIFORNIA 95616         *
*                                      *
* (916) 756-1104 OR (FTS) 448-3285     *
*                                      *
****************************************
```

```
                    BUCPAP50                50-YEAR STORM
                    DRAINAGE AREA FOR THE OUTER LOOP DRAINAGE STUDY FOR THE STRETCH OF
                    HIGHWAY BETWEEN BUCKEYE ROAD AND INTERSTATE 10 (PAPAGO FREEWAY).

  5 ID        OUTPUT CONTROL VARIABLES
                   IPRNT          5  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT         HYDROGRAPH TIME DATA
                    NMIN          6  MINUTES IN COMPUTATION INTERVAL
                   IDATE     10JUL86  STARTING DATE
                   ITIME        1200  STARTING TIME
                      NQ         240  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE     11   86  ENDING DATE
                  NDTIME        1154  ENDING TIME

             COMPUTATION INTERVAL    0.10 HOURS
                  TOTAL TIME BASE   23.90 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

  6 JD        INDEX STORM NO. 1
                  STRM       3.29  PRECIPITATION DEPTH
                  TRDA       0.50  TRANSPOSITION DRAINAGE AREA

  7 PI          PRECIPITATION PATTERN
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
```

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
0.02	0.02	0.02	0.02	0.08	0.09	0.11	0.19	0.38	0.71
0.25	0.16	0.10	0.09	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

8 JD INDEX STORM NO. 2

STRM 3.28 PRECIPITATION DEPTH

TRDA 1.00 TRANSPOSITION DRAINAGE AREA

7 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
0.02	0.02	0.02	0.02	0.08	0.09	0.11	0.19	0.38	0.70
0.25	0.16	0.10	0.09	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

9 JD INDEX STORM NO. 3

STRM 3.28 PRECIPITATION DEPTH

TRDA 2.00 TRANSPOSITION DRAINAGE AREA

7 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
0.02	0.02	0.02	0.02	0.08	0.09	0.11	0.18	0.37	0.72
0.24	0.16	0.10	0.09	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

10 JD INDEX STORM NO. 4

STRM 3.28 PRECIPITATION DEPTH

TRDA 3.00 TRANSPOSITION DRAINAGE AREA

7 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
0.22	0.22	0.02	0.03	0.08	0.09	0.11	0.18	0.37	0.69
0.24	0.16	0.10	0.09	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

11 JD INDEX STORM NO. 5

STRM 3.27 PRECIPITATION DEPTH

TRDA 4.00 TRANSPOSITION DRAINAGE AREA

7 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
0.02	0.02	0.02	0.03	0.08	0.09	0.11	0.18	0.37	0.69
0.24	0.16	0.10	0.09	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

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	SB1	309.	13.40	119.	33.	33.	0.81		
ROUTED TO	CP2	308.	13.60	120.	33.	33.	0.81		
HYDROGRAPH AT	SB2	517.	15.00	331.	99.	99.	2.40		
2 COMBINED AT	CP2	697.	14.20	446.	132.	132.	3.21		
ROUTED TO	CP3	695.	14.30	445.	131.	131.	3.21		
HYDROGRAPH AT	SB3	193.	13.70	84.	23.	23.	0.60		
2 COMBINED AT	CP3	855.	14.20	524.	154.	154.	3.81		

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

BUCKEYE ROAD TO PAPAGO FREEWAY

100-Year Case

```
*                                        *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*            FEBRUARY 1981               *
*           REVISED 14 JUN 85            *
*                                        *
*      RUN DATE: Thu 10-JUL-1986         *
*          TIME: 11:56:36.00             *
*                                        *
******************************************
```

```
*                                        *
*    U.S. ARMY CORPS OF ENGINEERS        *
*  THE HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616          *
*                                        *
*  (916) 756-1104 OR (FTS) 448-3285      *
*                                        *
******************************************
```

```
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 -AMBK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THE VERSION RELEASED 31JAN85 CONTAINS NEW OPTIONS ON RL AND BA RECORDS, AND ADDS THE HL RECORD. SEE JANUARY 1985 INPUT DESCRIPTION FOR NEW DEFINITIONS.

```
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION  :::
:::          By: John R. Haestad         :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

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============================
H A E S T A D   M E T H O D S
============================
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 753-9802

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

  1           ID        BUCPA100                100-YEAR STORM
  2           ID        DRAINAGE AREA FOR THE OUTER LOOP DRAINAGE STUDY FOR THE STRETCH OF
  3           ID        HIGHWAY BETWEEN BUCKEYE ROAD AND INTERSTATE 10 (PAPAGO FREEWAY).
              *DIAGRAM
  4           IT       610JULY86    1200     240
  5           ID       5
  6           JD             .5
  7           PH                    .71    1.40    2.45    2.64    2.82    3.10    3.40    3.71
  8           JD            1.0
  9           JD            2.0
 10           JD            3.0
 11           JD            4.0

 12           KK     SB1
 13           KM        SUBWATERSHED 1 (SB1) IN THE BUCKEYE ROAD TO PAPAGO FREEWAY SECTION.
 14           KM        THE HYPOTHETICAL DATA CARD IS USED TO INPUT STORM RAINFALL DATA
 15           KM        COMPUTED FROM THE ADDENDUM TO ADOT'S "HYDROLOGIC DESIGN FOR HIGHWAY
 16           KM        DRAINAGE IN ARIZONA" APRIL 1975.
 17           BA     .81
 18           LS             81
 19           UD    1.37

 22           KK     CP2
 21           KM        ROUTE FLOW FROM SB1 TO CONCENTRATION POINT 2 (CP2).
 22           RK    2640    .0223     .25                     1.0     4.0

 23           KK     SB2
 24           KM        RUNOFF FROM SUBWATERSHED 2.
 25           BA    2.40
 26           LS             82
 27           UD    2.81

 28           KK     CP2
 29           KM        COMBINE HYDROGRAPHS AT CP2.
 30           HC       2

 31           KK     CP3
 32           KM        ROUTE COMBINED FLOW AT CP2 TO CP3.
 33           RK    2642   .0223    .250                     1.0     4.0

 34           KK     SB3
 35           KM        RUNOFF FROM SUBWATERSHED 3.
 36           BA     .60
 37           LS             83
 38           UD    1.53

 39           KK     CP3
 40           KM        COMBINE TOTAL DRAINAGE AREA AT CP3.
 41           HC       2
 42           ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   12        SB1
              V
              V
   22        CP2
              .
              .
   23         .         SB2
              .           .
              .           .
   28        CP2............
              V
              V
   31        CP3
              .
              .
   34         .         SB3
              .           .
              .           .
   39        CP3............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          FEBRUARY 1981               *
*        REVISED 14 JUN 85             *
*                                      *
*     RUN DATE: Thu 10-JUL-1986        *
*        TIME: 11:56:46.08             *
*                                      *
****************************************
```

```
****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
* THE HYDROLOGIC ENGINEERING CENTER    *
*        609 SECOND STREET             *
*      DAVIS, CALIFORNIA 95616         *
*                                      *
* (916) 756-1104 OR (FTS) 448-3283     *
*                                      *
****************************************
```

```
                    BUCPA120              100-YEAR STORM
                    DRAINAGE AREA FOR THE OUTER LOOP DRAINAGE STUDY FOR THE STRETCH OF
                    HIGHWAY BETWEEN BUCKEYE ROAD AND INTERSTATE 10 (PAPAGO FREEWAY).

5 ID        OUTPUT CONTROL VARIABLES
                IPRNT          5  PRINT CONTROL
                IPLOT          0  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE

  IT        HYDROGRAPH TIME DATA
                NMIN           6  MINUTES IN COMPUTATION INTERVAL
               IDATE     10JLY86  STARTING DATE
               ITIME        1200  STARTING TIME
                  NQ         242  NUMBER OF HYDROGRAPH ORDINATES
              NDDATE     11   86  ENDING DATE
              NDTIME        1154  ENDING TIME

          COMPUTATION INTERVAL    0.10 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

6 JD        INDEX STORM NO. 1
               STRM        3.71  PRECIPITATION DEPTH
               TRDA        0.50  TRANSPOSITION DRAINAGE AREA

7 PI          PRECIPITATION PATTERN
              0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
              0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
              0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
              0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
              0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
              0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
              0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
              0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.01      0.01      0.01
              0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01
              0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01
              0.01      0.01      0.01      0.01      0.02      0.02      0.02      0.02      0.02      0.02
              0.03      0.03      0.03      0.03      0.03      0.11      0.13      0.31      0.43      0.52
```

0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

8 ID INDEX STORM NO. 2

STRM 3.70 PRECIPITATION DEPTH

TRDA 1.00 TRANSPOSITION DRAINAGE AREA

7 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01
0.02	0.02	0.02	0.02	0.05	0.11	0.13	0.21	0.43	0.79
0.28	0.18	0.12	0.10	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

9 ID INDEX STORM NO. 3

STRM 3.70 PRECIPITATION DEPTH

TRDA 2.00 TRANSPOSITION DRAINAGE AREA

7 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01
0.02	0.02	0.02	0.02	0.05	0.11	0.13	0.21	0.43	0.79
0.38	0.19	0.12	0.10	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

10 JD INDEX STORM NO. 4

STRM 3.69 PRECIPITATION DEPTH

TRDA 3.00 TRANSPOSITION DRAINAGE AREA

7 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.09	0.11	0.13	0.21	0.43	0.78
0.28	0.18	0.12	0.10	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

11 JD INDEX STORM NO. 5

STRM 3.69 PRECIPITATION DEPTH

TRDA 4.00 TRANSPOSITION DRAINAGE AREA

7 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.09	0.11	0.13	0.20	0.42	0.75
0.26	0.18	0.12	0.10	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

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	S81	380.	13.40	146.	40.	40.	0.81		
ROUTED TO	CP2	379.	13.50	146.	40.	40.	0.81		
HYDROGRAPH AT	S82	632.	15.00	404.	121.	121.	2.40		
2 COMBINED AT	CP2	841.	14.20	543.	161.	161.	3.21		
ROUTED TO	CP3	839.	14.30	542.	160.	160.	3.21		
HYDROGRAPH AT	S83	239.	13.70	103.	29.	29.	0.60		
2 COMBINED AT	CP3	1040.	14.10	639.	188.	188.	3.81		

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

APPENDIX 3

HEC-1 OUTPUT

Papago Freeway to Northern Avenue - Case A

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            FEBRUARY 1981             *
*          REVISED 14 JUN 85           *
*                                      *
*       RUN DATE: Mon 07-DEC-1987      *
*           TIME: 15:31:43.11          *
*                                      *
****************************************
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```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*                                      *
*  (916) 756-1104 OR (FTS) 448-3285    *
*                                      *
****************************************
```

```
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. THE VERSION RELEASED 31JAN85 CONTAINS NEW OPTIONS ON RL AND BA RECORDS, AND ADDS THE HL RECORD. SEE JANUARY 1985 INPUT DESCRIPTION FOR NEW DEFINITIONS.

```
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION  :::
:::          By: John R. Haestad         :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
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==========
HAESTAD METHODS
==========

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 753-9800

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

  1           ID        CASEA50                 50-YEAR STORM DATA
  2           ID       HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
  3           ID       NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
  4           ID       THAT THE PARADISE CORRIDOR AND GRAND AVENUE EXPRESSWAY ARE BUILT AS LOW
  5           ID       LEVEL FACILITIES, i.e., NO CHANNEL ON THE PARADISE CORRIDOR.
              *DIAGRAM
  6           IT      6 22MAY86    1200     240
  7           IO      5
  8           JD            .09
  9           PH                    .63    1.23    2.16    2.36    2.50    2.76    3.02    3.29
 10           JD            10
 11           JD            20
 12           JD            30
 13           JD            40

 14           KK      A1
 15           KM       SUBWATERSHED 1 IN THE OUTER LOOP DRAINAGE STUDY.
 16           KM       THE HYPOTHETICAL DATA CARD IS USED TO INPUT STORM RAINFALL DATA COMPUTED
 17           KM       FROM THE ADDEMDUM TO ADOT'S "HYDROLOGIC DESIGN FOR HIGHWAY DRAINAGE IN
 18           KM       ARIZONA" APRIL 1975.
 19           BA    7.45
 20           LS      0      86       0
 21           UD    2.26

 22           KK     CP2
 23           KM       ROUTE FLOW FROM SUBWATERSHED 1 (A1) TO CONCENTRATION POINT 2 (CP2).
 24           RK    5280  .00094    .018                     30       1

 25           KK      A2
 26           KM       RUNOFF FROM SUBWATERSHED 2.
 27           BA    7.79
 28           LS      0      86       0
 29           UD    2.49

 30           KK     CP2
 31           KM       COMBINE HYDROGRAPHS AT CP2.
 32           HC      2

 33           KK     CP3
 34           KM       ROUTE COMBINED HYDROGRAPH AT CP2 TO CP3.
 35           RK    5280  .00094    .018              12       2

 36           KK      A3
 37           KM       RUNOFF FROM SUBWATERSHED 3.
 38           BA    6.70
 39           LS      0      86       0
 40           UD    2.47

 41           KK     CP3
 42           KM       COMBINE HYDROGRAPHS AT CP3.
 43           HC      2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  44          KK     CP4
  45          KM       ROUTE COMBINED HYDROGRAPH  AT CP3 TO CP4.
  46          RK    5280  .00195    .018                     12       2

  47          KK      A4
  48          KM        RUNOFF FROM SUBWATERSHED 4.
  49          BA    5.80
  50          LS       0      88       0
  51          UD    2.15

  52          KK     CP4
  53          KM        COMBINE HYDROGRAPHS AT CP4.
  54          HC       2

  55          KK     CP5
  56          KM       ROUTE COMBINED HYDROGRAPH  AT CP4 TO CP5.
  57          RK    5280   .0014    .018                     12       2

  58          KK      A5
  59          KM        RUNOFF FROM SUBWATERSHED 5.
  60          BA    3.19
  61          LS       0      79       0
  62          UD    1.65

  63          KK     CP5
  64          KM        COMBINE HYDROGRAPHS AT CP5.
  65          HC       2

  66          KK     CP6
  67          KM       ROUTE COMBINED HYDROGRAPH AT CP5 TO CP6.
  68          RK    5280   .0016    .018                     15       2

  69          KK      A6
  70          KM        RUNOFF FROM SUBWATERSHED 6.
  71          BA    2.23
  72          LS       0      84       0
  73          UD    1.22

  74          KK     CP6
  75          KM        COMBINE HYDROGRAPHS AT CP6.
  76          HC       2

  77          KK     CP7
  78          KM       ROUTE COMBINED HYDROGRAPH AT CP6 TO CP7.
  79          RK    5280   .0018    .018                     15       2

  80          KK      A7
  81          KM        RUNOFF FROM SUBWATERSHED 7.
  82          BA    1.47
  83          LS       0      84       0
  84          UD    1.17
```

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

 85           KK     CP7
 86           KM        COMBINE HYDROGRAPHS AT CP7.
 87           HC       2

 88           KK    CP8A
 89           KM       ROUTE COMBINED HYDROGRAPH AT CP7 TO CP8.  FIRST TO TRANSITION AT
 90           KM        CP8A THEN TO CP8.
 91           RK    3800   .0023    .018                      15       2

 92           KK     CP8
 93           RK    1480   .0008    .018                      25       2

 94           KK      A8
 95           KM        RUNOFF FROM SUBWATERSHED 8.
 96           BA    1.19
 97           LS       0      78       0
 98           UD    .83

 99           KK     CP8
100           KM        COMBINE HYDROGRAPHS AT CP8.
101           HC       2

102           KK     CP9
103           KM       ROUTE COMBINED HYDROGRAPH AT CP8 TO CP9.
104           RK    5280   .0008    .018                      25       2

105           KK      A9
106           KM        RUNOFF FROM SUBWATERSHED 9.
107           BA     .2
108           LS       0      78       0
109           UD    .57

110           KK     CP9
111           KM        COMBINE HYDROGRAPHS AT CP9.
112           HC       2

113           KK     A9C
114           KM        RUNOFF FROM SUBWATERSHED A9C.
115           BA    .093
116           LS              78
117           UD    .43

118           KK    CP9B
119           KM        ROUTE FLOW AT CP9C TO CP9B.
120           RK     660   .0043    .012            CIRC       5

121           KK     A9B
122           KM        RUNOFF FROM SUBWATERSHED A9B.
123           BA    .093
124           LS              78
125           UD    .43
```

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

 126          KK    CP9B
 127          KM        ADD HYDROGRAPHS AT CP9B.
 128          HC       2

 129          KK    CP9A
 130          KM        ROUTE FLOW FROM CP9B TO CP9A.
 131          RK    1320   .0043    .012            CIRC     6.5

 132          KK     A9A
 133          KM        RUNOFF FROM SUBWATERSHED A9A.
 134          BA    .185
 135          LS              78
 136          UD     .49

 137          KK    CP9A
 138          KM        ADD HYDROGRAPHS AT CP9A.
 139          HC       2

 140          KK     CP9
 141          KM        ROUTE FLOW FROM CP9A TO CP9.
 142          RK    1000    .003    .012            CIRC     6.5

 143          KK     CP9
 144          KM        COMBINE HYDROGRAPHS AT CP9.
 145          HC       2

 146          KK     A12
 147          KM        RUNOFF FROM SUBWATERSHED 12.
 148          BA    3.14
 149          LS       0      83       0
 150          UD    1.69

 151          KK    CP13
 152          KM       ROUTE FLOW FROM CP12 TO CP13.
 153          RK   26400   .0025    .020                      0      50

 154          KK     A11
 155          KM        RUNOFF FROM SUBWATERSHED 11.
 156          BA    3.30
 157          LS       0      81       0
 158          UD    1.69

 159          KK    CP13
 160          KM       ROUTE FLOW FROM CP11 TO CP13.
 161          RK   26400   .0025   .0200                      0      50

 162          KK     A13
 163          KM        RUNOFF FROM SUBWATERSHED 13.
 164          BA    4.10
 165          LS       0      82       0
 166          UD    2.00
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 167          KK    CP13
 168          KM       COMBINE ROUTED AND RUNOFF HYDROGRAPHS AT CP13.
 169          HC      3

 170          KK    CP14
 171          KM       ROUTE COMBINED HYDROGRAPH AT CP13 TO CP14.
 172          RK    5280   .0023    .018                     30       2

 173          KK     A10
 174          KM       RUNOFF FROM SUBWATERSHED 10.
 175          BA    6.33
 176          LS      0      83       0
 177          UD    1.69

 178          KK    CP14
 179          KM       ROUTE FLOW FROM CP10 TO CP14.
 180          RK   31680   .0027    .020                      0      50

 181          KK     A14
 182          KM       RUNOFF FROM SUBWATERSHED 14.
 183          BA    5.29
 184          LS      0      80       0
 185          UD    2.20

 186          KK    CP14
 187          KM       COMBINE HYDROGRAPHS AT CP14.
 188          HC      2

 189          KK    CP14
 190          KM       COMBINE FLOWS AT CP14.
 191          HC      2

 192          KK    CP18
 193          KM       ROUTE COMBINED HYDROGRAPH AT CP14 TO CP18.
 194          RK    5600   .0008    .018                     70       3

 195          KK     A18
 196          KM       RUNOFF FROM A18.
 197          BA     .70
 198          LS             77
 199          UD     .79

 200          KK    CP18
 201          KM       COMBINE HYDROGRAPHS AT CP18.
 202          HC      2

 203          KK     A15
 204          KM       RUNOFF FROM SUBWATERSHED 15.
 205          BA    1.77
 206          LS      0      77       0
 207          UD    1.12
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 208          KK    CP16
 209          KM       ROUTE COMBINED HYDROGRAPH AT CP15 TO CP16.
 210          RK    5280   .0015    .018                    15       2

 211          KK     A16
 212          KM       RUNOFF FROM SUBWATERSHED A16.
 213          BA    5.31
 214          LS       0      81       0
 215          UD    1.91

 216          KK    CP16
 217          KM       COMBINE HYDROGRAPHS AT CP16.
 218          HC       2

 219          KK    CP17
 220          KM       ROUTE COMBINED HYDROGRAPH AT CP16 TO CP17.
 221          RK    5280   .0032    .018                    20       2

 222          KK     A17
 223          KM       RUNOFF FROM SUBWATERSHED 17.
 224          BA    6.28
 225          LS       0      82       0
 226          UD    2.78

 227          KK    CP17
 228          KM       COMBINE HYDROGRAPHS AT CP17.
 229          HC       2

 230          KK    A17A
 231          KM       RUNOFF FROM SUBWATERSHED A17A.
 232          BA     .50
 233          LS              78
 234          UD     .73

 235          KK    CP17
 236          KM       COMBINE HYDROGRAPHS AT CP17.
 237          HC       2

 238          KK    CP19
 239          KM       ROUTE COMBINED HYDROGRAPH AT CP17 TO CP19.
 240          RK   14500   .0011    .018                    30       2

 241          KK     A19
 242          KM       RUNOFF FROM A19.
 243          BA    1.32
 244          LS              76
 245          UD    1.43

 246          KK    CP19
 247          KM       COMBINE HYDROGRAPHS AT CP19.
 248          HC       2
 249          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   14        A1
              V
              V
   22       CP2
              .
              .
   25         .          A2
              .           .
              .           .
   30       CP2............
              V
              V
   33       CP3
              .
              .
   36         .          A3
              .           .
              .           .
   41       CP3............
              V
              V
   44       CP4
              .
              .
   47         .          A4
              .           .
              .           .
   52       CP4............
              V
              V
   55       CP5
              .
              .
   58         .          A5
              .           .
              .           .
   63       CP5............
              V
              V
   66       CP6
              .
              .
   69         .          A6
              .           .
              .           .
   74       CP6............
              V
              V
   77       CP7
              .
              .
   80         .          A7
              .           .
```

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 85        CP7............
             V
             V
 88       CP8A
             V
             V
 92        CP8
             .
             .
 94          .          A8
             .           .
             .           .
 99        CP8............
             V
             V
102        CP9
             .
             .
105          .          A9
             .           .
             .           .
110        CP9............
             .
             .
113          .         A9C
             .           V
             .           V
118          .        CP9B
             .           .
             .           .
121          .           .        A9B
             .           .          .
             .           .          .
126          .        CP9B............
             .           V
             .           V
129          .        CP9A
             .           .
             .           .
132          .           .        A9A
             .           .          .
             .           .          .
137          .        CP9A............
             .           V
             .           V
140          .         CP9
             .           .
             .           .
143        CP9............
             .
             .
146          .         A12
             .           V
             .           V
151          .        CP13
             .           .
             .           .
154          .           .        A11
             .           .          V
             .           .          V
159          .           .       CP13
             .           .          .
             .           .          .
162          .           .          .        A13
             .           .          .          .
```

```
167         .       CP13.......................
            .         V
            .         V
170         .       CP14
            .         .
            .         .
173         .         .        A10
            .         .         V
            .         .         V
178         .         .       CP14
            .         .         .
            .         .         .
181         .         .         .        A14
            .         .         .          .
            .         .         .          .
186         .         .       CP14............
            .         .         .
            .         .         .
189         .       CP14............
            .         V
            .         V
192         .       CP18
            .         .
            .         .
195         .         .        A18
            .         .         .
            .         .         .
200         .       CP18............
            .         .
            .         .
203         .         .        A15
            .         .         V
            .         .         V
208         .         .       CP16
            .         .         .
            .         .         .
211         .         .         .        A16
            .         .         .          .
            .         .         .          .
216         .         .       CP16............
            .         .         V
            .         .         V
219         .         .       CP17
            .         .         .
            .         .         .
222         .         .         .        A17
            .         .         .          .
            .         .         .          .
227         .         .       CP17............
            .         .         .
            .         .         .
230         .         .         .       A17A
            .         .         .          .
            .         .         .          .
235         .         .       CP17............
            .         .         V
            .         .         V
238         .         .       CP19
            .         .         .
            .         .         .
241         .         .         .        A19
            .         .         .          .
            .         .         .          .
246         .         .       CP19............
```

```
*************************************
*                                   *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*          FEBRUARY 1981            *
*        REVISED 14 JUN 85          *
*                                   *
*     RUN DATE: Mon 07-DEC-1987     *
*        TIME: 15:32:07.66          *
*                                   *
*************************************
```

```
*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
* THE HYDROLOGIC ENGINEERING CENTER *
*        609 SECOND STREET          *
*      DAVIS, CALIFORNIA 95616      *
*                                   *
* (916) 756-1104 OR (FTS) 448-3285  *
*                                   *
*************************************
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                    CASEA50                50-YEAR STORM DATA
                  HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
                  NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
                  THAT THE PARADISE CORRIDOR AND GRAND AVENUE EXPRESSWAY ARE BUILT AS LOW
                  LEVEL FACILITIES, i.e., NO CHANNEL ON THE PARADISE CORRIDOR.

  7 ID        OUTPUT CONTROL VARIABLES
                   IPRNT          5  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT        HYDROGRAPH TIME DATA
                    NMIN          6  MINUTES IN COMPUTATION INTERVAL
                   IDATE     22MAY86  STARTING DATE
                   ITIME        1200  STARTING TIME
                      NQ         240  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE     23MAY86  ENDING DATE
                  NDTIME        1154  ENDING TIME

              COMPUTATION INTERVAL    0.10 HOURS
                   TOTAL TIME BASE   23.90 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

  8 JD        INDEX STORM NO. 1
                   STRM        3.29  PRECIPITATION DEPTH
                   TRDA        0.09  TRANSPOSITION DRAINAGE AREA

  9 PI          PRECIPITATION PATTERN
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01
```

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
0.02	0.02	0.02	0.02	0.08	0.09	0.11	0.19	0.38	0.71
0.25	0.16	0.10	0.09	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

10 JD INDEX STORM NO. 2

STRM 3.25 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
0.02	0.02	0.02	0.03	0.08	0.09	0.11	0.17	0.35	0.66
0.23	0.15	0.10	0.09	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

11 JD INDEX STORM NO. 3

STRM 3.21 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.08	0.10	0.12	0.16	0.33	0.62
0.22	0.14	0.10	0.09	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

12 JD INDEX STORM NO. 4

STRM 3.18 PRECIPITATION DEPTH

TRDA 30.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.09	0.10	0.12	0.15	0.31	0.59
0.21	0.13	0.11	0.09	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

13 JD INDEX STORM NO. 5

STRM 3.15 PRECIPITATION DEPTH

TRDA 40.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.09	0.10	0.12	0.15	0.30	0.55
0.19	0.13	0.11	0.09	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

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	A1	2281.	14.40	1274.	367.	367.	7.45		
ROUTED TO	CP2	2279.	14.40	1272.	365.	365.	7.45		
HYDROGRAPH AT	A2	2195.	14.60	1305.	382.	382.	7.79		
2 COMBINED AT	CP2	4367.	14.50	2536.	738.	738.	15.24		
ROUTED TO	CP3	4364.	14.50	2535.	737.	737.	15.24		
HYDROGRAPH AT	A3	1903.	14.60	1125.	329.	329.	6.70		
2 COMBINED AT	CP3	6103.	14.60	3590.	1050.	1050.	21.94		
ROUTED TO	CP4	6102.	14.60	3591.	1048.	1048.	21.94		
HYDROGRAPH AT	A4	2029.	14.20	1092.	312.	312.	5.80		
2 COMBINED AT	CP4	7841.	14.50	4583.	1341.	1341.	27.74		
ROUTED TO	CP5	7839.	14.60	4583.	1337.	1337.	27.74		
HYDROGRAPH AT	A5	910.	13.80	412.	116.	116.	3.19		
2 COMBINED AT	CP5	8418.	14.50	4935.	1442.	1442.	30.93		
ROUTED TO	CP6	8411.	14.60	4936.	1439.	1439.	30.93		
HYDROGRAPH AT	A6	1054.	13.30	373.	103.	103.	2.23		
2 COMBINED AT	CP6	8763.	14.50	5233.	1532.	1532.	33.16		
ROUTED TO	CP7	8754.	14.60	5235.	1529.	1529.	33.16		
HYDROGRAPH AT	A7	722.	13.20	247.	68.	68.	1.47		
2 COMBINED AT	CP7	8973.	14.50	5430.	1590.	1590.	34.63		
ROUTED TO	CP8A	8964.	14.60	5428.	1588.	1588.	34.63		
ROUTED TO	CP8	8963.	14.60	5427.	1587.	1587.	34.63		
HYDROGRAPH AT	A8	566.	12.90	152.	42.	42.	1.19		
2 COMBINED AT	CP8	9032.	14.60	5529.	1624.	1624.	35.82		
ROUTED TO	CP9	9028.	14.60	5530.	1618.	1618.	35.82		

HYDROGRAPH AT	A9	128.	12.60	26.	7.	7.	0.20
2 COMBINED AT	CP9	9034.	14.60	5542.	1625.	1625.	36.02
HYDROGRAPH AT	A9C	71.	12.50	12.	3.	3.	0.09
ROUTED TO	CP9B	71.	12.50	12.	3.	3.	0.09
HYDROGRAPH AT	A9B	71.	12.50	12.	3.	3.	0.09
2 COMBINED AT	CP9B	140.	12.50	24.	7.	7.	0.19
ROUTED TO	CP9A	140.	12.50	24.	7.	7.	0.19
HYDROGRAPH AT	A9A	131.	12.50	24.	7.	7.	0.19
2 COMBINED AT	CP9A	268.	12.50	48.	13.	13.	0.37
ROUTED TO	CP9	265.	12.50	48.	13.	13.	0.37
2 COMBINED AT	CP9	9044.	14.60	5562.	1636.	1636.	36.39
HYDROGRAPH AT	A12	1077.	13.80	491.	137.	137.	3.14
ROUTED TO	CP13	957.	15.20	466.	131.	131.	3.14
HYDROGRAPH AT	A11	1025.	13.80	469.	132.	132.	3.30
ROUTED TO	CP13	906.	15.20	445.	125.	125.	3.30
HYDROGRAPH AT	A13	1158.	14.10	598.	170.	170.	4.10
3 COMBINED AT	CP13	2677.	15.00	1430.	423.	423.	10.54
ROUTED TO	CP14	2676.	15.10	1431.	422.	422.	10.54
HYDROGRAPH AT	A10	2158.	13.80	985.	276.	276.	6.33
ROUTED TO	CP14	1929.	15.20	938.	263.	263.	6.33
HYDROGRAPH AT	A14	1242.	14.40	689.	199.	199.	5.29
2 COMBINED AT	CP14	2970.	15.00	1556.	459.	459.	11.62
2 COMBINED AT	CP14	5413.	15.10	2902.	861.	861.	22.16
ROUTED TO	CP18	5400.	15.20	2898.	854.	854.	22.16
HYDROGRAPH AT	A18	328.	12.80	85.	24.	24.	0.70
2 COMBINED AT	CP18	5420.	15.20	2935.	875.	875.	22.86
HYDROGRAPH AT	A15	628.	13.20	213.	59.	59.	1.77
ROUTED TO	CP16	623.	13.30	211.	59.	59.	1.77
HYDROGRAPH AT	A16	1480.	14.00	742.	211.	211.	5.31
2 COMBINED AT	CP16	1943.	13.70	950.	269.	269.	7.08

ROUTED TO	CP17	1942.	13.80	951.	268.	268.	7.08
HYDROGRAPH AT	A17	1335.	15.00	853.	256.	256.	6.28
2 COMBINED AT	CP17	2958.	14.20	1771.	519.	519.	13.36
HYDROGRAPH AT	A17A	264.	12.80	64.	18.	18.	0.50
2 COMBINED AT	CP17	3001.	14.20	1821.	536.	536.	13.86
ROUTED TO	CP19	2976.	14.40	1797.	527.	527.	13.86
HYDROGRAPH AT	A19	363.	13.50	149.	42.	42.	1.32
2 COMBINED AT	CP19	3200.	14.30	1922.	566.	566.	15.18

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

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****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            FEBRUARY 1981             *
*          REVISED 14 JUN 85           *
*                                      *
*      RUN DATE: Mon 07-DEC-1987       *
*         TIME: 15:17:24.24            *
*                                      *
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****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
* THE HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616        *
*                                      *
* (916) 756-1104 OR (FTS) 448-3285     *
*                                      *
****************************************
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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
```

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. THE VERSION RELEASED 31JAN85 CONTAINS NEW OPTIONS ON RL AND BA RECORDS, AND ADDS THE HL RECORD. SEE JANUARY 1985 INPUT DESCRIPTION FOR NEW DEFINITIONS.

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:::::::::::::::::::::::::::::::::::::::::::::
:::                                       :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION  :::
:::          By: John R. Haestad          :::
:::                                       :::
:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
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H A E S T A D M E T H O D S

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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 753-9800

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

  1           ID        CASEA100                100-YEAR STORM DATA
  2           ID        HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
  3           ID        NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
  4           ID        THAT THE PARADISE CORRIDOR AND GRAND AVENUE EXPRESSWAY ARE BUILT AS LOW
  5           ID        LEVEL FACILITIES, i.e., NO CHANNEL ON THE PARADISE CORRIDOR.
              *DIAGRAM
  6           IT       6 22MAY86    1200     240
  7           IO       5
  8           JD            .09
  9           PH                     .71    1.40    2.45    2.64    2.82    3.10    3.40    3.71
 10           JD             10
 11           JD             20
 12           JD             30
 13           JD             40

 14           KK      A1
 15           KM        SUBWATERSHED 1 IN THE OUTER LOOP DRAINAGE STUDY.
 16           KM        THE HYPOTHETICAL DATA CARD IS USED TO INPUT STORM RAINFALL DATA COMPUTED
 17           KM        FROM THE ADDEMDUM TO ADOT'S "HYDROLOGIC DESIGN FOR HIGHWAY DRAINAGE IN
 18           KM        ARIZONA" APRIL 1975.
 19           BA    7.45
 20           LS       0      86       0
 21           UD    2.26

 22           KK     CP2
 23           KM       ROUTE FLOW FROM SUBWATERSHED 1 (A1) TO CONCENTRATION POINT 2 (CP2).
 24           RK    5280  .00094    .018                     30       1

 25           KK      A2
 26           KM        RUNOFF FROM SUBWATERSHED 2.
 27           BA    7.79
 28           LS       0      86       0
 29           UD    2.49

 30           KK     CP2
 31           KM        COMBINE HYDROGRAPHS AT CP2.
 32           HC       2

 33           KK     CP3
 34           KM       ROUTE COMBINED HYDROGRAPH AT CP2 TO CP3.
 35           RK    5280  .00094    .018              12       2

 36           KK      A3
 37           KM        RUNOFF FROM SUBWATERSHED 3.
 38           BA    6.70
 39           LS       0      86       0
 40           UD    2.47

 41           KK     CP3
 42           KM        COMBINE HYDROGRAPHS AT CP3.
 43           HC       2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  44          KK     CP4
  45          KM       ROUTE COMBINED HYDROGRAPH  AT CP3 TO CP4.
  46          RK    5280  .00195    .018                     12       2

  47          KK      A4
  48          KM        RUNOFF FROM SUBWATERSHED 4.
  49          BA    5.80
  50          LS      0      88       0
  51          UD    2.15

  52          KK     CP4
  53          KM        COMBINE HYDROGRAPHS AT CP4.
  54          HC      2

  55          KK     CP5
  56          KM       ROUTE COMBINED HYDROGRAPH  AT CP4 TO CP5.
  57          RK    5280   .0014    .018                     12       2

  58          KK      A5
  59          KM        RUNOFF FROM SUBWATERSHED 5.
  60          BA    3.19
  61          LS      0      79       0
  62          UD    1.65

  63          KK     CP5
  64          KM        COMBINE HYDROGRAPHS AT CP5.
  65          HC      2

  66          KK     CP6
  67          KM       ROUTE COMBINED HYDROGRAPH AT CP5 TO CP6.
  68          RK    5280   .0016    .018                     15       2

  69          KK      A6
  70          KM        RUNOFF FROM SUBWATERSHED 6.
  71          BA    2.23
  72          LS      0      84       0
  73          UD    1.22

  74          KK     CP6
  75          KM        COMBINE HYDROGRAPHS AT CP6.
  76          HC      2

  77          KK     CP7
  78          KM       ROUTE COMBINED HYDROGRAPH AT CP6 TO CP7.
  79          RK    5280   .0018    .018                     15       2

  80          KK      A7
  81          KM        RUNOFF FROM SUBWATERSHED 7.
  82          BA    1.47
  83          LS      0      84       0
  84          UD    1.17
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 85           KK     CP7
 86           KM        COMBINE HYDROGRAPHS AT CP7.
 87           HC       2

 88           KK    CP8A
 89           KM       ROUTE COMBINED HYDROGRAPH AT CP7 TO CP8.  FIRST TO TRANSITION AT
 90           KM        CP8A THEN TO CP8.
 91           RK    3800   .0023    .018                     15       2

 92           KK     CP8
 93           RK    1480   .0008    .018                     25       2

 94           KK      A8
 95           KM        RUNOFF FROM SUBWATERSHED 8.
 96           BA    1.19
 97           LS       0      78       0
 98           UD    .83

 99           KK     CP8
100           KM        COMBINE HYDROGRAPHS AT CP8.
101           HC       2

102           KK     CP9
103           KM       ROUTE COMBINED HYDROGRAPH AT CP8 TO CP9.
104           RK    5280   .0008    .018                     25       2

105           KK      A9
106           KM        RUNOFF FROM SUBWATERSHED 9.
107           BA     .2
108           LS       0      78       0
109           UD    .57

110           KK     CP9
111           KM        COMBINE HYDROGRAPHS AT CP9.
112           HC       2

113           KK     A9C
114           KM        RUNOFF FROM SUBWATERSHED A9C.
115           BA    .093
116           LS              78
117           UD    .43

118           KK    CP9B
119           KM        ROUTE FLOW AT CP9C TO CP9B.
120           RK     660   .0043    .012            CIRC       5

121           KK     A9B
122           KM        RUNOFF FROM SUBWATERSHED A9B.
123           BA    .093
124           LS              78
125           UD    .43
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 126          KK    CP9B
 127          KM       ADD HYDROGRAPHS AT CP9B.
 128          HC      2

 129          KK    CP9A
 130          KM       ROUTE FLOW FROM CP9B TO CP9A.
 131          RK    1320   .0043    .012            CIRC     6.5

 132          KK     A9A
 133          KM       RUNOFF FROM SUBWATERSHED A9A.
 134          BA    .185
 135          LS              78
 136          UD     .49

 137          KK    CP9A
 138          KM       ADD HYDROGRAPHS AT CP9A.
 139          HC      2

 140          KK     CP9
 141          KM       ROUTE FLOW FROM CP9A TO CP9.
 142          RK    1000    .003    .012            CIRC     6.5

 143          KK     CP9
 144          KM       COMBINE HYDROGRAPHS AT CP9.
 145          HC      2

 146          KK     A12
 147          KM       RUNOFF FROM SUBWATERSHED 12.
 148          BA    3.14
 149          LS      0      83       0
 150          UD    1.69

 151          KK    CP13
 152          KM       ROUTE FLOW FROM CP12 TO CP13.
 153          RK   26400   .0025    .020                     0      50

 154          KK     A11
 155          KM       RUNOFF FROM SUBWATERSHED 11.
 156          BA    3.30
 157          LS      0      81       0
 158          UD    1.69

 159          KK    CP13
 160          KM       ROUTE FLOW FROM CP11 TO CP13.
 161          RK   26400   .0025   .0200                     0      50

 162          KK     A13
 163          KM       RUNOFF FROM SUBWATERSHED 13.
 164          BA    4.10
 165          LS      0      82       0
 166          UD    2.00
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 167          KK    CP13
 168          KM       COMBINE ROUTED AND RUNOFF HYDROGRAPHS AT CP13.
 169          HC      3

 170          KK    CP14
 171          KM       ROUTE COMBINED HYDROGRAPH AT CP13 TO CP14.
 172          RK    5280   .0023    .018                     30       2

 173          KK     A10
 174          KM       RUNOFF FROM SUBWATERSHED 10.
 175          BA    6.33
 176          LS      0      83       0
 177          UD    1.69

 178          KK    CP14
 179          KM       ROUTE FLOW FROM CP10 TO CP14.
 180          RK   31680   .0027    .020                      0      50

 181          KK     A14
 182          KM       RUNOFF FROM SUBWATERSHED 14.
 183          BA    5.29
 184          LS      0      80       0
 185          UD    2.20

 186          KK    CP14
 187          KM       COMBINE HYDROGRAPHS AT CP14.
 188          HC      2

 189          KK    CP14
 190          KM       COMBINE FLOWS AT CP14.
 191          HC      2

 192          KK    CP18
 193          KM       ROUTE COMBINED HYDROGRAPH AT CP14 TO CP18.
 194          RK    5600   .0008    .018                     70       3

 195          KK     A18
 196          KM       RUNOFF FROM A18.
 197          BA     .70
 198          LS             77
 199          UD     .79

 200          KK    CP18
 201          KM       COMBINE HYDROGRAPHS AT CP18.
 202          HC      2

 203          KK     A15
 204          KM       RUNOFF FROM SUBWATERSHED 15.
 205          BA    1.77
 206          LS      0      77       0
 207          UD    1.12
```

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

 208          KK    CP16
 209          KM       ROUTE COMBINED HYDROGRAPH AT CP15 TO CP16.
 210          RK    5280   .0015    .018                     15       2

 211          KK     A16
 212          KM        RUNOFF FROM SUBWATERSHED A16.
 213          BA    5.31
 214          LS       0      81       0
 215          UD    1.91

 216          KK    CP16
 217          KM        COMBINE HYDROGRAPHS AT CP16.
 218          HC       2

 219          KK    CP17
 220          KM       ROUTE COMBINED HYDROGRAPH AT CP16 TO CP17.
 221          RK    5280   .0032    .018                     20       2

 222          KK     A17
 223          KM        RUNOFF FROM SUBWATERSHED 17.
 224          BA    6.28
 225          LS       0      82       0
 226          UD    2.78

 227          KK    CP17
 228          KM        COMBINE HYDROGRAPHS AT CP17.
 229          HC       2

 230          KK    A17A
 231          KM        RUNOFF FROM SUBWATERSHED A17A.
 232          BA     .50
 233          LS              78
 234          UD     .73

 235          KK    CP17
 236          KM        COMBINE HYDROGRAPHS AT CP17.
 237          HC       2

 238          KK    CP19
 239          KM       ROUTE COMBINED HYDROGRAPH AT CP17 TO CP19.
 240          RK   14500   .0011    .018                     30       2

 241          KK     A19
 242          KM        RUNOFF FROM A19.
 243          BA    1.32
 244          LS              76
 245          UD    1.43

 246          KK    CP19
 247          KM        COMBINE HYDROGRAPHS AT CP19.
 248          HC       2
 249          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   14        A1
              V
              V
   22       CP2
              .
              .
   25         .          A2
              .           .
              .           .
   30       CP2............
              V
              V
   33       CP3
              .
              .
   36         .          A3
              .           .
              .           .
   41       CP3............
              V
              V
   44       CP4
              .
              .
   47         .          A4
              .           .
              .           .
   52       CP4............
              V
              V
   55       CP5
              .
              .
   58         .          A5
              .           .
              .           .
   63       CP5............
              V
              V
   66       CP6
              .
              .
   69         .          A6
              .           .
              .           .
   74       CP6............
              V
              V
   77       CP7
              .
              .
   80         .          A7
              .           .
              .           .
```

```
 85     CP7............
         V
         V
 88     CP8A
         V
         V
 92     CP8
         .
         .
 94      .        A8
         .         .
         .         .
 99     CP8............
         V
         V
102     CP9
         .
         .
105      .        A9
         .         .
         .         .
110     CP9............
         .
         .
113      .       A9C
         .         V
         .         V
118      .      CP9B
         .         .
         .         .
121      .         .        A9B
         .         .          .
         .         .          .
126      .      CP9B............
         .         V
         .         V
129      .      CP9A
         .         .
         .         .
132      .         .        A9A
         .         .          .
         .         .          .
137      .      CP9A............
         .         V
         .         V
140      .      CP9
         .         .
         .         .
143     CP9............
         .
         .
146      .      A12
         .         V
         .         V
151      .      CP13
         .         .
         .         .
154      .         .       A11
         .         .         V
         .         .         V
159      .         .      CP13
         .         .         .
         .         .         .
162      .         .         .       A13
         .         .         .         .
```

```
167          .        CP13.......................
             .          V
             .          V
170          .        CP14
             .          .
             .          .
173          .          .        A10
             .          .         V
             .          .         V
178          .          .       CP14
             .          .         .
             .          .         .
181          .          .         .        A14
             .          .         .         .
             .          .         .         .
186          .          .       CP14............
             .          .         .
             .          .         .
189          .        CP14............
             .          V
             .          V
192          .        CP18
             .          .
             .          .
195          .          .        A18
             .          .         .
             .          .         .
200          .        CP18............
             .          .
             .          .
203          .          .        A15
             .          .         V
             .          .         V
208          .          .       CP16
             .          .         .
             .          .         .
211          .          .         .        A16
             .          .         .         .
             .          .         .         .
216          .          .       CP16............
             .          .         V
             .          .         V
219          .          .       CP17
             .          .         .
             .          .         .
222          .          .         .        A17
             .          .         .         .
             .          .         .         .
227          .          .       CP17............
             .          .         .
             .          .         .
230          .          .         .       A17A
             .          .         .         .
             .          .         .         .
235          .          .       CP17............
             .          .         V
             .          .         V
238          .          .       CP19
             .          .         .
             .          .         .
241          .          .         .        A19
             .          .         .         .
             .          .         .         .
246          .          .       CP19............
```

(***) BRANCH ALSO COMPUTED AT THIS LOCATION

```
*************************************
*                                   *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*          FEBRUARY 1981            *
*         REVISED 14 JUN 85         *
*                                   *
*     RUN DATE: Mon 07-DEC-1987     *
*        TIME: 15:17:48.29          *
*                                   *
*************************************
```

```
*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
* THE HYDROLOGIC ENGINEERING CENTER *
*        609 SECOND STREET          *
*      DAVIS, CALIFORNIA 95616      *
*                                   *
* (916) 756-1104 OR (FTS) 448-3285  *
*                                   *
*************************************
```

```
                    CASEA100                100-YEAR STORM DATA
                    HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
                    NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
                    THAT THE PARADISE CORRIDOR AND GRAND AVENUE EXPRESSWAY ARE BUILT AS LOW
                    LEVEL FACILITIES, i.e., NO CHANNEL ON THE PARADISE CORRIDOR.

 7 ID        OUTPUT CONTROL VARIABLES
                  IPRNT          5  PRINT CONTROL
                  IPLOT          0  PLOT CONTROL
                  QSCAL         0.  HYDROGRAPH PLOT SCALE

  IT         HYDROGRAPH TIME DATA
                   NMIN          6  MINUTES IN COMPUTATION INTERVAL
                  IDATE     22MAY86  STARTING DATE
                  ITIME       1200  STARTING TIME
                     NQ        240  NUMBER OF HYDROGRAPH ORDINATES
                 NDDATE     23MAY86  ENDING DATE
                 NDTIME       1154  ENDING TIME

             COMPUTATION INTERVAL    0.10 HOURS
                  TOTAL TIME BASE   23.90 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

 8 JD        INDEX STORM NO. 1
                  STRM       3.71  PRECIPITATION DEPTH
                  TRDA       0.03  TRANSPOSITION DRAINAGE AREA

 9 PI          PRECIPITATION PATTERN
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.01      0.01      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01
```

0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01
0.02	0.02	0.02	0.02	0.09	0.11	0.13	0.21	0.44	0.80
0.28	0.18	0.12	0.10	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

10 JD INDEX STORM NO. 2

STRM 3.66 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.03	0.09	0.11	0.13	0.20	0.41	0.75
0.26	0.17	0.12	0.10	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

11 JD INDEX STORM NO. 3

STRM 3.62 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.03	0.09	0.11	0.13	0.18	0.38	0.70
0.25	0.16	0.12	0.10	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

12 JD INDEX STORM NO. 4

STRM 3.59 PRECIPITATION DEPTH

TRDA 30.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.10	0.11	0.13	0.17	0.36	0.66
0.23	0.15	0.12	0.10	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

13 JD INDEX STORM NO. 5

STRM 3.56 PRECIPITATION DEPTH

TRDA 40.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.03	0.03	0.03	0.10	0.11	0.13	0.17	0.34	0.63
0.22	0.14	0.12	0.10	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

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	A1	2731.	14.40	1522.	439.	439.	7.45		
ROUTED TO	CP2	2730.	14.40	1520.	436.	436.	7.45		
HYDROGRAPH AT	A2	2629.	14.60	1560.	457.	457.	7.79		
2 COMBINED AT	CP2	5232.	14.50	3031.	883.	883.	15.24		
ROUTED TO	CP3	5230.	14.50	3031.	882.	882.	15.24		
HYDROGRAPH AT	A3	2279.	14.60	1345.	393.	393.	6.70		
2 COMBINED AT	CP3	7315.	14.50	4293.	1257.	1257.	21.94		
ROUTED TO	CP4	7314.	14.60	4294.	1255.	1255.	21.94		
HYDROGRAPH AT	A4	2405.	14.20	1292.	370.	370.	5.80		
2 COMBINED AT	CP4	9383.	14.50	5471.	1602.	1602.	27.74		
ROUTED TO	CP5	9376.	14.60	5472.	1598.	1598.	27.74		
HYDROGRAPH AT	A5	1132.	13.70	510.	143.	143.	3.19		
2 COMBINED AT	CP5	10107.	14.50	5911.	1728.	1728.	30.93		
ROUTED TO	CP6	10102.	14.50	5912.	1725.	1725.	30.93		
HYDROGRAPH AT	A6	1274.	13.30	450.	124.	124.	2.23		
2 COMBINED AT	CP6	10531.	14.50	6275.	1838.	1838.	33.16		
ROUTED TO	CP7	10527.	14.50	6277.	1834.	1834.	33.16		
HYDROGRAPH AT	A7	874.	13.20	298.	82.	82.	1.47		
2 COMBINED AT	CP7	10794.	14.50	6515.	1909.	1909.	34.63		
ROUTED TO	CP8A	10788.	14.50	6514.	1906.	1906.	34.63		
ROUTED TO	CP8	10781.	14.50	6512.	1904.	1904.	34.63		
HYDROGRAPH AT	A8	710.	12.90	189.	52.	52.	1.19		
2 COMBINED AT	CP8	10876.	14.50	6641.	1950.	1950.	35.82		
ROUTED TO	CP9	10871.	14.60	6644.	1945.	1945.	35.82		

HYDROGRAPH AT	A9	161.	12.60	32.	9.	9.	0.20
2 COMBINED AT	CP9	10879.	14.60	6661.	1953.	1953.	36.02
HYDROGRAPH AT	A9C	89.	12.40	15.	4.	4.	0.09
ROUTED TO	CP9B	89.	12.50	15.	4.	4.	0.09
HYDROGRAPH AT	A9B	89.	12.40	15.	4.	4.	0.09
2 COMBINED AT	CP9B	176.	12.50	30.	8.	8.	0.19
ROUTED TO	CP9A	176.	12.50	30.	8.	8.	0.19
HYDROGRAPH AT	A9A	164.	12.50	30.	8.	8.	0.19
2 COMBINED AT	CP9A	337.	12.50	60.	16.	16.	0.37
ROUTED TO	CP9	334.	12.50	60.	16.	16.	0.37
2 COMBINED AT	CP9	10890.	14.60	6688.	1967.	1967.	36.39
HYDROGRAPH AT	A12	1309.	13.80	595.	166.	166.	3.14
ROUTED TO	CP13	1184.	15.10	568.	159.	159.	3.14
HYDROGRAPH AT	A11	1260.	13.80	574.	161.	161.	3.30
ROUTED TO	CP13	1134.	15.10	548.	154.	154.	3.30
HYDROGRAPH AT	A13	1417.	14.10	729.	207.	207.	4.10
3 COMBINED AT	CP13	3363.	14.90	1755.	516.	516.	10.54
ROUTED TO	CP14	3362.	15.00	1756.	514.	514.	10.54
HYDROGRAPH AT	A10	2623.	13.80	1194.	334.	334.	6.33
ROUTED TO	CP14	2377.	15.10	1142.	319.	319.	6.33
HYDROGRAPH AT	A14	1536.	14.30	848.	245.	245.	5.29
2 COMBINED AT	CP14	3705.	14.90	1911.	561.	561.	11.62
2 COMBINED AT	CP14	6785.	15.00	3567.	1052.	1052.	22.16
ROUTED TO	CP18	6769.	15.10	3563.	1045.	1045.	22.16
HYDROGRAPH AT	A18	416.	12.80	107.	29.	29.	0.70
2 COMBINED AT	CP18	6794.	15.10	3612.	1071.	1071.	22.86
HYDROGRAPH AT	A15	791.	13.20	266.	74.	74.	1.77
ROUTED TO	CP16	786.	13.30	264.	73.	73.	1.77
HYDROGRAPH AT	A16	1821.	14.00	909.	258.	258.	5.31
2 COMBINED AT	CP16	2401.	13.70	1169.	330.	330.	7.08

ROUTED TO	CP17	2398.	13.00	1170.	329.	329.	7.08
HYDROGRAPH AT	A17	1632.	15.00	1040.	312.	312.	6.28
2 COMBINED AT	CP17	3633.	14.20	2171.	635.	635.	13.36
HYDROGRAPH AT	A17A	331.	12.80	80.	22.	22.	0.50
2 COMBINED AT	CP17	3687.	14.10	2234.	656.	656.	13.86
ROUTED TO	CP19	3664.	14.40	2208.	646.	646.	13.86
HYDROGRAPH AT	A19	460.	13.50	187.	52.	52.	1.32
2 COMBINED AT	CP19	3956.	14.20	2367.	695.	695.	15.18

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

APPENDIX 4

HEC-1 OUTPUT

Papago Freeway to Northern Avenue - Case B

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            FEBRUARY 1981             *
*          REVISED 14 JUN 85           *
*                                      *
*      RUN DATE: Mon 07-DEC-1987       *
*          TIME: 15:56:07.86           *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*                                      *
*  (916) 756-1104 OR (FTS) 448-3285    *
*                                      *
****************************************
```

```
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. THE VERSION RELEASED 31JAN85 CONTAINS NEW OPTIONS ON RL AND BA RECORDS, AND ADDS THE HL RECORD. SEE JANUARY 1985 INPUT DESCRIPTION FOR NEW DEFINITIONS.

```
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION  :::
:::          By: John R. Haestad        :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```


==========
H A E S T A D M E T H O D S
==========

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 753-9800

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

  1           ID        CASE250                 50-YEAR STORM DATA
  2           ID        HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
  3           ID        NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
  4           ID        THAT THE PARADISE CORRIDOR CHANNEL IS IN PLACE AND GRAND AVENUE IS A
  5           ID        LOW LEVEL FACILITY.  NO DETENTION, FLOWS TO AGUA FRIA RIVER.
              *DIAGRAM
  6           IT       615JUNE86    1200     240
  7           ID       5
  8           JD            .09
  9           PH                     .63    1.23    2.16    2.36    2.50    2.76    3.02    3.29
 10           JD             10
 11           JD             20
 12           JD             30
 13           JD             40

 14           KK      B1
 15           KM        SUBWATERSHED 1 IN THE OUTER LOOP DRAINAGE STUDY.
 16           KM        THE HYPOTHETICAL DATA CARD IS USED TO INPUT STORM RAINFALL DATA COMPUTED
 17           KM        FROM THE ADDEMDUM TO ADOT'S "HYDROLOGIC DESIGN FOR HIGHWAY DRAINAGE IN
 18           KM        ARIZONA" APRIL 1975.
 19           BA    3.82
 20           LS       0      86       0
 21           UD    1.62

 22           KK     CP2
 23           KM       ROUTE FLOW FROM SUBWATERSHED 1 (B1) TO CONCENTRATION POINT 2 (CP2).
 24           RK    5280  .00094    .018                     30       1

 25           KK      B2
 26           KM        RUNOFF FROM SUBWATERSHED 2.
 27           BA    3.94
 28           LS       0      87       0
 29           UD    1.50

 30           KK     CP2
 31           KM        COMBINE HYDROGRAPHS AT CP2.
 32           HC       2

 33           KK     CP3
 34           KM       ROUTE COMBINED HYDROGRAPH AT CP2 TO CP3.
 35           RK    5280  .00094    .018              12       2

 36           KK      B3
 37           KM        RUNOFF FROM SUBWATERSHED 3.
 38           BA    3.54
 39           LS       0      85       0
 40           UD    1.56

 41           KK     CP3
 42           KM        COMBINE HYDROGRAPHS AT CP3.
 43           HC       2
```

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

  44          KK     CP4
  45          KM       ROUTE COMBINED HYDROGRAPH  AT CP3 TO CP4.
  46          RK    5280  .00195    .018                    12       2

  47          KK      B4
  48          KM        RUNOFF FROM SUBWATERSHED 4.
  49          BA    4.00
  50          LS      0      86       0
  51          UD    1.56

  52          KK     CP4
  53          KM       COMBINE HYDROGRAPHS AT CP4.
  54          HC      2

  55          KK     CP5
  56          KM       ROUTE COMBINED HYDROGRAPH  AT CP4 TO CP5.
  57          RK    5280   .0014    .018                    12       2

  58          KK      B5
  59          KM        RUNOFF FROM SUBWATERSHED 5.
  60          BA    3.19
  61          LS      0      79       0
  62          UD    1.65

  63          KK     CP5
  64          KM       COMBINE HYDROGRAPHS AT CP5.
  65          HC      2

  66          KK     CP6
  67          KM       ROUTE COMBINED HYDROGRAPH AT CP5 TO CP6.
  68          RK    5280   .0016    .018                    15       2

  69          KK      B6
  70          KM        RUNOFF FROM SUBWATERSHED 6.
  71          BA    2.23
  72          LS      0      84       0
  73          UD    1.22

  74          KK     CP6
  75          KM       COMBINE HYDROGRAPHS AT CP6.
  76          HC      2

  77          KK     CP7
  78          KM       ROUTE COMBINED HYDROGRAPH AT CP6 TO CP7.
  79          RK    5280   .0018    .018                    15       2

  80          KK      B7
  81          KM        RUNOFF FROM SUBWATERSHED 7.
  82          BA    1.47
  83          LS      0      84       0
  84          UD    1.17
```

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

 85           KK     CP7
 86           KM        COMBINE HYDROGRAPHS AT CP7.
 87           HC       2

 88           KK    CP8A
 89           KM       ROUTE CONBINED HYDROGRAPH AT CP7 TO CP8.  FRIST TO TRANSITION AT
 90           KM        CP8A THEN TO CP8.
 91           RK    3800   .0023    .018                      15       2

 92           KK     CP8
 93           RK    1480   .0008    .018                      25       2

 94           KK      B8
 95           KM        RUNOFF FROM SUBWATERSHED 8.
 96           BA    1.19
 97           LS       0      78       0
 98           UD    .83

 99           KK     CP8
100           KM        COMBINE HYDROGRAPHS AT CP8.
101           HC       2

102           KK     CP9
103           KM       ROUTE COMBINED HYDROGRAPH AT CP8 TO CP9.
104           RK    5280   .0008    .018                      25       2

105           KK      B9
106           KM        RUNOFF FROM SUBWATERSHED 9.
107           BA    .20
108           LS       0      78       0
109           UD    .57

110           KK     CP9
111           KM        COMBINE HYDROGRAPHS AT CP9.
112           HC       2

113           KK     B9C
114           KM        RUNOFF FROM SUBWATERSHED B9C.
115           BA    .093
116           LS              78
117           UD    .43

118           KK    CP9B
119           KM        ROUTE FLOW AT CP9C TO CP9B.
120           RK     660   .0043    .012            CIRC       5

121           KK     B9B
122           KM        RUNOFF FROM SUBWATERSHED B9B.
123           BA    .093
124           LS              78
125           UD    .43
```

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

 126          KK    CP9B
 127          KM       ADD HYDROGRAPHS AT CP9B.
 128          HC      2

 129          KK    CP9A
 130          KM       ROUTE FLOW FROM CP9B TO CP9A.
 131          RK    1320   .0043    .012            CIRC     6.5

 132          KK     B9A
 133          KM       RUNOFF FROM SUBWATERSHED B9A.
 134          BA    .185
 135          LS              78
 136          UD     .49

 137          KK    CP9A
 138          KM       ADD HYDROGRAPHS AT CP9A.
 139          HC      2

 140          KK     CP9
 141          KM       ROUTE FLOW FROM CP9A TO CP9.
 142          RK    1000    .003    .012            CIRC     6.5

 143          KK     CP9
 144          KM       COMBINE HYDROGRAPHS AT CP9.
 145          HC      2

 146          KK     B20
 147          KM       RUNOFF F B20.
 148          BA    1.51
 149          LS              77
 150          UD     .77

 151          KK    CP21
 152          KM       ROUTE FLOW TO CP21.
 153          RK    6600   .0015    .018                     15       2

 154          KK     B21
 155          KM       RUNOFF FROM SUBWATERSHED B21.
 156          BA    3.61
 157          LS      0      81       0
 158          UD    1.91

 159          KK    CP21
 160          KM       ADD HYDROGRAPHS AT CP21.
 161          HC      2

 162          KK    CP22
 163          KM       ROUTE FLOW FROM CP21 TO CP22.
 164          RK    5280   .0032    .018                     20       2
```

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

 165          KK     B22
 166          KM        RUNOFF FROM SUBWATERSHED 22.
 167          BA    5.57
 168          LS       0      83       0
 169          UD    2.96

 170          KK    CP22
 171          KM        COMBINE HYDROGRAPHS AT CP22.
 172          HC       2

 173          KK    B22A
 174          KM        RUNOFF FROM SUBWATERSHED B22A.
 175          BA     .50
 176          LS             78
 177          UD     .73

 178          KK    CP22
 179          KM        COMBINE HYDROGRAPHS AT CP22.
 180          HC       2

 181          KK    CP25
 182          KM       ROUTE COMBINED HYDROGRAPH AT CP22 TO CP25.
 183          RK   14500   .0011    .018                     30       2

 184          KK     B25
 185          KM        RUNOFF FROM B25.
 186          BA    1.32
 187          LS             76
 188          UD    1.43

 189          KK    CP25
 190          KM        COMBINE HYDROGRAPHS AT CP25.
 191          HC       2

 192          KK     B10
 193          KM        RUNOFF FROM SUBWATERSHED 10.
 194          BA    3.63
 195          LS       0      85       0
 196          UD    1.59

 197          KK    CP11
 198          KM       ROUTE FLOW FROM CP10 TO CP11.                          J
 199          RK    5280   .0008    .018                     15       2

 200          KK     B11
 201          KM        RUNOFF FROM SUBWATERSHED 11.
 202          BA    3.85
 203          LS       0      85       0
 204          UD    1.59
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 205          KK    CP11
 206          KM       COMBINE HYDROGRAPHS AT CP11.
 207          HC      2

 208          KK    CP12
 209          KM      ROUTE COMBINED HYDROGRAPH AT CP11 TO CP12.
 210          RK    5280   .0008    .018                     15       2

 211          KK     B12
 212          KM       RUNOFF FROM SUBWATERSHED 12.
 213          BA    3.16
 214          LS      0      86       0
 215          UD    1.64

 216          KK    CP12
 217          KM        COMBINE HYDROGRAPHS AT CP12.
 218          HC      2

 219          KK    CP13
 220          KM      ROUTE COMBINED HYDROGRAPH AT CP12 TO CP13.
 221          RK    5600  .00095    .018                     15       2

 222          KK     B13
 223          KM       RUNOFF FROM SUBWATERSHED 13.
 224          BA    1.80
 225          LS      0      91       0
 226          UD    1.24

 227          KK    CP13
 228          KM       COMBINE HYDROGRAPHS AT CP13.
 229          HC      2

 230          KK    CP14
 231          KM      ROUTE COMBINED HYDROGRAPH AT CP13 TO CP14.
 232          RK    6700   .0027    .018                     20       2

 233          KK     B14
 234          KM       RUNOFF FROM SUBWATERSHED 14.
 235          BA     .71
 236          LS      0      86       0
 237          UD     .85

 238          KK    CP14
 239          KM       COMBINE HYDROGRAPHS AT CP14.
 240          HC      2

 241          KK    CP23
 242          KM      ROUTE COMBINED HYDROGRAPH AT CP14 TO CP23.
 243          RK    9600   .0034    .018                     20       2
```

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

 244          KK     B23
 245          KM        RUNOFF FROM SUBWATERSHED 23.
 246          BA    1.96
 247          LS       0      82       0
 248          UD    1.35

 249          KK    CP23
 250          KM        COMBINE HYDROGRAPHS AT CP23.
 251          HC       2

 252          KK    CP19
 253          KM        ROUTE FLOW AT CP23 TO CP19.
 254          RK   10280   .0022    .018                     35       2

 255          KK     B15
 256          KM        RUNOFF FROM SUBWATERSHED 15.
 257          BA    6.33
 258          LS       0      83       0
 259          UD    1.69

 260          KK    CP19
 261          KM       ROUTE FLOW FROM CP15 TO CP19.
 262          RK   31680   .0027    .020                      0      50

 263          KK     B19
 264          KM        RUNOFF FROM SUBWATERSHED 19.
 265          BA    5.29
 266          LS       0      80       0
 267          UD    2.20

 268          KK    CP19
 269          KM        COMBINE HYDROGRAPHS AT CP19.
 270          HC       2

 271          KK    CP19
 272          KM        COMBINE HYDROGRAPHS AT CP19.
 273          HC       2

 274          KK     B17
 275          KM        RUNOFF FROM SUBWATERSHED 17.
 276          BA    3.14
 277          LS       0      83       0
 278          UD    1.69

 279          KK    CP18
 280          KM       ROUTE FLOW FROM CP17 TO CP18.
 281          RK   26400   .0025    .020                      0      50

 282          KK     B16
 283          KM        RUNOFF FROM SUBWATERSHED 16.
 284          BA    3.30
 285          LS       0      81       0
 286          UD    1.69
```

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

 287          KK   CP18
 288          KM      ROUTE FLOW FROM CP16 TO CP18.
 289          RK  26400  .0025  .0200                    0      50

 290          KK    B18
 291          KM       RUNOFF FROM SUBWATERSHED 18.
 292          BA   4.10
 293          LS     0      82       0
 294          UD   2.00

 295          KK   CP19
 296          KM      COMBINE ROUTED AND RUNOFF HYDROGRAPHS AT CP18.
 297          HC     3

 298          KK   CP19
 299          KM      ROUTE COMBINED HYDROGRAPH AT CP18 TO CP19.
 300          RK   5280  .0023   .018                   30       2

 301          KK   CP19
 302          KM      COMBINE HYDROGRAPHS AT CP19.
 303          HC     2

 304          KK   CP24
 305          KM      ROUTE HYDROGRAPH AT CP19 TO CP24.
 306          RK   5600  .0008   .018                   70       3

 307          KK    B24
 308          KM      RUNOFF FROM B24.
 309          BA    .70
 310          LS            77
 311          UD    .79

 312          KK   CP24
 313          KM      COMBINE HYDROGRAPHS AT CP24.
 314          HC     2
 315          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

  14         B1
              V
              V
  22        CP2
              .
              .
  25          .          B2
              .           .
              .           .
  32        CP2............
              V
              V
  33        CP3
              .
              .
  36          .          B3
              .           .
              .           .
  41        CP3............
              V
              V
  44        CP4
              .
              .
  47          .          B4
              .           .
              .           .
  52        CP4............
              V
              V
  55        CP5
              .
              .
  58          .          B5
              .           .
              .           .
  63        CP5............
              V
              V
  66        CP6
              .
              .
  69          .          B6
              .           .
              .           .
  74        CP6............
              V
              V
  77        CP7
              .
              .
  80          .          B7
              .           .
```

```
85        CP7............
            V
            V
88       CP8A
            V
            V
92        CP8
            .
            .
94          .          B8
            .           .
            .           .
99        CP8............
            V
            V
102       CP9
            .
            .
105         .          B9
            .           .
            .           .
110       CP9............
            .
            .
113         .         B9C
            .           V
            .           V
118         .        CP9B
            .           .
            .           .
121         .           .        B9B
            .           .          .
            .           .          .
126         .        CP9B............
            .           V
            .           V
129         .        CP9A
            .           .
            .           .
132         .           .        B9A
            .           .          .
            .           .          .
137         .        CP9A............
            .           V
            .           V
140         .         CP9
            .           .
            .           .
143       CP9............
            .
            .
146         .         B20
            .           V
            .           V
151         .        CP21
            .           .
            .           .
154         .           .        B21
            .           .          .
            .           .          .
159         .        CP21............
            .           V
            .           V
162         .        CP22
            .           .
```

```
165     .       .       B22
        .       .        .
        .       .        .
170     .     CP22............
        .       .
        .       .
173     .       .      B22A
        .       .        .
        .       .        .
178     .     CP22............
        .       V
        .       V
181     .     CP25
        .       .
        .       .
184     .       .       B25
        .       .        .
        .       .        .
189     .     CP25............
        .       .
        .       .
192     .       .       B10
        .       .        V
        .       .        V
197     .       .      CP11
        .       .        .
        .       .        .
200     .       .        .        B11
        .       .        .         .
        .       .        .         .
205     .       .      CP11............
        .       .        V
        .       .        V
208     .       .      CP12
        .       .        .
        .       .        .
211     .       .        .        B12
        .       .        .         .
        .       .        .         .
216     .       .      CP12............
        .       .        V
        .       .        V
219     .       .      CP13
        .       .        .
        .       .        .
222     .       .        .        B13
        .       .        .         .
        .       .        .         .
227     .       .      CP13............
        .       .        V
        .       .        V
230     .       .      CP14
        .       .        .
        .       .        .
233     .       .        .        B14
        .       .        .         .
        .       .        .         .
238     .       .      CP14............
        .       .        V
        .       .        V
241     .       .      CP23
        .       .        .
        .       .        .
244     .       .        .        B23
        .       .        .         .
```

```
                .         .         .         .
249             .         .      CP23............
                .         .         V
                .         .         V
252             .         .      CP19
                .         .         .
                .         .         .
255             .         .         .      B15
                .         .         .        V
                .         .         .        V
260             .         .         .     CP19
                .         .         .        .
                .         .         .        .
263             .         .         .        .      B19
                .         .         .        .        .
                .         .         .        .        .
268             .         .         .     CP19............
                .         .         .        .
                .         .         .        .
271             .         .      CP19............
                .         .         .
                .         .         .
274             .         .         .      B17
                .         .         .        V
                .         .         .        V
279             .         .         .     CP18
                .         .         .        .
                .         .         .        .
282             .         .         .        .      B16
                .         .         .        .        V
                .         .         .        .        V
287             .         .         .        .     CP18
                .         .         .        .        .
                .         .         .        .        .
290             .         .         .        .        .        B18
                .         .         .        .        .          .
                .         .         .        .        .          .
295             .         .         .     CP18........................
                .         .         .        V
                .         .         .        V
298             .         .         .     CP19
                .         .         .        .
                .         .         .        .
301             .         .      CP19............
                .         .         V
                .         .         V
304             .         .      CP24
                .         .         .
                .         .         .
307             .         .         .      B24
                .         .         .        .
                .         .         .        .
312             .         .      CP24............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*           FEBRUARY 1981              *
*         REVISED 14 JUN 85            *
*                                      *
*      RUN DATE: Mon 07-DEC-1987       *
*          TIME: 15:56:41.14           *
*                                      *
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```
****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*                                      *
*  (916) 756-1104 OR (FTS) 448-3285    *
*                                      *
****************************************
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                    CASEB50                50-YEAR STORM DATA
                    HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
                    NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
                    THAT THE PARADISE CORRIDOR CHANNEL IS IN PLACE AND GRAND AVENUE IS A
                    LOW LEVEL FACILITY.  NO DETENTION, FLOWS TO AGUA FRIA RIVER.

  7 ID        OUTPUT CONTROL VARIABLES
                   IPRNT          5  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT         HYDROGRAPH TIME DATA
                    NMIN          6  MINUTES IN COMPUTATION INTERVAL
                   IDATE     15JUN86  STARTING DATE
                   ITIME       1200  STARTING TIME
                      NQ        240  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE     16   86  ENDING DATE
                  NDTIME       1154  ENDING TIME

             COMPUTATION INTERVAL    0.10 HOURS
                 TOTAL TIME BASE    23.90 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

  8 JD        INDEX STORM NO. 1
                   STRM       3.29  PRECIPITATION DEPTH
                   TRDA       0.09  TRANSPOSITION DRAINAGE AREA

  9 PI          PRECIPITATION PATTERN
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01
                  0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01
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0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
0.02	0.02	0.02	0.02	0.08	0.09	0.11	0.19	0.38	0.71
0.25	0.16	0.10	0.09	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

10 JD INDEX STORM NO. 2

STRM 3.25 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
0.02	0.02	0.02	0.03	0.08	0.09	0.11	0.17	0.35	0.66
0.23	0.15	0.10	0.09	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

11 JD INDEX STORM NO. 3

STRM 3.21 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.0.	0.0.	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.08	0.10	0.12	0.16	0.33	0.62
0.22	0.14	0.10	0.09	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

12 JD INDEX STORM NO. 4

STRM 3.18 PRECIPITATION DEPTH

TRDA 30.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.09	0.10	0.12	0.15	0.31	0.59
0.21	0.13	0.11	0.09	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

13 JD INDEX STORM NO. 5

STRM 3.15 PRECIPITATION DEPTH

TRDA 40.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.09	0.10	0.12	0.15	0.30	0.55
0.19	0.13	0.11	0.09	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

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

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	B1	1559.	13.70	685.	191.	191.	3.82		
ROUTED TO	CP2	1554.	13.80	682.	189.	189.	3.82		
HYDROGRAPH AT	B2	1790.	13.50	741.	205.	205.	3.94		
2 COMBINED AT	CP2	3303.	13.60	1415.	393.	393.	7.76		
ROUTED TO	CP3	3296.	13.70	1414.	393.	393.	7.76		
HYDROGRAPH AT	B3	1425.	13.60	609.	169.	169.	3.54		
2 COMBINED AT	CP3	4667.	13.60	2009.	559.	559.	11.30		
ROUTED TO	CP4	4666.	13.70	2012.	559.	559.	11.30		
HYDROGRAPH AT	B4	1684.	13.60	719.	200.	200.	4.00		
2 COMBINED AT	CP4	6215.	13.70	2694.	751.	751.	15.30		
ROUTED TO	CP5	6205.	13.80	2696.	750.	750.	15.30		
HYDROGRAPH AT	B5	910.	13.80	412.	116.	116.	3.19		
2 COMBINED AT	CP5	7010.	13.80	3077.	859.	859.	18.49		
ROUTED TO	CP6	6994.	13.80	3080.	858.	858.	18.49		
HYDROGRAPH AT	B6	1054.	13.30	373.	103.	103.	2.23		
2 COMBINED AT	CP6	7736.	13.80	3418.	955.	955.	20.72		
ROUTED TO	CP7	7719.	13.80	3421.	954.	954.	20.72		
HYDROGRAPH AT	B7	722.	13.20	247.	68.	68.	1.47		
2 COMBINED AT	CP7	8178.	13.80	3638.	1017.	1017.	22.19		
ROUTED TO	CP8A	8157.	13.90	3638.	1016.	1016.	22.19		
ROUTED TO	CP8	8150.	13.90	3637.	1015.	1015.	22.19		
HYDROGRAPH AT	B8	566.	12.90	152.	42.	42.	1.19		
2 COMBINED AT	CP8	8312.	13.80	3759.	1054.	1054.	23.38		
ROUTED TO	CP9	8311.	13.90	3761.	1051.	1051.	23.38		
HYDROGRAPH AT	B9	128.	12.60	26.	7.	7.	0.20		

2 COMBINED AT	CP9	8325.	13.90	3777.	1057.	1057.	23.58
HYDROGRAPH AT	B9C	71.	12.50	12.	3.	3.	0.09
ROUTED TO	CP9B	71.	12.50	12.	3.	3.	0.09
HYDROGRAPH AT	B9B	71.	12.50	12.	3.	3.	0.09
2 COMBINED AT	CP9B	140.	12.50	24.	7.	7.	0.19
ROUTED TO	CP9A	140.	12.50	24.	7.	7.	0.19
HYDROGRAPH AT	B9A	131.	12.50	24.	7.	7.	0.19
2 COMBINED AT	CP9A	268.	12.50	48.	13.	13.	0.37
ROUTED TO	CP9	265.	12.50	48.	13.	13.	0.37
2 COMBINED AT	CP9	8344.	13.90	3806.	1069.	1069.	23.95
HYDROGRAPH AT	B20	719.	12.80	184.	51.	51.	1.51
ROUTED TO	CP21	700.	13.00	182.	50.	50.	1.51
HYDROGRAPH AT	B21	1010.	14.00	506.	144.	144.	3.61
2 COMBINED AT	CP21	1337.	13.40	685.	193.	193.	5.12
ROUTED TO	CP22	1337.	13.50	684.	193.	193.	5.12
HYDROGRAPH AT	B22	1179.	15.20	780.	237.	237.	5.57
2 COMBINED AT	CP22	2193.	14.30	1440.	427.	427.	10.69
HYDROGRAPH AT	B22A	264.	12.80	64.	18.	18.	0.50
2 COMBINED AT	CP22	2232.	14.30	1491.	444.	444.	11.19
ROUTED TO	CP25	2208.	14.50	1465.	436.	436.	11.19
HYDROGRAPH AT	B25	363.	13.50	149.	42.	42.	1.32
2 COMBINED AT	CP25	2423.	14.30	1593.	476.	476.	12.51
HYDROGRAPH AT	B10	1438.	13.70	624.	174.	174.	3.63
ROUTED TO	CP11	1433.	13.70	622.	172.	172.	3.63
HYDROGRAPH AT	B11	1524.	13.70	661.	184.	184.	3.85
2 COMBINED AT	CP11	2938.	13.70	1276.	355.	355.	7.48
ROUTED TO	CP12	2930.	13.80	1273.	354.	354.	7.48
HYDROGRAPH AT	B12	1279.	13.70	566.	158.	158.	3.16
2 COMBINED AT	CP12	4168.	13.70	1827.	509.	509.	10.64
ROUTED TO	CP13	4167.	13.80	1824.	507.	507.	10.64

HYDROGRAPH AT	B13	1134.	13.20	402.	111.	111.	1.80
2 COMBINED AT	CP13	5039.	13.70	2194.	615.	615.	12.44
ROUTED TO	CP14	5032.	13.80	2196.	613.	613.	12.44
HYDROGRAPH AT	B14	493.	12.90	132.	36.	36.	0.71
2 COMBINED AT	CP14	5213.	13.70	2311.	648.	648.	13.15
ROUTED TO	CP23	5207.	13.80	2307.	645.	645.	13.15
HYDROGRAPH AT	B23	775.	13.40	298.	83.	83.	1.96
2 COMBINED AT	CP23	5847.	13.70	2581.	723.	723.	15.11
ROUTED TO	CP19	5836.	13.80	2572.	718.	718.	15.11
HYDROGRAPH AT	B15	2158.	13.80	985.	276.	276.	6.33
ROUTED TO	CP19	1929.	15.20	938.	263.	263.	6.33
HYDROGRAPH AT	B19	1242.	14.40	689.	199.	199.	5.29
2 COMBINED AT	CP19	2970.	15.00	1556.	459.	459.	11.62
2 COMBINED AT	CP19	6940.	14.40	3997.	1150.	1150.	26.73
HYDROGRAPH AT	B17	1077.	13.80	491.	137.	137.	3.14
ROUTED TO	CP18	957.	15.20	466.	131.	131.	3.14
HYDROGRAPH AT	B16	1025.	13.80	469.	132.	132.	3.30
ROUTED TO	CP18	906.	15.20	445.	125.	125.	3.30
HYDROGRAPH AT	B18	1158.	14.10	598.	170.	170.	4.10
3 COMBINED AT	CP18	2677.	15.00	1430.	423.	423.	10.54
ROUTED TO	CP19	2676.	15.10	1431.	422.	422.	10.54
2 COMBINED AT	CP19	8711.	14.80	5245.	1532.	1532.	37.27
ROUTED TO	CP24	8703.	14.80	5236.	1522.	1522.	37.27
HYDROGRAPH AT	B24	328.	12.80	85.	24.	24.	0.70
2 COMBINED AT	CP24	8731.	14.80	5282.	1543.	1543.	37.97

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

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            FEBRUARY 1981             *
*          REVISED 14 JUN 85           *
*                                      *
*      RUN DATE: Mon 07-DEC-1987       *
*          TIME: 15:45:31.71           *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*                                      *
*  (916) 756-1104 OR (FTS) 448-3285    *
*                                      *
****************************************
```

```
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. THE VERSION RELEASED 31JAN85 CONTAINS NEW OPTIONS ON RL AND BA RECORDS, AND ADDS THE HL RECORD. SEE JANUARY 1985 INPUT DESCRIPTION FOR NEW DEFINITIONS.

```
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION  :::
:::          By: John R. Haestad        :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```

==========

H A E S T A D M E T H O D S

==========

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 753-9800

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

  1           ID        CASEB100                100-YEAR STORM DATA
  2           ID        HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
  3           ID        NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
  4           ID        THAT THE PARADISE CORRIDOR CHANNEL IS IN PLACE AND GRAND AVENUE IS A
  5           ID        LOW LEVEL FACILITY.  NO DETENTION, FLOWS TO AGUA FRIA RIVER.
              *DIAGRAM
  6           IT       615JUNE86    1200     240
  7           IO       5
  8           JD            .09
  9           PH                     .71    1.40    2.45    2.64    2.82    3.10    3.40    3.71
 10           JD             10
 11           JD             20
 12           JD             30
 13           JD             40

 14           KK      B1
 15           KM        SUBWATERSHED 1 IN THE OUTER LOOP DRAINAGE STUDY.
 16           KM        THE HYPOTHETICAL DATA CARD IS USED TO INPUT STORM RAINFALL DATA COMPUTED
 17           KM        FROM THE ADDEMDUM TO ADOT'S "HYDROLOGIC DESIGN FOR HIGHWAY DRAINAGE IN
 18           KM        ARIZONA" APRIL 1975.
 19           BA    3.82
 20           LS      0      86       0
 21           UD    1.62

 22           KK     CP2
 23           KM       ROUTE FLOW FROM SUBWATERSHED 1 (B1) TO CONCENTRATION POINT 2 (CP2).
 24           RK    5280  .00094    .018                     30       1

 25           KK      B2
 26           KM        RUNOFF FROM SUBWATERSHED 2.
 27           BA    3.94
 28           LS      0      87       0
 29           UD    1.50

 30           KK     CP2
 31           KM        COMBINE HYDROGRAPHS AT CP2.
 32           HC       2

 33           KK     CP3
 34           KM       ROUTE COMBINED HYDROGRAPH AT CP2 TO CP3.
 35           RK    5280  .00094    .018              12       2

 36           KK      B3
 37           KM        RUNOFF FROM SUBWATERSHED 3.
 38           BA    3.54
 39           LS      0      85       0
 40           UD    1.56

 41           KK     CP3
 42           KM        COMBINE HYDROGRAPHS AT CP3.
 43           HC       2
```

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

  44          KK     CP4
  45          KM       ROUTE COMBINED HYDROGRAPH  AT CP3 TO CP4.
  46          RK    5280  .00195    .018                    12       2

  47          KK      B4
  48          KM        RUNOFF FROM SUBWATERSHED 4.
  49          BA    4.00
  50          LS      0      86       0
  51          UD    1.56

  52          KK     CP4
  53          KM        COMBINE HYDROGRAPHS AT CP4.
  54          HC      2

  55          KK     CP5
  56          KM       ROUTE COMBINED HYDROGRAPH  AT CP4 TO CP5.
  57          RK    5280   .0014    .018                    12       2

  58          KK      B5
  59          KM        RUNOFF FROM SUBWATERSHED 5.
  60          BA    3.19
  61          LS      0      79       0
  62          UD    1.65

  63          KK     CP5
  64          KM        COMBINE HYDROGRAPHS AT CP5.
  65          HC      2

  66          KK     CP6
  67          KM       ROUTE COMBINED HYDROGRAPH AT CP5 TO CP6.
  68          RK    5280   .0016    .018                    15       2

  69          KK      B6
  70          KM        RUNOFF FROM SUBWATERSHED 6.
  71          BA    2.23
  72          LS      0      84       0
  73          UD    1.22

  74          KK     CP6
  75          KM        COMBINE HYDROGRAPHS AT CP6.
  76          HC      2

  77          KK     CP7
  78          KM       ROUTE COMBINED HYDROGRAPH AT CP6 TO CP7.
  79          RK    5280   .0018    .018                    15       2

  80          KK      B7
  81          KM        RUNOFF FROM SUBWATERSHED 7.
  82          BA    1.47
  83          LS      0      84       0
  84          UD    1.17
```

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

 85           KK     CP7
 86           KM       COMBINE HYDROGRAPHS AT CP7.
 87           HC      2

 88           KK    CP8A
 89           KM      ROUTE CONBINED HYDROGRAPH AT CP7 TO CP8.  FRIST TO TRANSITION AT
 90           KM       CP8A THEN TO CP8.
 91           RK    3800   .0023    .018                     15       2

 92           KK     CP8
 93           RK    1480   .0008    .018                     25       2

 94           KK      B8
 95           KM       RUNOFF FROM SUBWATERSHED 8.
 96           BA    1.19
 97           LS      0      78       0
 98           UD    .83

 99           KK     CP8
100           KM       COMBINE HYDROGRAPHS AT CP8.
101           HC      2

102           KK     CP9
103           KM      ROUTE COMBINED HYDROGRAPH AT CP8 TO CP9.
104           RK    5280   .0008    .018                     25       2

105           KK      B9
106           KM       RUNOFF FROM SUBWATERSHED 9.
107           BA    .20
108           LS      0      78       0
109           UD    .57

110           KK     CP9
111           KM       COMBINE HYDROGRAPHS AT CP9.
112           HC      2

113           KK     B9C
114           KM       RUNOFF FROM SUBWATERSHED B9C.
115           BA    .093
116           LS             78
117           UD    .43

118           KK    CP9B
119           KM       ROUTE FLOW AT CP9C TO CP9B.
120           RK     660   .0043    .012            CIRC      5

121           KK     B9B
122           KM       RUNOFF FROM SUBWATERSHED B9B.
123           BA    .093
124           LS             78
125           UD    .43
```

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

 126          KK    CP9B
 127          KM       ADD HYDROGRAPHS AT CP9B.
 128          HC      2

 129          KK    CP9A
 130          KM       ROUTE FLOW FROM CP9B TO CP9A.
 131          RK    1320   .0043    .012            CIRC     6.5

 132          KK     B9A
 133          KM       RUNOFF FROM SUBWATERSHED B9A.
 134          BA    .185
 135          LS              78
 136          UD     .49

 137          KK    CP9A
 138          KM       ADD HYDROGRAPHS AT CP9A.
 139          HC      2

 140          KK     CP9
 141          KM       ROUTE FLOW FROM CP9A TO CP9.
 142          RK    1000    .003    .012            CIRC     6.5

 143          KK     CP9
 144          KM       COMBINE HYDROGRAPHS AT CP9.
 145          HC      2

 146          KK     B20
 147          KM       RUNOFF FROM SUBWATERSHED B20.
 148          BA    1.51
 149          LS              77
 150          UD     .77

 151          KK    CP21
 152          KM       ROUTE FLOW TO CP21.
 153          RK    6600   .0015    .018                     15       2

 154          KK     B21
 155          KM       RUNOFF FROM SUBWATERSHED B21.
 156          BA    3.61
 157          LS      0      81       0
 158          UD    1.91

 159          KK    CP21
 160          KM       ADD HYDROGRAPHS AT CP21.
 161          HC      2

 162          KK    CP22
 163          KM       ROUTE FLOW FROM CP21 TO CP22.
 164          RK    5280   .0032    .018                     20       2
```

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

 165          KK     B22
 166          KM        RUNOFF FROM SUBWATERSHED 22.
 167          BA    5.57
 168          LS       0      83       0
 169          UD    2.96

 170          KK    CP22
 171          KM        COMBINE HYDROGRAPHS AT CP22.
 172          HC       2

 173          KK    B22A
 174          KM        RUNOFF FROM SUBWATERSHED B22A.
 175          BA     .50
 176          LS              78
 177          UD     .73

 178          KK    CP22
 179          KM        COMBINE HYDROGRAPHS AT CP22.
 180          HC       2

 181          KK    CP25
 182          KM       ROUTE COMBINED HYDROGRAPH AT CP22 TO CP25.
 183          RK   14500   .0011    .018                     30       2

 184          KK     B25
 185          KM        RUNOFF FROM B25.
 186          BA    1.32
 187          LS              76
 188          UD    1.43

 189          KK    CP25
 190          KM        COMBINE HYDROGRAPHS AT CP25.
 191          HC       2

 192          KK     B10
 193          KM        RUNOFF FROM SUBWATERSHED 10.
 194          BA    3.63
 195          LS       0      85       0
 196          UD    1.59

 197          KK    CP11
 198          KM       ROUTE FLOW FROM CP10 TO CP11.                          J
 199          RK    5280   .0008    .018                     15       2

 200          KK     B11
 201          KM        RUNOFF FROM SUBWATERSHED 11.
 202          BA    3.85
 203          LS       0      85       0
 204          UD    1.59
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 205          KK    CP11
 206          KM       COMBINE HYDROGRAPHS AT CP11.
 207          HC      2

 208          KK    CP12
 209          KM      ROUTE COMBINED HYDROGRAPH AT CP11 TO CP12.
 210          RK    5280  .0008    .018                    15       2

 211          KK     B12
 212          KM       RUNOFF FROM SUBWATERSHED 12.
 213          BA    3.16
 214          LS      0      86       0
 215          UD    1.64

 216          KK    CP12
 217          KM        COMBINE HYDROGRPHS AT CP12.
 218          HC      2

 219          KK    CP13
 220          KM      ROUTE COMBINED HYDROGRAPH AT CP12 TO CP13.
 221          RK    5600 .00095    .018                    15       2

 222          KK     B13
 223          KM       RUNOFF FROM SUBWATERSHED 13.
 224          BA    1.80
 225          LS      0      91       0
 226          UD    1.24

 227          KK    CP13
 228          KM       COMBINE HYDROGRAPHS AT CP13.
 229          HC      2

 230          KK    CP14
 231          KM      ROUTE COMBINED HYDROGRAPH AT CP13 TO CP14.
 232          RK    6700  .0027    .018                    20       2

 233          KK     B14
 234          KM       RUNOFF FROM SUBWATERSHED 14.
 235          BA     .71
 236          LS      0      86       0
 237          UD     .85

 238          KK    CP14
 239          KM       COMBINE HYDROGRAPHS AT CP14.
 240          HC      2

 241          KK    CP23
 242          KM      ROUTE COMBINED HYDROGRAPH AT CP14 TO CP23.
 243          RK    9600  .0034    .018                    20       2
```

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

 244          KK     B23
 245          KM        RUNOFF FROM SUBWATERSHED 23.
 246          BA    1.96
 247          LS       0      82       0
 248          UD    1.35

 249          KK    CP23
 250          KM        COMBINE HYDROGRAPHS AT CP23.
 251          HC       2

 252          KK    CP19
 253          KM        ROUTE FLOW AT CP23 TO CP19.
 254          RK   10280   .0022    .018                     35       2

 255          KK     B15
 256          KM        RUNOFF FROM SUBWATERSHED 15.
 257          BA    6.33
 258          LS       0      83       0
 259          UD    1.69

 260          KK    CP19
 261          KM       ROUTE FLOW FROM CP15 TO CP19.
 262          RK   31680   .0027    .020                      0      50

 263          KK     B19
 264          KM        RUNOFF FROM SUBWATERSHED 19.
 265          BA    5.29
 266          LS       0      80       0
 267          UD    2.20

 268          KK    CP19
 269          KM        COMBINE HYDROGRAPHS AT CP19.
 270          HC       2

 271          KK    CP19
 272          KM        COMBINE HYDROGRAPHS AT CP19.
 273          HC       2

 274          KK     B17
 275          KM        RUNOFF FROM SUBWATERSHED 17.
 276          BA    3.14
 277          LS       0      83       0
 278          UD    1.69

 279          KK    CP18
 280          KM       ROUTE FLOW FROM CP17 TO CP18.
 281          RK   26400   .0025    .020                      0      50

 282          KK     B16
 283          KM        RUNOFF FROM SUBWATERSHED 16.
 284          BA    3.30
 285          LS       0      81       0
 286          UD    1.69
```

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

 287          KK    CP18
 288          KM       ROUTE FLOW FROM CP16 TO CP18.
 289          RK   26400   .0025   .0200                      0      50

 290          KK     B18
 291          KM        RUNOFF FROM SUBWATERSHED 18.
 292          BA    4.10
 293          LS       0      82       0
 294          UD    2.00

 295          KK    CP18
 296          KM        COMBINE ROUTED AND RUNOFF HYDROGRAPHS AT CP18.
 297          HC       3

 298          KK    CP19
 299          KM        ROUTE COMBINED HYDROGRAPH AT CP18 TO CP19.
 300          RK    5280   .0023    .018                     30       2

 301          KK    CP19
 302          KM        COMBINE HYDROGRAPHS AT CP19.
 303          HC       2

 304          KK    CP24
 305          KM        ROUTE HYDROGRAPH AT CP19 TO CP24.
 306          RK    5600   .0008    .018                     70       3

 307          KK     B24
 308          KM        RUNOFF FROM B24.
 309          BA    .70
 310          LS              77
 311          UD    .79

 312          KK    CP24
 313          KM        COMBINE HYDROGRAPHS AT CP24.
 314          HC       2
 315          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

  14         B1
              V
              V
  22        CP2
              .
              .
  25          .          B2
              .           .
              .           .
  30        CP2............
              V
              V
  33        CP3
              .
              .
  36          .          B3
              .           .
              .           .
  41        CP3............
              V
              V
  44        CP4
              .
              .
  47          .          B4
              .           .
              .           .
  52        CP4............
              V
              V
  55        CP5
              .
              .
  58          .          B5
              .           .
              .           .
  63        CP5............
              V
              V
  66        CP6
              .
              .
  69          .          B6
              .           .
              .           .
  74        CP6............
              V
              V
  77        CP7
              .
              .
  80          .          B7
              .           .
              .           .
```

```
85        CP7............
            V
            V
88       CP8A
            V
            V
92        CP8
            .
            .
94          .          B8
            .           .
            .           .
99        CP8............
            V
            V
102       CP9
            .
            .
105         .          B9
            .           .
            .           .
110       CP9............
            .
            .
113         .         B9C
            .           V
            .           V
118         .        CP9B
            .           .
            .           .
121         .           .         B9B
            .           .          .
            .           .          .
126         .        CP9B............
            .           V
            .           V
129         .        CP9A
            .           .
            .           .
132         .           .         B9A
            .           .          .
            .           .          .
137         .        CP9A............
            .           V
            .           V
140         .         CP9
            .           .
            .           .
143       CP9............
            .
            .
146         .         B20
            .           V
            .           V
151         .        CP21
            .           .
            .           .
154         .           .         B21
            .           .          .
            .           .          .
159         .        CP21............
            .           V
            .           V
162         .        CP22
            .           .
```

```
165   .       .       B22
      .       .        .
      .       .        .
170   .     CP22............
      .       .
      .       .
173   .       .      B22A
      .       .        .
      .       .        .
178   .     CP22............
      .       V
      .       V
181   .     CP25
      .       .
      .       .
184   .       .       B25
      .       .        .
      .       .        .
189   .     CP25............
      .       .
      .       .
192   .       .       B10
      .       .        V
      .       .        V
197   .       .      CP11
      .       .        .
      .       .        .
200   .       .        .        B11
      .       .        .         .
      .       .        .         .
205   .       .      CP11............
      .       .        V
      .       .        V
208   .       .      CP12
      .       .        .
      .       .        .
211   .       .        .        B12
      .       .        .         .
      .       .        .         .
216   .       .      CP12............
      .       .        V
      .       .        V
219   .       .      CP13
      .       .        .
      .       .        .
222   .       .        .        B13
      .       .        .         .
      .       .        .         .
227   .       .      CP13............
      .       .        V
      .       .        V
230   .       .      CP14
      .       .        .
      .       .        .
233   .       .        .        B14
      .       .        .         .
      .       .        .         .
238   .       .      CP14............
      .       .        V
      .       .        V
241   .       .      CP23
      .       .        .
      .       .        .
244   .       .        .        B23
      .       .        .         .
      .       .        .         .
```

```
249          .          .        CP23............
             .          .           V
             .          .           V
252          .          .        CP19
             .          .           .
             .          .           .
255          .          .           .        B15
             .          .           .          V
             .          .           .          V
260          .          .           .       CP19
             .          .           .          .
             .          .           .          .
263          .          .           .          .        B19
             .          .           .          .          .
             .          .           .          .          .
268          .          .           .       CP19............
             .          .           .          .
             .          .           .          .
271          .          .        CP19............
             .          .           .
             .          .           .
274          .          .           .        B17
             .          .           .          V
             .          .           .          V
279          .          .           .       CP18
             .          .           .          .
             .          .           .          .
282          .          .           .          .        B16
             .          .           .          .          V
             .          .           .          .          V
287          .          .           .          .       CP18
             .          .           .          .          .
             .          .           .          .          .
290          .          .           .          .          .        B18
             .          .           .          .          .          .
             .          .           .          .          .          .
295          .          .           .       CP18........................
             .          .           .          V
             .          .           .          V
298          .          .           .       CP19
             .          .           .          .
             .          .           .          .
301          .          .        CP19............
             .          .           V
             .          .           V
304          .          .        CP24
             .          .           .
             .          .           .
307          .          .           .        B24
             .          .           .          .
             .          .           .          .
312          .          .        CP24............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*           FEBRUARY 1981              *
*          REVISED 14 JUN 85           *
*                                      *
*      RUN DATE: Mon 07-DEC-1987       *
*         TIME: 15:46:03.84            *
*                                      *
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****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616        *
*                                      *
*  (916) 756-1104 OR (FTS) 448-3285    *
*                                      *
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                    CASEB100              100-YEAR STORM DATA
                    HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
                    NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
                    THAT THE PARADISE CORRIDOR CHANNEL IS IN PLACE AND GRAND AVENUE IS A
                    LOW LEVEL FACILITY.  NO DETENTION, FLOWS TO AGUA FRIA RIVER.

  7 IO        OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT         HYDROGRAPH TIME DATA
                     NMIN          6  MINUTES IN COMPUTATION INTERVAL
                    IDATE     15JUN86  STARTING DATE
                    ITIME       1200  STARTING TIME
                       NQ        240  NUMBER OF HYDROGRAPH ORDINATES
                   NQDATE     16   86  ENDING DATE
                   NQTIME       1154  ENDING TIME

               COMPUTATION INTERVAL    0.10 HOURS
                    TOTAL TIME BASE   23.90 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

  8 JD        INDEX STORM NO. 1
                    STRM       3.71  PRECIPITATION DEPTH
                    TRDA       0.09  TRANSPOSITION DRAINAGE AREA

  9 PI          PRECIPITATION PATTERN
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.01      0.01      0.01
                  0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01
                  0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01
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0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01
0.02	0.02	0.02	0.02	0.09	0.11	0.13	0.21	0.44	0.80
0.28	0.18	0.12	0.10	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

10 JD INDEX STORM NO. 2

STRM 3.66 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.03	0.09	0.11	0.13	0.20	0.41	0.75
0.26	0.17	0.12	0.10	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

11 JD INDEX STORM NO. 3

STRM 3.62 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.03	0.09	0.11	0.13	0.18	0.38	0.70
0.25	0.16	0.12	0.10	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

12 JD INDEX STORM NO. 4

STRM 3.59 PRECIPITATION DEPTH

TRDA 30.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.10	0.11	0.13	0.17	0.36	0.66
0.23	0.15	0.12	0.10	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

13 JD INDEX STORM NO. 5

STRM 3.56 PRECIPITATION DEPTH

TRDA 40.00 TRANSPOSITION DRAINAGE AREA

9 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.03	0.03	0.03	0.10	0.11	0.13	0.17	0.34	0.63
0.22	0.14	0.12	0.10	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

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

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	B1	1865.	13.70	817.	228.	228.	3.82		
ROUTED TO	CP2	1862.	13.70	815.	226.	226.	3.82		
HYDROGRAPH AT	B2	2133.	13.50	880.	244.	244.	3.94		
2 COMBINED AT	CP2	3949.	13.60	1686.	469.	469.	7.76		
ROUTED TO	CP3	3941.	13.60	1686.	469.	469.	7.76		
HYDROGRAPH AT	B3	1715.	13.60	731.	203.	203.	3.54		
2 COMBINED AT	CP3	5595.	13.60	2400.	669.	669.	11.30		
ROUTED TO	CP4	5591.	13.70	2403.	668.	668.	11.30		
HYDROGRAPH AT	B4	2016.	13.60	858.	239.	239.	4.00		
2 COMBINED AT	CP4	7444.	13.70	3218.	898.	898.	15.30		
ROUTED TO	CP5	7426.	13.80	3220.	897.	897.	15.30		
HYDROGRAPH AT	B5	1132.	13.70	510.	143.	143.	3.19		
2 COMBINED AT	CP5	8433.	13.80	3694.	1032.	1032.	18.49		
ROUTED TO	CP6	8431.	13.80	3699.	1031.	1031.	18.49		
HYDROGRAPH AT	B6	1274.	13.30	450.	124.	124.	2.23		
2 COMBINED AT	CP6	9320.	13.70	4107.	1148.	1148.	20.72		
ROUTED TO	CP7	9320.	13.80	4110.	1147.	1147.	20.72		
HYDROGRAPH AT	B7	874.	13.20	298.	82.	82.	1.47		
2 COMBINED AT	CP7	9869.	13.80	4374.	1223.	1223.	22.19		
ROUTED TO	CP8A	9862.	13.80	4372.	1222.	1222.	22.19		
ROUTED TO	CP8	9846.	13.80	4372.	1221.	1221.	22.19		
HYDROGRAPH AT	B8	710.	12.90	189.	52.	52.	1.19		
2 COMBINED AT	CP8	10065.	13.80	4528.	1268.	1268.	23.38		
ROUTED TO	CP9	10053.	13.90	4526.	1264.	1264.	23.38		
HYDROGRAPH AT	B9	161.	12.60	32.	9.	9.	0.20		
2 COMBINED AT	CP9	10070.	13.90	4548.	1272.	1272.	23.58		

HYDROGRAPH AT	B9C	89.	12.40	15.	4.	4.	0.09
ROUTED TO	CP9B	89.	12.50	15.	4.	4.	0.09
HYDROGRAPH AT	B9B	89.	12.40	15.	4.	4.	0.09
2 COMBINED AT	CP9B	176.	12.50	30.	8.	8.	0.19
ROUTED TO	CP9A	176.	12.50	30.	8.	8.	0.19
HYDROGRAPH AT	B9A	164.	12.50	30.	8.	8.	0.19
2 COMBINED AT	CP9A	337.	12.50	60.	16.	16.	0.37
ROUTED TO	CP9	334.	12.50	60.	16.	16.	0.37
2 COMBINED AT	CP9	10095.	13.90	4585.	1287.	1287.	23.95
HYDROGRAPH AT	B20	909.	12.80	229.	63.	63.	1.51
ROUTED TO	CP21	887.	12.90	227.	63.	63.	1.51
HYDROGRAPH AT	B21	1242.	14.00	619.	176.	176.	3.61
2 COMBINED AT	CP21	1651.	13.30	843.	238.	238.	5.12
ROUTED TO	CP22	1650.	13.40	843.	237.	237.	5.12
HYDROGRAPH AT	B22	1433.	15.20	946.	287.	287.	5.57
2 COMBINED AT	CP22	2685.	14.30	1758.	521.	521.	10.69
HYDROGRAPH AT	B22A	331.	12.80	80.	22.	22.	0.50
2 COMBINED AT	CP22	2733.	14.30	1823.	542.	542.	11.19
ROUTED TO	CP25	2715.	14.50	1796.	533.	533.	11.19
HYDROGRAPH AT	B25	460.	13.50	187.	52.	52.	1.32
2 COMBINED AT	CP25	2988.	14.30	1958.	583.	583.	12.51
HYDROGRAPH AT	B10	1730.	13.60	748.	208.	208.	3.63
ROUTED TO	CP11	1727.	13.70	746.	207.	207.	3.63
HYDROGRAPH AT	B11	1834.	13.60	794.	221.	221.	3.85
2 COMBINED AT	CP11	3537.	13.70	1532.	427.	427.	7.48
ROUTED TO	CP12	3526.	13.70	1529.	425.	425.	7.48
HYDROGRAPH AT	B12	1530.	13.70	676.	188.	188.	3.16
2 COMBINED AT	CP12	5017.	13.70	2191.	611.	611.	10.64
ROUTED TO	CP13	5017.	13.80	2191.	609.	609.	10.64
HYDROGRAPH AT	B13	1326.	13.20	469.	130.	130.	1.80
2 COMBINED AT	CP13	6014.	13.70	2625.	735.	735.	12.44

ROUTED TO	CP14	6006.	13.80	2628.	734.	734.	12.44
HYDROGRAPH AT	B14	591.	12.90	157.	43.	43.	0.71
2 COMBINED AT	CP14	6227.	13.70	2766.	775.	775.	13.15
ROUTED TO	CP23	6221.	13.70	2762.	771.	771.	13.15
HYDROGRAPH AT	B23	949.	13.40	363.	100.	100.	1.96
2 COMBINED AT	CP23	7034.	13.70	3097.	867.	867.	15.11
ROUTED TO	CP19	7017.	13.80	3088.	861.	861.	15.11
HYDROGRAPH AT	B15	2623.	13.80	1194.	334.	334.	6.33
ROUTED TO	CP19	2377.	15.10	1142.	319.	319.	6.33
HYDROGRAPH AT	B19	1536.	14.30	848.	245.	245.	5.29
2 COMBINED AT	CP19	3705.	14.90	1911.	561.	561.	11.62
2 COMBINED AT	CP19	8570.	14.30	4842.	1390.	1390.	26.73
HYDROGRAPH AT	B17	1309.	13.80	595.	166.	166.	3.14
ROUTED TO	CP18	1184.	15.10	568.	159.	159.	3.14
HYDROGRAPH AT	B16	1260.	13.80	574.	161.	161.	3.30
ROUTED TO	CP18	1134.	15.10	548.	154.	154.	3.30
HYDROGRAPH AT	B18	1417.	14.10	729.	207.	207.	4.10
3 COMBINED AT	CP18	3363.	14.90	1755.	516.	516.	10.54
ROUTED TO	CP19	3362.	15.00	1756.	514.	514.	10.54
2 COMBINED AT	CP19	10868.	14.70	6380.	1859.	1859.	37.27
ROUTED TO	CP24	10866.	14.80	6376.	1849.	1849.	37.27
HYDROGRAPH AT	B24	416.	12.80	107.	29.	29.	0.70
2 COMBINED AT	CP24	10999.	14.80	6436.	1875.	1875.	37.97

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

APPENDIX 5

HEC-1 OUTPUT

Papago Freeway to Northern Avenue - Case C

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            FEBRUARY 1981             *
*          REVISED 14 JUN 85           *
*                                      *
*      RUN DATE: Mon 07-DEC-1987       *
*          TIME: 16:24:51.59           *
*                                      *
****************************************
```


```
****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
* THE HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616        *
*                                      *
*  (916) 756-1104 OR (FTS) 448-3283    *
*                                      *
****************************************
```


```
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. THE VERSION RELEASED 31JAN85 CONTAINS NEW OPTIONS ON RL AND BA RECORDS, AND ADDS THE HL RECORD. SEE JANUARY 1985 INPUT DESCRIPTION FOR NEW DEFINITIONS.

```
:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
:::                                       :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
:::          By: John R. Haestad          :::
:::                                       :::
:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
```


```
============================
H A E S T A D   M E T H O D S
============================
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 753-9802

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

  1           ID        CASEC50                 50-YEAR STORM DATA
  2           ID       HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
  3           ID       NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
  4           ID       THAT THE PARADISE CORRIDOR CHANNEL IS IN PLACE AND GRAND AVENUE IS A
  5           ID       HIGH LEVEL FACILITY.  100-YEAR DRAINAGE FACILITIES WERE ASSUMED IN
  6           ID       OLIVE, ORANGEWOOD, AND 27TH AVENUES TO HANDLE FLOW NORTH OF GRAND AVENUE
            *DIAGRAM
  7           IT      610JUNE86    1200     240
  8           IO      5
  9           JD            .09
 10           PH                    .63    1.23    2.16    2.36    2.50    2.76    3.02    3.29
 11           JD             10
 12           JD             20
 13           JD             30
 14           JD             40

 15           KK      C1
 16           KM       SUBWATERSHED 1 IN THE OUTER LOOP DRAINAGE STUDY.
 17           KM       SUBWATERSHEDS WILL HEREBY BE DESIGNATED AS THE LETTER C ALONG WITH A
 18           KM       CORRESPONDING NUMBER.  CONCENTRATION POINTS WILL BE LABELED WITH A CP AN
 19           KM       CORRESPONDING NUMBER FOR EACH SUBWATERSHED.  A DRAINAGE AREA MAP WILL BE
 20           KM       PROVIDED TO SHOW EXACT LOCATIONS OF EACH.
 21           KM       THE HYPOTHETICAL DATA CARD IS USED TO INPUT STORM RAINFALL DATA COMPUTED
 22           KM       FROM THE ADDENDUM TO ADOT'S "HYDROLOGIC DESIGN FOR HIGHWAY DRAINAGE IN
 23           KM       ARIZONA" APRIL 1975.
 24           BA    1.71
 25           LS      0      89       0
 26           UD    .70

 27           KK     CP2
 28           KM       ROUTE FLOW FROM SUBWATERSHED 1 (C1) TO CONCENTRATION POINT 2 (CP2).
 29           RK    5280  .00094    .018                     30       1

 30           KK      C2
 31           KM       RUNOFF FROM SUBWATERSHED 2.
 32           BA    2.66
 33           LS      0      87       0
 34           UD    .90

 35           KK     CP2
 36           KM       COMBINE HYDROGRAPHS AT CP2.
 37           HC      2

 38           KK     CP3
 39           KM       ROUTE COMBINED HYDROGRAPH AT CP2 TO CP3.
 40           RK    5280  .00094    .018              12       2

 41           KK      C3
 42           KM       RUNOFF FROM SUBWATERSHED 3.
 43           BA    3.58
 44           LS      0      87       2
 45           UD    1.41
```

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

  46          KK     CP3
  47          KM       COMBINE HYDROGRAPHS AT CP3.
  48          HC      2

  49          KK     CP4
  50          KM       ROUTE COMBINED HYDROGRAPH AT CP3 TO CP4.
  51          RK    5280  .00195    .018                    12       2

  52          KK      C4
  53          KM       RUNOFF FROM SUBWATERSHED 4.
  54          BA    4.00
  55          LS      0      66       0
  56          UD    1.56

  57          KK     CP4
  58          KM       COMBINE HYDROGRAPHS AT CP4.
  59          HC      2

  60          KK     CP5
  61          KM       ROUT COMBINED HYDROGRAPH AT CP4 TO CP5.
  62          RK    5280  .0014    .018                    12       2

  63          KK      C5
  64          KM       RUNOFF FROM SUBWATERSHED 5.
  65          BA    3.19
  66          LS      0      79       0
  67          UD    1.65

  68          KK     CP5
  69          KM       COMBINE HYDROGRAPHS AT CP5.
  70          HC      2

  71          KK     CP6
  72          KM       ROUTE COMBINED HYDROGRAPH AT CP5 TO CP6.
  73          RK    5280  .0016    .018                    15       2

  74          KK      C6
  75          KM       RUNOFF FROM SUBWATERSHED 6.
  76          BA    2.23
  77          LS      0      84       0
  78          UD    1.22

  79          KK     CP6
  80          KM       COMBINE HYDROGRAPHS AT CP6.
  81          HC      2

  82          KK     CP7
  83          KM       ROUTE COMBINED HYDROGRAPH AT CP6 TO CP7.
  84          RK    5280  .0018    .018                    15       2
```

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

 85           KK     C7
 86           KM       RUNOFF FROM SUBWATERSHED 7.
 87           BA    1.47
 88           LS      0      84       0
 89           UD    1.17

 90           KK    CP7
 91           KM       COMBINE HYDROGRAPHS AT CP7.
 92           HC      2

 93           KK    CP8A
 94           KM       ROUT COMBINED HYDROGRAPH AT CP7 TO CP8.  FIRST TO TRANSITION AT
 95           KM       CP8A THEN TO CP8.
 96           RK    3900   .0023    .018                    15       2

 97           KK    CP8
 98           RK    1480   .0008    .018                    25       2

 99           KK     C8
100           KM       RUNOFF FROM SUBWATERSHED 8.
101           BA    1.19
102           LS      0      78       0
103           UD     .83

104           KK    CP8
105           KM       COMBINE HYDROGRAPHS AT CP8.
106           HC      2

107           KK    CP9
108           KM       ROUTE COMBINED HYDROGRAPH AT CP8 TO CP9.
109           RK    5280   .0008    .018                    25       2

110           KK     C9
111           KM       RUNOFF FROM SUBWATERSHED 9.
112           BA     .20
113           LS      0      78       0
114           UD     .57

115           KK    CP9
116           KM       COMBINE HYDROGRAPHS AT CP9.
117           HC      2

118           KK    C9C
119           KM       RUNOFF FROM SUBWATERSHED C9C.
120           BA    .093
121           LS             78
122           UD     .43

123           KK    CP9B
124           KM       ROUTE FLOW AT CP9C TO CP9B.
125           RK     660   .0043    .012           CIRC       5
```

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

 126          KK    C9B
 127          KM       RUNOFF FROM SUBWATERSHED C9B.
 128          BA   .093
 129          LS            78
 130          UD    .43

 131          KK   CP9B
 132          KM       ADD HYDROGRAPHS AT CP9B.
 133          HC      2

 134          KK   CP9A
 135          KM       ROUTE FLOW FROM CP9B TO CP9A.
 136          RK   1320  .0043   .012           CIRC     6.5

 137          KK    C9A
 138          KM       RUNOFF FROM SUBWATERSHED C9A.
 139          BA   .185
 140          LS            78
 141          UD    .49

 142          KK   CP9A
 143          KM       ADD HYDROGRAPHS AT CP9A.
 144          HC      2

 145          KK    CP9
 146          KM       ROUTE FLOW FROM CP9A TO CP9.
 147          RK   1000   .003   .012           CIRC     6.5

 148          KK    CP9
 149          KM       COMBINE HYDROGRAPHS AT CP9.
 150          HC      2

 151          KK    C10
 152          KM       RUNOFF FROM SUBWATERSHED 10.
 153          BA   3.63
 154          LS      0      85       0
 155          UD   1.59

 156          KK   CP11
 157          KM      ROUTE FLOW FROM CP10 TO CP11.
 158          RK   5280  .0008   .018                    15       3

 159          KK    C11
 160          KM       RUNOFF FROM SUBWATERSHED 11.
 161          BA   3.85
 162          LS      0      85       0
 163          UD   1.59

 164          KK   CP11
 165          KM       COMBINE HYDROGRAPHS AT CP11.
 166          HC      2
```

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

 167          KK    CP12
 168          KM       ROUTE COMBINED HYDROGRAPH AT CP11 TO CP12.
 169          RK    2500   .0008    .018                     15       2

 170          KK     C12
 171          KM        RUNOFF FROM SUBWATERSHED 12.
 172          BA    2.94
 173          LS       0      85       0
 174          UD    1.64

 175          KK     C13
 176          KM        RUNOFF FROM SUBWATERSHED 13.
 177          BA    1.03
 178          LS       0      89       0
 179          UD    1.12

 180          KK    CP12
 181          KM        ROUTE HYDROGRAPH TO CP12.
 182          RK    4000  .00125    .018                     10       2

 183          KK    CP12
 184          KM        ADD HYDROGRAPHS AT CP12.
 185          HC       3

 186          KK    CP14
 187          KM       ROUTE COMBINED HYDROGRAPH AT CP12 TO CP14.
 188          RK    8425   .0212    .018                     15       2

 189          KK     C14
 190          KM        RUNOFF FROM SUBWATERSHED 14.
 191          BA     .99
 192          LS       0      95       0
 193          UD     .45

 194          KK    CP14
 195          KM        COMBINE HYDROGRAPHS AT CP14.
 196          HC       2

 197          KK    CP15
 198          KM        ROUTE HYDROGRAPH TO C15.
 199          RK    5280   .0232    .018                     20       2

 200          KK     C15
 201          KM        RUNOFF FROM SUBWATERSHED 15.
 202          BA     .71
 203          LS       0      86       0
 204          UD     .65

 205          KK    CP15
 206          KM        ADD HYDROGRAPHS AT CP15.
 207          HC       2
```

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

 208          KK   CP21
 209          KM       ROUTE HYDROGRAPH TO CP21.
 210          RK   9500   .0034    .018                    20       2

 211          KK    C21
 212          KM       RUNOFF FROM C21.
 213          BA   1.96
 214          LS      0      82       0
 215          UD   1.35

 216          KK   CP21
 217          KM       ADD HYDROGRAPHS AT CP21.
 218          HC      2

 219          KK   CP17
 220          KM       ROUTE FLOW AT CP21 TO CP17.
 221          RK  10280   .0025    .018                    25       2

 222          KK    C17
 223          KM       RUNOFF FROM C17.
 224          BA   4.69
 225          LS      0      81       0
 226          UD   2.20

 227          KK   CP17
 228          KM       ADD HYDROGRAPHS AT CP17.
 229          HC      2

 230          KK    C16
 231          KM       RUNOFF FROM C16.
 232          BA   4.70
 233          LS      0      82       0
 234          UD   1.89

 235          KK   CP17
 236          KM       ROUTE HYDROGRAPH TO CP17.
 237          RK   5280   .0023    .018                    10       2

 238          KK   CP17
 239          KM       ADD HYDROGRAPH FROM CP21 WITH CP17.
 240          HC      2

 241          KK   CP22
 242          KM       ROUTE FLOW AT CP17 TO CP22.
 243          RK   5600   .0008    .018                    70       3

 244          KK    C22
 245          KM       RUNOFF FROM C22.
 246          BA    .70
 247          LS             77
 248          UD    .79
```

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

 249          KK    CP22
 250          KM       COMBINE HYDROGRAPHS AT CP22.
 251          HC      2

 252          KK     C18
 253          KM       RUNOFF FROM C18.
 254          BA    1.51
 255          LS             77
 256          UD     .77

 257          KK    CP19
 258          KM       ROUTE FLOW FROM CP18 TO CP19.
 259          RK    6600   .0015    .018                    15       2

 260          KK     C19
 261          KM       RUNOFF FROM SUBWATERSHED C19.
 262          BA    3.61
 263          LS      0      81       0
 264          UD    1.91

 265          KK    CP19
 266          KM       COMBINE HYDROGRAPHS AT CP19.
 267          HC      2

 268          KK    CP20
 269          KM      ROUTE COMBINED HYDROGRAPH TO CP20.
 270          RK    5280   .0032    .018                    20       2

 271          KK     C20
 272          KM       RUNOFF FROM SUBWATERSHED 20.
 273          BA    5.57
 274          LS      0      83       0
 275          UD    2.96

 276          KK    CP20
 277          KM       COMBINE HYDROGRAPHS AT CP20.
 278          HC      2

 279          KK    C20A
 280          KM       RUNOFF FROM C20A.
 281          BA     .50
 282          LS             78
 283          UD     .73

 284          KK    CP20
 285          KM       COMBINE HYDROGRAPHS AT CP20.
 286          HC      2

 287          KK    CP23
 288          KM       ROUT COMBINED HYDROGRAPH AT CP20 TO CP23.
 289          RK   14500   .0011    .018                    30       2
```

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

 290          KK     C23
 291          KM        RUNOFF FROM C23.
 292          BA    1.32
 293          LS              76
 294          UD    1.43

 295          KK    CP23
 296          KM        COMBINE FLOW AT CP23.
 297          HC       2
 298          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

  15         C1
              V
              V
  27        CP2
              .
              .
  30          .          C2
              .           .
              .           .
  35        CP2............
              V
              V
  38        CP3
              .
              .
  41          .          C3
              .           .
              .           .
  46        CP3............
              V
              V
  49        CP4
              .
              .
  52          .          C4
              .           .
              .           .
  57        CP4............
              V
              V
  60        CP5
              .
              .
  63          .          C5
              .           .
              .           .
  68        CP5............
              V
              V
  71        CP6
              .
              .
  74          .          C6
              .           .
              .           .
  79        CP6............
              V
              V
  82        CP7
              .
              .
  85          .          C7
              .           .
              .           .
```

```
90        CP7............
            V
            V
93       CP8A
            V
            V
97        CP8
            .
            .
99          .          C8
            .           .
            .           .
104       CP8............
            V
            V
107       CP9
            .
            .
110         .          C9
            .           .
            .           .
115       CP9............
            .
            .
118         .         C9C
            .           V
            .           V
123         .        CP9B
            .           .
            .           .
126         .           .         C9B
            .           .           .
            .           .           .
131         .        CP9B............
            .           V
            .           V
134         .        CP9A
            .           .
            .           .
137         .           .         C9A
            .           .           .
            .           .           .
142         .        CP9A............
            .           V
            .           V
145         .         CP9
            .           .
            .           .
148       CP9............
            .
            .
151         .         C10
            .           V
            .           V
156         .        CP11
            .           .
            .           .
159         .           .         C11
            .           .           .
            .           .           .
164         .        CP11............
            .           V
            .           V
167         .        CP12
            .           .
```

```
170         .         .        C12
            .         .         .
            .         .         .
175         .         .         .        C13
            .         .         .         V
            .         .         .         V
180         .         .         .       CP12
            .         .         .         .
            .         .         .         .
183         .       CP12......................
            .         V
            .         V
186         .       CP14
            .         .
            .         .
189         .         .        C14
            .         .         .
            .         .         .
194         .       CP14............
            .         V
            .         V
197         .       CP15
            .         .
            .         .
200         .         .        C15
            .         .         .
            .         .         .
205         .       CP15............
            .         V
            .         V
208         .       CP21
            .         .
            .         .
211         .         .        C21
            .         .         .
            .         .         .
216         .       CP21............
            .         V
            .         V
219         .       CP17
            .         .
            .         .
222         .         .        C17
            .         .         .
            .         .         .
227         .       CP17............
            .         .
            .         .
230         .         .        C16
            .         .         V
            .         .         V
235         .         .       CP17
            .         .         .
            .         .         .
238         .       CP17............
            .         V
            .         V
241         .       CP22
            .         .
            .         .
244         .         .        C22
            .         .         .
            .         .         .
249         .       CP22............
            .         .
```

```
252        .          .        C18
           .          .         V
           .          .         V
257        .          .       CP19
           .          .         .
           .          .         .
260        .          .         .        C19
           .          .         .         .
           .          .         .         .
265        .          .       CP19............
           .          .         V
           .          .         V
268        .          .       CP20
           .          .         .
           .          .         .
271        .          .         .        C20
           .          .         .         .
           .          .         .         .
276        .          .       CP20............
           .          .         .
           .          .         .
279        .          .         .       C20A
           .          .         .         .
           .          .         .         .
284        .          .       CP20............
           .          .         V
           .          .         V
287        .          .       CP23
           .          .         .
           .          .         .
290        .          .         .        C23
           .          .         .         .
           .          .         .         .
295        .          .       CP23............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            FEBRUARY 1981             *
*          REVISED 14 JUN 85           *
*                                      *
*      RUN DATE: Mon 07-DEC-1987       *
*          TIME: 16:25:23.33           *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*                                      *
*  (916) 756-1104 OR (FTS) 448-3283    *
*                                      *
****************************************
```

```
                    CASEC50                 50-YEAR STORM DATA
                   HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PARADISE FREEWAY TO
                   NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
                   THAT THE PARADISE CORRIDOR CHANNEL IS IN PLACE AND GRAND AVENUE IS A
                   HIGH LEVEL FACILITY.  100-YEAR DRAINAGE FACILITIES WERE ASSUMED IN
                   OLIVE, ORANGEWOOD, AND 27TH AVENUES TO HANDLE FLOW NORTH OF GRAND AVENUE

  8 ID        OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    GSCAL         0.  HYDROGRAPH PLOT SCALE

    IT        HYDROGRAPH TIME DATA
                     NMIN          6  MINUTES IN COMPUTATION INTERVAL
                    IDATE     10JUN86  STARTING DATE
                    ITIME       1200  STARTING TIME
                       NQ        240  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE     11  86  ENDING DATE
                    NDTIME       1154  ENDING TIME

              COMPUTATION INTERVAL    0.10 HOURS
                   TOTAL TIME BASE   23.90 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

  9 JD        INDEX STORM NO. 1
                    STRM       3.29  PRECIPITATION DEPTH
                    TRDA       0.09  TRANSPOSITION DRAINAGE AREA

 10 PI          PRECIPITATION PATTERN
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
```

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
0.02	0.02	0.02	0.02	0.08	0.05	0.11	0.19	0.38	0.71
0.25	0.16	0.10	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

11 ID INDEX STORY NO. 2

STRM 3.25 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

10 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.05	0.09	0.11	0.17	0.35	0.66
0.23	0.15	0.10	0.03	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

12 ID INDEX STORY NO. 3

STRM 3.21 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

10 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.08	0.10	0.12	0.16	0.33	0.63
0.22	0.14	0.10	0.03	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

13 JD INDEX STORM NO. 4

STRM 3.18 PRECIPITATION DEPTH

TRDA 30.00 TRANSPOSITION DRAINAGE AREA

10 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.09	0.10	0.12	0.15	0.31	0.58
0.21	0.13	0.11	0.09	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

14 JD INDEX STORM NO. 5

STRM 3.15 PRECIPITATION DEPTH

TRDA 42.00 TRANSPOSITION DRAINAGE AREA

10 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.09	0.10	0.12	0.15	0.30	0.55
0.19	0.13	0.11	0.09	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

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	C1	1539.	12.70	357.	98.	98.	1.71		
ROUTED TO	CP2	1522.	12.80	356.	97.	97.	1.71		
HYDROGRAPH AT	C2	1825.	12.90	510.	140.	140.	2.66		
2 COMBINED AT	CP2	3283.	12.80	862.	236.	236.	4.37		
ROUTED TO	CP3	3275.	12.90	862.	236.	236.	4.37		
HYDROGRAPH AT	C3	1713.	13.50	676.	187.	187.	3.58		
2 COMBINED AT	CP3	4591.	13.00	1532.	422.	422.	7.95		
ROUTED TO	CP4	4572.	13.10	1533.	421.	421.	7.95		
HYDROGRAPH AT	C4	1684.	13.60	719.	200.	200.	4.00		
2 COMBINED AT	CP4	5895.	13.20	2233.	617.	617.	11.95		
ROUTED TO	CP5	5884.	13.20	2239.	617.	617.	11.95		
HYDROGRAPH AT	C5	910.	13.80	412.	116.	116.	3.19		
2 COMBINED AT	CP5	6566.	13.30	2623.	727.	727.	15.14		
ROUTED TO	CP6	6549.	13.40	2623.	725.	725.	15.14		
HYDROGRAPH AT	C6	1054.	13.30	373.	103.	103.	2.23		
2 COMBINED AT	CP6	7484.	13.40	2970.	823.	823.	17.37		
ROUTED TO	CP7	7483.	13.40	2970.	822.	822.	17.37		
HYDROGRAPH AT	C7	722.	13.20	247.	68.	68.	1.47		
2 COMBINED AT	CP7	8104.	13.40	3197.	886.	886.	18.84		
ROUTED TO	CP8A	8069.	13.40	3198.	886.	886.	18.84		
ROUTED TO	CP8	8069.	13.50	3198.	885.	885.	18.84		
HYDROGRAPH AT	C8	566.	12.90	152.	42.	42.	1.19		
2 COMBINED AT	CP8	8353.	13.40	3329.	924.	924.	20.03		
ROUTED TO	CP9	8353.	13.50	3330.	922.	922.	20.03		

HYDROGRAPH AT	C9	128.	12.60	26.	7.	7.	0.20
2 COMBINED AT	CP9	8378.	13.50	3348.	928.	928.	20.23
HYDROGRAPH AT	C9C	71.	12.50	12.	3.	3.	0.09
ROUTED TO	CP9B	71.	12.50	12.	3.	3.	0.09
HYDROGRAPH AT	C9B	71.	12.50	12.	3.	3.	0.09
2 COMBINED AT	CP9B	140.	12.50	24.	7.	7.	0.19
ROUTED TO	CP9A	140.	12.50	24.	7.	7.	0.19
HYDROGRAPH AT	C9A	131.	12.50	24.	7.	7.	0.19
2 COMBINED AT	CP9A	268.	12.50	48.	13.	13.	0.37
ROUTED TO	CP9	265.	12.50	48.	13.	13.	0.37
2 COMBINED AT	CP9	8414.	13.50	3380.	940.	940.	20.60
HYDROGRAPH AT	C10	1438.	13.70	624.	174.	174.	3.63
ROUTED TO	CP11	1433.	13.70	622.	172.	172.	3.63
HYDROGRAPH AT	C11	1524.	13.70	661.	184.	184.	3.85
2 COMBINED AT	CP11	2938.	13.70	1276.	355.	355.	7.48
ROUTED TO	CP12	2929.	13.80	1277.	355.	355.	7.48
HYDROGRAPH AT	C12	1137.	13.70	505.	141.	141.	2.94
HYDROGRAPH AT	C13	654.	13.10	214.	59.	59.	1.03
ROUTED TO	CP12	652.	13.20	214.	59.	59.	1.03
3 COMBINED AT	CP12	4519.	13.70	1976.	550.	550.	11.45
ROUTED TO	CP14	4505.	13.80	1970.	547.	547.	11.45
HYDROGRAPH AT	C14	1440.	12.40	258.	72.	72.	0.99
2 COMBINED AT	CP14	4626.	13.70	2172.	617.	617.	12.44
ROUTED TO	CP15	4620.	13.80	2173.	616.	616.	12.44
HYDROGRAPH AT	C15	493.	12.90	132.	36.	36.	0.71
2 COMBINED AT	CP15	4797.	13.70	2295.	650.	650.	13.15
ROUTED TO	CP21	4793.	13.80	2291.	647.	647.	13.15
HYDROGRAPH AT	C21	775.	13.40	298.	83.	83.	1.96
2 COMBINED AT	CP21	5436.	13.70	2572.	726.	726.	15.11
ROUTED TO	CP17	5429.	13.80	2562.	721.	721.	15.11
HYDROGRAPH AT	C17	1160.	14.30	642.	185.	185.	4.69

2 COMBINED AT	CP17	6378.	13.90	3159.	897.	897.	19.80
HYDROGRAPH AT	C16	1392.	14.00	690.	196.	196.	4.70
ROUTED TO	CP17	1389.	14.00	690.	195.	195.	4.70
2 COMBINED AT	CP17	7567.	13.90	3784.	1078.	1078.	24.50
ROUTED TO	CP22	7558.	14.00	3774.	1071.	1071.	24.50
HYDROGRAPH AT	C22	328.	12.80	85.	24.	24.	0.70
2 COMBINED AT	CP22	7631.	14.00	3838.	1093.	1093.	25.20
HYDROGRAPH AT	C18	719.	12.80	184.	51.	51.	1.51
ROUTED TO	CP19	700.	13.00	182.	50.	50.	1.51
HYDROGRAPH AT	C19	1010.	14.00	505.	144.	144.	3.61
2 COMBINED AT	CP19	1337.	13.40	685.	193.	193.	5.12
ROUTED TO	CP20	1337.	13.50	684.	193.	193.	5.12
HYDROGRAPH AT	C20	1179.	15.20	780.	237.	237.	5.57
2 COMBINED AT	CP20	2193.	14.30	1440.	427.	427.	10.69
HYDROGRAPH AT	C20A	264.	12.80	64.	18.	18.	0.50
2 COMBINED AT	CP20	2232.	14.30	1491.	444.	444.	11.19
ROUTED TO	CP23	2208.	14.50	1465.	436.	436.	11.19
HYDROGRAPH AT	C23	363.	13.50	149.	42.	42.	1.32
2 COMBINED AT	CP23	2423.	14.30	1593.	476.	476.	12.51

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

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*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            FEBRUARY 1981             *
*          REVISED 14 JUN 85           *
*                                      *
*      RUN DATE: Mon 07-DEC-1987       *
*          TIME: 16:08:40.72           *
*                                      *
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*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET            *
*      DAVIS, CALIFORNIA 95616         *
*                                      *
*  (916) 756-1104 OR (FTS) 448-3285    *
*                                      *
****************************************
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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. THE VERSION RELEASED 31JAN85 CONTAINS NEW OPTIONS ON RL AND BA RECORDS, AND ADDS THE HL RECORD. SEE JANUARY 1985 INPUT DESCRIPTION FOR NEW DEFINITIONS.

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::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION  :::
:::          By: John R. Haestad         :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
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==========
HAESTAD METHODS
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 753-9800

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

  1           ID        CASEC100                100-YEAR STORM DATA
  2           ID        HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
  3           ID        NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
  4           ID        THAT THE PARADISE CORRIDOR CHANNEL IS IN PLACE AND GRAND AVENUE IS A
  5           ID        HIGH LEVEL FACILITY.  100-YEAR DRAINAGE FACILITIES WERE ASSUMED IN
  6           ID        OLIVE, ORANGEWOOD, AND 27TH AVENUES TO HANDLE FLOW NORTH OF GRAND AVENUE
              *DIAGRAM
  7           IT       610JUNE86    1200     240
  8           IO       5
  9           JD            .09
 10           PH                     .71    1.40    2.45    2.64    2.82    3.10    3.40    3.71
 11           JD             10
 12           JD             20
 13           JD             30
 14           JD             40

 15           KK      C1
 16           KM        SUBWATERSHED 1 IN THE OUTER LOOP DRAINAGE STUDY.
 17           KM        SUBWATERSHEDS WILL HEREBY BE DESIGNATED AS THE LETTER C ALONG WITH A
 18           KM        CORRESPONDING NUMBER.  CONCENTRATION POINTS WILL BE LABELED WITH A CP AN
 19           KM        CORRESPONDING NUMBER FOR EACH SUBWATERSHED.  A DRAINAGE AREA MAP WILL BE
 20           KM        PROVIDED TO SHOW EXACT LOCATIONS OF EACH.
 21           KM        THE HYPOTHETICAL DATA CARD IS USED TO INPUT STORM RAINFALL DATA COMPUTED
 22           KM        FROM THE ADDEMDUM TO ADOT'S "HYDROLOGIC DESIGN FOR HIGHWAY DRAINAGE IN
 23           KM        ARIZONA" APRIL 1975.
 24           BA    1.71
 25           LS       0      89       0
 26           UD     .70

 27           KK     CP2
 28           KM       ROUTE FLOW FROM SUBWATERSHED 1 (C1) TO CONCENTRATION POINT 2 (CP2).
 29           RK    5280  .00094    .018                     30       1

 30           KK      C2
 31           KM        RUNOFF FROM SUBWATERSHED 2.
 32           BA    2.66
 33           LS       0      87       0
 34           UD     .90

 35           KK     CP2
 36           KM        COMBINE HYDROGRAPHS AT CP2.
 37           HC       2

 38           KK     CP3
 39           KM       ROUTE COMBINED HYDROGRAPH AT CP2 TO CP3.
 40           RK    5280  .00094    .018              12       2

 41           KK      C3
 42           KM        RUNOFF FROM SUBWATERSHED 3.
 43           BA    3.58
 44           LS       0      87       0
 45           UD    1.41
```

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

  46          KK     CP3
  47          KM       COMBINE HYDROGRAPHS AT CP3.
  48          HC      2

  49          KK     CP4
  50          KM       ROUTE COMBINED HYDROGRAPH AT CP3 TO CP4.
  51          RK    5280  .00195    .018                    12       2

  52          KK      C4
  53          KM       RUNOFF FROM SUBWATERSHED 4.
  54          BA    4.00
  55          LS      0      86       0
  56          UD    1.56

  57          KK     CP4
  58          KM       COMBINE HYDROGRAPHS AT CP4.
  59          HC      2

  60          KK     CP5
  61          KM       ROUT COMBINED HYDROGRAPH AT CP4 TO CP5.
  62          RK    5280   .0014    .018                    12       2

  63          KK      C5
  64          KM       RUNOFF FROM SUBWATERSHED 5.
  65          BA    3.19
  66          LS      0      79       0
  67          UD    1.65

  68          KK     CP5
  69          KM       COMBINE HYDROGRAPHS AT CP5.
  70          HC      2

  71          KK     CP6
  72          KM       ROUTE COMBINED HYDROGRAPH AT CP5 TO CP6.
  73          RK    5280   .0016    .018                    15       2

  74          KK      C6
  75          KM       RUNOFF FROM SUBWATERSHED 6.
  76          BA    2.23
  77          LS      0      84       0
  78          UD    1.22

  79          KK     CP6
  80          KM       COMBINE HYDROGRAPHS AT CP6.
  81          HC      2

  82          KK     CP7
  83          KM       ROUTE COMBINED HYDROGRAPH AT CP6 TO CP7.
  84          RK    5280   .0018    .018                    15       2
```

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

 85           KK     C7
 86           KM       RUNOFF FROM SUBWATERSHED 7.
 87           BA    1.47
 88           LS      0      84       0
 89           UD    1.17

 90           KK    CP7
 91           KM       COMBINE HYDROGRAPHS AT CP7.
 92           HC      2

 93           KK    CP8A
 94           KM       ROUT COMBINED HYDROGRAPH AT CP7 TO CP8.  FIRST TO TRANSITION AT
 95           KM       CP8A THEN TO CP8.
 96           RK    3800  .0023   .018                    15       2

 97           KK    CP8
 98           RK    1480  .0008   .018                    25       2

 99           KK     C8
100           KM       RUNOFF FROM SUBWATERSHED 8.
101           BA    1.19
102           LS      0      78       0
103           UD     .83

104           KK    CP8
105           KM       COMBINE HYDROGRAPHS AT CP8.
106           HC      2

107           KK    CP9
108           KM      ROUTE COMBINED HYDROGRAPH AT CP8 TO CP9.
109           RK    5280  .0008   .018                    25       2

110           KK     C9
111           KM       RUNOFF FROM SUBWATERSHED 9.
112           BA     .20
113           LS      0      78       0
114           UD     .57

115           KK    CP9
116           KM       COMBINE HYDROGRAPHS AT CP9.
117           HC      2

118           KK    C9C
119           KM       RUNOFF FROM SUBWATERSHED C9C.
120           BA    .093
121           LS             78
122           UD     .43

123           KK    CP9B
124           KM       ROUTE FLOW AT CP9C TO CP9B.
125           RK     660  .0043   .012           CIRC       5
```

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

 126          KK     C9B
 127          KM        RUNOFF FROM SUBWATERSHED C9B.
 128          BA    .093
 129          LS              78
 130          UD     .43

 131          KK    CP9B
 132          KM        ADD HYDROGRAPHS AT CP9B.
 133          HC       2

 134          KK    CP9A
 135          KM        ROUTE FLOW FROM CP9B TO CP9A.
 136          RK    1320   .0043    .012            CIRC     6.5

 137          KK     C9A
 138          KM        RUNOFF FROM SUBWATERSHED C9A.
 139          BA    .185
 140          LS              78
 141          UD     .49

 142          KK    CP9A
 143          KM        ADD HYDROGRAPHS AT CP9A.
 144          HC       2

 145          KK     CP9
 146          KM        ROUTE FLOW FROM CP9A TO CP9.
 147          RK    1000    .003    .012            CIRC     6.5

 148          KK     CP9
 149          KM        COMBINE HYDROGRAPHS AT CP9.
 150          HC       2

 151          KK     C10
 152          KM        RUNOFF FROM SUBWATERSHED 10.
 153          BA    3.63
 154          LS       0      85       0
 155          UD    1.59

 156          KK    CP11
 157          KM       ROUTE FLOW FROM CP10 TO CP11.
 158          RK    5280   .0008    .018                     15       2

 159          KK     C11
 160          KM        RUNOFF FROM SUBWATERSHED 11.
 161          BA    3.85
 162          LS       0      85       0
 163          UD    1.59

 164          KK    CP11
 165          KM        COMBINE HYDROGRAPHS AT CP11.
 166          HC       2
```

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

 167          KK    CP12
 168          KM       ROUTE COMBINED HYDROGRAPH AT CP11 TO CP12.
 169          RK    2500   .0008    .018                    15       2

 170          KK     C12
 171          KM        RUNOFF FROM SUBWATERSHED 12.
 172          BA    2.94
 173          LS       0      85       0
 174          UD    1.64

 175          KK     C13
 176          KM        RUNOFF FROM SUBWATERSHED 13.
 177          BA    1.03
 178          LS       0      89       0
 179          UD    1.12

 180          KK    CP12
 181          KM        ROUTE HYDROGRAPH TO CP12.
 182          RK    4000  .00125    .018                    10       2

 183          KK    CP12
 184          KM        ADD HYDROGRAPHS AT CP12.
 185          HC       3

 186          KK    CP14
 187          KM       ROUTE COMBINED HYDROGRAPH AT CP12 TO CP14.
 188          RK    8405   .0012    .018                    15       2

 189          KK     C14
 190          KM        RUNOFF FROM SUBWATERSHED 14.
 191          BA     .99
 192          LS       0      95       0
 193          UD     .46

 194          KK    CP14
 195          KM        COMBINE HYDROGRAPHS AT CP14.
 196          HC       2

 197          KK    CP15
 198          KM        ROUTE HYDROGRAPH TO C15.
 199          RK    5280   .0032    .018                    20       2

 200          KK     C15
 201          KM        RUNOFF FROM SUBWATERSHED 15.
 202          BA     .71
 203          LS       0      86       0
 204          UD     .85

 205          KK    CP15
 206          KM        ADD HYDROGRAPHS AT CP15.
 207          HC       2
```

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

 208          KK   CP21
 209          KM       ROUTE HYDROGRAPH TO CP21.
 210          RK   9600  .0034   .018                    20      2

 211          KK    C21
 212          KM       RUNOFF FROM C21.
 213          BA   1.96
 214          LS      0      82       0
 215          UD   1.35

 216          KK   CP21
 217          KM       ADD HYDROGRAPHS AT CP21.
 218          HC      2

 219          KK   CP17
 220          KM       ROUTE FLOW AT CP21 TO CP17.
 221          RK  10280  .0025   .018                    25      2

 222          KK    C17
 223          KM       RUNOFF FROM C17.
 224          BA   4.69
 225          LS      0      81       0
 226          UD   2.20

 227          KK   CP17
 228          KM       ADD HYDROGRAPHS AT CP17.
 229          HC      2

 230          KK    C16
 231          KM       RUNOFF FROM C16.
 232          BA   4.70
 233          LS      0      82       0
 234          UD   1.89

 235          KK   CP17
 236          KM       ROUTE HYDROGRAPH TO CP17.
 237          RK   5280  .0023   .018                    10      2

 238          KK   CP17
 239          KM       ADD HYDROGRAPH FROM CP21 WITH CP17.
 240          HC      2

 241          KK   CP22
 242          KM       ROUTE FLOW AT CP17 TO CP22.
 243          RK   5600  .0008   .018                    70      3

 244          KK    C22
 245          KM       RUNOFF FROM C22.
 246          BA    .70
 247          LS             77
 248          UD    .79
```

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

 249          KK    CP22
 250          KM       COMBINE HYDROGRAPHS AT CP22.
 251          HC      2

 252          KK     C18
 253          KM       RUNOFF FROM C18.
 254          BA    1.51
 255          LS             77
 256          UD     .77

 257          KK    CP19
 258          KM       ROUTE FLOW FROM CP18 TO CP19.
 259          RK    6600   .0015    .018                    15       2

 260          KK     C19
 261          KM       RUNOFF FROM SUBWATERSHED C19.
 262          BA    3.61
 263          LS      0      81       0
 264          UD    1.91

 265          KK    CP19
 266          KM       COMBINE HYDROGRAPHS AT CP19.
 267          HC      2

 268          KK    CP20
 269          KM      ROUTE COMBINED HYDROGRAPH TO CP20.
 270          RK    5280   .0032    .018                    20       2

 271          KK     C20
 272          KM       RUNOFF FROM SUBWATERSHED 20.
 273          BA    5.57
 274          LS      0      83       0
 275          UD    2.96

 276          KK    CP20
 277          KM       COMBINE HYDROGRAPHS AT CP20.
 278          HC      2

 279          KK    C20A
 280          KM       RUNOFF FROM C20A.
 281          BA     .50
 282          LS             78
 283          UD     .73

 284          KK    CP20
 285          KM       COMBINE HYDROGRAPHS AT CP20.
 286          HC      2

 287          KK    CP23
 288          KM       ROUT COMBINED HYDROGRAPH AT CP20 TO CP23.
 289          RK   14500   .0011    .018                    30       2
```

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

 290          KK     C23
 291          KM        RUNOFF FROM C23.
 292          BA    1.32
 293          LS              76
 294          UD    1.43

 295          KK    CP23
 296          KM        COMBINE FLOW AT CP23.
 297          HC       2
 298          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   15        C1
              V
              V
   27       CP2
              .
              .
   30         .          C2
              .           .
              .           .
   35       CP2............
              V
              V
   38       CP3
              .
              .
   41         .          C3
              .           .
              .           .
   46       CP3............
              V
              V
   49       CP4
              .
              .
   52         .          C4
              .           .
              .           .
   57       CP4............
              V
              V
   60       CP5
              .
              .
   63         .          C5
              .           .
              .           .
   68       CP5............
              V
              V
   71       CP6
              .
              .
   74         .          C6
              .           .
              .           .
   79       CP6............
              V
              V
   82       CP7
              .
              .
   85         .          C7
              .           .
```

```
 90        CP7............
             V
             V
 93        CP8A
             V
             V
 97        CP8
             .
             .
 99          .          C8
             .           .
             .           .
104        CP8............
             V
             V
107        CP9
             .
             .
110          .          C9
             .           .
             .           .
115        CP9............
             .
             .
118          .         C9C
             .           V
             .           V
123          .        CP9B
             .           .
             .           .
126          .           .         C9B
             .           .           .
             .           .           .
131          .        CP9B............
             .           V
             .           V
134          .        CP9A
             .           .
             .           .
137          .           .         C9A
             .           .           .
             .           .           .
142          .        CP9A............
             .           V
             .           V
145          .         CP9
             .           .
             .           .
148        CP9............
             .
             .
151          .         C10
             .           V
             .           V
156          .        CP11
             .           .
             .           .
159          .           .         C11
             .           .           .
             .           .           .
164          .        CP11............
             .           V
             .           V
167          .        CP12
             .           .
```

```
170         .         .        C12
            .         .         .
            .         .         .
175         .         .         .        C13
            .         .         .         V
            .         .         .         V
180         .         .         .       CP12
            .         .         .         ..
            .         .         .         .
183         .       CP12.......................
            .         V
            .         V
186         .       CP14
            .         .
            .         .
189         .         .        C14
            .         .         .
            .         .         .
194         .       CP14............
            .         V
            .         V
197         .       CP15
            .         .
            .         .
200         .         .        C15
            .         .         .
            .         .         .
205         .       CP15............
            .         V
            .         V
208         .       CP21
            .         .
            .         .
211         .         .        C21
            .         .         .
            .         .         .
216         .       CP21............
            .         V
            .         V
219         .       CP17
            .         .
            .         .
222         .         .        C17
            .         .         .
            .         .         .
227         .       CP17............
            .         .
            .         .
230         .         .        C16
            .         .         V
            .         .         V
235         .         .       CP17
            .         .         .
            .         .         .
238         .       CP17............
            .         V
            .         V
241         .       CP22
            .         .
            .         .
244         .         .        C22
            .         .         .
            .         .         .
249         .       CP22............
            .         .
```

```
252        .         .       C18
           .         .        V
           .         .        V
257        .         .      CP19
           .         .        .
           .         .        .
260        .         .        .        C19
           .         .        .         .
           .         .        .         .
265        .         .      CP19............
           .         .        V
           .         .        V
268        .         .      CP20
           .         .        .
           .         .        .
271        .         .        .        C20
           .         .        .         .
           .         .        .         .
276        .         .      CP20............
           .         .        .
           .         .        .
279        .         .        .       C20A
           .         .        .         .
           .         .        .         .
284        .         .      CP20............
           .         .        V
           .         .        V
287        .         .      CP23
           .         .        .
           .         .        .
290        .         .        .        C23
           .         .        .         .
           .         .        .         .
295        .         .      CP23............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*           FEBRUARY 1981              *
*         REVISED 14 JUN 85            *
*                                      *
*      RUN DATE: Mon 07-DEC-1987       *
*          TIME: 16:09:11.81           *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*                                      *
*  (916) 756-1104 OR (FTS) 448-3285    *
*                                      *
****************************************
```

```
                    CASEC100              100-YEAR STORM DATA
                    HEC-1 MODEL FOR THE OUTER LOOP DRAINAGE STUDY, PAPAGO FREEWAY TO
                    NORTHERN AVENUE SECTION.  DRAINAGE AREA DELINEATIONS WERE MADE ASSUMING
                    THAT THE PARADISE CORRIDOR CHANNEL IS IN PLACE AND GRAND AVENUE IS A
                    HIGH LEVEL FACILITY.  100-YEAR DRAINAGE FACILITIES WERE ASSUMED IN
                    OLIVE, ORANGEWOOD, AND 27TH AVENUES TO HANDLE FLOW NORTH OF GRAND AVENUE

  8 IO        OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT         HYDROGRAPH TIME DATA
                     NMIN          6  MINUTES IN COMPUTATION INTERVAL
                    IDATE     10JUN85  STARTING DATE
                    ITIME       1200  STARTING TIME
                       NQ        240  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE     11   86  ENDING DATE
                   NDTIME       1154  ENDING TIME

              COMPUTATION INTERVAL    0.10 HOURS
                   TOTAL TIME BASE   23.90 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

  9 JD        INDEX STORM NO. 1
                    STRM       3.71  PRECIPITATION DEPTH
                    TRDA       0.03  TRANSPOSITION DRAINAGE AREA

 10 PI          PRECIPITATION PATTERN
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.01      0.01      0.01
                  0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01
```

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01
0.02	0.02	0.02	0.02	0.09	0.11	0.13	0.21	0.44	0.80
0.28	0.18	0.12	0.10	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

11 JD INDEX STORM NO. 2

STRM 3.66 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

10 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.03	0.09	0.11	0.13	0.20	0.41	0.75
0.26	0.17	0.12	0.10	0.03	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

12 JD INDEX STORM NO. 3

STRM 3.62 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

10 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.03	0.09	0.11	0.13	0.18	0.38	0.70
0.25	0.16	0.12	0.10	0.03	0.03	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

13 JD INDEX STORM NO. 4

STRM 3.59 PRECIPITATION DEPTH

TRDA 30.00 TRANSPOSITION DRAINAGE AREA

10 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.10	0.11	0.13	0.17	0.36	0.66
0.23	0.15	0.12	0.10	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

14 JD INDEX STORM NO. 5

STRM 3.56 PRECIPITATION DEPTH

TRDA 40.00 TRANSPOSITION DRAINAGE AREA

10 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.03	0.03	0.03	0.10	0.11	0.13	0.17	0.34	0.63
0.22	0.14	0.12	0.10	0.03	0.03	0.03	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

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	C1	1820.	12.70	419.	116.	116.	1.71		
ROUTED TO	CP2	1799.	12.80	418.	115.	115.	1.71		
HYDROGRAPH AT	C2	2178.	12.90	604.	166.	166.	2.66		
2 COMBINED AT	CP2	3907.	12.80	1019.	280.	280.	4.37		
ROUTED TO	CP3	3884.	12.90	1019.	280.	280.	4.37		
HYDROGRAPH AT	C3	2041.	13.40	803.	222.	222.	3.58		
2 COMBINED AT	CP3	5449.	13.00	1815.	501.	501.	7.95		
ROUTED TO	CP4	5427.	13.00	1819.	501.	501.	7.95		
HYDROGRAPH AT	C4	2016.	13.60	858.	239.	239.	4.00		
2 COMBINED AT	CP4	7004.	13.10	2655.	735.	735.	11.95		
ROUTED TO	CP5	7003.	13.20	2659.	735.	735.	11.95		
HYDROGRAPH AT	C5	1132.	13.70	510.	143.	143.	3.19		
2 COMBINED AT	CP5	7844.	13.30	3135.	871.	871.	15.14		
ROUTED TO	CP6	7821.	13.30	3141.	871.	871.	15.14		
HYDROGRAPH AT	C6	1274.	13.30	450.	124.	124.	2.23		
2 COMBINED AT	CP6	8974.	13.30	3561.	989.	989.	17.37		
ROUTED TO	CP7	8963.	13.40	3568.	989.	989.	17.37		
HYDROGRAPH AT	C7	874.	13.20	298.	82.	82.	1.47		
2 COMBINED AT	CP7	9713.	13.40	3843.	1067.	1067.	18.84		
ROUTED TO	CP8A	9692.	13.40	3844.	1066.	1066.	18.84		
ROUTED TO	CP8	9663.	13.40	3843.	1065.	1065.	18.84		
HYDROGRAPH AT	C8	710.	12.90	189.	52.	52.	1.19		
2 COMBINED AT	CP8	10058.	13.40	4010.	1114.	1114.	20.03		
ROUTED TO	CP9	10045.	13.50	4013.	1111.	1111.	20.03		

HYDROGRAPH AT	C9	161.	12.60	32.	9.	9.	0.20
2 COMBINED AT	CP9	10076.	13.50	4037.	1119.	1119.	20.23
HYDROGRAPH AT	C9C	89.	12.40	15.	4.	4.	0.09
ROUTED TO	CP9B	89.	12.50	15.	4.	4.	0.09
HYDROGRAPH AT	C9B	89.	12.40	15.	4.	4.	0.09
2 COMBINED AT	CP9B	176.	12.50	30.	8.	8.	0.19
ROUTED TO	CP9A	176.	12.50	30.	8.	8.	0.19
HYDROGRAPH AT	C9A	164.	12.50	30.	8.	8.	0.19
2 COMBINED AT	CP9A	337.	12.50	60.	16.	16.	0.37
ROUTED TO	CP9	334.	12.50	60.	16.	16.	0.37
2 COMBINED AT	CP9	10120.	13.50	4080.	1134.	1134.	20.60
HYDROGRAPH AT	C10	1730.	13.60	748.	208.	208.	3.63
ROUTED TO	CP11	1727.	13.70	746.	207.	207.	3.63
HYDROGRAPH AT	C11	1834.	13.60	794.	221.	221.	3.85
2 COMBINED AT	CP11	3537.	13.70	1532.	427.	427.	7.48
ROUTED TO	CP12	3530.	13.70	1533.	426.	426.	7.48
HYDROGRAPH AT	C12	1368.	13.70	605.	169.	169.	2.94
HYDROGRAPH AT	C13	772.	13.10	252.	69.	69.	1.03
ROUTED TO	CP12	770.	13.20	252.	69.	69.	1.03
3 COMBINED AT	CP12	5432.	13.60	2367.	660.	660.	11.45
ROUTED TO	CP14	5423.	13.70	2361.	656.	656.	11.45
HYDROGRAPH AT	C14	1658.	12.40	295.	83.	83.	0.99
2 COMBINED AT	CP14	5564.	13.70	2597.	737.	737.	12.44
ROUTED TO	CP15	5550.	13.70	2597.	735.	735.	12.44
HYDROGRAPH AT	C15	591.	12.90	157.	43.	43.	0.71
2 COMBINED AT	CP15	5776.	13.70	2744.	776.	776.	13.15
ROUTED TO	CP21	5763.	13.80	2739.	773.	773.	13.15
HYDROGRAPH AT	C21	949.	13.40	363.	100.	100.	1.96
2 COMBINED AT	CP21	6571.	13.70	3090.	869.	869.	15.11
ROUTED TO	CP17	6558.	13.80	3072.	864.	864.	15.11

HYDROGRAPH AT	C17	1427.	14.30	786.	227.	227.	4.69
2 COMBINED AT	CP17	7711.	13.80	3805.	1079.	1079.	19.80
HYDROGRAPH AT	C16	1702.	14.00	841.	238.	238.	4.70
ROUTED TO	CP17	1702.	14.10	841.	237.	237.	4.70
2 COMBINED AT	CP17	9172.	13.90	4571.	1301.	1301.	24.50
ROUTED TO	CP22	9156.	13.90	4560.	1293.	1293.	24.50
HYDROGRAPH AT	C22	416.	12.80	107.	29.	29.	0.70
2 COMBINED AT	CP22	9260.	13.90	4641.	1320.	1320.	25.20
HYDROGRAPH AT	C18	909.	12.80	229.	63.	63.	1.51
ROUTED TO	CP19	887.	12.90	227.	63.	63.	1.51
HYDROGRAPH AT	C19	1242.	14.00	619.	176.	176.	3.61
2 COMBINED AT	CP19	1651.	13.30	843.	238.	238.	5.12
ROUTED TO	CP20	1650.	13.40	843.	237.	237.	5.12
HYDROGRAPH AT	C20	1433.	15.20	946.	287.	287.	5.57
2 COMBINED AT	CP20	2685.	14.30	1758.	521.	521.	10.69
HYDROGRAPH AT	C20A	331.	12.80	80.	22.	22.	0.50
2 COMBINED AT	CP20	2733.	14.30	1823.	542.	542.	11.19
ROUTED TO	CP23	2715.	14.50	1796.	533.	533.	11.19
HYDROGRAPH AT	C23	460.	13.50	187.	52.	52.	1.32
2 COMBINED AT	CP23	2988.	14.30	1958.	583.	583.	12.51

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